
Pro-Server EX Reference Manual

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Supported Models

■ ST6000 Series

| Series Name | Model | Type |
|----------------|-----------|---------------|
| ST-6200 Series | ST-6200WA | PFXST6200WADE |
| ST-6300 Series | ST-6300TA | PFXST6300TADE |
| ST-6400 Series | ST-6400WA | PFXST6400WADE |
| ST-6500 Series | ST-6500WA | PFXST6500WADE |
| | ST-6500TA | PFXST6500TADE |
| ST-6600 Series | ST-6600WA | PFXST6600WADE |
| ST-6700 Series | ST-6700WA | PFXST6700WADE |

■ STM6000 Series

| Series Name | Model | Type |
|--------------------|------------|----------------|
| STM-6200 Series | STM-6200WA | PFXSTM6200WADE |
| STM-6400 Series | STM-6400WA | PFXSTM6400WADE |
| STM-Gateway Series | STM-6B00 | PFXSTM6B00DE |

■ STC6000 Series

| Series Name | Model | Type |
|-----------------|------------|---------------|
| STC-6300 Series | STC-6300TA | PFXSTC6300TAD |

■ SP5000 Series

| Box Module | Model | Type |
|--------------|---------|-----------|
| Standard Box | SP-5B00 | PFXSP5B00 |
| Power Box | SP-5B10 | PFXSP5B10 |
| eXtreme Box | SP-5B90 | PFXSP5B90 |
| Open Box | SP-5B40 | PFXSP5B40 |
| | SP-5B41 | PFXSP5B41 |

■ GP4000 Series

| Series Name | Model | Type |
|----------------|---------------------------------------|------------------|
| GP-4100 Series | GP-4114T | PFXGP4114T2D |
| GP-4200 Series | GP-4201T | PFXGP4201TAD |
| | GP-4201TM(Modular Type) ^{*1} | PFXGM4201TAD |
| | GP-4203T | PFXGP4203TAD |
| GP-4300 Series | GP-4301T | PFXGP4301TAD |
| | GP-4301TM(Modular Type) ^{*1} | PFXGM4301TAD |
| | GP-4301TW | PFXGP4301TADW |
| | GP-4303T | PFXGP4303TAD |
| | GP-4311HT | PFXGP4311HTAD |
| | | PFXGP4311HTADER |
| | | PFXGP4311HTADERK |
| | | PFXGP4311HTADEYK |
| | | PFXGP4311HTADEGK |
| GP-4400 Series | GP-4401T | PFXGP4401TAD |
| | GP-4401WW | PFXGP4401WADW |
| GP-4500 Series | GP-4501T(Analog Touch Panel) | PFXGP4501TAA |
| | | PFXGP4501TAD |
| | GP-4501T(Matrix Touch Panel) | PFXGP4501TMD |
| | | PFXGP4501TMA |
| | GP-4501TW | PFXGP4501TADW |
| | GP-4503T | PFXGP4503TAD |
| GP-4600 Series | GP-4601T(Analog Touch Panel) | PFXGP4601TAA |
| | | PFXGP4601TAD |
| | GP-4601T(Matrix Touch Panel) | PFXGP4601TMA |
| | | PFXGP4601TMD |
| | GP-4603T | PFXGP4603TAD |
| | GP-4621T | PFXGP4621TAA |
| | | PFXGP4621TAD |
| GP-4G00 Series | GP-4G01 | PFXGP4G01D |
| GP-Rear Module | GP-4000M(Rear Modular Type) | PFXGM4B01D |

*1 You need to transfer a screen project file created in GP-Pro EX V3.10 or later.

■ GP3000 Series

| Series Name | Model | Type |
|----------------|----------------|---------------------|
| GP3000H Series | AGP-3300HL | AGP3300H-L1-D24 |
| | AGP-3300HS | AGP3300H-S1-D24 |
| | AGP-3310HT | AGP3310H-T1-D24 |
| GP-3200 Series | AGP-3200A | AGP3200-A1-D24 |
| | AGP-3200T | AGP3200-T1-D24 |
| GP-3300 Series | AGP-3300L | AGP3300-L1-D24 |
| | AGP-3300L-D81 | AGP3300-L1-D24-D81K |
| | | AGP3300-L1-D24-D81C |
| | AGP-3300L-FN1M | AGP3300-L1-D24-FN1M |
| | AGP-3300L-CA1M | AGP3300-L1-D24-CA1M |
| | AGP-3300S | AGP3300-S1-D24 |
| | AGP-3300S-D81 | AGP3300-S1-D24-D81K |
| | | AGP3300-S1-D24-D81C |
| | AGP-3300S-CA1M | AGP3300-S1-D24-CA1M |
| | AGP-3300T | AGP3300-T1-D24 |
| | AGP-3300T-D81 | AGP3300-T1-D24-D81K |
| | | AGP3300-T1-D24-D81C |
| | AGP-3300T-FN1M | AGP3300-T1-D24-FN1M |
| | AGP-3300T-CA1M | AGP3300-T1-D24-CA1M |
| | AGP-3300U | AGP3300-U1-D24 |
| | AGP-3310T | AGP3310-T1-D24 |
| | AGP-3360T | AGP3360-T1-D24 |
| GP-3400 Series | AGP-3400S | AGP3400-S1-D24 |
| | AGP-3400S-D81 | AGP3400-S1-D24-D81K |
| | | AGP3400-S1-D24-D81C |
| | AGP-3400S-CA1M | AGP3400-S1-D24-CA1M |
| | AGP-3400T | AGP3400-T1-D24 |
| | AGP-3400T-D81 | AGP3400-T1-D24-D81K |
| | | AGP3400-T1-D24-D81C |
| | AGP-3400T-FN1M | AGP3400-T1-D24-FN1M |
| | AGP-3400T-CA1M | AGP3400-T1-D24-CA1M |
| | AGP-3450T | AGP3450-T1-D24 |

| Series Name | Model | Type |
|----------------|----------------|---------------------|
| GP-3500 Series | AGP-3500L | AGP3500-L1-D24 |
| | AGP-3500L-D81 | AGP3500-L1-D24-D81C |
| | AGP-3500S | AGP3500-S1-AF |
| | | AGP3500-S1-D24 |
| | AGP-3500S-D81 | AGP3500-S1-AF-D81K |
| | | AGP3500-S1-AF-D81C |
| | | AGP3500-S1-D24-D81K |
| | | AGP3500-S1-D24-D81C |
| | AGP-3500S-CA1M | AGP3500-S1-AF-CA1M |
| | | AGP3500-S1-D24-CA1M |
| | AGP-3500T | AGP3500-T1-AF |
| | | AGP3500-T1-D24 |
| | AGP-3500T-D81 | AGP3500-T1-AF-D81K |
| | | AGP3500-T1-AF-D81C |
| | | AGP3500-T1-D24-D81K |
| | | AGP3500-T1-D24-D81C |
| | AGP-3500T-FN1M | AGP3500-T1-AF-FN1M |
| | | AGP3500-T1-D24-FN1M |
| | AGP-3500T-CA1M | AGP3500-T1-AF-CA1M |
| | | AGP3500-T1-D24-CA1M |
| | AGP-3510T | AGP3510-T1-AF |
| | AGP-3510T-CA1M | AGP3510-T1-AF-CA1M |
| | AGP-3550T | AGP3550-T1-AF |
| | AGP-3560T | AGP3560-T1-AF |
| GP-3600 Series | AGP-3600T | AGP3600-T1-AF |
| | | AGP3600-T1-D24 |
| | AGP-3600T-D81 | AGP3600-T1-AF-D81K |
| | | AGP3600-T1-AF-D81C |
| | | AGP3600-T1-D24-D81K |
| | | AGP3600-T1-D24-D81C |
| | AGP-3600T-FN1M | AGP3600-T1-AF-FN1M |
| | | AGP3600-T1-D24-FN1M |
| | AGP-3600T-CA1M | AGP3600-T1-AF-CA1M |
| | | AGP3600-T1-D24-CA1M |
| | AGP-3600U-CA1M | AGP3600-U1-D24-CA1M |
| | AGP-3650T | AGP3650-T1-AF |
| | AGP-3650U | AGP3650-U1-D24 |
| GP-3700 Series | AGP-3750T | AGP3750-T1-AF |
| | | AGP3750-T1-D24 |

■ WinGP

| Series Name | | Type |
|-------------|----------------------------|--|
| PS Series | PS-2000B Series | PS2000B-41 |
| | PS-3000B Series | PS3000-BA |
| | PS-3001B Series | PS3001-BD |
| | PS-3450A Series | PS3450A-T41 |
| | | PS3450A-T41-24V |
| | PS-3451A Series | PS3451A-T41-24V |
| | PS-3650A Series | PS3650A-T41 |
| | | PS3650A-T42 |
| | | PS3650A-T42-24V |
| | PS-3651A Series | PS3651A-T41 |
| | | PS3651A-T42 |
| | | PS3651A-T42-24V |
| | PS-3700A Series | PS3700A-T41-ASU-P41 |
| | PS-3710A Series | PS3710A-T41 |
| | | PS3710A-T42 |
| | | PS3710A-T41-PA1 |
| | | PS3710A-T42-24V |
| | PS-3711A Series | PS3711A-T41 |
| | | PS3711A-T42 |
| | | PS3711A-T41-24V |
| | | PS3711A-T42-24V |
| | PS-5000, PS/PE-4*00 Series | PS5000 Series, PS4000 Series PE4000 Series, PE4000B Series *1 |
| PL Series | PL-3000B Series | APL3000-BA |
| | | APL3000-BD |
| | PL-3600T Series | APL3600-TA |
| | | APL3600-TD |
| | PL-3600K Series | APL3600-KA |
| | | APL3600-KD |
| | PL-3700T Series | APL3700-TA |
| | | APL3700-TD |
| | PL-3700K Series | APL3700-KA |
| | | APL3700-KD |
| PC/AT | PC/AT | APL3900-TA |
| | | APL3900-TD |
| PC/AT | PC/AT | - |

*1 For details about the models, refer to the corresponding hardware manual for your display unit.

■ LT4000 Series

| Series Name | Model | Type |
|---------------|------------------------------------|----------------|
| LT4000 Series | LT-4201TM (Modular Type Analog) | PFXLM4201TADAC |
| | | PFXLM4201TADAK |
| | LT-4201TM (Modular Type DIO) | PFXLM4201TADDC |
| | | PFXLM4201TADDK |
| | LT-4301TM (Modular Type Analog) | PFXLM4301TADAC |
| | | PFXLM4301TADAK |
| | LT-4301TM (Modular Type DIO) | PFXLM4301TADDC |
| | | PFXLM4301TADDK |
| | LT-4000M (Rear Module Analog) | PFXLM4B01DAC |
| | | PFXLM4B01DAK |
| | LT-4000M (Rear Module DIO) | PFXLM4B01DDC |
| | | PFXLM4B01DDK |

■ LT3000 Series

| Series Name | Model | Type |
|---------------|----------|-----------------|
| LT3000 Series | LT-3300L | LT3300-L1-D24-K |
| | | LT3300-L1-D24-C |
| | LT-3300S | LT3300-S1-D24-K |
| | | LT3300-S1-D24-C |
| | LT-3300T | LT3300-T1-D24-K |
| | | LT3300-T1-D24-C |

■ GP2000 Series/GP77R Series/GLC Series/Factory Gateway

IMPORTANT

- The selected GP2000 Series / GP77R Series / GLC Series / Factory Gateway are no longer sold nor maintained.
Please consider replacing your devices with a new, successor model.
For details, please visit our homepage for "Recommended Substitution", which will also reduce cybersecurity vulnerabilities.

| Series Name | Model | Type | Built-in Ethernet | External Ethernet | Remarks |
|-----------------|------------------|---------------------|-------------------|-------------------|---------------|
| GP2300 Series | GP-2300L | GP2300-LG41-24V | Available | Not Available | - |
| | GP-2300T | GP2300-TC41-24V | | | |
| GP2400 Series | GP-2400T | GP2400-TC41-24V | | Not Available | Available |
| GP2500 Series | GP-2500T | GP2500-TC11 | | | |
| | | GP2500-TC41-24V | | | |
| GP2501 Series | GP-2501S | GP2501-SC11 | | | |
| | GP-2501T | GP2501-TC11 | | | |
| GP2600 Series | GP-2600T | GP2600-TC11 | Available | Available | *1 |
| | | GP2600-TC41-24V | | | |
| GP2601 Series | GP-2601 | GP2601-TC11 | Not Available | | *2 |
| GLC2300 Series | GLC2300L | GLC2300-LG41-24V | Available | | Not Available |
| | GLC2300T | GLC2300-TC41-24V | | | |
| GLC2400 Series | GLC2400T | GLC2400-TC41-24V | | Available | Available |
| GLC2500 Series | GLC2500T | GLC2500-TC41-24V | | | |
| | | GLC2500-TC41-200V | | | |
| GLC2600 Series | GLC2600T | GLC2600-TC41-24V | | | |
| | | GLC2600-TC41-200V | | | |
| GP77R Series | GP-377RT | GP377R-TC11-24V | Not Available | Available | *2 |
| | | GP377R-TC41-24V | | | |
| | GP-477RE | GP477R-EG11 | | | |
| | | GP477R-EG41-24VP | | | |
| | GP-577RS | GP577R-SC11 | | | |
| | | GP577R-SC41-24VP | | | |
| GP-577RT | GP577R-TC11 | | | | |
| | GP577R-TC41-24VP | | | | |
| IT2400 Series | IT2400 TypeA | IT2400-TC41-GP | Available | Not Available | - |
| | | IT2400-TC41-GP200V | | | |
| | IT2400 TypeB | IT2400-TC41-GLC | | | |
| | | IT2400-TC41-GLC200V | | | |
| Factory Gateway | Factory Gateway | FGW-SE41-24V | Available | - | - |

*1 GP Ethernet I/F Unit or Multi Unit E is also applicable.

*2 GP Ethernet I/F Unit or Multi Unit E is necessary.

NOTE

- Using 'Pro-Server EX' with GP-2501 Series or GP-2601 Series requires an expansion Ethernet unit. Therefore, protocols that need expansion units cannot be used in this case.
 - For GP-2501 Series and GP-2601 Series, 'Pro-Server EX' and Ethernet protocols cannot be used simultaneously.
 - The IP addresses, port Nos., etc. are different when with only built-in Ethernet and when with an expansion Ethernet unit mounted.
-

OPERATING ENVIRONMENT

Confirm that the computer (PC/AT compatible machine) or display unit on which you will install this product meets the following operating requirements..

IMPORTANT

- This product must be installed and configured by qualified software installation staff with administrator rights.

| Item | Requirements |
|-------------------------------|--|
| OS | PC/AT Compatible Machine <ul style="list-style-type: none"> • Windows 10 For 32/64-bit versions, Home Edition, Pro Edition, Enterprise Edition • Windows 11 For 64-bit versions, Home Edition, Pro Edition, Enterprise Edition • Windows Server 2016 For 64-bit versions, Essentials Edition, Standard Edition, Datacenter Edition • Windows Server 2019 For 64-bit versions, Essentials Edition, Standard Edition, Datacenter Edition SP5000 Series Open Box <ul style="list-style-type: none"> • Windows Embedded Standard 7 (ML) • Windows 10 IoT Enterprise 2019 LTSC (32 bit) PE4000B Series <ul style="list-style-type: none"> • Windows Embedded Standard 7 (ML) PS5000 Series <ul style="list-style-type: none"> • Windows 7 (ML) • Windows Embedded Standard 7 (ML) • Windows Embedded 8.1 Industry (ML) • Windows 10 32bit/64bit (Home/Pro/Enterprise) • Windows 10 IoT Enterprise 2016 LTSC (64 bit) PS6000 Series <ul style="list-style-type: none"> • Windows 10 IoT Enterprise 2019 LTSC (64 bit) |
| CPU | Follows the above operating system requirements. |
| Resolution | SVGA 800x600 or more 256 colors or more is required. Only 96dpi font is supported. |
| Memory | Follows the above operating system requirements. |
| Hard Disk Space ^{*1} | Pro-Server EX Developer Operating Environment : 1.1 GB (2.2 GB recommended) Pro-Server EX Runtime Operating Environment : 650 MB (1.3 GB recommended) |
| Others programs | <ul style="list-style-type: none"> • .NET Framework Ver.2.0^{*2} • Adobe^(R) Acrobat^(R) Reader^(R) Ver.6.0.3 or later |
| Supported Language | English, Japanese |
| LAN Port | <ul style="list-style-type: none"> • Commercially available LAN cable (10BASE-2, 10BASE-5, 10BASE-T, 100BASE-T, 1000BASE-T) • HUB |
| DVD Drive | Compatible with the above operating systems (Use during installation.) |
| Mouse | Compatible with the above operating systems (Required.) |
| Printer | Compatible with the above operating systems (Required for printing.) |

| Item | Requirements |
|----------------------------|---|
| Other required environment | Environment for connecting to the Internet (Required for user registration and online updates.) |

*1 Free space required for installation.

*2 Automatically installed in the PC without .NET Framework Ver.2.0

■ Application Software

Depending on the Pro-Server EX feature you want to use, you may need to install one or all the following software.

- Microsoft^(R) Excel^(R) 2016, 2019, 2021
- Microsoft^(R) Access^(R) 2016, 2019, 2021
- Microsoft^(R) SQL Server^(R) 2016 / 2017 / 2019 / 2022 or Oracle^(R) database 8, 10g, 11g'

NOTE

- This product supports Microsoft^(R) Office 32-bit edition. Even if you use the 64-bit edition of the operating system (x64 Edition), you can only use the 32-bit version of Microsoft^(R) Office.
- The file format needed to be compatible with Microsoft^(R) Office 2003 or earlier for actions (except for Excel Form Action).
- For SQL Server^(R), use SQL Server authentication. Windows authentication is not supported.
- When using a 64-bit operating system, the Oracle^(R) databases above will not run. Use "Oracle ODBC Driver" version 8.0.5.5.0 or later.
- This product supports the Microsoft^(R) Desktop Office Apps. You cannot use the Office applications from the Microsoft Store. For information on how to migrate to the Desktop Office Apps, see the Microsoft website.

■ User Application Development Environment

The programming languages that can use API functions are:

- Visual Basic 6.0
- Visual C++
- Excel VBA
- VB.NET (.NET Framework 1.1 to 4.5)
- C# (.NET Framework 1.1 to 4.5)

When creating original programs, development environments that can use the programming languages listed above can be used.

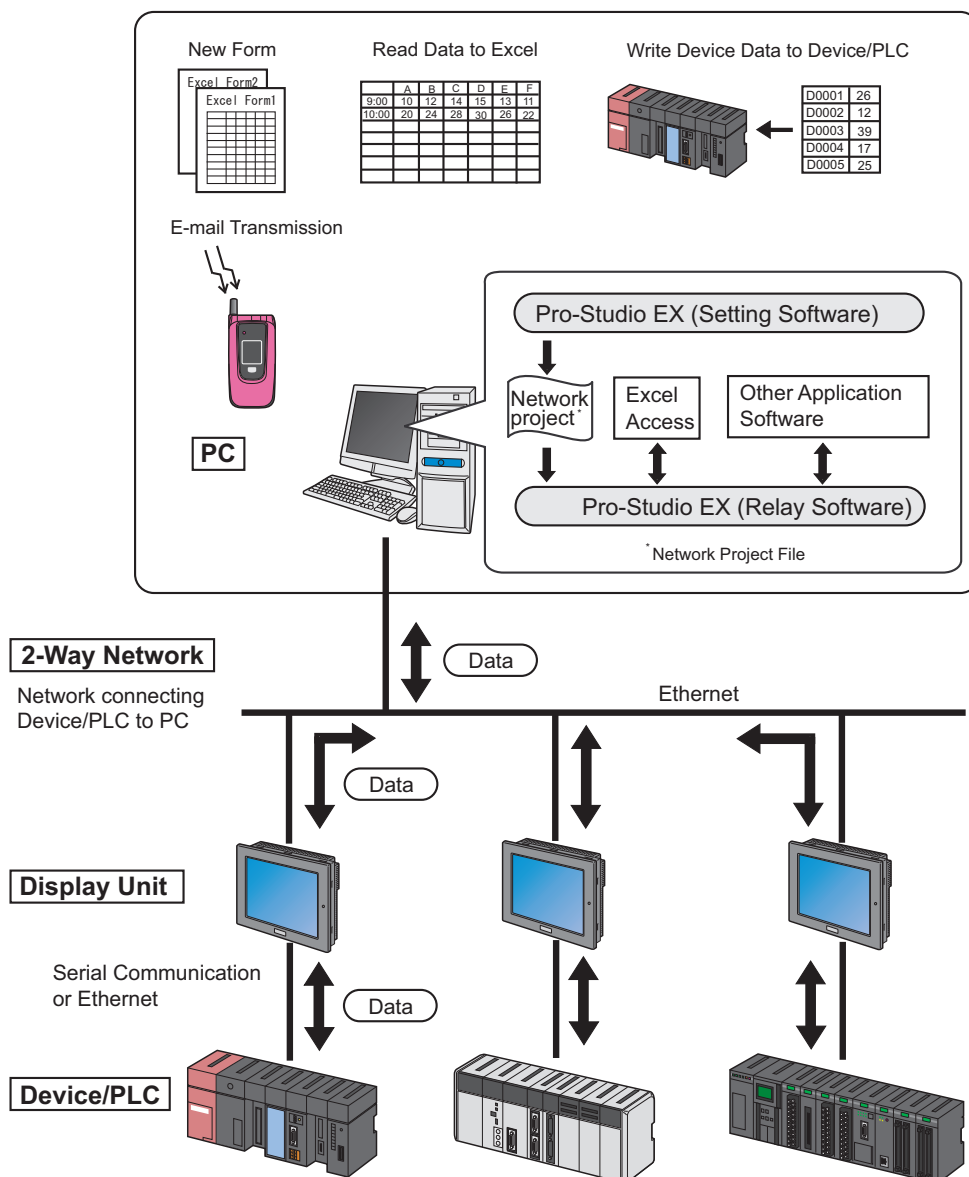
NOTE

- This product supports 32-bit user applications.

1.1 What is 'Pro-Server EX'?

'Pro-Server EX' is PC software to collect displayed data from the Display Units and measured data from the devices connected to the PC via a network (Ethernet) in the PC and execute various processing of the collected data.

'Pro-Server EX' is linked with various application software such as 'Microsoft^(R) Excel^(R)' (referred to as 'Excel'), and 'Microsoft^(R) Access^(R)' (referred to as 'Access'). This allows you to use the data as you desire utilizing various features of application software such as form creation and write of device data to the Device/PLC.

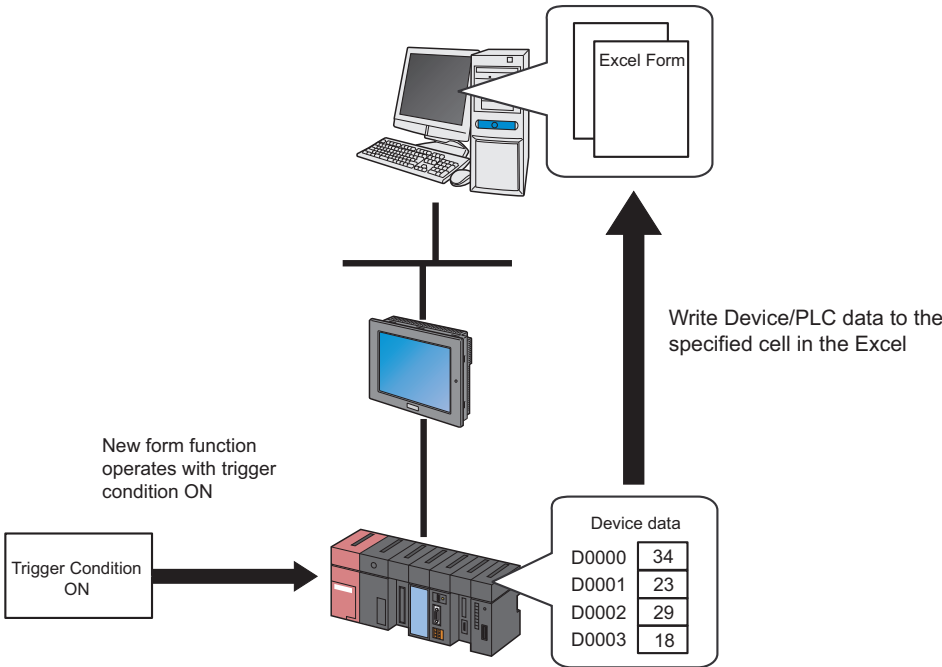


1.2 What You can Do with 'Pro-Server EX'

■ Form Creation

'Pro-Server EX' allows you to automatically create various forms such as control sheets and reports based on the data read from the display units or Device/PLCs. 'Pro-Server EX' prepares a wide variety of templates that are applicable to the formats frequently used in production sites.

☞ "5 Creating a Form Using Excel"



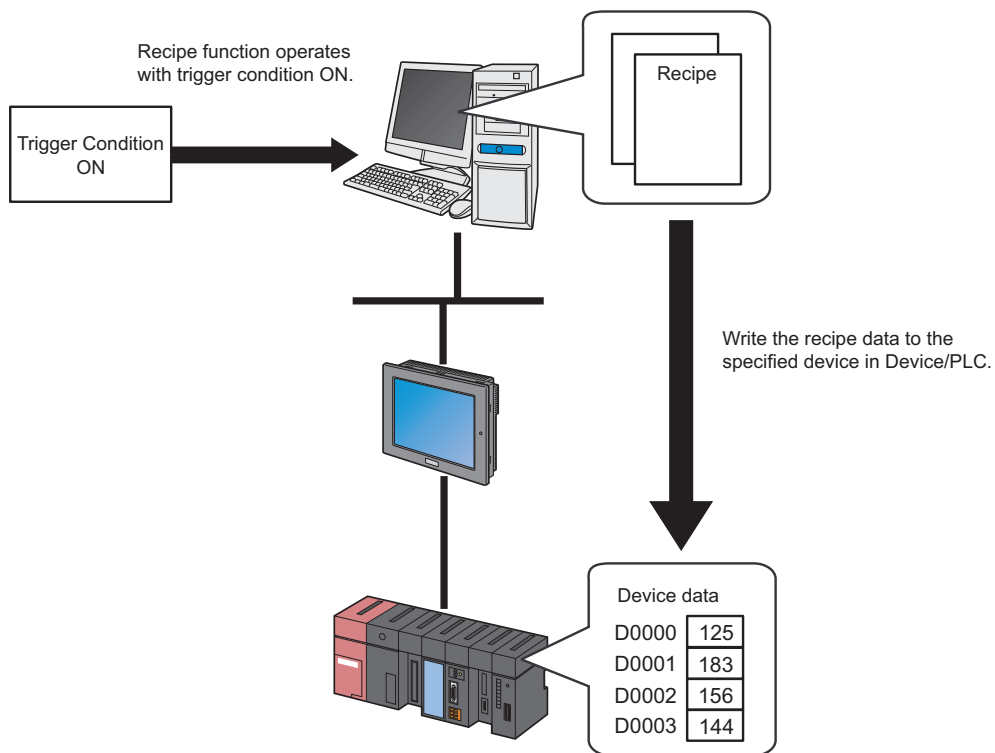
■ Data Input to Device/PLC

'Pro-Server EX' allows you to write plural data to the Device/PLCs at an arbitrary timing. This enables you to input working instructions, various parameters, etc. in the office without going out to the production site.

☞ "12 Writing Excel Data in Device/PLC"

☞ "13 Writing CSV File Data in Device/PLC"

☞ "14 Reading Device/PLC from Database"

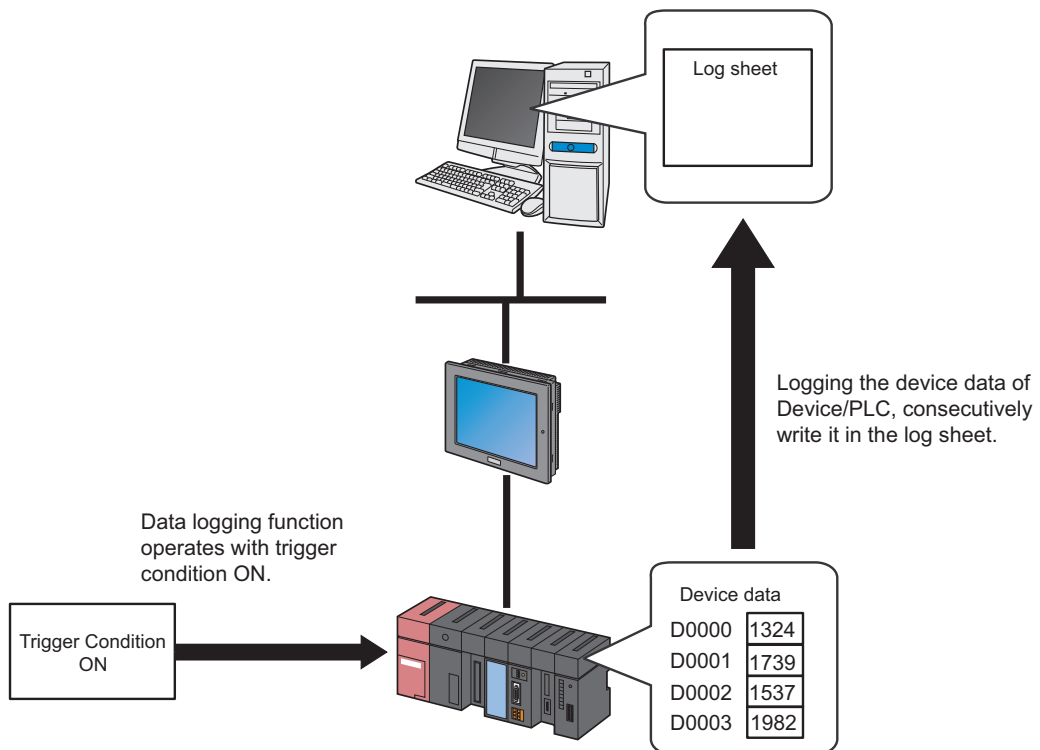


■ Logging of Device/PLC Data

'Pro-Server EX' allows periodic logging (continuous read) of plural data at an arbitrary interval. The logged data is written in application software such as 'Excel'. This feature enables you to easily edit or process the data.

☞ "6 Writing Device/PLC Data in Excel File"

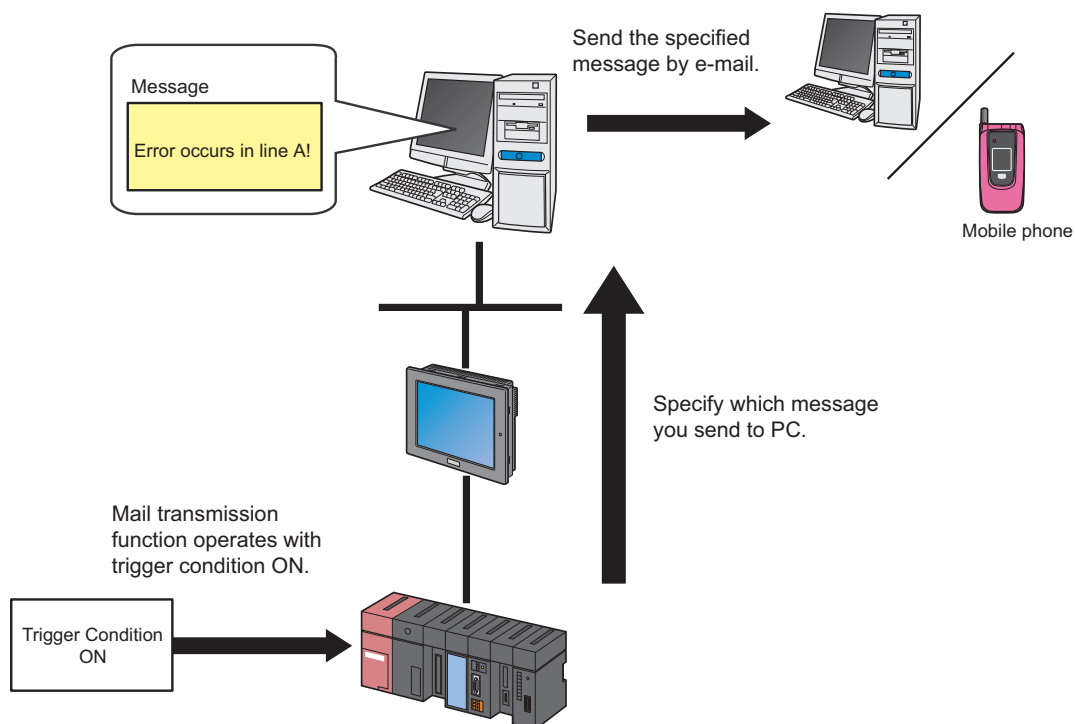
☞ "7 Writing Device/PLC Data in CSV File"



■ Sending Message via E-Mail

'Pro-Server EX' allows e-mailing preset messages when a preset event has occurred such as change in data or occurrence of trouble. This feature enables you to report to the manager immediately after a trouble occurred.

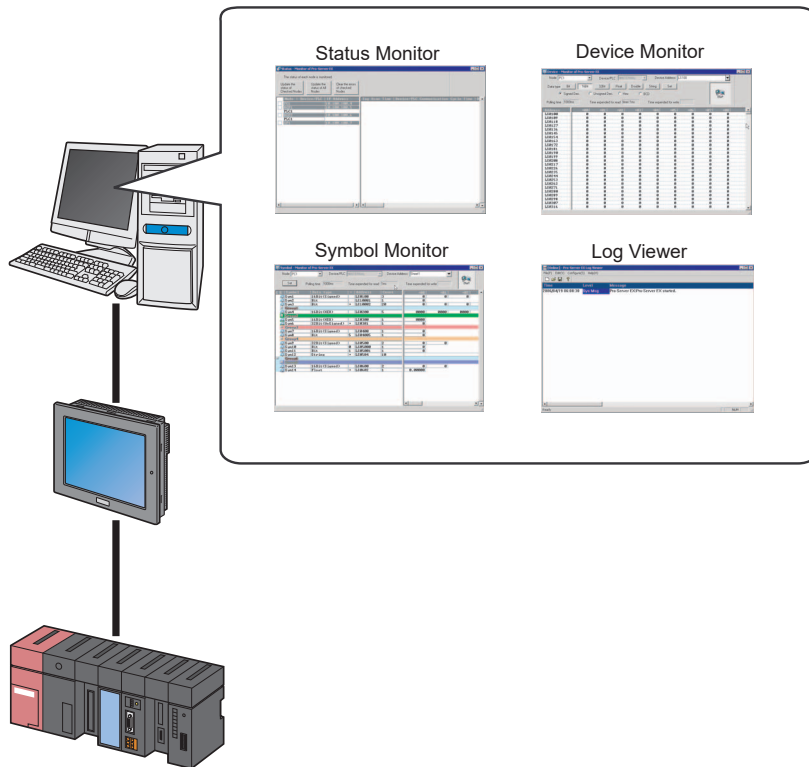
☞ "15 Reporting Alarm by E-mail"



■ Monitoring of Device/PLC Data

'Pro-Server EX' allows you to monitor device data of the display units and Device/PLCs with simple operation. It also allows you to write the data to an arbitrary device address from the PC.

☞ "28 Simply Confirming On-site Status"

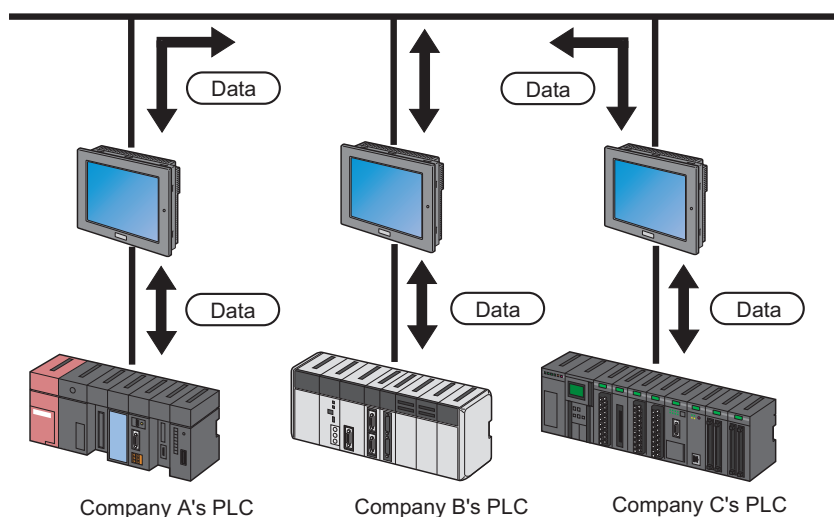


The 'Pro-Server EX' has other features as follows.

■ Data Transfer between Device/PLCs

'Pro-Server EX' allows data transfer among the display units and Device/PLCs without a PC. This feature enables data sharing even when the Device/PLCs are of different manufacturer.

☞ "19 Sending Data between Devices"



■ Data Processing using a User Application Program

'Pro-Server EX' allows access to the data of Device/PLCs using a user application program created in VB ('Visual Basic'), VC ('Visual C++'), VB .NET, or C# format. This feature enables a variety of data processing depending on the contents of the program.

☞ "27 Designing Your Own Program"

The above features are only a part of the various features of 'Pro-Server EX'. Refer to each chapter of this manual for the other features of 'Pro-Server EX'.

1.3 How the Data Management System Operates

This section describes how the data management system using 'Pro-Server EX' operates.

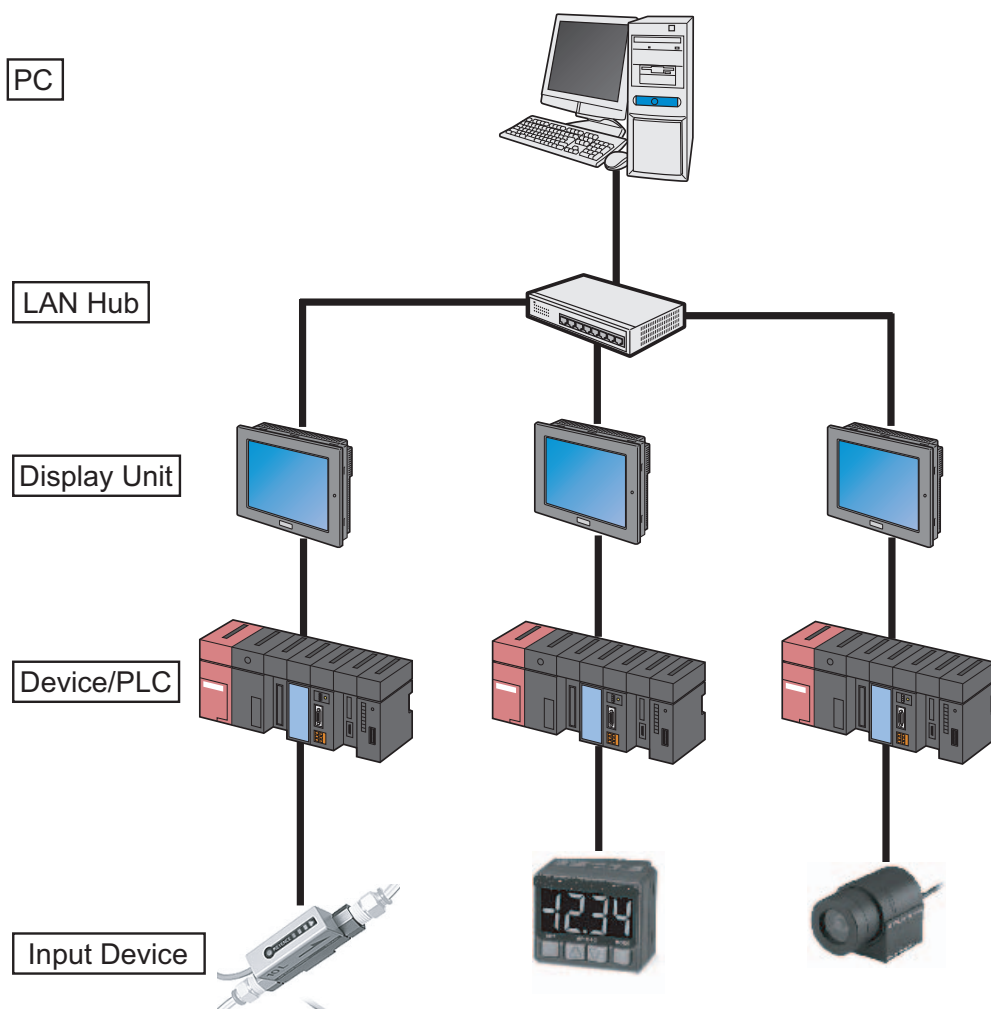
1.3.1 Devices to be Used

The data management system using Pro-Server EX needs the following devices.

You must prepare an appropriate system configuration as follows before actual use.

☞ "2 Preparation"

*The following shows an example of the system. You can use other devices depending on the working environments.



■ PC (PC/AT compatible machine)/Display Unit

Used to read/write the data of display units and Device/PLCs via a network (Ethernet) after 'Pro-Server EX' and 'Pro-Studio EX' are installed therein.

■ LAN Hub

Used to connect all the devices together via Ethernet.

■ Display Unit

A combination of operation panels and display units that have been provided separately for machines and equipment.

The display unit has features of displaying characters information, graphics information, etc. and entering data from touch keys.

■ Device/PLC

Used to capture data and perform control. The Device/PLC includes a PLC, thermostat, inverter, etc. The Device/PLC performs control based on the data from the input devices and outputs the result to the display units.

■ Input Device

An externally connected device such as a sensor and a switch that performs measurement, counting, etc. The data is captured via the Device/PLC.

1.3.2 Software to be Used

The data management system using 'Pro-Server EX' includes following software. This section describes the overview and features of the software.

■ 'Pro-Studio EX'

System designing software to be used when developing a data management system.

'Pro-Studio EX' allows various settings such as those of information about the devices being connected to the network and conditions for receiving/sending data and then creating a network project file containing those settings.

After the created network project file is transferred to the display units, the data management system can operate effectively according to the settings in the network project file.

■ 'Pro-Server EX'

A data relay driver for operating data management system.

'Pro-Server EX' allows data communication between the PC and the display units in accordance with the content of the network project file created using Pro-Studio EX, and to read/write of the collected data to the application software of the PC and the devices.

Network Project File

The data management system using 'Pro-Server EX' creates a file in the display unit's screen data (screen project file), which contains information about the devices being connected and features to be used. This file is called "Network project file". There are two types of network project files: NPX (.npx), the traditional file format, and NPXE (.npxe), a file format with enhanced security. The same network project file is basically used for all the devices being connected via a network, and the data is processed based on the settings.

IMPORTANT

- It is recommended to re-save NPX network project files created in "Pro-Studio EX" before version 1.37.300 to the NPXE format with enhanced security. In the [Save As] dialog box, from [File Type] select [Enhanced Network Project File (*.npxe)]. The NPXE format cannot be used in versions before 1.37.300 of "Pro-Studio EX" or "Pro-Server EX". In the [Save As] dialog box, select [Network Project File (*.npx)] to open in versions before 1.37.300.

Screen Project File

Created using screen editing software such as GP-Pro EX or GP-Pro/PBIII for Windows, a screen project file is a collection of information that includes screen data, display unit, and Device/PLCs, as well as configuration of fonts and features. To run the data management system, first you need to transfer the screen project file to the display unit.

■ '2-Way Driver'

Built-in software in a display unit, which serves as an interactive communication driver to translate communication protocols of various Device/PLCs and to perform communication between the PC and the Device/PLCs via the display units.

The 2-way driver acts according to the content of the network project file transferred from the PC.

IMPORTANT

- The GP77R Series, GP2501 Series, and GP2601 Series have no built-in '2-way driver'. Be sure to download a '2-way driver' from 'GP-Pro PB III'. For help with downloading, refer to the 'GP-Pro PB III Operation Manual'.

1.3.3 How to Transfer the Data

The data management system using 'Pro-Server EX' uses the following features to read/write data from/to application software such as 'Excel'.

Depending on the ACTION to be executed, an appropriate feature is used.

■ DDE(Dynamic Data Exchange)

A system to support exchange of data between two applications running simultaneously on Windows.

For example, in the case when reading the data of the Device/PLCs using 'Excel', 'Excel' requests data and 'Pro-Server EX' sends the data. That is how the data is automatically exchanged.

Application software such as 'Pro-Server EX', 'Excel' and 'Access' has this DDE function preinstalled, making it possible to read/write data without any special settings.

■ API(Application Programming Interface)

A series of functions used for relaying 'Pro-Server EX' and application programs. Using API can exchange data via user application programs created in VB ('Visual Basic'), VC ('Visual C++'), VB .NET, or C# format.

Access of an application program to the 'Pro-Server EX' API used for exchanging data enables read/write of the data of the Device/PLCs.

■ ACTION

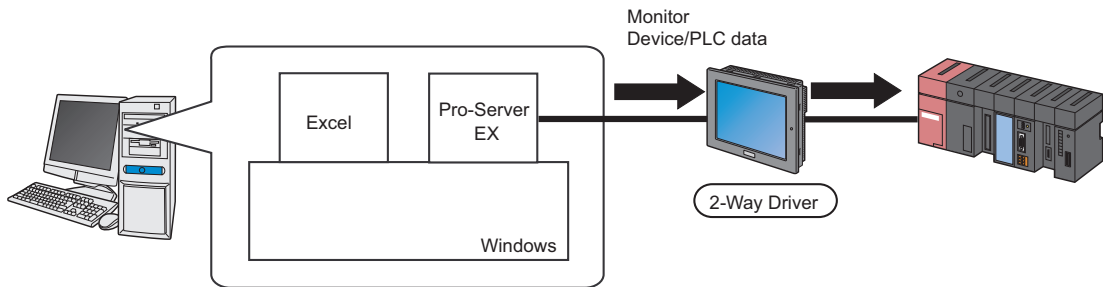
A system preinstalled in 'Pro-Server EX' to exchange data.

The ACTION includes data exchange with an application program, access to a transmission server when sending e-mails.

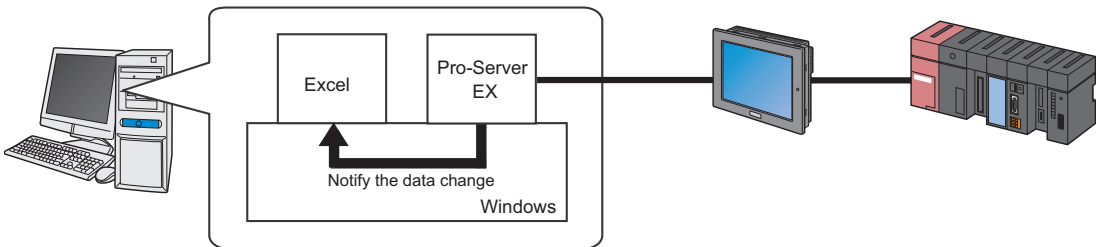
The following shows how the DDE function runs.

[Data Exchange by DDE]

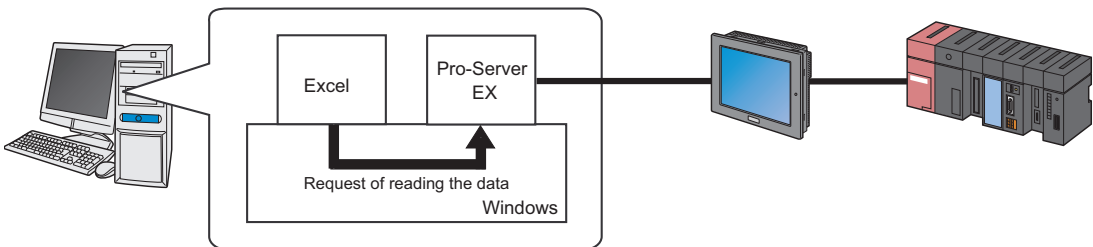
- (1) 'Pro-Server EX' on Windows always monitors the measurement data in the Device/PLC via the 2-way driver.



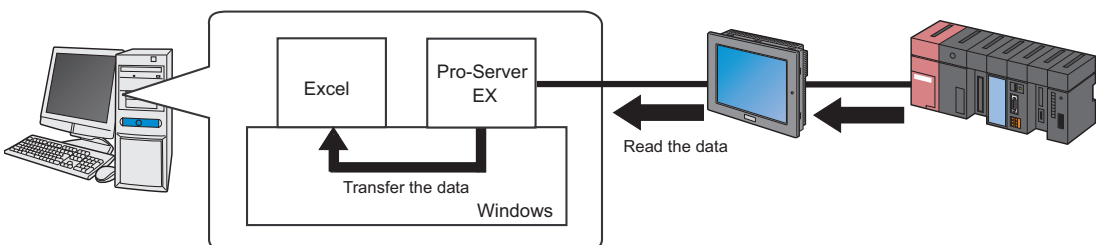
- (2) The 'Pro-Server EX' notifies 'Excel' of a change in the data in the Device/PLC, if any.



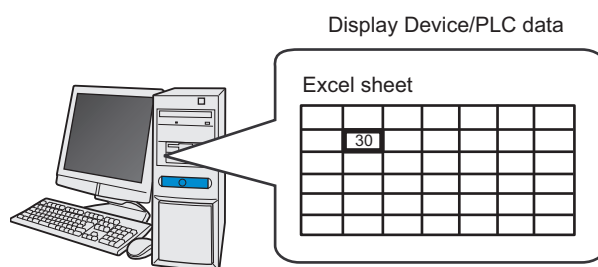
- (3) 'Excel' requests read of the data to 'Pro-Server EX'.



- (4) 'Pro-Server EX' reads the Device/PLC data and transfers the read data to 'Excel'.



(5) 'Excel' displays the transferred data on the specified cell.



1.4 Necessary Operation

This chapter describes necessary operation for executing data management using 'Pro-Server EX' and the flow of the procedures.

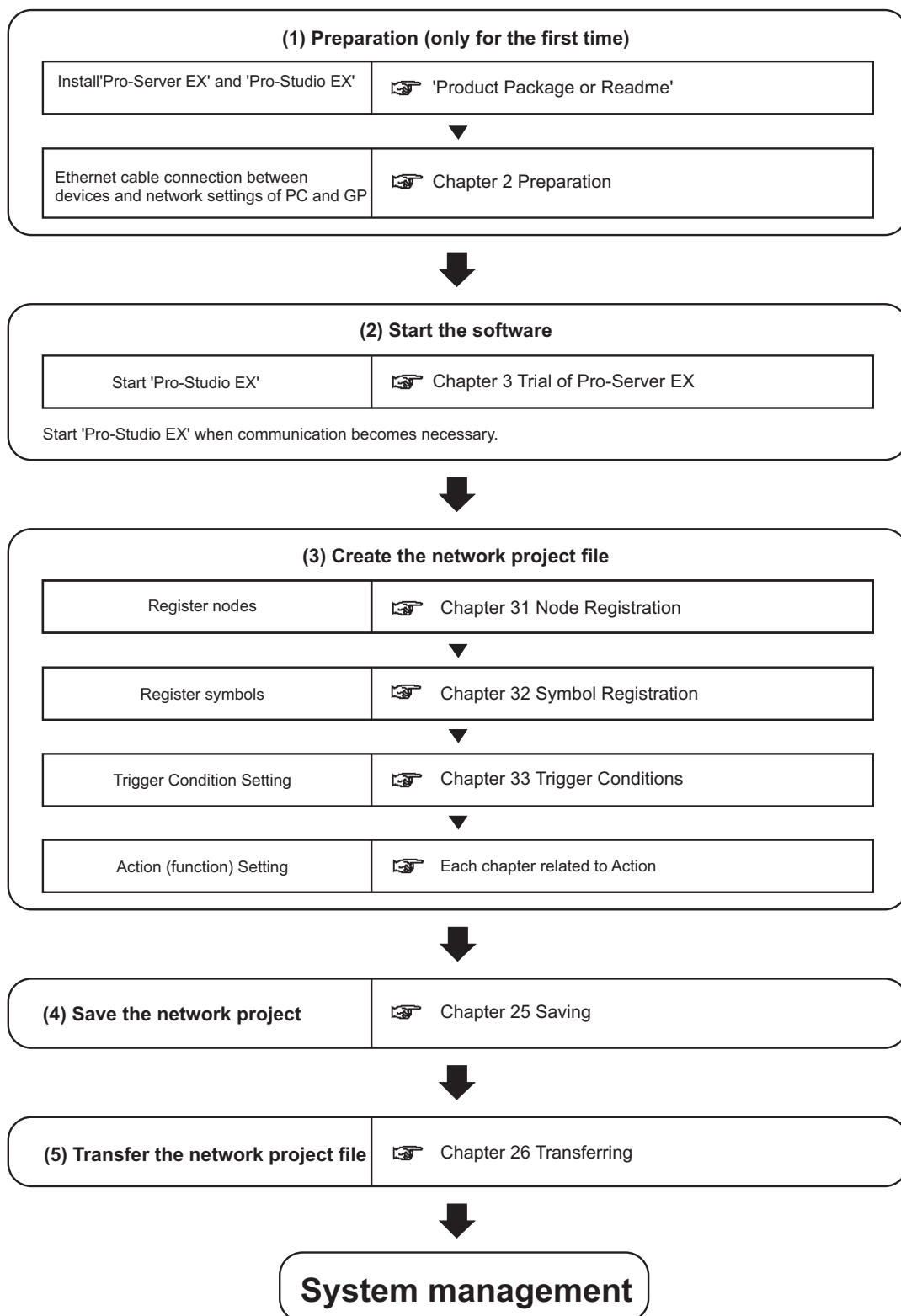
Refer to each chapter in this manual for more details.

IMPORTANT

- The following procedures assume the screen project file is already transferred to the display unit and that the connection between the display unit and Device/PLC is complete. Incomplete connection or settings may result in failure to read/write the data using the PC. Be sure to complete the correct connection and settings by referring to the user documentation for both the display unit and the screen creation software ('GP-Pro EX' or 'GP-PRO/PB III for Windows').
-

NOTE

- When you are using Windows Embedded machines, you can set the write filter (write protection) on drives installed with the operating system. If the write filter settings are enabled, disable the write filter settings (EWF Manager) before installing Pro-Server EX. Additionally, to install this product on the SP5000 series Open Box, run the installation from the Explorer Shell. For details, refer to the user manual for your unit
-



1.5 About the Trial Version

Even without a license, you can try out the functions available in "Pro-Server EX" and "Pro-Studio EX". The trial version does not require a serial number or key code.

To check if your application is a product version or trial version, from the menu click [Version Information]. If you are using the trial version, it will show "Trial Version".

In the trial version:

- You can use all the functions except transfer
- The application ends after about 3 hours of operation
- Network projects created using the trial version cannot be loaded into a product version of Pro-Server EX
-

NOTE

- You can load network project files created in the trial version to a product version of Pro-Server EX by converting the files in a product version of Pro-Studio EX.
-

1.5.1 Changing to the Full Version

After purchasing a license, from the menu click [Enter key code] and enter the serial number and key code.

2 | Preparation

| | | |
|-----|---------------------------------------|-----|
| 2.1 | Items to Check | 2-2 |
| 2.2 | Connecting PC with display unit..... | 2-5 |
| 2.3 | Setting PC Network..... | 2-8 |
| 2.4 | Set the network of display unit | 2-9 |

2.1 Items to Check

Before installing this product, ensure that the following prerequisites are completed.

2.1.1 Preparing the Computer

■ Installing Pro-Server EX

After confirming the computer you are planning to install the software onto is compatible with the operating environment, run the install. If the computer you are using is not compatible with the Pro-Server EX operating environment, the software may not work properly.

For details about the operating environment, see "OPERATING ENVIRONMENT 1-10".

If the trial version is installed, see "1.5 About the Trial Version".

■ Application Software

Check that the software required by the Pro-Server EX feature you want to use is installed.

For supported software, refer to "OPERATING ENVIRONMENT".

■ Windows Firewall

Depending on your operating system, there are cases when a message displays indicating the Windows firewall is blocking communication. In those instances, set up the **[Check firewall status]**.

If "Release Block" does not display, use the Control Panel's [Check firewall status] command to set up the following.

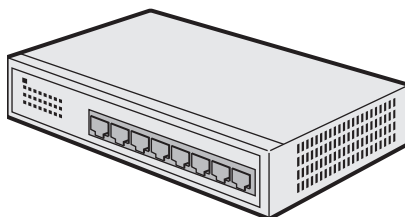
| | |
|-------------|--|
| NOTE | • Depending on the operating system you are using, the display and part names may differ. If so, replace the names with those with similar features used in your system configuration. |
|-------------|--|

- 1 From the Control Panel, select [Windows Defender Firewall] and then [Allow a application or feature through Windows Defender Firewall] to display the [Allowed Programs] page.
- 2 From [Change Settings], select [Allow another program].
- 3 In the [Add a Program] dialog box, select the Pro-Server EX and Pro-Studio EX applications, and click [Add].
- 4 Select the domain and other settings as required by your environment, and click [OK].

2.1.2 Necessary Equipment

■ LAN Hub

Used to connect all the Ethernet cables together. A LAN hub is necessary even when connecting one PC and one display unit (one-to-one connection).



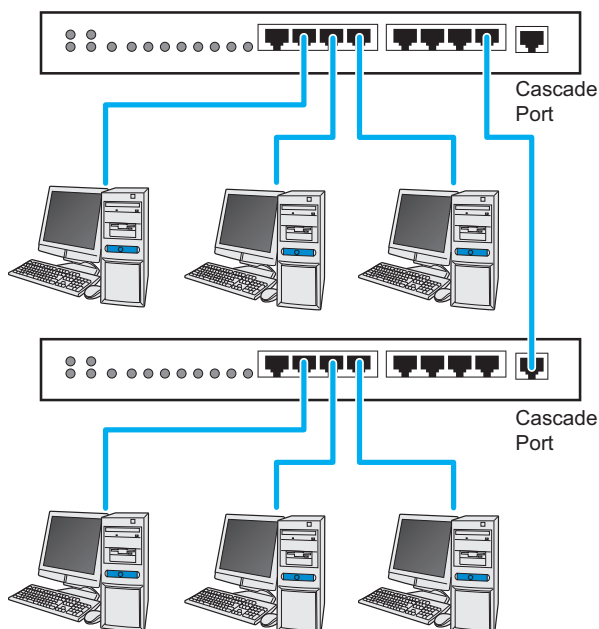
- Prepare equipment that conforms to the communication specifications of the PC and display unit Ethernet ports.
- The minimum number of ports required is a sum of PCs and display units to be connected. When the ports are not enough, prepare plural LAN hubs and make a cascade connection. Refer to the operation manual of the LAN hub for the connection method.

What is a cascade connection?

To connect plural LAN hubs using cable wires. This can increase the number of devices to be connected to one network.

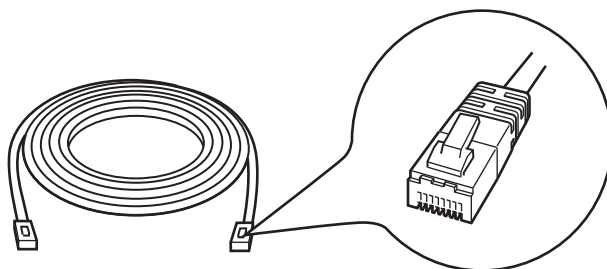
For a cascade connection, 1 port is required for cascade.

(Connection Sample)



■ Ethernet Cable (straight cable)

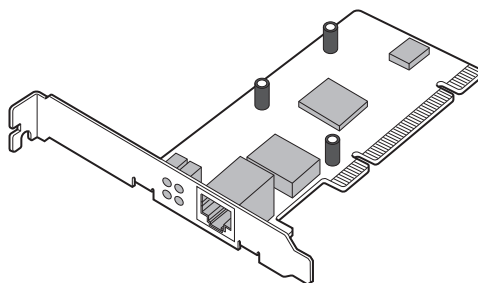
Used to connect the PC and the display unit



- This cable is necessary even when connecting one PC and one display unit (one-to-one connection) since a LAN hub is used even in this case. When you use a cross cable for connection, we do not guarantee the operation.
- The minimum number of cables required is a sum of PCs and display units to be connected. Prepare equipment that conforms to the communication specifications of the PC and display unit Ethernet ports.

■ Network Adapter (LAN board/LAN card)

Used by attaching to the PC.



(Illustration shows a LAN board)

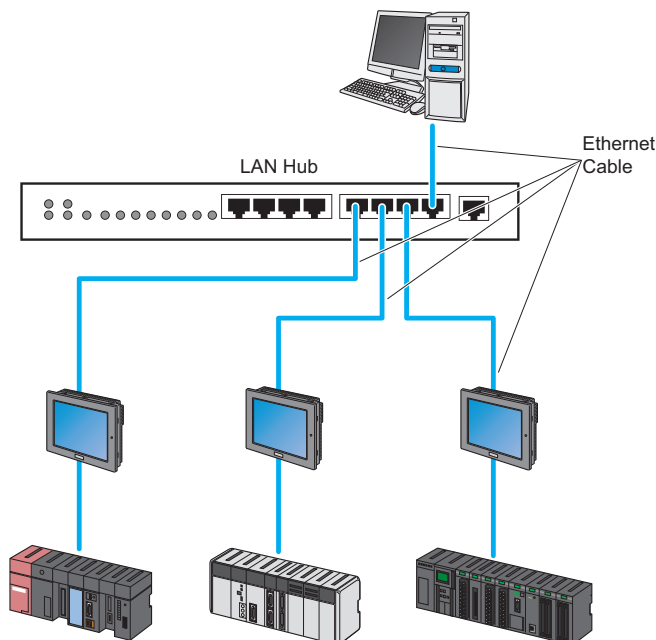
- When the Ethernet port for system connection has been preinstalled on the PC, it is not necessary to attach a network adapter.
- Follow either appropriate method below to attach the network adapter to the PC. Refer to the operation manual of the PC or the network adapter for more details about attaching method.
 - Attach a LAN board to the expansion slot of the PC.
 - Attach a LAN card to the PC card slot of the PC.

2.2 Connecting PC with display unit

The following explains how to connect the PC and the display units using Ethernet cables.

Connect Ethernet cables to the PC and the display units separately, and then connect them together using a LAN hub as shown below.

Example: Connecting three display units and one PC



■ Cybersecurity Guideline

Use this product inside a secure industrial automation and control system. Total protection of components (equipment/devices), systems, organizations, and networks from cyber attack threats requires multi-layered cyber risk mitigation measures, early detection of incidents, and appropriate response and recovery plans when incidents occur.

For more information about cybersecurity, refer to the Pro-face HMI/IPC Cybersecurity Guide.

https://www.proface.com/ja/download/manual/cybersecurity_guide

⚠ WARNING

POTENTIAL COMPROMISE OF SYSTEM AVAILABILITY, INTEGRITY, AND CONFIDENTIALITY

- Change default passwords at first use to help prevent unauthorized access to device settings, controls and information.
- Disable unused ports/services and default accounts, where possible, to minimize pathways for malicious attacks.
- Place networked devices behind multiple layers of cyber defenses (such as firewalls, network segmentation, and network intrusion detection and protection).
- Apply the latest updates and hotfixes to your Operating System and software.
- Use cybersecurity best practices (for example: least privilege, separation of duties) to help prevent unauthorized exposure, loss, modification of data and logs, interruption of services, or unintended operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

■ Security Features Provided

This product provides the following security features. These features provide security capabilities which contribute towards protecting the product from potential security threats.

- In order to prevent unauthorized access by a node that has not been registered on the network, you can set a password for the network to enhance the security.

23.1 Blocking Unauthorized Access with Password

- To protect the contents of a network project file, you can set a password when saving a created network project file.

23.2 Blocking Unauthorized Editing with Password

- When a network project file is transferred to display unit, enter the password to access if the display unit has password protection.

23.3 Blocking Unauthorized Transfer with Password

- Network project files can be saved in NPXE format with enhanced security.

■ Precautions for Safe Operation of Pro-Server EX

1 To build a secure network for unauthorized access prevention

- Build a communication environment using encrypted communications (ex. VPN).
- Check that the network is secured before communication is established and data is transferred or remote connections through the Ethernet.
- To prevent unauthorized access, set a password for remote connections.
- Open the data communication port only when using communication services.
- Protect your personal computer with a firewall and use it on a reliable network.

2 Prevent unauthorized operations from third parties

- Hide the Pro-Server EX task tray icon to help prevent unauthorized operations, such as downloading a network project by a third party. For information, refer to “34.1 Setting Up the Environment of 'Pro-Server EX' ”.
- Use the security features in Windows (set a password, use the auto-logout feature, etc.).
- When using Windows administrator account for runtime, define the secured password and security settings.
- When starting Pro-Server EX as a service:
 - Operate the run time on trusted computers only.
 - Use Windows security features (such as passwords, automatic logout, and so on).
 - Set secure passwords and security for your projects.

3 To protect information from alteration

- To protect your computer and enhance security settings, use the following guidelines which are based on cybersecurity best practices (including antivirus software, operating system updates, strong password policies, and application allowlist software).

<https://www.pro-face.com/trans/ja/manual/1087.html>

- Carefully manage your own data.
- Apply a network project password to your project for protection.

23.2 Blocking Unauthorized Editing with Password

- When transferring a network project, on the display unit, in [Send/Receive Project File] enable [Password].

- Use Pro-Server EX and Pro-Studio EX on trusted computers only. (For example, strictly control the location of the LAN hub between Pro-Server EX, Pro- Studio EX, and the Display)
- As password setting data includes security information, store in a secure environment.

2.3 Setting PC Network

The following explains how to connect the PC to display units via the network (Ethernet). You can set up the items below.

The check and the setup processes depend on the OS. Refer to the documentation for your OS before proceeding.

- Check operation of the network adapter (LAN board/card)
Using the Windows "Device manager", check that the network adapter (LAN board/LAN card) attached to the PC performs correctly.
- Set up the TCP/IP protocol
Set the IP address and subnet mask. .

IMPORTANT

- Log on to Windows as the Administrator, or with a user name that has the equivalent of administrator rights. For information on user rights, refer to the OS documentation.
- Before operation, consult with the network administrator.

NOTE

- For the TCP/IP protocol, use [Internet Protocol Version 4 (TCP/IPv4)]. [Internet Protocol Version 6 (TCP/IPv6)] is not supported.
- The [Default Gateway] is not required if a relay device, such as a router, to other networks is not used.
- If the subnet masks between the PC and display unit are different, when searching for nodes, the display unit is not listed.
- If required, define settings related to the DNS server.

What is TCP/IP protocol?

One of the network protocols (standards regarding communication such as communication speed, and communication method). TCP/IP protocol is a combination of "TCP" (Transmission Control Protocol) and "IP" (Internet Protocol). This protocol is used on the Internet and electronic mails, and is the most popular protocol currently used.

What is IP address?

Internet protocol numerical address assigned to each computer on the network so that its location and activities can be distinguished from other computers. The IP address takes the form of four numbers separated by dots, for example: 192.168.0.3

What is Subnet Mask?

The subnet mask is used to determine what subnet an IP address belongs to. An IP address has two components: the network address that represents the network being connected and the host address that is used to distinguish individual device.

For example, consider the IP address "192.168.2.1" and the Subnet Mask "255.255.255.0". Each address in a binary pattern is:

| | | |
|-------------|---|-------------------------------------|
| IP address | : | 11000000.10101000.00000010.00000001 |
| Subnet Mask | : | 11111111.11111111.11111111.00000000 |

In the IP address, the part shown in a logical "1" in the Subnet Mask represents the network number, and the part shown in a logical "0" in the Subnet Mask represents the host number. Accordingly, the areas allocated for the network number and the host number in the IP address "192.168.2.1" are as follow.

| | | |
|------------|---|---|
| IP Address | : | <u>11000000</u> . <u>10101000</u> . <u>00000010</u> . <u>00000001</u> |
| | | Network number Host number |

2.4 Set the network of display unit

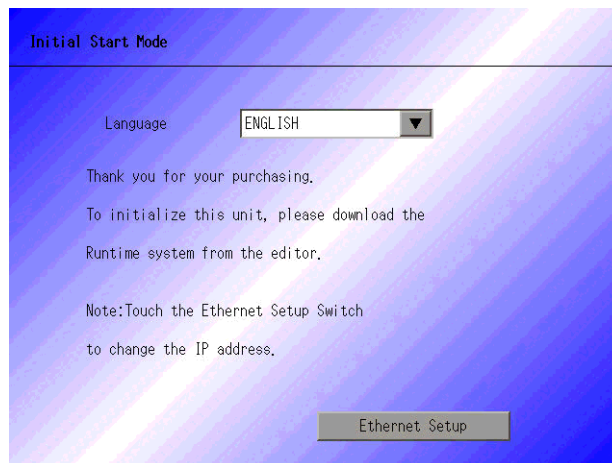
The following explains how to connect the display units via a network (Ethernet).

This section explains how to configure Ethernet settings for a display unit directly out of the box. For information on how to check or edit Ethernet settings after you transfer a screen project file to the display unit, refer to the corresponding user documentation for the screen editing software.

-
- NOTE** • Depending on the operating system you are using, the display and part names may differ. If so, replace the names with those with similar features used in your system configuration.
-

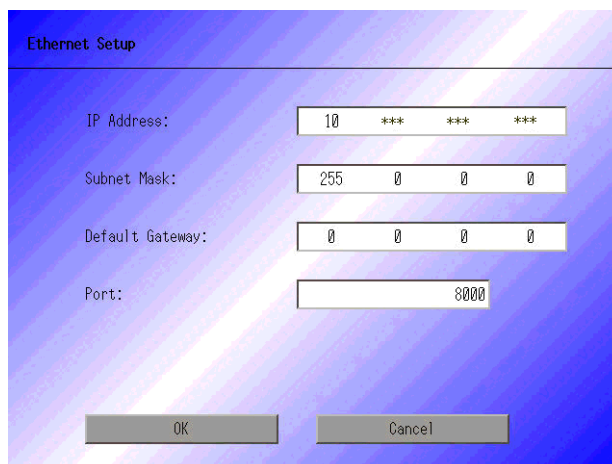
1 Turn on the display unit's power.

After a while, the "Initial Transfer Mode" screen or the "Welcome" screen will appear on the monitor of the display unit.



2 Touch the [Ethernet Setting] button.

The "Ethernet Setting" screen will appear. This screen displays default settings.



- 3 Enter the numbers of the IP address, Subnet Mask, Default Gateway and Self Node, and then touch the [Set] button.

Contact the network administrator for the values to set.

NOTE

- If no relay device to the other network such as a router is connected, it is not necessary to input about [Default Gateway].
-

This completes the network setting of the display unit.

3

Trial of Pro-Server EX

| | | |
|-----|----------------------------------|------|
| 3.1 | Starting 'Pro-Studio EX' | 3-2 |
| 3.2 | Trial of New Form..... | 3-9 |
| 3.3 | Trial of Recipe Function | 3-38 |
| 3.4 | Trial of Logging Funtion | 3-51 |
| 3.5 | Trial of Send Mail Function..... | 3-65 |

3.1 Starting 'Pro-Studio EX'

Operating the data management system using 'Pro-Server EX' requires network setting of the Device/PLCs and functions to be used (Network project file creation).

'Pro-Studio EX' is used to create a network project file.

After having set up, start 'Pro-Studio EX'.

3.1.1 Start 'Pro-Studio EX'

- 1 Turn on the PC power to start Windows.
 - 2 From the [Start] menu, go to 'Pro-Server EX' and click 'Pro-Studio EX'.
- 'Pro-Studio EX' will start and the opening screen will appear.

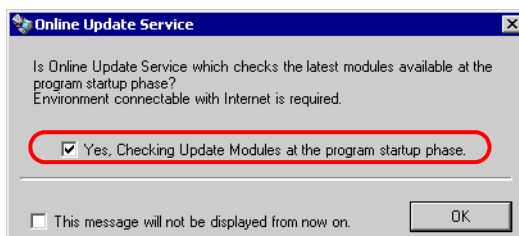
NOTE

- When you have a shortcut on the Desktop, you can also double-click the shortcut icon to start it.

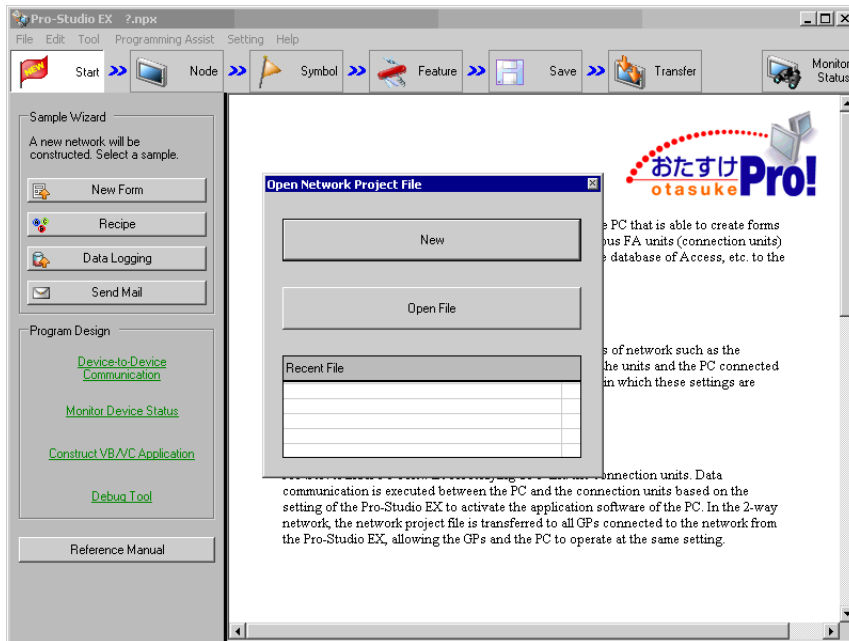


At the same time, the "Online Update Service" screen will appear.

When you receive the online update service, check "Yes, Checking Update Module at the program startup phase" and click [OK].



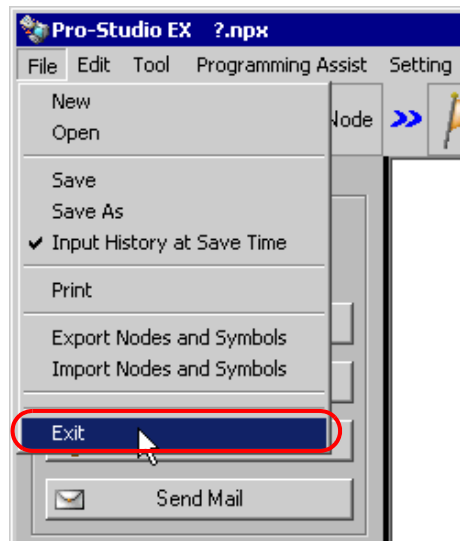
After a while, the start screen will appear with the "Open Network Project File" screen.



Then proceed to manipulate on the "Open Network Project File" screen.

How to close 'Pro-Studio EX'

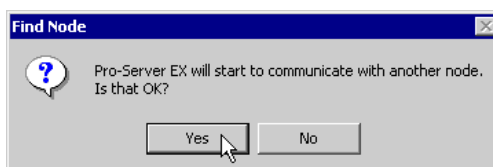
On the start screen, click "Files" on the menu bar, and select "Exit" from the pull-down menu.



Startup of 'Pro-Server EX' (Normal Mode)

While operating 'Pro-Studio EX', if communication is required between the PC and the display unit, the following message to request startup of 'Pro-Server EX' will appear.

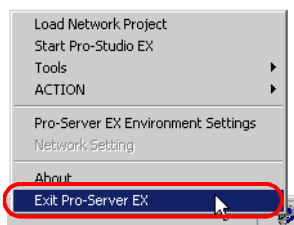
In this case, click the [Yes] button and start 'Pro-Server EX'.



After 'Pro-Server EX' has started, the Pro-Server EX icon will appear in the task tray. 'Pro-Server EX' is always active (resident) unless you close it.



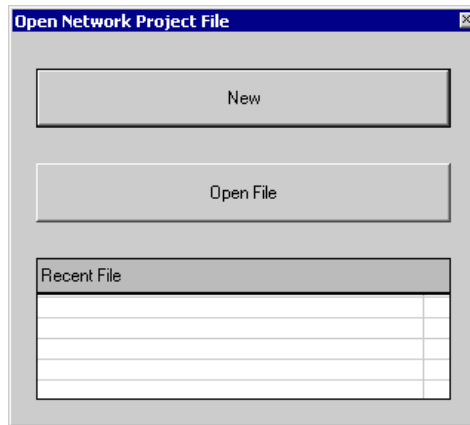
To close 'Pro-Server EX' (resident cancellation), right-click the icon in the task tray and select 'Close Pro-Server EX' from the menu.

**NOTE**

- You can also start 'Pro-Server EX' as Windows service. Refer to "30 Starting 'Pro-Server EX' in the Service Mode" for more details.
- When you set the starting method of 'Pro-Server EX' to "Service Mode", it is different to how to close 'Pro-Server EX'. Refer to " 30.1.2 Starting and Closing 'Pro-Server EX' in the "Service Mode"" .

3.1.2 Selecting Network Project File

After the program has started, the "Open Network Project File" screen will appear in front of the start screen.



On this screen, choose whether to create a new network project file or use an existing network project file.

■ Creating New File

When you use 'Pro-Server EX' for the first time or you want to create a new network project file, click the [New] button.

■ Using Existing File

When you want to use an existing network project file, click the [Open File], and select the file to use in the "Open Files" dialogue.

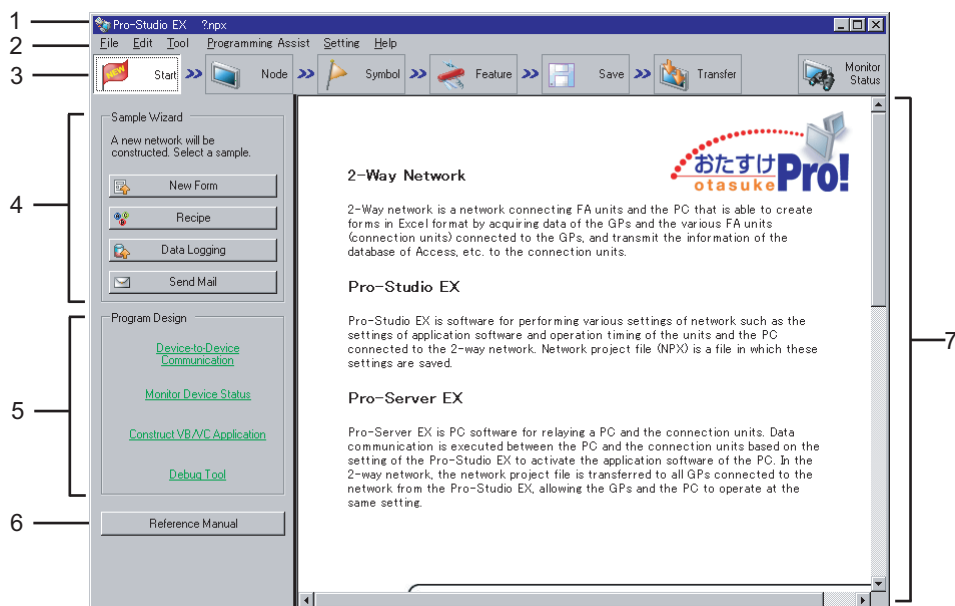
If you find the file name of the network project file you want to start on the list of "Recent File", click the file name on the list.

(Follow the same procedures above when you want to edit an existing network project file.)

The network project file you selected through the operations above will open, and the "Opening Network Project File" screen will close.

3.1.3 Start Screen of 'Pro-Studio EX'

The following explains about the start screen.



(1) Title bar

Displays the currently open network project file's name.

The file name of a new document is denoted as '? .npix'.

(2) Menu bar

Displays the menu to be used to operate 'Pro-Studio EX'. Clicking this bar displays the pull-down menu.

(3) Status bar

Displays necessary setting items for creating a network project file in a form of icon. Clicking the icon displays the corresponding setting screen.



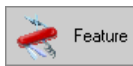
Clicking this icon displays the start screen. At an initial startup, the start screen will appear without clicking this icon.



Clicking this icon displays the entry nodes setting screen. You can register or delete entry nodes on this screen.



Clicking this icon displays the symbol setting screen. You can register, delete or group symbols on this screen.



Clicking this icon displays the feature setting screen. You can register or set an ACTION item and content of data transfer, as well as register cache on this screen.



Clicking this icon displays the save setting screen. You can save the network project file you set on this screen.



The Transfer Settings screen appears. Use this setting to transfer to network nodes set up in the network project file.



Clicking this icon displays the monitoring setting screen. You can monitor the current status of the PC and the Device/PLCs on this screen.

(4) [Sample Wizard]

'Pro-Server EX' has built-in "Sample Wizard" that allows you to learn how to set frequently used ACTION items such as form creation and recipe.

Clicking each item button activates the 'Sample Wizard' corresponding to the clicked item, and the "Sample Wizard" screen will appear.

Pointing each item button with mouse cursor will display a guide to the wizard of the pointed item in the task area (7).

(5) [Program Design]

Displays a guide to setting items and operation procedures of useful features in programming.

Pointing each item button with mouse cursor will display a guide to the pointed item in the task area (7).

Clicking each item button displays a detailed guide to the clicked item.

(6) [Reference Manual]

Displays the 'Pro-Server EX Reference Manual' (this manual).

(7) Task Area

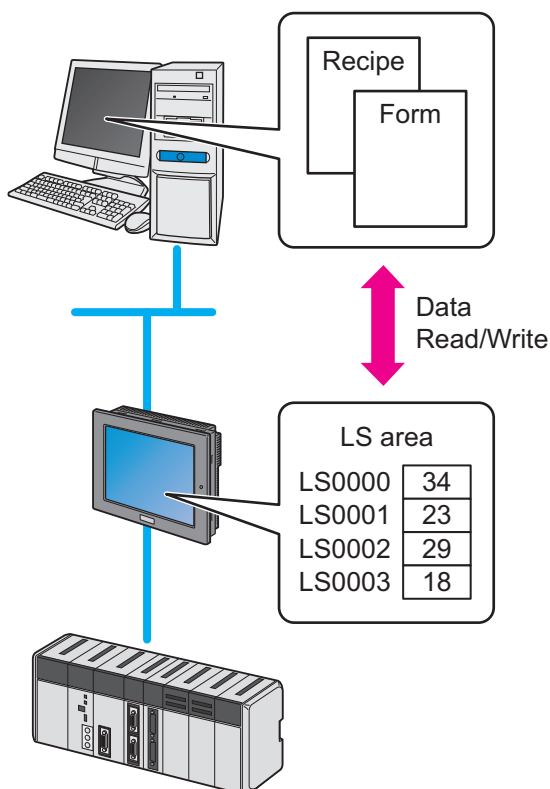
Displays the guide to each item pointed by mouse cursor. On the setting screen, this area is used as a setting area.

3.1.4 Before Learning

Device data to use in "Sample Wizard"

While the "Sample Wizard" can use device data of Device/PLCs, this chapter explains the process of accessing internal devices (LS Area) on the display unit to read and write data.

Before learning with the "Sample Wizard", ensure that the PC in which 'Pro-Server EX' is installed is connected to the display unit as shown below.



NOTE You can use each menu to edit the contents set in the "Sample Wizard" after the wizard ends.

- Node --- "Node" Menu
- Symbol ---- "Symbol" Menu
- Trigger Condition, Feature (ACTION) --- "Feature" Menu

3.2 Trial of New Form

3.2.1 What is a New Form Function?

Pro-Server EX allows creating various forms including a management chart and a report according to the purpose by writing production data and measurement data read from the Device/PLCs into the pre-created form template in 'Excel'.

'Pro-Studio EX' is provided with approximately 30 kinds of form formats as "Form Templates". These formats allow you to easily create various forms. The following shows one of those forms.

■ Production Management Chart (Tabular form)

| Production Management Board (per Day) | | | | | |
|---------------------------------------|----------------------------|---------------------------|---------------|--------------|----------|
| Time | Cumulative Planned Num. | Cumulative Result Num. | Result Num./H | Difference/H | Problems |
| Early Morning | | | | | |
| 9 | 100 | | | | |
| 10 | 200 | | | | |
| 11 | 300 | | | | |
| 12 | 400 | | | | |
| 13 | 500 | | | | |
| 14 | 600 | | | | |
| 15 | 700 | | | | |
| 16 | 800 | | | | |
| 17 | 900 | | | | |
| Overtime | | | | | |

You can edit the format of "Form Templates" as you desire using 'Excel'. You can also create a new template and add it to the existing templates.

For more details, see "5 Creating a Form Using Excel".

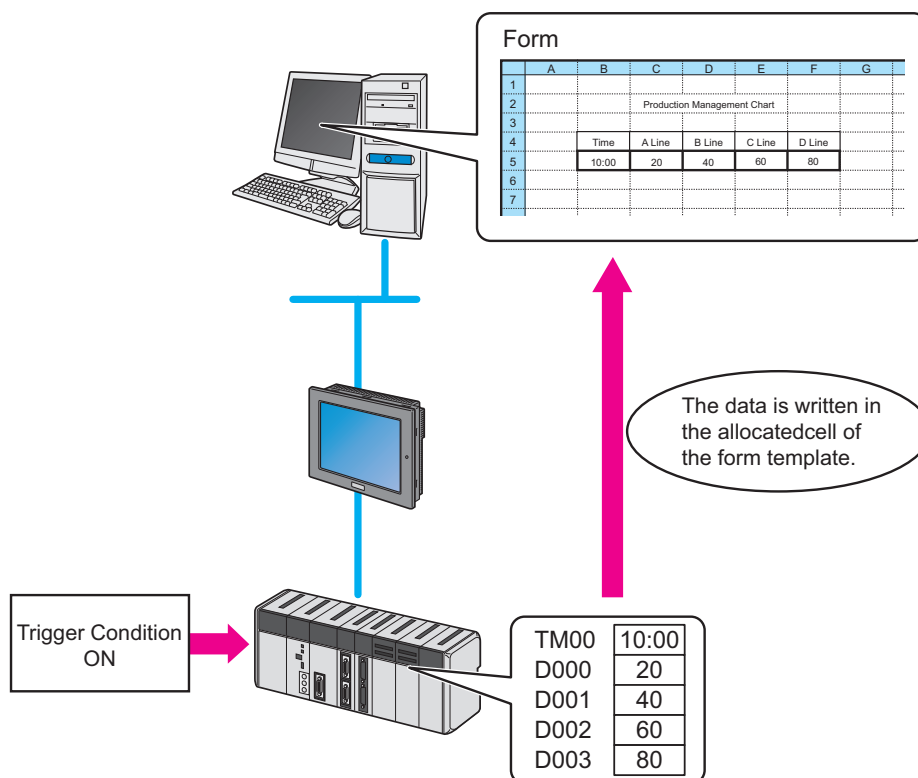
Flow of Form Creation

(1) Decide which device address data in the Device/PLC should be written in each cell of the form template in 'Excel'. Allocate each cell for the data beforehand.

| | A | B | C | D | E | F | G |
|----|---|-------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|---|
| 1 | | | | | | | |
| 2 | | | Production Management Chart | | | | |
| 3 | | | | | | | |
| 4 | | Time | A Line | B Line | C Line | D Line | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | Data for address "TM00" | Data for address "D000" | Data for address "D001" | Data for address "D002" | Data for address "D003" | |
| 10 | | | | | | | |

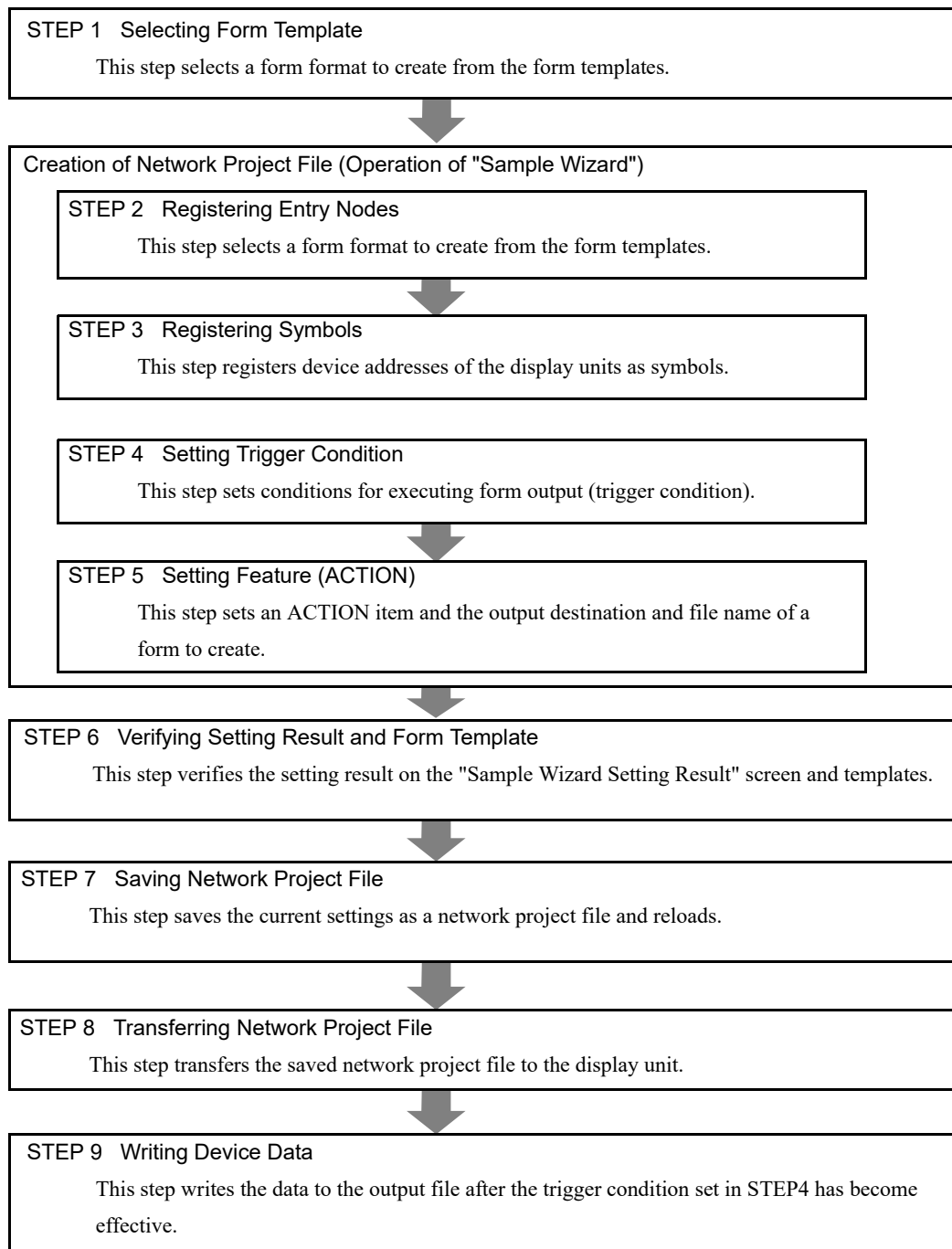
(2) Using 'Pro-Studio EX', execute action setting of the form creation function, including setting data of the device address to output and requirements for outputting forms.

(3) At a specific timing or at a specific interval, the data of each device address of the Device/PLC is written in the allocated cell of the form template.



3.2.2 Workflow from Settings to Form Creation

The following explains about the operation flow from setting to creating a sample form using the "Form Creation" wizard.



3.2.3 For clients using Microsoft Excel 2007 or later

When using 'Microsoft Excel 2007' or later, refer to the following notes.

■ Notes on Excel's Version Compatibility

In the "Form Creation" wizard, a template file is created with the extension (xls or xlt) for 'Microsoft Excel 2003' or older.

To use a function supported only by 'Microsoft Excel 2007' or later while editing the template file created in the "Form Creation" wizard, you need to save the template file as.xlsx (xlsm) or .xltx (xltm).

Save the template file again using the following steps as you cannot specify the file extension in the Form Creation Action.

- 1 Close the Excel Form Creation Action.
- 2 Check the template file with the following two points.
 - Whether it includes the macro program or not
 - File format (Book or Template)
- 3 Open the template file in 'Microsoft Excel 2007' or later and save it again using the extensions in the table below.

| Template File | | Extensions used for saving | |
|---------------|-----------------|--------------------------------------|---------------------------------------|
| Macro | File Format | With Excel 2007 or later functions | Without Excel 2007 or later functions |
| Not included | Book Format | Extension for the template: .xlsx | Extension for the template: .xls |
| | | Extension for the output book: .xlsx | Extension for the output book: .xls |
| | Template Format | Extension for the template: .xltx | Extension for the template: .xlt |
| | | Extension for the output book: .xlsx | Extension for the output book: .xls |
| Included | Book Format | Extension for the template: .xlsm | Extension for the template: .xls |
| | | Extension for the output book: .xlsm | Extension for the output book: .xls |
| | Template Format | Extension for the template: .xltm | Extension for the template: .xlt |
| | | Extension for the output book: .xlsm | Extension for the output book: .xls |

- 4 Again, specify the file which has been saved again in step 3 as the template file in the Excel Form Action editing.
- 5 Set the extension for the output file according to the extension types above.
- 6 Edit the template file and save the Action.

■ Notes on File Format

When using the following sample wizards including the functions specific to 'Microsoft Excel 2007' or later, you need to specify "xlsm" (book file format with macro enabled) as the extension for the output book.

- Setup Work Planning and Result Management Board
- Setup Work Transition Graph
- Monthly Equipment Short-Time Stop Transition Graph (daily/weekly/monthly/yearly)
- First Run Rate Transition Graph (daily/weekly/monthly/yearly)
- Reduction of Man-hour Transition Graph
- Production Process Stock Days Transition Graph
- Reduction of Production Cost Transition Graph

■ Caution Regarding Incorrect Display of Excel Forms

When the sample wizard display is incorrect, from Excel's [Options], in the [Advanced] settings, select the [Cut, copy, and sort inserted objects with their parent cells] check box.

3.2.4 Creating a Form

This section helps you to learn necessary settings efficiently for creating a form by simply following the instructions of the "Form Creation" wizard of the "Sample Wizard" to actually create a sample form.

Example of Sample Form Created with this Wizard

| | A | B | C | D | E | F | G | H | I |
|----|--|-------------|------------------------------------|-----------------------------------|--------------------------|---------------------|-----------------|---|---|
| 1 | Excel01 Production Management Board (per Day) | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | Time | Cumulative Planned Num. | Cumulative Result Num. | Result Num./H | Difference/H | Problems | | |
| 4 | Early Mornin | | | | | | | | |
| 5 | | 9 | 100 | | | | | | |
| 6 | | 10 | 200 | | | | | | |
| 7 | | 11 | 300 | | | | | | |
| 8 | | 12 | 400 | | | | | | |
| 9 | | 13 | 500 | | | | | | |
| 10 | | 14 | 600 | | | | | | |
| 11 | | 15 | 700 | | | | | | |
| 12 | | 16 | 800 | | | | | | |
| 13 | | 17 | 900 | | | | | | |
| 14 | | Overtime | | | | | | | |
| 15 | | | | | | | | | |
| 16 | Time to set Result Num. | | | | | | | | |
| 17 | Readout Cumulative Result Num. | | | | | | | | |
| 18 | | | Execute | | | | | | |
| 19 | Debug(Cumulative Result Num) | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | Debug(Time to set) | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |
| 25 | | | | | | | | | |

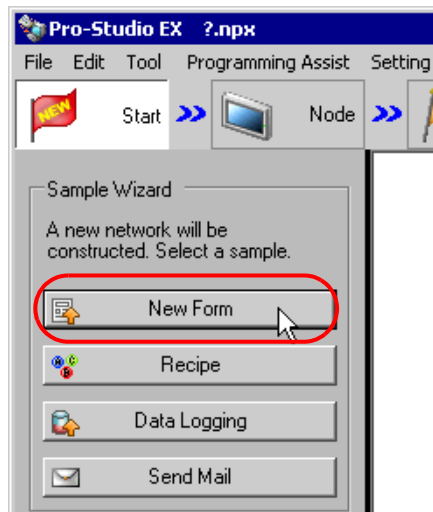
IMPORTANT

- Form creation needs 'Excel' preinstalled on the PC. Before getting started, ensure that 'Excel' is installed on the PC.

STEP 1 Selecting Form Template

This step selects a form template to create.

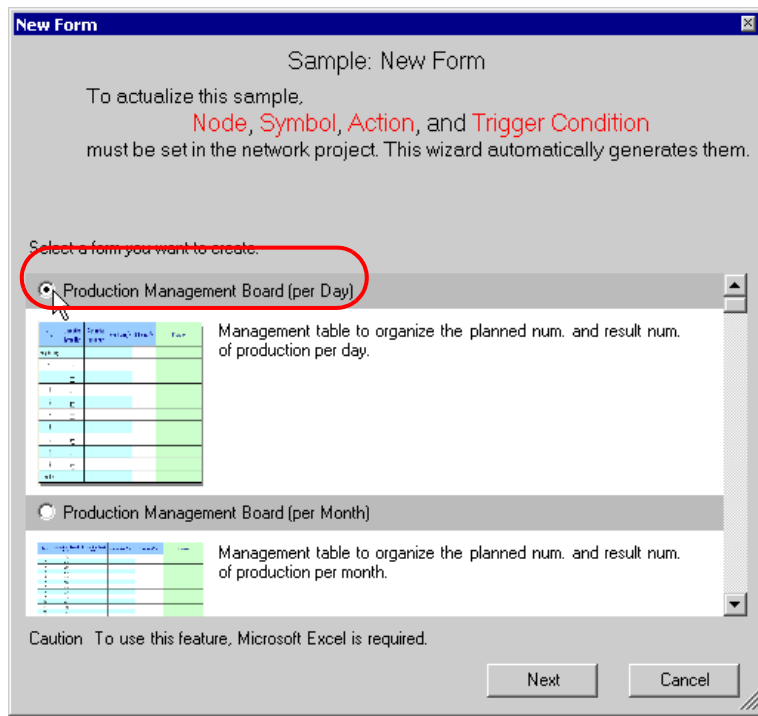
- 1 On the start screen, click the [New Form] button in the [Sample Wizard].

**NOTE**

- Pointing each item button in the "Sample Wizard" with mouse cursor will display an explanation to the wizard of the pointed item in the task area.

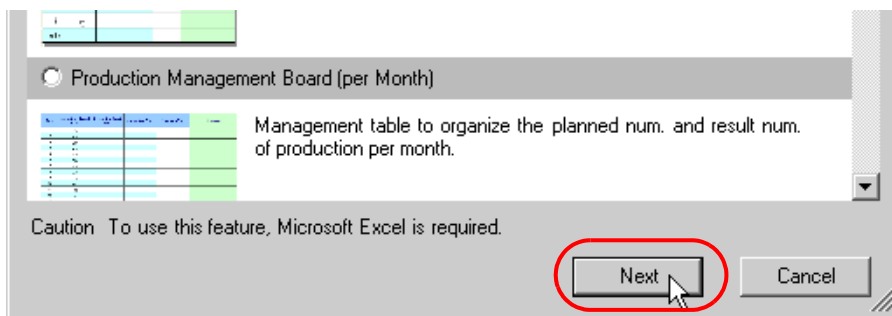
- 2 The "New Form" wizard starts. The form template selection screen will appear. Scroll the screen by moving the scroll bar and select the form format you want to output.

In this example, select the "Production Management Per Day".



NOTE • Clicking the form thumb nail display will enlarge the format on the monitor.

Click the [Next] button.



This is the end of selecting a form template. The entry nodes setting screen will appear.

NOTE • It is necessary to set which device data should be written in which cell in Excel; however, this is preset in this wizard. You do not need to execute data allocation.

Proceed to "STEP 2 Registering Entry Nodes".

STEP 2 Registering Entry Nodes

This step registers the PC and the display units as entry nodes in 'Pro-Studio EX' to allow the PC to read the data.

What is Entry Node?

In order to read and write the data of the Device/PLCs using 'Pro-Server EX', the information of the PC and the display units connected via network must be registered in the network beforehand.

The PC and the display units registered are referred to as an "Entry node".

- **Pro-Server EX Node**

Register the PC to be used for execution of various features of 'Pro-Server EX'.

- **ST6000 Series Node**

Register the ST-6000 series, STM-6000 series, STC-6000 series, and Device/PLCs you want to read from and write to. You can register up to two protocols for each node. Depending on the protocol, you can register up to 32 connections for a single protocol.

- **SP-5B4*/WinGP Node**

Register the SP5000 Series Open Box, WinGP, and Device/PLCs you want to read from and write to. You can register up to four protocols for each node. Depending on the protocol, you can register up to 64 connections for a single protocol.

- **SP-5B00/5B10/5B90 Node**

Register the SP5000 Series (except Open Box) and Device/PLCs you want to read from and write to. You can register up to four protocols for each node. Depending on the protocol, you can register up to 64 connections for a single protocol.

- **GP4000/LT4000 Series Node**

Register the GP4000 series, LT4000 series, and Device/PLCs you want to read from and write to. You can register up to four protocols for each node. Depending on the protocol, you can register up to 64 connections for a single protocol.

- **GP3000 Series Node**

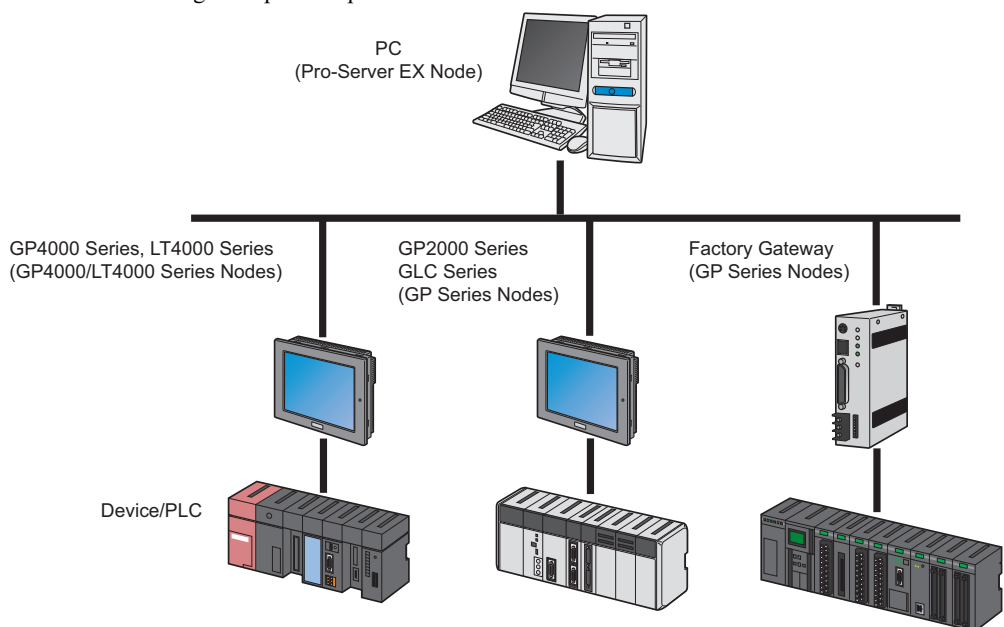
Register the GP3000 series and Device/PLCs you want to read from and write to. You can register up to four protocols for each node. Depending on the protocol, you can register up to 64 connections for a single protocol.

- **LT3000 Node**

Register the LT3000 series and Device/PLCs you want to read from and write to. You can register up to one protocols for each node. Depending on the protocol, you can register up to 32 connections for a single protocol.

- **GP Series Node**

Register the GP2000 series, GLC series, Factory Gateway, and Device/PLCs you want to read from and write to. You can register up to one protocols for each node.



1 Register the PC currently used (PC for creating a form) as an "Action Node".

In this wizard, select [Yes].

-To create a form, a PC on the network has to be specified for creation and registered as a participation node.

Do you want to create with this PC?

☒ Yes Node Name

☐ No will be created with

-A form is composed of two or more device values, and the node having the devices (Data Source Node) has to also be registered on the network as a participation node.

As a Data Source Node

☒ A new NODE is registered. (Device/PLC is set to Memory Link.)

Node Name IP Address

☐ A new NODE is registered. (Device/PLC is specified.)

The PC currently used is set as an "Action Node", named as "PC1".

2 Register the display unit being connected as a "Data Source Node".

Select the [A new NODE is registered. (Device/PLC is set to Memory Link)], and enter the IP address of the display unit.

-To create a form, a PC on the network has to be specified for creation and registered as a participation node.

Do you want to create with this PC?

☒ Yes Node Name

☐ No will be created with

-A form is composed of two or more device values, and the node having the devices (Data Source Node) has to also be registered on the network as a participation node.

As a Data Source Node

☒ A new NODE is registered. (Device/PLC is set to Memory Link.)

Node Name IP Address

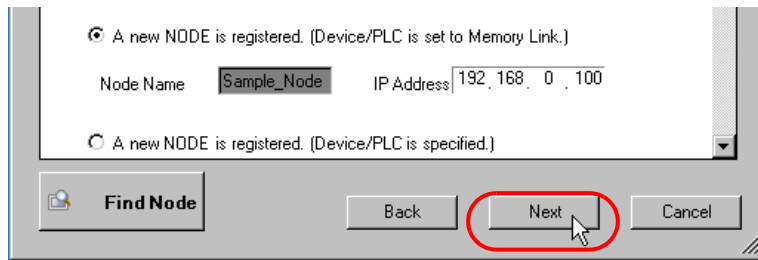
☐ A new NODE is registered. (Device/PLC is specified.)

NOTE

- For how to check IP address set in the display unit, see "2.4 Set the network of display unit".
- If you select a Device/PLC other than Memory Link, select [A new NODE is registered. (Device/PLC is specified.)].

The "Data Source Node" is set to the address above.

3 Click the [Next] button.



This is the end of registering entry nodes necessary for creating a form.

Proceed to "STEP 3 Registering Symbols".

STEP 3 Registering Symbols

This step registers a device address including data necessary for creating a form as a "Symbol".

In this wizard, the display unit's internal device are registered as symbols.

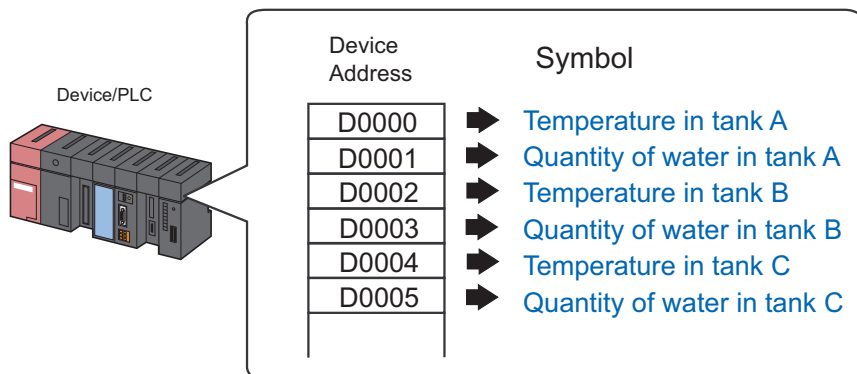
What is Symbol?

In controllers such as PLCs, an area to store data is referred to as a "Device address". Each company adopts its original code such as "D0001" and "DM001" to the device address.

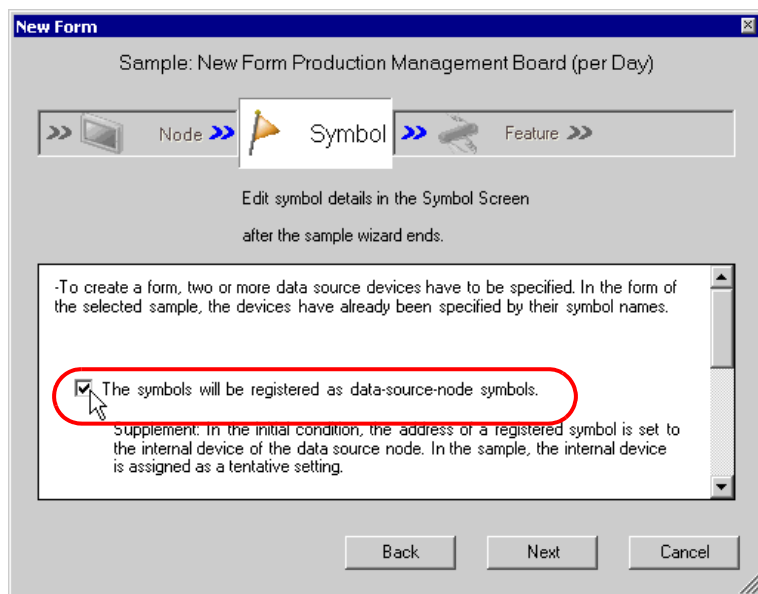
'Pro-Studio EX' controls these addresses by naming the address (referred to as a "Symbol").

By registering the address as a symbol, you can access to the device by the symbol name.

The symbol could be a name such as "Valve A" and "Tank A_Temperature", which will ease access to the device in a more understandable way.



- 1 Check the [The symbols will be registered as data-source-node symbols.] check box, and then enlarge or scroll the screen to confirm the preset symbol.



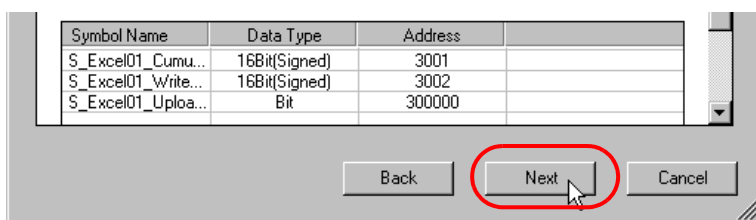
| Symbol Name | Data Type | Address |
|--------------------|---------------|---------|
| S_Excel01_Cumu... | 16Bit(Signed) | 3001 |
| S_Excel01_Write... | 16Bit(Signed) | 3002 |
| S_Excel01_Uploa... | Bit | 300000 |

NOTE

- If you select a Device/PLC other than memory link, a temporary address is set. Click on the calculator icon and change it to the actual address.

| Symbol Name | Data Type | Address |
|--------------------|---------------|---------|
| S_Excel01_Cumu... | 16Bit(Signed) | D00000 |
| S_Excel01_Write... | 16Bit(Signed) | D00001 |
| S_Excel01_Uploa... | Bit | X00000 |

2 Click the [Next] button.



The screenshot shows a software window with a table of symbol information. The table has four columns: Symbol Name, Data Type, Address, and an empty column. There are three rows of data. Below the table are three buttons: Back, Next, and Cancel. The 'Next' button is circled in red, and a mouse cursor is pointing at it.

| Symbol Name | Data Type | Address | |
|--------------------|---------------|---------|--|
| S_Excel01_Cumu... | 16Bit(Signed) | 3001 | |
| S_Excel01_Write... | 16Bit(Signed) | 3002 | |
| S_Excel01_Uploa... | Bit | 300000 | |

Back Next Cancel

This is the end of registering symbols necessary for creating a form. The trigger condition setting screen will appear.

Proceed to "STEP 4 Setting Trigger Condition".

STEP 4 Setting Trigger Condition

This step sets conditions for executing form output (trigger condition).

In this wizard, the trigger condition of detecting a rise of "Upload Start_BIT" is preset.

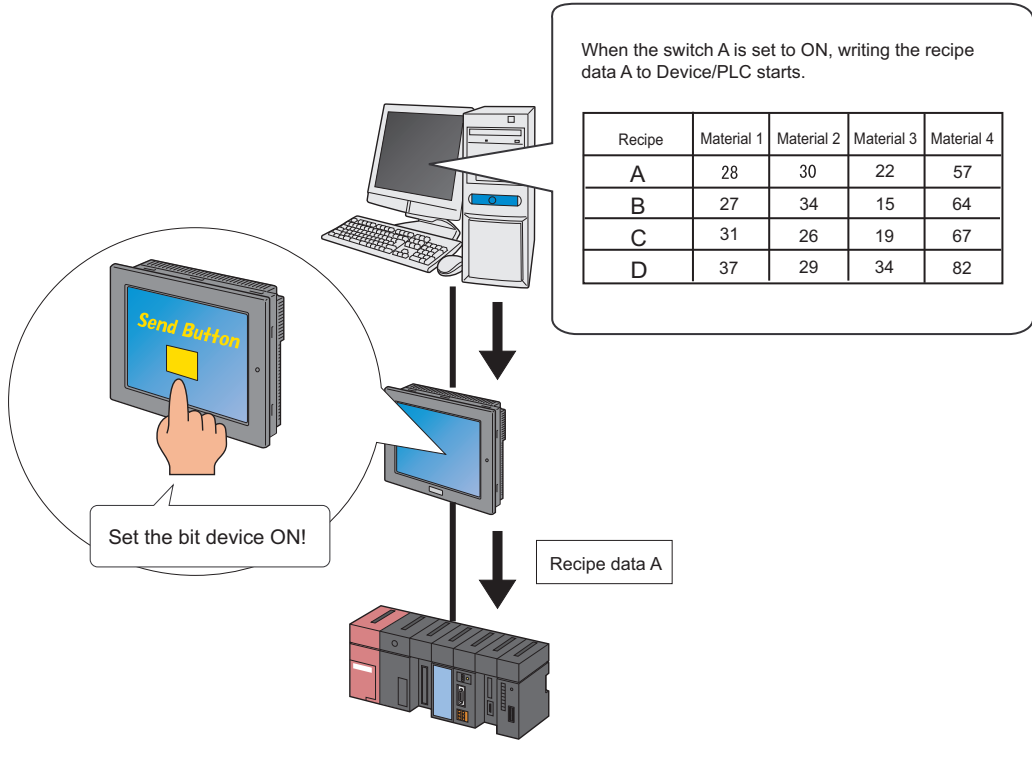
What is Trigger Condition?

'Pro-Server EX' allows executing various operations at a specific timing.

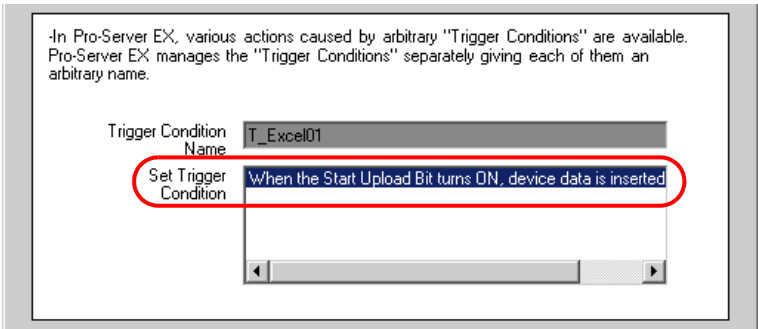
This timing is referred to as a "Trigger condition".

Presetting the trigger condition corresponding to ACTION, data transfer, etc. allows the operation to start when the preset trigger condition is satisfied.

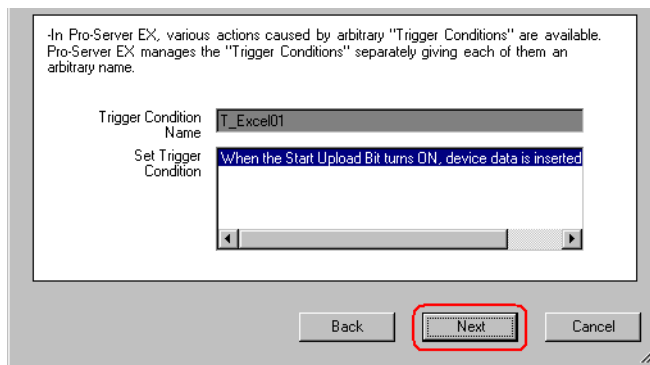
Trigger Condition: when the device is ON



- 1 Confirm the content of the trigger condition in the [Set Trigger Condition].



2 Click the [Next] button.



The screenshot shows a software window titled "In Pro-Server EX, various actions caused by arbitrary 'Trigger Conditions' are available. Pro-Server EX manages the 'Trigger Conditions' separately giving each of them an arbitrary name." The window contains two input fields: "Trigger Condition Name" with the text "T_Excel01" and "Set Trigger Condition" with the text "When the Start Upload Bit turns ON, device data is inserted". Below these fields is a horizontal scrollbar. At the bottom of the window are three buttons: "Back", "Next", and "Cancel". The "Next" button is highlighted with a red rectangular box.

This is the end of setting a trigger condition necessary for creating a form. The ACTION setting screen will appear.

Proceed to "STEP 5 Setting Feature (ACTION)".

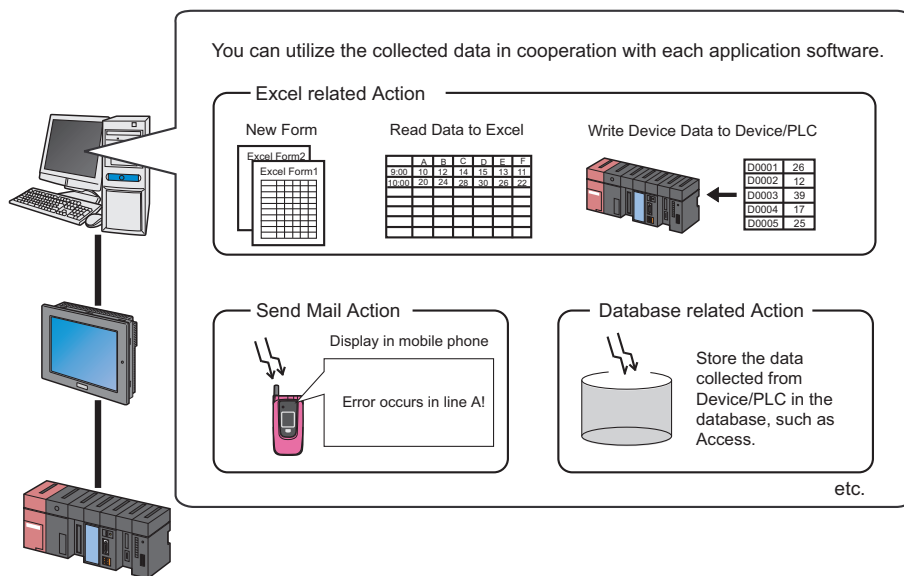
STEP 5 Setting Feature (ACTION)

This step sets functions (ACTION) to use. This step sets an ACTION item and the output destination folder and file name of a form to create.

What is ACTION?

In addition to the access to the devices, 'Pro-Server EX' allows advanced processing using application software, for example creating a form using 'Excel' and creating a database using 'Access'.

In the 'Pro-Server EX', the advanced processing in the PC using application software is referred to as "ACTION".



- Click the [Browse] button. On the "Refer to Folder" screen, specify the output destination folder.

-Pro-Server EX can execute any pre-registered ACTION.

This Sample Form is also executed as one of such ACTIONS

An ACTION requires an ACTION name. Specify an ACTION name.

ACTION Name

Form Destination Folder

Form Output File Name

IMPORTANT

- The ACTION name can be an arbitrary name. However, in this wizard the name is preset. Changing this name in this trial may cause discrepancies. Accept the default provided by this wizard.

- * You can type the folder name. In this case, begin the name with a drive name of the PC, e.g. "C:\Users\<<User name>>\Documents".

- 2** Enter the output file name in the [Form Output File Name] field.
In this trial, enter "Production Management".

-Pro-Server EX can execute any pre-registered ACTION.

This Sample Form is also executed as one of such ACTIONS

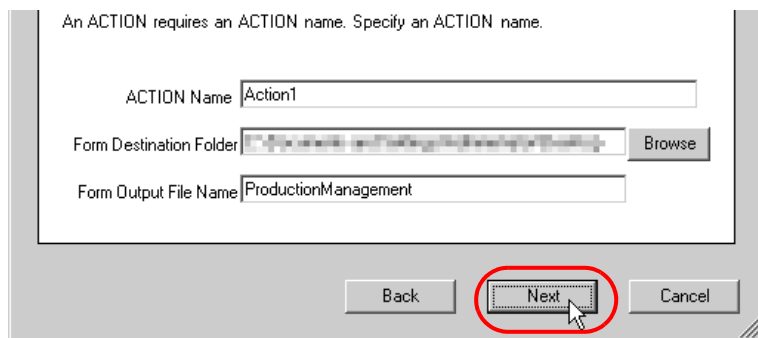
An ACTION requires an ACTION name. Specify an ACTION name.

ACTION Name

Form Destination Folder

Form Output File Name

- 3 Click the [Next] button.



An ACTION requires an ACTION name. Specify an ACTION name.

ACTION Name

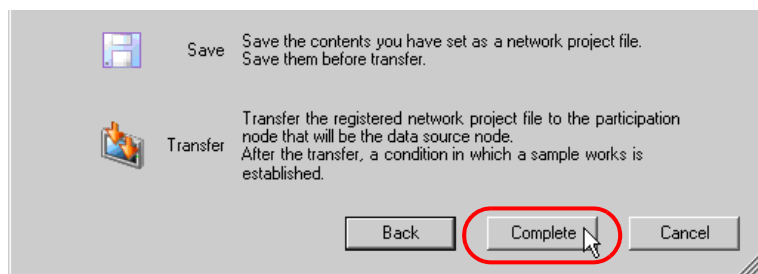
Form Destination Folder Browse


Form Output File Name


Back Next Cancel

This is the end of setting an ACTION item necessary for creating a form. The screen that explains the procedures to follow (saving and transferring network project file) will appear. You can read the explanations how to save and transfer the network project file on the screen.

- 4 Click the [Complete] button.



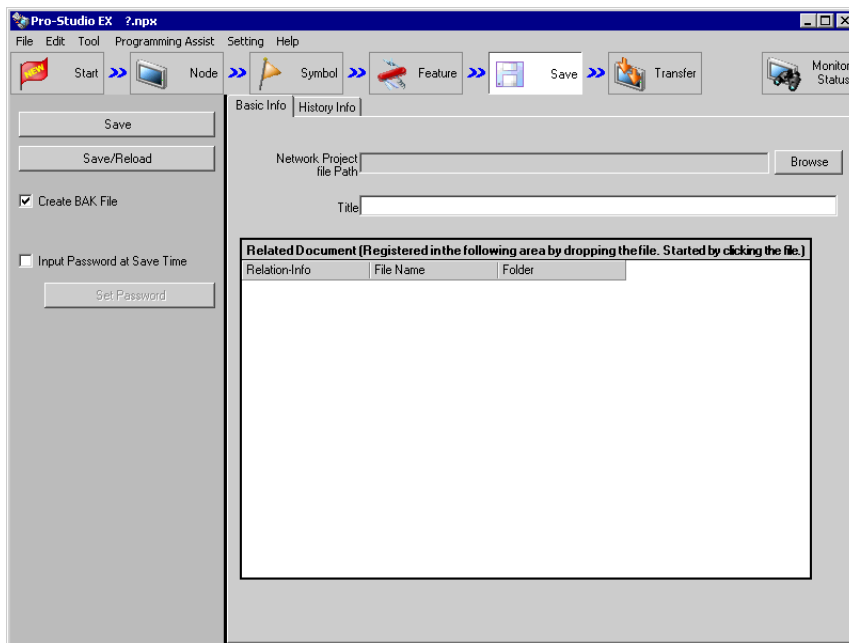
 Save Save the contents you have set as a network project file. Save them before transfer.

 Transfer Transfer the registered network project file to the participation node that will be the data source node. After the transfer, a condition in which a sample works is established.

Back Complete Cancel

This completes the "Sample Wizard".

Then the save setting screen will appear.



At this time, the "Sample Wizard Setting Result" screen and the form template file (ProduceManagementPerDay.xlt) in Excel format are also created.

Proceed to "STEP 6 Verifying Setting Result and Form Template".

STEP 6 Verifying Setting Result and Form Template

This step opens the "Sample Wizard Setting Result" screen to verify the setting result.

- 1 Click the "Sample Wizard" in the task bar of the PC.

The "Sample Wizard Setting Result" screen will appear.

Sample Wizard Setting Result

Production Management Board (per Day)

Creation Date and Time: Tuesday, November 13, 2007 6:24:47 PM

Node

| | Node Name | Node Type | IP Address |
|----------------|-------------|---------------|-------------|
| Operation Node | PC1 | Pro-Server EX | 172.21.3.38 |
| Trigger Node | Sample_Node | GP3000 Series | 172.21.3.39 |

Symbol

| Symbol Name | Node Name | Data Type | Device Address | Comment |
|---------------------------------|-------------|---------------|----------------|--|
| S_Excel01_Upload_BIT | Sample_Node | Bit | 300000 | Bit to order the start of Upload |
| S_Excel01_CumulativeNumber_WORD | Sample_Node | 16Bit(Signed) | 3001 | Device storing the Cumulative Result Number |
| S_Excel01_WriteDestination_WORD | Sample_Node | 16Bit(Signed) | 3002 | Device storing the Time Data to set the Cumulative Result Number |

Trigger Condition

| Condition Name | Condition |
|----------------|---|
| T_Excel01 | When the Start Upload Bit turns ON, device data is inserted into the cell |

ACTION

| ACTION Name | Action1 |
|-------------|---------|
| | |

- 2 Scroll the screen and verify that the settings have been correctly entered.

NOTE • Scroll down the "Sample Wizard Setting Result" screen and look for the [Sequence]. The content of action is shown here.

- 3 After having verified, click the [x] (close) button to close the screen and click the [-] (minimize) button to minimize the screen.

NOTE

- When created, the "Sample Wizard Setting Result" file will be automatically saved in the output destination folder set in procedure 1 of "STEP 5 Setting Feature (ACTION)". The file name is "(the ACTION name set in procedure 1 of STEP 5).html".

Proceed to opening the form template in 'Excel' to verify the setting result.

- 4 Open the form output destination folder set in procedure 1 of "STEP 5 Setting Feature (ACTION)" and double-click the Excel form template (ProductManagementPerDay.xlt).



Verify that the correct form template selected in "STEP 1 Selecting Form Template" is created.

 The screenshot shows the Microsoft Excel application window titled 'Microsoft Excel - ProductManagementPerDay1'. The menu bar includes File, Edit, View, Insert, Format, Tools, Data, Window, and Help. The toolbar contains various icons for file operations and formatting. The worksheet is named 'Excel01 Production Management Board (per Day)'. The data is organized as follows:

| Time | Cumulative Planned Num. | Cumulative Result Num. | Result Num./H | Difference/H | Problems |
|---------------|-------------------------|------------------------|---------------|--------------|----------|
| Early Morning | | | | | |
| 9 | 100 | | | | |
| 10 | 200 | | | | |
| 11 | 300 | | | | |
| 12 | 400 | | | | |
| 13 | 500 | | | | |
| 14 | 600 | | | | |
| 15 | 700 | | | | |
| 16 | 800 | | | | |
| 17 | 900 | | | | |
| Overtime | | | | | |

 Below the table, there are input fields and buttons:

- Time to set Result Num. (input field)
- Readout Cumulative Result Num. (input field) with an 'Execute' button.
- Debug(Cumulative Result Num) (input field)
- Debug(Time to set) (input field)

 The status bar at the bottom shows 'Ready' and 'CAPS NUM'.

- NOTE

- You can read the explanations how to use the template by clicking the [Explanation] tab.

Excel01 Production Management Board (per Day)

| Time | Cumulative Planned Num. | Cumulative Result Num. | Result Num./H | Difference/H | Problems |
|---------------|-------------------------|------------------------|---------------|--------------|----------|
| Early Morning | | 5 | 5 | | |
| 9 | 100 | 102 | 97 | -3 | |
| 10 | 200 | 200 | 98 | -2 | |
| 11 | 300 | 298 | 96 | -2 | |
| 12 | 400 | 398 | | | |
| 13 | 500 | 498 | | | |
| 14 | 600 | 598 | | | |
| 15 | 700 | 695 | 97 | -3 | |
| 16 | 800 | 795 | 100 | 0 | |
| 17 | 900 | 890 | 95 | -5 | |
| Overtime | | 900 | 10 | | |

Time to set Result Num.

Readout Cumulative Result Num.

Execute

Debug(Cumulative Result Num)

900

Debug(Time to set)

18

Planned Num. set beforehand

Result Num. per hour

Difference between Planned Num. and Result Num. per hour

Actual Cumulative Result Num. The value read out from the device is reflected here.

Clicking the Execute button turns On the "S_Excel01_Upload_BIT", and starts the Action.

Please input a value as data for debugging. Clicking the Debug button writes "Cumulative Result Num." and "Time to set Result Num." into "S_Excel01_Cumulative_WORD" and "S_Excel01_WriteDestination_WORD". Executing the Action acquires values from the written devices, and displays them in the column of "Cumulative Result Num" corresponding the value displayed in the "Time to set Result Num".

Proceed to "STEP 7 Saving Network Project File".

STEP 7 Saving Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

- 1 Enter a save destination folder and a save file name in the [Network Project file Path] field.
Click the [Browse] button to specify the save destination folder. On the "Save As" screen, enter the save file name in the [File Name] field, and then click the [Save] button.

Basic Info

History Info

Network Project file Path

...

Browse

Title

Related Document (Registered in the following area by dropping the file. Started by clicking the file.)

| Relation-Info | File Name | Folder |
|---------------|-----------|--------|
|---------------|-----------|--------|

- NOTE

- The extension of network project file (.npxe) will be affixed to the file name automatically.

- 2 Enter the title of the network project file in the [Title] field.

Basic Info | History Info

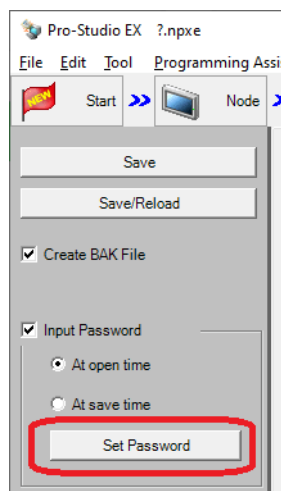
Network Project file Path: Browse

Title:

Related Document (Registered in the following area by dropping the file. Started by clicking the file.)

| Relation-Info | File Name | Folder |
|---------------|-----------|--------|
|---------------|-----------|--------|

- 3 Click the [Set Password] button.



The "Set Password" screen appears.

- 4 In the [New Password] field, enter a password of up to 32 characters. Enter the same password in the [Confirmation Password] field.

Set Password

Set a password for the network project.

Current Password:

New Password:

Confirmation Password:

OK Cancel

IMPORTANT

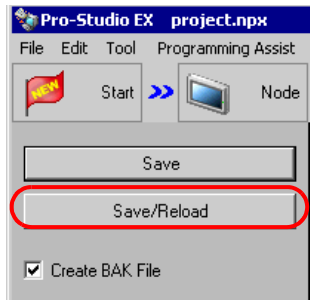
- If you forget the password, you cannot open or save the project file.

NOTE

- For enhanced security, passwords should meet the following requirements:
 - At least 8 characters long.
 - At least one of each of the following four types of characters: Lowercase letters (a-z), uppercase letters (A-Z), numbers (0-9), and special characters (SPACE!"#\$%&'()*+,-./:;<=>?@[\]^_`{|}~).

5 Click the [OK] button.

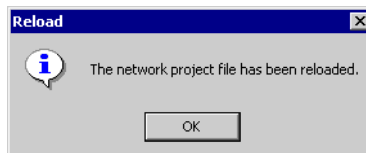
6 Click the [Save/Reload] button.



The setting result is saved as a network project file.

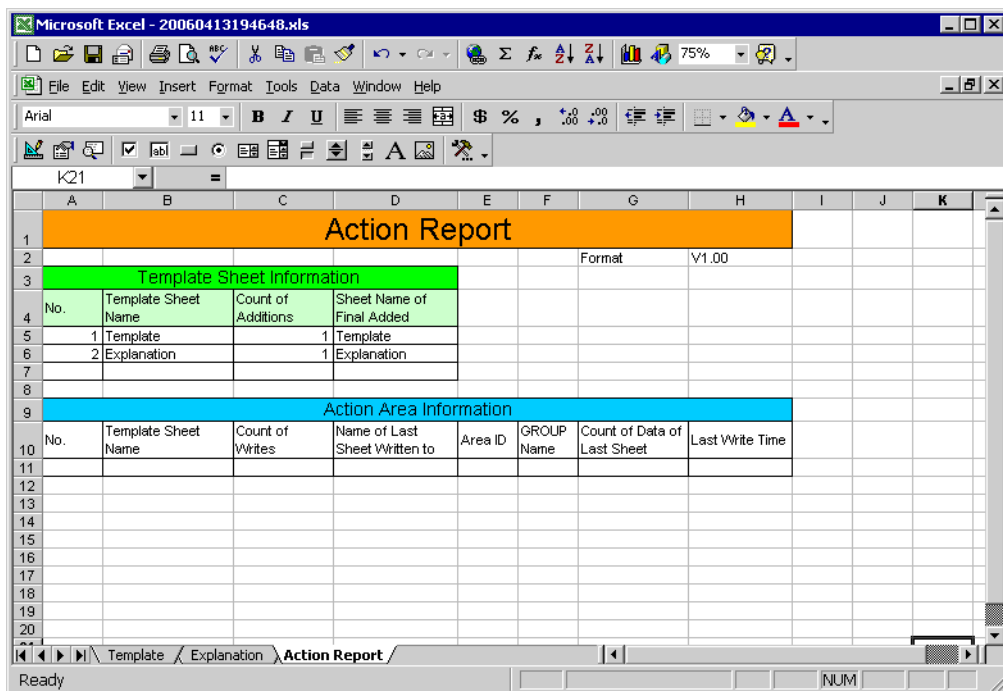
What is Reload?

'Pro-Server EX' performs data read/write, etc according to the settings of the network project file. Reload is an operation to make 'Pro-Server EX' recognize the created network project file. Clicking the [Save/Reload] button activates 'Pro-Server EX', execute reload, and display the screen below.

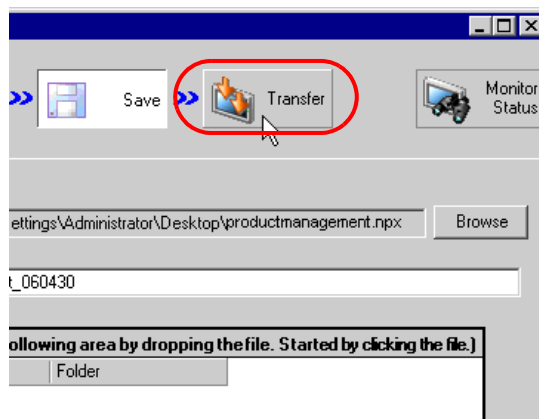


Click the [OK] button.

In this screen, working history such as how this ACTION output to the output file is always recorded.



7 Click the [Transfer] button.



Proceed to "STEP 8 Transferring Network Project File".

STEP 8 Transferring Network Project File

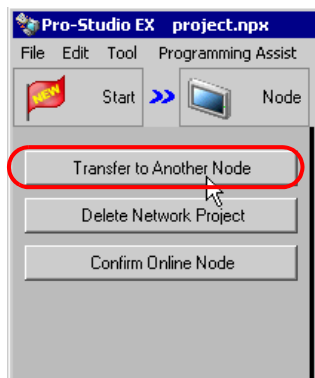
This step transfers the saved network project file to the display unit.

- 1 Turn on the check box of the entry node to which the network project file will be transferred.

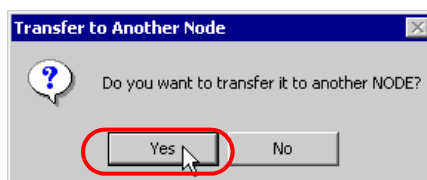
In this wizard, check "Sample_Node", which is the data source node set in procedure 2 of "STEP 2 Registering Entry Nodes".

| Node Name | IP Address | Actual Device... | No. | Build No. | Last Transfe |
|---|---------------|------------------|-----|-----------|--------------|
| <input checked="" type="checkbox"/> Sample_Node | 192.168.0.100 | Unconfirmed | | | |
| | | | | | |
| | | | | | |
| | | | | | |

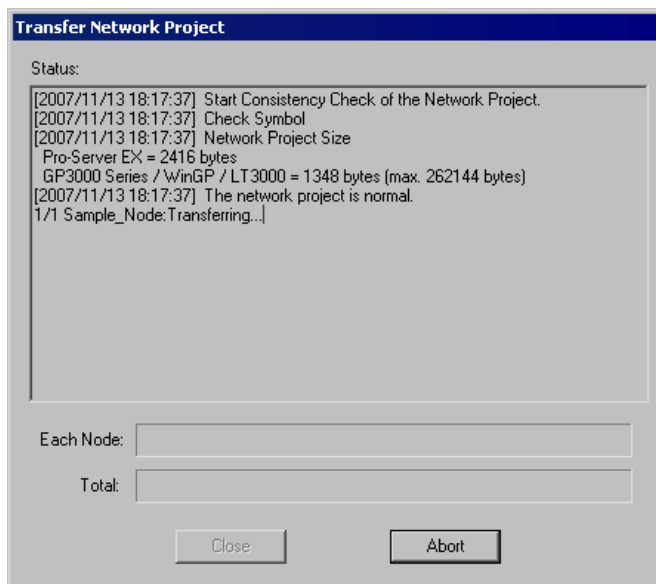
- 2 Click the [Transfer to Another Node] button.



- 3 On the "Transfer to Another Node" screen, click the [Yes] button.



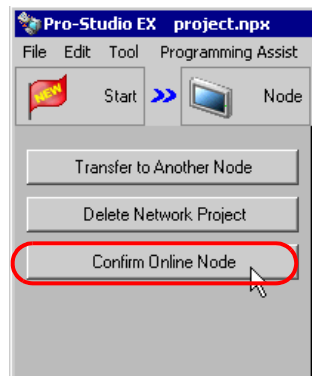
The "Transfer Network Project" screen will appear, transferring the network project file to the entry node checked in procedure 1.



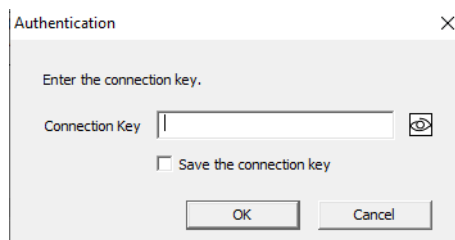
Click the [Close] button to close the "Transfer Network Project" screen.

NOTE

- The network project file cannot be transferred if each entry node is not in on-line status (if communication is not active). Before transfer, always click the [Confirm Online Node] button and confirm each node is in on-line status.



- When the connected node's [Verify device configuration at transfer] is enabled in the [Connection key] setting, the connection key must be entered when transferring a network project. Configure the [Connection Key] setting in offline mode from the [Security Settings] screen.



Proceed to "STEP 9 Writing Data to Forms".

STEP 9 Writing Data to Forms

This step writes the data to the output file after the trigger condition set in "STEP 4 Setting Trigger Condition" has become effective.

In this trial, you can confirm that the data will be written to the output file.

- 1 Open the output destination folder of the form set in procedure 1 of "STEP 5 Setting Feature (ACTION)" and then open the Excel file whose file name set in procedure 2 .

The screenshot shows a Microsoft Excel window titled "Microsoft Excel - ProductManagementPerDay1". The spreadsheet contains a table titled "Excel01 Production Management Board (per Day)". The table has columns for Time, Cumulative Planned Num., Cumulative Result Num., Result Num./H, Difference/H, and Problems. The data rows show times from 9 to 17, with cumulative planned numbers increasing by 100 each hour. Below the table, there are input fields for "Time to set Result Num.", "Readout Cumulative Result Num.", "Debug(Cumulative Result Num)", and "Debug(Time to set)", along with an "Execute" button. The status bar at the bottom shows "Ready" and "NUM".

| Time | Cumulative Planned Num. | Cumulative Result Num. | Result Num./H | Difference/H | Problems |
|---------------|-------------------------|------------------------|---------------|--------------|----------|
| Early Morning | | | | | |
| 9 | 100 | | | | |
| 10 | 200 | | | | |
| 11 | 300 | | | | |
| 12 | 400 | | | | |
| 13 | 500 | | | | |
| 14 | 600 | | | | |
| 15 | 700 | | | | |
| 16 | 800 | | | | |
| 17 | 900 | | | | |
| Overtime | | | | | |

Time to set Result Num.

Readout Cumulative Result Num. Execute

Debug(Cumulative Result Num)

Debug(Time to set)

- 2 Store the values for debugging in the display unit's internal device, "S_Excel01_Accum Qty_WORD" and "S_Excel01_Write Destination_WORD".

In this trial, enter any reasonable values in the "Debug (Cumulative Result Num)" and "Debug (Time to set)" and then click the each debug button. The values will then be stored "S_Excel01_Accum Qty_WORD" and "S_Excel01_Write Destination_WORD" of the display unit respectively.

| | | | |
|----|--------------------------------|-----|---------|
| 16 | | | |
| 17 | Time to set Result Num. | | |
| 18 | Readout Cumulative Result Num. | | Execute |
| 19 | | | |
| 20 | Debug(Cumulative Result Num) | 103 | |
| 21 | | | |
| 22 | | | |
| 23 | Debug(Time to set) | 9 | |
| 24 | | | |
| 25 | | | |

NOTE • The values to input the Debug (Time to Set) field should be from 9 to 17. This value is used to specify the row to which the accumulative quantity will be written.

- 3 Click the [Execute] button.

Trigger Condition bit "T_Excel01" is automatically turned ON.

That allows Trigger Condition to set and New Form ACTION to operate, and then the output file is created.

The values stored "S_Excel01_Accum Qty_WORD" and "S_Excel01_Write Destination_WORD" of the display unit will be written in Excel form. Verify that the cell of the accumulative quantity at 9 o'clock shows "103".

| | A | B | C | D | E | F | G |
|---|---|----------------------------|---------------------------|-------------------|--------------|---|---|
| 1 | Excel01 Production Management Board (per Day) | | | | | | |
| 2 | | | | | | | |
| 3 | Time | Cumulative Planned Num. | Cumulative Result Num. | Result Num. /H | Difference/H | | |
| 4 | Early Morning | | | | | | |
| 5 | 9 | 100 | 103 | 103 | 3 | | |
| 6 | 10 | 200 | | | | | |
| 7 | 11 | 300 | | | | | |

- 4 After having verified the form, click the [x] (close) button.

This is the end of creating a sample form using the "Sample Wizard".

3.3 Trial of Recipe Function

3.3.1 What is a Recipe Function?

'Pro-Server EX' allows writing data created beforehand using application software such as 'Excel', or data in CSV format to an arbitrary device of the Device/PLC.

Flow of Recipe Creation

(1) Create a sheet (recipe sheet) of data to be written to the Device/PLC in Excel format.

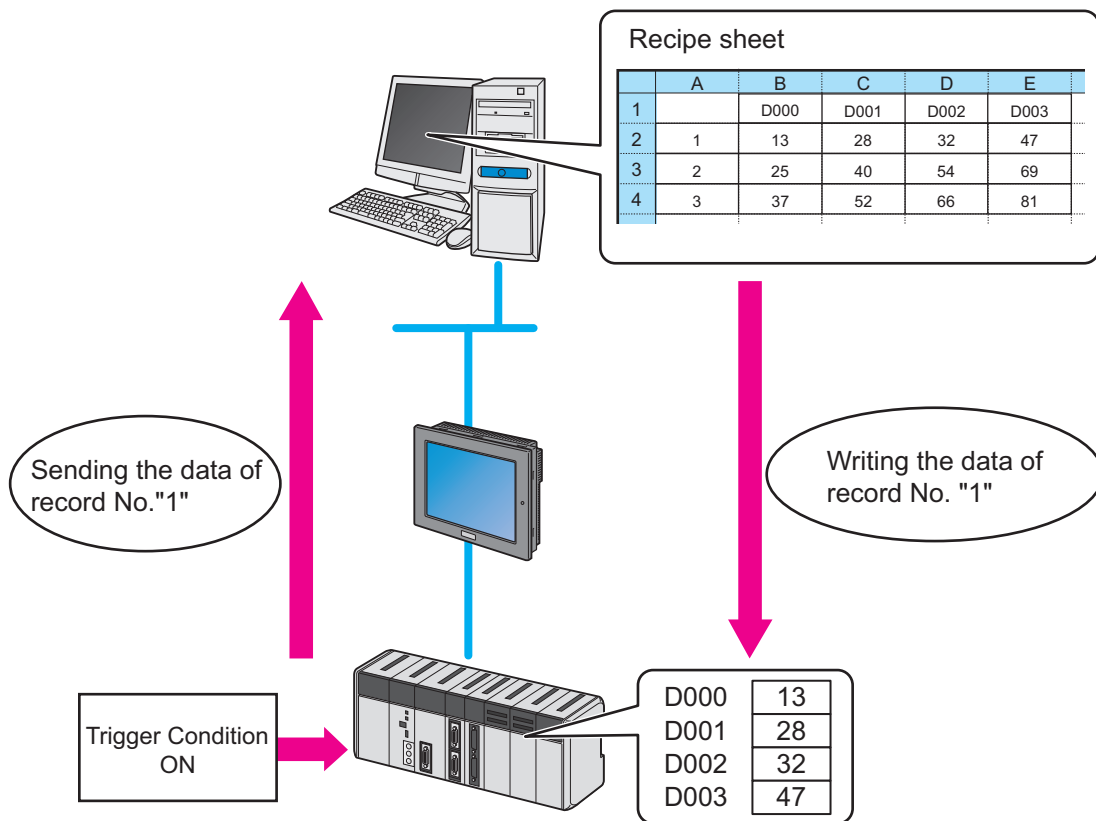
| | A | B | C | D | E | |
|---|---|------|------|------|------|----------------|
| 1 | | D000 | D001 | D002 | D003 | Device address |
| 2 | 1 | 13 | 28 | 32 | 47 | |
| 3 | 2 | 25 | 40 | 54 | 69 | |
| 4 | 3 | 37 | 52 | 66 | 81 | |

Record No.

(2) Execute action setting of the recipe function, for example setting a write destination of data and requirements for writing data using 'Pro-Studio EX'.

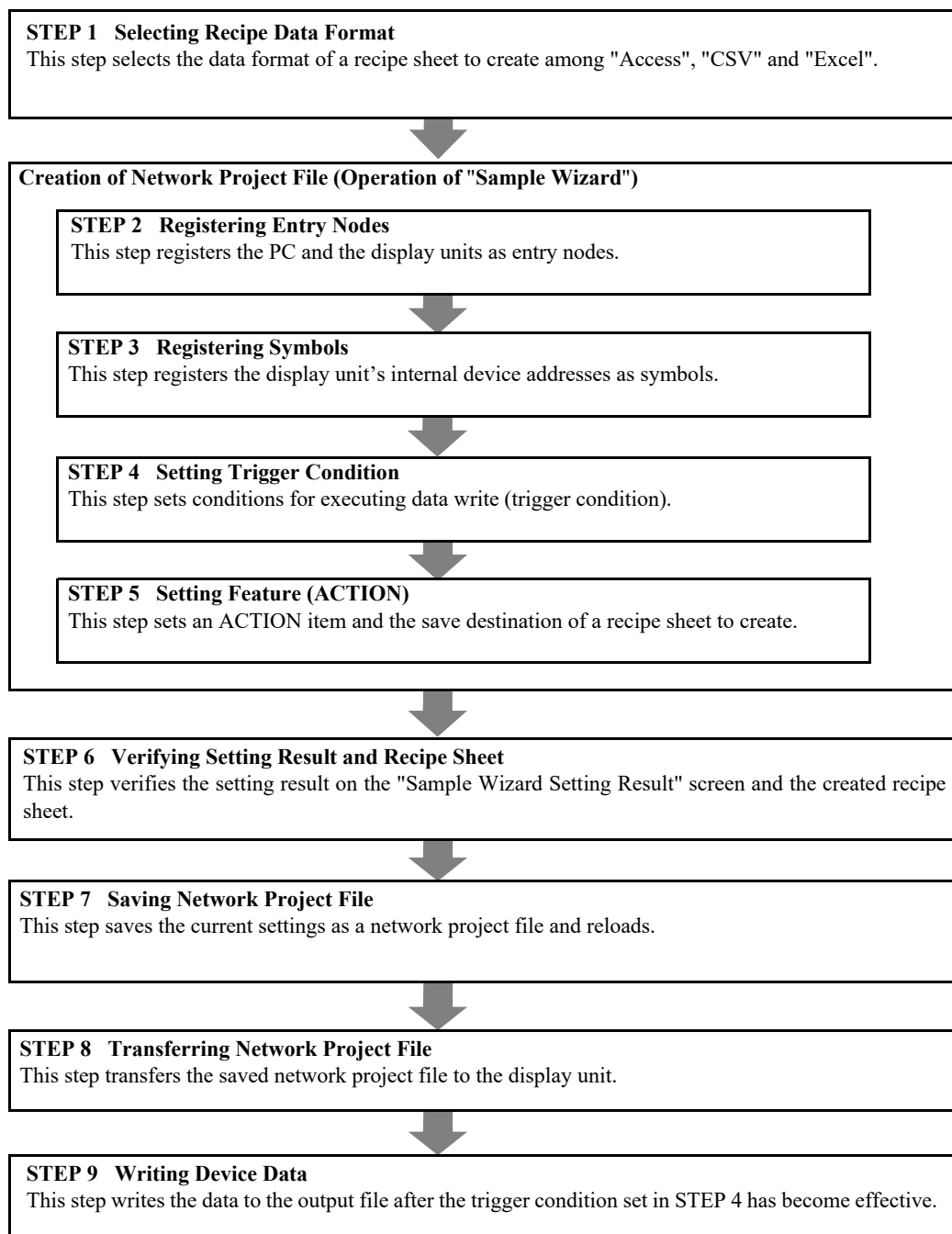
(3) At a specific timing or at a specific interval, the data of preset record No. in the recipe sheet is written to the device address of the Device/PLC.

(Example) Writing the data of record No. "1" of the recipe sheet to the device addresses "D000" to "D003".



3.3.2 Workflow from Settings to Write Data

The following explains about the operation flow from setting to device data write using the "Recipe" wizard.



3.3.3 Writing the Device Data

This section helps you to learn necessary settings efficiently for writing data by simply following the instructions of the "Recipe" wizard of the "Sample Wizard" to actually write data to the display unit.

IMPORTANT

- Recipe sheet creation in Access format or Excel format needs 'Access' or 'Excel' preinstalled on the PC.
Before getting started, ensure that necessary software is installed on the PC.

STEP 1 Selecting Data Format of Recipe Sheet

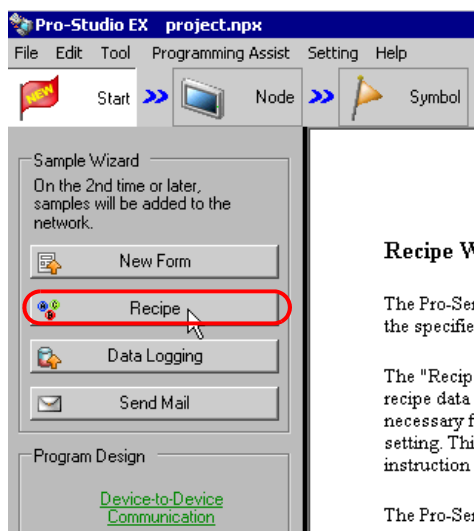
This step selects the data format of a recipe sheet to create.

In this trial, create a recipe sheet in 'Excel' format.

Creating Recipe Sheet (Sample)

Before using the recipe function, you must create a recipe sheet on which device data to be written to the Device/PLC are entered. In this wizard, the sample recipe sheet will be automatically created and stored in the folder specified by the wizard.

- 1 On the start screen, click the [Recipe] button in the [Sample Wizard].



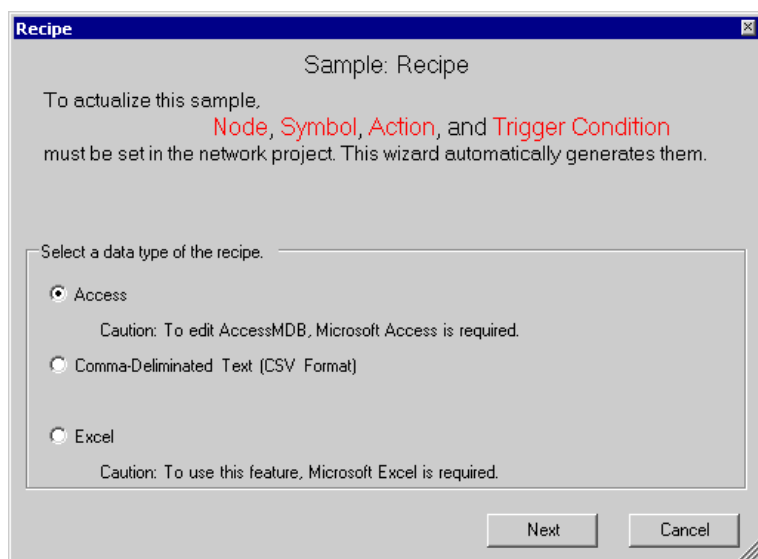
Recipe W

The Pro-Ser
the specifie

The "Recipe
recipe data i
necessary f
setting. This
instruction (

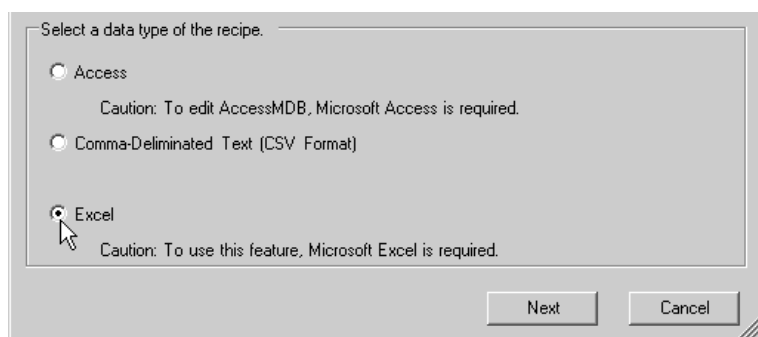
The Pro-Ser

The "Recipe" wizard starts. The data format selection screen will appear.

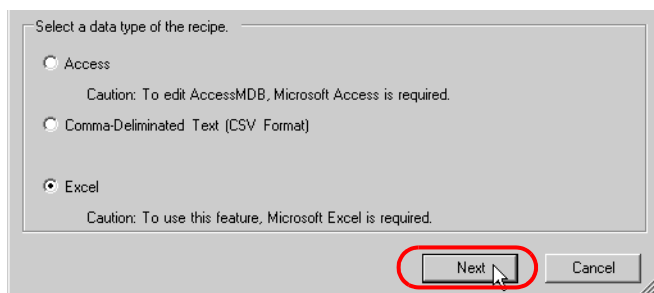


2 Select the data format of a recipe sheet to create.

In this trial, select "Excel".



Click the [Next] button.



This is the end of selecting a data format. The entry nodes setting screen will appear.

NOTE

- The following explanation assumes that "Excel" is selected on the data format selection screen. Note that if "Comma-Delimited Text (CSV Format)" or "Access" is selected, the screens and settings are different from the followings.

Proceed to "STEP 2 Registering Entry Nodes".

STEP 2 Registering Entry Nodes

The setting items are the same as those in the "New Form" wizard above.

See "STEP 2 Registering Entry Nodes" in "Creating a Form".

If you have tried another wizard and registered entry nodes already, you can skip this procedure.

Click the [Next] button and proceed to "STEP 3 Registering Symbols".

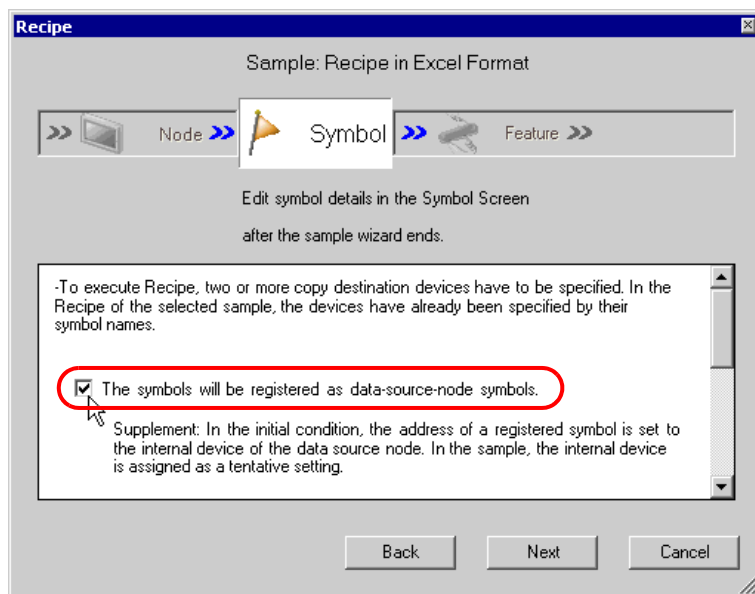
Proceed to "STEP 3 Registering Symbols".

STEP 3 Registering Symbols

This step registers the device address to which data will be written as a "Symbol".

In this wizard, the display unit's internal device are registered as symbols.

- 1 Check the [The symbols will be registered as data-source-node symbols.] check box, and then enlarge or scroll the screen to confirm the preset symbol.



| Symbol Name | Data Type | Address |
|--------------------|---------------|---------|
| S_Recipe03_Rec... | 16Bit(Signed) | 2191 |
| S_Recipe03_Writ... | 16Bit(Signed) | 2192 |

- 2 Click the [Next] button.

| Symbol Name | Data Type | Address |
|--------------------|---------------|---------|
| S_Recipe03_Rec... | 16Bit(Signed) | 2191 |
| S_Recipe03_Writ... | 16Bit(Signed) | 2192 |
| S_Recipe03_Do... | Bit | 219000 |

Back Next Cancel

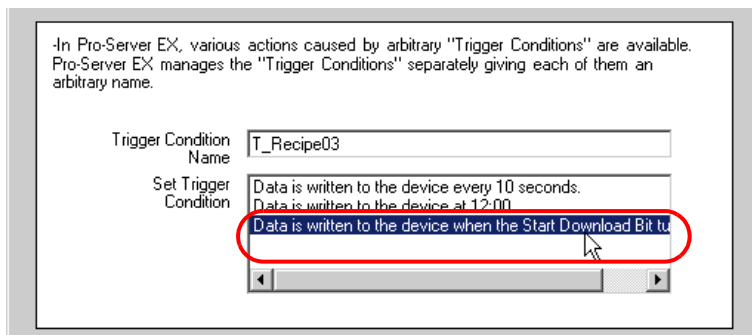
This is the end of registering symbols necessary for data write. The trigger condition setting screen will appear.

Proceed to "STEP 4 Setting Trigger Condition".

STEP 4 Setting Trigger Condition

This step sets conditions for executing data write (trigger condition).

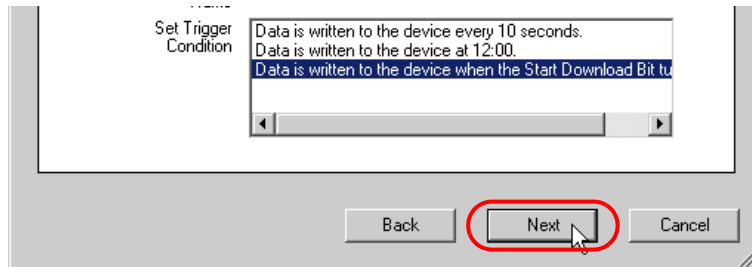
- 1 Select a trigger condition in the [Set Trigger Condition] field. Here, select "Data is written to the device when the Start Download Bit turns ON".



IMPORTANT

- The name of the trigger condition can be an arbitrary name. However, in this wizard the name is preset. Changing this name in this trial may cause discrepancies. Accept the default provided by this wizard.

- 2 Click the [Next] button.



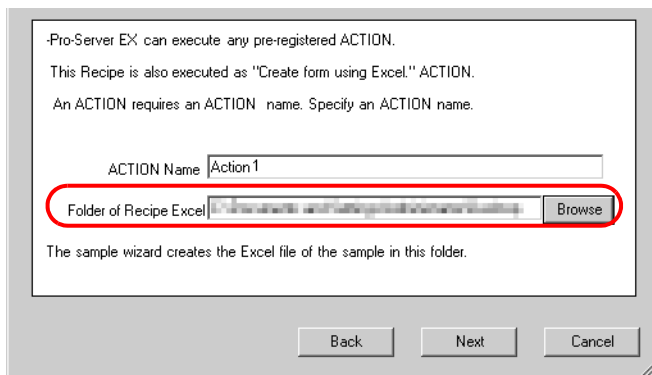
This is the end of setting a trigger condition necessary for data write. The ACTION setting screen will appear.

Proceed to "STEP 5 Setting Feature (ACTION)".

STEP 5 Setting Feature (ACTION)

This step sets functions (ACTION) to use. Specifically, this step sets the name of ACTION to use and the save destination of a recipe sheet to create as a sample.

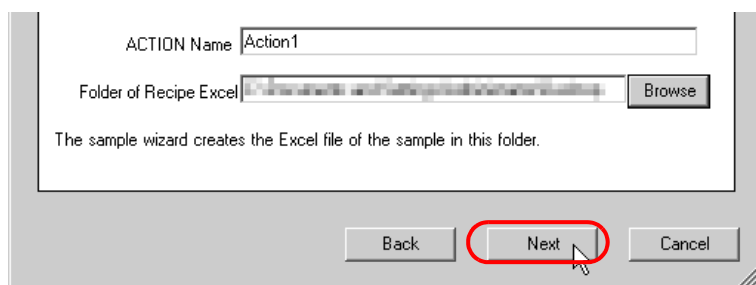
- 1 Enter the folder of save destination of a recipe sheet in the [Folder of Recipe Excel] field.



IMPORTANT

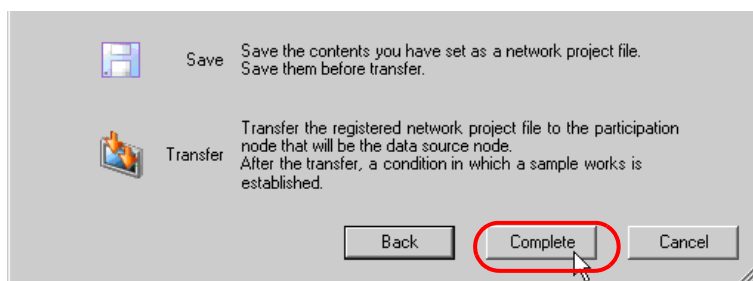
- The ACTION name can be an arbitrary name. However, in this wizard the name is preset. Changing this name in this trial may cause discrepancies. Accept the default provided by this wizard.

- 2 Click the [Next] button.



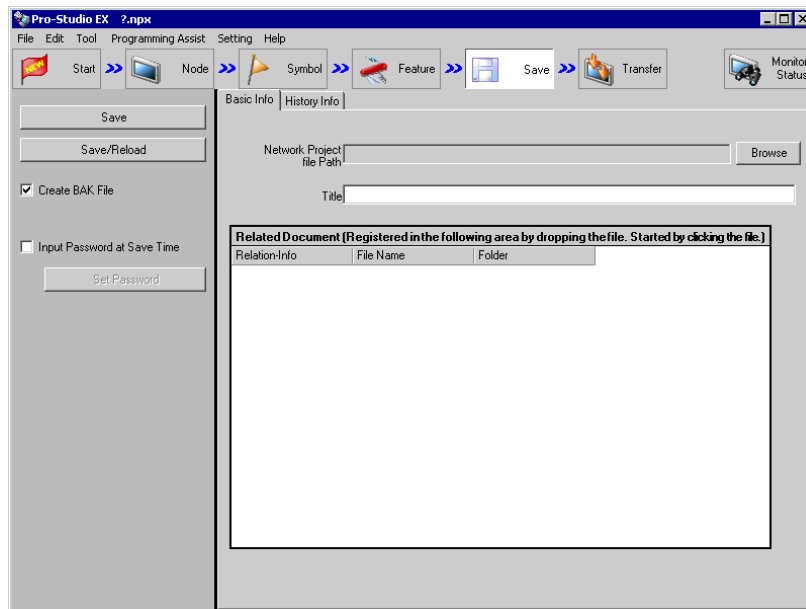
This is the end of setting an ACTION item necessary for data write. The screen that explains the procedures to follow (saving and transferring network project file) will appear. You can read the explanations how to save and transfer the network project file on the screen.

- 3 Click the [Complete] button.



This completes the "Sample Wizard".

Then the save setting screen will appear.



At this time, the "Sample Wizard Setting Result" screen and the recipe sheet file (Recipe_Excel.xlt) in Excel format are also created.

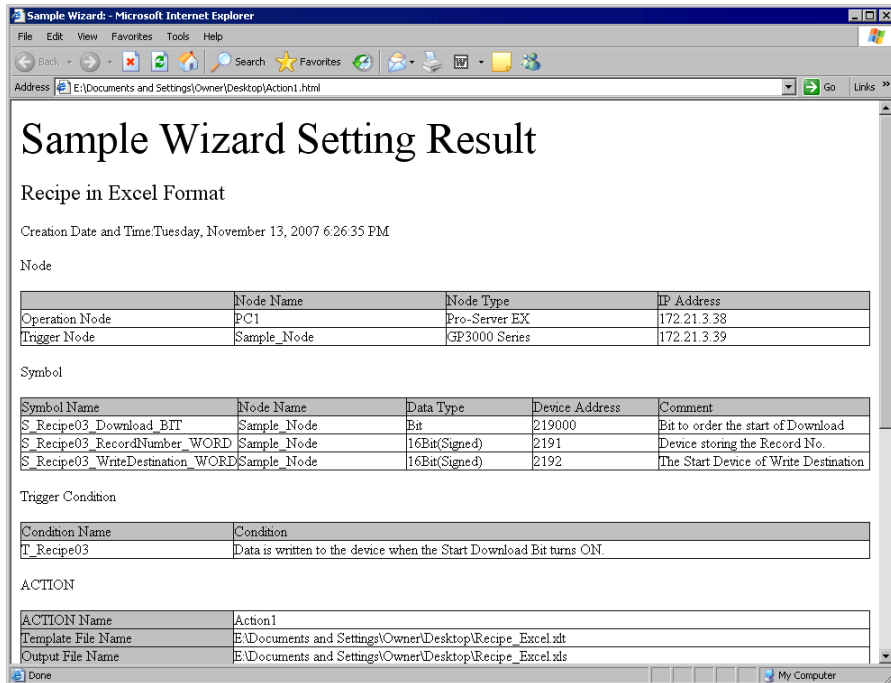
Proceed to "STEP 6 Verifying Setting Result and Recipe Sheet".

STEP 6 Verifying Setting Result and Recipe Sheet

This step opens the "Sample Wizard Setting Result" screen to verify the setting result.

- 1 Click the "Sample Wizard" in the task bar of the PC.

The "Sample Wizard Setting Result" screen will appear.



- 2 Scroll the screen and verify that the settings have been correctly entered.

NOTE • Scroll down the "Sample Wizard Setting Result" screen and look for the [Sequence]. The content of action is shown here.

- 3 After having verified, click the [x] (close) button to close the screen and click the [-] (minimize) button to minimize the screen.

NOTE • When created, the "Sample Wizard Setting Result" file will be automatically saved in the save destination folder of the recipe sheet set in procedure 2 of "STEP 5 Setting Feature (ACTION)". The file name is "(ACTION name).html".

Proceed to opening the recipe sheet in 'Excel' to verify the setting result.

- 4 Open the save destination folder of the recipe sheet set in procedure 1 of "STEP 5 Setting Feature (ACTION)" and double-click the recipe sheet (Recipe_Excel.xlt) in 'Excel'.



Verify that the recipe sheet is created.

The screenshot shows the Microsoft Excel interface with the title bar 'Microsoft Excel - Book1'. The menu bar includes File, Edit, View, Insert, Format, Tools, Data, and Window. The toolbar contains various icons for file operations and editing. The active cell is H9. The worksheet contains data in columns A, B, and C, with rows 1 through 6 highlighted in light blue. The data is as follows:

| | A | B | C | D | E |
|----|------|-----|----|---|---|
| 1 | 1 | 2 | 3 | | |
| 2 | 1111 | 111 | 11 | | |
| 3 | 2222 | 222 | 22 | | |
| 4 | 3333 | 333 | 33 | | |
| 5 | 4444 | 444 | 44 | | |
| 6 | 5555 | 555 | 55 | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |

Proceed to "STEP 7 Saving Network Project File".

STEP 7 Saving Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

The setting items are the same as those in the "New Form" wizard above.
See "STEP 7 Saving Network Project File" in "Creating a Form".

Proceed to "STEP 8 Transferring Network Project File".

STEP 8 Transferring Network Project File

This step transfers the saved network project file to the display unit.

The setting items are the same as those in the "New Form" wizard above.
See "STEP 8 Transferring Network Project File" in "Creating a Form".

Proceed to "STEP 9 Writing Device Data".

STEP 9 Writing Device Data

This step writes the display unit's internal device data after the trigger condition set in "STEP 4 Setting Trigger Condition" has become effective.

In this trial, you can confirm that the data will be written to the display unit.

1 Turn on the download start bit to effect the trigger condition.

NOTE

You can turn ON the download start bit by:

- turning on the bit from the screen of the display unit; or
- turning on the bit on the "Device Monitor" or "Symbol Monitor".

For more details, see 'GP-Pro EX Reference Manual' or "28 Simply Confirming On-site Status".

2 When Trigger Condition is enabled, check that the recipe sheet data corresponding to the record number stored in "S_Recipe_record number_WORD" is written in "S_Recipe03_Write Destination_WORD".

This is the end of writing recipe data using the "Sample Wizard".

3.4 Trial of Logging Function

3.4.1 What is a Data Logging Function?

'Pro-Server EX' allows logging (continuously read) of data that has been collected in Device/PLCs over a period of time and at an arbitrary timing and writing the logged data in application software such as 'Excel'.

Flow of Data Logging

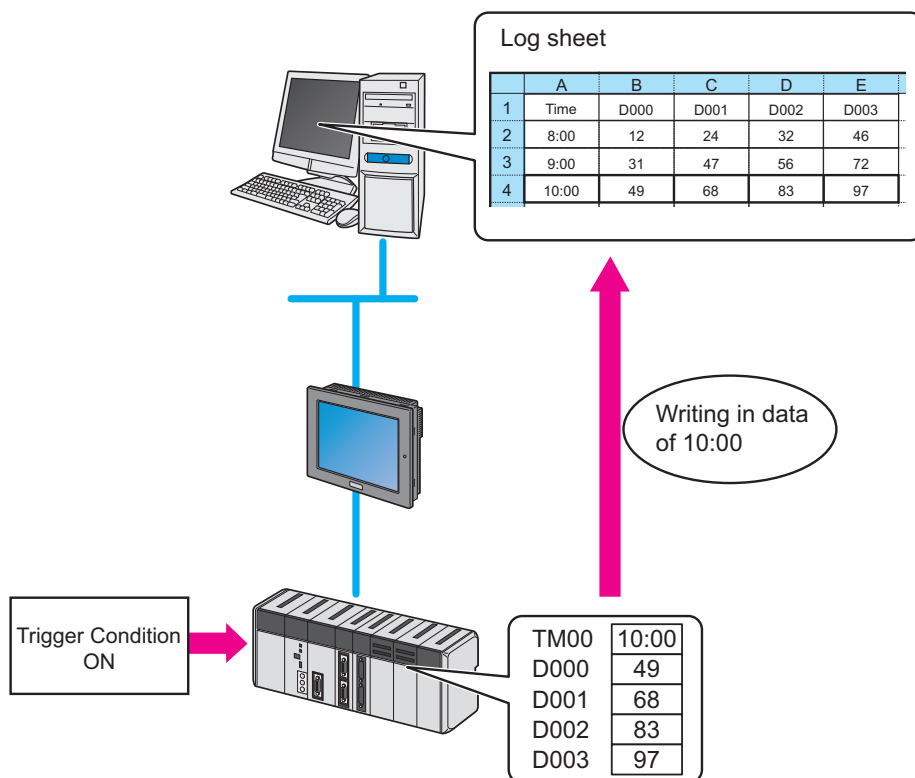
(1) Create a sheet (log sheet) in Excel format to which logged data will be written.

| | A | B | C | D | E |
|---|-------|------|------|------|------|
| 1 | Time | D000 | D001 | D002 | D003 |
| 2 | 9:00 | | | | |
| 3 | 10:00 | | | | |
| 4 | 11:00 | | | | |
| 5 | 12:00 | | | | |

(2) Execute action setting of the data logging function, for example setting of a write destination of data and requirements for logging using 'Pro-Studio EX'.

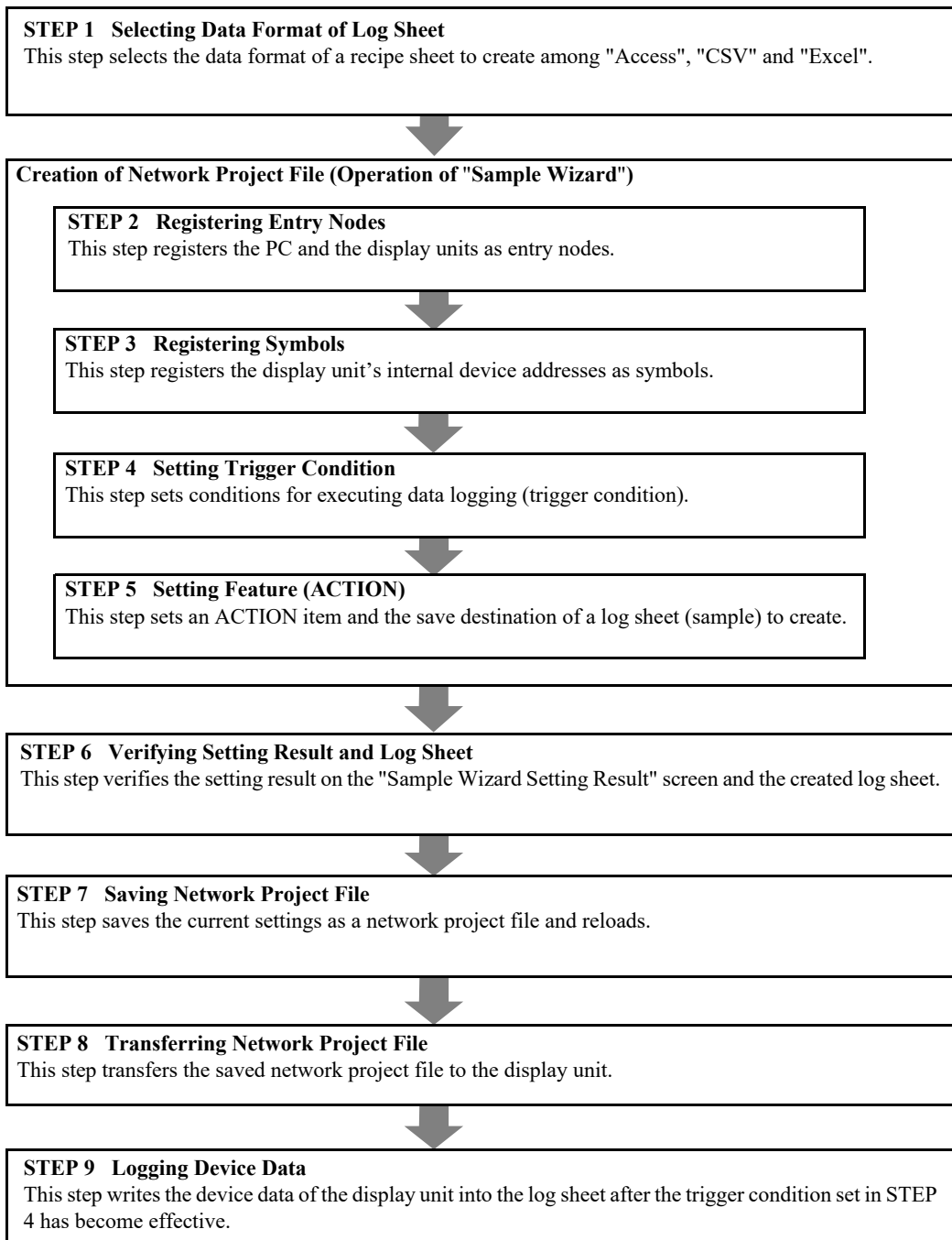
(3) At a specific timing or at a specific interval, data logging is executed and the data of the Device/PLC are written onto the log sheet.

(Example) Logging the data of the device addresses, "D000" to "D003" of the Device/PLC every one hour.



3.4.2 Workflow from Settings to Data Logging

The following explains about the operation flow from setting to data logging using the "Data Logging" wizard.



3.4.3 Logging the Device Data

This section helps you to learn necessary settings efficiently for logging the data of the display unit by simply following the instructions of the "Data Logging" wizard of the "Sample Wizard" to actually log the data of the display unit.

IMPORTANT • Log sheet creation in Access format or Excel format needs 'Access' or 'Excel' preinstalled on the PC. Before getting started, ensure that necessary software is installed on the PC. Before getting started, ensure that necessary software is installed on the PC.

STEP 1 Selecting Data Format of Log Sheet

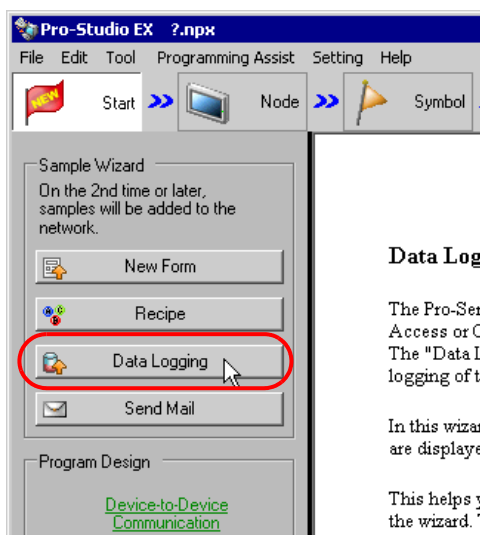
This step selects the data format of a log sheet to create.

In this trial, create a log sheet in Excel format.

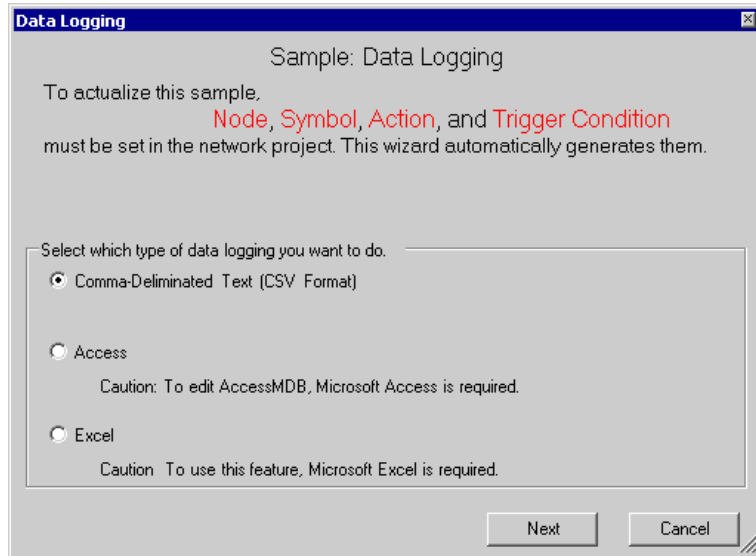
Creating Log Sheet (Sample)

Before using the recipe function, you must create a log sheet on which device data or logging time are entered. In this wizard, the sample log sheet will be automatically created and stored in the folder specified by the wizard.

- 1 On the start screen, click the [Data Logging] button in the [Sample Wizard].

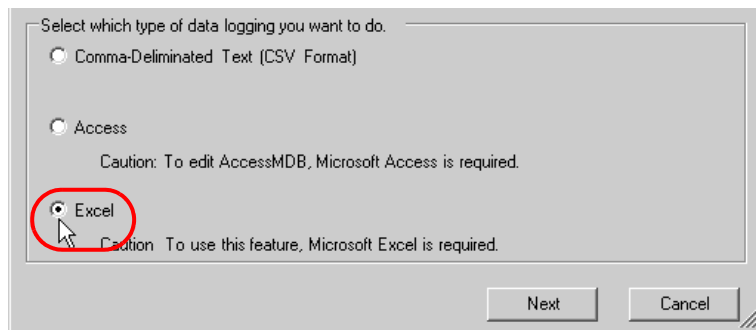


The "Data Logging" wizard starts. The data format selection screen will appear.

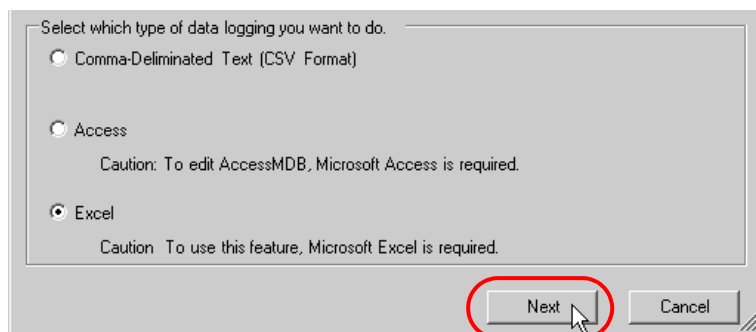


2 Select the data format of a log sheet to create.

In this trial, select "Excel".



Click the [Next] button.



This is the end of selecting a data format. The entry nodes setting screen will appear.

NOTE

- The following explanation assumes that "Excel" is selected on this screen.
Note that if "Comma-Delimited Text (CSV Format)" or "Access" is selected, the screens and settings are different from the followings.
-

Proceed to "STEP 2 Registering Entry Nodes".

STEP 2 Registering Entry Nodes

The setting items are the same as those in the "New Form" wizard above.
See "STEP 2 Registering Entry Nodes" in "Creating a Form".
If you have tried another wizard and registered entry nodes already, you can skip this procedure.
Click the [Next] button and proceed to "STEP 3 Registering Symbols".

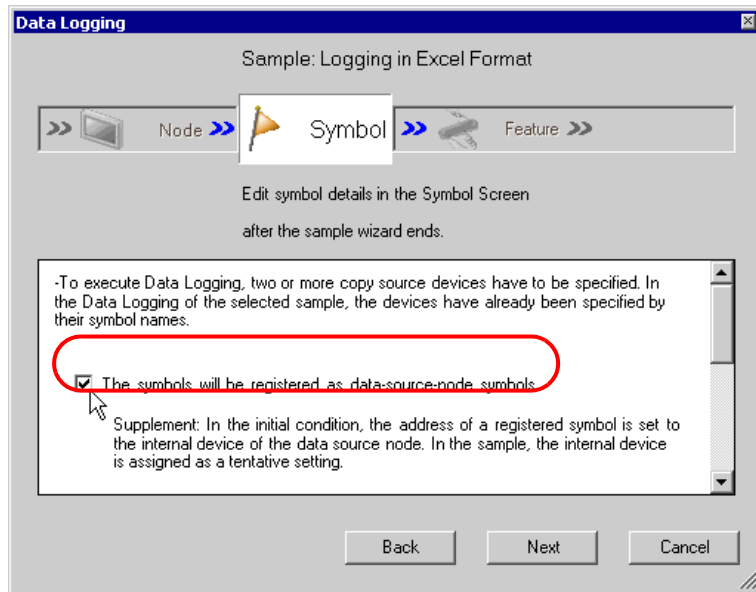
Proceed to "STEP 3 Registering Symbols".

STEP 3 Registering Symbols

This step registers the device address from which data will be read as a "Symbol".

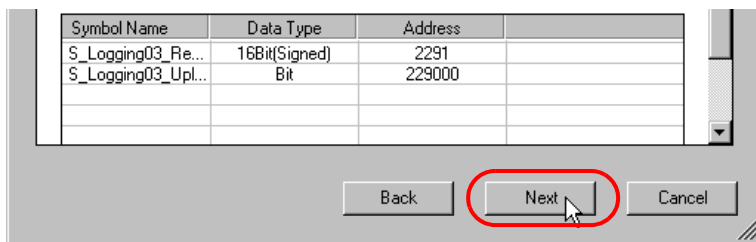
In this wizard, the display unit's internal device are registered as symbols.

- 1 Check the [The symbols will be registered as data-source-node symbols.] check box, and then enlarge or scroll the screen to confirm the preset symbol.



| Symbol Name | Data Type | Address | |
|--------------------|---------------|---------|--|
| S_Logging03_Re... | 16Bit(Signed) | 2291 | |
| S_Logging03_Upl... | Bit | 229000 | |
| | | | |
| | | | |

- 2 Click the [Next] button.



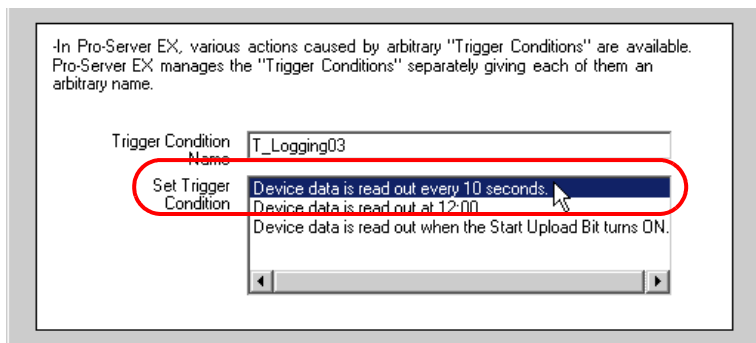
This is the end of registering symbols necessary for data logging. The trigger condition setting screen will appear.

Proceed to "STEP 4 Setting Trigger Condition".

STEP 4 Setting Trigger Condition

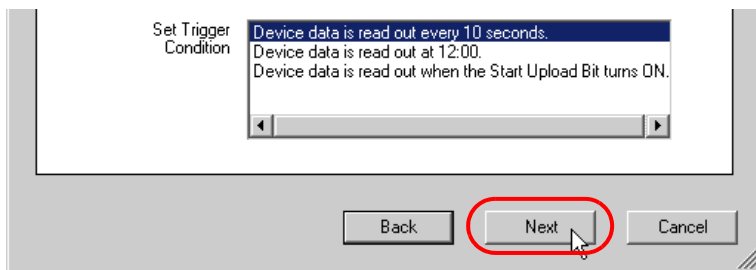
This step sets conditions for executing data logging (trigger condition).

- 1 Select a trigger condition in the [Set Trigger Condition] field. Here, select "Device data read out every 10 seconds".

**IMPORTANT**

- The name of the trigger condition can be an arbitrary name. However, in this wizard the name is preset. Changing this name in this trial may cause discrepancies. Accept the default provided by this wizard.

- 2 Click the [Next] button.



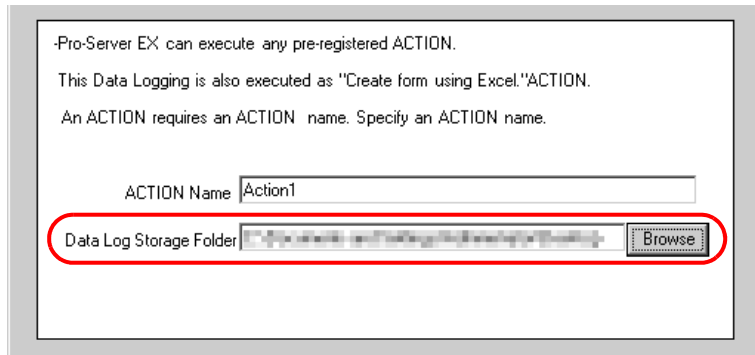
This is the end of setting a trigger condition necessary for data logging. The ACTION setting screen will appear.

Proceed to "STEP 5 Setting Feature (ACTION)".

STEP 5 Setting Feature (ACTION)

This step sets functions (ACTION) to use. This step sets functions (ACTION) to use. Specifically, this step sets the name of ACTION to use and the save destination of a log sheet to create as a sample.

- 1 Enter the folder of save destination of a log sheet in the [Data Log Storage Folder] field.



-Pro-Server EX can execute any pre-registered ACTION.
This Data Logging is also executed as "Create form using Excel."ACTION.
An ACTION requires an ACTION name. Specify an ACTION name.

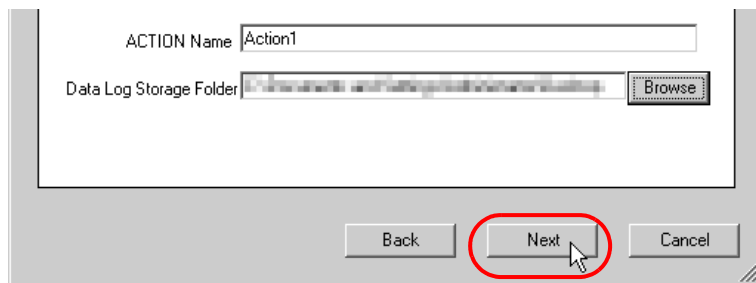
ACTION Name

Data Log Storage Folder

IMPORTANT

- The ACTION name can be an arbitrary name. However, in this wizard the name is preset. Changing this name in this trial may cause discrepancies. Accept the default provided by this wizard.

- 2 Click the [Next] button.

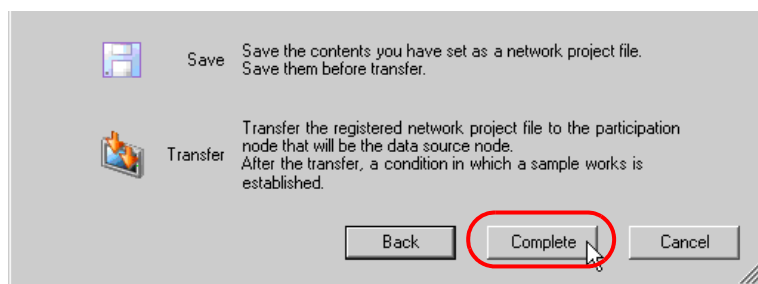


ACTION Name

Data Log Storage Folder

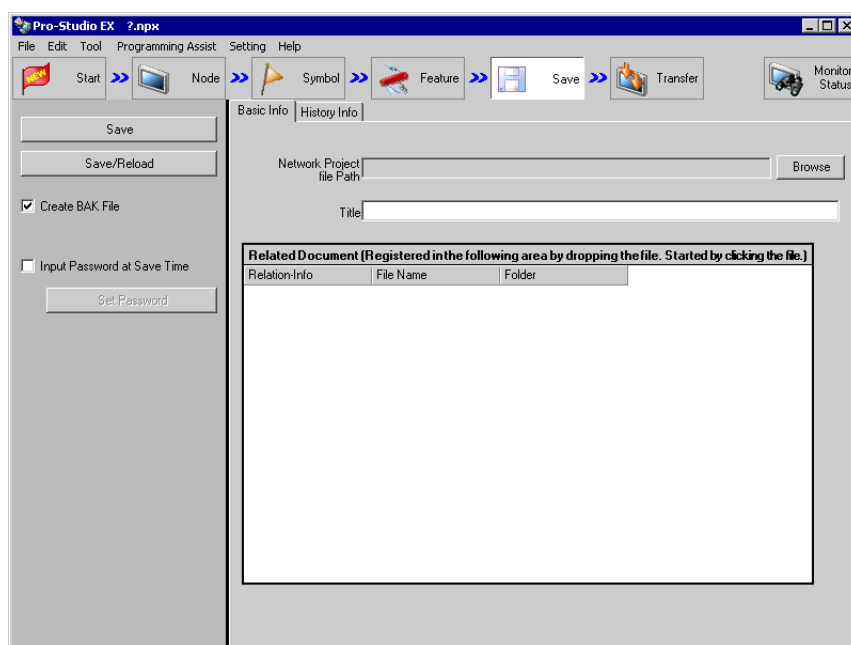
This is the end of setting an ACTION item necessary for data logging. The screen that explains the procedures to follow (saving and transferring network project file) will appear.

3 Click the [Complete] button.



This completes the "Sample Wizard".

Then the save setting screen will appear.



At this time, the "Sample Wizard Setting Result" screen and the log sheet file (Logging_Excel) in Excel format are also created.

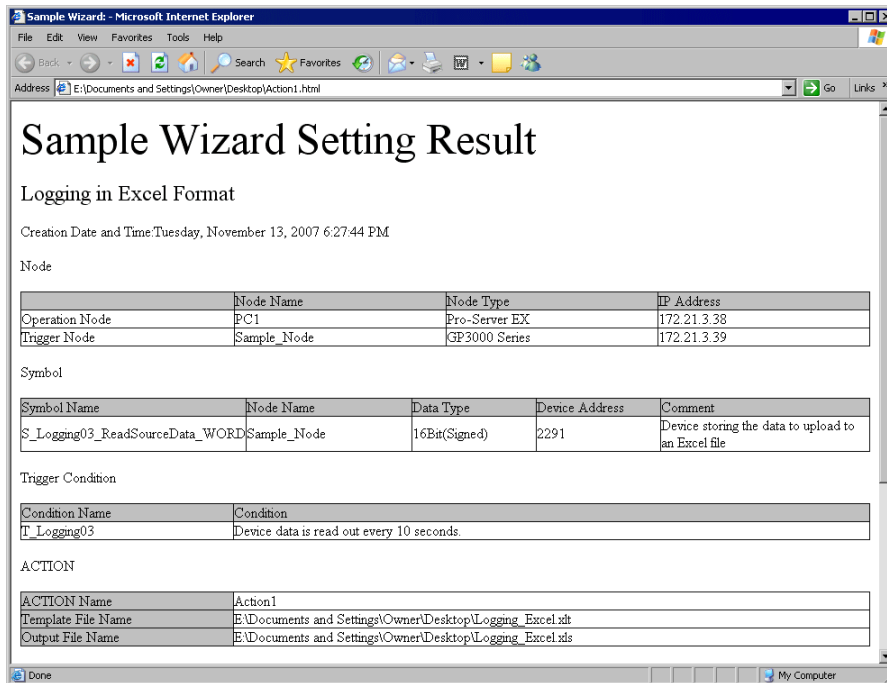
Proceed to "STEP 6 Verifying Setting Result and Log Sheet".

STEP 6 Verifying Setting Result and Log Sheet

This step opens the "Sample Wizard Setting Result" screen to verify the setting result.

- 1 Click the "Sample Wizard" in the task bar of the PC.

The "Sample Wizard Setting Result" screen will appear.



- 2 Scroll the screen and verify that the settings have been correctly entered.

NOTE

- Scroll down the "Sample Wizard Setting Result" screen and look for the [Sequence]. The content of action is shown here.

- 3 After having verified, click the [x] (close) button to close the screen and click the [-] (minimize) button to minimize the screen.

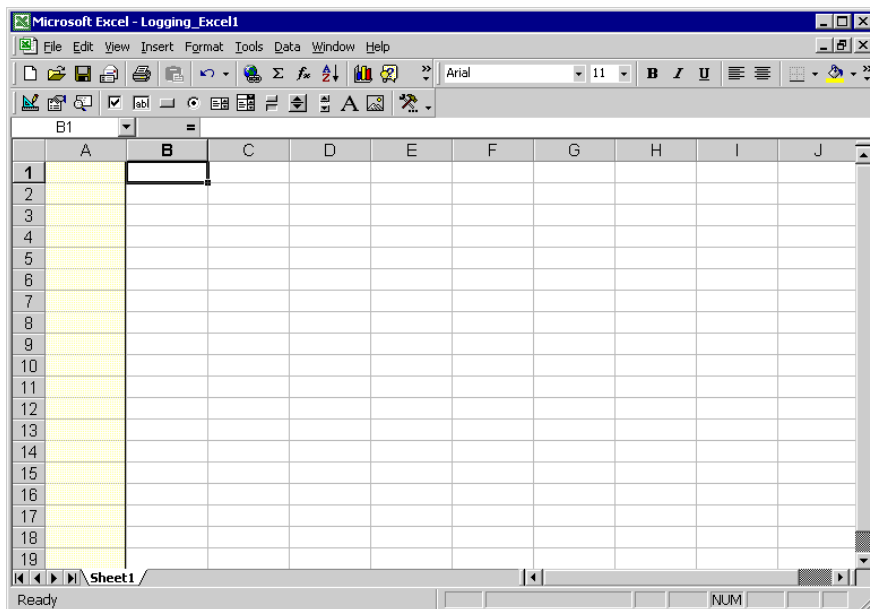
NOTE • When created, the "Sample Wizard Setting Result" file will be automatically saved in the save destination folder of the recipe sheet set in procedure 2 of "STEP 5 Setting Feature (ACTION)". The file name is "(the ACTION name set in procedure 1 of STEP 5).html".

Proceed to opening the log sheet in 'Excel' to verify the setting result.

- 4 Open the save destination folder of the log sheet set in procedure 1 of "STEP 5 Setting Feature (ACTION)" and double-click the log sheet (Logging_Excel.xlt) in 'Excel'.



Verify that the log sheet is created.



Proceed to "STEP 7 Saving Network Project File".

STEP 7 Saving Network Project File

This step saves the current settings as a network project file.

The setting items are the same as those in the "New Form" wizard above.
See "STEP 7 Saving Network Project File" in "Creating a Form".

Proceed to "STEP 8 Transferring Network Project File".

STEP 8 Transferring Network Project File

This step transfers the saved network project file to the display unit.

The setting items are the same as those in the "New Form" wizard above.
See "STEP 8 Transferring Network Project File" in "Creating a Form".

Proceed to "STEP 9 Logging Device Data".

STEP 9 Logging Device Data

This step starts data logging after the trigger condition set in "STEP 4 Setting Trigger Condition" has become effective.

In this trial, you can confirm that the data will be logged at a preset interval in the log sheet.

- 1 Open the Data Log Check Destination Folder set in step 1 of "STEP 5 Setting Feature (ACTION)".
- 2 When 10 seconds elapse after transferring the Network Project File, the preset Trigger Condition becomes enabled, and the log sheet of the Excel file in which the data stored in "S_Logging03_Reading Source Data_WORD" is written is created.

| | A | B | C | D | E | F | G | H |
|----|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |

At every 10 seconds, new data will be written onto the log sheet.

| | A | B | C | D | E | F | G | H |
|----|----|---|---|---|---|---|---|---|
| 1 | 0 | | | | | | | |
| 2 | 0 | | | | | | | |
| 3 | 11 | | | | | | | |
| 4 | 11 | | | | | | | |
| 5 | 18 | | | | | | | |
| 6 | 22 | | | | | | | |
| 7 | 22 | | | | | | | |
| 8 | 44 | | | | | | | |
| 9 | 48 | | | | | | | |
| 10 | 48 | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |

- 3 After having verified the log sheet, click the [x] (close) button.

This is the end of data logging using the "Sample Wizard".

3.5 Trial of Send Mail Function

3.5.1 What is a Send Mail Function?

Pro-Server EX allows e-mailing a preset message to a specific mail address when a preset event occurs such as change in data or trouble. You can send mail messages by:

- Sending a same message all the time;
- Sending a message created on the Device/PLC; and
- Sending a message preset on the Excel sheet.

Flow of Mail Send

(Example) E-mailing a message preset on the Excel sheet.

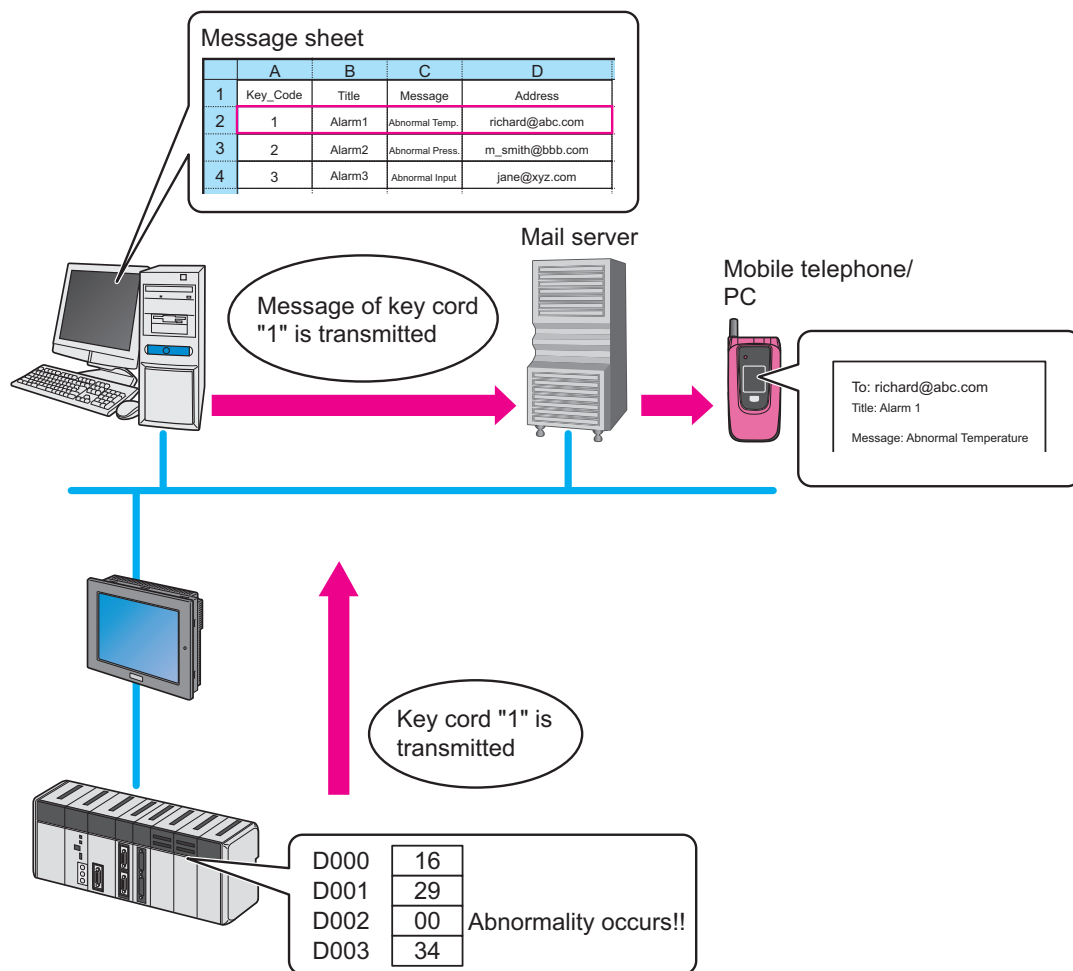
(1) Create an Excel sheet (message sheet) in which messages to send and the mail addresses of send destinations are entered.

| | A | B | C | D |
|---|----------|--------|-----------------|-----------------|
| 1 | Key_Code | Title | Message | Address |
| 2 | 1 | Alarm1 | Abnormal Temp. | richard@abc.com |
| 3 | 2 | Alarm2 | Abnormal Press. | m_smith@bbb.com |
| 4 | 3 | Alarm3 | Abnormal Input | jane@xyz.com |

(2) Execute action setting of the Mail send function, for example setting of a mail server name and requirements for e-mailing using 'Pro-Studio EX'.

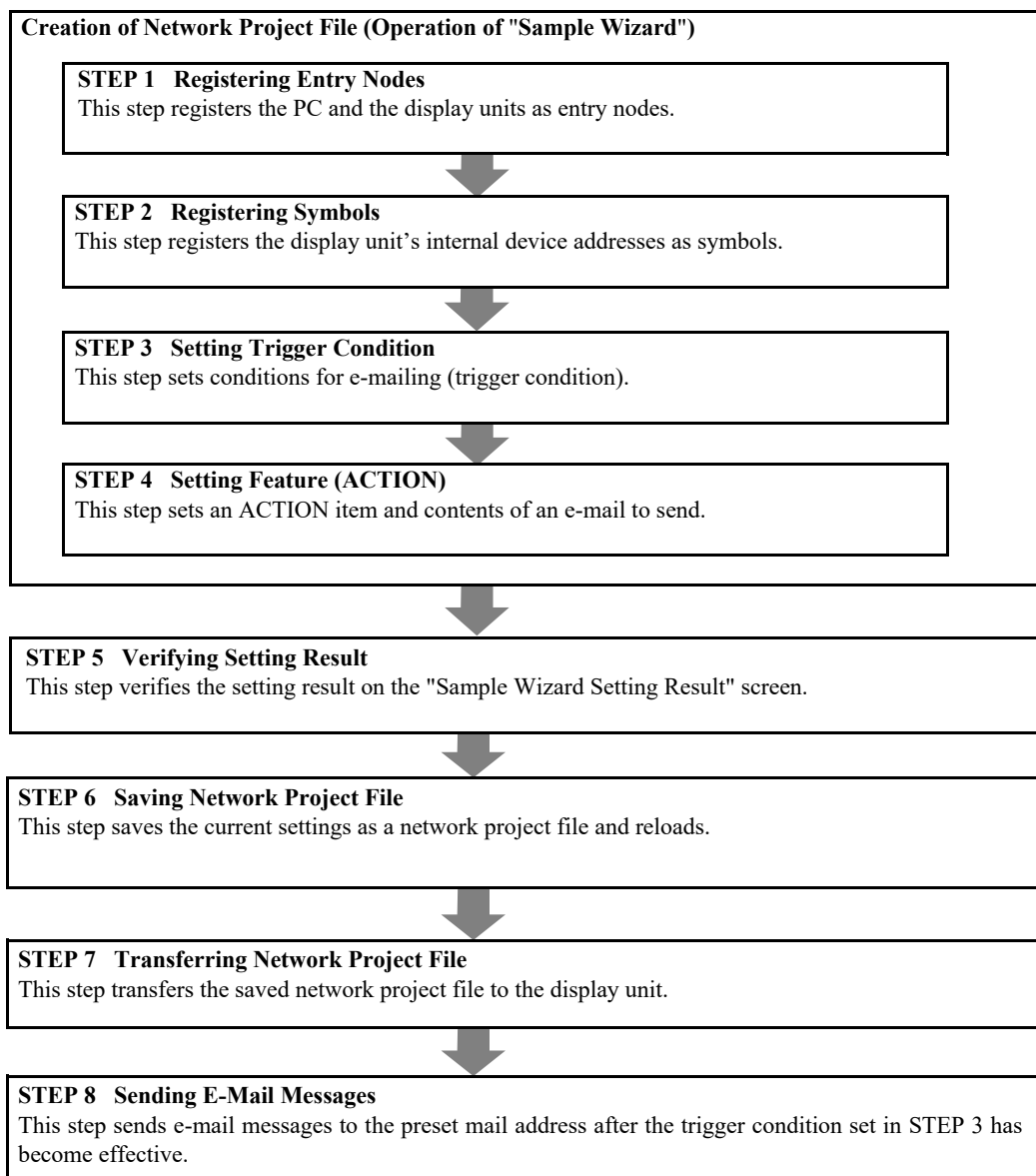
(3) When a preset event has occurred, the message of the key code corresponding to the occurred event on the message sheet will be sent to the recipient such as a cellular phone or a PC via the mail server.

(Example) Transmitting the content of "Alarm 1 Abnormal Temperature" of the key code "1" on the message sheet



3.5.2 Workflow from Settings to Send Mail

The following explains about the operation flow from setting to e-mailing using the "Mail Send" wizard.



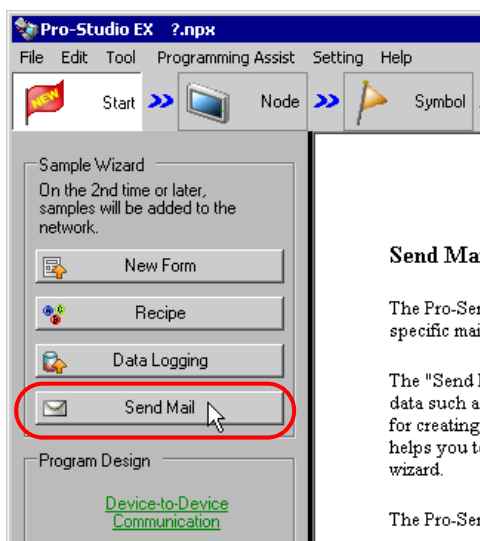
3.5.3 Sending a Message

This section helps you to learn necessary settings efficiently for sending mail messages by simply following the instructions of the "Mail Send" wizard of the "Sample Wizard" to actually send an e-mail message.

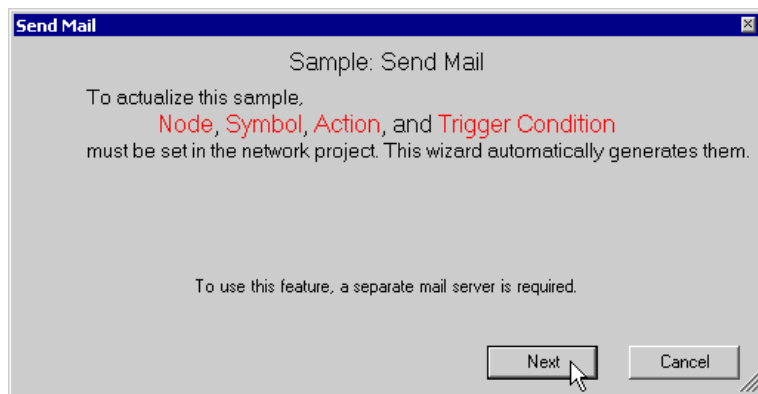
-
- NOTE** • An e-mail message cannot be sent if the PC is not connected to a mail server (SMTP server) via a network. Before getting started, confirm the connection environment of the PC.
-

STEP 1 Registering Entry Nodes

- 1 On the start screen, click the [Send Mail] button in the [Sample Wizard].



- 2 Click the [Next] button.



The entry node setting screen will appear.

Send Mail Sample: Send Mail

Node Symbol Feature

Edit node details in the Node Screen after the sample wizard ends.

-To perform Send Mail maintenance, a PC on the network has to be specified as the executing PC, and registered as a participation node.

Do you want to create with this PC?

☒ Yes Node Name

☐ No will be created with

-Send Mail is executed when a condition occurs. The node generating the condition (Condition Generating Node) has to also be pre-registered as a participation node.

As a Condition Generating Node

☒ Node Name IP Address is registered.

☐ Existing is used.

Find Node Back Next Cancel

The setting items are the same as those in the "Form Creation" wizard above. See "STEP 2 Registering Entry Nodes" in "Creating a Form". If you have tried another wizard and registered entry nodes already, you can skip this procedure. Click the [Next] button and proceed to "STEP 2 Registering Symbols".

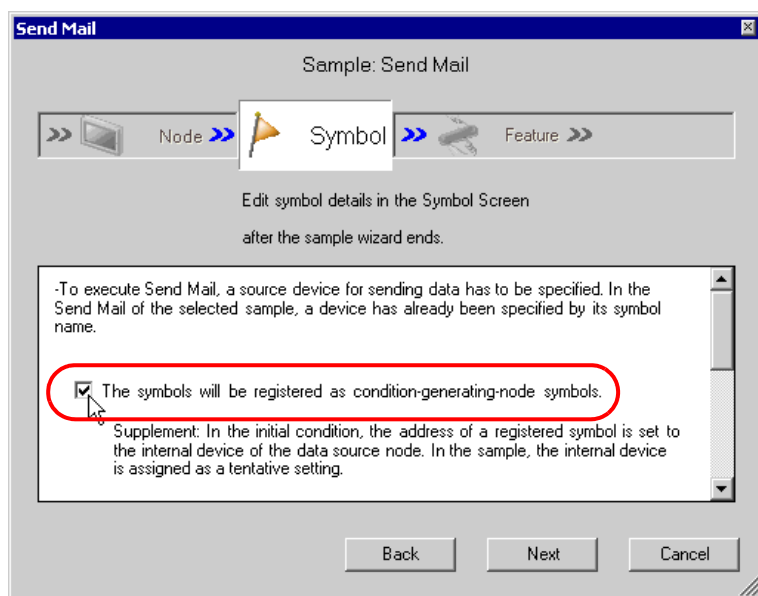
Proceed to "STEP 2 Registering Symbols".

STEP 2 Registering Symbols

This step registers the device address from which data will be read as a "Symbol".

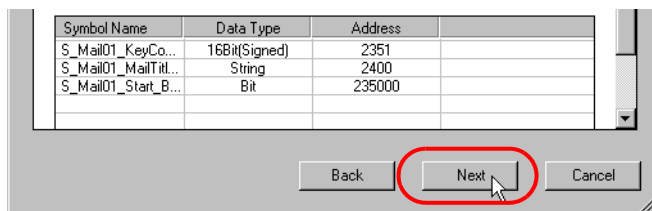
In this wizard, the display unit's internal device are registered as symbols.

- 1 Check the [The symbols will be registered as condition-generating-node symbols.] check box, and then enlarge or scroll the screen to confirm the preset symbol.



| Symbol Name | Data Type | Address |
|----------------------|---------------|---------|
| S_Mail01_KeyCo... | 16Bit(Signed) | 2351 |
| S_Mail01_MailTitl... | String | 2400 |
| S_Mail01_Start B... | Bit | 235000 |

- 2 Click the [Next] button.



This is the end of registering symbols necessary for data write. The trigger condition setting screen will appear.

Proceed to "STEP 3 Setting Trigger Condition".

STEP 3 Setting Trigger Condition

This step sets conditions for executing data send (trigger condition).

In this wizard, the trigger condition of detecting a rise of "Mail Send Start_BIT" is preset.

- 1 Confirm the content of the trigger condition in the [Set Trigger Condition].

In Pro-Server EX, various actions caused by arbitrary "Trigger Conditions" are available. Pro-Server EX manages the "Trigger Conditions" separately giving each of them an arbitrary name.

Trigger Condition Name: T_Mail01

Set Trigger Condition: The mail is sent when the Start Sending Mail_BIT turns ON.

- 2 Click the [Next] button.

IMPORTANT

- The name of the trigger condition can be an arbitrary name. However, in this wizard the name is preset. Changing this name in this trial may cause discrepancies. Accept the default provided by this wizard.

Set Trigger Condition: The mail is sent when the Start Sending Mail_BIT turns ON.

Buttons: Back, Next, Cancel

This is the end of setting a trigger condition necessary for mail send. The ACTION setting screen will appear.

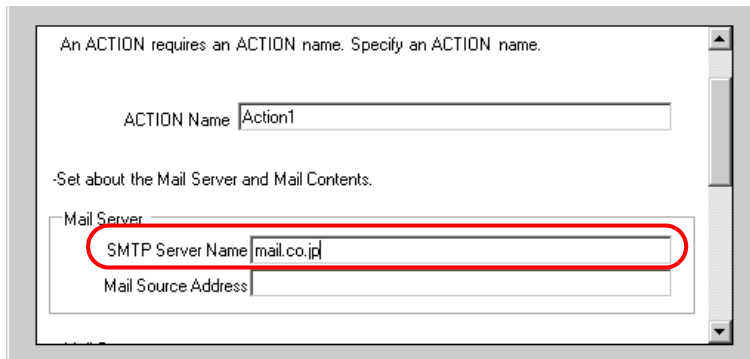
Proceed to "STEP 4 Setting Feature (ACTION)".

STEP 4 Setting Feature (ACTION)

This step sets functions (ACTION) to use. Specifically, this step sets the name of ACTION to use and the save destination of a message sheet to create as a sample.

1 Execute setting of mail server

Enter the name of the currently connected server for mail send (e.g. Mail.xxx.co.jp) in the [SMTP Server Name] field in single-byte characters.



An ACTION requires an ACTION name. Specify an ACTION name.

ACTION Name

-Set about the Mail Server and Mail Contents.

Mail Server

SMTP Server Name

Mail Source Address

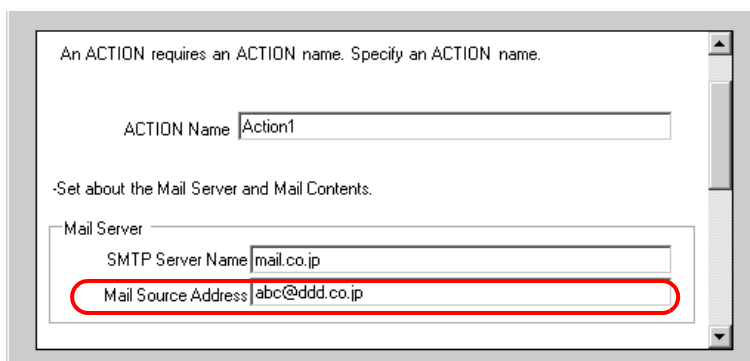
IMPORTANT

- The ACTION name can be an arbitrary name. However, in this wizard the name is preset. Changing this name in this trial may cause discrepancies. Accept the default provided by this wizard.

SMTP Server

A server for delivering e-mail messages complying with SMTP (Simple Mail Transfer Protocol), a mail transfer protocol (standard for data communication). E-mail messages are sent or received through a computer called "Server" that is always on the Internet. There are two types of serves: for sending and for receiving. SMTP server is typically used to send messages from a mail client to a mail server.

Enter the mail address of the currently using PC (PC saved as an entry node in "STEP1 Registering Entry Nodes") in the [Mail Source Address] field.



An ACTION requires an ACTION name. Specify an ACTION name.

ACTION Name

-Set about the Mail Server and Mail Contents.

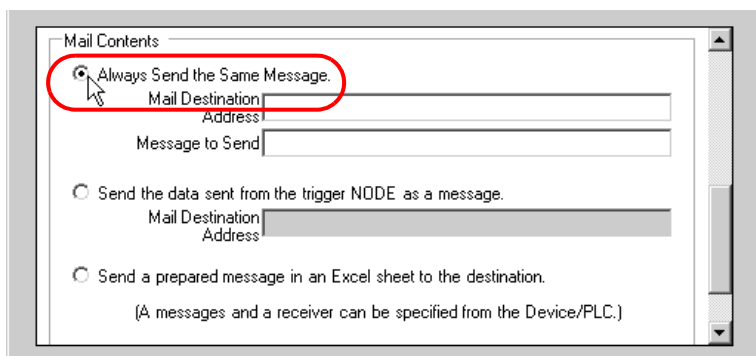
Mail Server

SMTP Server Name

Mail Source Address

2 Execute setting for mail message

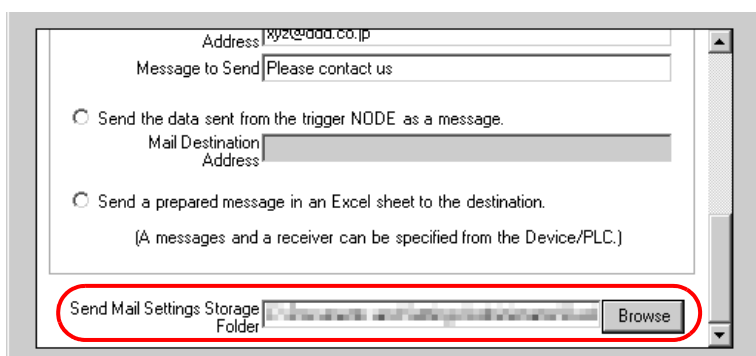
Select the [Always Send the Same Message] to send the message preset in this wizard.



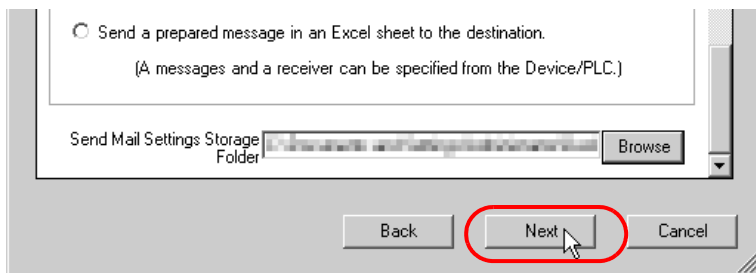
Enter the mail address of the recipient (PC or cellular phone) in the [Mail Destination Address] field, and a message you want to send in the [Message to Send] field in single-byte characters.



3 Enter the save destination folder of the message sheet in the [Send Mail Setting Storage Folder] field.

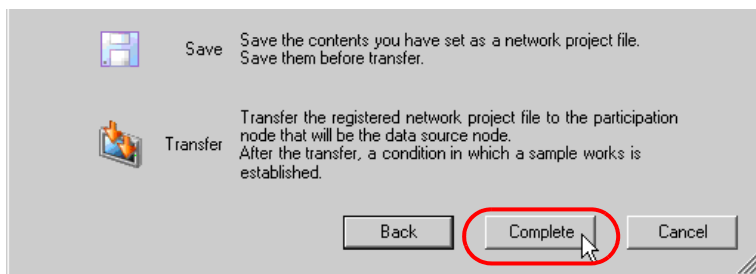


4 Click the [Next] button.



This is the end of setting an ACTION item necessary for mail send. The screen that explains the procedures to follow (saving and transferring network project file) will appear.

5 Click the [Complete] button.

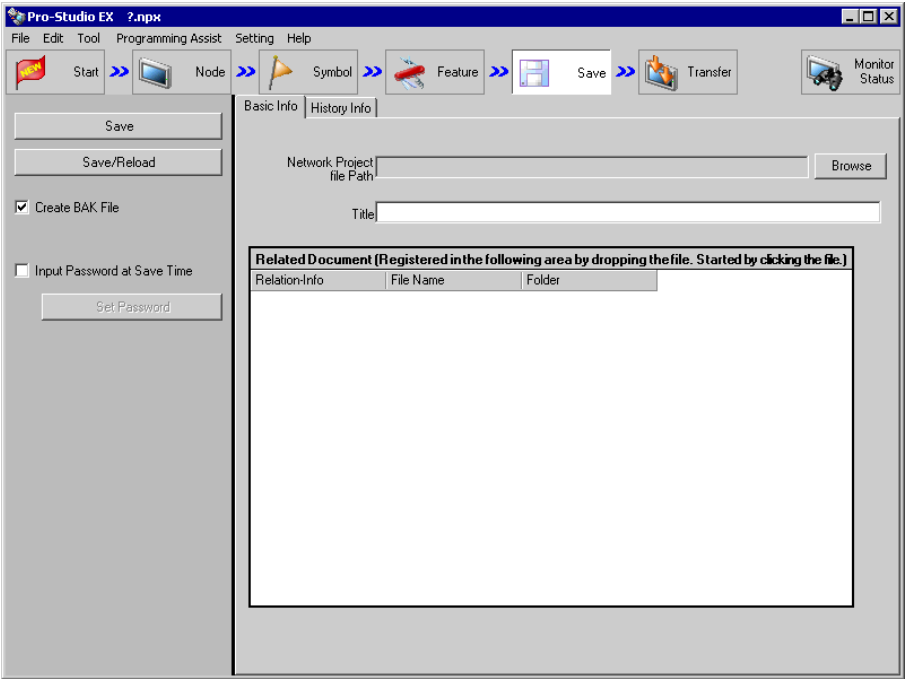


This completes the "Sample Wizard".

NOTE

- The encryption method SMTP over SSL, SMTP authentication, and POP authentication are disabled in the Sample Wizard's Send Mail command. To send mail using encryption and SMTP authentication, double-click the action created in the [Feature] step and configure the necessary settings. For details, refer to "15.2 Setting Guide".

Then the save setting screen will appear.



At this time, the "Sample Wizard Setting Result" screen is also created.

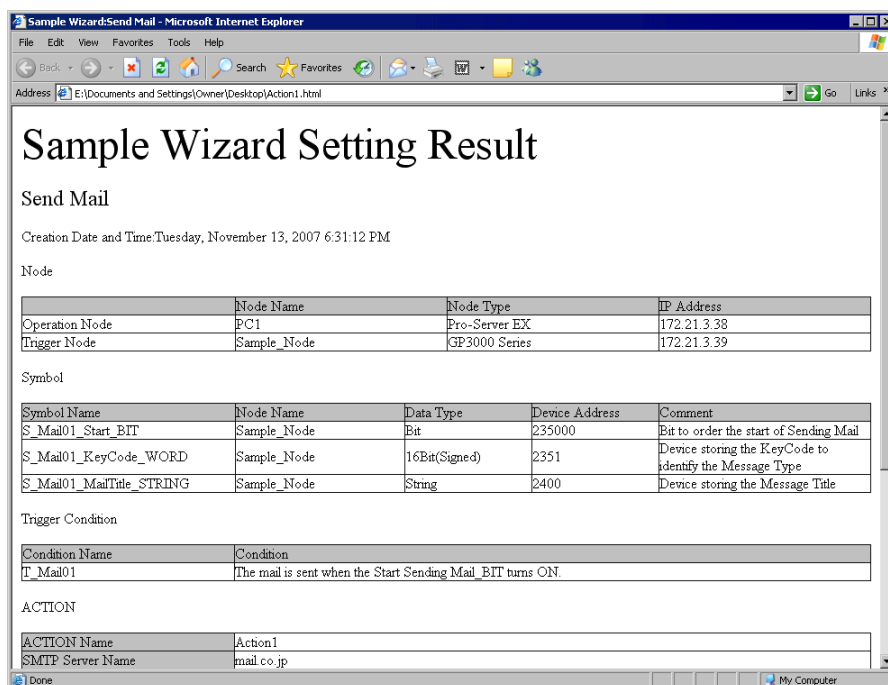
Proceed to "STEP 5 Verifying Setting Result".

STEP 5 Verifying Setting Result

This step opens the "Sample Wizard Setting Result" screen to verify the setting result.

- 1 Click the "Sample Wizard" in the task bar of the PC.

The "Sample Wizard Setting Result" screen will appear.



- 2 Scroll the screen and verify that the settings have been correctly entered.
- 3 After having verified, click the [x] (close) button to close the screen and click the [-] (minimize) button to minimize the screen.

Proceed to "STEP 6 Saving Network Project File".

STEP 6 Saving Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

The setting items are the same as those in the "New Form" wizard above.
See "STEP 7 Saving Network Project File" in "Creating a Form".

Proceed to "STEP 7 Transferring Network Project File".

STEP 7 Transferring Network Project File

This step transfers the saved network project file to the display unit.

The setting items are the same as those in the "New Form" wizard above.
See "STEP 8 Transferring Network Project File" in "Creating a Form".

Proceed to "STEP 8 Sending E-Mail Messages".

STEP 8 Sending E-Mail Messages

When the trigger condition set in "STEP 3 Setting Trigger Condition" has become effective, the e-mail message set in the wizard will be sent to the specified mail address.

In this trial, you can confirm that an e-mail message will be sent to the specific mail address.

1 Turn on the mail send start bit to effect the trigger condition.

NOTE You can turn ON the mail send start bit by:

- turning on the bit from the screen of the display unit; or
- turning on the bit on the "Device Monitor" or "Symbol Monitor".

For more details, see 'GP-Pro EX Reference Manual' or "28 Simply Confirming On-site Status".

2 When the trigger condition becomes effective, the content of the [Message to Send] field set in the procedure 3 of the "STEP 4 Setting Feature (ACTION)" will be transmitted.


This is the end of sending e-mail messages using the "Sample Wizard".

4


What You Want to Do with Pro-Server EX


| | | |
|-----|---|-----|
| 4.1 | Creating a Form | 4-2 |
| 4.2 | Reading from Display Unit to PC | 4-2 |
| 4.3 | Reading from PC to Display Unit | 4-3 |
| 4.4 | Reporting Alarm by E-mail | 4-3 |
| 4.5 | Starting Optional Application | 4-3 |
| 4.6 | Sending Data between Devices | 4-4 |
| 4.7 | Monitoring Site Status from the Office..... | 4-4 |
| 4.8 | Designing Your Own Program..... | 4-4 |


4.1 Creating a Form


| Creating a Form | |
|--|---|
| This feature allows you to create various forms in Excel format automatically such as management charts and reports based on the data read from the display unit or the Device/PLC. 'Pro-Server EX' prepares a wide variety of templates that are applicable to the formats frequently used in production sites. |  "5 Creating a Form Using Excel" |


4.2 Reading from Display Unit to PC

| Reading in CSV File | |
|--|---|
| This feature allows you to read plural data of the display unit and the Device/PLC and write the read data in a CSV format file. |  "7 Writing Device/PLC Data in CSV File" |


| Reading in Excel File | |
|---|---|
| This feature allows you to read plural data of the display unit and the Device/PLC and write the read data in an Excel format file. |  "6 Writing Device/PLC Data in Excel File" |


| Reading in Database | |
|--|---|
| This feature allows you to read plural data of the display unit and the Device/PLC and write the read data in a specified relational database. |  "8 Writing Device/PLC Data in Database" |


| Reading Filing Data | |
|--|--|
| This feature allows you to read filing data of the backup SRAM of the display unit or the CF card and write the read data in an Excel format file. |  "17 Writing the display unit's Filing Data to Excel" |


| Importing the display unit Capture Data | |
|---|---|
| This feature allows you to capture a capture screen (JPEG file) of the display unit automatically or manually and save the captured screen. |  "11 Importing the display unit's Capture Data (JPEG)" |

4.3 Reading from PC to Display Unit


| Writing CSV Data | |
|---|--|
| This feature allows you to read plural data of a CSV format file on the PC and write the read data in a specified device of the display unit or the Device/PLC. |  "13 Writing CSV File Data in Device/PLC" |

| Writing Excel Data | |
|--|---|
| This feature allows you to read plural data of an Excel format file on the PC and write the read data in a specified device of the display unit or the Device/PLC. |  "12 Writing Excel Data in Device/PLC" |


| Writing Database Data | |
|---|---|
| This feature allows you to read plural data of the relational database and write the read data in a specified device of the display unit or the Device/PLC. |  "14 Reading Device/PLC from Database" |

| Writing Filing Data | |
|--|--|
| This feature allows you to edit the filing data having read in the PC and write the edited data in the backup SRAM of the display unit or a CF card. |  "18 Returning Filing Data to the display unit" |


4.4 Reporting Alarm by E-mail

| Reporting Alarm by E-mail | |
|--|--|
| This feature allows you to send a preset e-mail message such as warning when a preset event occurs such as change in data. |  "15 Reporting Alarm by E-mail" |


4.5 Starting Optional Application


| Starting Optional Application | |
|--|--|
| This feature allows you to activate arbitrary software such as 'Memo' when a preset event occurs such as change in data. |  "16 Starting Optional Application" |


4.6 Sending Data between Devices


| Sending Data between Devices | |
|--|---|
| <p>This feature allows you to exchange data between the Device/PLCs being connected to the display unit even when the PC is not connected.</p> <p>This enables data sharing regardless of the types of the Device/PLCs and data.</p> |  "19 Sending Data between Devices" |

4.7 Monitoring Site Status from the Office


| Monitoring Operational Status of Device/PLC | |
|---|--|
| <p>This feature allows you to monitor the current status of each entry node and Device/PLC (e.g. scan time, error information).</p> |  "28.2 Monitoring Operational Status" |

| Monitoring Device Values | |
|---|---|
| <p>This feature allows you to monitor the current values of specified devices. This feature is useful when you want to confirm the values of continuous device addresses.</p> <p>This feature also allows you to write device values.</p> |  "28.3 Monitoring Device Values" |

| Monitoring Device Values by Symbol | |
|--|---|
| <p>This feature allows you to monitor the current values of specified symbols. This feature is useful when you want to confirm the values of non-sequential device addresses at the same time.</p> <p>This feature also allows you to write device values.</p> |  "28.4 Monitoring Symbol Values" |

| Confirming Errors and Messages | |
|--|---|
| <p>This feature allows you to confirm past and current system event logs such as various messages and errors of 'Pro-Server EX'.</p> |  "28.5 Monitoring System Event Logs" |

4.8 Designing Your Own Program

| Designing Your Own Program | |
|---|---|
| <p>'Pro-Server EX API' allows you to access from application program created in VB ('Visual Basic'), VC ('Visual C++'), VB .NET, or C# to a specified device of the display unit or the Device/PLC.</p> |  "27 Designing Your Own Program" |

5



Creating a Form Using Excel

| | | |
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| 5.1 | Writing Measurement Data in a Form | 5-3 |
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'Pro-Server EX' supports a new action called "Excel Form" action, a simplified and sophisticated version of the "Creating a Report using Excel" action of 'Pro-Server'.

This allows you to collect data and execute various processing more easily than ever before.

This chapter describes how to use "Data Logging" feature, a typical feature to use in creating a form.

In addition to the "Data Logging" feature, 'Pro-Server EX' is provided with the following features for creating a form.

- Monitoring device data in Excel

☞ "6.1 Monitoring Device Value on Excel"

- Correcting read device data and restoring the data to the source device

☞ "6.2 Correcting and Restoring Once Read Data"

- Writing log data and capture data from the display unit to Excel

☞ "9 Working with the display unit's Log Data in Excel"

- Writing data of Excel in the Device/PLCs

☞ "12 Writing Excel Data in Device/PLC"

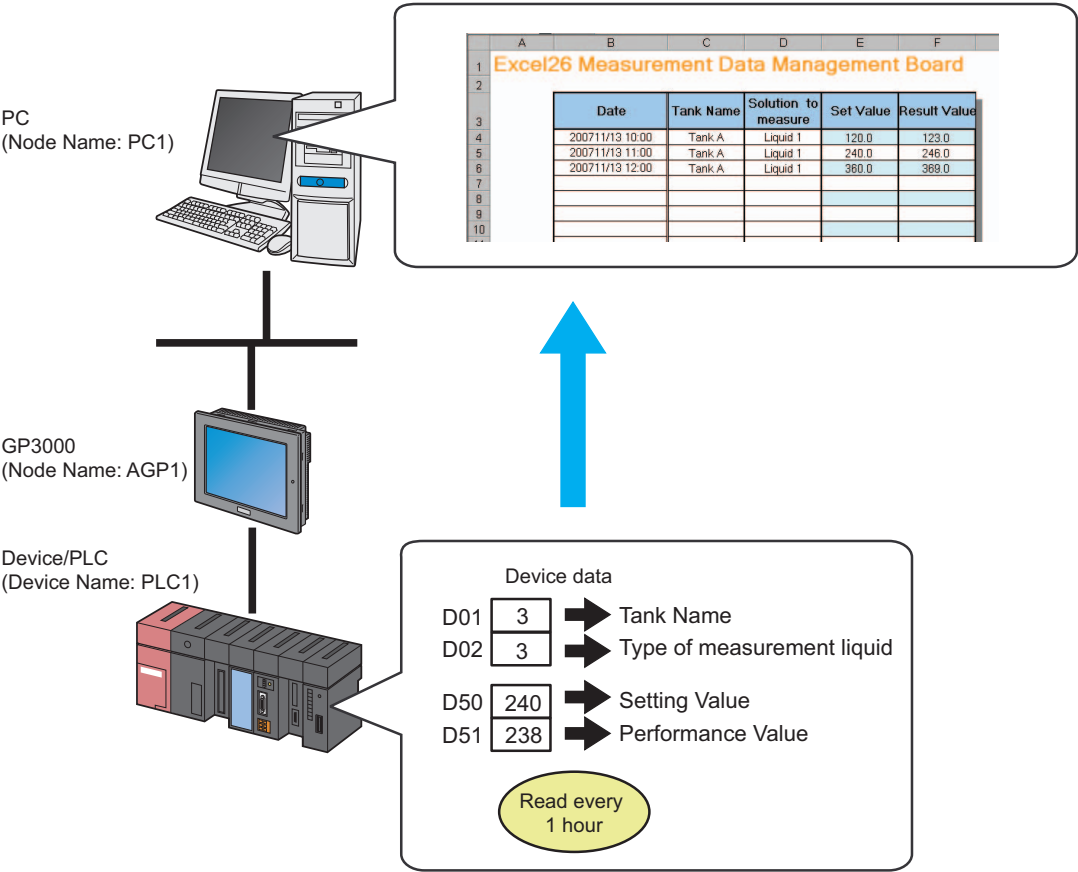
5.1 Writing Measurement Data in a Form

5.1.1 Try to write Measurement Data in a Form

[Action Example]

This example reads four device data (Word device: Address "01", "02", "50", and "51") of the Device/PLC at an interval of one hour, and then write them to a form.

- NOTE**
- Here, use the template sample attached to 'Pro-Server EX' to write in a form.
 - Refer to "■ About Sample Template to Use" in the next page for details about data to be written to the form template to use.



This section describes the setting procedures for executing the above action (ACTION) as an example.

■ About Sample Template to Use

First, you need to create the template based on a form, however, 'Pro-Server EX' includes the template samples according to various purposes.

In this trial, use the sample below as a form template.

| | A | B | C | D | E | F | G |
|----|--|-------------|------------------|----------------------------|------------------|---------------------|---|
| 1 | Excel26 Measurement Data Management Board | | | | | | |
| 2 | | | | | | | |
| 3 | | Date | Tank Name | Solution to measure | Set Value | Result Value | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |
| 11 | | | | | | | |
| 12 | | | | | | | |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | | | | | | | |
| 17 | | | | | | | |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | |
| 21 | | | | | | | |
| 22 | | | | | | | |
| 23 | | | | | | | |
| 24 | | | | | | | |

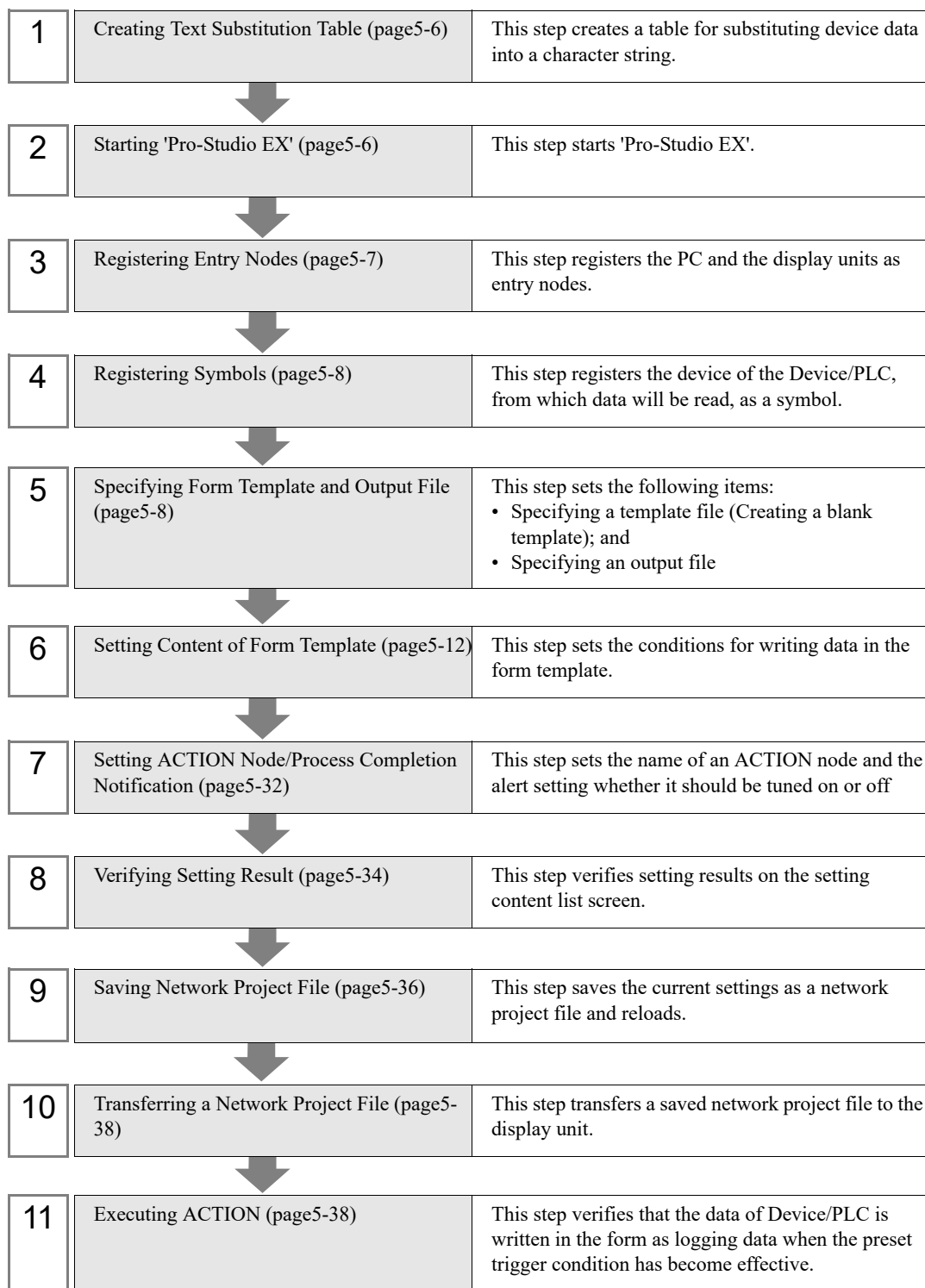
The table below shows the content of data to be written in each row of the template.

| Item | Device | Description |
|---------------------|--------|--|
| Date | - | Date/Time of the PC (use time stamp) |
| Tank Name | D01 | Character string (Tank name) converted from device data Device data "1": Tank A Device data "2": Tank B Device data "3": Tank C |
| Solution to measure | D02 | Character string (Measurement solution type) converted from device data Device data "1": Solution 1 Device data "2": Solution 2 Device data "3": Solution 3 |
| Set Value | D50 | Device data not converted |
| Result Value | D51 | Device data not converted |

NOTE

- Pro-Server EX has approximately 30 kinds of built-in templates for creating a report. You can create your own new template, or customize the existing sample templates.
- You can organize data as a QC chart. Refer to "5.7 Creating QC Charts in a Form" for details.

[Setting Procedure]



■ Creating Text Substitution Table

This step creates a table for substituting device values, "01" (Tank Name) and "02" (Solution to measure), into character strings.

Refer to "■ About Text Substitution of Data" for more details about a text substitution table.

1 Start Excel and create the text substitution table below.

Text Substitution Table of Device "01"

| | A | B | C | D |
|---|-------------|-----------|------------------|---|
| 1 | Start Value | End Value | Character String | |
| 2 | 1 | | TankA | |
| 3 | 2 | | TankB | |
| 4 | 3 | | TankC | |
| 5 | | | | |

Text Substitution Table of Device "02"

| | A | B | C | D |
|---|-------------|-----------|------------------|---|
| 1 | Start Value | End Value | Character String | |
| 2 | 1 | | Liquid1 | |
| 3 | 2 | | Liquid2 | |
| 4 | 3 | | Liquid3 | |
| 5 | | | | |

2 Save the created table on the desktop of the PC as "Convert_D01.xls" and "Convert_D02.xls", respectively.

This is the end of creating a text substitution table.

■ Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

■ Registering Entry Nodes

This step registers the PC and the display units, which will serve as trigger conditions (trigger), as entry nodes. Refer to "31 Node Registration" for details about entry nodes.



Node Name : PC1

IP Address : 192.168.0.1



Node Name : AGP1

IP Address : 192.168.0.100

Device/PLC Information

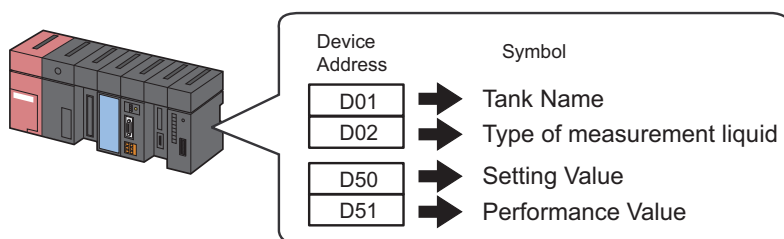
Ex.

| Entry node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

■ Registering Symbols

This step registers the device address of the Device/PLC, from which data will be read, as a symbol.

Refer to "32 Symbol Registration" for details about symbols.



Ex.

| Setting item | Setting content | | | |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Symbol Name | Tank Name | Type of measurement liquid | Setting Value | Performance Value |
| Data Type | 16Bit (Signed) | | | |
| Device address for symbol registration | "D01" of Device/ PLC (PLC1) | "D02" of Device/ PLC (PLC1) | "D50" of Device/ PLC (PLC1) | "D51" of Device/ PLC (PLC1) |
| No. of Devices | 1 | 1 | 1 | 1 |

■ Specifying Form Template and Output File

This step specifies a template file (Creating a blank template) and an output file.

When the trigger condition is satisfied, the device data in the form template is reflected and output as a file.

In this case, the device data is not reflected to the form template.

Refer to "5.1.2 Setting Guide" for more details.

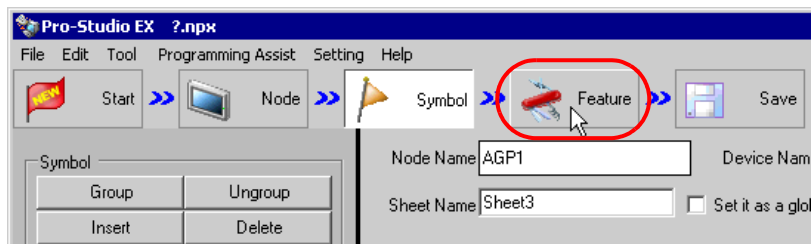
NOTE

- This action example uses a built-in template of 'Pro-Server EX'.
First, prepare a new template. Then import the sample template included in 'Pro-Server EX' in it.

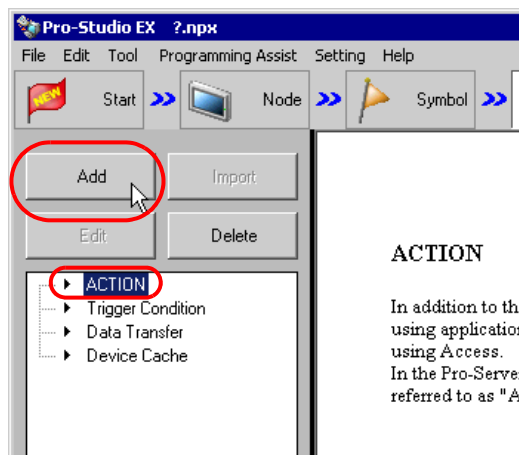
Ex.

| Setting item | Setting content | |
|------------------|---|---|
| Specify Template | Template File | C:\Users\<<User name>>\Desktop\template.xls |
| Output File | Folder Name | C:\Users\<<User name>>\Desktop |
| | File Name | Measurement data.xls |
| | Start with the output book displayed | Checked |
| | Do not save the output file when ACTION runs. | Not checked |

- 1 Click the [Feature] icon on the status bar.



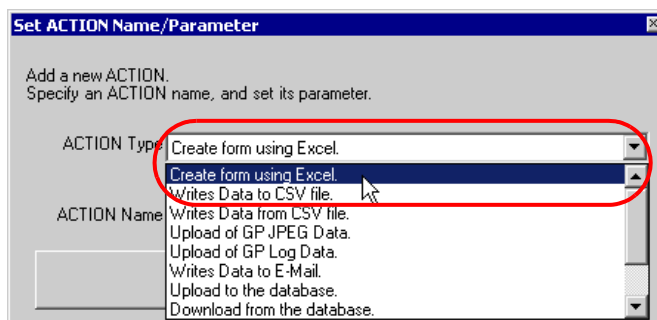
- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.



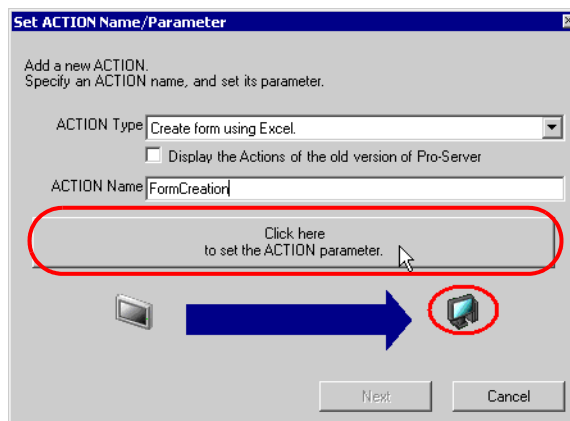
- 3 Click the [ACTION Type] list button, and select "EXCEL form".

Then, enter the name of ACTION to set in the [ACTION name] field. In this example, enter "Create form using Excel".

NOTE • [ACTION Name] can be an arbitrary name.

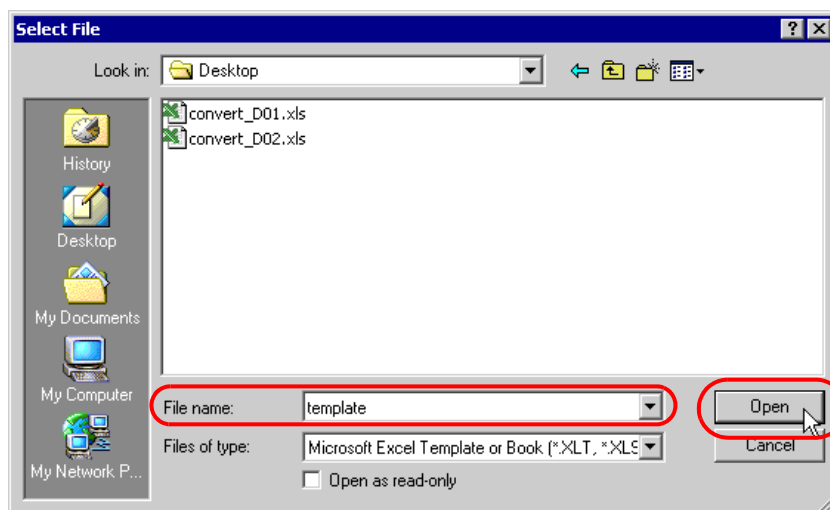
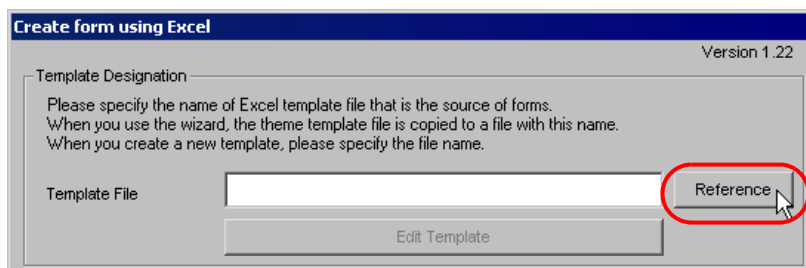


- 4 Click the [Click here to set the ACTION parameter] button.



- 5 Set regarding an Excel template and an output file.

- 1) Click the [Reference] button of [Template File]. On the "Select File" screen, type "template" in the [File name] field, and then click the [Open] button.



- 2) Click the [Reference] button of [Folder Name], specify "Desktop" as a folder to save the output file, and then enter "Measurement data.xls" in the [File Name] field.

Output File

The template file stores setting info. The actual output result will be displayed in the following file.

Folder Name: [Folder Name] Reference

File Name: MeasurementData.xls Return to Default Settings

☒ Start from Displayed State

☐ Do not save the output file when ACTION runs.
(Please use the Save or Save by Macro of Excel.)

OK Cancel

- 3) Check the [Start from Displayed State] check box.

Output File

The template file stores setting info. The actual output result will be displayed in the following file.

Folder Name: [Folder Name] Reference

File Name: MeasurementData.xls Return to Default Settings

☒ Start from Displayed State

☐ Do not save the output file when ACTION runs.
(Please use the Save or Save by Macro of Excel.)

OK Cancel

NOTE

- If you check [Start from Displayed State], you can read/write data with an output file displayed. This is useful if you need to confirm data immediately.

■ Setting Content of Form Template

This step sets the content of the template for writing data in a form.
Refer to "5.1.2 Setting Guide" for more details.

Target Cell Range of "Tank Name" (with time stamp)

Target Cell Range of "Solution to measure"

Target Cell Range of "Set Value"

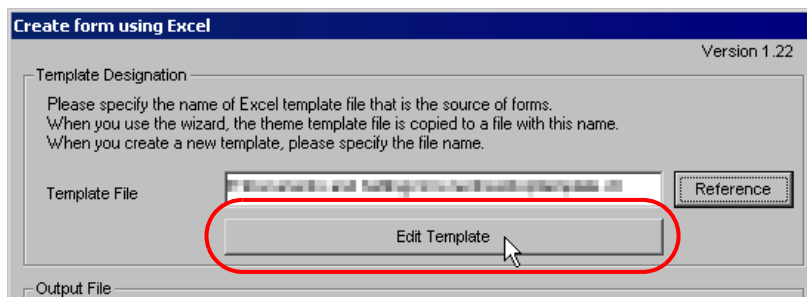
Target Cell Range of "Result Value"

| Date | Tank Name | Solution to measure | Set Value | Result Value |
|------|-----------|---------------------|-----------|--------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
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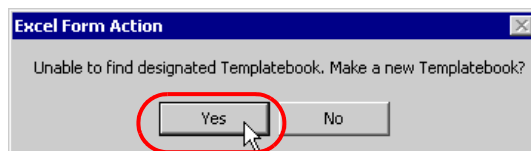
Logging Direction

- NOTE**
- There are some restrictions when using this feature with 'Microsoft Excel 2002' or later.
Refer to "■ Changing the Security Settings" in "5.9 Restrictions".
 - There are some restrictions when using this feature with 'Microsoft Excel 2007' or later.
Refer to "■ Notes on File Format when using 'Microsoft Excel 2007' or later" in "5.9 Restrictions" for more details.

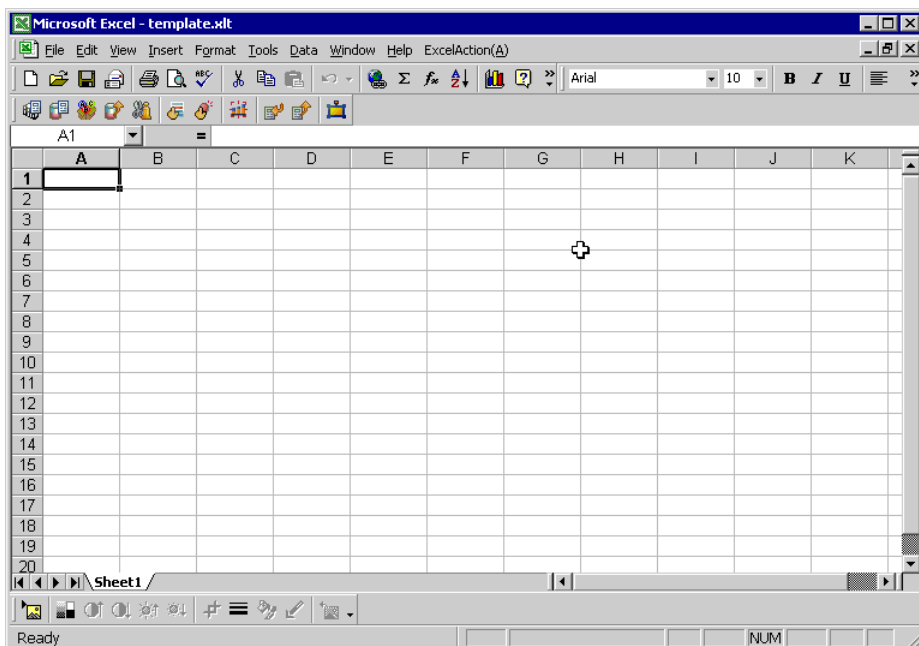
- 1 Click the [Edit Template] button.



- 2 Select the [Yes] button.

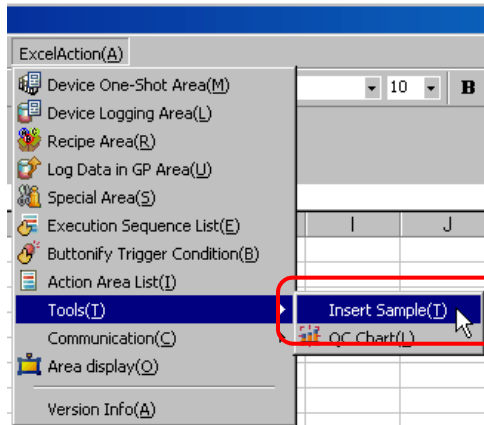


A blank form template will appear.

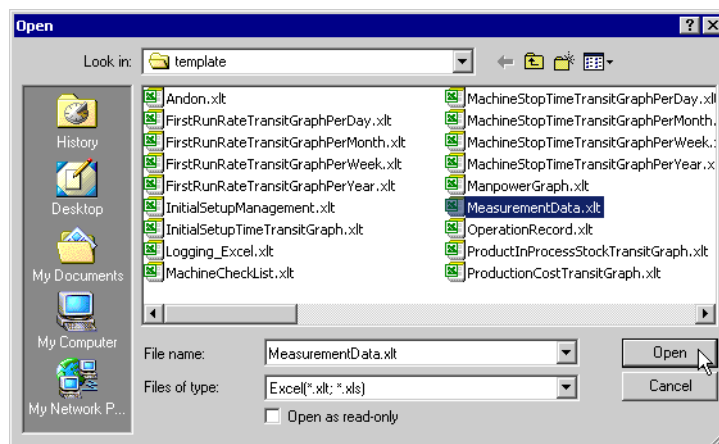


3 Open a built-in form template.

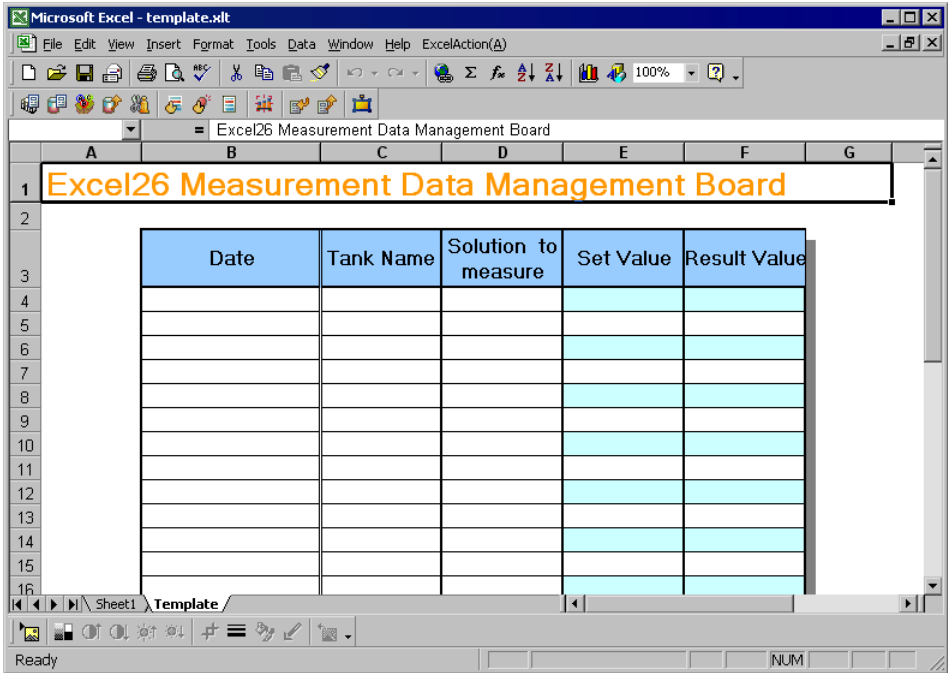
- 1) Click [Excel Action] on the menu bar. Select [Tools] - [Insert Sample].



- 2) Select "MeasurementData.xlt", and click the [Open] button.



A form template will appear.



4 Specify an area to enter "Tank Name".

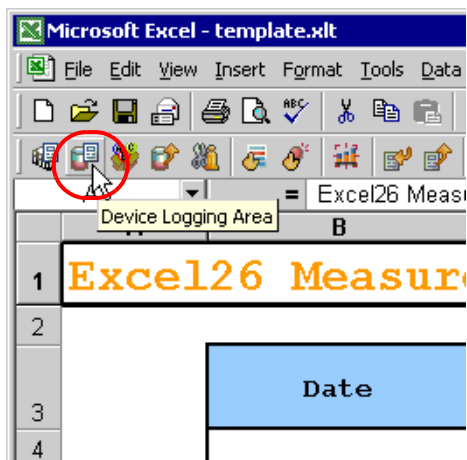
NOTE

- You do not need to specify an area to enter "Time". The time stamp feature specifies this area.

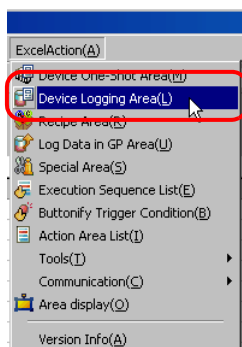
Ex.

| Setting item | | Setting content |
|--|------------------------------|--|
| Entry Node | | AGP1 |
| Device Name | | PLC1 |
| Device Address/Symbol Group | | Tank Name |
| Target Cell Range | | B4 to C23 |
| Logging Direction | | Vertical |
| Time Stamp | | Forward ("Use PC time") |
| Convert device value to certain text at Read | EXCEL book storing the table | C:\Users\<<User name>>\Desktop\convert_D01.xls |
| | Cell storing the table | Sheet A2 |
| Action when cell gets full | | Scroll |
| Trigger Condition | | Constant interval |
| Interval | | 3600000ms (One hour) |

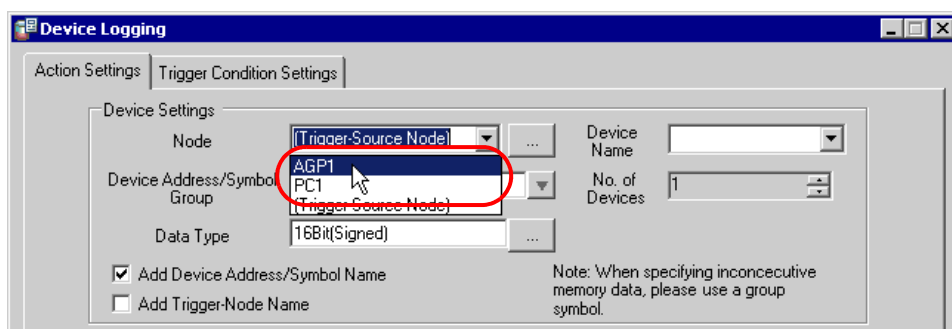
- Click the [Device Logging Area] icon on the Excel template.



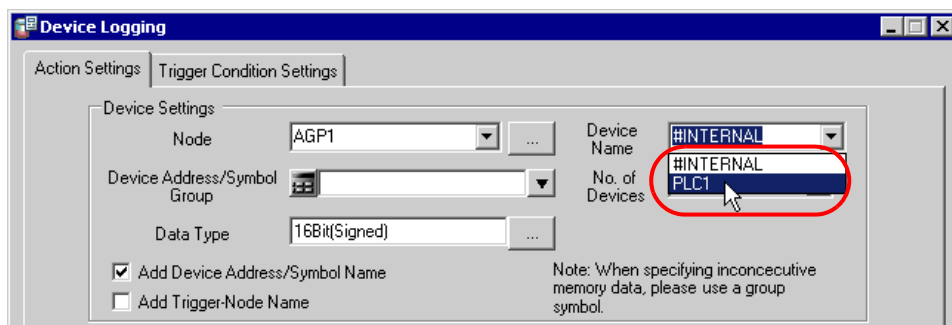
- NOTE** • Selecting [Device Logging Area] from [Excel Action] of the menu displays the same screen.



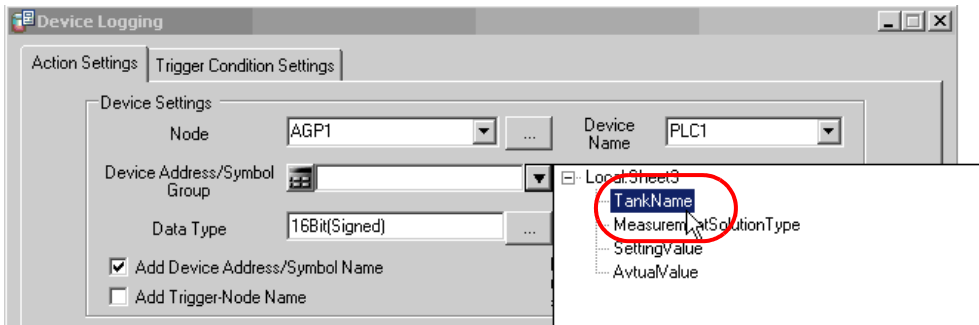
- 2) Click the list button of [Node] and select "AGP1" as a data transfer source node.



- 3) Click the list button of [Node] and select "PLC1" as a data transfer source device.

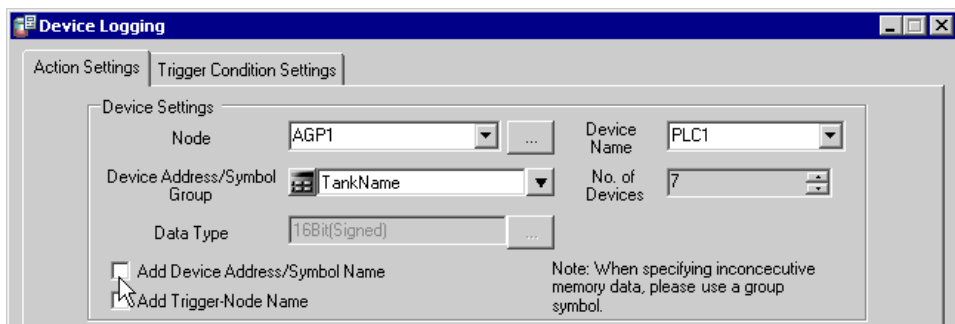


- 4) Click the list button of [Device Address/Symbol Group] and select "Tank Name" as a symbol of the data to log.

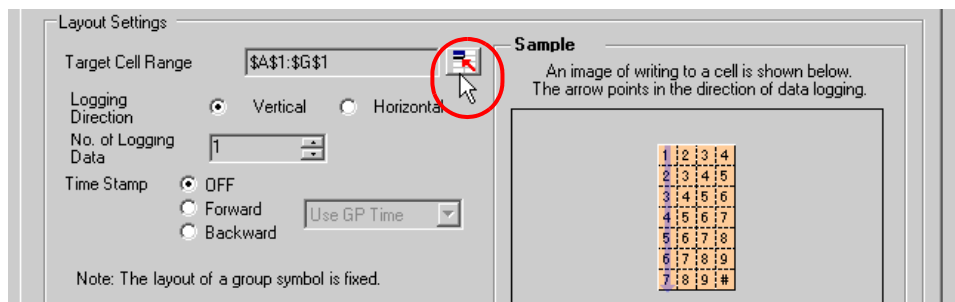


The device number "1" will be automatically entered in [No. of Devices], and "16Bit(Signed)" in [Data Type].

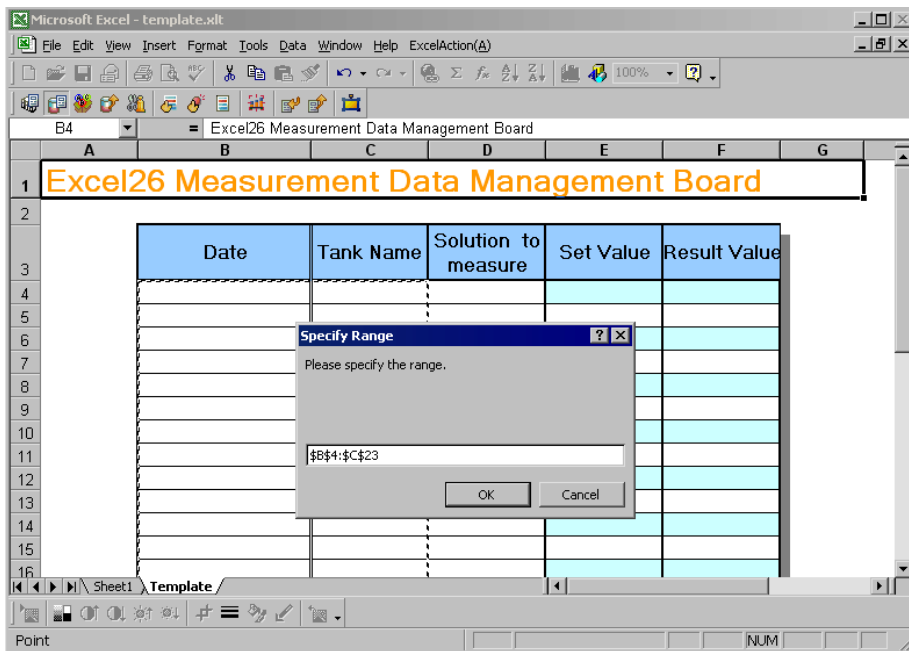
- 5) Turn off the [Add Device Address/Symbol Name] check box, if checked.



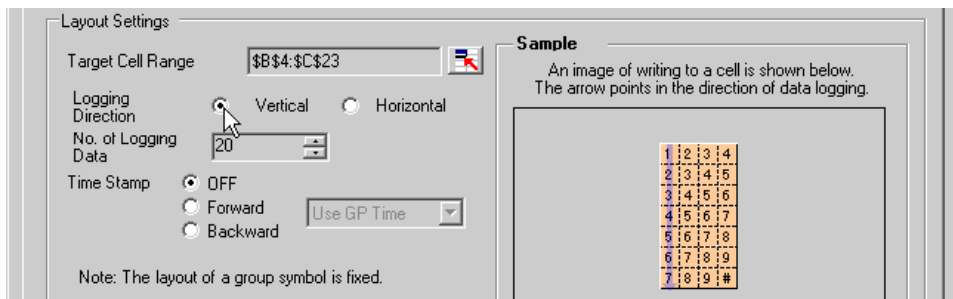
- 6) Click the cell range specify button of [Target Cell Range].



- 7) Drag the mouse to specify the area to use for data logging (cells B4 to C23). Then click the [OK] button.

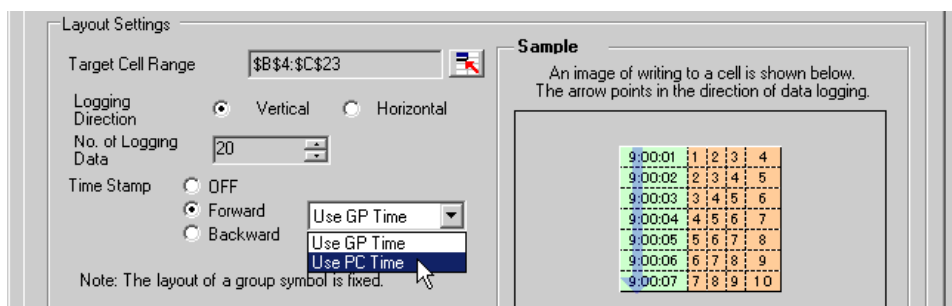


- 8) Select "Vertical" of [Logging Direction].

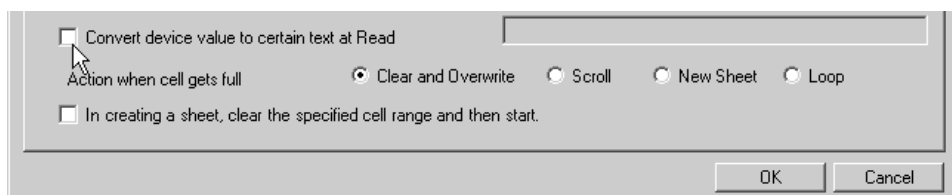


The logging number "20" will be automatically entered in [No. of Logging Data].

- 9) Select [Forward] of [Time Stamp]. Then click the list button of [Time Stamp], and select "Use PC Time".

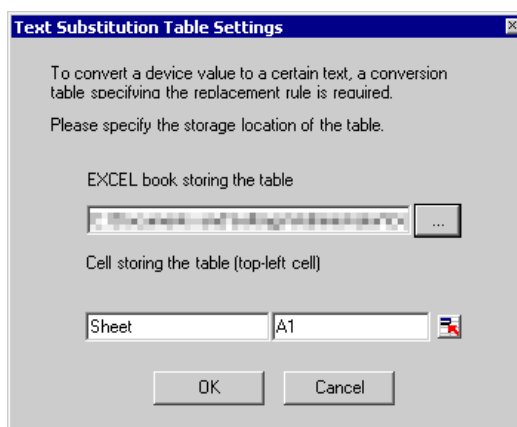


- 10) Check the [Convert device value to certain text at Read] check box.

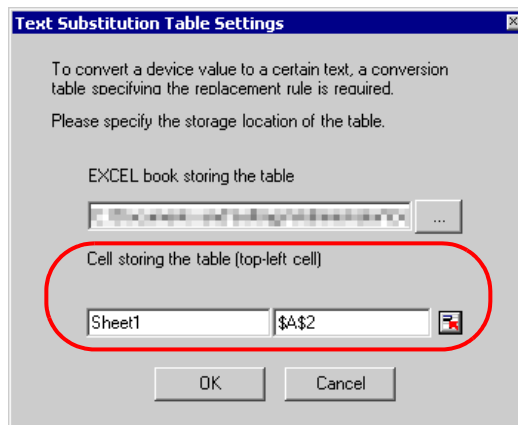


The "Text Substitution Table Settings" screen will appear.

- 11) Click the [...] button of [EXCEL book storing the table] and specify "convert_D01", which you created as a text substitution table.



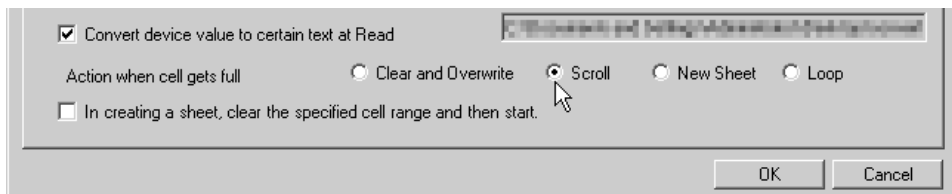
- 12) Enter the sheet name in [Cell storing the table]. Click the cell range specification button, and then enter the sheet name of the text substitution table and the cell number "A2" of the top-left cell.



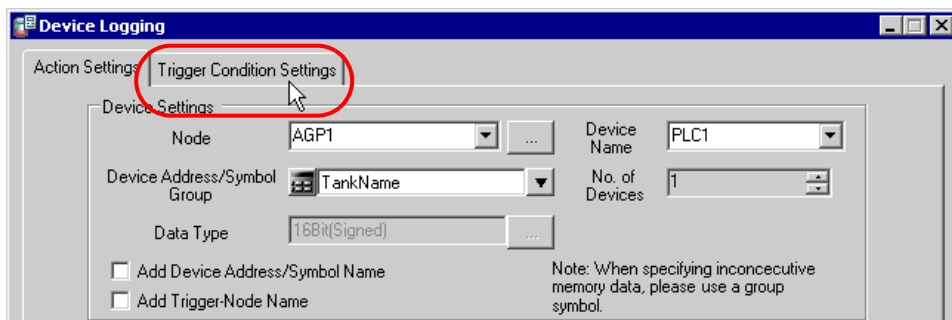
- NOTE** • Specify the cell on the top-left of data area in the text substitution table. Do not specify the title lines such as "Start Value" or "End Value".

- 13) Click the [OK] button.

- 14) Select "Scroll" in [Action when cell gets full].



- 15) Click the [Trigger Condition Settings] tab.

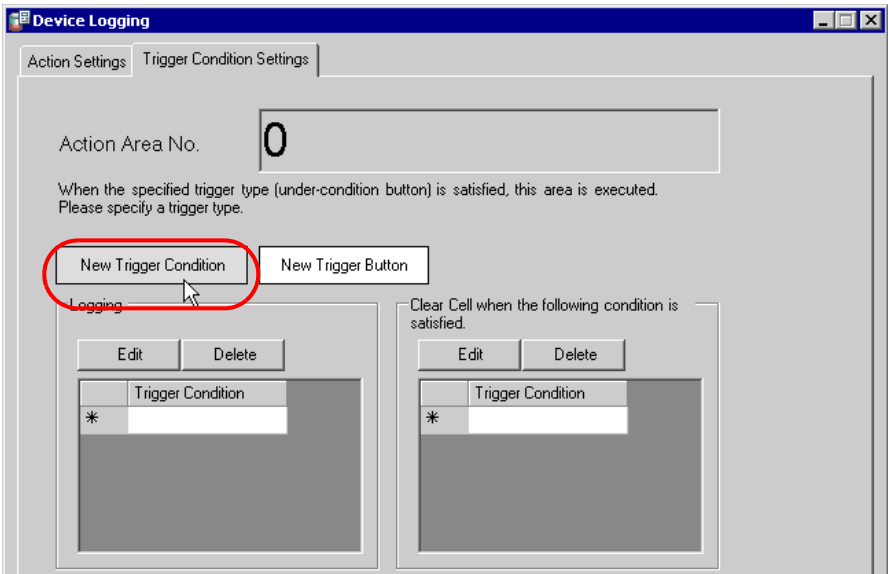


The "Trigger Condition Settings" screen will appear.

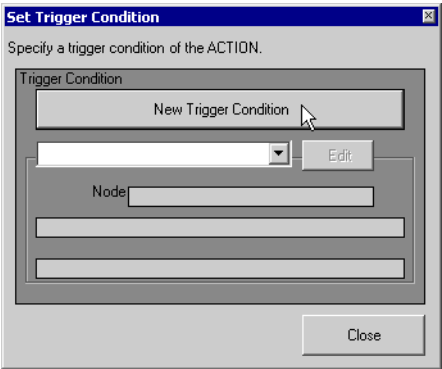
- NOTE**
- You can create a button on the Excel sheet, and use this as a trigger condition to execute ACTION. For more details, refer to "5.6 Creating Trigger Buttons in a Form".

| | | |
|--|------------|--|
| | | |
| | | |
| | | |
| | | |
| | Write Data | |
| | | |
| | | |

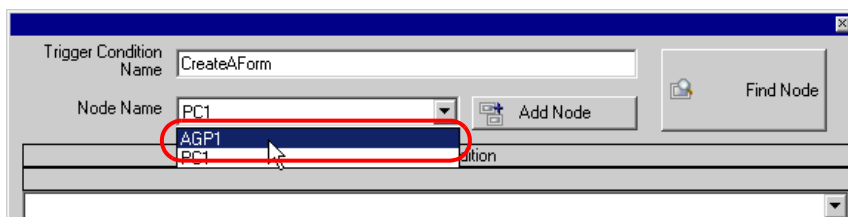
16) Click the [New Trigger Condition] button.



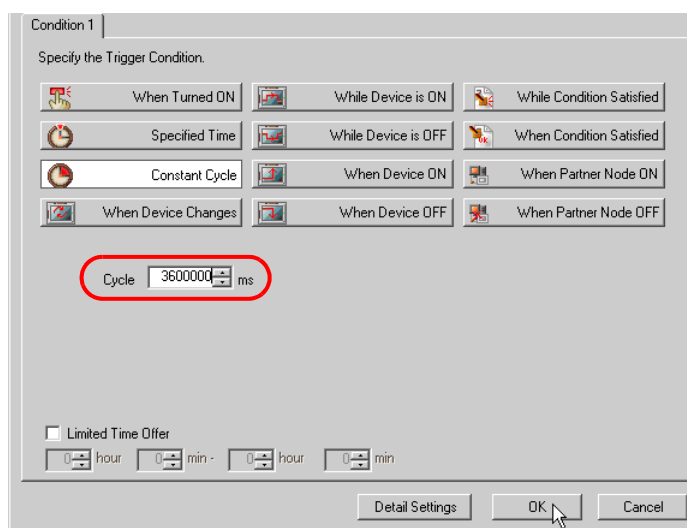
17) Click the [New Trigger Condition] button.



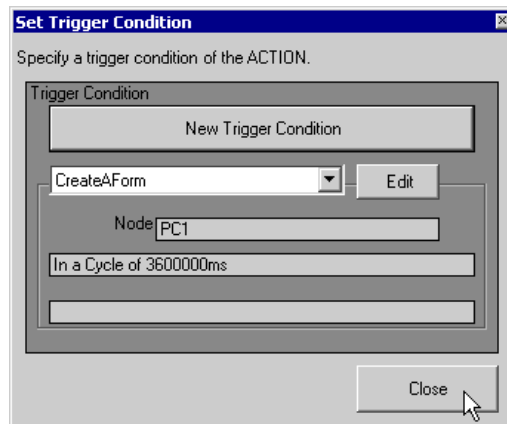
- 18) Enter the trigger condition name "Create a form" in [Trigger Condition Name], and select "AGP1" in [Node Name] as a name of the data transfer source.



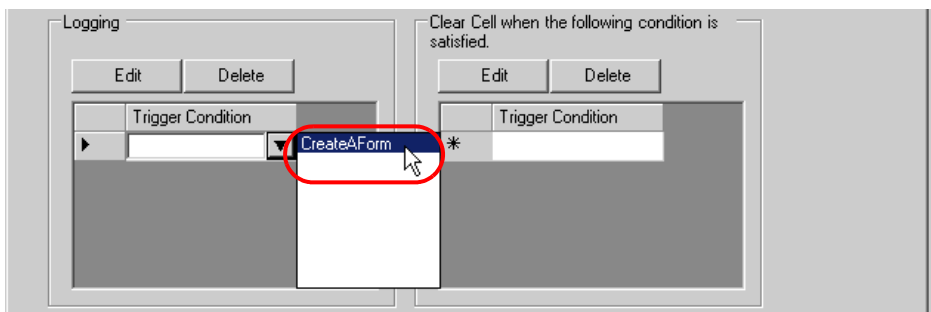
- 19) Click the [Constant Cycle] button in the [Condition 1] tab, and enter "3600000ms" (one hour). Then, click the [OK] button.



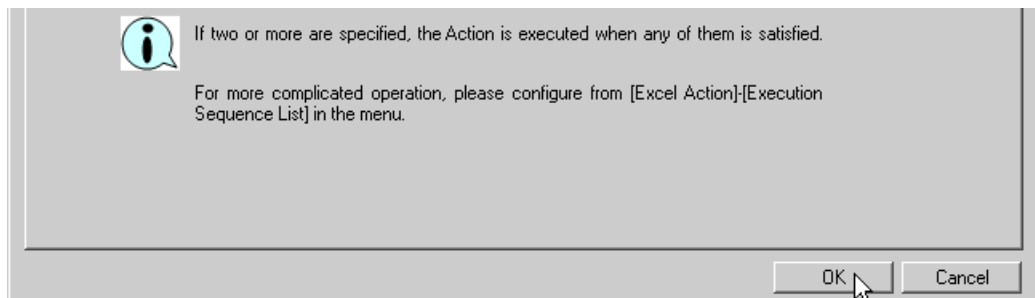
20) Click the [Close] button.



21) In [Logging], click the blank line of [Trigger Condition] and select "CreateAForm" as a trigger condition.



22) Click the [OK] button.



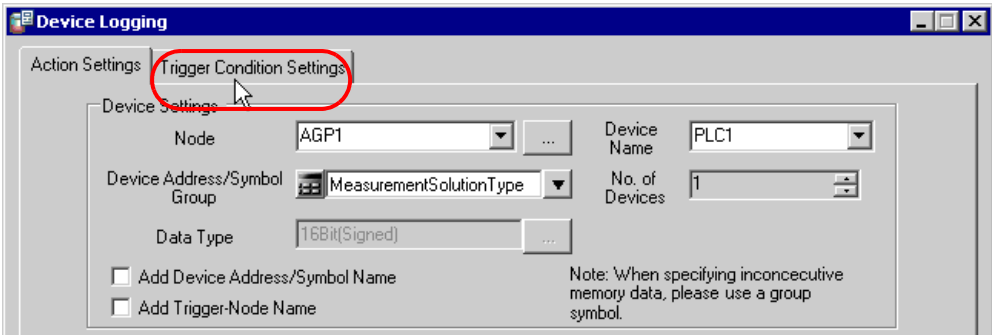
This is the end of the settings of the "Tank Name" area.

5 Specify an area to enter "Measurement Solution Type".

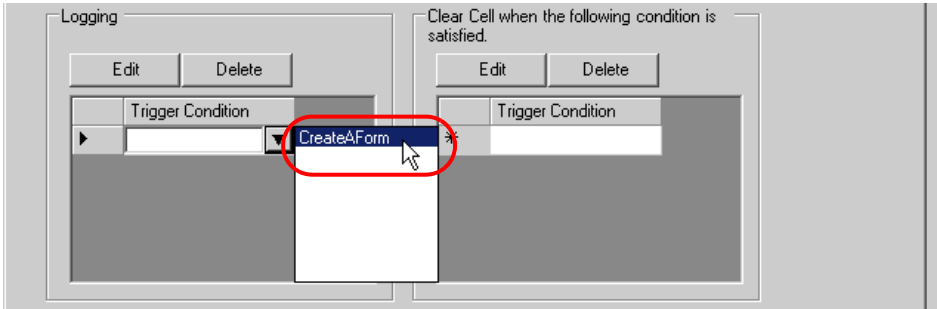
Ex.

| Setting item | | Setting content |
|--|------------------------------|--|
| Entry Node | | AGP1 |
| Device Name | | PLC1 |
| Device Address/Symbol Group | | Measurement Solution Type |
| Target Cell Range | | D4 to D23 |
| Logging Direction | | Vertical |
| Time Stamp | | OFF |
| Convert device value to certain text at Read | EXCEL book storing the table | C:\Users\<<User name>>\Desktop\convert_D02.xls |
| | Cell storing the table | Sheet A2 |
| Action when cell gets full | | Scroll |

- 1) Repeat the procedures 1) to 14) in 4 to set the above items.
- 2) Click the [Trigger Condition Settings] tab.



- 3) In [Logging], click the blank line of [Trigger Condition] and select "CreateAForm", which is the preset trigger condition.



- 4) Click the [OK] button.

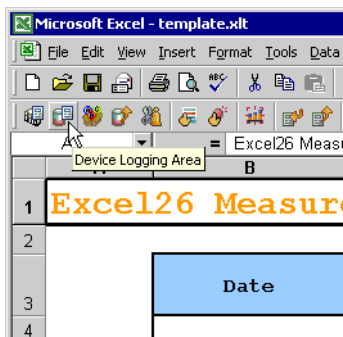
This is the end of the settings of the "Measurement Solution Type" area.

- 6 Specify an area to enter "Setting Value".

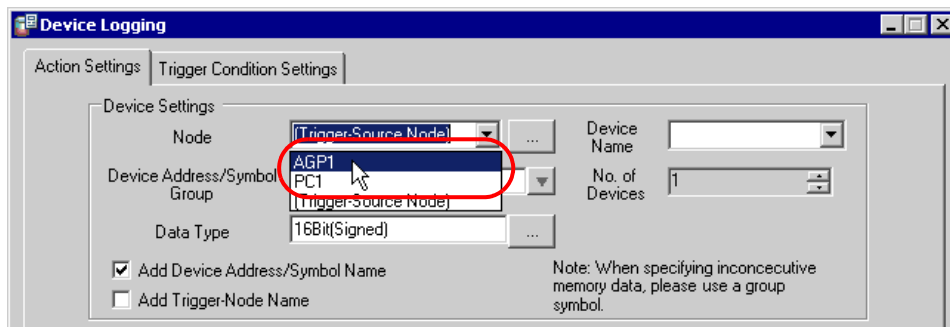
Ex.

| Setting item | Setting content |
|-----------------------------|-----------------|
| Entry Node | AGP1 |
| Device Name | PLC1 |
| Device Address/Symbol Group | Setting Value |
| Target Cell Range | E4 to E23 |
| Logging Direction | Vertical |
| Time Stamp | OFF |
| Action when cell gets full | Scroll |

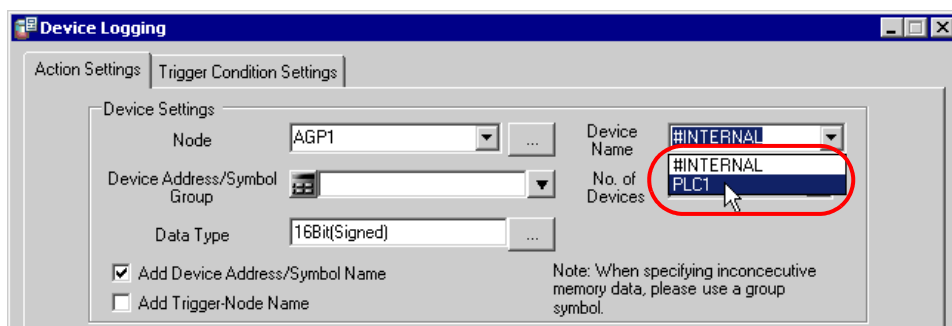
- 1) Click the [Device Logging Area] icon on Excel.



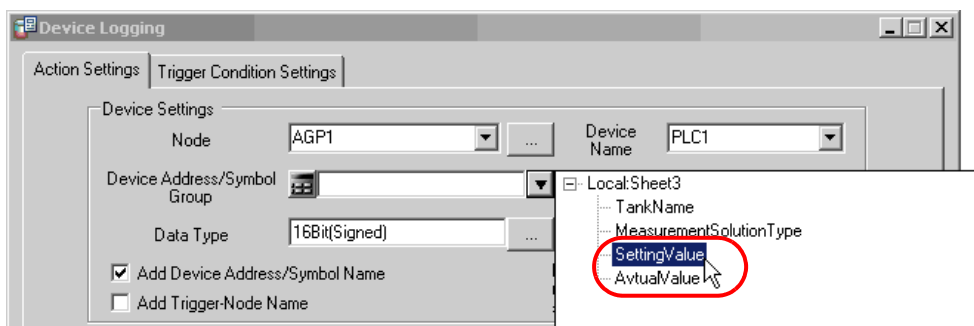
- 2) Click the list button of [Node] and select "AGP1" as a data transfer source node.



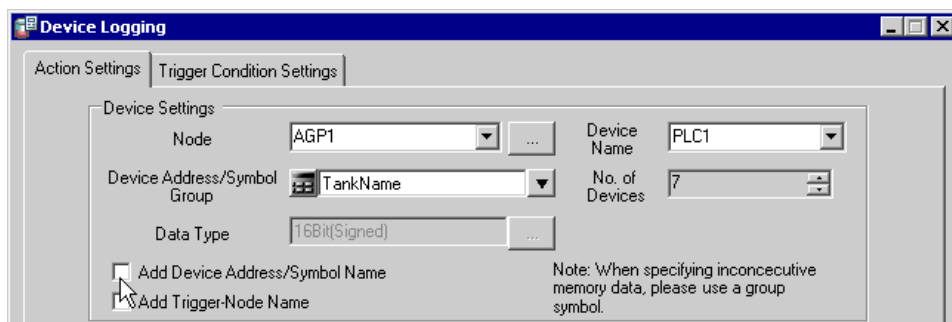
- 3) Click the list button of [Device Name] and select "PLC1" as a data transfer source device.



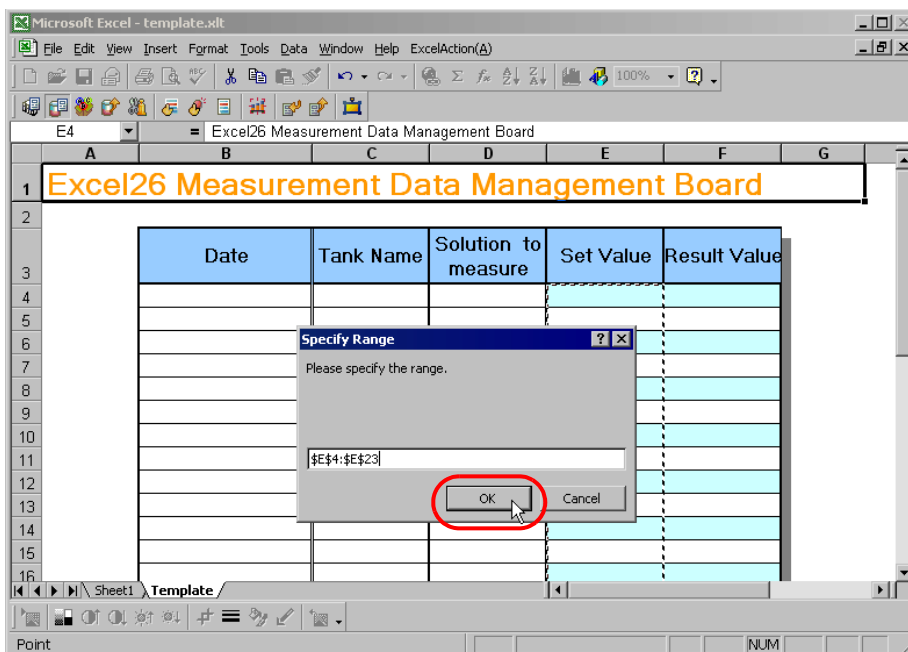
- 4) Click the list button of [Device Address/Symbol Group] and select "Setting Value" as a symbol of the data to log.



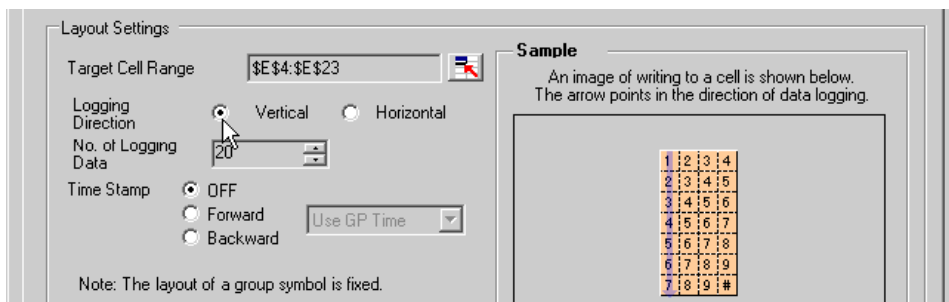
- 5) Turn off the [Add Device Address/Symbol Name] check box, if checked.



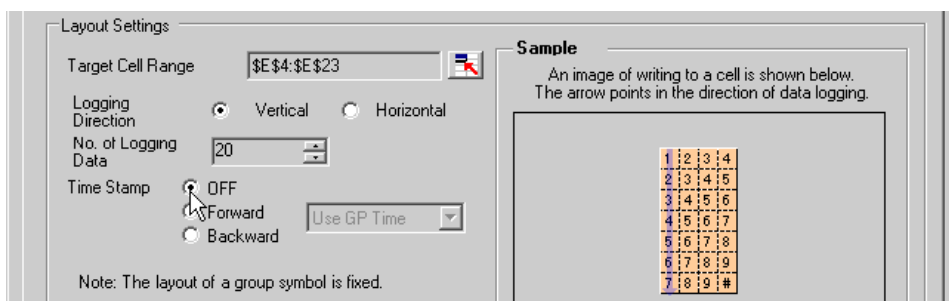
- 6) Click the cell range specify button of [Target Cell Range]. Drag the mouse to specify the area to use for data logging (cells E4 to E23). Then click the [OK] button.



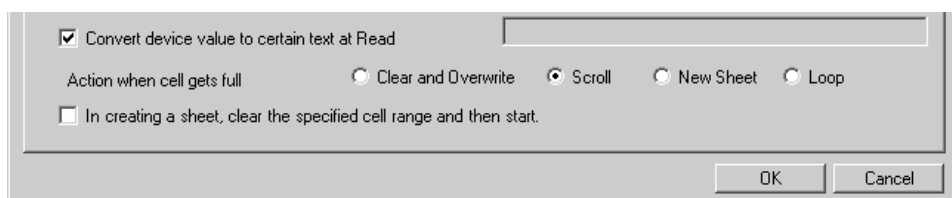
- 7) Select "Vertical" of [Logging Direction].



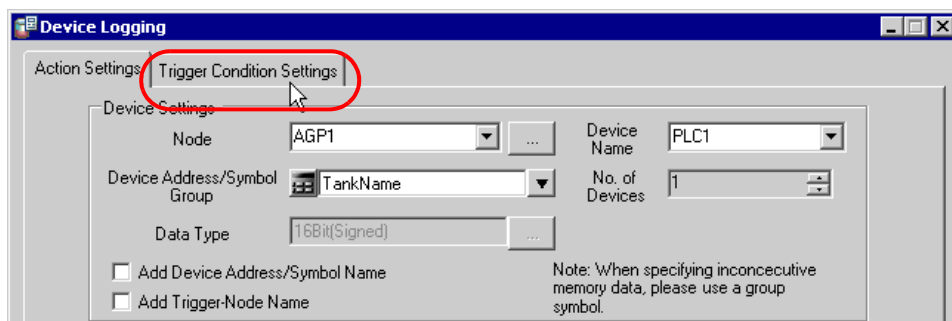
- 8) Select "OFF" of [Time Stamp].



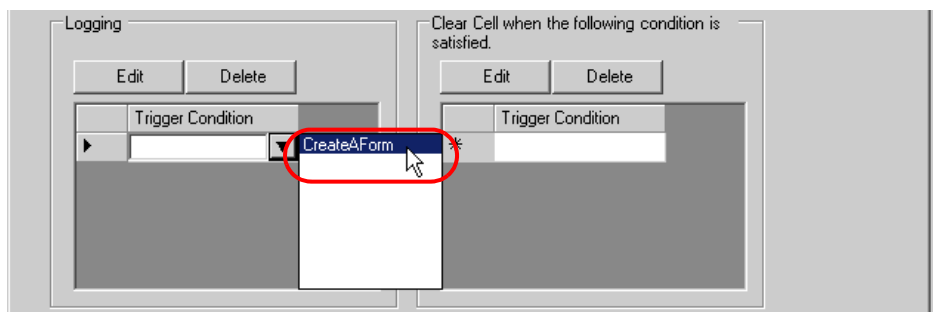
- 9) Select "Scroll" in [Action when cell gets full].



- 10) Click the [Trigger Condition Settings] tab.



- 11) In [Logging], click the blank line of [Trigger Condition] and select "CreateAForm", which is the preset trigger condition.



- 12) Click the [OK] button.

This is the end of the settings of the "Setting Value" area.

7 Specify an area to enter "Actual Value".

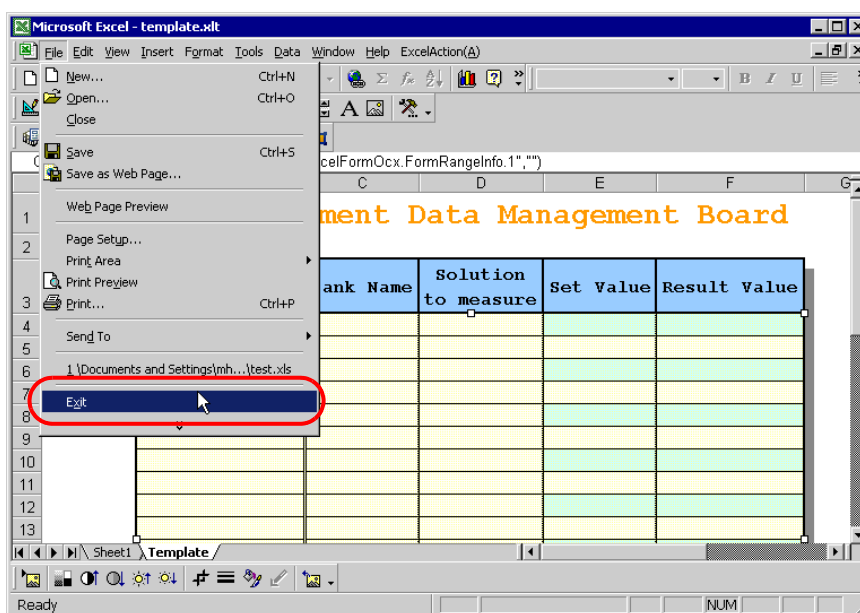
Ex.

| Setting item | Setting content |
|-----------------------------|-----------------|
| Entry Node | AGP1 |
| Device Name | PLC1 |
| Device Address/Symbol Group | Actual Value |
| Target Cell Range | F4 to F23 |
| Logging Direction | Vertical |
| Time Stamp | OFF |
| Action when cell gets full | Scroll |

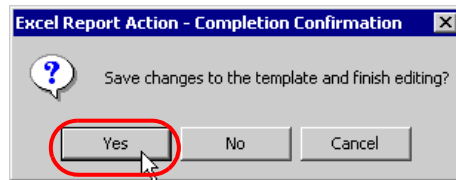
1) Repeat the procedures 1) to 12) in 5 to set the above items.

This is the end of the settings of a form template.

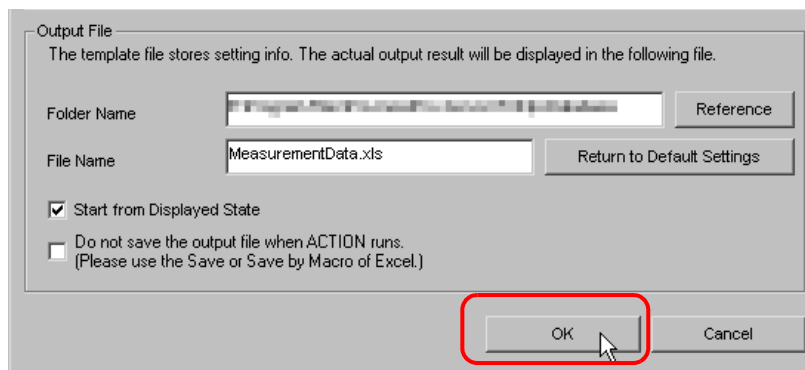
8 Close 'Excel'.



- 9 The following dialog box will appear, asking you if you want to save changes before closing. Click the [Yes] button.



- 10 On the "Create form using Excel" screen, click the [OK] button.



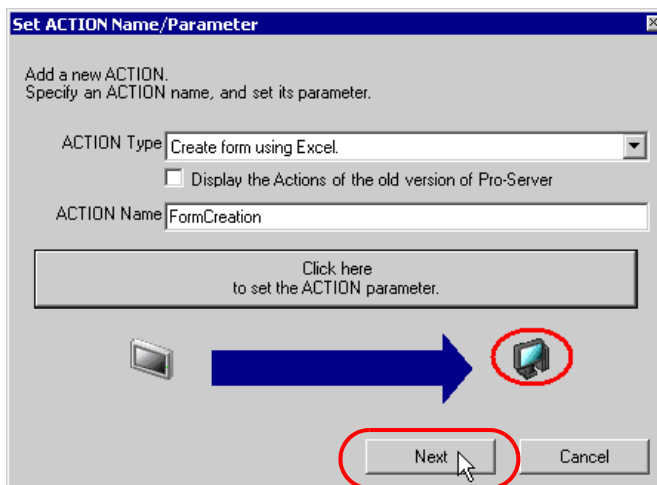
■ Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed.

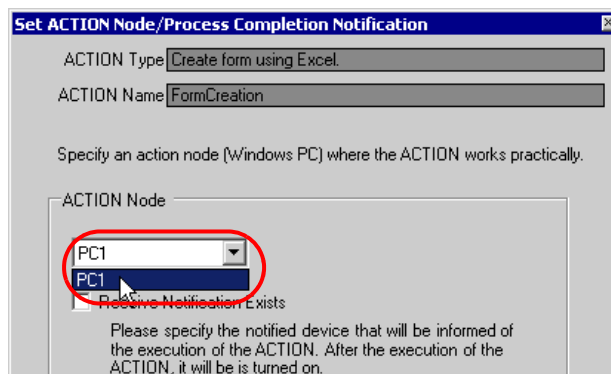
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

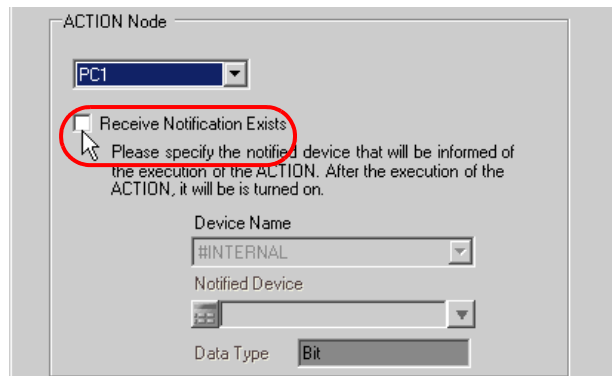
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



2 Click the list button of [Action Node] and select "PC1" as a node where ACTION operates.



- 3 Turn off the [Receive Notification Exists] check box, if checked.



NOTE • Do not check "Receive Notification Exists".

- 4 Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the name of ACTION you set will appear.



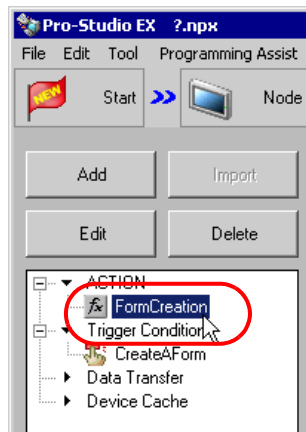
This is the end of the settings of the ACTION node and process completion notification.

■ Verifying Setting Result

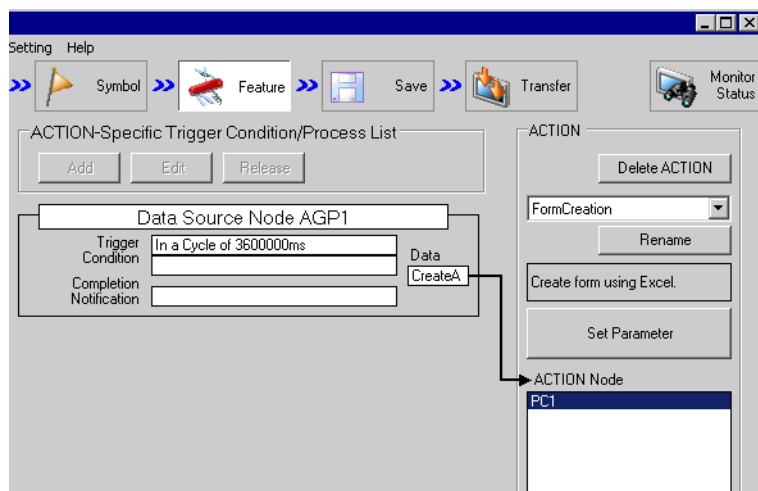
This step verifies setting results on the setting content list screen.

-
- NOTE** • In case of the Excel Report ACTION, you cannot add, edit or delete trigger conditions from "Trigger Condition/Process List per ACTION". To change the settings, click the [Parameters Settings] button and change the settings in [Edit Template] on Excel.
-

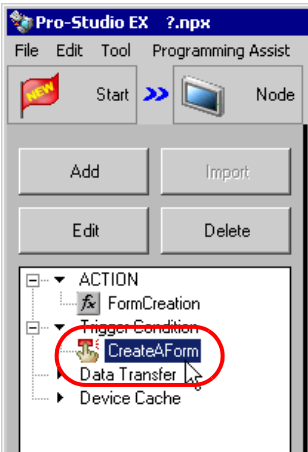
- 1 Select the ACTION name "Form Creation" from the tree display on the left of the screen.



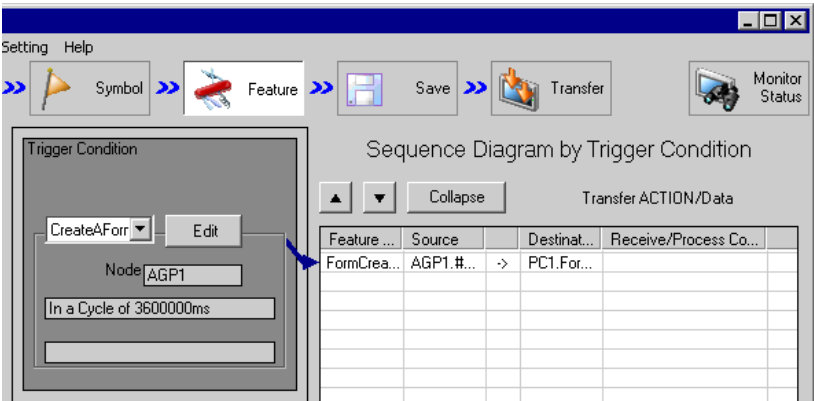
Confirm that the setting content appears on the right of the screen.



- 2 Select the trigger condition name "CreateAForm" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

■ Saving Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
 - Be sure to reload the network project file to 'Pro-Server EX'. If not, ACTION will not work.
-

Ex.

- Path of network project file : Desktop\report.npxe
- Title : EXCEL Report ACTION

■ Test Read

You can check if the settings are correct before transferring a created network project file to entry nodes.

When executing ACTION, the setting data is output to an output file. However, when executing a test read, it is reflected in a template file.

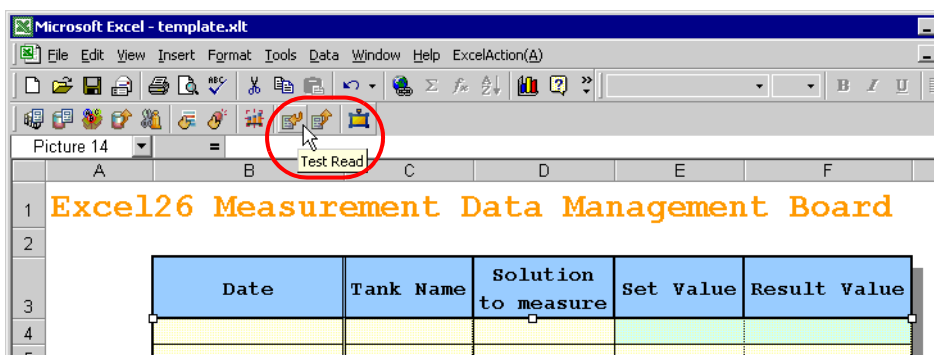
NOTE

- You do not necessarily have to perform a test read. If you skip this, proceed to "■ Transferring a Network Project File".

IMPORTANT

- To perform a test read, it is necessary that 'Pro-Server EX', to which a created network project file has been loaded, is running.

- 1 Click the [Feature] button.
- 2 Click "ACTION" from the tree display on the left of the screen, then click the [Edit] button.
- 3 On the "Set ACTION Name/Parameter" screen, click the [Click here to set the ACTION parameter] button.
- 4 On the "Create form using Excel" screen, click the [Edit Template] button.
- 5 With the ACTION area selected, click the [Test Read] icon.



The setup contents will be read in the template.

NOTE

- Refer to "5.9 Restrictions" for details about the restrictions on test reads.

■ Transferring a Network Project File

This step transfers a saved network project file to entry nodes.

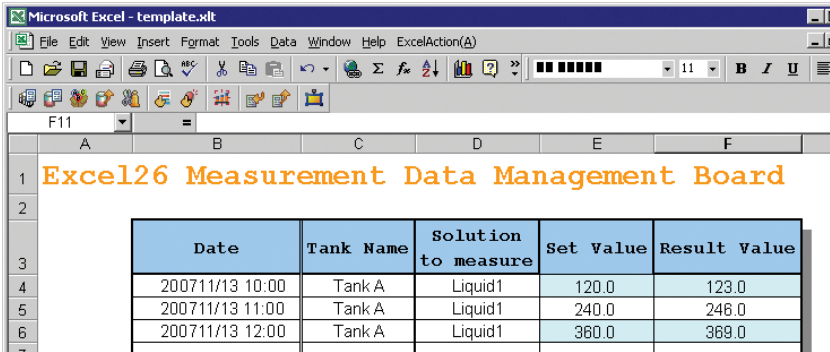
Refer to "26 Transferring" for details about transferring a network project file.

| | |
|-------------|---|
| NOTE | • Be sure to transfer a network project file. If not, ACTION will not work. |
|-------------|---|

■ Executing ACTION

This step verifies that transferring the network project file activates ACTION, opens a form (file name:

"Measurement data.xls"), and then the logging data is written in the specified location at an interval of one hour.



The screenshot shows a Microsoft Excel window titled 'Microsoft Excel - template.xls'. The menu bar includes File, Edit, View, Insert, Format, Tools, Data, Window, Help, and ExcelAction(A). The toolbar contains various icons for file operations, editing, and data management. The active cell is F11. The spreadsheet displays the title 'Excel26 Measurement Data Management Board' in orange text. Below the title is a table with the following data:

| Date | Tank Name | Solution to measure | Set Value | Result Value |
|-----------------|-----------|---------------------|-----------|--------------|
| 200711/13 10:00 | Tank A | Liquid1 | 120.0 | 123.0 |
| 200711/13 11:00 | Tank A | Liquid1 | 240.0 | 246.0 |
| 200711/13 12:00 | Tank A | Liquid1 | 360.0 | 369.0 |

| | |
|-------------|---|
| NOTE | <ul style="list-style-type: none">• If error occurs, you can check the log in the Log Viewer. For more details, refer to "28.5 Monitoring System Event Logs".• If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication". |
|-------------|---|

This is the end of the explanation of this ACTION.

5.1.2 Setting Guide

This section explains how to set the parameters of ACTION.

■ "Creating form using Excel" Screen

| Setting item | | Setting content |
|------------------|----------------------------|--|
| Specify Template | Template File | Specifies the location of Excel template. Click the [Reference] button. In the "Select File" dialog box, specify the location of the template and the file name. |
| | Edit Template | Displays the Excel template. On the Excel template, set the read/write condition of data. |
| Output File | Folder Name | Specifies an output destination folder of the Excel file on which data are read/written. Click the [Reference] button. In the "More Folders" dialog box, specify the location of an output file. |
| | File Name | Sets the file name of an output file. Default is "Report_%Y%M%D.xls". <div style="border: 1px solid black; padding: 2px; width: fit-content;">NOTE</div> <ul style="list-style-type: none"> "%Y%M%D" is set as "Year/Month/Date". When using the macro symbol "%DEV" (device name or symbol name) in the file name, disable [Start from Displayed State]. When this setting is enabled, returns an error instead of getting the device value. For details about %DEV, refer to "37.1 Restrictions on Names". |
| | Return to Default Settings | Resets the file name to the default, "Report_%Y%M%D.xls", if it has been changed. |

| Setting item | | Setting content |
|--------------|---|---|
| Output File | Start from Displayed State | <p>Starts data read/write when the output file is displayed.</p> <p>NOTE</p> <ul style="list-style-type: none"> • Be sure to turn on this check box, if you want to create a button on the Excel sheet and use this as a trigger condition to execute ACTION. • Refer to "5.6 Creating Trigger Buttons in a Form" for details about the trigger condition button. |
| | Do not save the output file when Action runs. | <p>The output file is not automatically saved when executing the Action. Save the output file using the Excel menu.</p> <p>IMPORTANT</p> <ul style="list-style-type: none"> • Checking this item helps if a large enough output file is used that it takes a long time to save. Note that if 'Pro-Server EX' or 'Excel' terminates abnormally for some reason, it's possible that the output file will not be saved, resulting in loss of data. Normally, we recommend leaving this item unchecked. If this item is checked, use the Excel auto save function to prevent unexpected loss of output files. For details on the Excel auto save function, refer to "■ Excel Auto Save Function". • If [Excel Operation Function/Export] is specified in the Execution Sequence List and is activated, output files are saved. |

■ "Device Logging" Screen

Device Logging

Action Settings

Trigger Condition Settings

Device Settings

Node

(Trigger-Source Node)

...

Device Name

Device Address/Symbol Group

No. of Devices

1

Data Type

16Bit(Signed)

...

☒ Add Device Address/Symbol Name

☐ Add Trigger-Node Name

Note: When specifying inconsecutive memory data, please use a group symbol.

Layout Settings

Target Cell Range

\$B\$8

Logging Direction

Vertical

Horizontal

No. of Logging Data

1

Time Stamp

OFF

Forward

Backward

Use GP Time

Note: The layout of a group symbol is fixed.

No. of Blank Cells to insert between Cells

Row

0

Column

0

☐ Convert device value to certain text at Read

Action when cell gets full

Clear and Overwrite

Scroll

New Sheet

Loop

☐ In creating a sheet, clear the specified cell range and then start.

OK

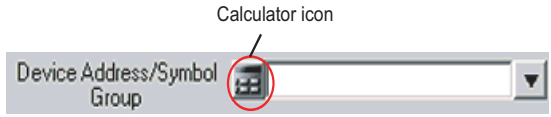

Cancel

Sample

An image of writing to a cell is shown below.
The arrow points in the direction of data logging.

| | | | |
|-------|-------|-------|-------|
| D1 01 | D1 02 | D1 03 | D1 04 |
| 1 | 2 | 3 | 4 |
| 2 | 3 | 4 | 5 |
| 3 | 4 | 5 | 6 |
| 4 | 5 | 6 | 7 |
| 5 | 6 | 7 | 8 |
| 6 | 7 | 8 | 9 |
| 7 | 8 | 9 | 10 |

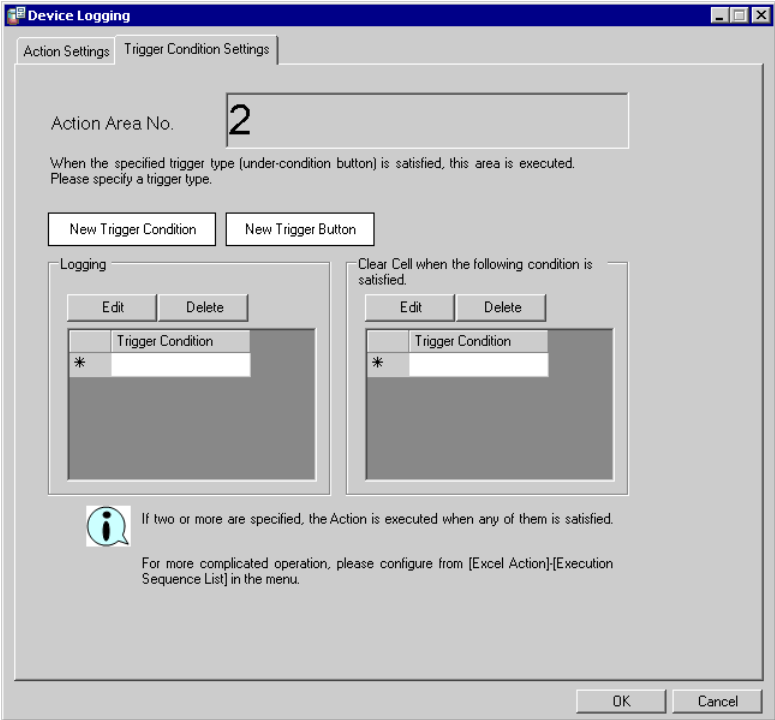
| Setting item | | Setting content | | | | | | | | |
|--|--|--|--|-------------------|---------------------------------|--|----------------------------|--|--|--|
| Device Settings | Node | Selects entry nodes that include the devices to execute data logging. | | | | | | | | |
| | | <div><div>NOTE</div><div><div><div>Clicking the [...] button can retrieve or add entry nodes.</div><div>Selecting "(Trigger-Source Node)" will select the entry node that has triggered the action.</div></div></div></div> | | | | | | | | |
| | | <table><tr><th>Trigger Cause</th><th>Target Entry Node</th></tr><tr><td>The trigger condition satisfied</td><td>Trigger condition node (except for Pro-Server EX node)</td></tr><tr><td>The trigger button clicked</td><td>Pro-Server EX node on which you clicked the button</td></tr><tr><td>Started directly from the user program</td><td>Pro-Server EX node on which the user program is operated</td></tr></table> | Trigger Cause | Target Entry Node | The trigger condition satisfied | Trigger condition node (except for Pro-Server EX node) | The trigger button clicked | Pro-Server EX node on which you clicked the button | Started directly from the user program | Pro-Server EX node on which the user program is operated |
| | | Trigger Cause | Target Entry Node | | | | | | | |
| | | The trigger condition satisfied | Trigger condition node (except for Pro-Server EX node) | | | | | | | |
| The trigger button clicked | Pro-Server EX node on which you clicked the button | | | | | | | | | |
| Started directly from the user program | Pro-Server EX node on which the user program is operated | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| Setting item | | Setting content |
|-----------------|---------------------------------|---|
| Device Settings | Device Name | <p>Selects Device/PLCs that include the devices to execute data logging.</p> <p>NOTE</p> <ul style="list-style-type: none"> It is not necessary to set when the entry nodes are GP Series nodes and Pro-Server EX nodes. |
| | Device Address/ Symbol Group | <p>Sets the device address or symbol to be used.</p> <ul style="list-style-type: none"> When specifying a device address: Enter directly from the Calculator icon.  <ul style="list-style-type: none"> When specifying a symbol: Select the symbol by clicking the list button.  <p>NOTE</p> <ul style="list-style-type: none"> When setting non-sequential devices, be sure to specify a group symbol. |
| | Data Type | <p>Selects the data type by clicking the [...] button. Enabled only when the device address has been directly input.</p> |
| | No. of Devices | <p>This field displays the number of devices, calculated from the selected range of cells, for the write operation.</p> <p>NOTE</p> <ul style="list-style-type: none"> When "String" is specified in [Data Type], the title of the setting item will be [No. of Characters]. |

| Setting item | | Setting content | | | |
|-----------------------|--------------------------------|---|---------|--------------------------|--|
| | Add Device Address/Symbol Name | Writes the device address, symbol name, or group symbol name in the Excel cells next to the cells in which logging data have been written. In this case, depending on the data logging direction, the device address, symbol name, or group symbol name will be written in the different cells as follows. | | | |
| | | Logging Direction | | Display Cell Position | |
| | | Vertical | | Above the value | |
| | | Horizontal | | On the left of the value | |
| | | Example) • Device address "D100", No. of devices "3", Write pattern "Vertical" | | | |
| | | D100 | D101 | D102 | |
| 9:00:01 | | | | | |
| 9:00:02 | | | | | |
| 9:00:03 | | | | | |
| | | • Device address "D100", No. of devices "3", Write pattern "Horizontal" | | | |
| | | 9:00:01 | 9:00:02 | 9:00:03 | |
| D100 | | | | | |
| D101 | | | | | |
| D102 | | | | | |
| Add Trigger Node Name | | Writes the name of the entry node that has triggered ACTION in the top of the cell. | | | |

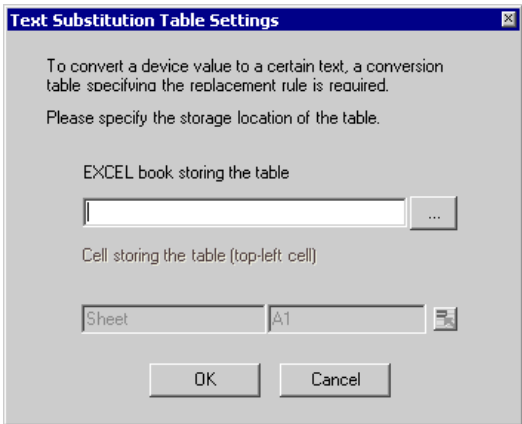
| Setting item | | Setting content |
|---|--|---|
| Layout Settings | Target Cell Range | <p>Displays the specified cell range. To change the cell range, click the button and select a cell range on Excel.</p> <p>NOTE</p> <ul style="list-style-type: none"> For the process on how to select cell ranges, refer to "■ Action Area Settings" in "5.1.2 Setting Guide". The useful function is available to check the specified cell range (Action area). Refer to "■ Action Area List" in "5.1.2 Setting Guide". |
| | Logging Direction | <p>Sets the data logging direction (vertical or horizontal).</p> <p>NOTE</p> <ul style="list-style-type: none"> The write image of the content set in "Layout Settings" appears in [Sample]. |
| | No. of Logging Data | Sets and displays the number of data logging that was calculated automatically from the specified cell range. |
| | Time Stamp | <p>Add time when data was written at the head of the logging data.</p> <ul style="list-style-type: none"> OFF Not add time information Forward Add time information at the head of the logging data. Backward Add time information at the end of the logging data. <p>You can select the following two types of time information by clicking the list button.</p> <ul style="list-style-type: none"> Use GP time Use PC time |
| Layout Settings | No. of Blank Cells to Insert between Cells | <p>Sets the number of blank cells to insert (blank cells to insert between data and data) when writing data in multiple cells. You can use different settings for columns and rows, respectively.</p> |
| Convert device value to certain text at Read | | <p>Converts the read device values into text. Turning on this check box will display "Text Substitution Table Settings" screen. Refer to "■ "Text Substitution Table Settings" Screen" for more details.</p> |
| Action when cell gets full | | <p>Sets the action when the specified cell for data logging has got full.</p> <ul style="list-style-type: none"> Clear and Overwrite Clears the cells, and continues logging from the beginning. Scroll Scrolls and continues logging New Sheet Continues logging on a new sheet. All features being output on the sheet will be copied to the new sheet. Loop Not clears the cells, and continues logging from the beginning. |
| In creating a sheet, clear the specified cell range and then start. | | Before copying a sheet from the template file, if data are written in the cell range of the sheet, clears the data and starts copying. |

- "Trigger Condition Settings" tab



| Setting item | Setting content |
|--|---|
| Action Area No. | Displays No. allocated to each ACTION area by template. |
| New Trigger Condition | The "Trigger Condition Settings" screen will appear. Click here to set a new trigger condition. |
| New Trigger Button | Displays the "Trigger Button" screen. Refer to "5.6.2 Setting Guide" for more details. |
| Logging | Selects a trigger condition for starting data logging. Click the blank line of [Trigger Condition] and then the list button to display the registered trigger condition. <div>NOTE</div> <ul style="list-style-type: none">• When multiple trigger conditions have been specified, satisfying at least one of those conditions executes ACTION.• Clicking the [Edit] button can edit the specified trigger conditions.• Clicking the [Delete] button cancels the specified trigger conditions. |
| Clear Cell when the following condition is satisfied | Selects a trigger condition for clearing data of the logging area. Click the blank line of [Trigger Condition] and then the list button to display the registered trigger condition. <div>NOTE</div> <ul style="list-style-type: none">• When multiple trigger conditions have been specified, satisfying at least one of those conditions executes ACTION.• Clicking the [Edit] button can edit the specified trigger conditions.• Clicking the [Delete] button cancels the specified trigger conditions. |

- "Text Substitution Table Settings" Screen



| Setting item | Setting content |
|------------------------------|--|
| Excel book storing the table | Specifies the Excel book in which the text substitution table is stored. Click the [...] button, and then specify the file on the "Open File" screen. |
| Cell storing the table | Specifies the book name in which the text substitution table is stored and then the cell number of the top-left of the table. Click the button to display the "Specify Cell" screen. Then enter the cell number at the top-left of the table. <div></div> |

Refer to "■ About Text Substitution of Data" for more details about a text substitution table.

■ About Text Substitution of Data

"Excel Form" ACTION has a feature of text substitution to use when writing device data in Excel cells. This feature substitutes device data into a set of characters.

Before using this feature, it is necessary to create a substitution table in which a text substitution rule is set and to save the table at an arbitrary location.

Example of Text Substitution Table

| | A | B | C | D |
|----|-------------|----------------|---------------------|---|
| 1 | Start value | terminus value | character string | |
| 2 | 0 | | bolt | |
| 3 | 1 | | nut | |
| 4 | 2 | | screw | |
| 5 | 100 | | water level low | |
| 6 | 101 | | water level excess | |
| 7 | 102 | | Voltage decrease | |
| 8 | 103 | | Voltage exaggerated | |
| 9 | 500 | 599 | red | |
| 10 | 600 | 699 | blue | |
| 11 | 700 | | green | |
| 12 | ELSE | | others | |
| 13 | | | | |

- "Start Value"

Sets start values to compare device data with.

In case of using a value other than the set start values, enter "ELSE".

- "End Value"

Sets end values to compare device data with.

- "Character String"

Sets character strings to substitute.

The flow of substitution is as follows: Compares device data with the substitution table from the top row. If satisfied, writes the value of the character string of the row in the cell.

If not satisfied, retrieves data until a blank start value or "ELSE" is found.

If an "ELSE" row found, writes the character string in the "ELSE" row in the cell.

If an "ELSE" not found, writes the read value itself in the cell.

If a blank line row found, writes the compare source value itself in the cell.

The comparison method for substitution is as follows:

(1) Numeral Data

1. When only the start value is set, if the start value and device data are identical, converts the data to a character string.
2. When both the start value and end value are set, if $\text{start value} \leq \text{data} < \text{end value}$, converts the data to a character string.
3. When only the end value is set, regards the data as a blank row and ends the comparison. Then writes the compare source value itself in the cell.
4. When both the start value and the end value are set in character strings, regards the data as non-object and neglects them.
5. When the Data Type is "16Bit(Signed)", describe the integer in the table.

Example) 1,2,3.....10,11

6. When the Data Type is HEX, describe the hexadecimal number in the table.

Example) 1,2,3,.....a,b,.....f,10,11,.....1a,1b

(2) Character String Data

If device data and the start value are identical, converts the data to a character sting. Neglects the end value, if any.

After the conversion, the cell format as well as character strings will be reflected in the output file. The format preset on the template (format for lines excluded) will therefore be overwritten. When the substitution feature is not used, the cell format will remain unchanged.

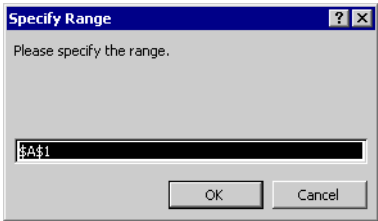
When macro characters (%DEVICE_VALUE%) for device value substitution are embedded in the string, converts the data to the character string of a device value.

■ Action Area Settings

The Action Area is a range of cells in Excel that you want to read from and write to when running actions in an Excel Form. You can set up the Action Area in Excel by dragging the mouse to select a range of cells.

- NOTE

 - Set up the cell range using the following parameters.
Rows: 65536 or less
Columns: 256 or less
 - Instead of using the mouse, you can specify a cell range by typing. Click the Excel screen, enter a cell range on the "Specify Range" screen, and then click the [OK] button.



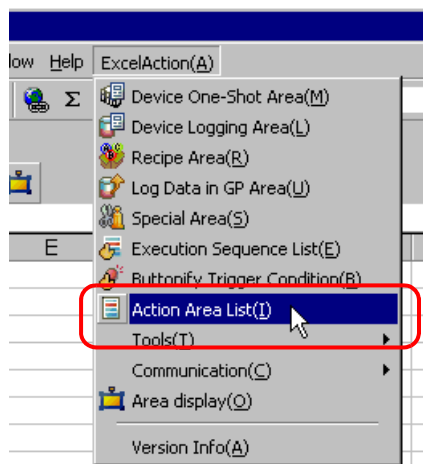
- To change the Action Area by dragging the mouse, you need to display the Action Area. When the Action Area is not displayed, from the [Excel Action] menu select [Display Area].
- When you specify 1501 rows or more in your cell range, only the top-left cell of the selected range will look like it's selected. Although dragging the mouse and moving inside the area will not change the Action Area, if you change the size of the Action Area the newly specified range is saved as the Action Area.

| | A | B | C |
|---|---------------------|-------|-------|
| 1 | ○△ Management Board | | |
| 2 | | | |
| 3 | ○ ○ ○ ○ | △ △ △ | □ □ □ |
| 4 | □ | □ | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |

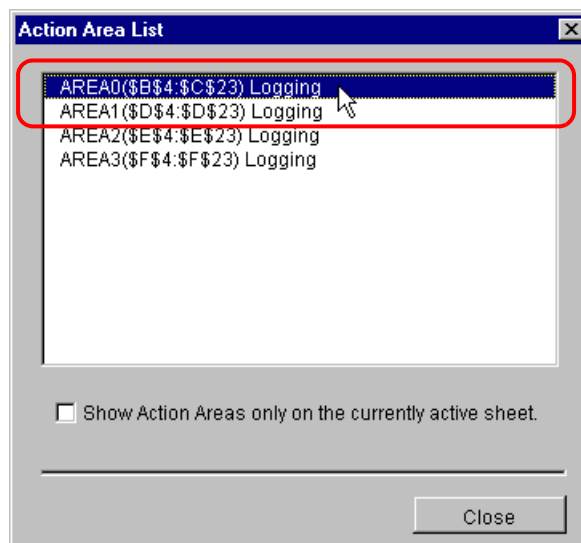
■ Action Area List

You can display the list of the specified Action area to check or edit quickly.

- 1 Click [Action Area List] under [Excel Action] on the Excel menu bar.



- 2 Click the Action area you want to check.



The selected Action area is displayed.

NOTE

- To display the Action area only on the currently displayed sheet, check [Show Action Areas only on the currently active sheet.].
- Double-click the item to display the edit screen for the selected Action area. This is useful when you want to edit quickly.

- 3 Click the [Close] button and check or edit the selected Action area.

5.2 Writing Date/Time in a Form

NOTE

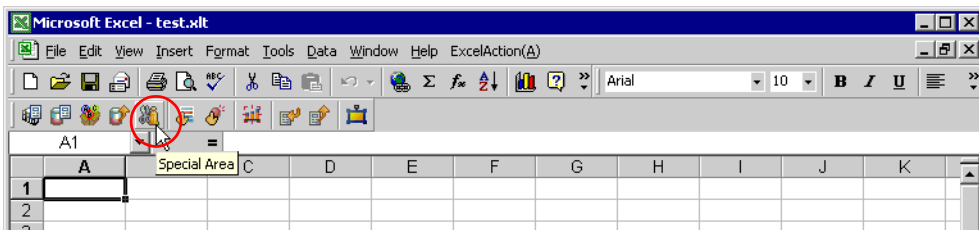
- There are instances when Excel forms display incorrectly. When the display is incorrect, refer to the following.

"■ Caution Regarding Incorrect Display of Excel Forms"

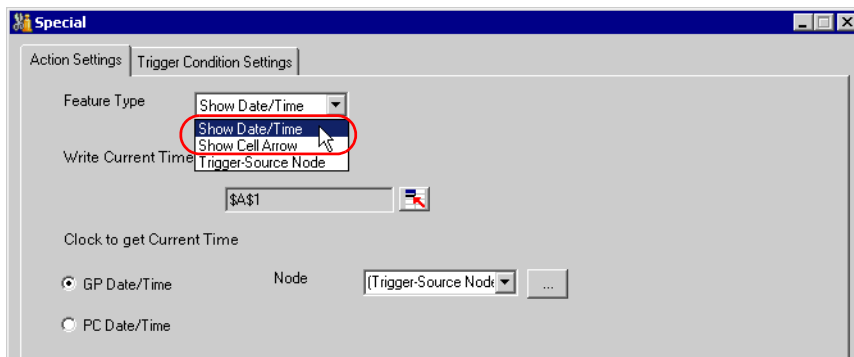
5.2.1 Try to Write Date/Time in a Form

This feature allows writing the current date and time in the specified cell of a form.

- Click the [Special Area] icon on the Excel template.



- Click the list button of [Feature Type] and then select [Show Date/Time].

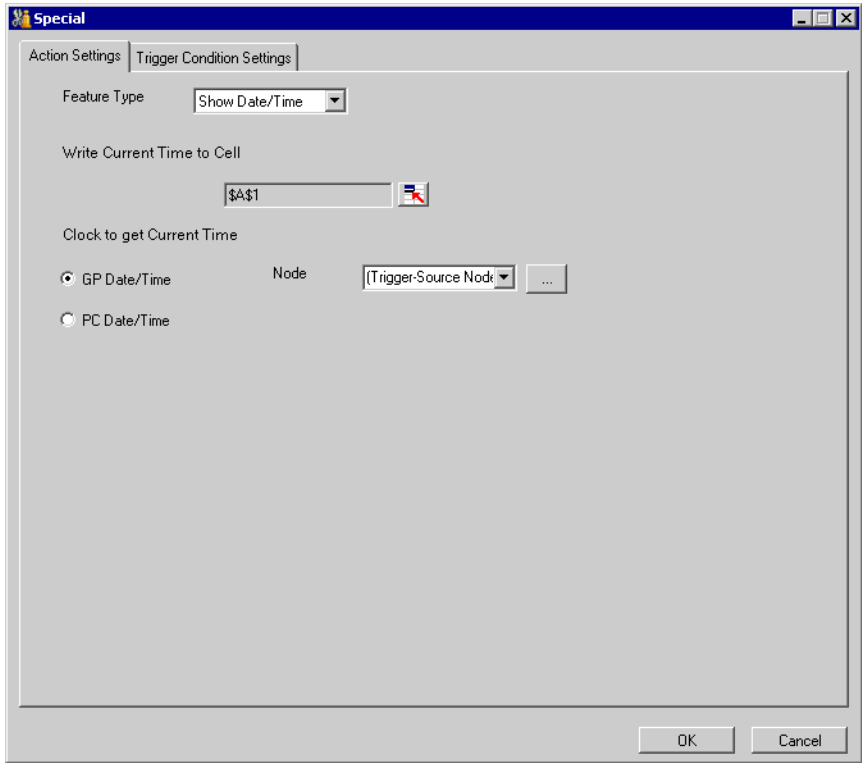


- Set the content and click the [OK] button.

Refer to "5.2.2 Setting Guide" for more details.

5.2.2 Setting Guide

■ "Action Settings" tab



| Setting item | Setting content |
|------------------------------|---|
| Feature Type | <p>Selects the type of feature to set.</p> <ul style="list-style-type: none"> • Show Date/Time • Show Cell Arrow ("5.3 Writing Arrows in a Form") • Trigger Source Node ("5.4 Writing Trigger Source Node Names in a Form") |
| Write Current Time to Cell | <p>Specifies a cell range to write date and time. Clicking the button can select a cell range on Excel.</p> <p>NOTE</p> <ul style="list-style-type: none"> • For the process on how to select cell ranges, refer to "■ Action Area Settings" in "5.1.2 Setting Guide". • When you select multiple cells as a cell range, the date and time will be written in the left top cell only. • The useful function is available to check the specified cell range (Action area). Refer to "■ Action Area List" in "5.1.2 Setting Guide". |
| GP Date/Time PC Date/Time | <p>Writes date and time of the specified node.</p> <ul style="list-style-type: none"> • GP Date/Time Writes date and time of the display unit. In this case, click the list button to specify the entry node. • PC Date/Time Write date and time of the PC on which ACTION is operating. |

■ "Trigger Condition Settings" tab

Special

Action Settings Trigger Condition Settings

Action Area No. 0

When the specified trigger type (under-condition button) is satisfied, this area is executed.
Please specify a trigger type.

New Trigger Condition New Trigger Button

Read

Edit Delete

| Trigger Condition |
|-------------------|
| * |

If two or more are specified, the Action is executed when any of them is satisfied.
For more complicated operation, please configure from [Excel Action]{Execution Sequence List} in the menu.

OK Cancel

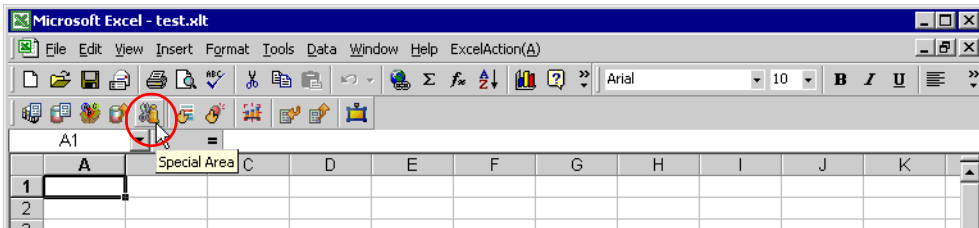
| Setting item | Setting content |
|-----------------------|--|
| Action Area No. | Displays No. allocated to each ACTION area by template. |
| New Trigger Condition | Displays the "Trigger Condition Settings" screen. Click here to set a new trigger condition. |
| New Trigger Button | Displays the "Trigger Button" screen. Refer to "5.6.2 Setting Guide" for more details. |
| Read | <p>Selects a trigger condition for write. Click the blank line of the [Trigger Condition] and then the list button to display the registered trigger condition.</p> <p>NOTE</p> <ul style="list-style-type: none"> When multiple trigger conditions have been specified, satisfying at least one of those conditions executes ACTION. Clicking the [Edit] button can edit the specified trigger conditions. Clicking the [Delete] button cancels the specified trigger conditions. |

5.3 Writing Arrows in a Form

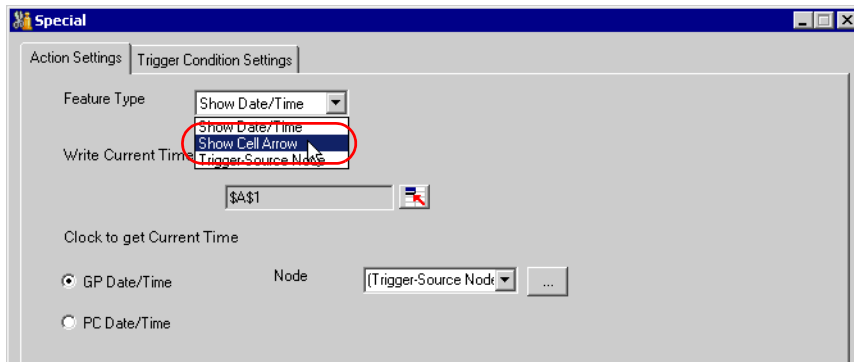
5.3.1 Try to Write Arrows in a Form

This feature allows writing arrows to show the area, etc on the specified cell of a form.

- 1 Click the [Special Area] icon on the Excel template.



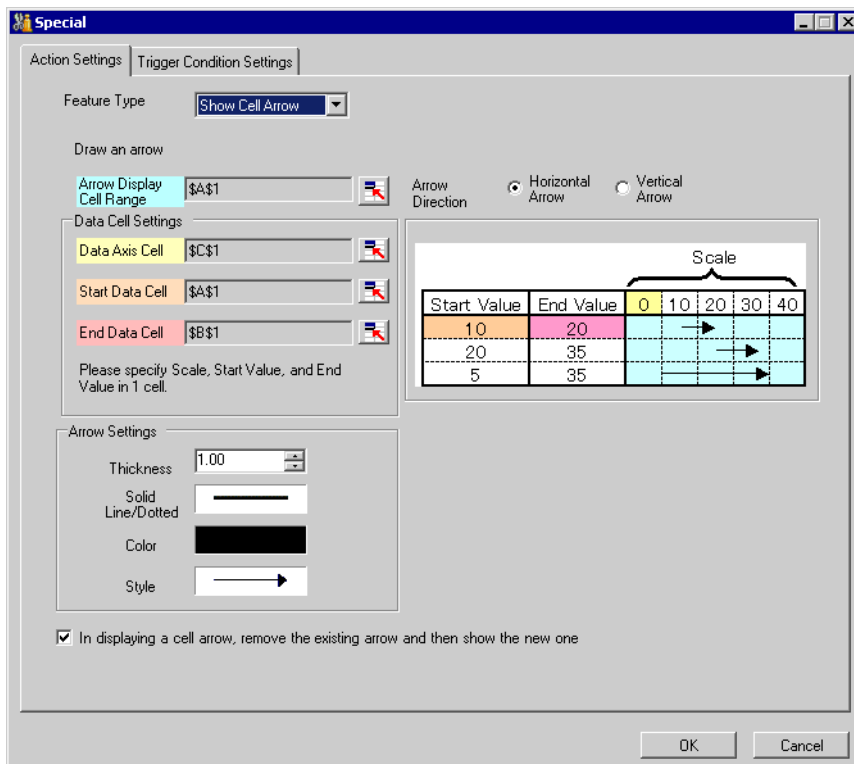
- 2 Click the [Feature Type] button and then select [Show Cell Arrow].



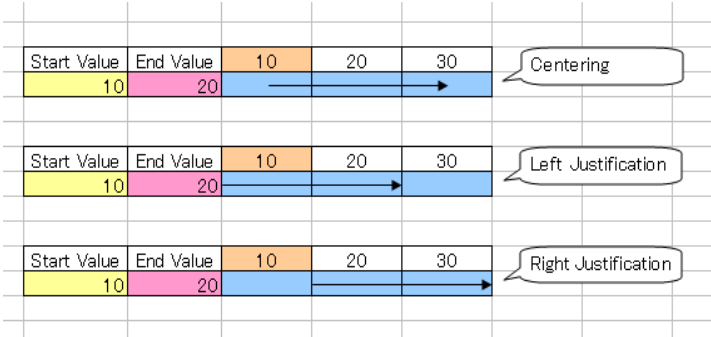
- 3 Set the content and click the [OK] button.


Refer to "5.3.2 Setting Guide" for more details.

5.3.2 Setting Guide



| Setting item | Setting content | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|--|-------------|-----------|----|----|----|----|----|----|----|--|---|--|--|--|----|----|--|--|---|--|--|---|----|--|--|--|---|--|
| Arrow Display Cell Range | <p>Specifies a cell range to which cell arrows will be written. Clicking the button can select a cell range on Excel.</p> <p>Start Data Cell End Data Cell Data Axis Cell</p> <table><tr><th>Start Value</th><th>End Value</th><th>0</th><th>10</th><th>20</th><th>30</th><th>40</th></tr><tr><td>10</td><td>20</td><td></td><td>→</td><td></td><td></td><td></td></tr><tr><td>20</td><td>35</td><td></td><td></td><td>→</td><td></td><td></td></tr><tr><td>5</td><td>35</td><td></td><td></td><td></td><td>→</td><td></td></tr></table> <p>Display Cell Range</p> <p>NOTE</p> <ul style="list-style-type: none">For the process on how to select cell ranges, refer to "■ Action Area Settings" in "5.1.2 Setting Guide".The useful function is available to check the specified cell range (Action area).Refer to "■ Action Area List" in "5.1.2 Setting Guide". | Start Value | End Value | 0 | 10 | 20 | 30 | 40 | 10 | 20 | | → | | | | 20 | 35 | | | → | | | 5 | 35 | | | | → | |
| Start Value | End Value | 0 | 10 | 20 | 30 | 40 | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 20 | | → | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 35 | | | → | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 35 | | | | → | | | | | | | | | | | | | | | | | | | | | | | | |

| Setting item | | Setting content |
|--------------------------|-----------------|---|
| Arrow Display Cell Range | | <ul style="list-style-type: none"> A cell arrow will appear according to the cell format in Excel. When the cell format is in "Left Justification", the arrow starts at the left end of the cell. When the cell format is in "Right Justification", on the other hand, the arrow starts at the right end of the cell. When the cell format is not in either of "Left Justification", "Right Justification", or "Centering", the arrow will be centered.  |
| Arrow Direction | | Selects either "Horizontal Arrow" or "Vertical Arrow". |
| Data Cell Settings | Data Axis Cell | <p>Specifies the first cell in which reference data are stored for wiring arrows. The write image of the content set in "Data Cell Settings" appears on the right of the screen.</p> <p>NOTE</p> <ul style="list-style-type: none"> Set the target cell range under the following conditions. Row: 65536 or less Column: 256 or less |
| | Start Data Cell | <p>Specifies the first cell in which data of the start value of an arrow are stored.</p> <p>NOTE</p> <ul style="list-style-type: none"> Set the target cell range under the following conditions. Row: 65536 or less Column: 256 or less An arrow will not be written if the start value is out of the scale range. |
| | End Data Cell | <p>Specifies the first cell in which data of the end value of an arrow are stored. Clicking the button can select a cell range on Excel. Drag the mouse to select the cell range.</p> <p>NOTE</p> <ul style="list-style-type: none"> Set the target cell range under the following conditions. Row: 65536 or less Column: 256 or less The same number of data as that of the start value must be specified. An arrow will not be written if the end value is out of the scale range. |

| Setting item | | Setting content |
|--|------------------------|--|
| Arrow Settings | Thickness | Sets the thickness of arrows (mm). |
| | Solid Line/Dotted Line | Sets the type of arrow line. |
| | Color | <p>Sets the color of arrows. On the "Color Settings" screen, set color and click the [OK] button.</p>  |
| | Style | Sets the style of arrows. |
| In displaying a cell arrow, remove the existing arrow, and then show a new one | | Before displaying a cell arrow, clears the existing arrow and then show a new one. |

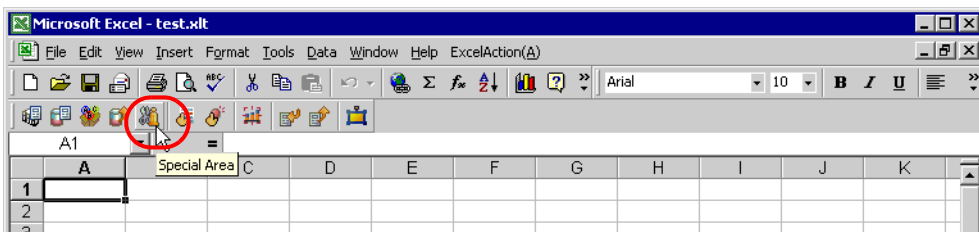
5.4 Writing Trigger Source Node Names in a Form

5.4.1 Try to Write Trigger Source Node Names in a Form

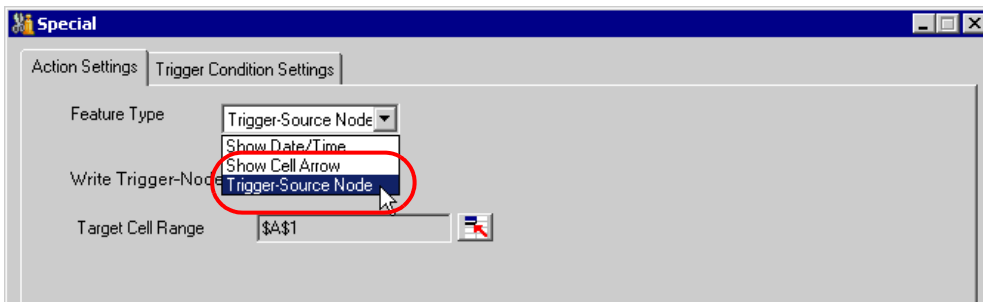
This feature allows writing the name of a trigger source node in the specified cell of a form.

A trigger source node means an entry node which satisfies the trigger condition.

- 1 Click the [Special Area] icon on the Excel template.



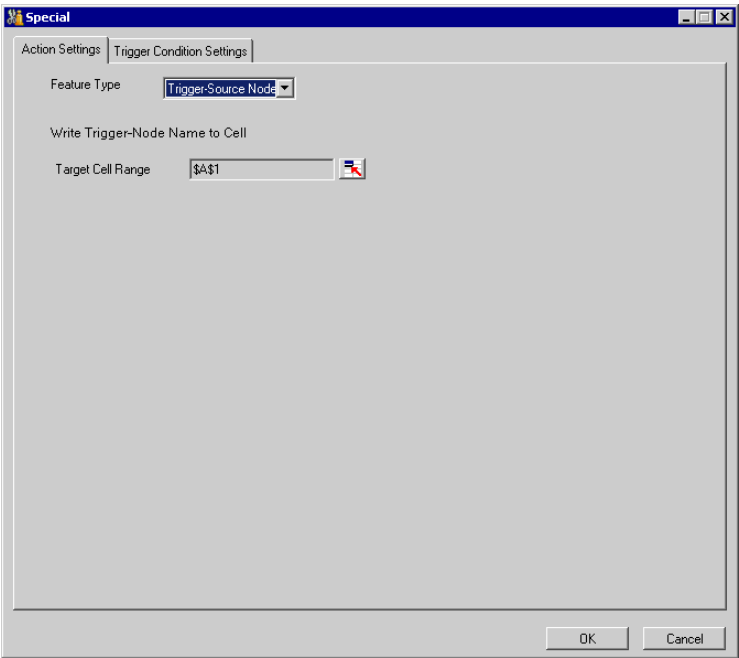
- 2 Click the list button of [Feature Type] and then select [Trigger Source Node].



- 3 Set the content and click the [OK] button.

Refer to "5.4.2 Setting Guide" for more details.

5.4.2 Setting Guide



| Setting item | Setting content |
|-------------------|---|
| Target Cell Range | <p>Specifies a cell range to which node names will be written. Clicking the button can select a cell range on Excel.</p> <p>NOTE</p> <ul style="list-style-type: none"> For the process on how to select cell ranges, refer to "■ Action Area Settings" in "5.1.2 Setting Guide". When you select multiple cells as a cell range, the node name will be written in the left top cell only. The useful function is available to check the specified cell range (Action area).Refer to "■ Action Area List" in "5.1.2 Setting Guide". |

5.5 Arranging Sequence of ACTION (New Form)

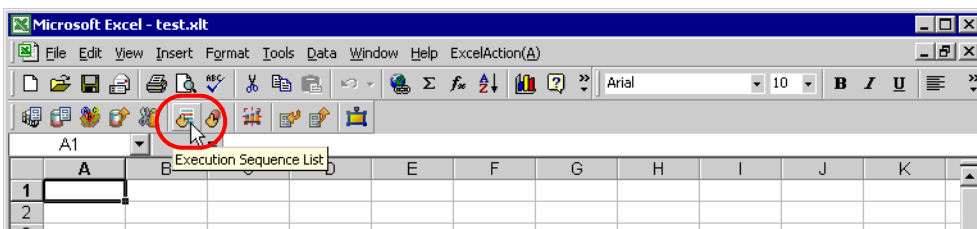
5.5.1 Try to arrange sequence of ACTION

This function allows you to specify the executing sequence of Excel Report Action, or Excel Operation Function including New Sheet or New Book.

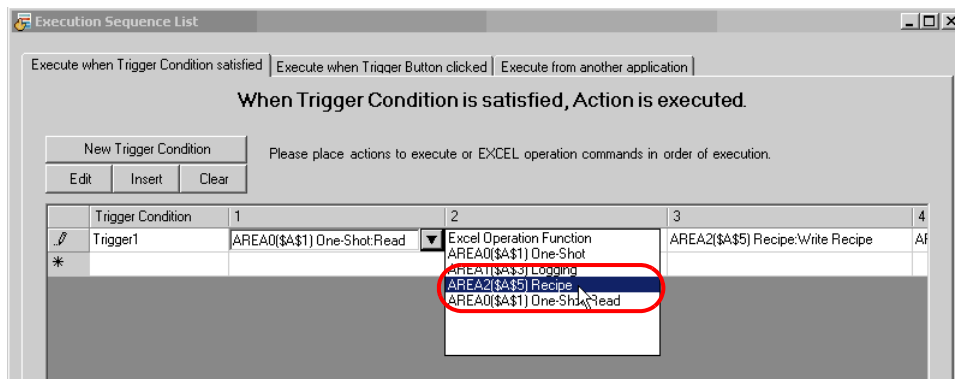
It is capable of displaying 1 to 40 ACTION items. Sorting, editing, and deleting are possible.

Here is the example how to change the executing sequence of multiple setup ACTION.

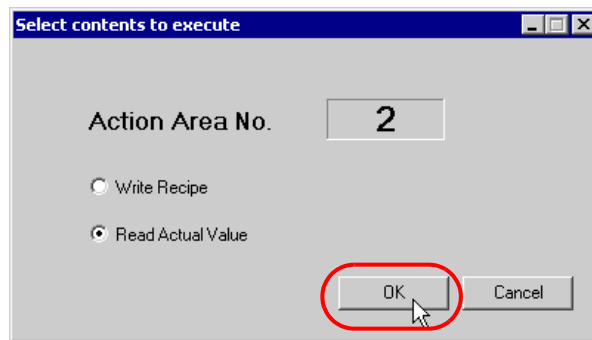
- 1 Click the [Execution Sequence List] icon on the Excel template.



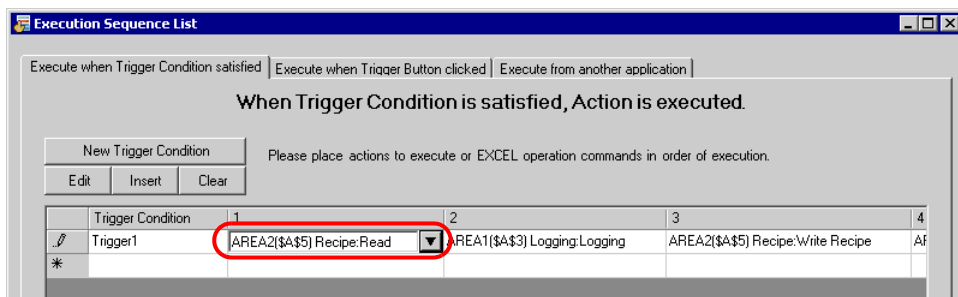
- 2 After clicking the ACTION name with the executing sequence "1", select the ACTION to execute for the first time.



- 3 Select the ACTION type in the "Select contents to execute" screen, and click the [OK] button.



The ACTION name with the executing sequence "1" changes to the selected ACTION name.



- 4 Similarly, click the ACTION name with other executing sequence and click the [OK] button.
Refer to "5.5.3 Setting Guide" for more details.

5.5.2 Excel Report Actions - Timing Differences When Reading Data

■ Summary

Using Excel Report Actions, after a trigger condition becomes true, you can export data to an Excel worksheet from internal devices on a display unit or from device addresses on an external device. However, if you set up multiple action areas on a single trigger condition, timing differences may arise when data is read. In the following paragraphs you can find why timing differences occur, examples of issues caused by a timing difference, and how to prevent timing differences.

■ Functions

Problems discussed in this topic occur when using the following functions.

- One-shot: Read
- Logging: Device logging
- Recipe: Read actual values

■ Why Timing Differences Occur (Excel Report Action operation flow)

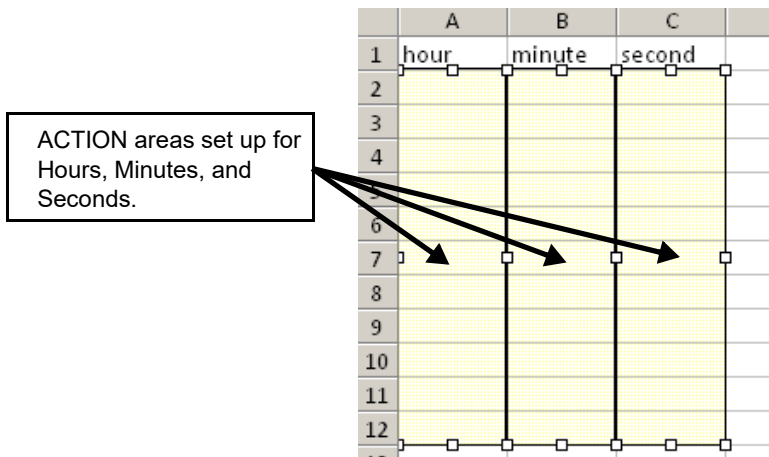
Excel Report Actions run after a trigger condition becomes true. The following illustrates the operation workflow of Excel Report Actions.

- 1 Find the trigger condition of the targeted process.
- 2 Run the ACTION area associated with the trigger condition found in step 1. ACTION area operations are as follows.
 - 2-1. From the ACTION area, get the device address, data type, and number of devices.
 - 2-2. Using the information from step 2-1, Pro-Server EX reads data from the display unit.
 - 2-3. Results are applied to cells in the Excel worksheet.
 - 2-4. If there are further ACTION areas, repeat from step 2-1.
- 3 Run the Excel Report Action's exit process.

As indicated in the operation workflow, when a single trigger condition runs multiple ACTION areas, timing differences arise due to the timing on reading data for each ACTION area. Due to this timing difference, your design could cause unintended repercussions.

■ Example Problem Caused by a Timing Difference

When using a single trigger condition and you use separate ACTION areas to read the Hours, Minutes, and Seconds from the clock on an external device or display unit, you may not be able to read the data properly. The following is a concrete example that uses Logging. The same applies when using One-shot or Recipe functions.



The above illustration shows ACTION areas that get the Hours, Minutes, and Seconds from the external device's clock register, and populate the data in columns A, B, and C. Columns A, B, and C each have different ACTION areas set up.

As the hours, minutes, and seconds need to be read at one time, as shown below in the [Execution Sequence List] screen, the ACTION areas are set to run on a single trigger.

| | Trigger Condition | 1 | 2 | 3 |
|---|-------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| ▶ | Trigger1 | AREA0(\$A\$2:\$A\$12) Logging:Logging | AREA1(\$B\$2:\$B\$12) Logging:Logging | AREA2(\$C\$2:\$C\$12) Logging:Logging |
| * | | | | |

However, as described in "■ Why Timing Differences Occur (Excel Report Action operation flow)", because Excel Report Actions read data one action area at a time, timing differences will occur between the Hours, Minutes, and Seconds. If the Excel Report Action runs at the moment the external device's clock register changes from 00:00:59 to 00:01:00, then the resulting data may actually be 00:01:59.

■ Preventing Timing Differences

To prevent time differences, merge the multiple ACTION areas and associated device addresses into a single ACTION area. The following describes the actual settings.

-
- NOTE** • If each of the multiple ACTION areas uses different functions, potential data-read timing differences cannot be prevented.
-

Set up Hours, Minutes, and Seconds in one ACTION area.

| | A | B | C | D |
|----|------|--------|--------|---|
| 1 | hour | minute | second | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |

The above illustration shows the ACTION area that gets the Hours, Minutes, and Seconds from the external device's clock register, and populates the data in columns A, B, and C. Columns A, B, and C are set up in a single ACTION area. In the [Execution Sequence List] screen, set up one trigger condition to run one ACTION area.

| | Trigger Condition | 1 | 2 | 3 | 4 | 5 |
|---|-------------------|---------------------------------------|---|---|---|---|
| ▶ | Trigger1 | AREA0(\$A\$2:\$C\$12) Logging:Logging | | | | |
| * | | | | | | |

Device Settings (Consecutive device addresses)

In the ACTION area's [Device Settings], you can set up multiple devices. Using this setting, you can handle multiple, consecutive device addresses in one ACTION area. The following example ACTION area setup is for Device 1 = D100, Device 2 = D101, and Device 3 = D102.

Device Settings

Node

AGP1

...

Device Address/Symbol Group

D0100

...

Data Type

16Bit(Signed)

...

☒ Add Device Address/Symbol Name

☐ Add Trigger-Node Name

Device Name

PLC1

...

No. of Devices

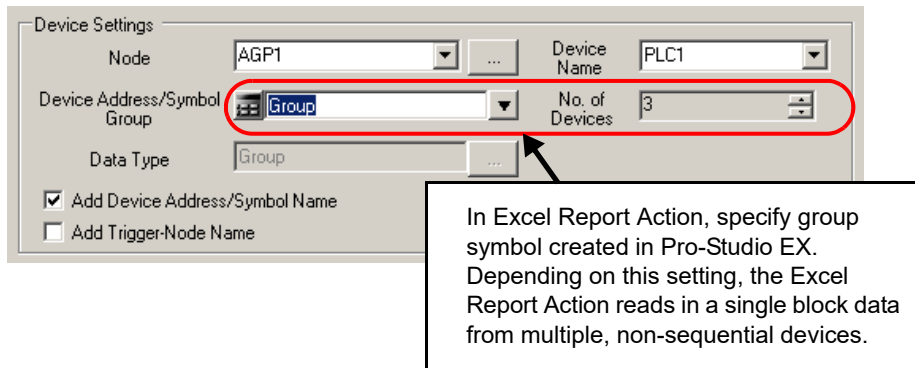
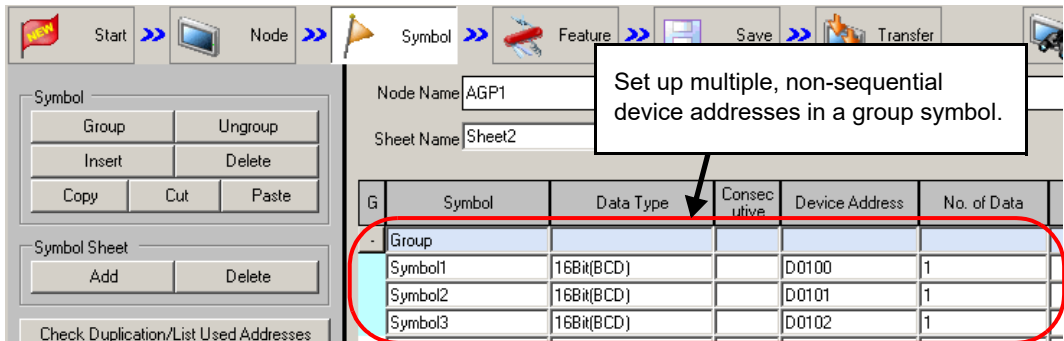
3

...

Starting from D100, set up 3 sets of devices. Excel Report Action reads data from consecutive devices.

Device Settings (Non-sequential device addresses)

By creating group symbols in Pro-Studio EX, you can use data from multiple, non-sequential device addresses in an ACTION area. The following example group symbol and ACTION area setup is for Device 1 = D100, Device 2 = D200, and Device 3 = D300.



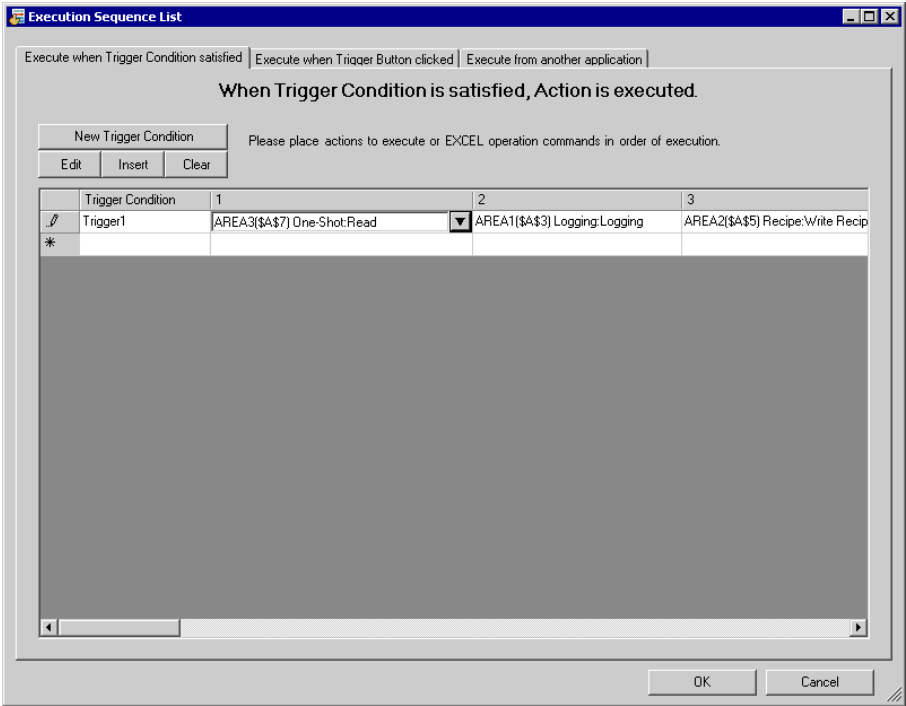
NOTE • For details about group symbols, see "29.3 Grouping Symbols".

5.5.3 Setting Guide

■ "Execute when Trigger Condition satisfied" Tab

This tab displays the ACTION to be executed when the Trigger Condition is satisfied, or the sequence of Excel Operation Function.

It is capable of displaying 1 to 40 ACTION items separately by the trigger condition.

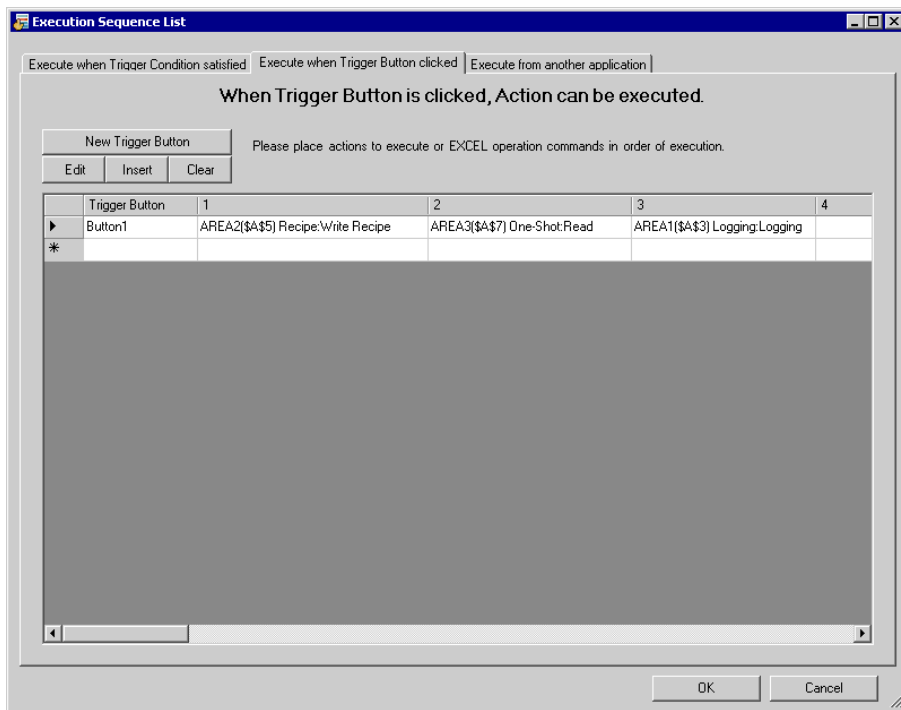


| Setting item | Setting content |
|------------------------------|--|
| New Trigger Condition | Displays the "Trigger Condition Settings" screen. Click here to set a new trigger condition. |
| Edit | When selecting the Trigger Condition, you can click the [Edit] button to edit the Trigger Condition. Also, when selecting the ACTION to execute or Excel Operation Function, you can click the [Edit] button to display each edit screen. |
| Insert | Inserts an empty cell. You can specify the ACTION or Excel Operation Function. |
| Clear | Clears the content of the row where a trigger condition is displayed. |
| Trigger Condition | Displays the name of the trigger condition. To change a trigger condition, click the trigger condition name and then click the list button to select a new one. |
| Execution Sequence (1 to 40) | Displays the ACTION items or the Excel operation function items in sequence (1 to 40). To change the sequence, click one of the ACTION items or of the Excel operation function items, and then click the list button to select new ones. <div>NOTE</div> <ul style="list-style-type: none">Clicking "Excel Operation Function" displays the "Excel Operation Function Setting" screen.Refer to "■ "Excel Operation Function" Screen" Screen" for more details. |

■ "Execute when Trigger Button clicked" Tab

This tab displays the ACTION or the sequence of Excel Operation Function to be executed when you click the created trigger button.

It is capable of displaying 1 to 40 ACTION items separately by the trigger button.



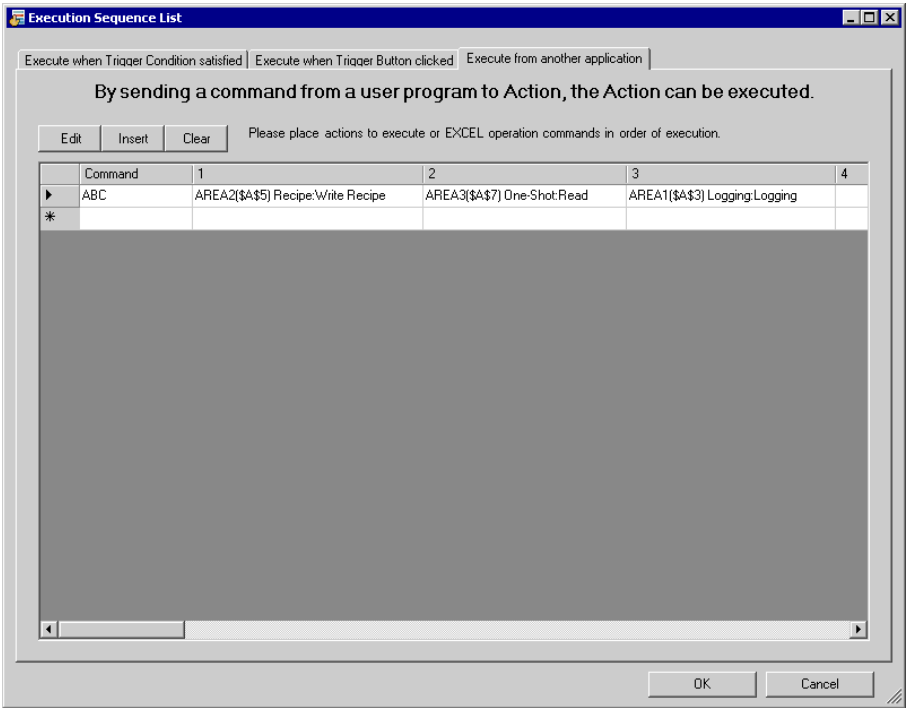
| Setting item | Setting content |
|------------------------------|---|
| New Trigger Button | Displays the "Trigger Button" screen. Click here to set a new trigger button. |
| Edit | When selecting the Trigger Condition, you can click the [Edit] button to edit the trigger button. Also, when selecting the ACTION to execute or Excel Operation Function, you can click the [Edit] button to display each edit screen. |
| Insert | Inserts an empty cell. You can specify the ACTION or Excel Operation Function. |
| Clear | Clears the content of the row where a trigger button is displayed. |
| Trigger Button | Displays the name of a trigger button. To change a trigger button, click the trigger button name and then click the list button to select a new one. |
| Execution Sequence (1 to 40) | Displays the ACTION items or the Excel operation function items in sequence (1 to 40). To change the sequence, click one of the items of the ACTIONS or of the Excel Operation Functions, and then click the list button to select new ones. NOTE <ul style="list-style-type: none"> Clicking "Excel Operation Function" displays the "Excel Operation Function Setting" screen. Refer to "■ "Excel Operation Function" Screen" for more details. |

■ "Execute from another application" tab

You can execute ACTION by sending the command from the user program to the Excel Report Action.

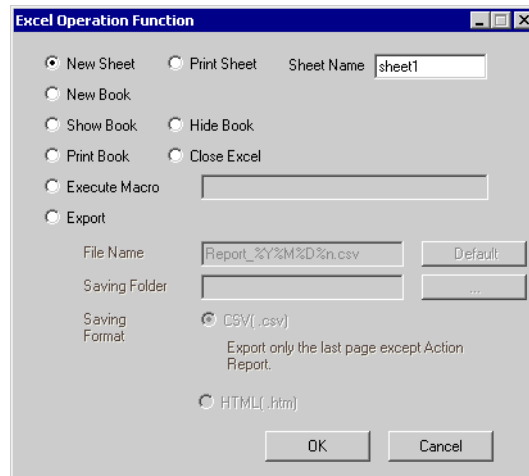
This tab displays the ACTION (Logging or Recipe function) or Excel Operation Function to be executed when sending this command.

It is capable of displaying 1 to 40 ACTION items separately by the trigger command.



| Setting item | Setting content |
|------------------------------|---|
| Edit | When selecting the ACTION to execute or Excel Operation Function, you can click the [Edit] button to display each edit screen. |
| Insert | Inserts an empty cell. You can specify the ACTION or Excel Operation Function. |
| Clear | Clears the content of the row where a trigger button is displayed. |
| Command | Inputs the trigger command created by the user program. Ex) You can use the following API function to send the command to Excel Report Action. "ABC" corresponds to the trigger command. WriteDeviceStr("PC1","Action1","ABC",5) |
| Execution Sequence (1 to 40) | Displays the ACTION items or the Excel operation function items in sequence (1 to 40). To change the sequence, click one of the ACTION items or of the Excel operation function items, and then click the list button to select new ones. <div>NOTE</div> <ul style="list-style-type: none">Clicking "Excel Operation Function" displays the "Excel Operation Function Setting" screen. Refer to "■ "Excel Operation Function" Screen" Screen" for more details. |

■ "Excel Operation Function" Screen



| Setting item | Setting content |
|---------------|--|
| New Sheet | <p>Creates a new sheet by copying a specified sheet from the template.</p> <p>NOTE</p> <ul style="list-style-type: none"> You cannot use the following characters as a sheet name. ",", "=", "+", "-", ".", "/", "\", " " When the cells used for write on "Device One-shot", etc are specified as data cells, you cannot see the cells on the new sheet. |
| Print Sheet | <p>Prints the latest output sheet in the template file. Select a template sheet to print in [Sheet Name].</p> |
| New Book | Creates a new output book by copying a template book. |
| Show Book | Displays an output book. |
| Hide Book | Hides an output book. |
| Print Book | Prints the all sheets in an output book except for ACTION report sheets. |
| Close Excel | Closes Excel. |
| Execute Macro | <p>Executes macro. Enter a macro name to execute in the text box.</p> <p>NOTE</p> <ul style="list-style-type: none"> There are some restrictions when using this feature with 'Microsoft Excel 2007' or later. Refer to "■Notes on File Format when using 'Microsoft Excel 2007' or later" for more details. |
| Export | <p>Exports data in a specified format. Specify the file name, save folder, save format (CSV or HTML) of a file to export.</p> <p>NOTE</p> <ul style="list-style-type: none"> You cannot use the following characters as a macro name. ",", "=", "+", "-", ".", "/", "\", " " If "Do not save the output file when ACTION runs" is checked on the "Create form using Excel" screen, output files are saved after being exported. |

5.6 Creating Trigger Buttons in a Form

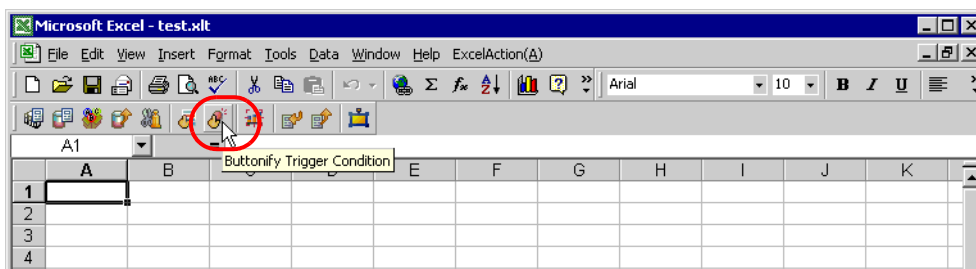
5.6.1 Try to Create Trigger Buttons in a Form

This feature allows creating a button on Excel. This button can be used as a trigger condition to execute ACTION.

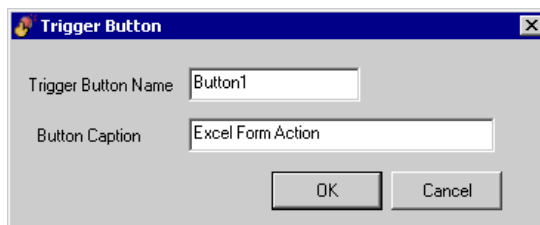
NOTE

- There are some restrictions when using this feature with 'Microsoft Excel 2007' or later. Refer to "■Notes on File Format when using 'Microsoft Excel 2007' or later" for more details.
- ACTION you can execute by the trigger button is "Excel Report" Action only.
- You cannot use the trigger button to exit Excel or open a new book.
- When specifying [Freeze Panes] in Excel, you can put a trigger button on the fixed window, not the scrollable window.
- When specifying [Split] in Excel, do not put a trigger button on the split windows.
- After the security patch of Microsoft Office is applied, the trigger button may not function normally. For details, refer to "■When the trigger button in Excel Report does not function normally" of "37.2 Restrictions on Pro-Server EX".

- 1 Click the [Buttonify Trigger Condition] icon on the Excel template.



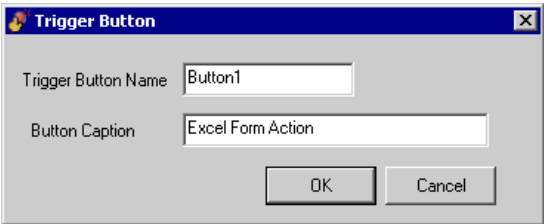
Displays the "Trigger Button" screen.

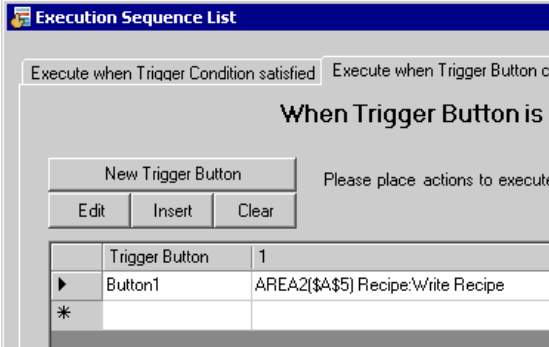


- 2 Set the content and click the [OK] button.

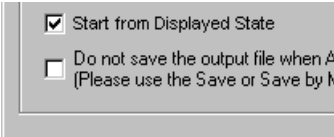
Refer to "5.6.2 Setting Guide" for more details.

5.6.2 Setting Guide



| Setting item | Setting content |
|---------------------|--|
| Trigger Button Name | <p>Set the name to identify the trigger button in the 'Pro-Studio EX'. This will be displayed such as in the Execution Sequence List screen as shown below.</p>  |
| Button Caption | Sets the caption to display above the button. |

- NOTE**
- Executing ACTION requires that the output file on which the button is located be open. Check the [Start from Displayed State] check box on the "Create form using Excel" screen.



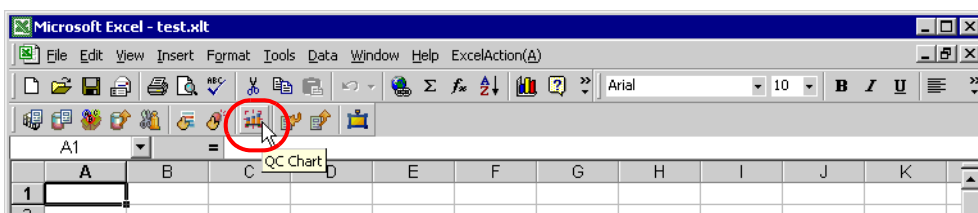
- The trigger button is disabled during outputting to Excel. The trigger button becomes effective when the ACTION is completed.

5.7 Creating QC Charts in a Form

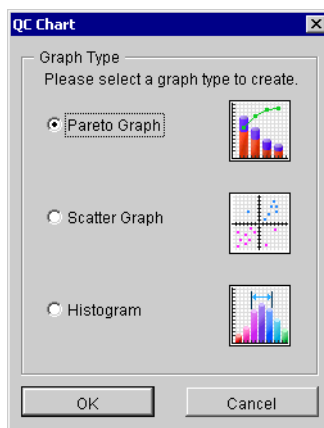
5.7.1 Try to Create QC Charts in a Form

This feature allows creating a QC chart such as a Pareto graph and a scatter graph on the Excel template.

- 1 Click the [QC Chart] icon on Excel.



The "QC Chart" screen will appear.



- 2 Set the content and click the [OK] button.

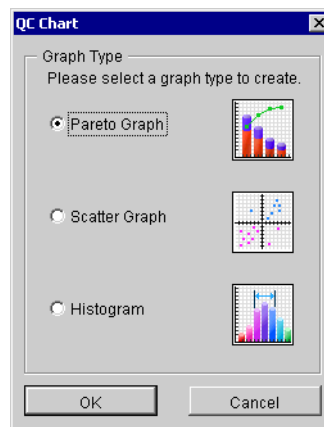
Refer to "5.7.2 Setting Guide" for more details.

NOTE

- There are some restrictions when using this feature with 'Microsoft Excel 2002' or later. Refer to "■Changing the Security Settings" in "5.9 Restrictions" for more details.
- There are some restrictions when using this feature with 'Microsoft Excel 2007' or later. Refer to "■Notes on File Format when using 'Microsoft Excel 2007' or later" in "5.9 Restrictions" for more details.

5.7.2 Setting Guide

■ "QC Chart" screen



| Setting item | Setting content |
|--------------|--|
| Graph Type | <p>Select the type of a graph to create and then click the [OK] button.</p> <p>The following graphs can be created:</p> <ul style="list-style-type: none">• Pareto Graph• Scatter Graph• Histogram |

■ "Create Pareto Graph" Screen

| Setting item | | Setting content |
|---------------------------|---|--|
| Input Data | Label Range | <p>Specifies a cell range of a label of the data items for input data. Clicking the button can select a cell range on Excel. Drag the mouse to select the cell range.</p> <div>NOTE</div> <ul style="list-style-type: none"> Setting range of cells: Rows 1 to 1500, Columns 1 to 256 Instead of using the mouse, you can type a cell range. On the "Specify Range" screen, enter a cell range and then click the [OK] button. |
| | Data Range | <p>Specifies a cell range of input data. Clicking the button can select a cell range on Excel. Drag the mouse to select the cell range.</p> |
| Output Settings | Output-Destination Start Cell | <p>Specifies a reference range to which a graph to create will refer.</p> |
| Graph-To-Display Settings | Graph Title | <p>Enter the title of a graph to create.</p> |
| | Highlight | <p>Highlights the following items.</p> <ul style="list-style-type: none"> Up to 80% Highlights the main items with cumulative percentage 80% or more. Top 3 items Highlights the top three items. OFF Turns off highlighting. |
| | Combine items with a ratio less than 1% | <p>Combines the items of a ratio less than 1% into one single item as "Others".</p> |

■ "Create Scatter Graph" Screen

| Setting item | | Setting content |
|---------------------------|-------------|--|
| Input Data | Value of X | <p>Specifies a cell range of X-axis value of input data. Clicking the button can select a cell range on Excel. Drag the mouse to select the cell range.</p> <p>NOTE</p> <ul style="list-style-type: none"> • Setting range of cells: Rows 1 to 1500, Columns 1 to 256 • When you specify multiple rows or columns, the data of one single row or column will be used to create a graph. • Instead of using the mouse, you can type a cell range. On the "Specify Range" screen, enter a cell range and then click the [OK] button. |
| | Value of Y | <p>Specifies a cell range of Y-axis value of input data. Clicking the button can select a cell range on Excel. Drag the mouse to select the cell range.</p> <p>NOTE</p> <ul style="list-style-type: none"> • Setting range of cells: Rows 1 to 1500, Columns 1 to 256 • When you specify multiple rows or columns, the data of one single row or column will be used to create a graph. • Instead of using the mouse, you can type a cell range. On the "Specify Range" screen, enter a cell range and then click the [OK] button. |
| Graph-To-Display Settings | Graph Title | Enter the title of a graph to create. |

■ "Create Histogram" Screen

The "Create Histogram" dialog box is shown with the following sections:

- Input Data:** Data Range: [Text Box] [Excel Icon]
- Output Settings:** Output-Destination Start Cell: [Text Box] [Excel Icon]
- Min Value:** ☒ Auto, ☐ Specify: [Text Box]
- Max Value:** ☒ Auto, ☐ Specify: [Text Box]
- No. of Classes:** ☒ Auto, ☐ Specify: [Text Box]
- Graph-To-Display Settings:** Title: [Text Box], OutLine: ☒ OFF, ☐ ON
- Buttons:** OK, Cancel

| Setting item | | Setting content |
|---------------------------|-------------------------------|---|
| Input Data | Data Range | <p>Specifies a cell range of input data. Clicking the button can select a cell range on Excel. Drag the mouse to select the cell range.</p> <p>NOTE</p> <ul style="list-style-type: none"> Setting range of cells: Rows 1 to 1500, Columns 1 to 256 Instead of using the mouse, you can type a cell range. On the "Specify Range" screen, enter a cell range and then click the [OK] button. |
| Output Settings | Output-Destination Start Cell | Specifies a reference range to which a graph to create will refer. |
| Min Value | | <p>Specifies a range of values of target data.</p> <ul style="list-style-type: none"> Auto Uses the minimum value of a specified input data. Specify Uses the value entered in the text box. |
| Max Value | | <p>Specifies a range of values of target data.</p> <ul style="list-style-type: none"> Auto Uses the maximum value of a specified input data. Specify Uses the value entered in the text box. |
| No. of Classes | | <p>Specifies the number of intervals to display.</p> <ul style="list-style-type: none"> Auto Obtains the number of classes from Sturge's law ($1+3.3 \cdot \text{LOG}_{10}(\text{No. of Data})$), rounding off after the decimal point). Specify Uses the value entered in the text box. |
| Graph-To-Display Settings | Title | Enter the title of a graph to create. |
| | Outline | <p>Selecting "ON" outlines the bar on a histogram. When a small number of classes are selected, this makes the graph easily viewable.</p> |

5.8 Compatibility between 'Microsoft Excel 2007' or later and 'Microsoft Excel 2003' or earlier

5.8.1 Specifying the Extension

In the Form Creation Action, you need specify the file extension for the following functions.

- Template Book
- Output Book
- Text Substitution Book
- Excel Operation Function Export CSV
- Excel Operation Function Export HTML

When using 'Microsoft Excel 2007' or later, specify the file extension according to the following table.

| Functions | Corresponding Extensions |
|------------------------|--------------------------|
| Template Book | xlsx, xlsxm, xltx, xltxm |
| Output Book | xlsx, xlsxm |
| Text Substitution Book | xlsx, xlsxm |

5.8.2 File Extensions for 'Microsoft Excel 2007' or later

'Microsoft Excel 2007' defines the file extensions in the table below.

| Type | Extensions |
|-------------------------------|------------|
| Book | xlsx |
| Book with macro enabled | xlsxm |
| Template | xltx |
| Template with macro enabled | xltxm |
| Binary book not in XML format | xlsb |
| Add-in with macro enabled | xlam |

5.9 Restrictions

■ Changing the Security Settings

To execute the Excel Form Creation Action, you need to change the Excel security settings. If you do not change the settings, the following problems will occur.

- [Tool] → [QC Chart]
Pareto graph tools cannot be used.
- [Tool] → [Insert Sample]
Form templates cannot be used.

The setting change steps vary depending on the Excel version.

Change the security settings according to the following steps.

| | |
|-------------|--|
| NOTE | <ul style="list-style-type: none"> • Depending on the Office version you are using, the display and part names may differ. If so, replace the names with those with similar features used in your system configuration. |
|-------------|--|

- 1 From the [File] tab, click [Options].
- 2 From the [Excel Options] dialog box, click [Customize Ribbon].
- 3 From the [Main Tabs] list, select the [Developer] check box.
- 4 Click [OK] to close the [Excel Options] dialog box.
- 5 Click [Macro Security] on the [Developer] tab.
- 6 Click [Macro Settings] in the [Trust Center] dialog box.
- 7 Check the [Enable VBA macros] option under [Macro Settings].

■ Notes on File Format when using 'Microsoft Excel 2007' or later

When using the following Excel Action, you need to specify "xlsm" (book file format with macro enabled) as the extension for the output book when using functions specific to 'Microsoft Excel 2007' or later.

- [Execution Sequence List] (only for macro operation)
- [Buttonify Trigger Condition]
- [Tool] → [QC Chart]
- [Tool] → [Insert Sample]

Refer to "5.8.2 File Extensions for 'Microsoft Excel 2007' or later" for more details on extensions.

- The Excel Form Creation Action may execute even if the Excel security level is "High" or the "Trust the access to the VBA project object model" option is OFF.
- Use the Excel 2007 or later format for template files. Do not use Excel 2003 or earlier formats for output files.

■ Additional Notes when using 'Microsoft Excel 2007' or later

- If you specify the macro enabled file format (xlsm, xltm) for a template file, and the macro disabled file format (xlsx, xlt) for the output file name with the Excel Form Creation Action, a warning message will appear in Excel. When that happens, select [Yes] to save the output file.

■ Notes on saving template files

- You cannot save a template file for the Excel Form Creation Action directly under the root drive (C:\ or D:\).

■ Combined Cells

Do not set an ACTION area on combined cells.

For example, if you set an ACTION area on the cells as shown below, correct operation can not be guaranteed.

| | A | B | C | D |
|---|-------|-------|-------|-------|
| 1 | D1 00 | D1 01 | D1 02 | D1 03 |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |

■ Over-pasted ACTION Areas

When you over-paste multiple ACTION areas of different size, read/write will be executed in the pasted order.

■ Action Report Sheet

This ACTION automatically adds the sheet called "Action Report" in the output book when creating the output book.

This Action Report sheet always describes the latest record for how this ACTION outputs the data to the output book. Refer to this report when checking how the process proceeds.

In addition, this ACTION executes the following operation based on the record in the Action Report sheet when the output book is once closed and reopened.

If you rewrite the contents of the Action Report sheet, it could cause the error, such as this ACTION does not normally operate. Be careful not to rewrite it.

■ Operation in ACTION area when error occurs

When you actually write/read in "Device Logging" function and exceed the ACTION area, perform the common operation as follows:

1) When performing a test read/ a test write

Error screen is displayed.

2) When executing ACTION in runtime

It will be recorded as ACTION error in the Log Viewer of the 'Pro-Server EX'.

■ Write Operation of Device One-Shot Recipe

When writing the cell value in "Device One-Shot" or "Recipe" and the cell is empty, 0 will be written for the numeral type, blank will be written for the character string type.

Also, when the data type is the character string, but you do not set the target cell format to "character string", you sometimes fail to write correctly.

In this case, you need to change the cell format to "character string" in advance.

■ Excel Window Size

When you open the setting screen of the Action Area, the Excel window is always displayed in regular size. (back to the regular size if maximized) The Excel user interaction mode is disabled then, you cannot operate Excel.

If the setting screen is hidden behind the Excel window, the screen and task tray windows will blink and notify the user. Blinking will stop automatically when the setting screen comes forward.

■ About the 1500 row limit for Action Area settings

Exceeding 1500 rows for the Action Area could cause the action to run longer. If you use Device One Shot or Device Logging's text conversion, the action could take even longer.

■ Grouping and Multiple Selections of Action Areas

You cannot group or make multiple selections of Action Areas. Grouping or multiple selections would result in improper management of the cell ranges. Also, be sure not to cancel grouping of Action Areas.

■ When deleting a line or row in the Action Area

When deleting a line or row in which the Action Area exists, the Action Area sometimes becomes linear depending on the object positioning setting. As the Action Area still exists in such status, the ACTION in that area will be executed when the Trigger Condition is satisfied.

Perform the following operation to display the object positioning.

Right-click - Object Format - Property - Object Positioning

Above status occurs when selecting "Move or Change Size According to Cell" here.

General auto shape operation in Excel is applied to the operation in the Action Area.

■ Restrictions on Copying or Cutting and Pasting the Action Area

When you paste the Action area using Ctrl+C & Ctrl+V or Ctrl+X & Ctrl+V, specify [Target Cell Range] for the copied Action area.

The Action area just after pasting remains the same [Target Cell Range] as that for the original Action area.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |

■ Copy Restriction by Ctrl + drag in the Action Area

When normally executing Ctrl+C & Ctrl+V to copy the Action Area, it will adhere to the cell just after pasting. Also, if you move the Action Area, it will continue to adhere to the cell.

Note that the restriction will be added if you copy by Ctrl + drag due to the restriction for OCX and Excel. If you copy by Ctrl + drag, the Action Area just after Ctrl + drag will not adhere to the cell. The Action Area will not adhere to the cell if you move it, either.

This happens because this Action Area is not placed under the control of the Excel New Form add-in. This Action Area is placed under the control of the Excel New Form add-in in the following cases.

When saving

When opening the setting screen (corresponding Action Area only)

When opening the "Execution Sequence List" screen

When one of the above operations is executed, the Action Area will adhere to the cell, and continue to adhere in the following operation. Note that this restriction is applied not only for the Action Area but also when dragging & copying the Sheet.

■ Functions which are not executed by a Test Read

The following functions are not executed by a Test Read.

Device Logging

"Add Trigger-Node Name"

"Time Stamp" (PC time is available)

"Action when cell gets full"

"In creating a sheet, clear the specified cell range and then start"

Special - "Show Date/Time"

"GP Date/Time" (PC Date/Time is available)

Special - "Show Cell Arrow"

"In displaying a cell arrow, remove the existing arrow, and then show a new one"

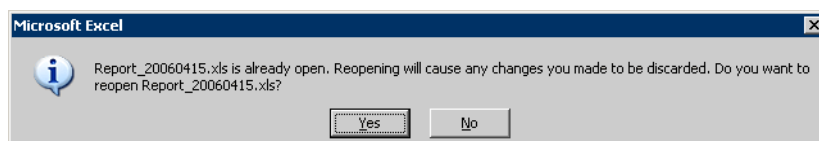
Special - "Trigger Source Node"

■ In the case of closing the displayed output book

If you have mistakenly closed an output book of Excel Report ACTION, follow these steps to open it again:

Dragging and dropping the book to open will make it read-only and the start button etc. invalid.

1. Double-click the output book.
2. When the following dialog box appears, select "No" to open it.



■ Receive notification

You cannot set the receive notification which indicates the completion of ACTION.

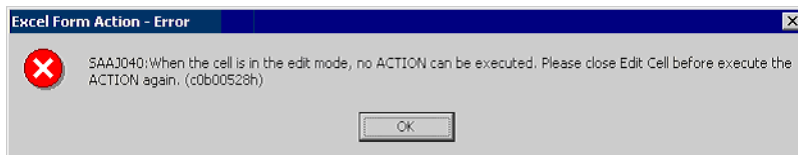
■ When setting “Trigger-Source Node”

When setting "Trigger-Source Node" at node in Excel Report action, node type and device are uncertain. Therefore, the device address is displayed in red. But, it is no problem.

■ Edit the output file

While Excel Report Action is executing, you can not edit the output file.

Therefore, it becomes very difficult to operate Excel at the setting in which the Trigger condition satisfies at a short cycle. Moreover, the following error message is displayed when the Action is executed during editing the output file.



■ Save the output file Do not use

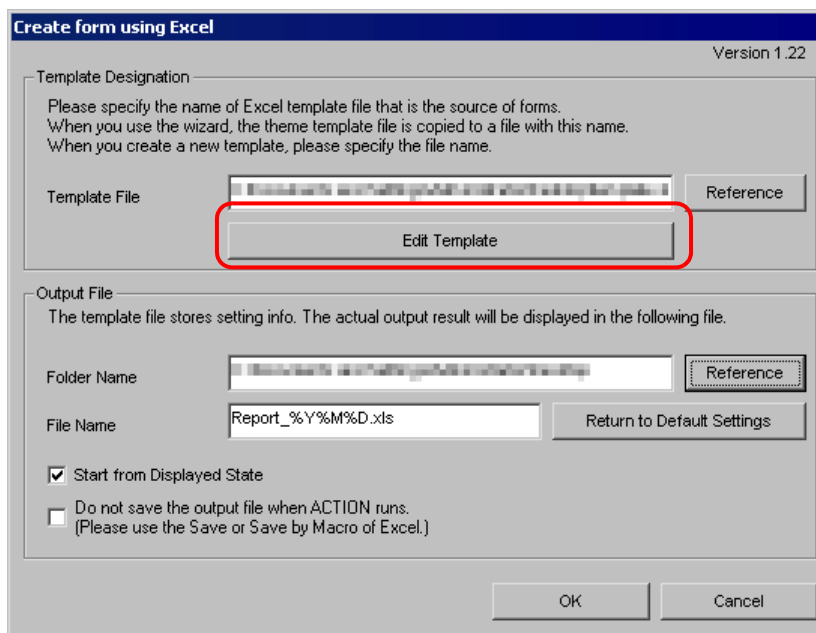
Do not use multiple Excel form actions to save output files to the same destination.

If you set the same destination for file outputs, Pro-Studio and Pro-Server EX may not be able to run.

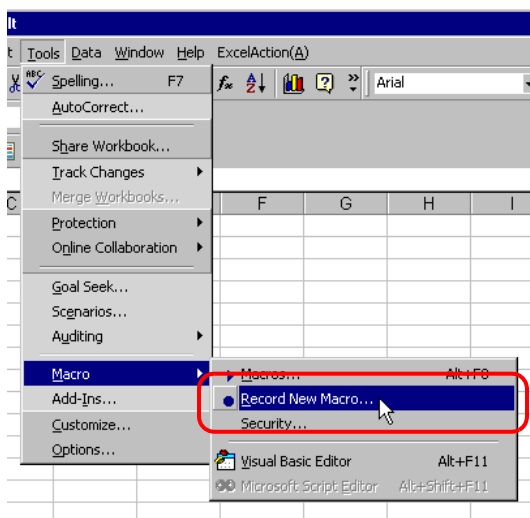
■ Excel Auto Save Function

The Excel auto save function does not operate due to the Excel restrictions. To save automatically, create the Excel save macro using the following procedure and execute the created save macro by Action.

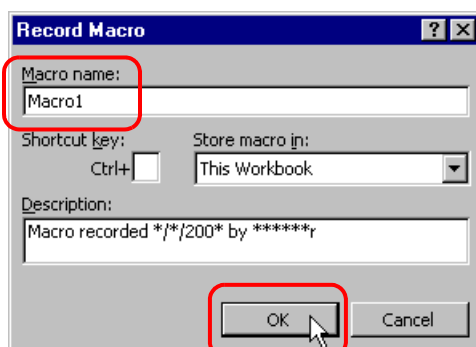
- 1 Open a template you want to save automatically using 'Pro-Studio EX'.



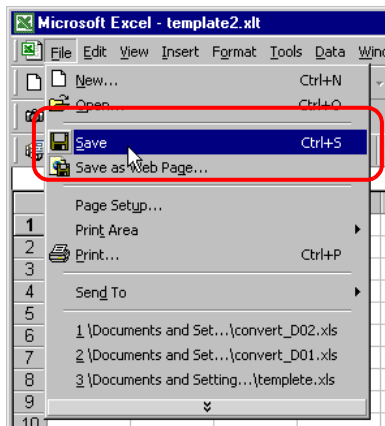
- 2 Select "Macro" and "Record New Macro" from the "Tools" menu.



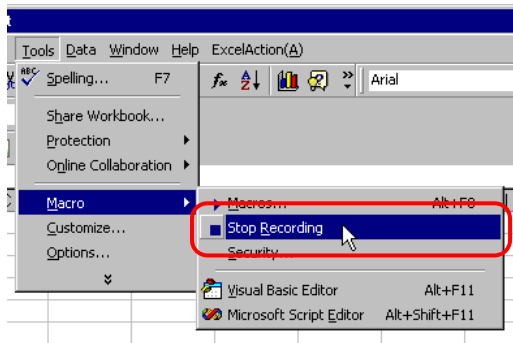
- 3 Enter the macro name "Macro1" and click the [OK] button. Recording the macro starts.



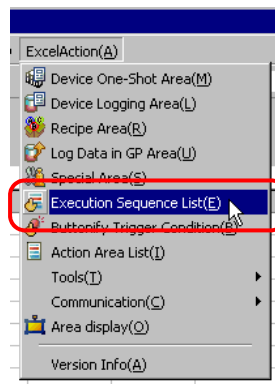
- 4 Select "Save" from the "File" menu. "Macro1" is recorded in the macro.



- 5 Select "Macro" and "Stop Recording" from the "Tools" menu. Recording the macro is complete.

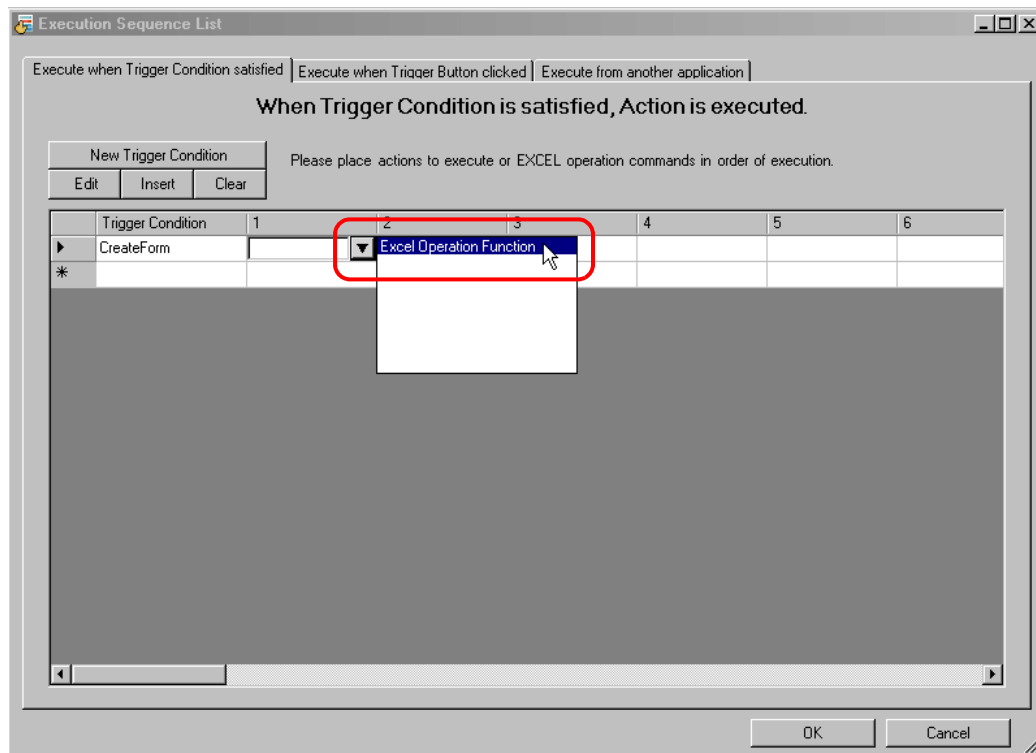


- 6 Select "Execution Sequence List" from the "Excel Action" menu.

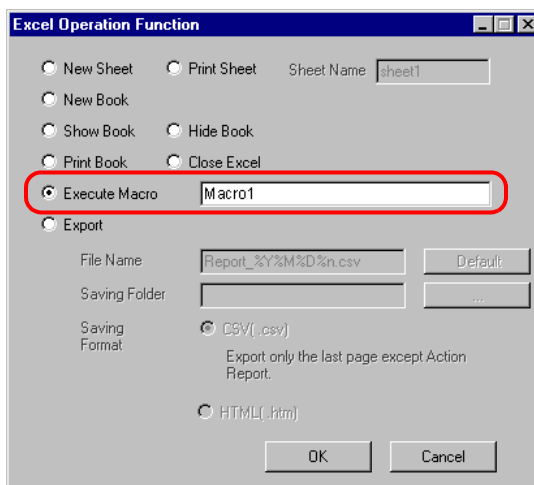


- 7 Create the trigger condition save automatically.

- 8 Select the created trigger condition and "Excel Operation Function".



- 9 Select "Execute Macro" and enter the macro name "Macro1".



- 10 Click the [OK] button.

- 11 Finish editing the template.

- 12 Save/Reload the setting contents.

According to the created trigger condition, the template is automatically saved.

■ Operation of the New Book Function

The New Book function acts differently between Excel Report Creation Action and Excel Form Creation Action.

●Excel Report Action

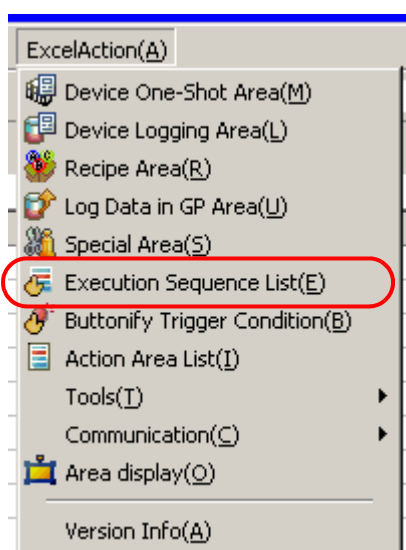
Excel Report Action activates the New Book function when 'Pro-Server' is launched or network project file is reloaded. This means that if the output book includes a date macro (%Y%M%D) or time macro (%h%d%m), the book is replaced with a new one when 'Pro-Server' is launched or network project file is reloaded.

●Excel Form Creation Action

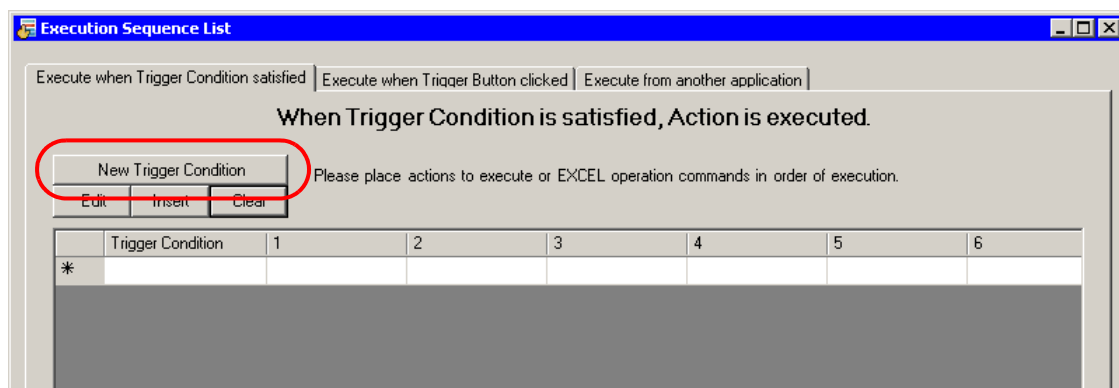
Excel Form Creation Action is designed to reopen the book file that was last output when 'Pro-Server' is launched or network project file is reloaded, and to output data subsequently.

For this reason, the difference between the New Book operations may result in problems when Excel Report Creation Action is replaced with Excel Form Creation Action.

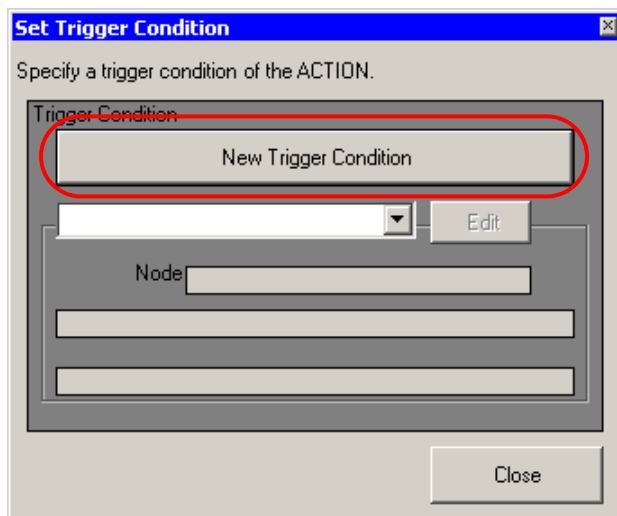
- 1 From "Excel Action" on the Excel menu bar, select [Execution Sequence List].



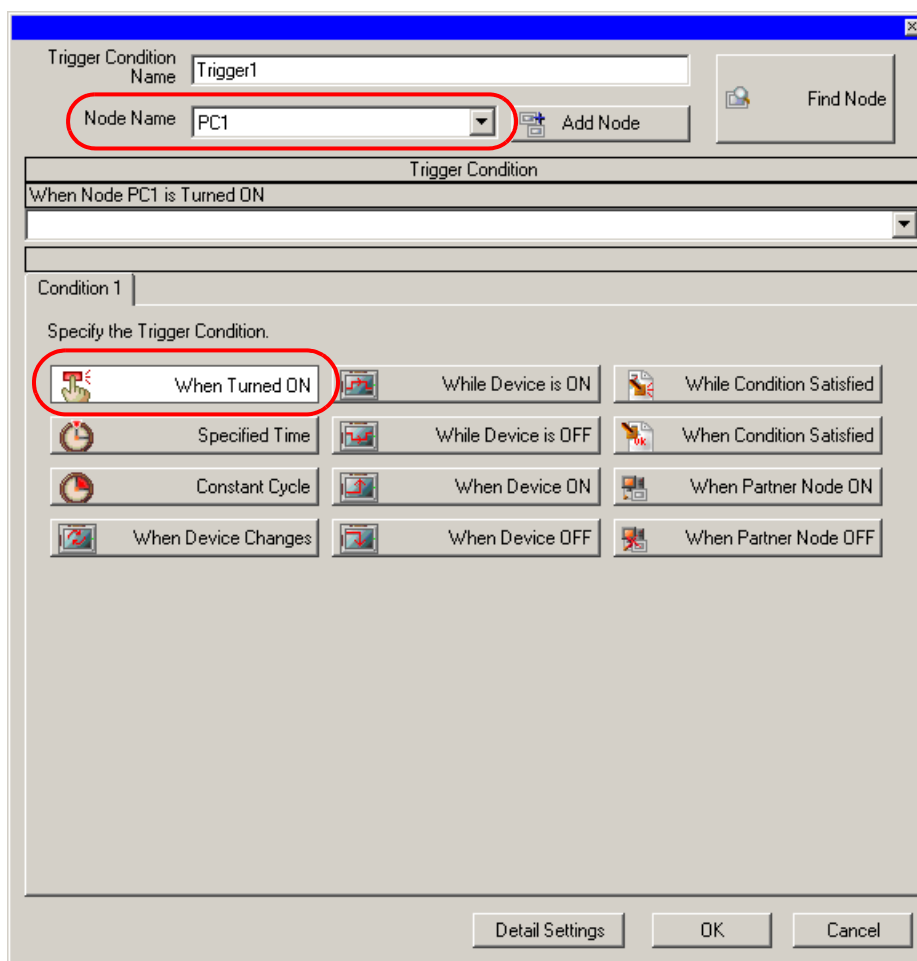
- 2 Click [New Trigger Condition].



- 3 Click [New Trigger Condition].

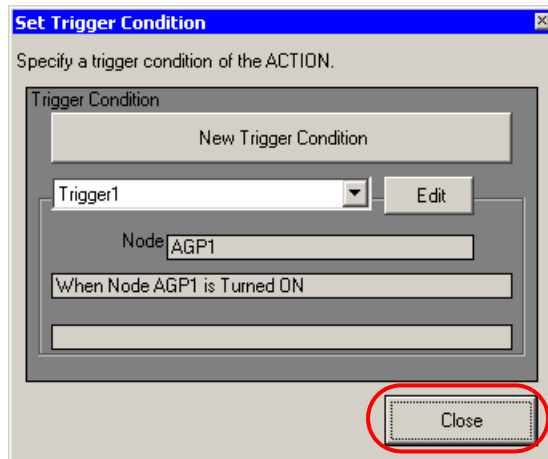


- 4 Select the 'Pro-Server EX' node from "Node Name", and click [When Turned ON].

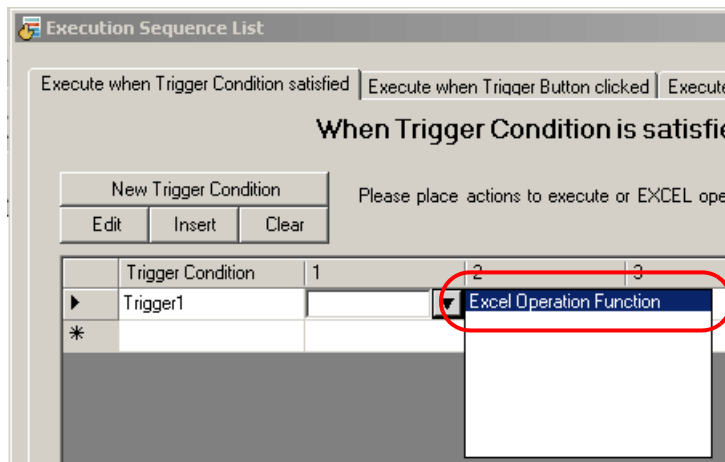


- 5 Click [OK].

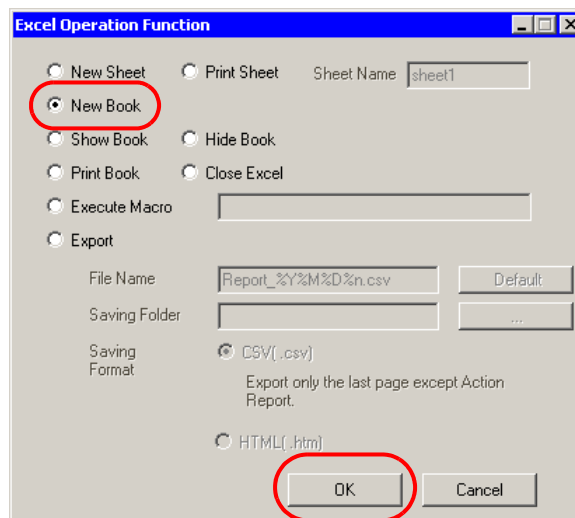
6 Click [Close].



7 Select the created power-on trigger condition, and select "Excel Operation Function".



8 Select "New Book" and click [OK].



9 Performing a save or reload activates the New Book.

■ About Tag Settings

In Excel Form Actions, you cannot set up DATE_AND_TIME formatted tags in the following features:

- Device Logging - Device Settings
- Device One Shot - Device Settings
- Recipe - Device Settings
- Recipe - record number on writing to recipe
- Recipe - record number on reading recipe
- GP log data - specify file number
- GP log data - specify sampling group

■ Editing template files

When editing a template, do not open another template file in Excel.

While editing, trigger conditions for actions in the template file may get deleted.

If trigger conditions for actions are accidentally deleted, close the template file without saving, then open it again for editing.

6



Writing Device/PLC Data in Excel File

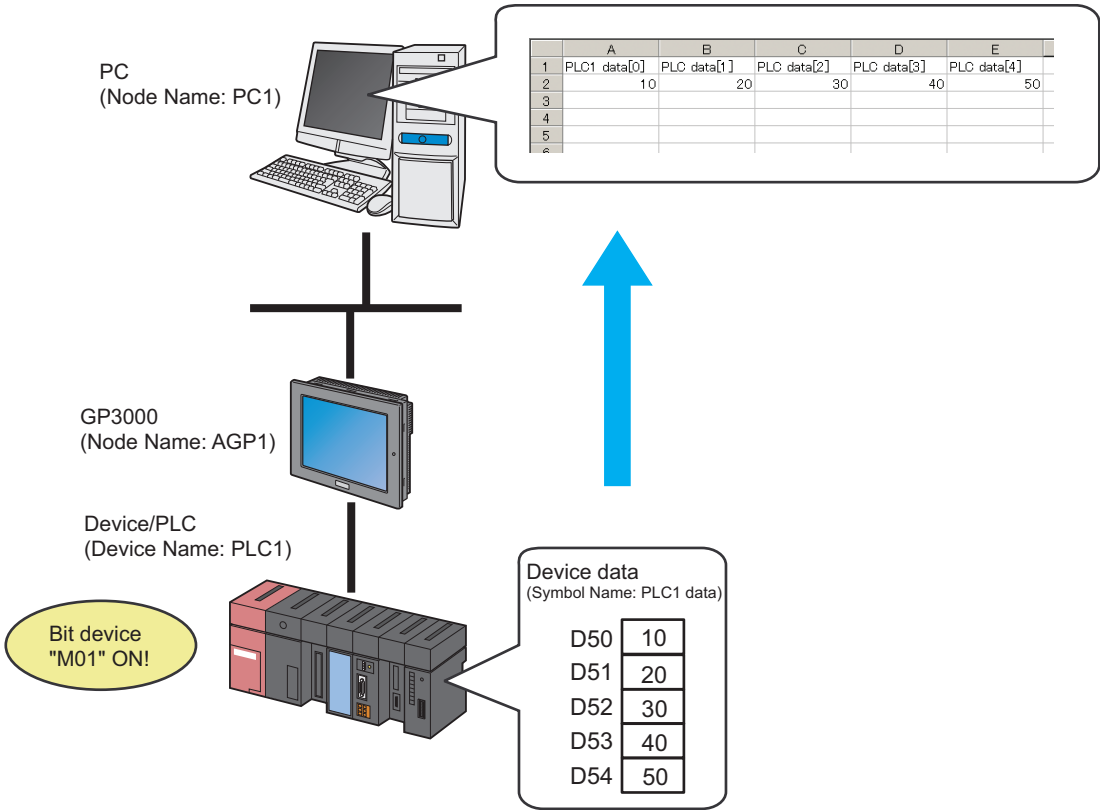
| | | |
|-----|---|------|
| 6.1 | Monitoring Device Value on Excel..... | 6-2 |
| 6.2 | Correcting and Restoring Once Read Data | 6-33 |
| 6.3 | Setting Guide | 6-61 |
| 6.4 | Restrictions | 6-67 |

6.1 Monitoring Device Value on Excel

NOTE • To read next data while keeping data read on Excel, refer to "5 Creating a Form Using Excel".
Since this function is One-Shot action, data is overwritten in the next capturing action.

[Action Example]

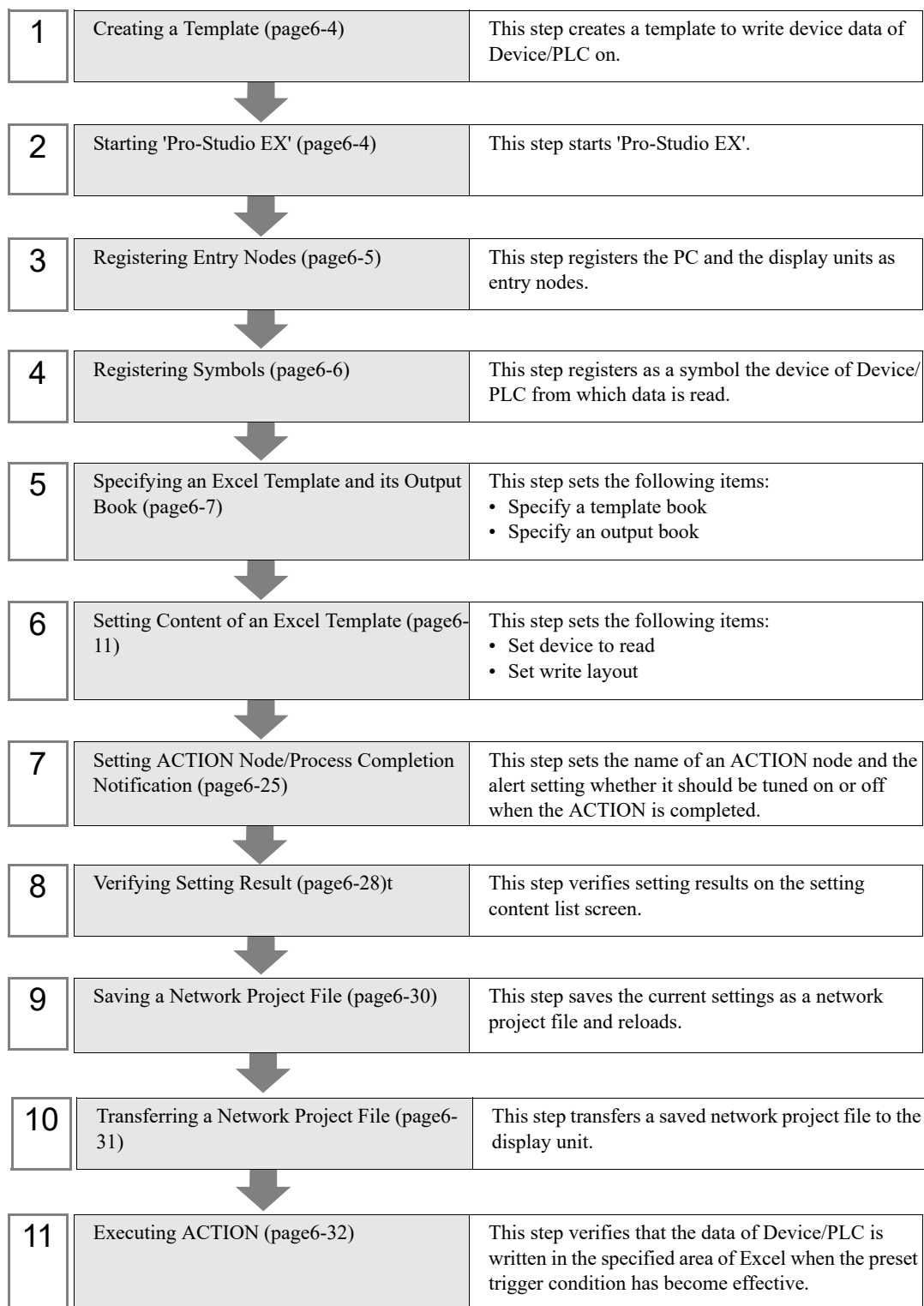
Detect the rising of the trigger device (Bit device: "M01") of Device/PLC, write 5 device values of device address (Word device: address "D50" to "D54") onto an Excel file, and monitor.



This section describes the setting procedures for executing the above action (ACTION) as an example.

NOTE • Use only sequential address to write on an Excel file. If you specify non-sequential address, use a group symbol.
• For more details about a group symbol, refer to "29.3 Grouping Symbols".

[Setting Procedure]



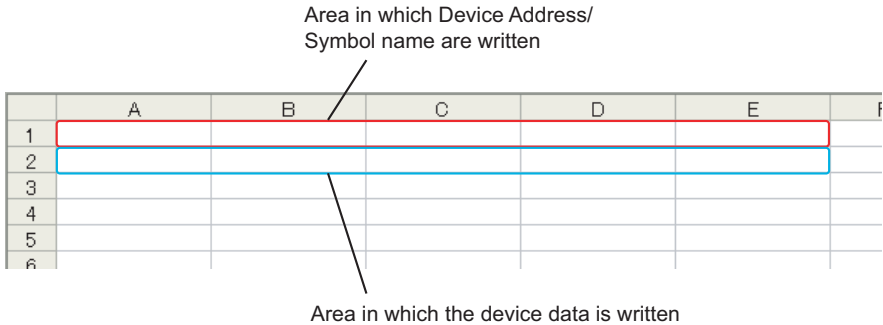
6.1.1 Creating a Template

This step creates a template to write device data of Device/PLC on.

1 Start Excel.

Leave the template blank to write data in.

You can write each data on space below when executing action.



2 Save the file on PC desktop naming "template.xlt".

6.1.2 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

6.1.3 Registering Entry Nodes

This step registers the PC and the display unit connected with network as nodes.

Refer to "Chapter31 Node Registration" for details about entry nodes.



Node Name : PC1

IP Address : 192.168.0.1



Node Name : AGP1

IP Address : 192.168.0.100

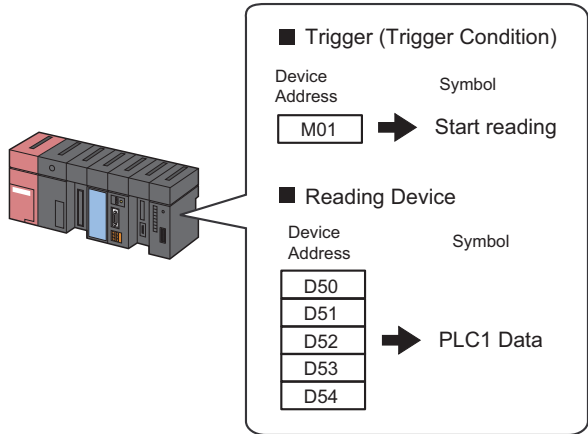
Device/PLC Information

Ex.

| Entry node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

6.1.4 Registering Symbols

This step registers as a symbol the device address of Device/PLC from which data is read.
Refer to "32 Symbol Registration" for details about symbols.



Ex.

- Trigger (Trigger Condition)

| Setting item | Setting content |
|--|---------------------------|
| Symbol Name | Start reading |
| Data Type | Bit |
| Device address for symbol registration | "01" of Device/PLC (PLC1) |
| No. of Devices | 1 |

- Reading Device

| Setting item | Setting content |
|--|-------------------------------------|
| Symbol Name | PLC1 data |
| Data Type | 16Bit (Signed) |
| Device address for symbol registration | "D50" to "D54" of Device/PLC (PLC1) |
| No. of Devices | 5 |

6.1.5 Specifying an Excel Template and its Output Book

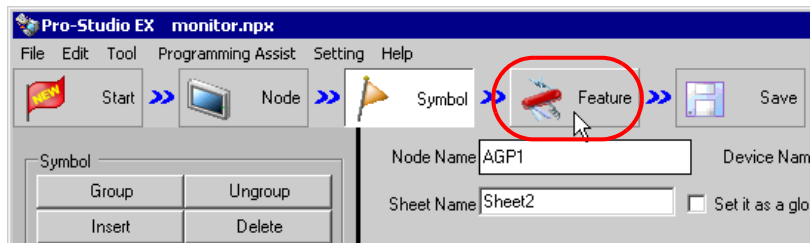
Specify the form template and output book created in (1).

Refer to "6.3 Setting Guide" for more details.

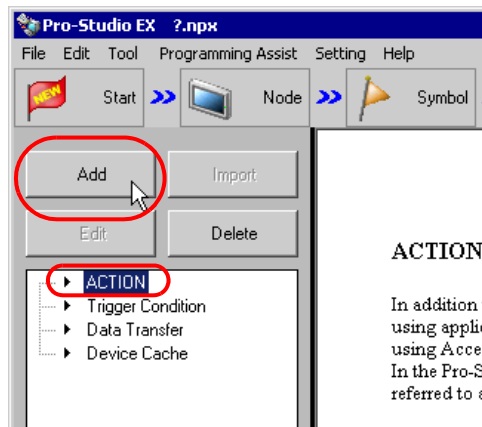
Ex.

| Setting item | | Setting content |
|--------------------|---|---|
| Specify a Template | Template Book | C:\Users\<<User name>>\Desktop\templete.xlt |
| Output Book | Folder Name | C:\Users\<<User name>>\Desktop |
| | File Name | monitor.xls |
| | Start with the output book displayed | Checked |
| | Do not save the output file when ACTION runs. | Not checked |

- 1 Click the [Feature] icon on the status bar.



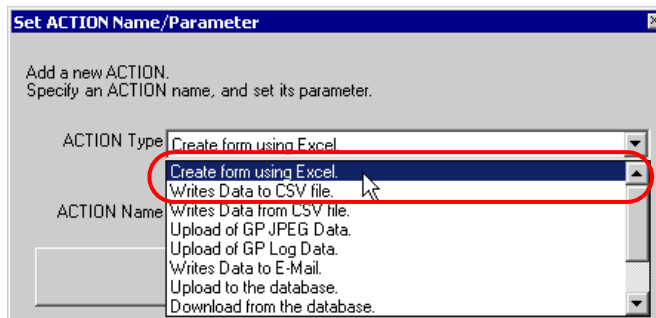
- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.



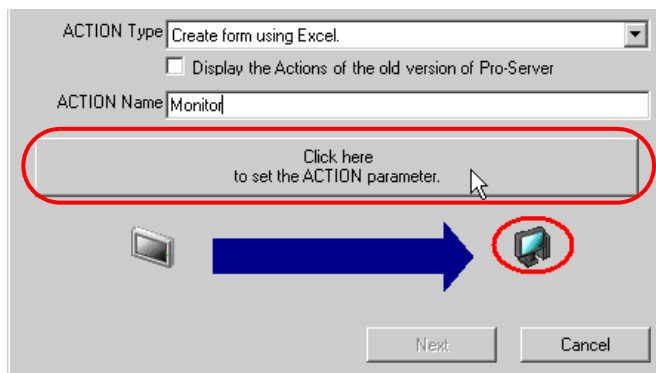
- 3 Click the [ACTION Type] list button, and select "Create form using Excel".

Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "Monitor".

NOTE • [ACTION Name] can be an arbitrary name.

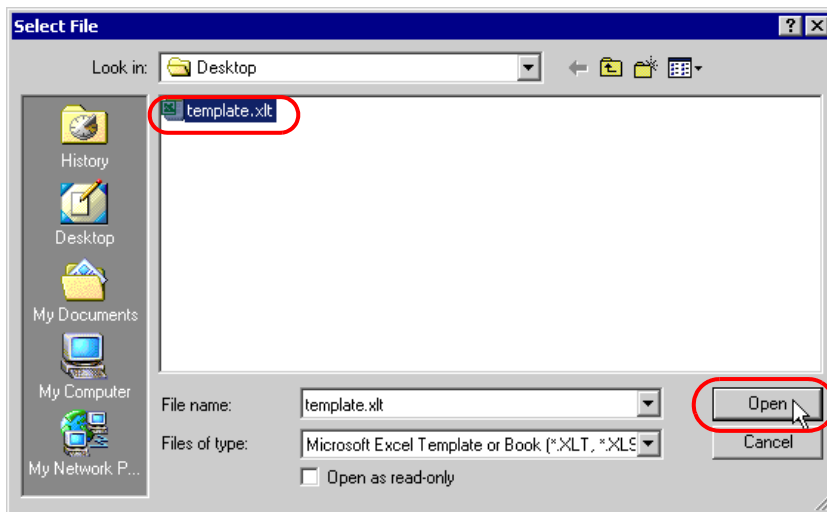
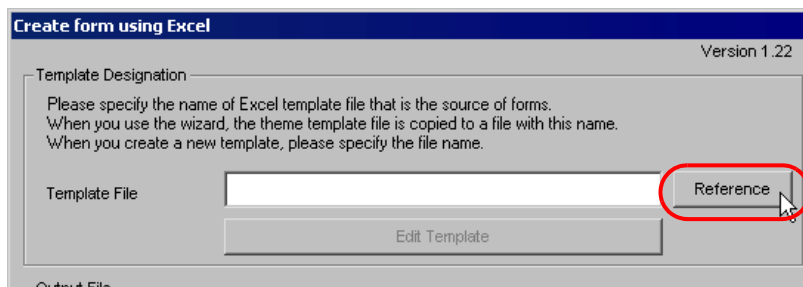


- 4 Click the [Click here to set the ACTION parameter] button.

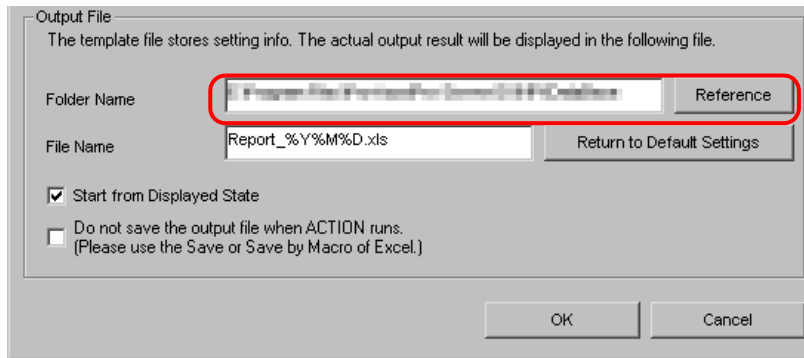


5 Set an Excel template and its output book.

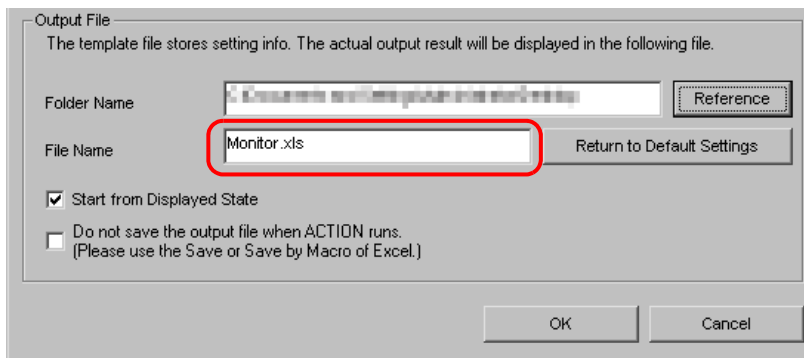
- 1) Click the [Reference] button of [Template File] to set the Excel file "template.xls" which you created.



- 2) Click the [Reference] button of [Folder Name] and specify "Desktop" as a folder to save the output book.

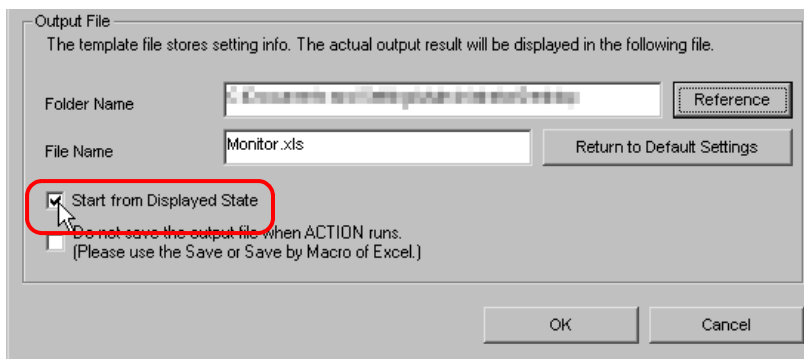


- 3) Set the file name "monitor.xls" for the output book to set.



NOTE • "%Y%M%D" is preset as "Year/Month/Date". For more details, refer to "37.1 Restrictions on Names".

- 4) Check the [Start from Displayed State] check box.



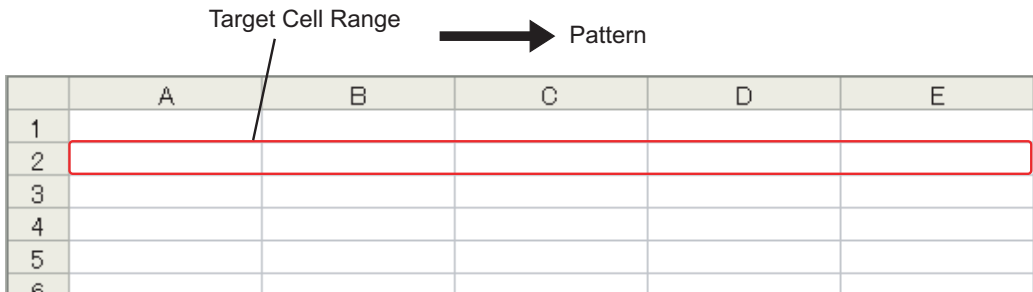
NOTE • If you check [Start from Displayed State], you can read/write data with an output book displayed. This is useful if you need to confirm data immediately.

6.1.6 Setting Content of an Excel Template

Set the content of an Excel template to monitor data on Excel.

The example below shows the setting of data write area (Device one-shot area) in a template.

Refer to "6.3 Setting Guide" for more details.

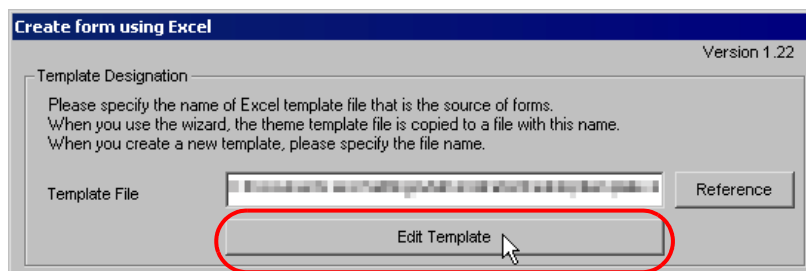


| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

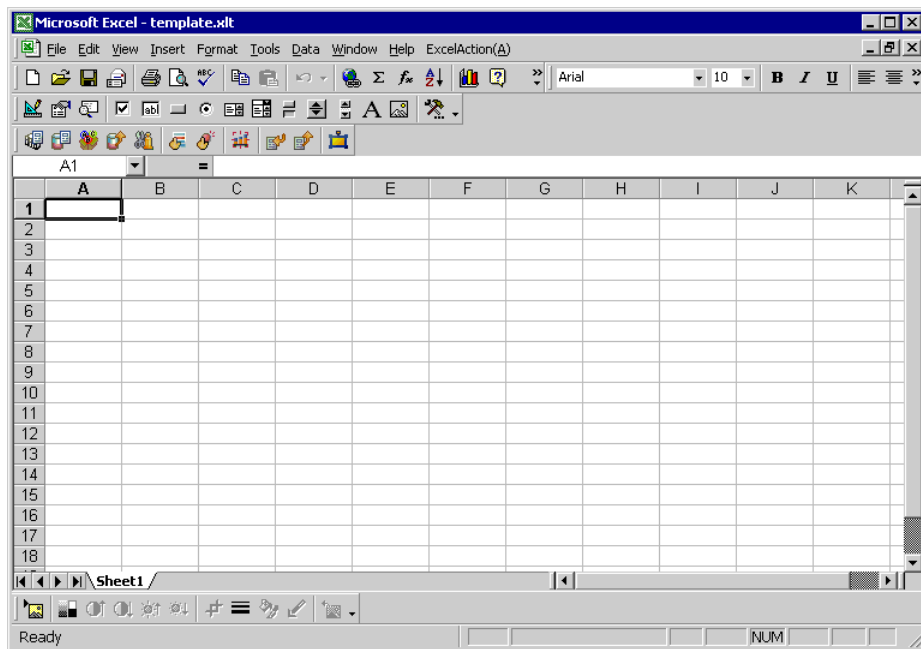
Ex.

| Setting item | Setting content |
|---------------------------------|----------------------------------|
| Entry Node | AGP1 |
| Device Name | PLC1 |
| Device Address/Symbol Group | PLC1 data |
| Add Device Address/Symbol Group | Checked |
| Target Cell Range | 1 to E2 |
| Pattern | Z type |
| Trigger Condition Name | Turn on read start bit |
| Trigger Condition | When "Start reading" (M01) is ON |

- 1 Click the [Edit Template] button.

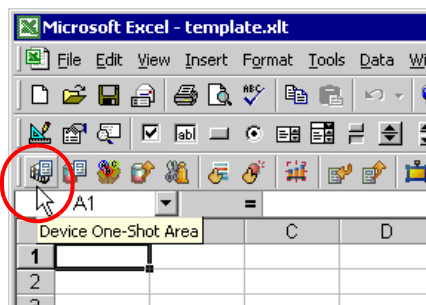


The Excel template will appear.



2 Set a data write area.

- 1) Click the [Device One-Shot Area] icon on Excel.



The "Device OneShot" screen will appear.

Device OneShot

Action Settings | Trigger Condition Settings

Device Settings

Node: (Trigger-Source Node) ... Device Name: ...

Device Address/Symbol Group: ... No. of Devices: 1

Data Type: 16Bit(Signed) ...

☒ Add Device Address/Symbol Name

Note: When specifying inconsecutive memory data, please use a group symbol.

Layout Settings

Target Cell Range: \$A:\$1

Pattern:

Note: When using a group symbol, please select its layout from the followings.

Layout 1: S1, S2[0], S2[1], S2[2], S3

Layout 2: S1, S2[0], S2[1], S2[2], S3

No. of Blank Cells to insert between Cells: Row: 0, Column: 0

☐ Convert device value to certain text at Read

☐ In creating a sheet, clear the specified cell range and then start.

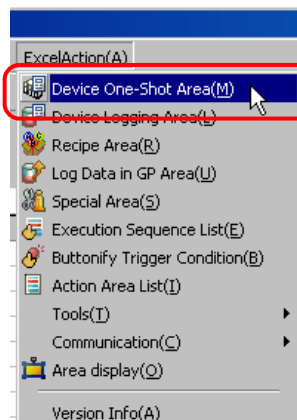
OK Cancel

Sample

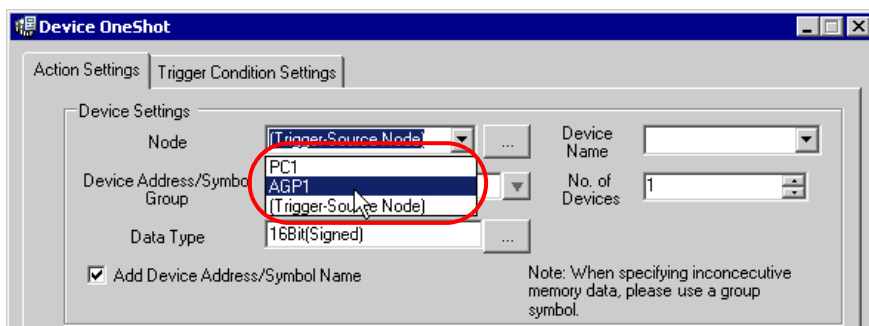
An image of writing to a cell is shown below.

| | | | | | |
|-------|---|-------|---|-------|---|
| D1 01 | 1 | D1 04 | 4 | D1 07 | 7 |
| D1 02 | 2 | D1 05 | 5 | D1 08 | 8 |
| D1 03 | 3 | D1 06 | 6 | D1 09 | 9 |

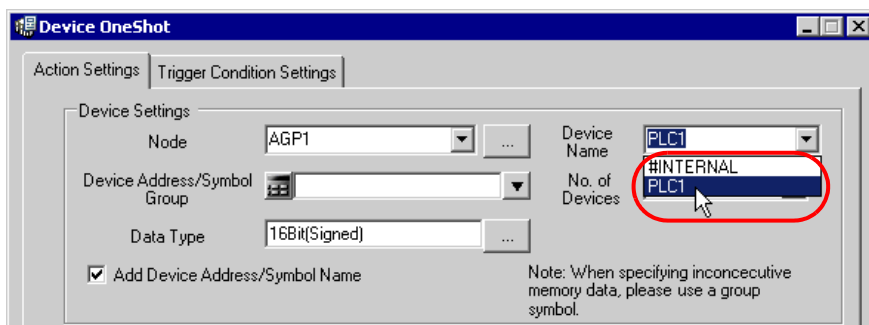
NOTE • Selecting "Device One-Shot Area" from [Excel Action] of the menu displays the same screen.



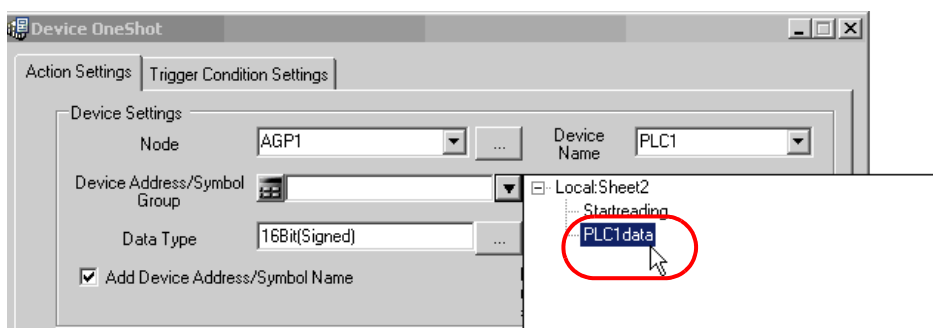
- 2) Click the list button of [Node] and select "AGP1" as a data transfer source node.



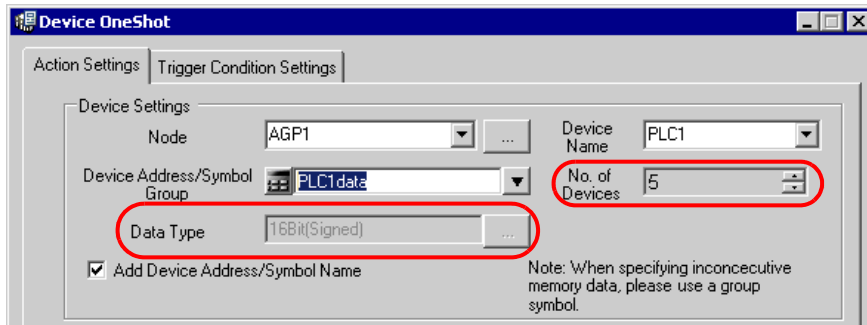
- 3) Click the list button of [Device Name] and select "PLC1" as a data transfer source device.



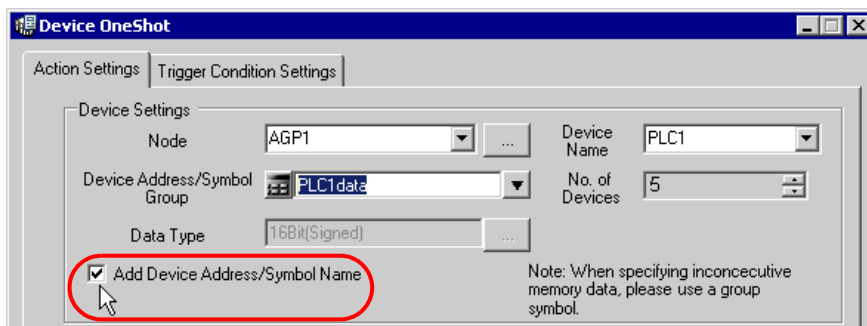
- 4) Click the list button of [Device Address/Symbol Group] and select "PLC1 data" as a symbol of the data to read out.



The device number "5" will be automatically entered in [No. of Devices], and "16Bit(Signed)" in [Data Type].

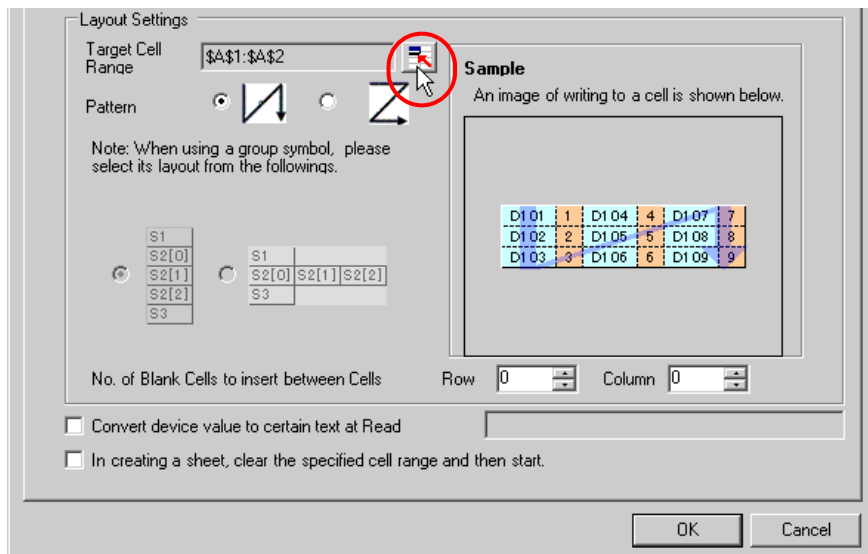


5) Check [Add Device Address/Symbol Name].

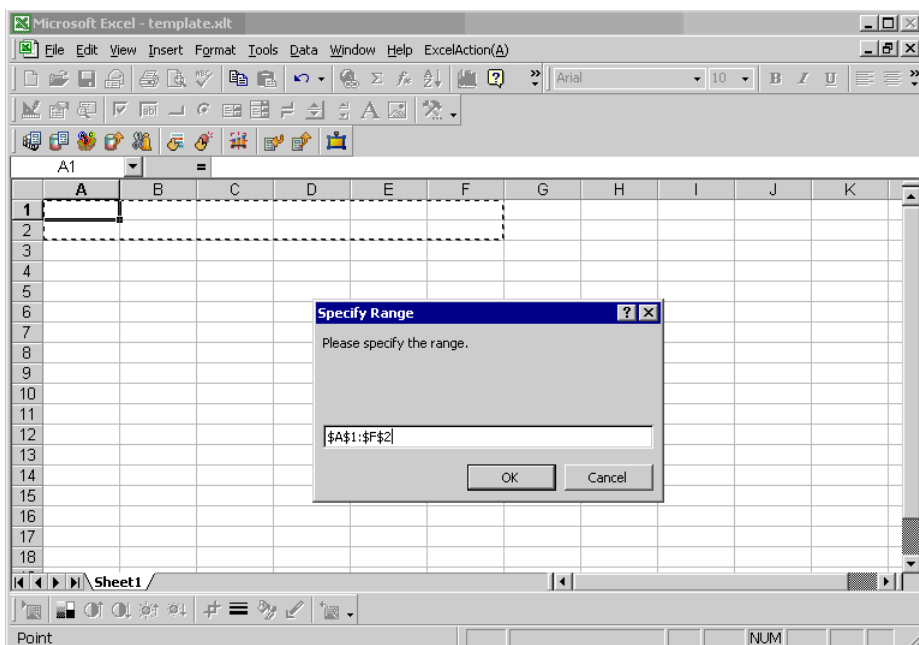

NOTE

- Device Address/Symbol Name is to appear in the right or upper cell of the data read in Excel. Refer to [Sample] on screen.

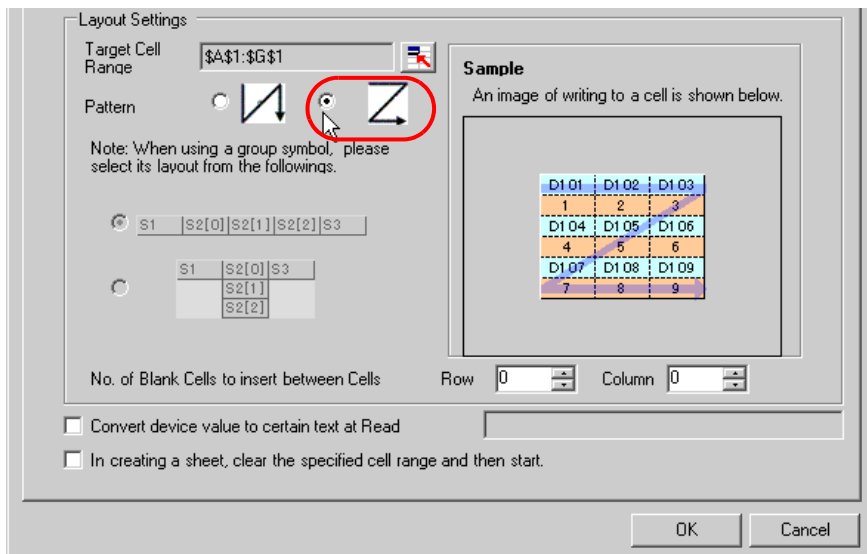
- 6) Click the cell range specify button of [Target Cell Range].



- 7) Drag the mouse to specify the data write area (cells A1 to E2). Then click the [OK] button.

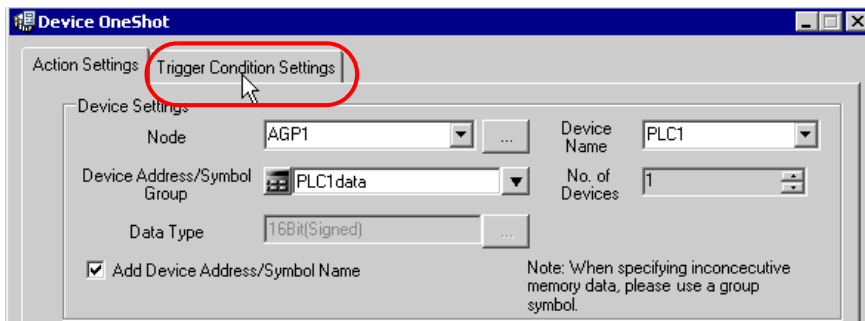


- 8) Select "Z type" of [Pattern].



3 Set trigger conditions.

- 1) Click the [Trigger Condition Settings] tab.



The "Trigger Condition Settings" screen will appear.

The screenshot shows the 'Device OneShot' dialog box with the 'Trigger Condition Settings' tab selected. The 'Action Area No.' is set to 0. Below it, a text box explains: 'When the specified trigger type (under-condition button) is satisfied, this area is executed. Please specify a trigger type.' There are two buttons: 'New Trigger Condition' and 'New Trigger Button'. Below these are two panels: 'Read' and 'Write'. Each panel contains a table with 'Trigger Condition' and a '*' in the first column. The 'Read' panel has 'Edit' and 'Delete' buttons above the table. The 'Write' panel also has 'Edit' and 'Delete' buttons above the table. At the bottom, there is an information icon and text: 'If two or more are specified, the Action is executed when any of them is satisfied. For more complicated operation, please configure from [Excel Action]-[Execution Sequence List] in the menu.' The 'OK' and 'Cancel' buttons are at the bottom right.

Device OneShot

Action Settings Trigger Condition Settings

Action Area No. 0

When the specified trigger type (under-condition button) is satisfied, this area is executed.
Please specify a trigger type.

New Trigger Condition New Trigger Button

Read

| | Trigger Condition |
|---|-------------------|
| * | |

Edit Delete

Write

| | Trigger Condition |
|---|-------------------|
| * | |

Edit Delete

If two or more are specified, the Action is executed when any of them is satisfied.
For more complicated operation, please configure from [Excel Action]-[Execution Sequence List] in the menu.

OK Cancel

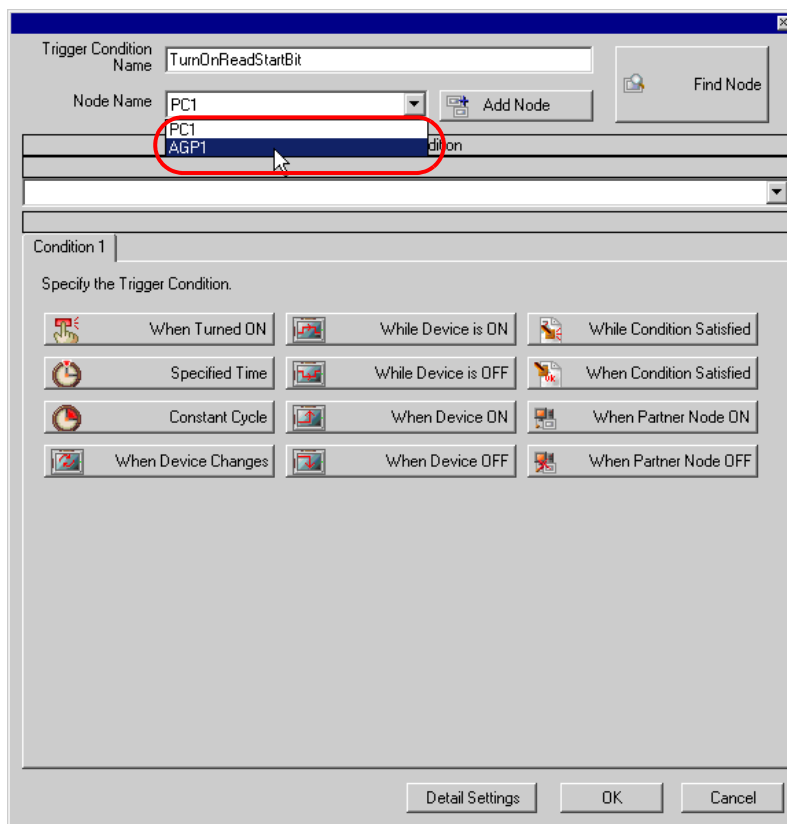
- 2) Click the [New Trigger Condition] button.

The screenshot shows a configuration window for an 'Action Area'. At the top, 'Action Area No.' is set to '0'. Below this, a text box explains: 'When the specified trigger type (under-condition button) is satisfied, this area is executed. Please specify a trigger type.' Two buttons are visible: 'New Trigger Condition' and 'New Trigger Button'. The 'New Trigger Condition' button is highlighted with a red circle and a mouse cursor. Below these buttons are two sections: 'Read' and 'Write'. Each section contains 'Edit' and 'Delete' buttons, a 'Trigger Condition' label, and a list area with a '*' symbol and an empty input field.

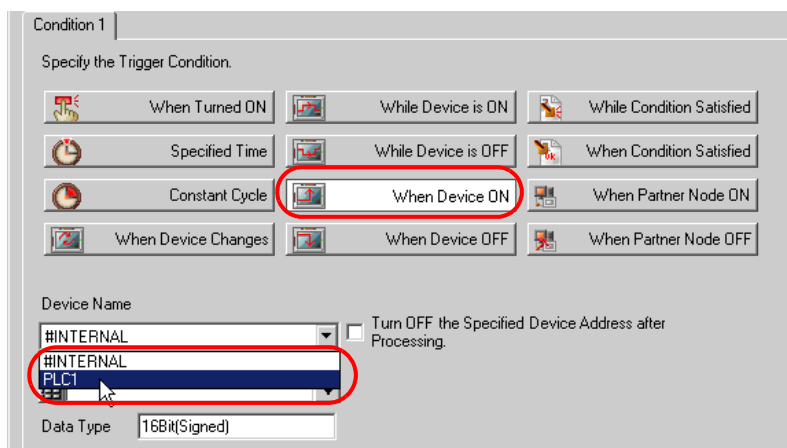
- 3) Click the [New Trigger Condition] button.

The screenshot shows a dialog box titled 'Set Trigger Condition'. It contains the instruction 'Specify a trigger condition of the ACTION.' Below this, there is a 'Trigger Condition' section with a list area showing 'New Trigger Condition' as the selected item. To the right of the list is an 'Edit' button. Below the list is a 'Node' label followed by three empty input fields. At the bottom right of the dialog is a 'Close' button.

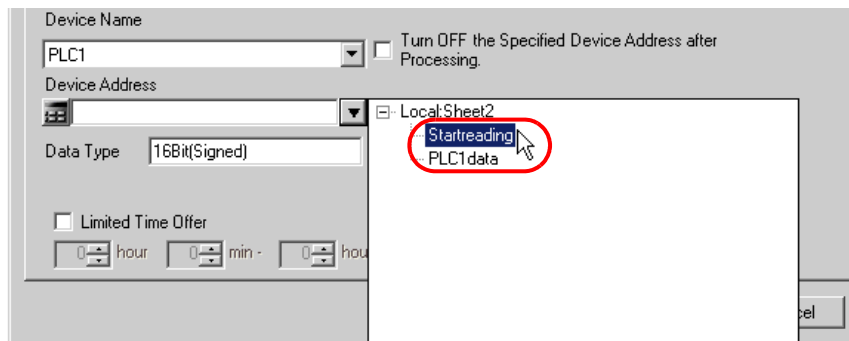
- 4) Enter the trigger condition name "TurnOnReadStartBit" in [Trigger Condition Name], and select "AGP1" in [Node Name] as a name of the data transfer source.



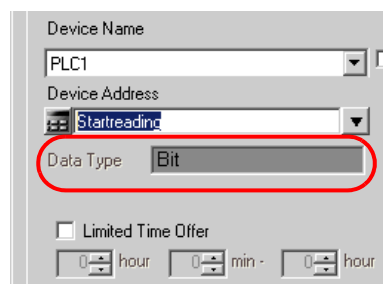
- 5) Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



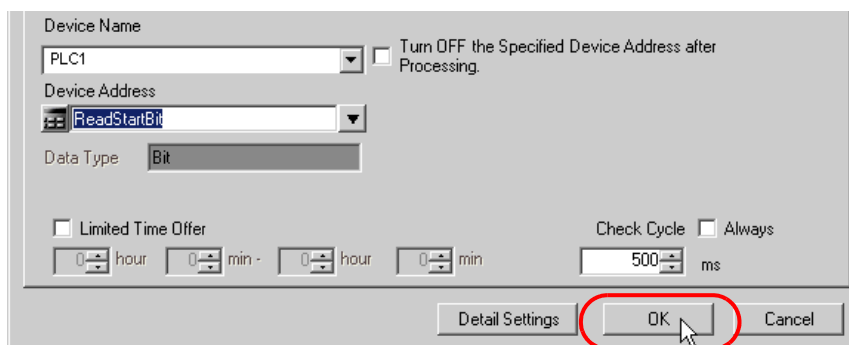
- 6) Click the [Device Address] list button and select "Start reading" for the device symbol name which serves as a trigger.



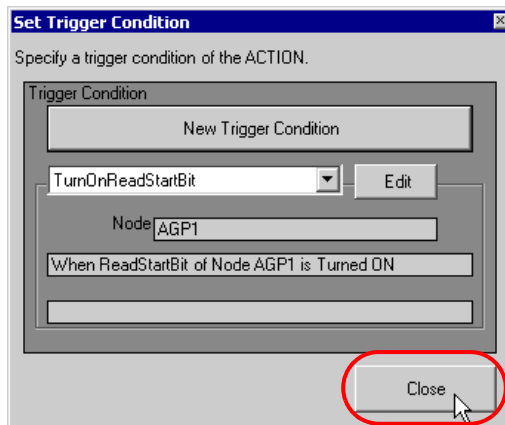
[Data Type] automatically appears after selection, too.



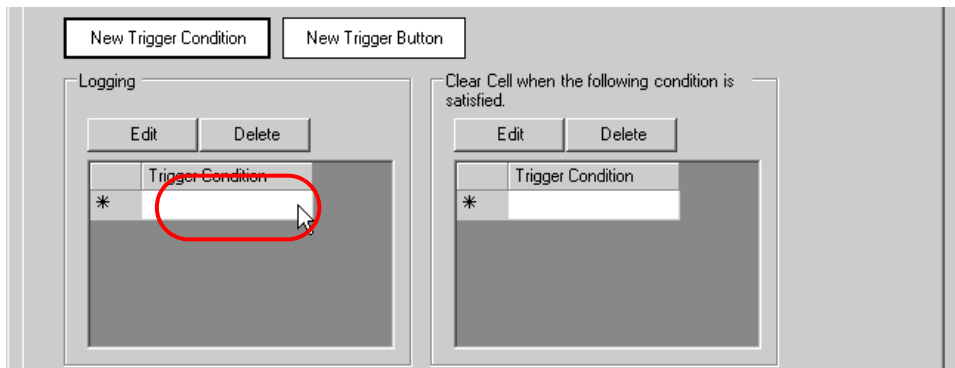
- 7) Click the [OK] button.



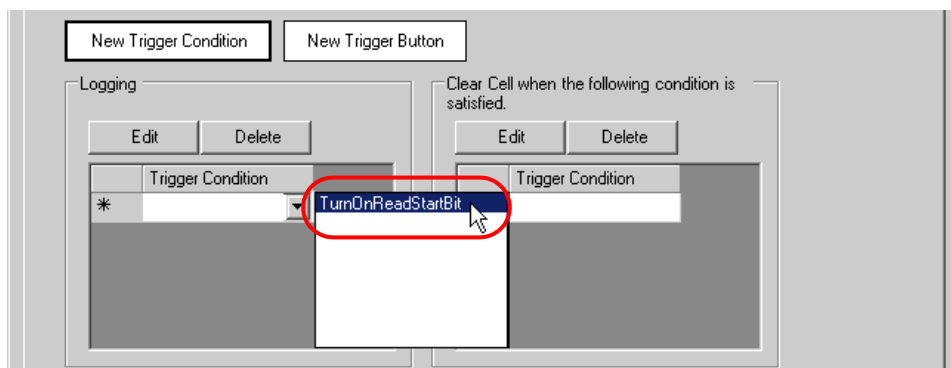
- 8) Click the [Close] button.



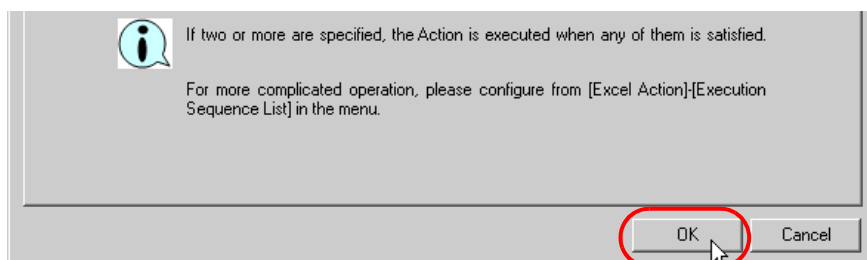
- 9) Click the blank line of [Trigger Condition] of [Logging].



10) Click the list button and select "TurnOnReadStartBit" as a trigger condition.

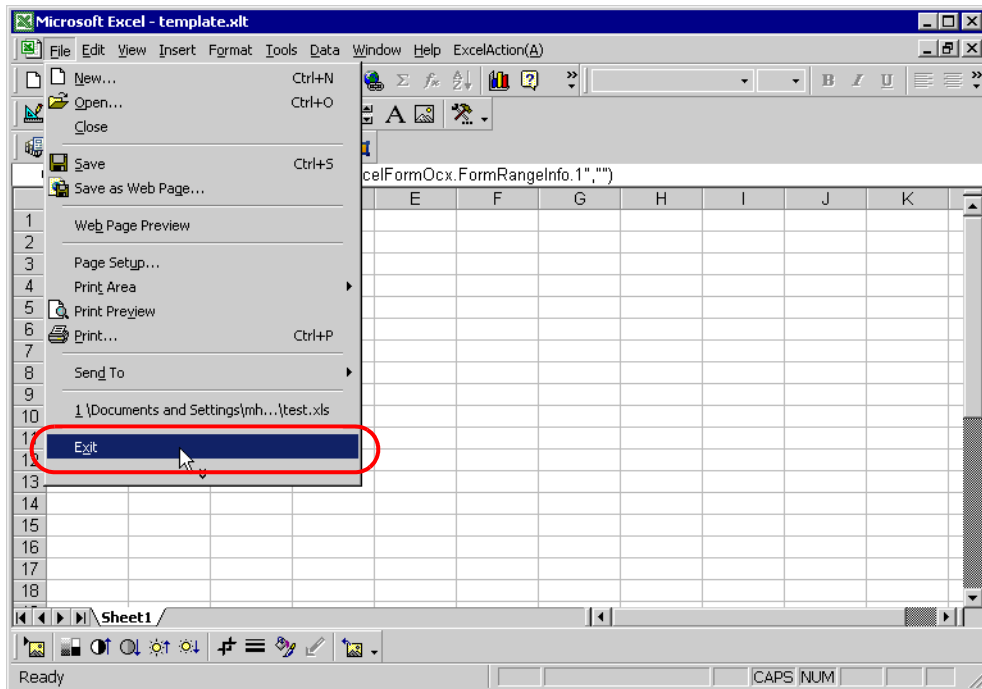


11) Click the [OK] button.

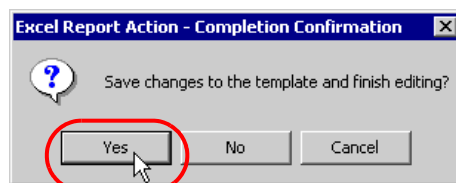


This is the end of the content settings of an Excel template.

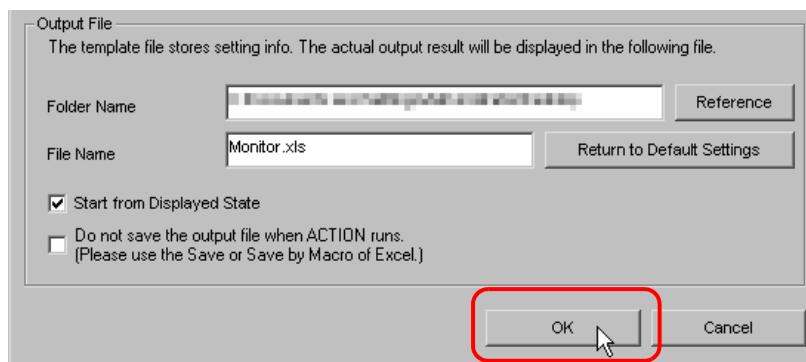
4 Close "Excel".



The following dialog box will appear, asking you if you want to save changes before closing. Click the [Yes] button.



5 On the "Create form using Excel" screen, click the [OK] button.



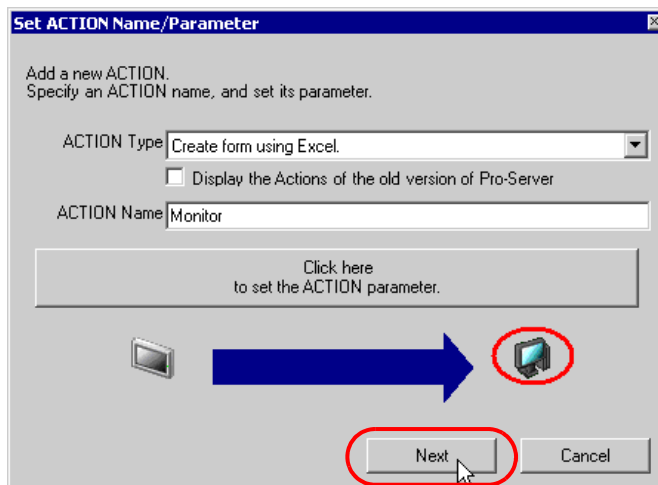
6.1.7 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed.

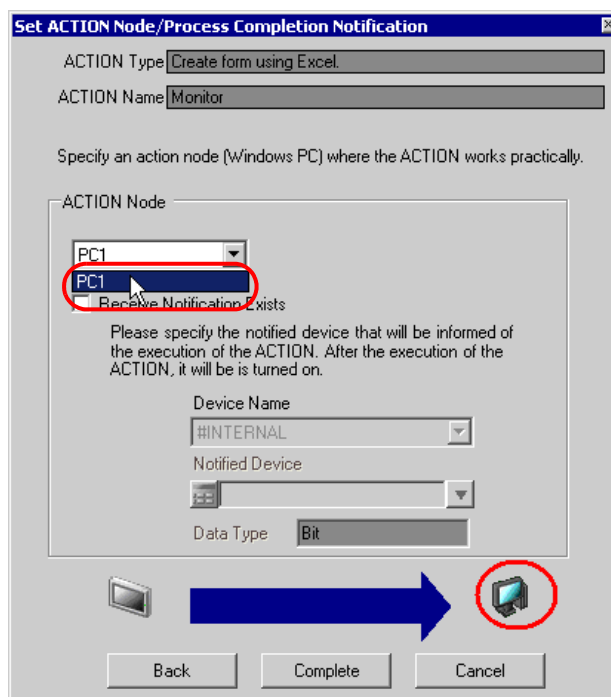
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

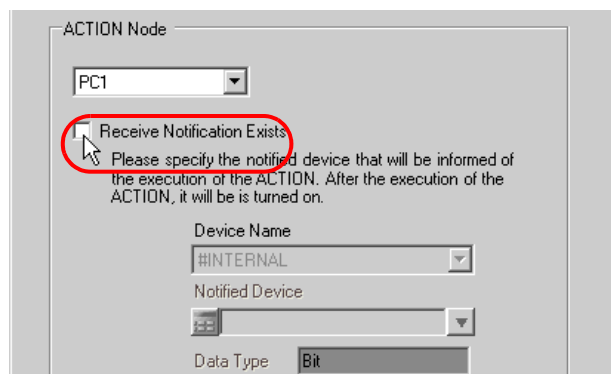
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



- 2 Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates.



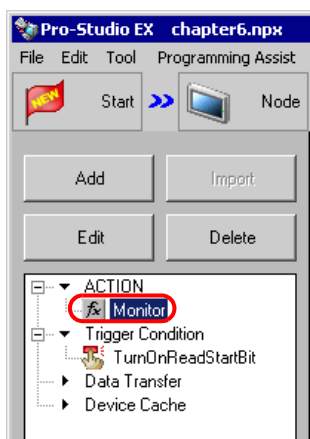
- 3 Turn off the check box of [Receive Notification Exists], if checked.



NOTE • Do not check "Receive Notification Exists".

4 Click the [End] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the name of ACTION you set will appear.

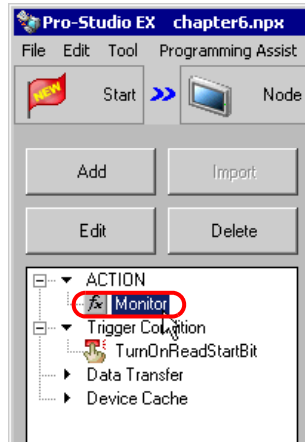


This is the end of the settings of the ACTION node and process completion notification.

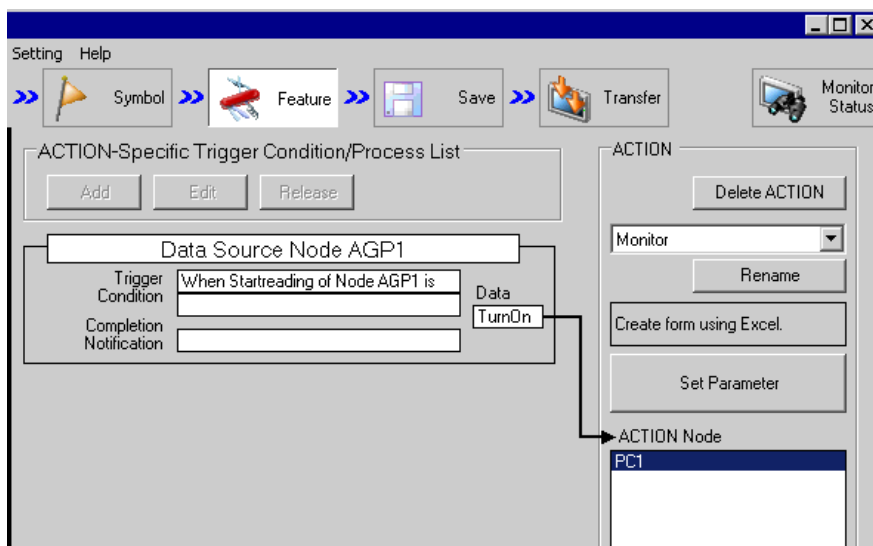
6.1.8 Verifying Setting Result

This step verifies setting results on the setting content list screen.

- 1 Select the ACTION name "Monitor" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.





6.1.9 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
- Be sure to reload the network project file to 'Pro-Server EX' If not, ACTION will not work.

Ex.

- Path of network project file : Desktop\monitor.npxe
- Title : EXCEL Report ACTION

6.1.10 Test Read

You can check if the settings are correct before transferring a created network project file to entry nodes.

When executing ACTION, the setting data is output to an output file. However, when executing a test read, it is reflected in a template file.

NOTE

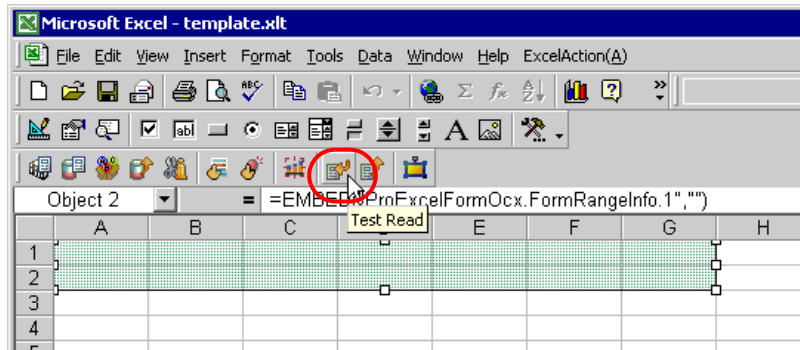
- You do not necessarily have to perform a test read.
If you skip this, proceed to "6.1.11 Transferring a Network Project File".

IMPORTANT

- To perform a test read, it is necessary that 'Pro-Server EX', to which a created network project file has been loaded, is running.

- 1 Click the [Feature] button.
- 2 Click "ACTION" from the tree display on the left of the screen, then click the [Edit] button.
- 3 On the "Set ACTION Name/Parameter" screen, click the [Click here to set the ACTION parameter] button.
- 4 On the "Create form using Excel" screen, click the [Edit Template] button.

5 With the ACTION area selected, click the [Test Read] icon.



The setup contents will be read in the template.

NOTE • Refer to "6.4 Restrictions" for details about the restrictions on test reads.

6.1.11 Transferring a Network Project File

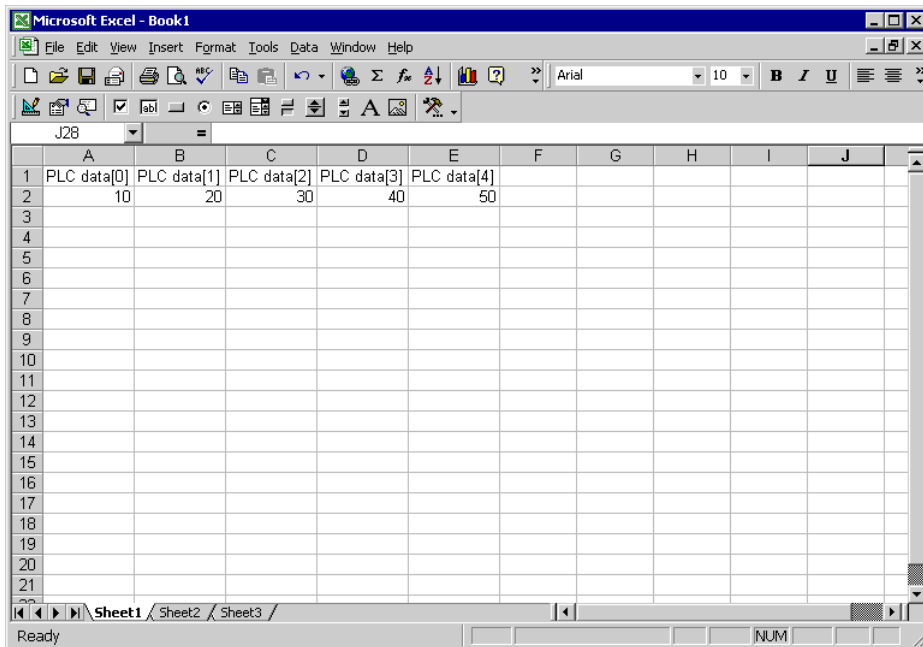
This step loads a saved network project file to 'Pro-Server EX' and then transfers to entry nodes.

Refer to "26 Transferring" for details about transferring a network project file.

NOTE • Be sure to transfer a network project file. If not, ACTION will not work.

6.1.12 Executing ACTION

This step verifies that enabling trigger conditions activates ACTION, opens an Excel book (file name: "Monitor.xls"), and then writes the device data in the specified location in Excel.



This is the end of the explanation of this ACTION.

| | |
|-------------|---|
| NOTE | • If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication". |
|-------------|---|

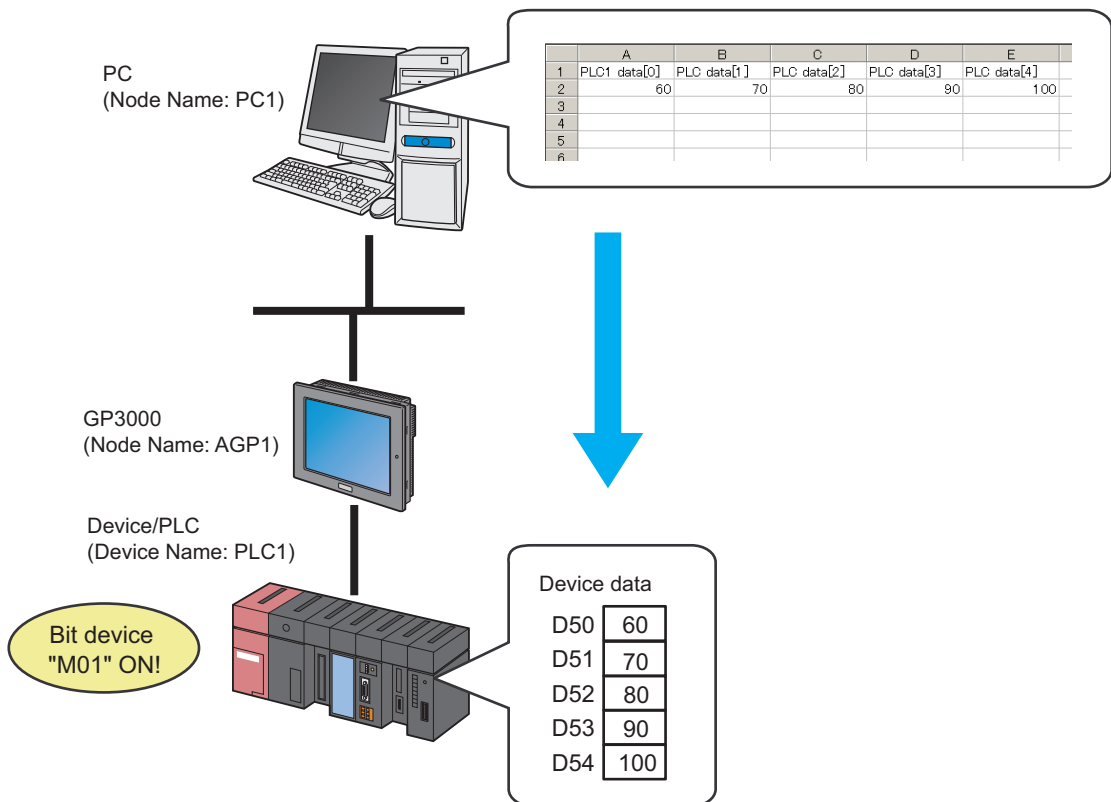
6.2 Correcting and Restoring Once Read Data

NOTE • If you want to select data case by case among several recipe data on Excel, refer to "12 Writing Excel Data in Device/PLC".

This function, which is One-Shot action, is fixed to 1 recipe.

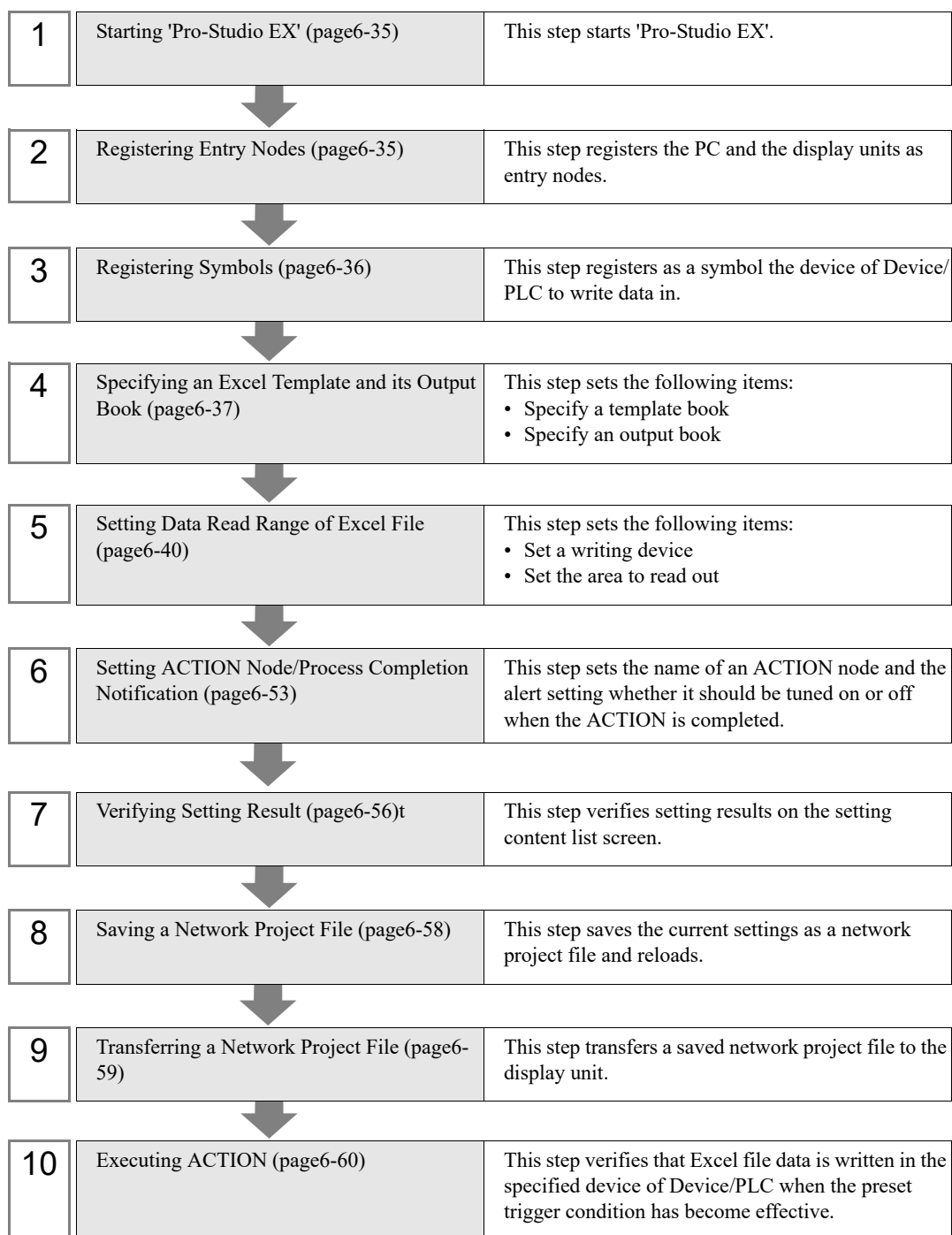
[Action Example]

Restore data to Device/PLC after correcting device address value of Device/PLC (word device: address "D50" to "D54") from which data was read into Excel and detecting the rising of trigger device (bit device: "M01") of Device/PLC.



This section describes the setting procedures for executing the above action (ACTION) as an example.

[Setting Procedure]



6.2.1 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

6.2.2 Registering Entry Nodes

This step registers the PC and the display unit connected with network as nodes.

Refer to "31 Node Registration" for details about entry nodes.



Node Name : PC1

IP Address : 192.168.0.1



Node Name : AGP1

IP Address : 192.168.0.100

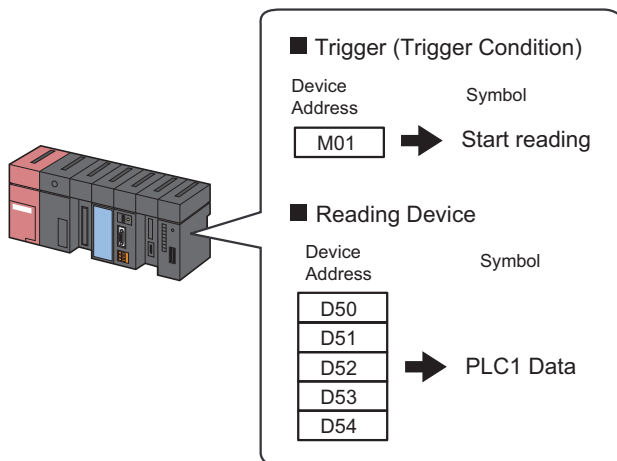
Device/PLC Information

Ex.

| Entry Node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

6.2.3 Registering Symbols

This step registers as a symbol the device address of Device/PLC to which Excel device data is written.
Refer to "32 Symbol Registration" for details about symbols.



Ex.

- Trigger (Trigger Condition)

| Setting item | Setting content |
|--|----------------------------|
| Symbol Name | Start writing |
| Data Type | Bit |
| Device address for symbol registration | "M01" of Device/PLC (PLC1) |
| No. of Devices | 1 |

- Writing Device

| Setting item | Setting content |
|--|-------------------------------------|
| Symbol Name | PLC1 data |
| Data Type | 16Bit (Signed) |
| Device address for symbol registration | "D50" to "D54" of Device/PLC (PLC1) |
| No. of Devices | 5 |

6.2.4 Specifying an Excel Template and its Output Book

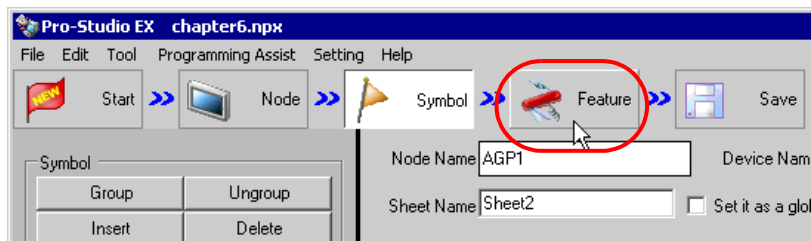
This step specifies an Excel file and an output book where device data has been written.

Refer to "6.3 Setting Guide" for more details.

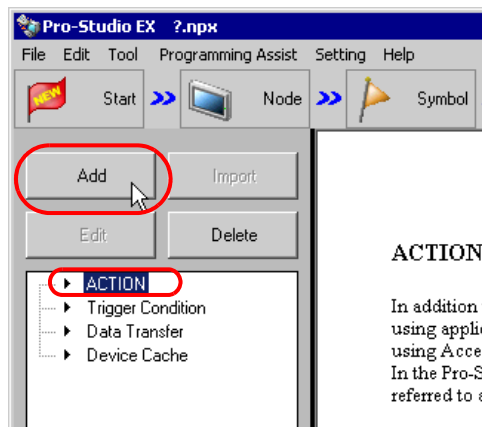
Ex.

| Setting item | | Setting content |
|--------------------|---|--|
| Specify a Template | Template Book | C:\Users\<<User name>>\Desktop\monitor.xls |
| Output Book | Folder Name | C:\Users\<<User name>>\Desktop |
| | File Name | Device data modification.xls |
| | Start with the output book displayed | Not checked |
| | Do not save the output file when ACTION runs. | Not checked |

- 1 Click the [Feature] icon on the status bar.



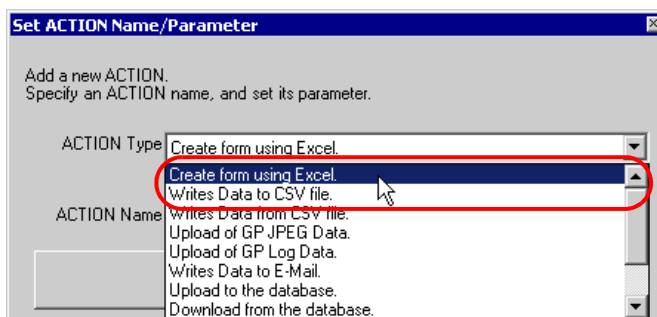
- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.



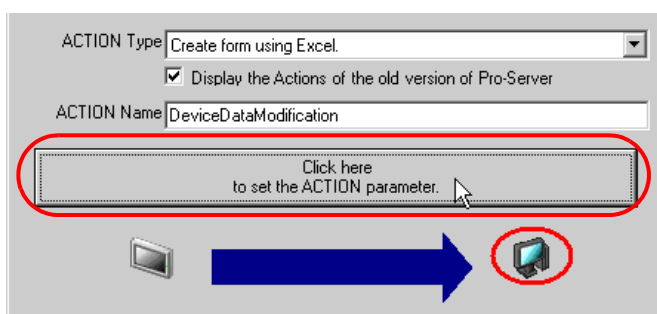
- 3 Click the [ACTION Type] list button, and select "Create form using Excel".

Then, enter the name of ACTION to set in the [ACTION name] field. In this example, enter "DeviceData Modification".

NOTE • [ACTION Name] can be an arbitrary name.

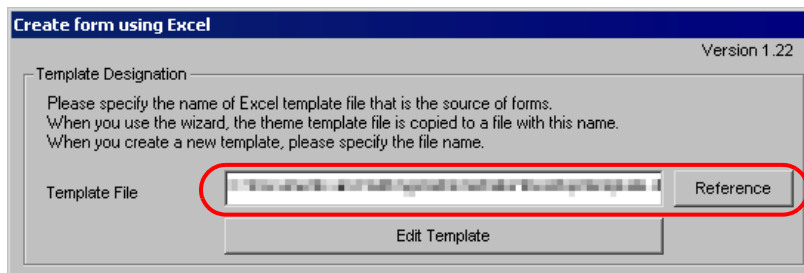


4 Click the [Click here to set the ACTION parameter] button.

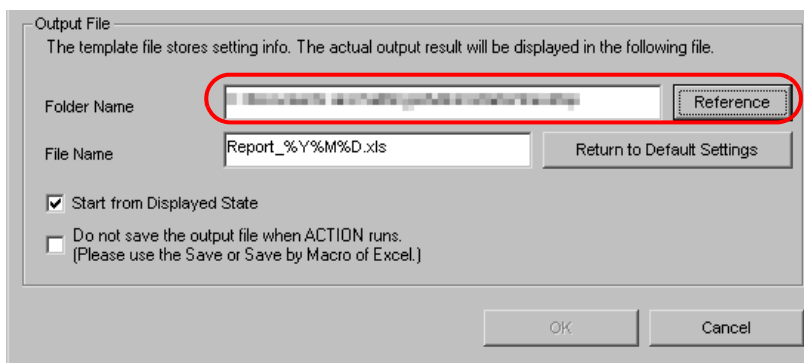


5 Set an Excel template and its output book.

- 1) Click the [Reference] button of [Template File] to set the Excel file "monitor.xls" where device data has been written.

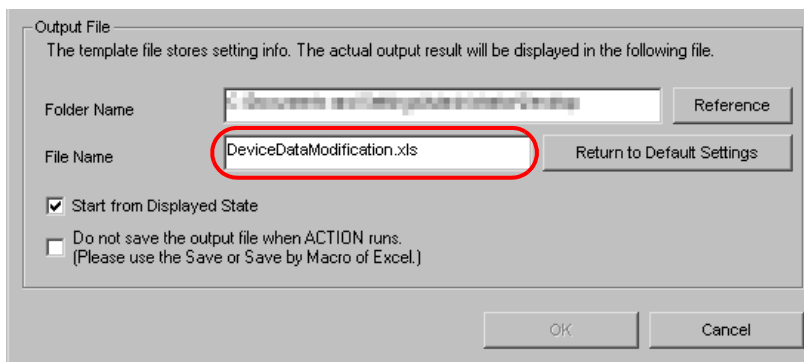


- 2) Click the [Reference] button of [Folder Name] and specify "Desktop" as a folder to save the output book.



NOTE • "%Y%M%D" is preset as "Year/Month/Date". For more details, refer to "37 Restrictions".

- 3) Set the file name "DeviceDataModification.xls" in the [File Name] field, for the output book to set.



6.2.5 Setting Data Read Range of Excel File

This step sets data read range on Excel file to write in Device/PLC.

The example below shows the setting of data read area (Device One-Shot Area) of Excel file.

Refer to "6.3 Setting Guide" for more details.

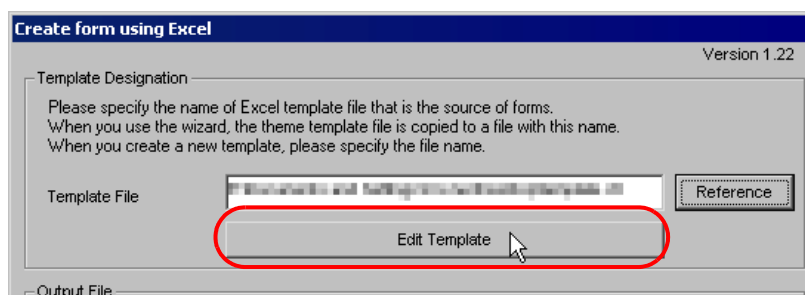
Target Cell Range → Pattern

| | A | B | C | D | E |
|---|--------------|--------------|--------------|--------------|--------------|
| 1 | PLC1 data[0] | PLC1 data[1] | PLC1 data[2] | PLC1 data[3] | PLC1 data[4] |
| 2 | 60 | 70 | 80 | 90 | 100 |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

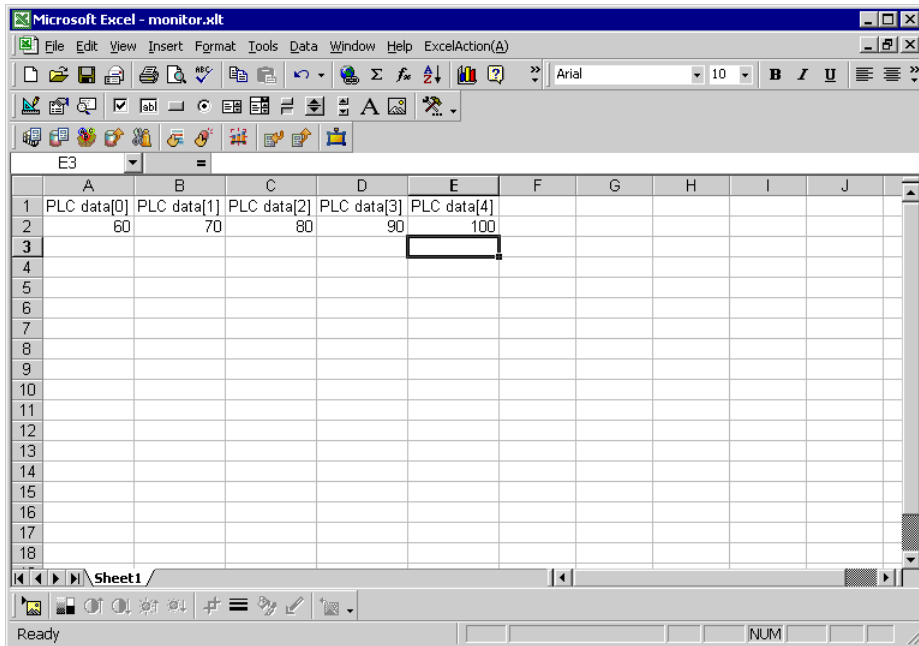
Ex.

| Setting item | Setting content |
|------------------------------------|----------------------------------|
| Entry Node | AGP1 |
| Device Name | PLC1 |
| Device Address/ Symbol Group | PLC1 data |
| Add Device Address/ Symbol Name | Not checked |
| Target Cell Range | A1 to E2 |
| Pattern | Z type |
| Trigger Condition Name | Turn on write start bit |
| Trigger Condition | When "Start writing" (M01) is ON |

- 1 Click the [Edit Template] button.

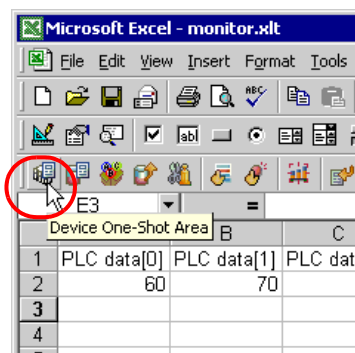


The Excel file contents will appear.

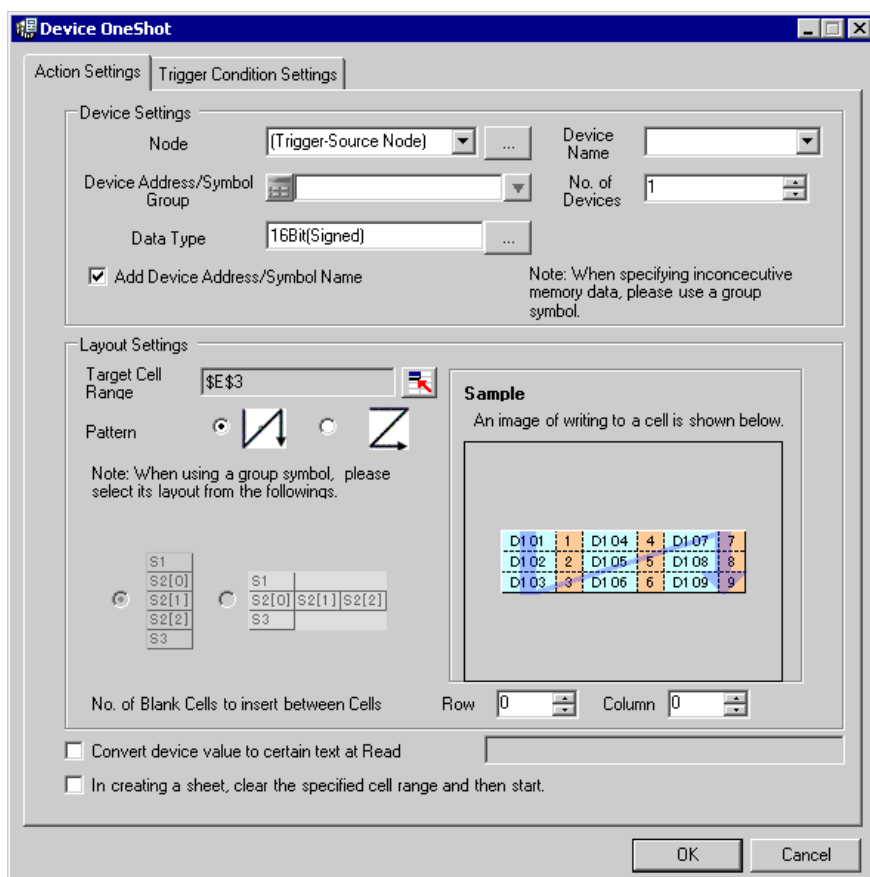


2 Set a data read area.

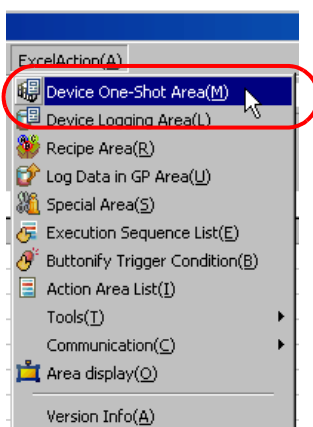
- 1) Click the [Device One-Shot Area] icon on Excel.



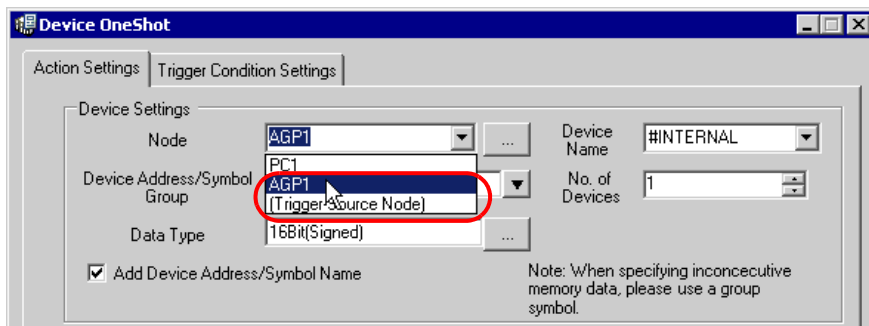
The "Device OneShot" screen will appear.



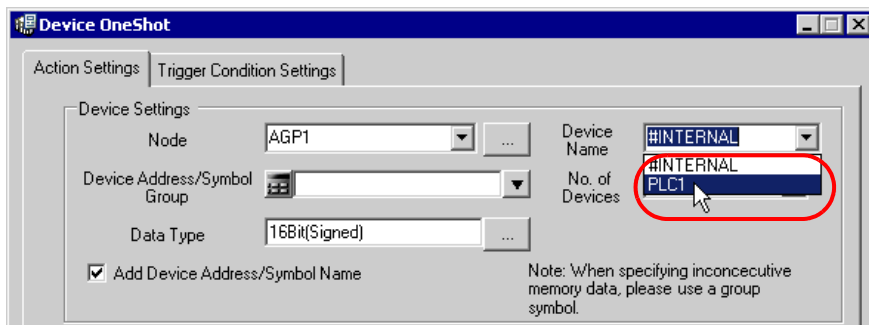
NOTE • Selecting "Device One-Shot Area" from [Excel Action] of the menu displays the same screen.



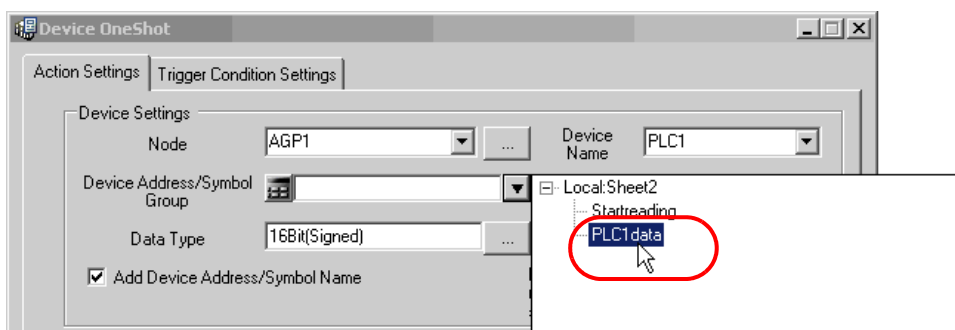
- 2) Click the list button of [Node] and select "AGP1" as a data transfer destination node.



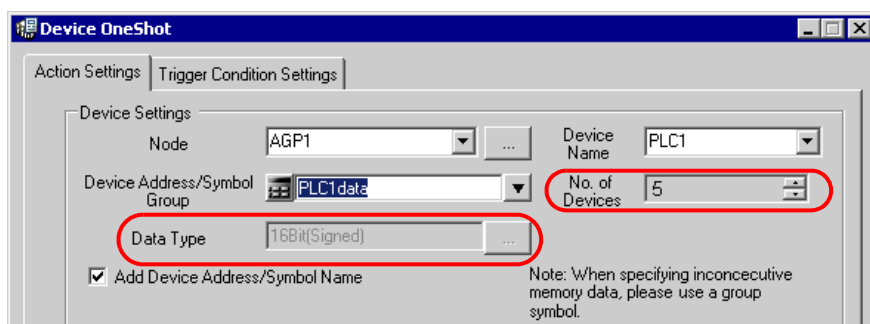
- 3) Click the list button of [Device Name] and select "PLC1" as a data transfer destination device.



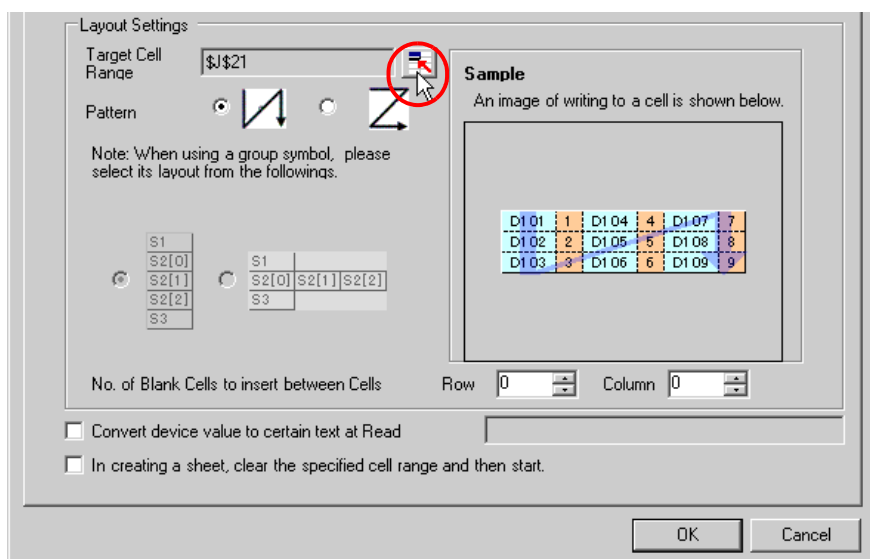
- 4) Click the list button of [Device Address/Symbol Group] and select "PLC1 data" as a symbol of the data to read out.



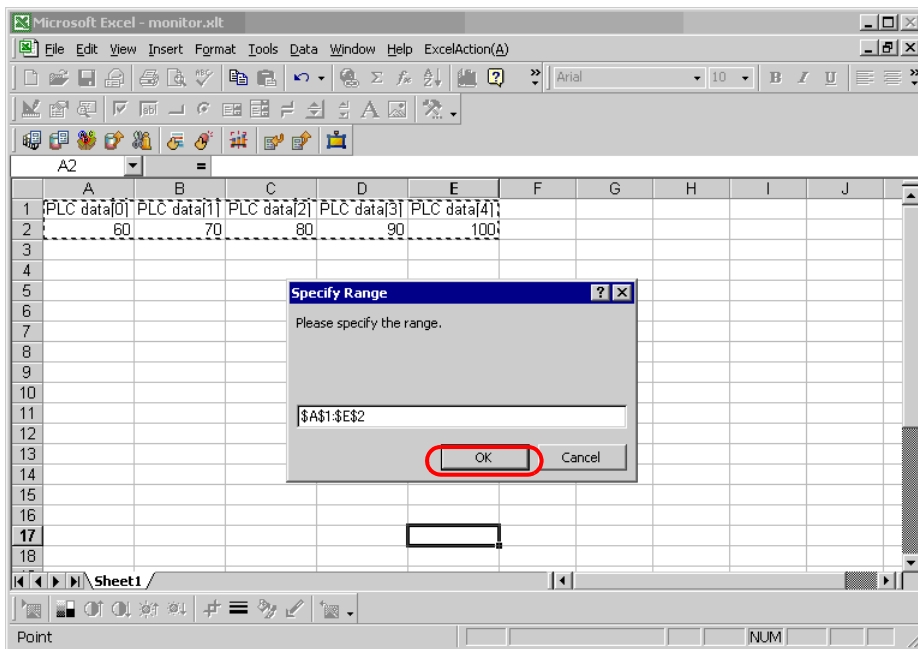
The device number "5" will be automatically entered in [No. of Devices], and "16Bit(Signed)" in [Data Type].



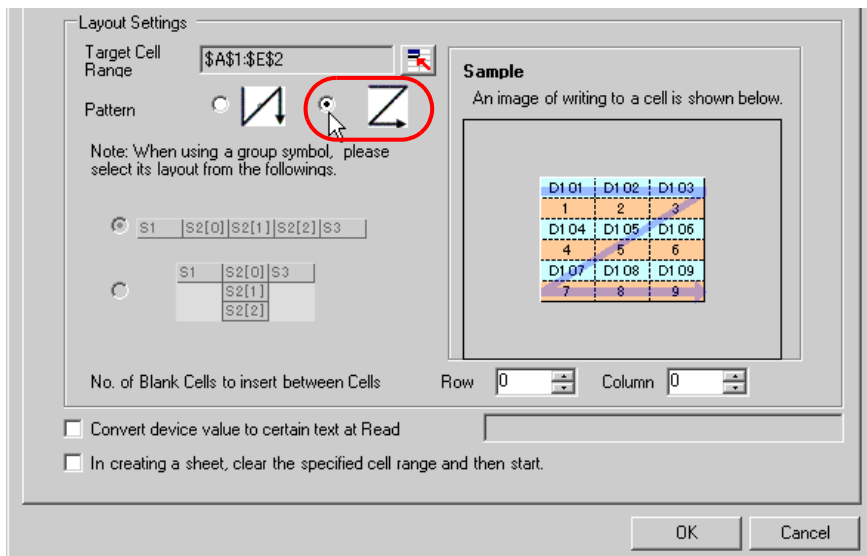
5) Click the cell range specify button of [Target Cell Range].



- 6) Drag the mouse to specify the data read area (cells A1 to E2). Then click the [OK] button.

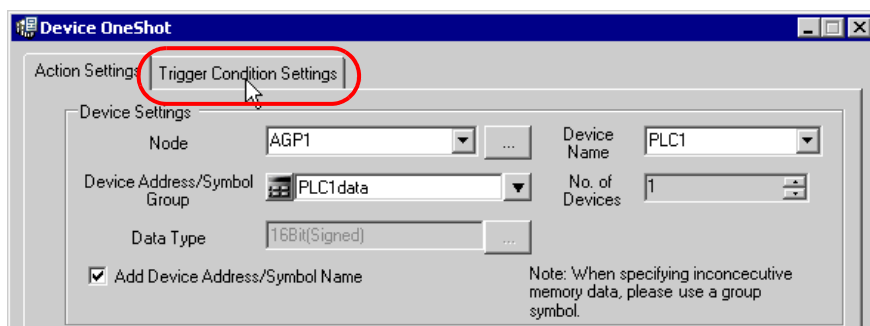


- 7) Select "Z type" of [Pattern].

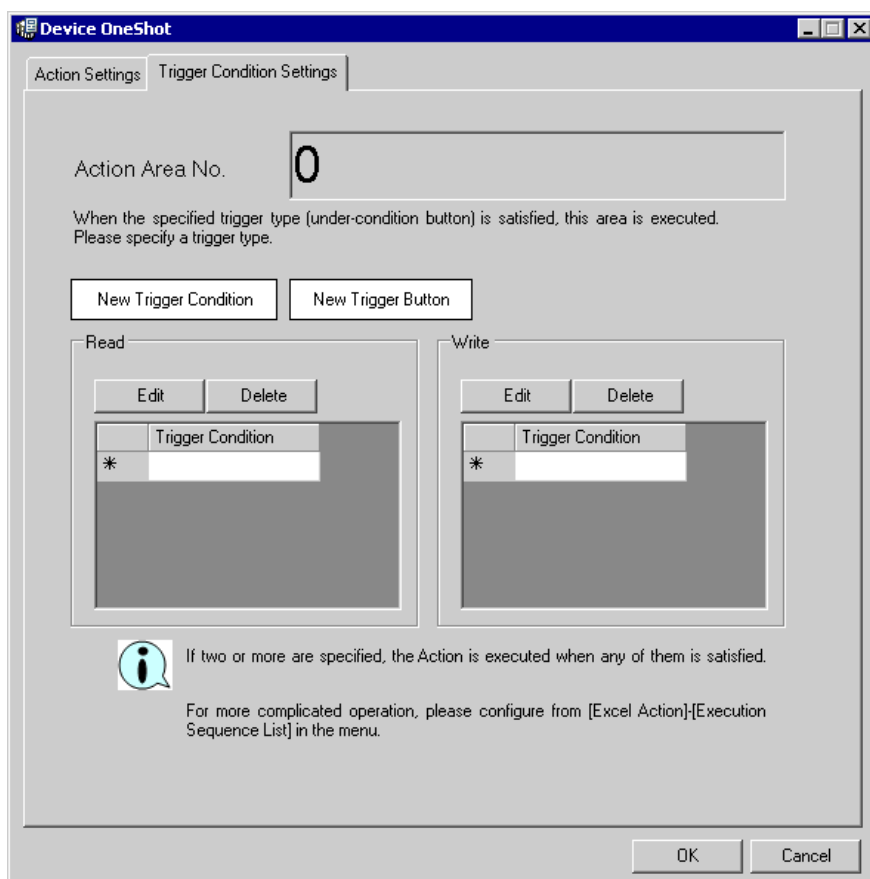


3 Set trigger conditions.

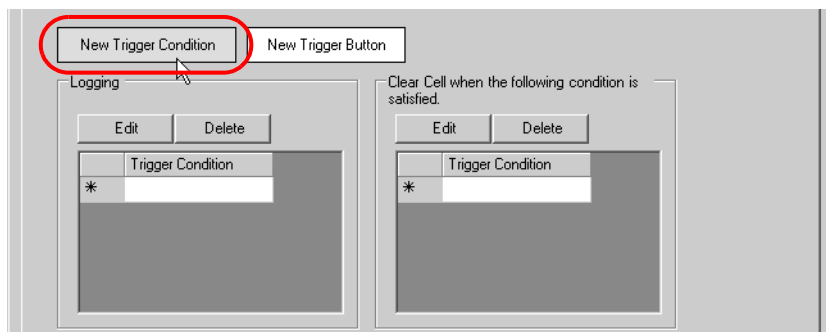
- 1) Click the [Trigger Condition Settings] tab.



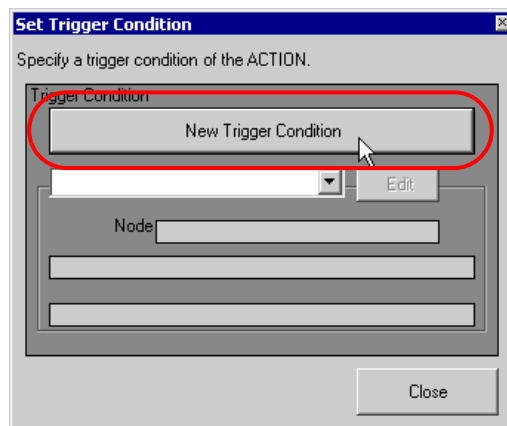
The "Device OneShot" screen will appear.



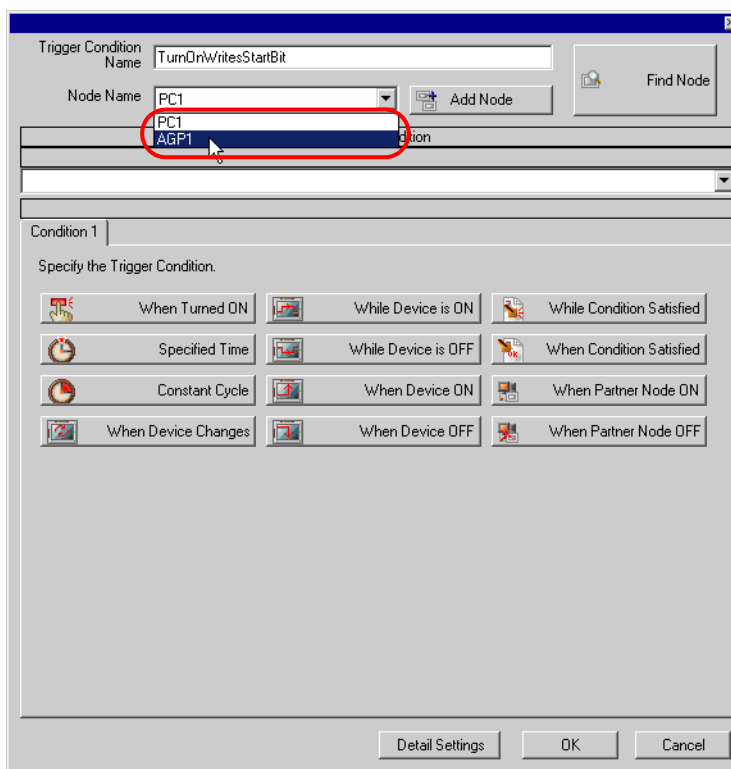
- 2) Click the [New Trigger Condition] button.



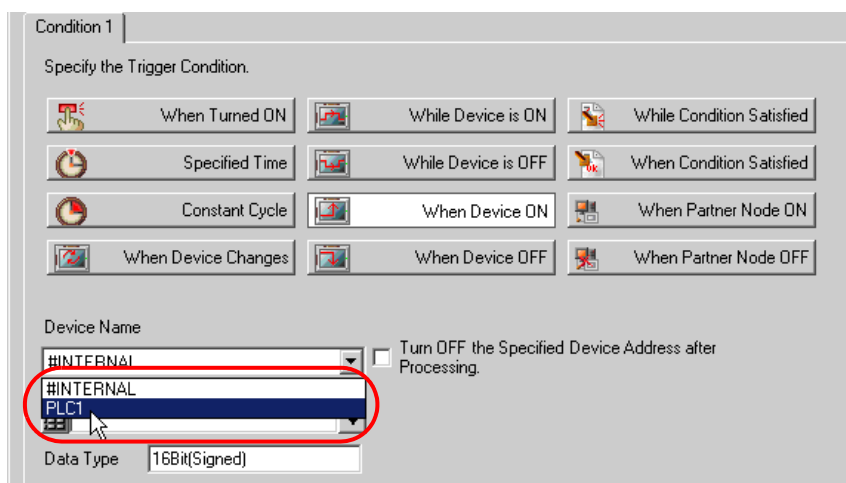
- 3) Click the [New Trigger Condition] button.



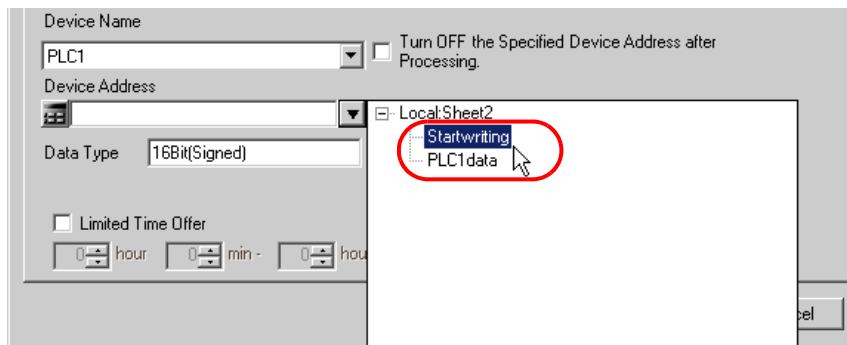
- 4) Enter the trigger condition name "TurnOnWritesStartBit" in [Trigger Condition Name], and select "AGP1" in [Node Name] as a name of the data transfer source.



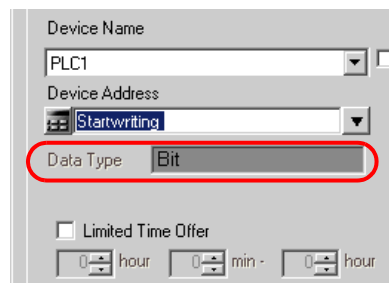
- 5) Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



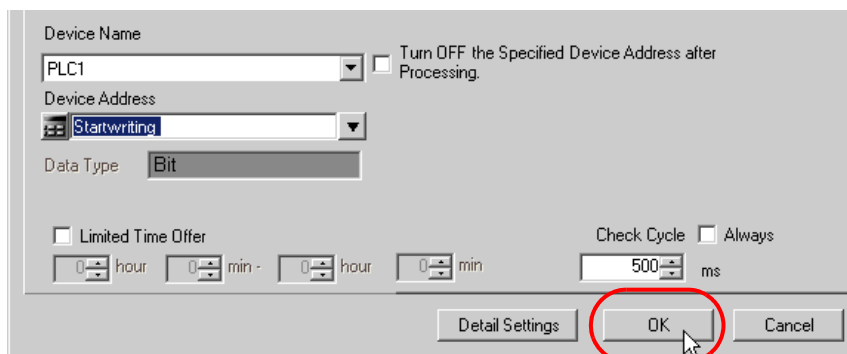
- 6) Click the [Device Address] list button and select "Start writing" for the device symbol name which serves as a trigger.



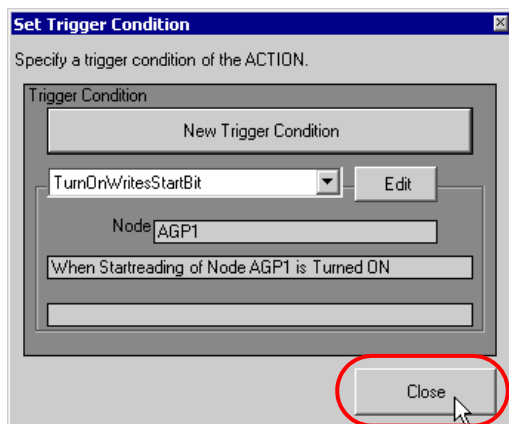
[Data Type] automatically appears after selection, too.



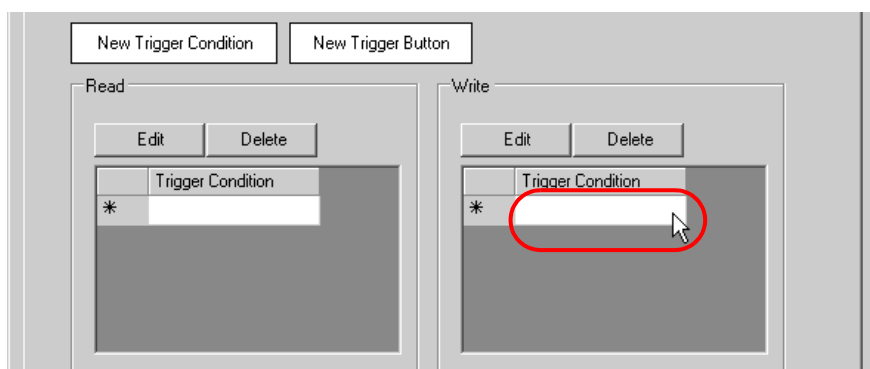
- 7) Click the [OK] button.



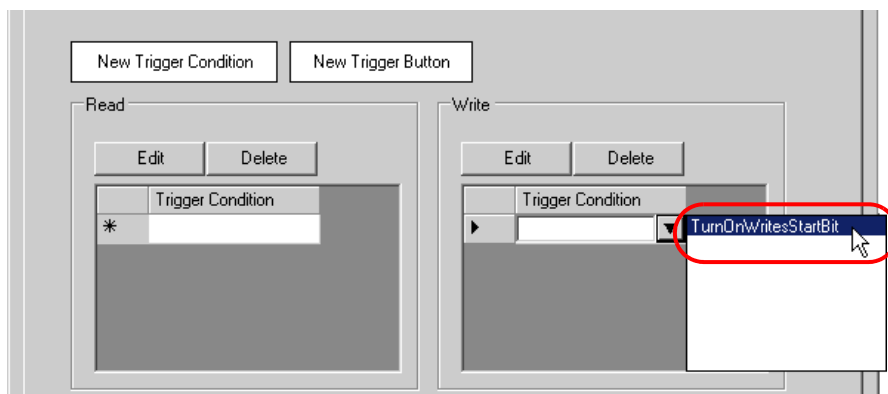
- 8) Click the [Close] button.



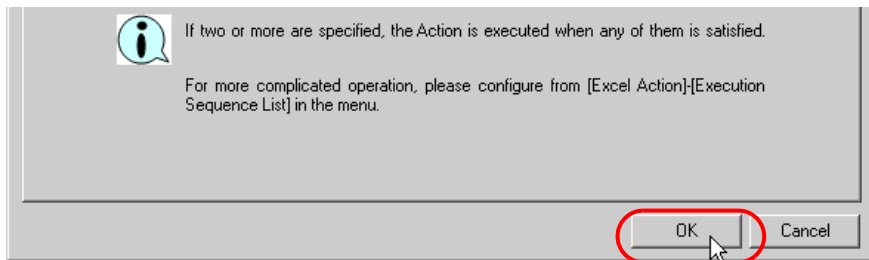
- 9) Click the blank line of [Trigger Condition] of [Write].



- 10) Click the list button and select "TurnOnWritesStartBit" as a trigger condition.

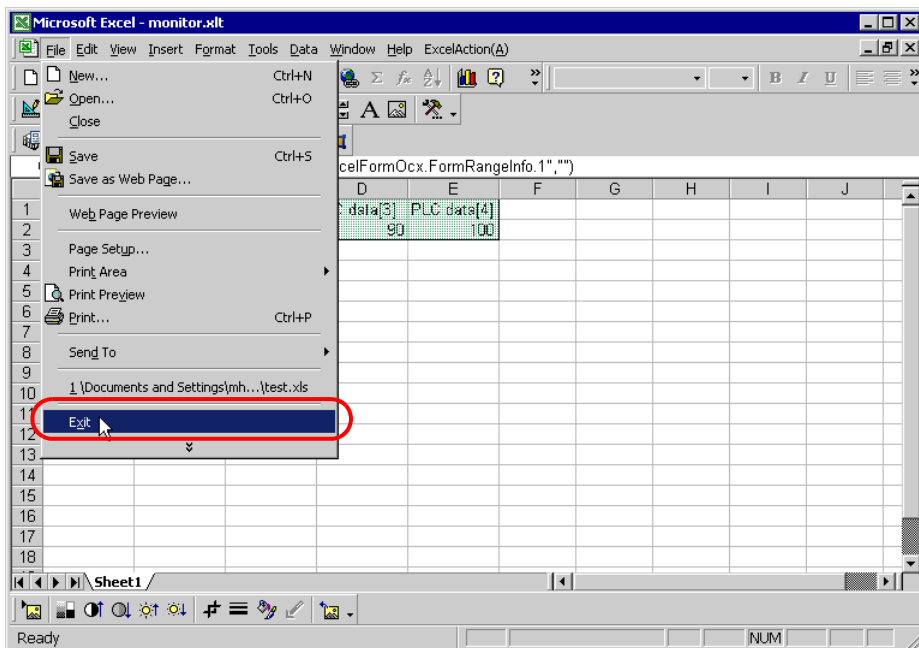


11) Click the [OK] button.

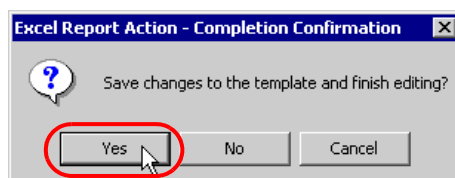


This is the end of the content settings of an Excel template.

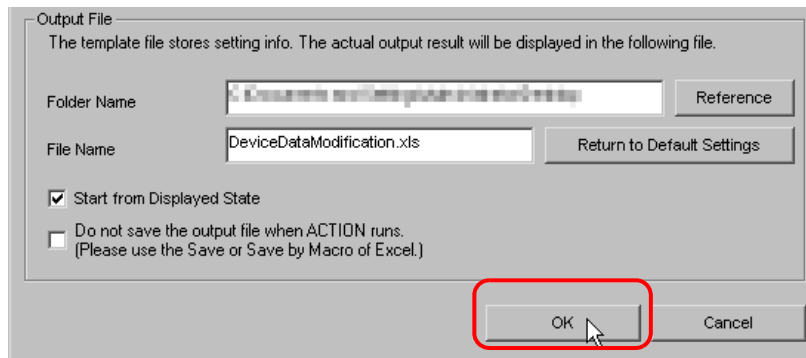
4 Close 'Excel'.



The following dialog box will appear, asking you if you want to save changes before closing. Click the [Yes] button.



- 5 On the "Create form using Excel" screen, click the [OK] button.



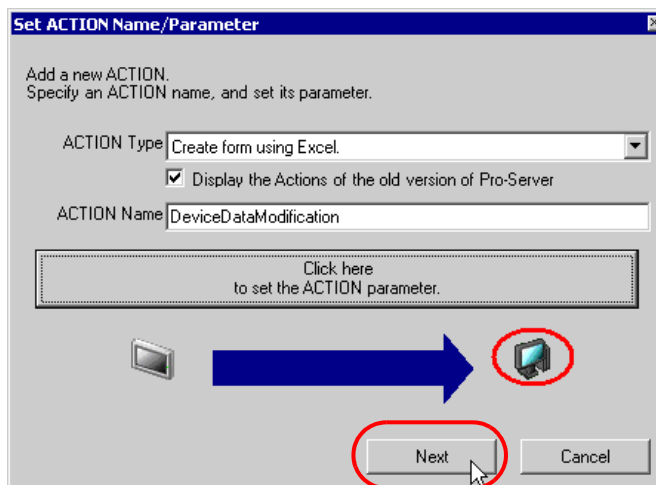
6.2.6 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed.

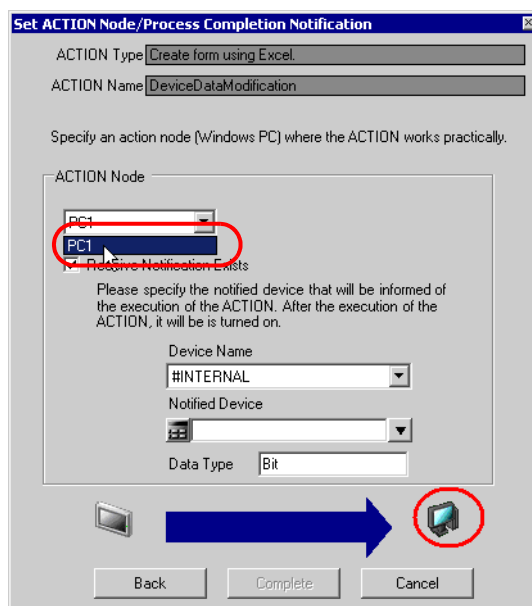
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

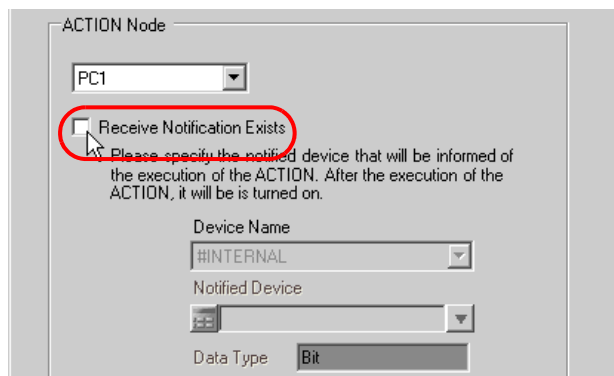
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



- 2 Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates.



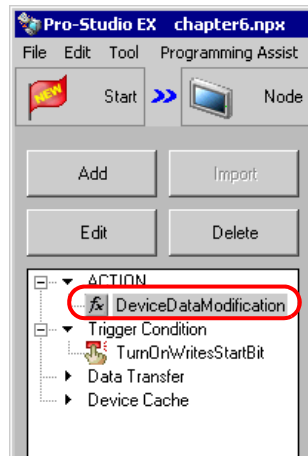
- 3 Turn off the check box of [Receive Notification Exists], if checked.



NOTE • Do not check "Receive Notification Exists".

4 Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the name of ACTION you set will appear.



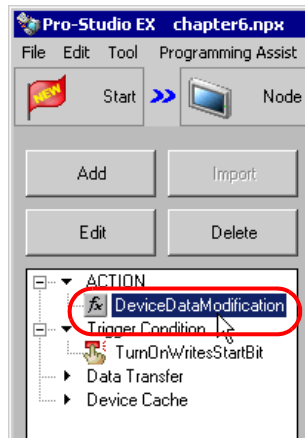
This is the end of the settings of the ACTION node and process completion notification.

6.2.7 Verifying Setting Result

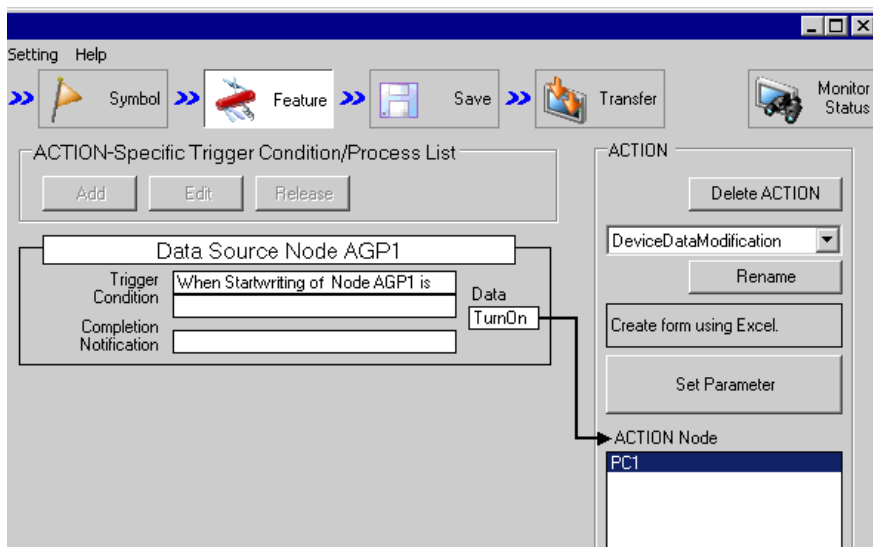
This step verifies setting results on the setting content list screen.

-
- NOTE** • With the "Excel Report" ACTION, you cannot add, edit or delete a trigger condition in "ACTION-specific Trigger Condition/Process List". To change a preset condition, click the [Set Parameter] button, and select [Edit Template] to change data on Excel.
-

- 1 Select the ACTION name "DeviceDataModification" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.





6.2.8 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
- Be sure to reload the network project file to 'Pro-Server EX'. If not, ACTION will not work.

Ex.

- Path of network project file : Desktop\monitor_write.npxe
- Title : EXCEL Report ACTION

6.2.9 Test Write

You can check if the settings are correct before transferring a created network project file to entry nodes.

NOTE

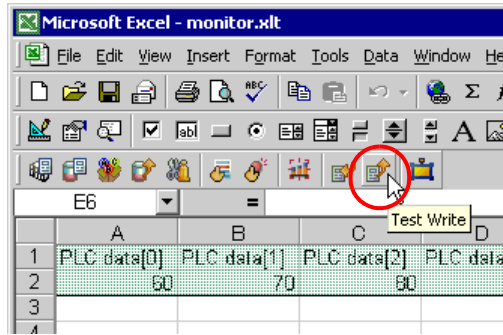
- You do not necessarily have to perform a test write. If you skip this, proceed to "6.2.10 Transferring a Network Project File".

IMPORTANT

- Note that the data will be actually written in the Device/PLC when you specify the device of Device/PLC as a write destination.
- To perform a test write, it is necessary that 'Pro-Server EX', to which a created network project file has been loaded, is running.

- 1 Click the [Feature] button.
- 2 Click "ACTION" from the tree display on the left of the screen, then click the [Edit] button.
- 3 On the "Set ACTION Name/Parameter" screen, click the [Click here to set the ACTION parameter] button.
- 4 On the "Create form using Excel" screen, click the [Edit Template] button.

5 With the ACTION area selected, click the [Test Write] icon.



At this point, data is written in the Device/PLC.

-
- NOTE**
- You can check that data is being written in the "Symbol Monitor" screen of "Status Monitor". For more details, see "28 Simply Confirming On-site Status".
 - Refer to "6.4 Restrictions" for details about the restrictions on test writes.
-

6.2.10 Transferring a Network Project File

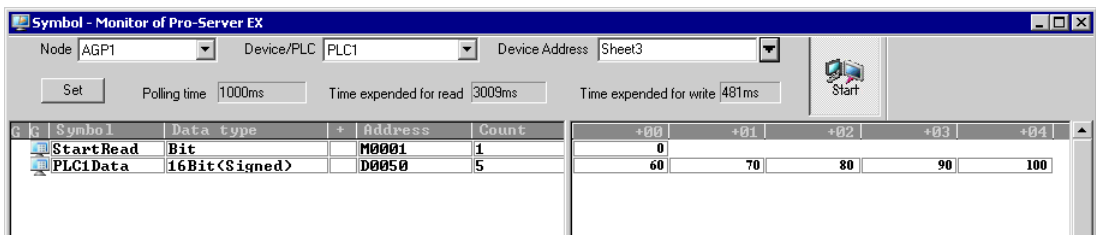
This step loads a saved network project file to 'Pro-Server EX' and then transfers to entry nodes.

Refer to "26 Transferring" for details about transferring a network project file.

-
- NOTE**
- Be sure to transfer a network project file. If not, ACTION will not work.
-

6.2.11 Executing ACTION

This step verifies that enabling trigger conditions activates ACTION and writes Excel data to the specified device of Device/PLC.



- NOTE**
- Check actually written value with such function as monitor of rudder creation software.
 - If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".

This is the end of the explanation of this ACTION.

6.3 Setting Guide

This section explains how to set each screen in detail.

6.3.1 "Create form using Excel" Screen

☞ ■ "Creating form using Excel" Screen

6.3.2 Device OneShot" Screen

■ "Action Settings" Tab

Device OneShot

Action Settings | Trigger Condition Settings

Device Settings

Node: (Trigger-Source Node) ... Device Name: ...

Device Address/Symbol Group: ... No. of Devices: 1

Data Type: 16Bit(Signed) ...

☒ Add Device Address/Symbol Name

Note: When specifying inconsecutive memory data, please use a group symbol.

Layout Settings

Target Cell Range: \$B:\$6

Pattern: ☒ [Pattern 1] ☐ [Pattern 2]

Note: When using a group symbol, please select its layout from the followings.

Layout 1: S1, S2[0], S2[1], S2[2], S3

Layout 2: S1, S2[0], S2[1], S2[2], S3

Sample

An image of writing to a cell is shown below.



| | | | | | |
|-------|---|-------|---|-------|---|
| D1 01 | 1 | D1 04 | 4 | D1 07 | 7 |
| D1 02 | 2 | D1 05 | 5 | D1 08 | 8 |
| D1 03 | 3 | D1 06 | 6 | D1 09 | 9 |



No. of Blank Cells to insert between Cells: Row: 0 Column: 0

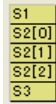
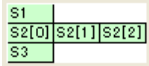
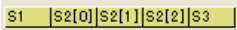
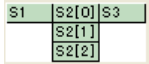
☐ Convert device value to certain text at Read

☐ In creating a sheet, clear the specified cell range and then start.

OK Cancel

| Setting item | | Setting content | | | | | | | | | | | |
|---------------------------------|--|--|---------------|-------------------|---------------------------------|------------------------|----------------------------|--|--|--|-----------------|-----------------|-------|
| Device Settings | Node | <p>Selects nodes which have a device to read/write data</p> <div>NOTE</div> <ul style="list-style-type: none">Clicking the [...] button can retrieve or add entry nodes.Selecting "(Trigger-Source Node)" will select the entry node that has triggered the action. <table><tr><th>Trigger Cause</th><th>Target Entry Node</th></tr><tr><td>The trigger condition satisfied</td><td>Trigger condition node</td></tr><tr><td>The trigger button clicked</td><td>Pro-Server EX node on which you clicked the button</td></tr><tr><td>Started directly from the user program</td><td>Pro-Server EX node on which the user program is operated</td></tr></table> | Trigger Cause | Target Entry Node | The trigger condition satisfied | Trigger condition node | The trigger button clicked | Pro-Server EX node on which you clicked the button | Started directly from the user program | Pro-Server EX node on which the user program is operated | | | |
| | Trigger Cause | Target Entry Node | | | | | | | | | | | |
| | The trigger condition satisfied | Trigger condition node | | | | | | | | | | | |
| | The trigger button clicked | Pro-Server EX node on which you clicked the button | | | | | | | | | | | |
| | Started directly from the user program | Pro-Server EX node on which the user program is operated | | | | | | | | | | | |
| Device Name | <p>Selects nodes which have a device to read/write data</p> <div>NOTE</div> <ul style="list-style-type: none">It is not necessary to set when the entry nodes are GP Series nodes and Pro-Server EX nodes. | | | | | | | | | | | | |
| Device Address/ Symbol Group | <p>Sets the device address or symbol to be used.</p> <ul style="list-style-type: none">When specifying a device address: Enter directly from the Calculator icon. <div><p>Calculator icon</p></div> <ul style="list-style-type: none">When specifying a symbol: Select the symbol by clicking the list button. <div><p>List button</p></div> | | | | | | | | | | | | |
| Data Type | <ul style="list-style-type: none">When specifying a device address: Specify the data type. <div><table><tr><th colspan="3">Data Type</th></tr><tr><td colspan="3">Deselect</td></tr><tr><td>16Bit(Signed)</td><td>32Bit(Signed)</td><td>Bit</td></tr><tr><td>16Bit(Unsigned)</td><td>32Bit(Unsigned)</td><td>Float</td></tr></table></div> <ul style="list-style-type: none">When specifying a symbol: Data type automatically appears. | Data Type | | | Deselect | | | 16Bit(Signed) | 32Bit(Signed) | Bit | 16Bit(Unsigned) | 32Bit(Unsigned) | Float |
| Data Type | | | | | | | | | | | | | |
| Deselect | | | | | | | | | | | | | |
| 16Bit(Signed) | 32Bit(Signed) | Bit | | | | | | | | | | | |
| 16Bit(Unsigned) | 32Bit(Unsigned) | Float | | | | | | | | | | | |
| No. of Devices | <p>Sets the number of devices to read/write. Enabled only when the device address has been directly input.</p> <div>NOTE</div> <ul style="list-style-type: none">When the symbol or group symbol is specified, this is set automatically. | | | | | | | | | | | | |

| Setting item | | Setting content | | | | | | |
|--|--------------------------------|--|--------------------------|-----------------------|--------|--------------------------|-----------------|-----------------|
| Device Settings | Add Device Address/Symbol Name | Displays the device address, symbol name, or group symbol name in the Excel cells next to the cells in which data have been written. In this case, depending on the data write pattern, the device address, symbol name, or group symbol name will be written in the different cells as follows. | | | | | | |
| | | <table><tr><th>Write Pattern</th><th>Display Cell Position</th></tr><tr><td>N type</td><td>On the left of the value</td></tr><tr><td>Z type</td><td>Above the value</td></tr></table> | Write Pattern | Display Cell Position | N type | On the left of the value | Z type | Above the value |
| | | Write Pattern | Display Cell Position | | | | | |
| | | N type | On the left of the value | | | | | |
| Z type | Above the value | | | | | | | |
| Example) • Device address "D100", No. of devices "3", Write pattern "N type" | | | | | | | | |
| <table><tr><td>D100</td><td>(Value of D100)</td></tr><tr><td>D101</td><td>(Value of D101)</td></tr><tr><td>D102</td><td>(Value of D102)</td></tr></table> • Device address "D100", No. of devices "3", Write pattern "Z type" | D100 | (Value of D100) | D101 | (Value of D101) | D102 | (Value of D102) | | |
| D100 | (Value of D100) | | | | | | | |
| D101 | (Value of D101) | | | | | | | |
| D102 | (Value of D102) | | | | | | | |
| | | <table><tr><td>D100</td><td>D101</td><td>D102</td></tr><tr><td>(Value of D100)</td><td>(Value of D101)</td><td>(Value of D102)</td></tr></table> | D100 | D101 | D102 | (Value of D100) | (Value of D101) | (Value of D102) |
| D100 | D101 | D102 | | | | | | |
| (Value of D100) | (Value of D101) | (Value of D102) | | | | | | |
| Layout Settings | Target Cell Range | Specifies the cell range to which data will be written. Clicking the button can select the cell range on Excel. <div>NOTE</div> <ul style="list-style-type: none">For the process on how to select cell ranges, refer to "■ Action Area Settings" in "5.1.2 Setting Guide".The useful function is available to check the specified cell range (Action area). Refer to "■ Action Area List" in "5.1.2 Setting Guide". | | | | | | |
| | Pattern | Sets the data write/read direction when selecting multiple cells. <ul style="list-style-type: none"> (N type) Sequentially from top to bottom. (Z type) Sequentially from left to right. <div>NOTE</div> <ul style="list-style-type: none">The write/read image of the content set in "Layout Settings" appears in [Sample]. | | | | | | |

| Setting item | | Setting content |
|---|--|--|
| Layout Settings | Layout to Cell | <p>Specifies write/read layout of symbols making up a group if group symbols have been specified.</p> <p>(Example)</p> <ul style="list-style-type: none"> N type  <p>Aligns symbols from up to bottom to write/read.</p>  <p>Aligns symbols from left to right to write/read.</p> <ul style="list-style-type: none"> Z type  <p>Aligns symbols from left to right to write/read.</p>  <p>Aligns symbols from up to bottom to write/read.</p> |
| | No. of Blank Cells to insert between Cells | <p>Sets the number of blank cells to insert (blank cells to insert between data and data) when writing data in plural cells.</p> <p>You can use different settings for columns and rows, respectively.</p> |
| | Convert device value to certain text at Read | <p>Converts the read device values into text.</p> <p>Turning on this check box will display "Text Substitution Table Settings" screen.</p> <p>Refer to "■ "Text Substitution Table Settings" Screen" for more details.</p> <p>NOTE</p> <ul style="list-style-type: none"> If checked, the data write function is not available. |
| In creating a sheet, clear the specified cell range and then start. | | <p>Before copying a sheet from the template file, if data are written in the cell range of the sheet, clears the data and starts copying.</p> |

■ "Trigger Condition Settings" tab

Device OneShot

Action Settings Trigger Condition Settings

Action Area No. 1

When the specified trigger type (under-condition button) is satisfied, this area is executed.
Please specify a trigger type.

New Trigger Condition New Trigger Button

Read

Edit Delete

Trigger Condition

*

Write

Edit Delete

Trigger Condition

*

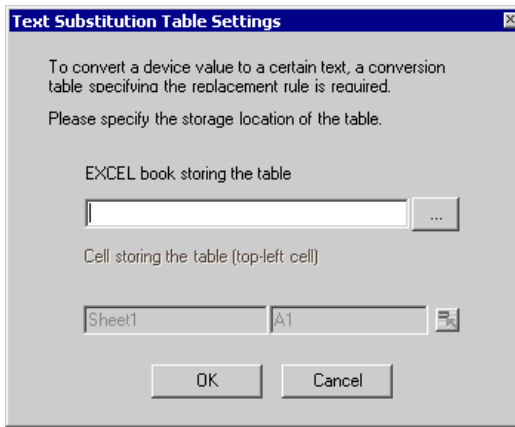
If two or more are specified, the Action is executed when any of them is satisfied.
For more complicated operation, please configure from [Excel Action]-[Execution Sequence List] in the menu.

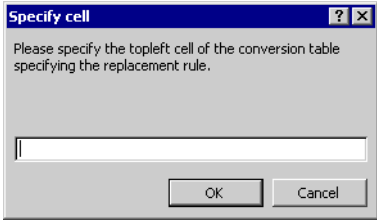
OK Cancel

| Setting item | Setting content |
|-----------------------|---|
| Action Area No. | Displays No. allocated to each ACTION area by template. |
| New Trigger Condition | Displays the "Trigger Condition Settings" dialog box. Click here to set a new trigger condition. |
| New Trigger Button | Displays the "Create Trigger Button" dialog box. Refer to "5.6.2 Setting Guide" Screen" for more details. |
| Read | <p>Selects a trigger condition to read data. Click the blank line of [Trigger Condition] and then the list button to display the registered trigger condition.</p> <p>NOTE</p> <ul style="list-style-type: none"> When plural trigger conditions have been specified, satisfying at least one of those conditions executes ACTION. Clicking the [Edit] button can edit the specified trigger conditions. Clicking the [Delete] button deletes the specified trigger conditions. |

| Setting item | Setting content |
|--------------|---|
| Write | <p>Selects a trigger condition for writing data. Click the blank line of [Trigger Condition] and then the list button to display the registered trigger condition.</p> <p>NOTE</p> <ul style="list-style-type: none"> When plural trigger conditions have been specified, satisfying at least one of those conditions executes ACTION. Clicking the [Edit] button can edit the specified trigger conditions. Clicking the [Delete] button deletes the specified trigger conditions. |

■ "Text Substitution Table Settings" Screen



| Setting item | Setting content |
|------------------------------|--|
| Excel book storing the table | Specifies the Excel book in which the text substitution table is stored. Click the [...] button, and then specify the file on the "Open File" screen. |
| Cell storing the table | <p>Specifies the book name in which the text substitution table is stored and then the cell number of the top-left of the table. On the "Specify Cell" screen, click the button and enter the cell number of the top-left of the table.</p>  |

Refer to "■ About Text Substitution of Data" for more details about a text substitution table.

6.4 Restrictions

■ Writing data of Excel in the Device/PLCs

When writing the cell value and the cell is empty, 0 will be written for the numeral type, blank will be written for the character string type.

Also, when the data type is the character string, but you do not set the target cell format to "character string", you sometimes fail to write correctly.

In this case, you need to change the cell format to "character string" in advance.

■ Operation in ACTION area when error occurs

When you actually write/read in "Device One-Shot" function and exceed the ACTION area, perform the common operation as follows:

1) When performing a test read/ a test write

Error screen is displayed.

2) When executing ACTION in runtime

It will be recorded as ACTION error in the Log Viewer of the 'Pro-Server EX'.

■ Functions which are not executed by a Test Write/Read

The following function is not executed by a Test Read/Write.

"Clear the cell range specified in creating a sheet to start"

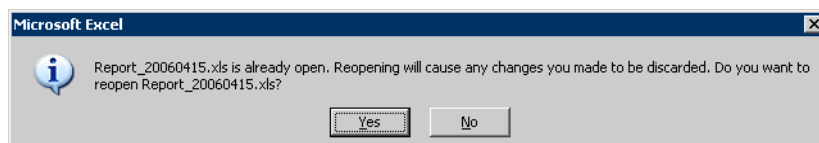
■ In the case of closing the displayed output book

If you have mistakenly closed an output book of Excel Report ACTION, follow these steps to open it again:

Dragging and dropping the book to open will make it read-only and the start button etc. invalid.

1. Double-click the output book.

2. When the following dialog box appears, select "No" to open it.



■ Receive notification

You cannot set the receive notification which indicates the completion of ACTION.

■ When setting "Trigger-Source Node"

When setting "Trigger-Source Node" at node in Excel Report action, node type and device are uncertain.

Therefore, the device address is displayed in red. But, it is no problem.

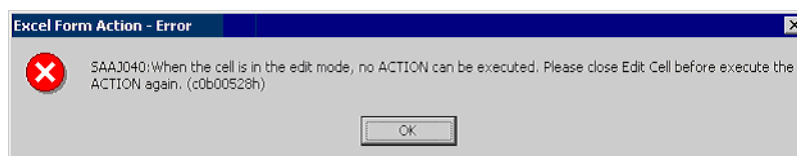
■ About the 1500 row limit for Action Area settings

Exceeding 1500 rows for the Action Area could cause the action to run longer. If you use Device One Shot or Device Logging's text conversion, the action could take even longer.

■ Edit the output file

While Excel Report Action is executing, you can not edit the output file.

Therefore, it becomes very difficult to operate Excel at the setting in which the Trigger condition satisfies at a short cycle. Moreover, the following error message is displayed when the Action is executed during editing the output file.



■ Save the output file Do not use

Do not use multiple Excel form actions to save output files to the same destination.

If you set the same destination for file outputs, Pro-Studio and Pro-Server EX may not be able to run.

■ Restrictions on Copying or Cutting and Pasting the Action Area

When you paste the Action area using Ctrl+C & Ctrl+V or Ctrl+X & Ctrl+V, specify [Target Cell Range] for the copied Action area.

The Action area just after pasting remains the same [Target Cell Range] as that for the original Action area.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |

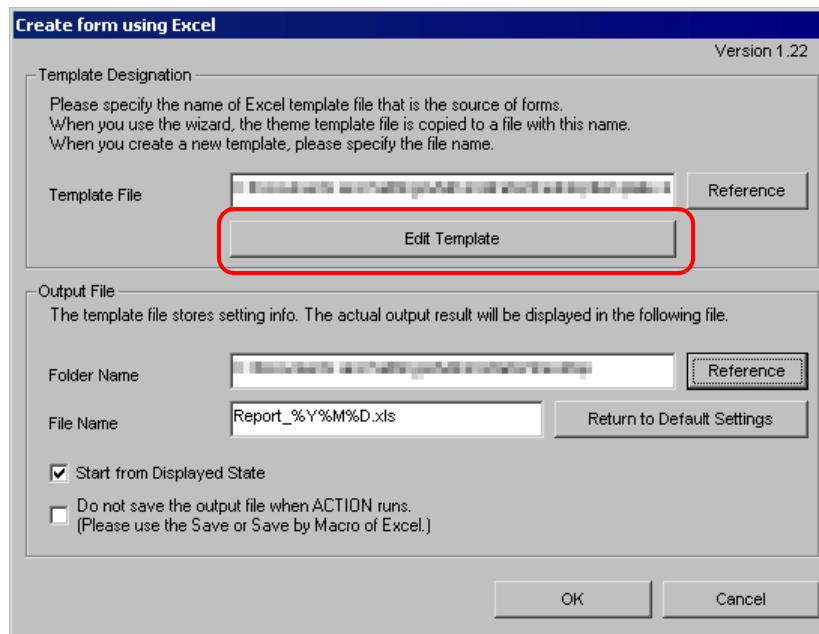
■ When the trigger button does not function normally

After the security patch of Microsoft Office is applied, the trigger button may not function normally. For details, refer to "■When the trigger button in Excel Report does not function normally" of "37.2 Restrictions on Pro-Server EX".

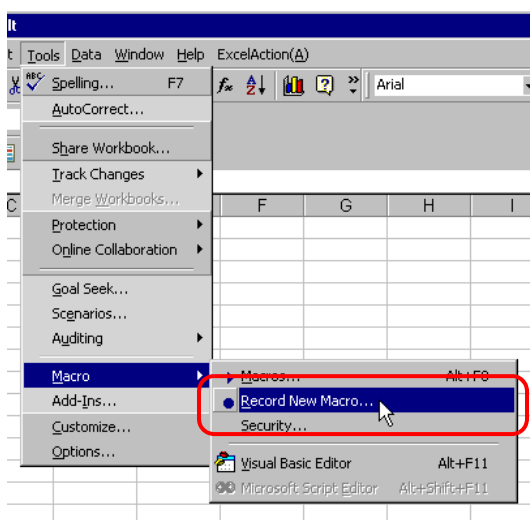
■ Excel Auto Save Function

The Excel auto save function does not operate due to the Excel restrictions. To save automatically, create the Excel save macro using the following procedure and execute the created save macro by Action.

- 1 Open a template you want to save automatically using 'Pro-Studio EX'.

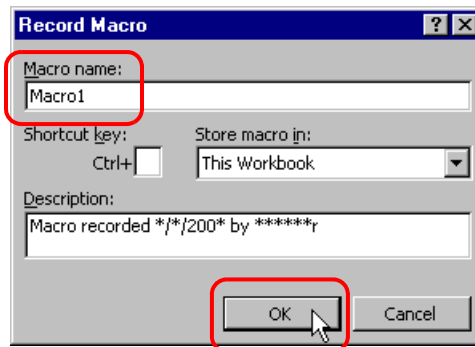


- 2 Select "Macro" and "Record New Macro" from the "Tools" menu.



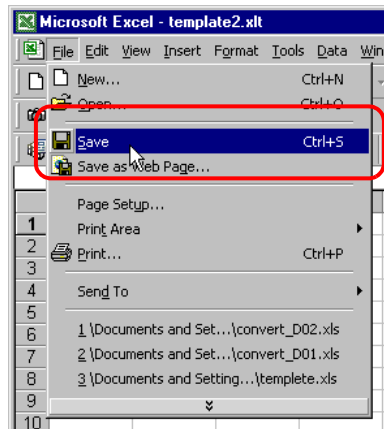
- 3 Enter the macro name "Macro1" and click the [OK] button.

Recording the macro starts.



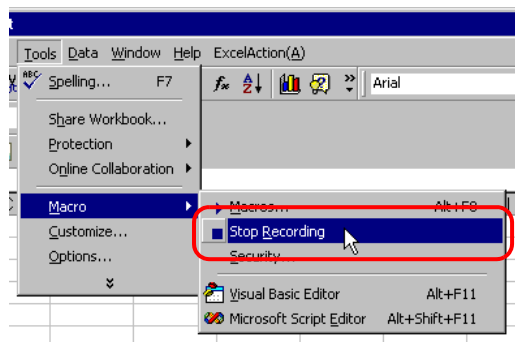
- 4 Select "Save" from the "File" menu.

"Macro1" is recorded in the macro.

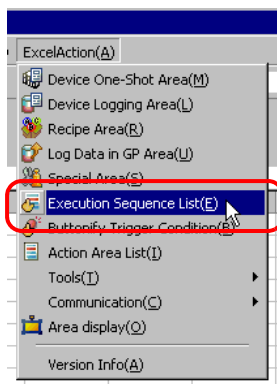


- 5 Select "Macro" and "Stop Recording" from the "Tools" menu.

Recording the macro is complete.

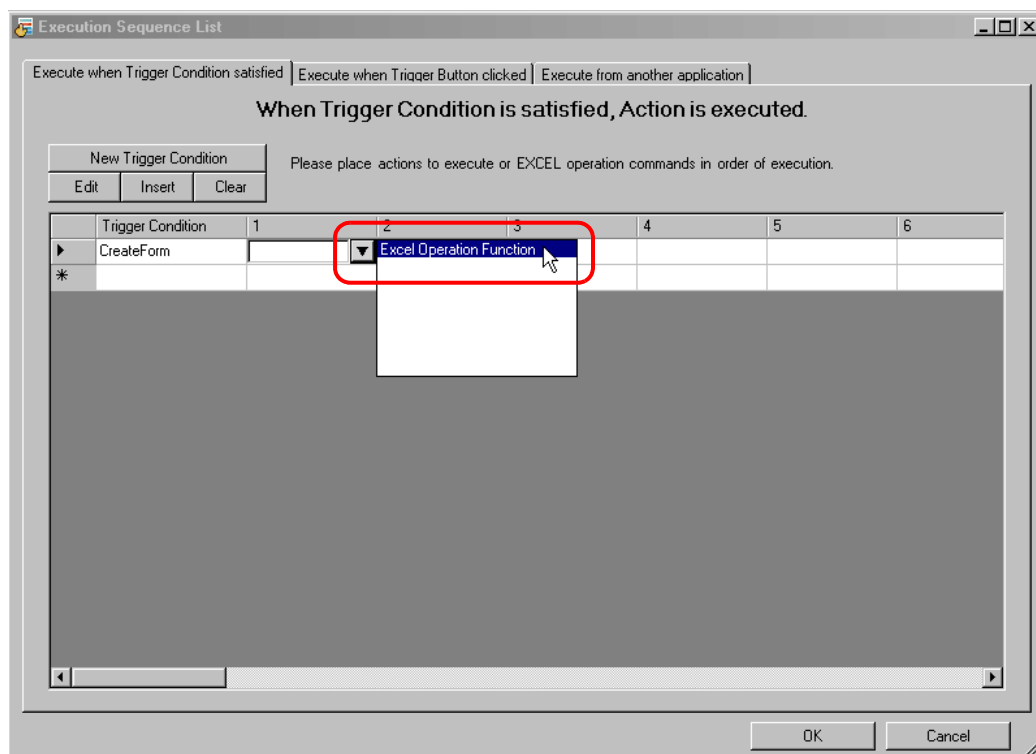


- 6 Select "Execution Sequence List" from the "Excel Action" menu.

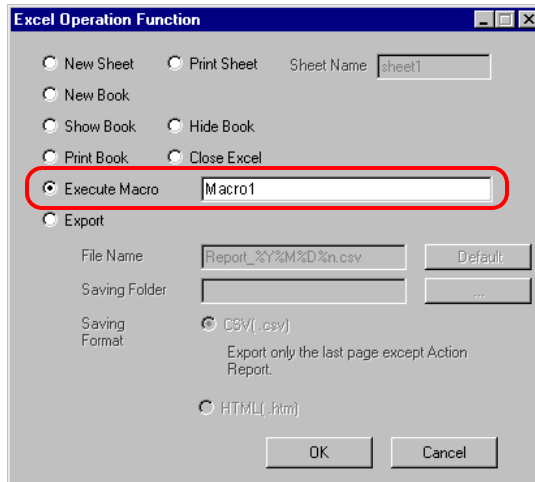


- 7 Create the trigger condition save automatically.

- 8 Select the created trigger condition and "Excel Operation Function".



- 9 Select "Execute Macro" and enter the macro name "Macro1".



- 10 Click the [OK] button.

- 11 Finish editing the template.

- 12 Save/Reload the setting contents.

According to the created trigger condition, the template is automatically saved.

7



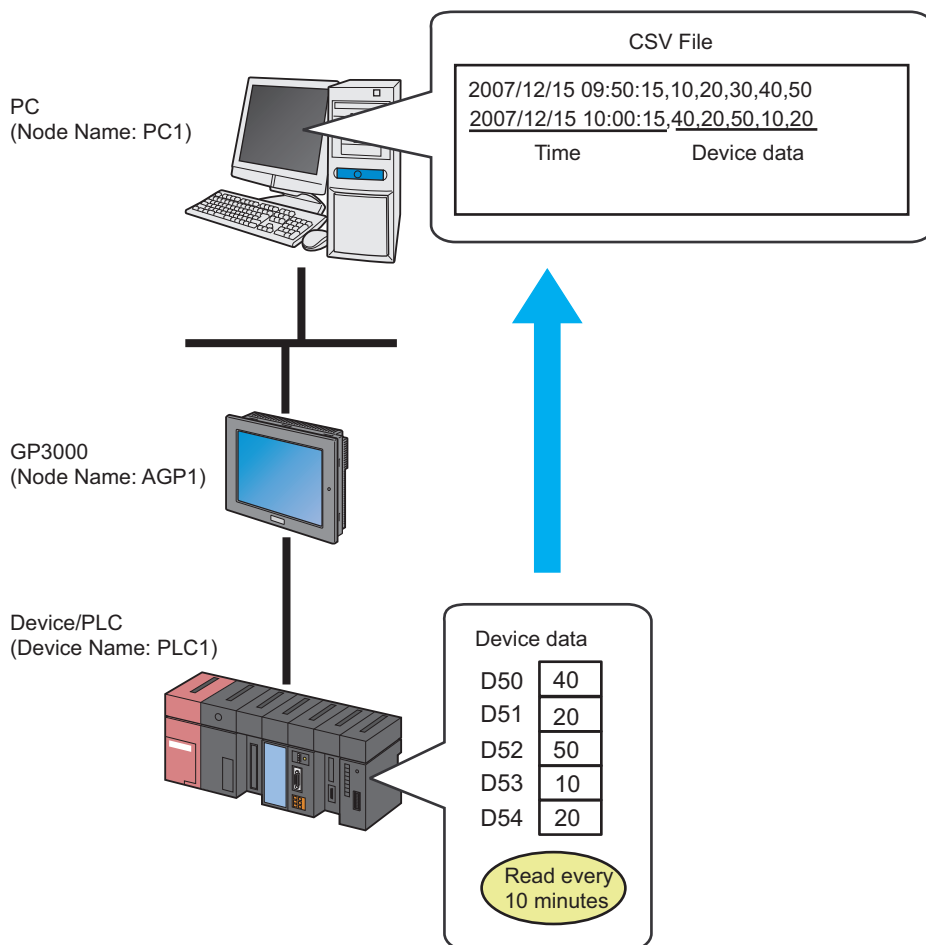
Writing Device/PLC Data in CSV File

| | | |
|-----|--|------|
| 7.1 | Try to Write Device/PLC Data in CSV File | 7-2 |
| 7.2 | Setting Guide | 7-19 |

7.1 Try to Write Device/PLC Data in CSV File

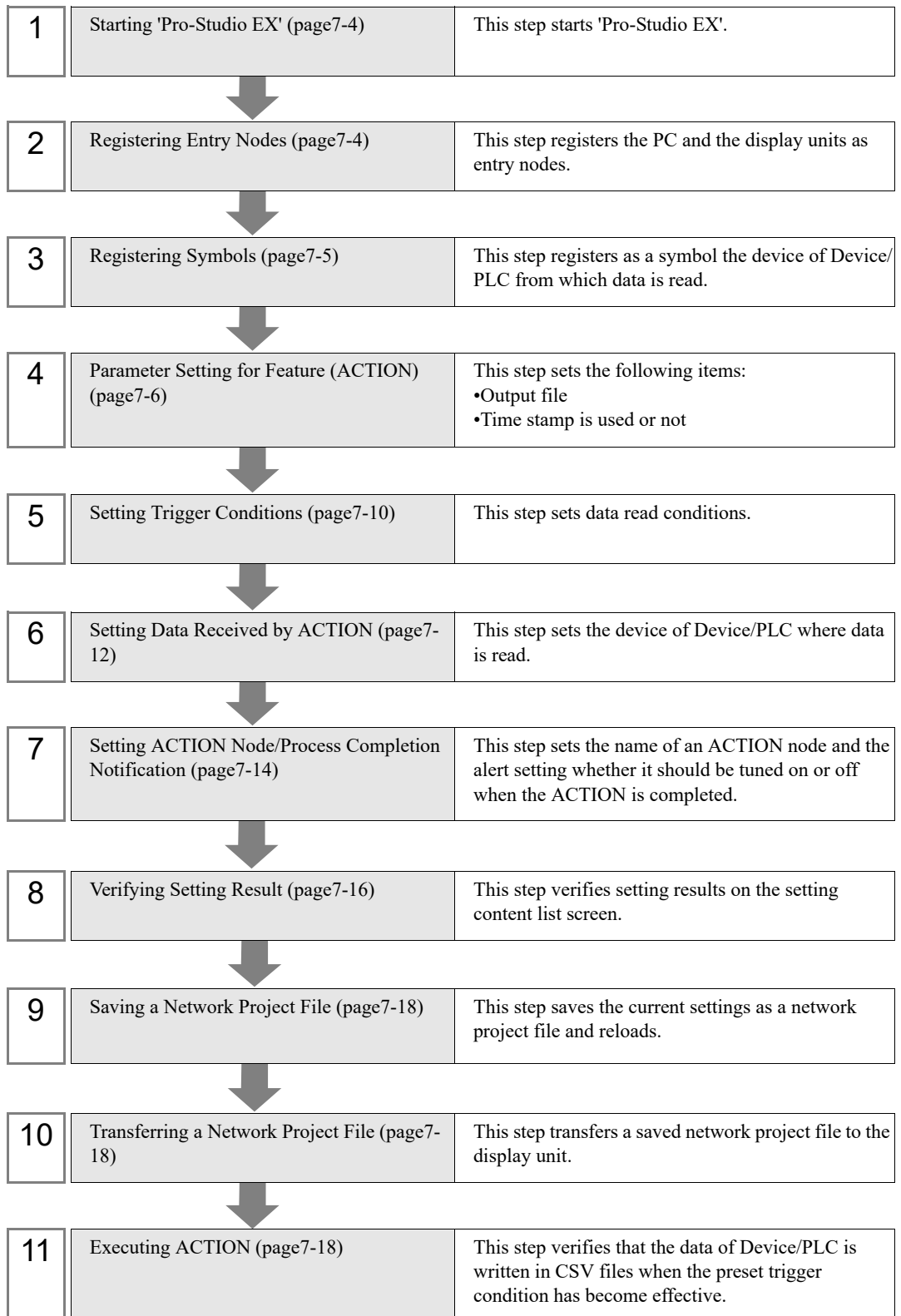
[Action Example]

Write 5 device values of device address (Word device: Address "D50" to "D54") every 10 minutes in CSV file.



This section describes the setting procedures for executing the above action (ACTION) as an example.

[Setting Procedure]



7.1.1 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.
Refer to "3 Trial of Pro-Server EX" for details about starting method.

7.1.2 Registering Entry Nodes

This step registers the PC and the display unit connected with network as nodes.
Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1
IP Address :192.168.0.1



Node Name :AGP1
IP Address :192.168.0.100
Device/PLC Information

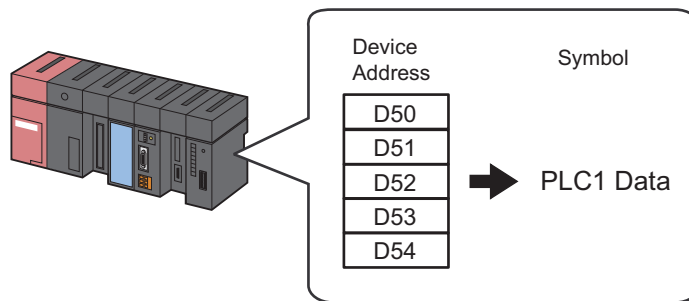
Ex.

| Entry Node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 Series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

7.1.3 Registering Symbols

This step registers as a symbol the device address of Device/PLC from which data is read.

Refer to "32 Symbol Registration" for details about symbols.



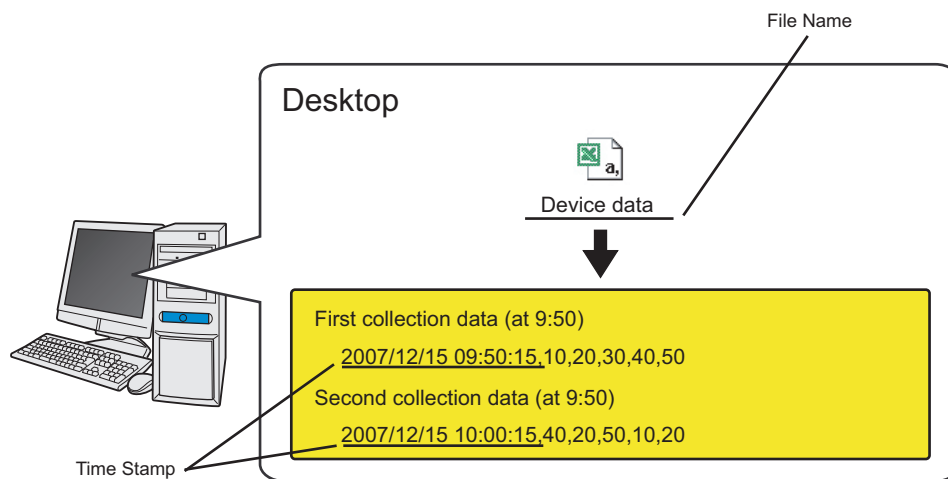
Ex.

| Setting item | Setting content |
|--|-------------------------------------|
| Symbol Name | PLC1 data |
| Data Type | 16Bit (Signed) |
| Device address for symbol registration | "D50" to "D54" of Device/PLC (PLC1) |
| No. of Devices | 5 |

7.1.4 Parameter Setting for Feature (ACTION)

This step makes settings to write data in CSV files. (parameter settings)

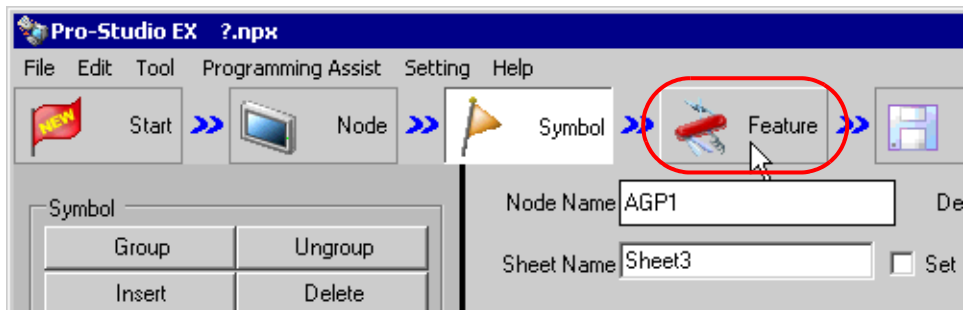
Refer to "7.2 Setting Guide" for more details about ACTION parameter.



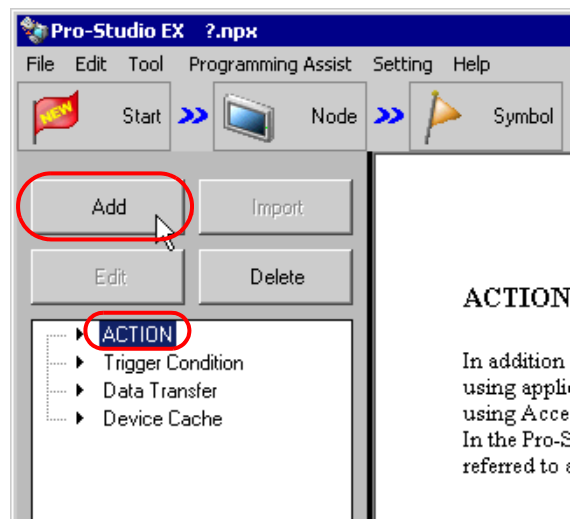
Ex.

| Setting item | Setting content |
|--------------------|---------------------|
| ACTION Name | CSV Upload |
| Where to Save File | PC Desktop |
| Saved File Name | Device data |
| File Save Method | Append data to Book |
| Time Stamp | Forward |

- 1 Click the [Feature] icon on the toolbar.



- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.

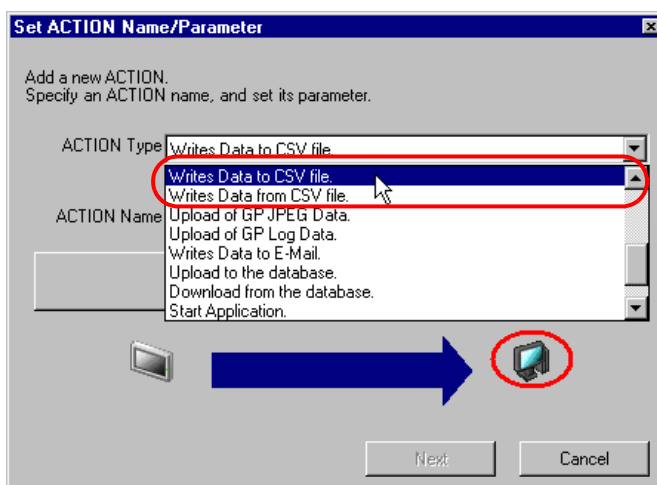
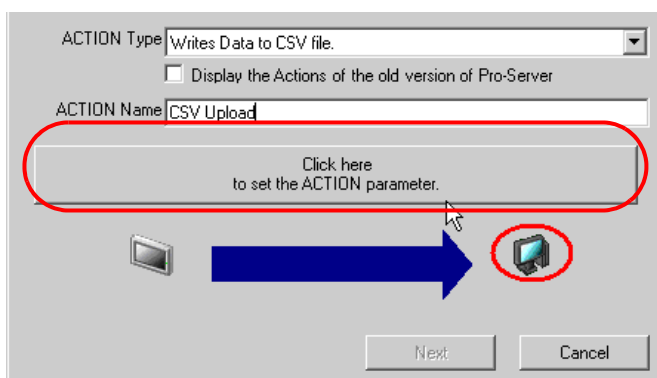


3 Click the [ACTION Type] list button, and select "Writes Data to CSV file."

Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "CSV Upload".

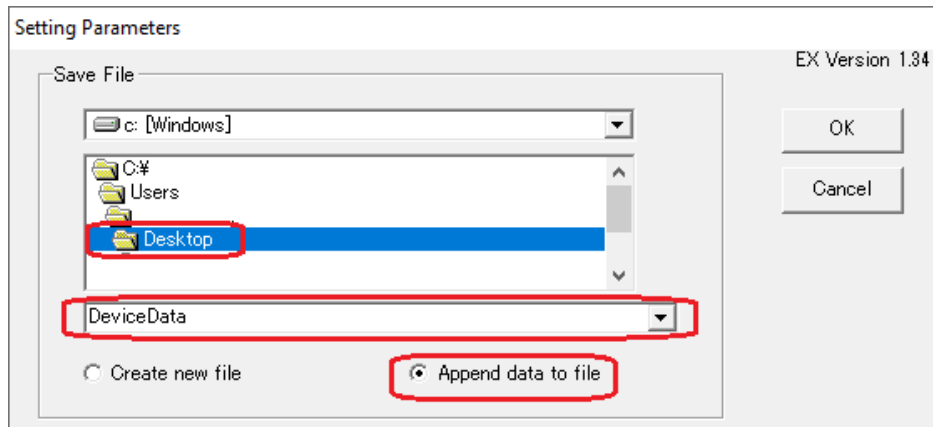
NOTE

- [ACTION Name] can be an arbitrary name.
- When using [Writes Data to CSV file], regardless of the original data type, 8, 16, and 32-bit data is converted to signed 8, 16, and 32-bit data in the CSV output.

**4** Click the [Click here to set the ACTION parameter] button.

5 Make settings regarding an output file.

Set "Desktop" as a destination to save in the upper list box. Enter "Device Data" as the save file name, and check "Append data to file" as the save format.



What is %Y%M%D%h%m%s?

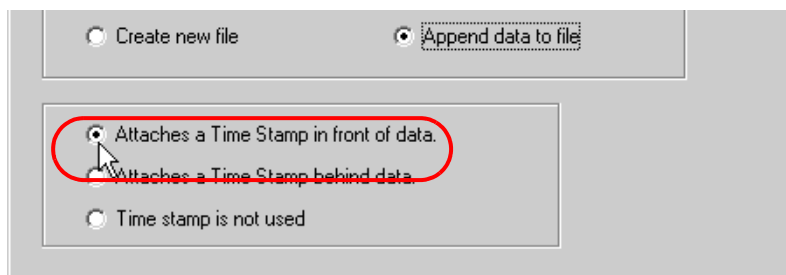
%Y%M%D%h%m%s refers to the time when data has been written and this is saved in the format of "Year_Month_Date_Hour/Minute/Second".

(Example) The file name for which data was written at 9:50:15 on Dec, 15, 2007 becomes "2007_12_15_095015".

Refer to "37.1 Restrictions on Names" for more details.

6 Make settings regarding time stamps.

Check [Attaches a Time Stamp in front of data].



What is a time stamp?

This writes the time in the first or last cell to write data in, referring to the clock of PC.

(Example) If written at 9:50:15 on Dec, 15, 2007, the data will be written in a CSV file in the format of "2007/12/15 09:50:15,data1,data2,data3,..."

7 Click the [OK] button.

This is the end of the feature (ACTION) settings.

7.1.5 Setting Trigger Conditions

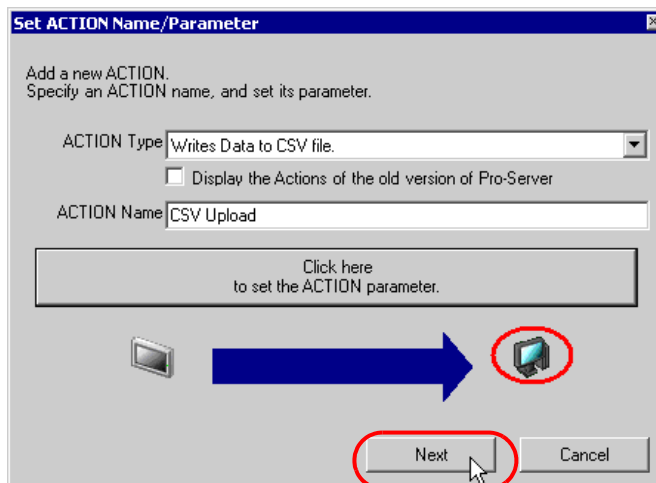
This step sets trigger conditions (every 10 minutes) to read out device data.

Refer to "33 Trigger Conditions" for details about trigger conditions.

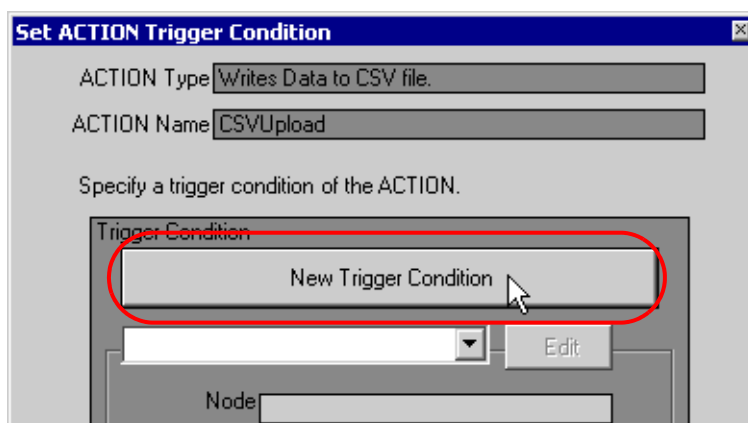
Ex.

- Trigger Condition Name: Collect at constant intervals
- Trigger Condition : 600000ms (10 minutes) cycle

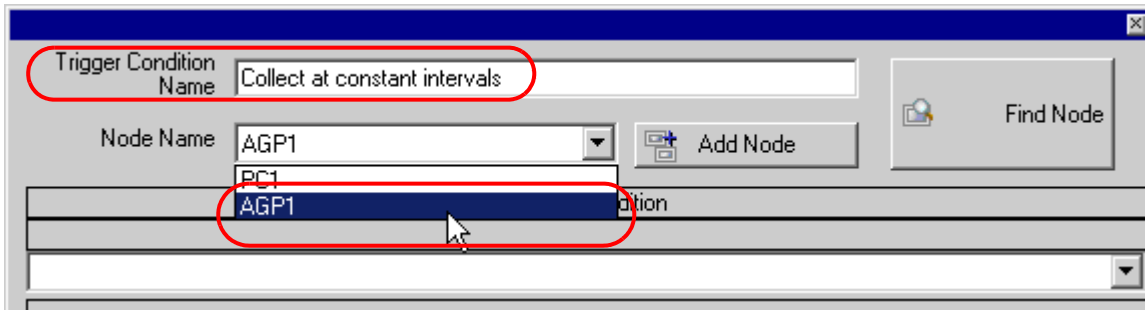
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



2 Click the [New Trigger Condition] button.



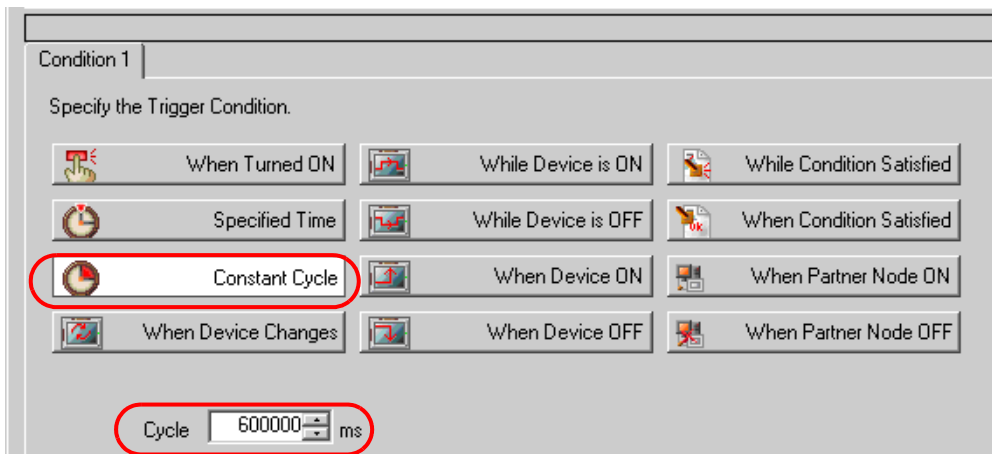
- 3 Enter the trigger condition name "Collect at constant intervals" in [Trigger Condition Name], and select "AGP1" in [Node Name] as a name of the data transfer source.

**NOTE**

- Here, you are to specify the node having the device to be the trigger condition or having data to transfer.

☞ "33 Trigger Conditions"

- 4 Click the [Constant Cycle] button in the [Condition 1] tab, and enter "600000ms" (10 minutes). Then, click the [OK] button.

**NOTE**

- You can also set trigger conditions by combining 2 different types of conditions ("And" condition or "Or" condition).

☞ "33 Trigger Conditions"

This is the end of trigger condition settings.

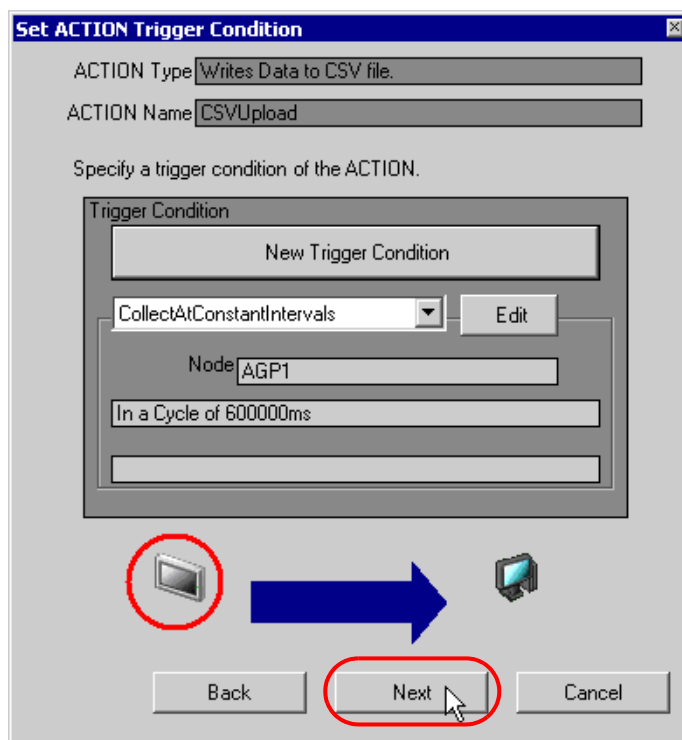
7.1.6 Setting Data Received by ACTION

This step sets data to transfer in ACTION.

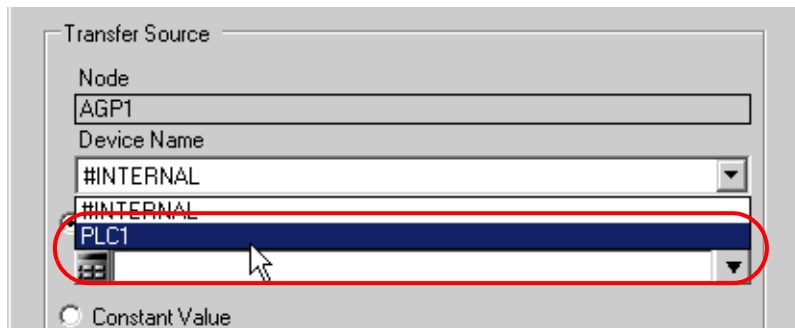
Ex.

- Device Name as Transfer Source: PLC1
- Transfer Source Device: PLC1 symbol "PLC1 data"

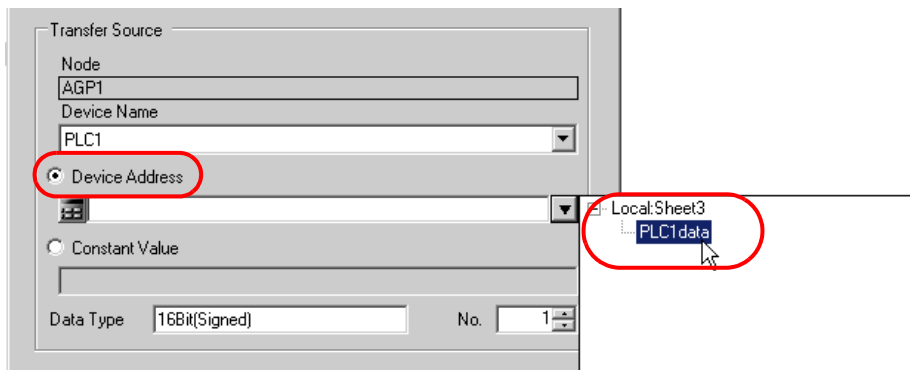
1 On the "Set ACTION Trigger Condition" screen, click the [Next] button.



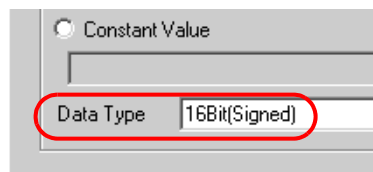
- 2 Click the list button of [Device Name] and select "PLC1" for the Device/PLC reading data from.



- 3 Click [Device Address] and then the list button to select "PLC1 data" for the symbol name of the Device/PLC "PLC1" reading data from.



[Data Type] automatically appears after selection, too.



NOTE • You can transfer any constant number instead of device values.

This is the end of the setting of data received by ACTION.

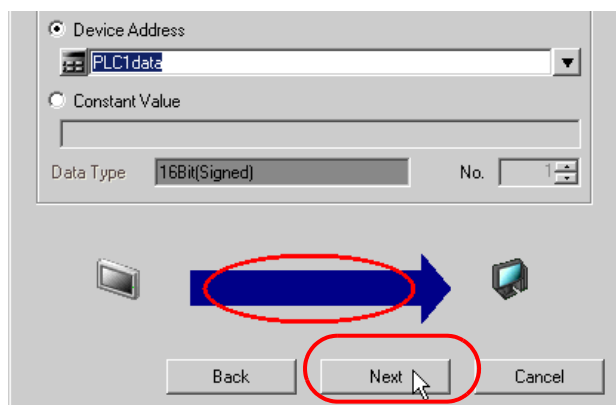
7.1.7 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be turned on or off when the ACTION is completed.

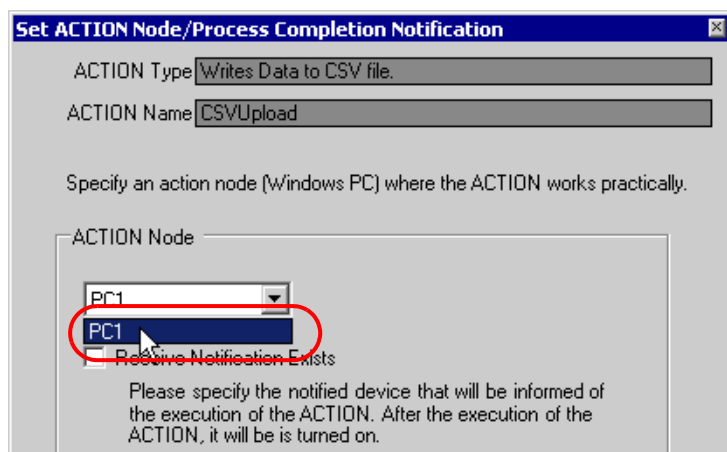
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

1 On the "Data settings to be received by ACTION" screen, click the [Next] button.



2 Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates. Also, clear the check if [Receive Notification Exists] has been checked.



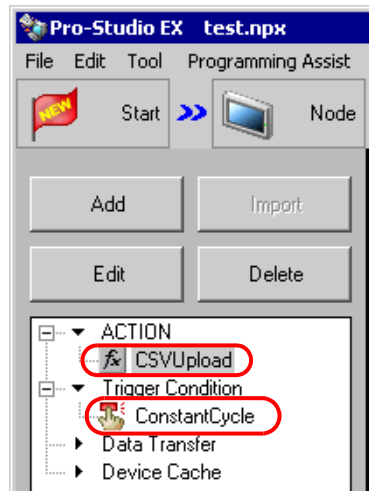
NOTE

- When "Receive Notification Exists" is turned on, the specified bit device will be turned on when the ACTION is completed. This can be used as a trigger condition (trigger) of the subsequent ACTION when you want to execute two or more ACTIONS sequentially.

☞ "33 Trigger Conditions"

3 Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the ACTION and trigger condition names you set will appear.

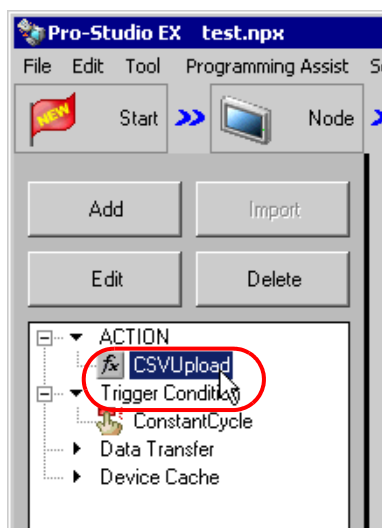


This is the end of the settings of the ACTION node and process completion notification.

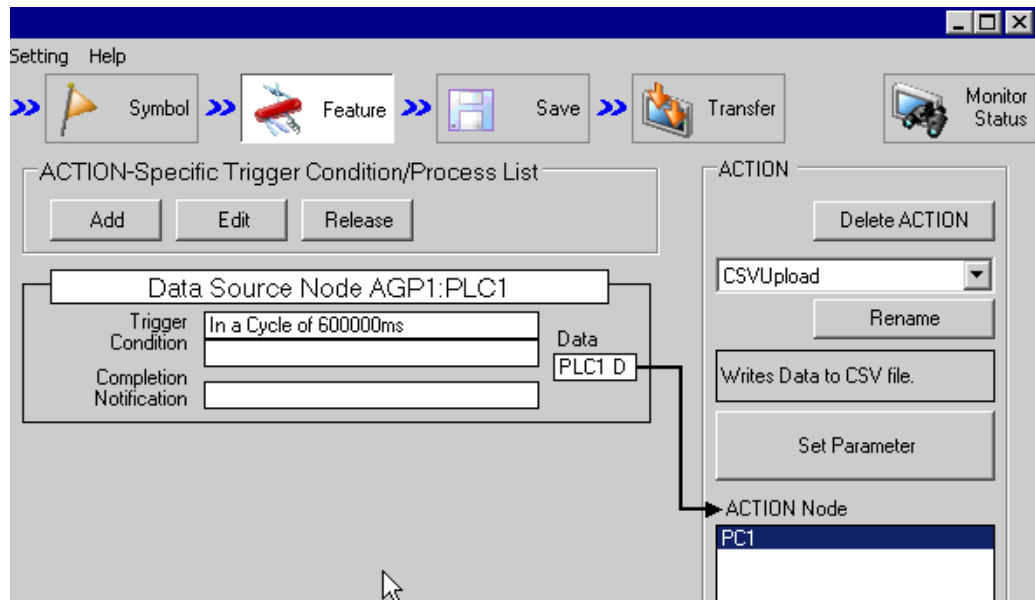
7.1.8 Verifying Setting Result

This step verifies setting results on the setting content list screen.

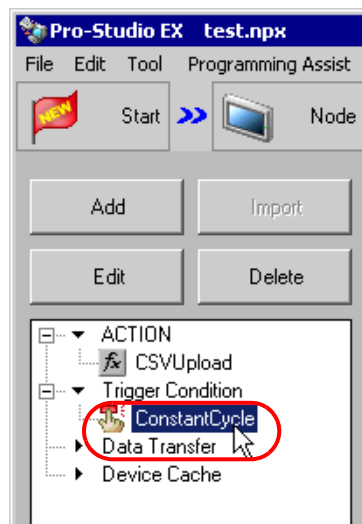
- 1 Select the ACTION name "CSV Upload" from the tree display on the left of the screen.



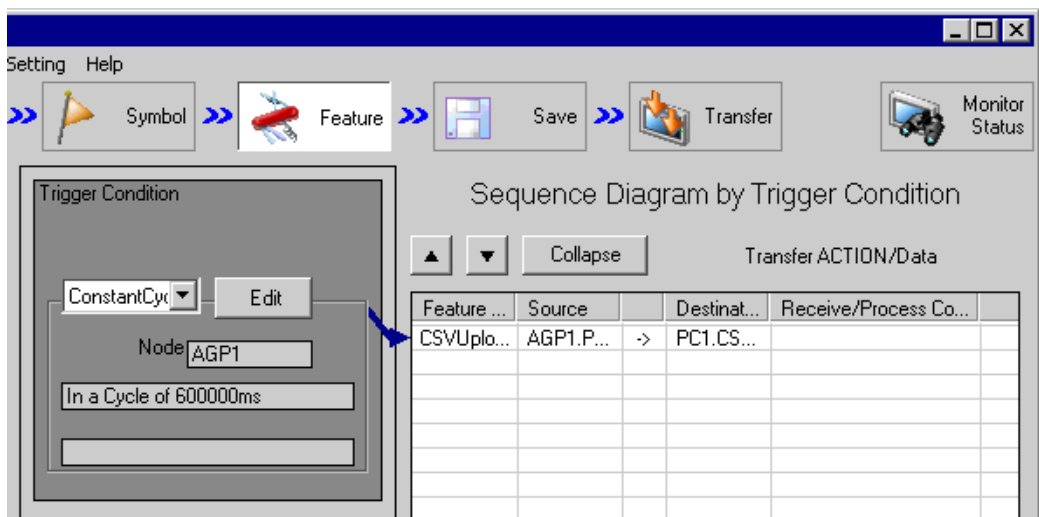
Confirm that the setting content appears on the right of the screen.



- 2 Select the trigger condition name "ConstantCycle" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

7.1.9 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
- Be sure to reload the network project file to 'Pro-Server EX' If not, ACTION will not work.

Ex.

- Path of network project file : Desktop\CSV_upload.npxe
- Title : CSV upload action

7.1.10 Transferring a Network Project File

This step transfers a saved network project file to entry nodes.

Refer to "26 Transferring" for details about transferring a network project file.

NOTE

- Be sure to transfer a network project file. If not, ACTION will not work.

7.1.11 Executing ACTION

Confirm that ACTION activates at every 10 minute interval, and at the first collection creates the CSV file (File Name: "device data.csv") on the desktop, and then writes 5 device data into it. Also, confirm device data is additionally written in 10 minute cycle.

| | A | B | C | D | E | F | G |
|---|------------------|----|----|----|----|----|---|
| 1 | 2007/12/15 9:50 | 10 | 20 | 30 | 40 | 50 | |
| 2 | 2007/12/15 10:00 | 40 | 20 | 50 | 10 | 20 | |
| 3 | 2007/12/15 10:10 | 20 | 10 | 40 | 50 | 30 | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |

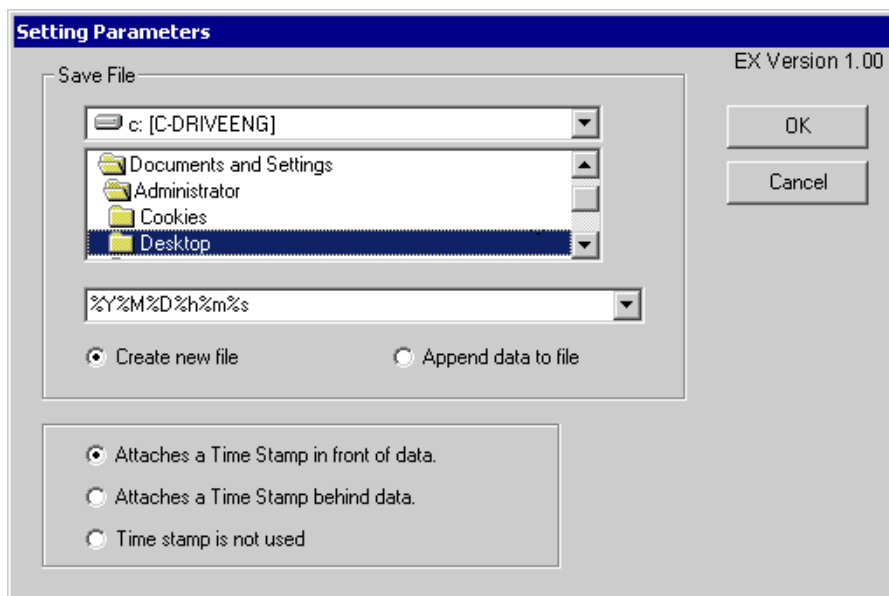
This is the end of the explanation of this ACTION.

NOTE

- If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".

7.2 Setting Guide

This section explains how to set the parameters of ACTION.



| Setting item | | Setting content |
|--------------|--------------------|---|
| Save File | Where to Save File | <p>Selects the folder to save a CSV file to create.</p> <p>C drive (C:) folder is to appear for initial setting.</p> <p>To change the drive to display, click the list button to select new one.</p> |
| | Saved File Name | <p>Sets the file name to save.</p> <p>"Y%M%D%h%m%s" is to appear for initial setting. If you do not change the file name, time data of PC is to set for "%" position.</p> <p>NOTE</p> <ul style="list-style-type: none"> By designating a macro code for the file name to save, you can set the file name as a node name or device data. <p> "37.1 Restrictions on Names"</p> |

| Setting item | | Setting content |
|--|---------------------|---|
| Save File | Create new file | <p>Check this option to always write the collected data in a new file. In this case, put the saved file name using such macro as "%Y%M%D%h%m%s" (time) to be different from the one on the previously collected point. If the file name is same as the one on the previously collected point, the new file overwrites the previous file, which results that no history remains. Refer to "37.1 Restrictions on Names" for more details on macros.</p> <p>(Example)</p> <p>----- First collection (Collected at 9:50:15 on Dec. 15, 2007) -----</p> <ul style="list-style-type: none"> File name (Year, month, day, and time are separated inbetween with underbars.) 2007_12_15_095015 Data format for collecting 2007/12/15 09:50:15,10,20,30,40,50 <p>----- Second collection (Collected at 10:00:15 on Dec. 15, 2007) -----</p> <ul style="list-style-type: none"> File name 2007_12_15_100015 Data format for collecting 2007/12/15 10:00:15,40,20,50,10,20 |
| | Append data to file | <p>Check this option to add the collected data in the specified file. In this case, put the save file name to be same as the previous one. If the file name is different from the one on the previously collected point, the current data is written in a new file.</p> <p>(Example)</p> <ul style="list-style-type: none"> File name 2007_12_15_095015 Data format for collecting (Displayed on a newer line for the second and after.) 2007/12/15 09:50:15,10,20,30,40,50 2007/12/15 10:00:15,40,20,50,10,20 <p style="text-align: center;">• •</p> |
| Attaches a Time Stamp in front of data | | <p>Attaches the time of transfer at the head of transferred data.</p> <p>(Example) If transferred at 9:50:15 on Dec, 15, 2007, the data will be written in a CSV file in the format of "2007/12/15 09:50:15,data1,data2,data3,...".</p> |
| Attaches a Time Stamp behind data | | <p>Attaches the time of transfer behind transferred data.</p> <p>(Example) If transferred at 9:50:15 on Dec. 15, 2007, the data will be written in a CSV file in the format of "data1, data2, data3,..., 2007/12/15 09:50:15".</p> |
| Time Stamp is not used | | Not add time information |

8



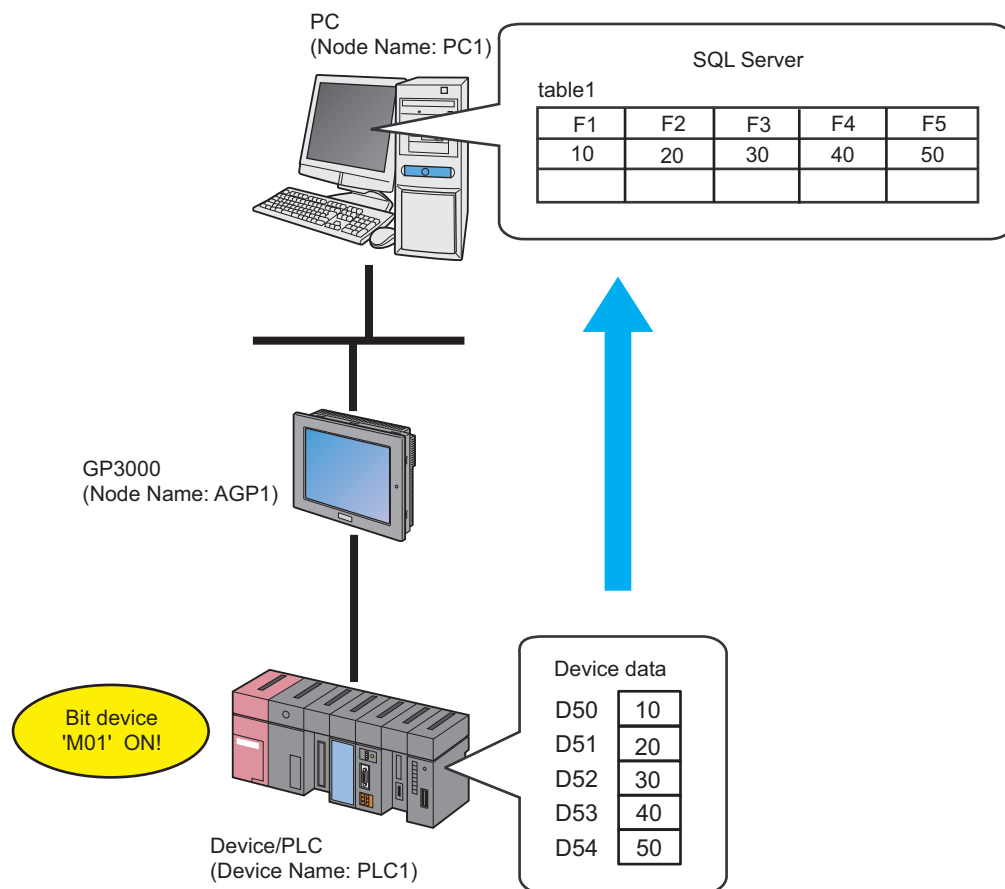
Writing Device/PLC Data in Database

| | | |
|-----|--|------|
| 8.1 | Try to Write Device/PLC Data in Database | 8-2 |
| 8.2 | Setting Guide | 8-23 |

8.1 Try to Write Device/PLC Data in Database

[Action Example]

Detect the rising of the trigger device (bit device: "M01") of Device/PLC, read device address (word device: address "D50" to "D54") values specified in an Excel file table, and write the values into the specified relational database field.



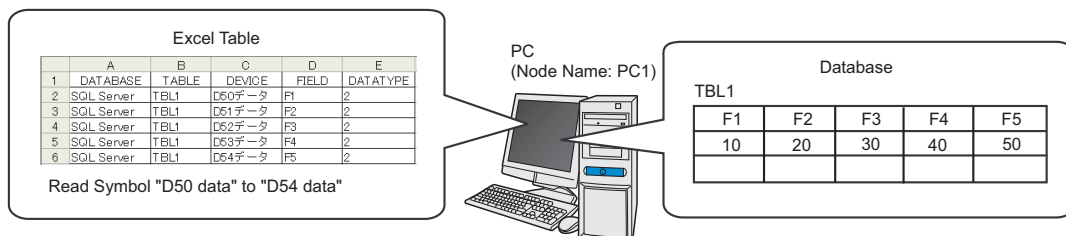
This section describes the setting procedures for executing the above action (ACTION) as an example.

[Setting Procedure]

| | | |
|----|--|---|
| 1 | Creating a Table (page8-4) | This step creates a table to specify the device to read data from or the database to read data in. |
| 2 | Starting 'Pro-Studio EX' (page8-7) | This step starts 'Pro-Studio EX'. |
| 3 | Registering Entry Nodes (page8-7) | This step registers the PC and the display units as |
| 4 | Registering Symbols (page8-8) | This step registers as a symbol the device of Device/PLC which serves as a trigger condition (trigger) and also a data read destination. |
| 5 | Parameter Setting for Feature (ACTION) (page8-9) | This step sets the following items: <ul style="list-style-type: none"> • Database information • Database/Device address setting file • File location |
| 6 | Setting Trigger Conditions (page8-13) | This step sets data read conditions (trigger). |
| 7 | Setting Data Received by ACTION (page8-16) | This step sets a constant value to transfer. |
| 8 | Setting ACTION Node/Process Completion Notification (page8-17) | This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed. |
| 9 | Verifying Setting Result (page8-19) | This step verifies setting results on the setting content list screen. |
| 10 | Saving a Network Project File (page8-21) | This step saves the current settings as a network project file and reloads. |
| 11 | Transferring a Network Project File (page8-21) | This step transfers a saved network project file to the display unit. |
| 12 | Executing ACTION (page8-22) | This step verifies that device data is written in database when the preset trigger condition has become effective. |

8.1.1 Creating a Table

This step creates a table to specify the device to read data from or the database to read data in.



You can create a table using the following file formats:

- Excel

| | A | B | C | D | E |
|---|----------|--------|--------|--------|----------|
| 1 | DATABASE | TABLE | DEVICE | FIELD | DATATYPE |
| 2 | DBA | table1 | D1 00 | field1 | 2 |
| 3 | DBA | table1 | D1 01 | field2 | 2 |
| 4 | DBB | table2 | D1 02 | field3 | 2 |

- Access

| | DATABASE | TABLE | DEVICE | FIELD | DATATYPE |
|--|----------|--------|--------|--------|----------|
| | DBA | table1 | D100 | field1 | 2 |
| | DBA | table1 | D101 | field2 | 2 |
| | DBB | table2 | D102 | field3 | 2 |

- CSV

```

DATABASE,TABLE,DEVICE,FIELD,DATATYPE
DBA,table1,D100,field1,2
DBA,table1,D101,field2,2
DBA,table2,D102,field3,2

```

NOTE

- When running an action that repeats, create the table in Excel or CSV.
If created with Access, you cannot run an action that repeats.

The following uses Excel as an example in the descriptions. The same applies when using other file formats.

- 1 Start Excel and create the table below.

| DATABASE | TABLE | DEVICE | FIELD | DATATYPE |
|------------|-------|----------|-------|----------|
| SQL Server | TBL1 | D50 data | F1 | 2 |
| SQL Server | TBL1 | D51 data | F2 | 2 |
| SQL Server | TBL1 | D52 data | F3 | 2 |
| SQL Server | TBL1 | D53 data | F4 | 2 |
| SQL Server | TBL1 | D54 data | F5 | 2 |

Below are the contents of each item of this table.

[DATABASE]

Set the name of the database in which data is written.

[TABLE]

Set the table name of the database in which data is written.

[DEVICE]

Set the device or symbol name of the device from which data is read.

[FIELD]

Set the field of the database table in which data is written.

[DATATYPE]

Set the type of data to write.

Specify a data type as the following table shows.

| Value | Data type | Value | Data type |
|-------|---------------------------------|-------|---------------------------------|
| 1 | Bit | 11 | Double-precision floating point |
| 2 | Decimal 16 bit signed | 12 | Character string |
| 3 | Decimal 16 bit unsigned | 13 | Decimal 8 bit signed |
| 4 | Hexadecimal 16 bits | 14 | Decimal 8 bit unsigned |
| 5 | BCD 16 bits | 15 | Hexadecimal 8 bit |
| 6 | Decimal 32 bit signed | 16 | BCD 8 bit |
| 7 | Decimal 32 bit unsigned | 17 | TIME data |
| 8 | Hexadecimal 32 bits | 18 | TIME_OF_DAY Data |
| 9 | BCD 32 bits | 19 | DATE Data |
| 10 | Single precision floating point | - | |

NOTE

- Be sure to enter table item names like [DATABASE] or [TABLE] in the first row of Excel sheets.
- When "12" (character string) is set to [TYPE], read 255 characters from the device address specified in [DEVICE] and write the data until NULL of the character string in the database.
- When you want to specify two or more Device/PLC devices, set a device name and a device address to [DEVICE].

Example: [PLC1]D100

- There is a sample file (ProDB.xls) of an Excel table in the "PRO-SDK" folder where Pro-Server EX has been installed. Use this as a template when creating a table. (When installed as standard, the directory is C:\Program Files\Pro-face\Pro-Server EX\PRO-SDK.)

The "PRO-SDK" folder is located on the following path when installed as standard.

C:\Program File(x86)\Pro-face\Pro-Server EX\PRO-SDK

-
- 2 Save it with the file name "exceltable.xls" on PC desktop after creating.

8.1.2 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

8.1.3 Registering Entry Nodes

This step registers as entry nodes the PC and the display units which serve as trigger conditions (trigger).

Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1

IP Address :192.168.0.1



Node Name :AGP1

IP Address :192.168.0.100

Subnet Mask :255.255.255.0

Device/PLC Information

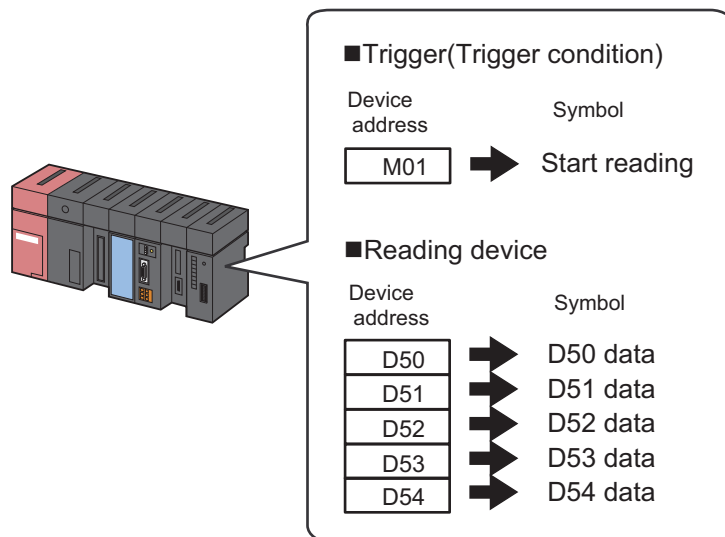
Ex.

| Entry node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

8.1.4 Registering Symbols

This step registers as a symbol the device address of Device/PLC which serves as a trigger condition and from which data is read.

Refer to "32 Symbol Registration" for details about symbols.



Ex.

- Trigger (Trigger Condition)

| Setting item | Setting content |
|--|----------------------------|
| Symbol Name | Start reading |
| Data Type | Bit |
| Device address for symbol registration | "M01" of Device/PLC (PLC1) |
| No. of Devices | 1 |

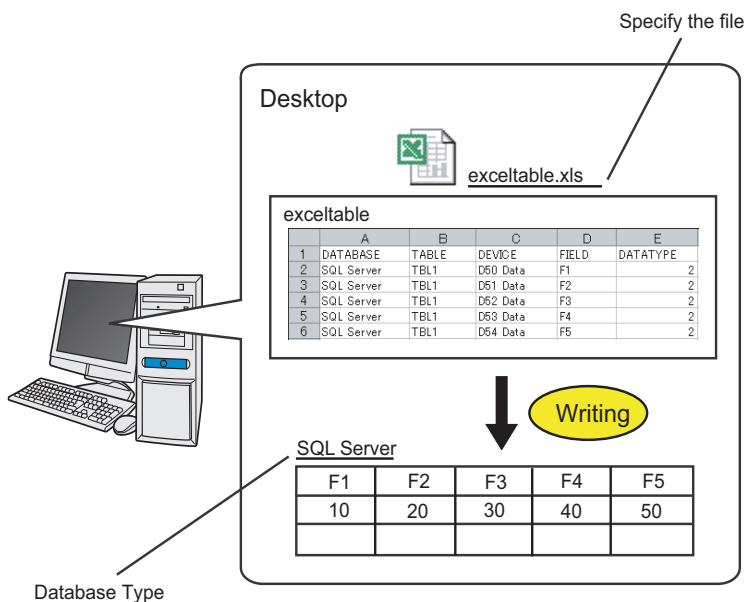
- Reading Device

| Setting item | Setting content | | | | |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Symbol Name | D50 data | D51 data | D52 data | D53 data | D54 data |
| Data Type | 16Bit (Signed) | | | | |
| Device address for symbol registration | "D50" of Device/PLC (PLC1) | "D51" of Device/PLC (PLC1) | "D52" of Device/PLC (PLC1) | "D53" of Device/PLC (PLC1) | "D54" of Device/PLC (PLC1) |
| No. of Devices | 1 | 1 | 1 | 1 | 1 |

8.1.5 Parameter Setting for Feature (ACTION)

This step makes settings to write device data in database. (parameter settings)

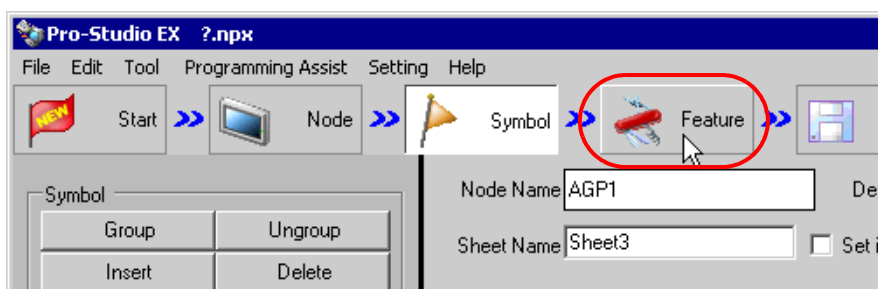
Refer to "8.2 Setting Guide" for more details about ACTION parameters.



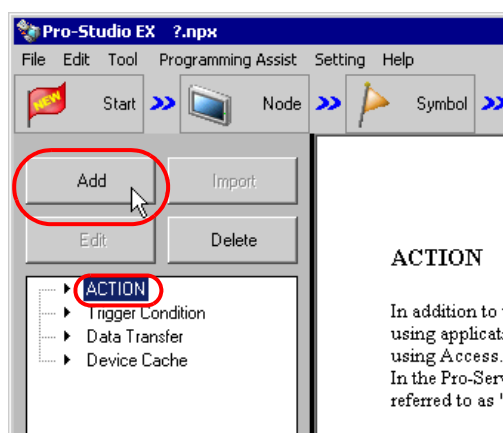
Ex.

| Setting item | Setting content |
|--------------------------------------|---|
| Login Name | login |
| Password | abcde |
| Server Name | server |
| Database Type | SQL Server |
| Database/Device address setting file | Excel (access database directly) |
| File location | C:\Users\<<User name>>\Desktop\exceltable.xls |

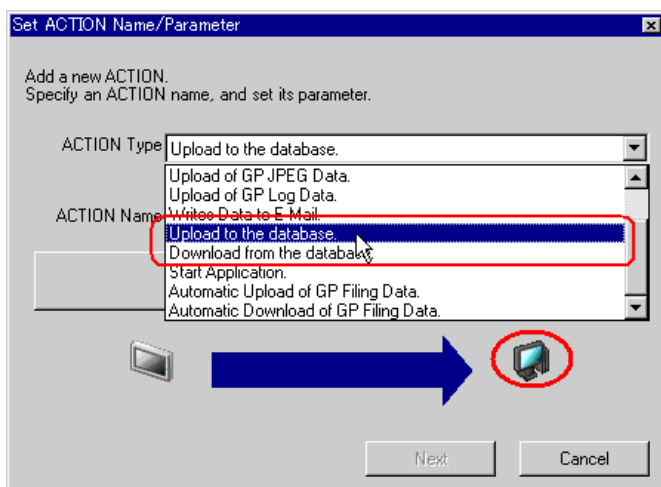
- 1 Click the [Feature] icon on the status bar.



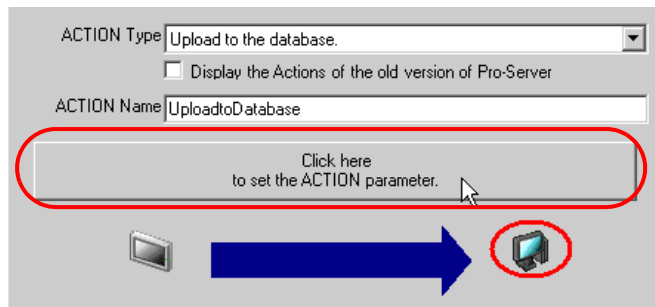
- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.



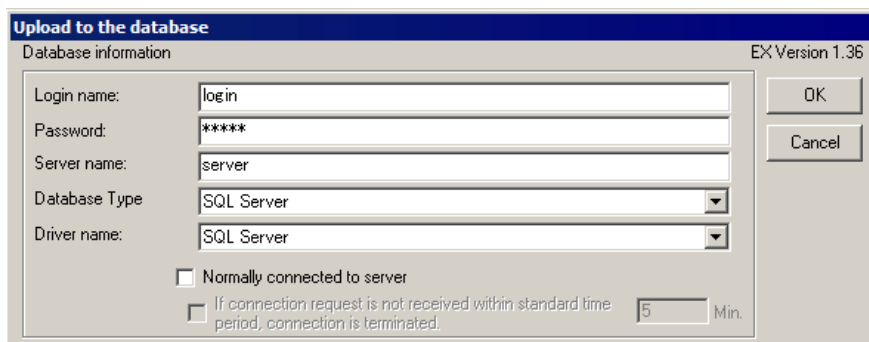
- 3 Click the [ACTION Type] list button, and select "Upload to the database".
Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "UploadtoDatabase".



- 4 Click the [Click here to set the ACTION parameter] button.



- 5 Make settings regarding a database.



- 1) Set "login" in [Login name] and "abcde" in [Password] to access the database server with, and "server" in [Server name] for the database server PC name.

NOTE • Enter "PC Name" or "IP Address" of the database server in [Server name].

- 2) Set "SQL Server" in [Database Type].

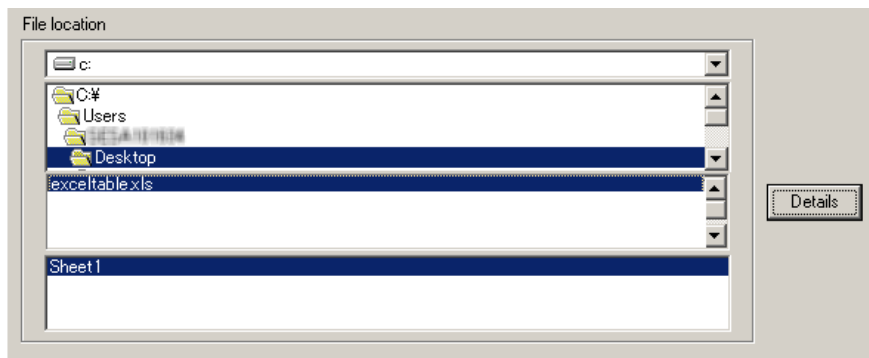
NOTE

- When selecting [Oracle ODBC Driver], you cannot specify [Server name].
- Supports Oracle8, 10g, and 11g. However, cannot run on 64-bit operating systems.
- Use [Oracle ODBC Driver] with version 8.0.5.5.0 or later. If it is earlier than the specified version, the "Reverse set does not support the scroll in the reversed direction" message is displayed and the Action ends.
- [DSN] supports Access only.
- When selecting [DSN], enter nothing in [Server name].
- Do not search when opening with the Access design view.
- For [SQL Server], use SQL Server authentication. Windows authentication is not supported.

- 3) Set "SQL Server" in [Driver name].

- 6 In [Database/Device address setting file], set up with Excel (access database directly).

7 Make settings regarding a file (a table).



- 1) Set "Desktop" as a destination to save in the upper list box.
- 2) Select the Excel table file name "exceltable.xls".

8 Click the [OK] button.

This is the end of the feature (ACTION) settings.

8.1.6 Setting Trigger Conditions

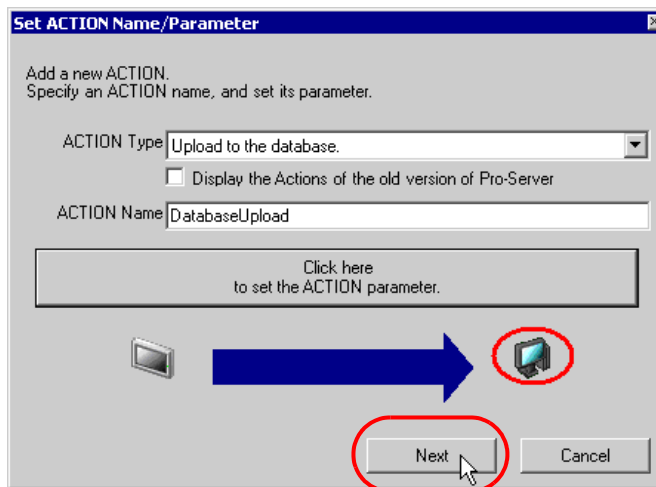
This step sets a trigger condition (trigger bit ON) to read out device data.

Refer to "33 Trigger Conditions" for details about trigger conditions.

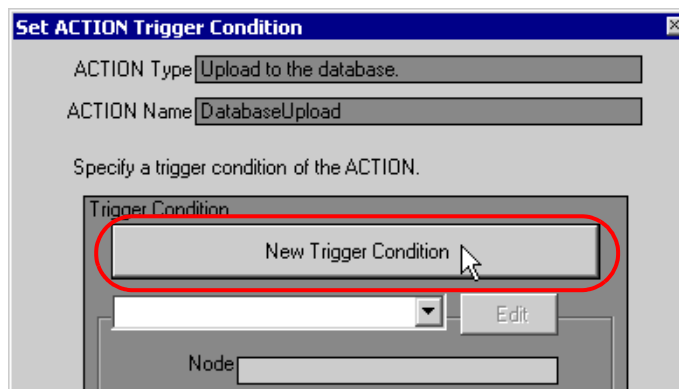
Ex.

- Trigger Condition Name: Turn on read start bit
- Trigger Condition: When "Start reading" (M01) is ON

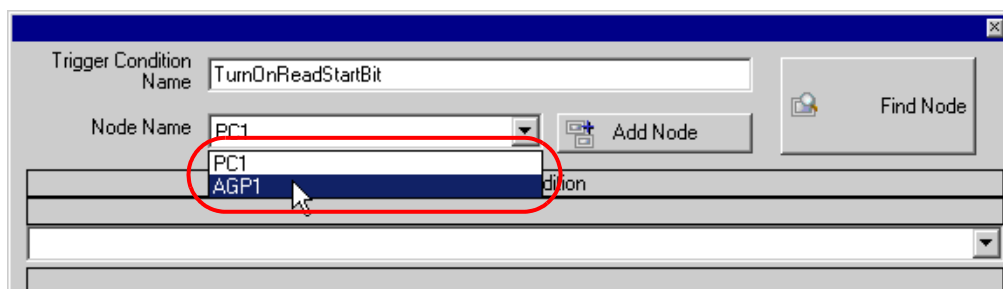
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



2 Click the [New Trigger Condition] button.



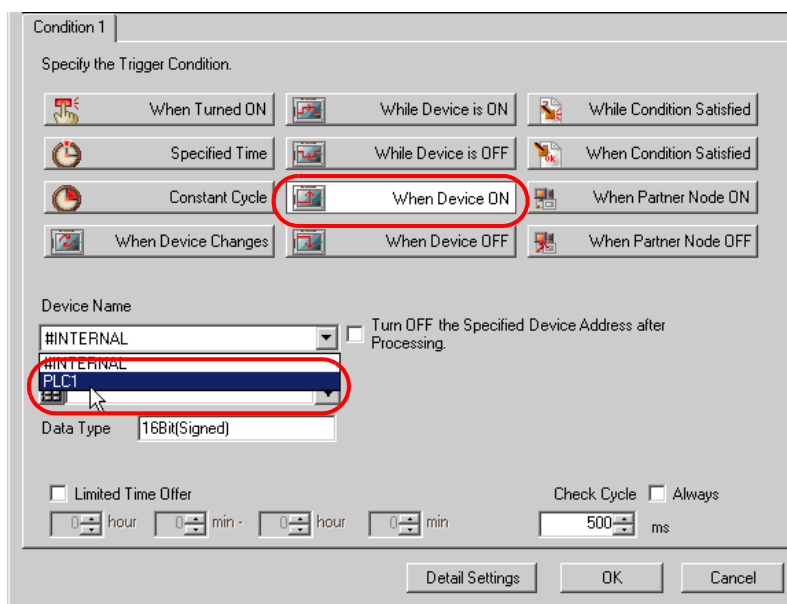
- 3 Enter the trigger condition name "TurnOnReadStartBit" in [Trigger Condition Name], and select "AGP1" in [Node Name] which has the device to serve as the trigger condition (trigger).



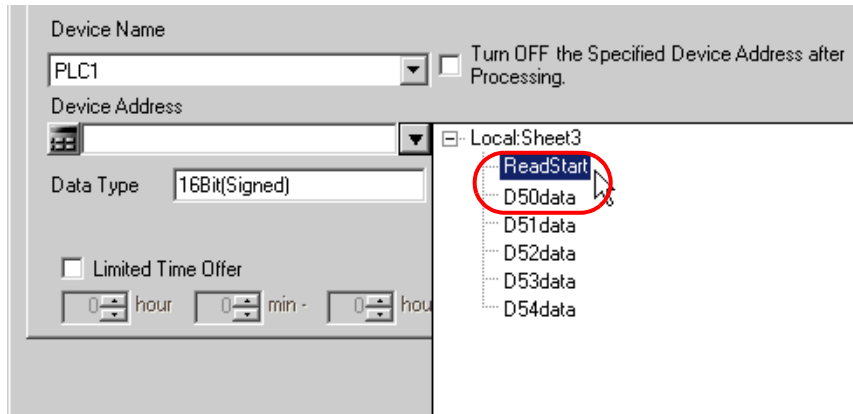
NOTE • Here, you are to specify the node having the device to be the trigger condition or having data to transfer.

☞ "33 Trigger Conditions"

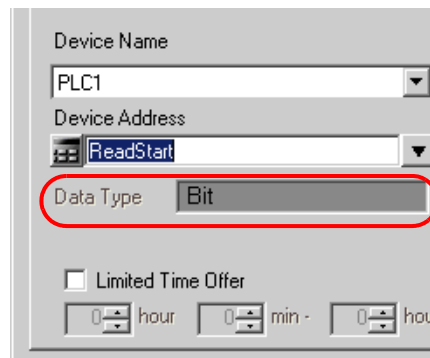
- 4 Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



- 5 Click the [Device Address] list button and select "Read Start" for the device symbol name which serves as the trigger.



[Data Type] automatically appears after selection, too.



NOTE

- You can also set trigger conditions by combining 2 different types of conditions ("And" condition or "Or" condition).

☞ "33 Trigger Conditions"

- 6 Click the [OK] button.

This is the end of trigger condition settings.

8.1.7 Setting Data Received by ACTION

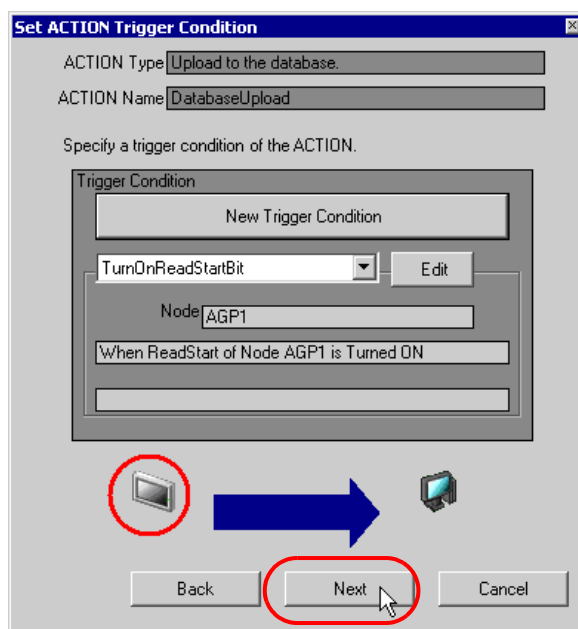
This step sets data to transfer in ACTION.

Any constant value is acceptable as data to transfer.

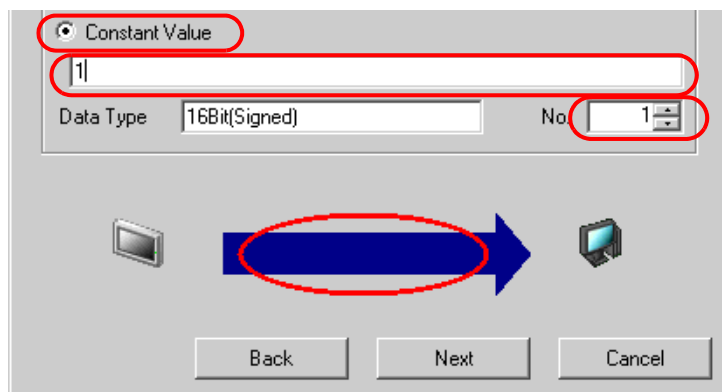
[Setting Example]

- Constant value to transfer: 1

- 1 On the "Set ACTION Trigger Condition" screen, click the [Next] button.



- 2 After clicking [Constant Value], enter "1" in the text box for the constant value to transfer and "1" in [No.].



This is the end of the setting of data received by ACTION.

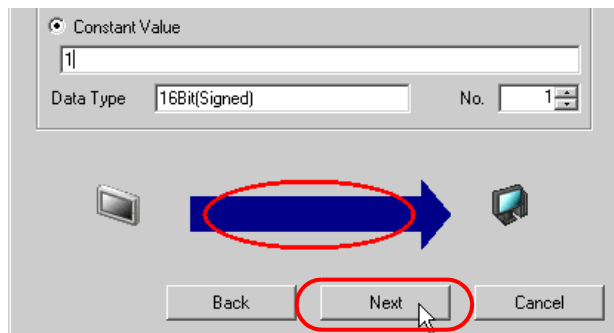
8.1.8 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be turned on or off when the ACTION is completed.

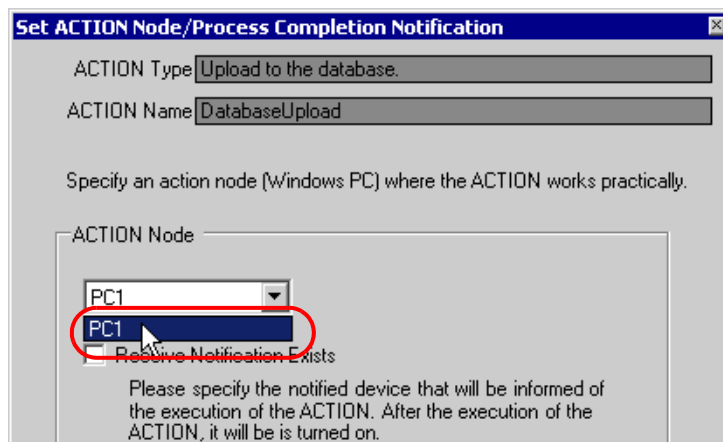
[Setting Example]

- ACTION Node: PC1
- Receive Notification: OFF

1 On the "Data settings to be received by ACTION" screen, click the [Next] button.



2 Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates. Also, clear the check if [Receive Notification Exists] has been checked.

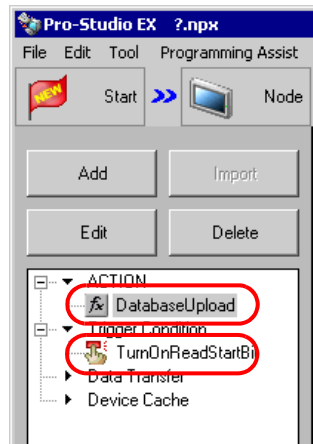


NOTE • When "Receive Notification Exists" is turned on, the specified bit device will be turned on when the ACTION is completed. This can be used as a trigger condition (trigger) of the subsequent ACTION when you want to execute two or more ACTIONs sequentially.

☞ "33 Trigger Conditions"

3 Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the ACTION and trigger condition names you set will appear.

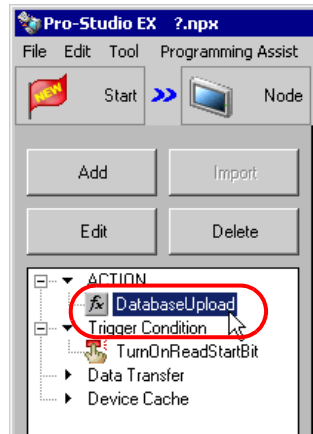


This is the end of the settings of the ACTION node and process completion notification.

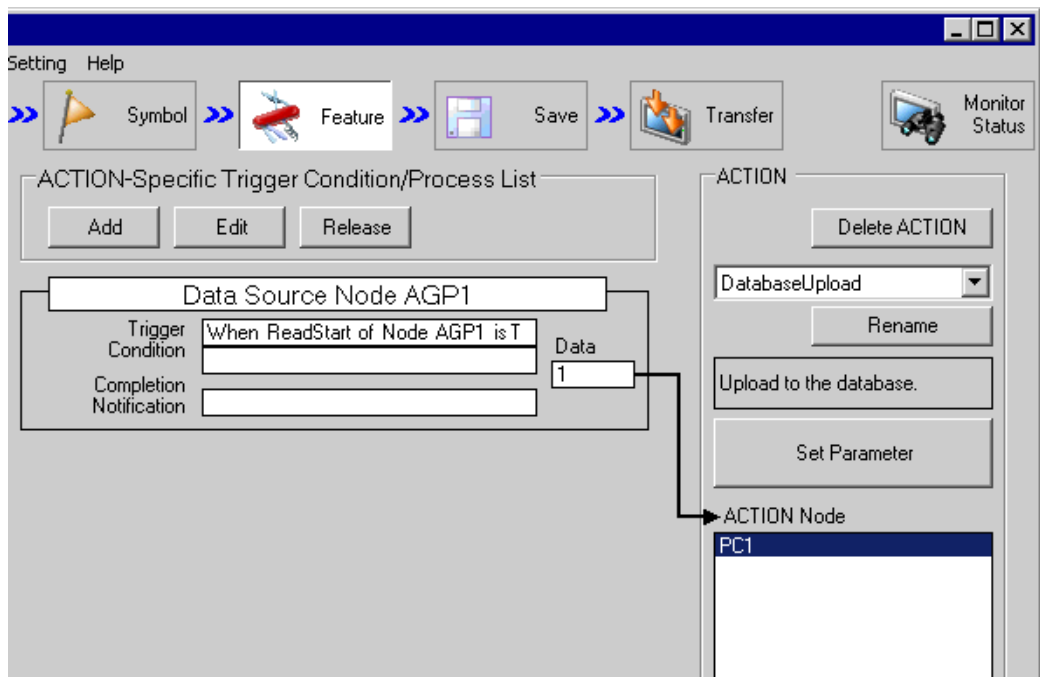
8.1.9 Verifying Setting Result

This step verifies setting results on the setting content list screen.

- 1 Select the ACTION name "Database Upload" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.





8.1.10 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
- Be sure to reload the network project file to 'Pro-Server EX' If not, ACTION will not work.

Ex.

- Path of network project file : Desktop\Database_upload.npxc
- Title : Database upload action

8.1.11 Transferring a Network Project File

This step transfers a saved network project file to entry nodes.

Refer to "26 Transferring" for details about transferring a network project file.

NOTE

- Be sure to transfer a network project file. If not, ACTION will not work.

8.1.12 Executing ACTION

This step verifies that 5 device data are written in the field of database when the preset trigger condition has become effective.

SQL Server

| F1 | F2 | F3 | F4 | F5 |
|----|----|----|----|----|
| 10 | 20 | 30 | 40 | 50 |
| | | | | |

This is the end of the explanation of this ACTION.

NOTE

- If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".
-

8.2 Setting Guide

This section explains how to set the parameters of ACTION.

| Setting item | | Setting content |
|----------------------|---------------|--|
| Database Information | Login name | Sets a login name to access the database server with. |
| | Password | Sets a password to access the database server with. |
| | Server name | Enters "PC Name" or "IP Address" of the database server.- {} - NOTE • If you select "DSN" in [Database Type], you do not have to enter this. |
| | Database Type | Selects database type between [SQL Server], [Oracle], and [DSN]. NOTE • If you select [DSN] with 'Pro-Server EX' used as a service, register the DSN as a system DSN. |
| | Driver name | Selects a driver depending on the selected database type. NOTE • If you select "DSN" in [Database Type], you do not have to enter this. |

| Setting item | | Setting content |
|--------------------------------------|--|---|
| Database Information | Normally connected to server | <p>Check if you want to connect with the server all the time.</p> <p>NOTE</p> <ul style="list-style-type: none"> If you connect with the server frequently, an always-on connection is useful to reduce the time to open database. |
| | If connection request is not received within standard time period, connection is terminated. | <p>Check if you want to disconnect when no connection requested in a certain period in case of regular connection to the server.</p> |
| Database/Device address setting file | | <p>Select the file format for the setting (parameter) that defines how to write device data to the database. For parameter details, refer to "8.1.1 Creating a Table".</p> <p>Excel (access database directly)</p> <ul style="list-style-type: none"> Write device data directly to the database. <p>Access (access database indirectly)</p> <ul style="list-style-type: none"> After writing device data to the Access file selected in [File location], write data to the database. As a result, even if you could not connect to the database, saved device data is written to the database when the next action is triggered. When using files with extension .accdb, Microsoft^(R) Access^(R) must be installed first. <p>CSV (access database indirectly)</p> <ul style="list-style-type: none"> After writing device data to the CSV file selected in [File location], write data to the database. As a result, even if you could not connect to the database, saved device data is written to the database when the next action is triggered. Device data is written to the file "*****_stocktable.csv", in the same folder level as the CSV file selected in [File location]. The ampersands (*****) are replaced with the CSV file name selected in [File location]. |
| File location | | <p>Specify the save folder of the file including a table. After you specify the folder, select the file name from the list and the sheet name including a table.</p> <p>NOTE</p> <ul style="list-style-type: none"> When the file exceeds the number of characters below, the file may not display. Excel or Access file: 255 single-byte characters CSV file: 244 single-byte characters (Note that a double-byte character is regarded as 2 single-byte characters.) The CSV file cannot be shared with other actions. If the same CSV file is accessed, writing device data may fail. |
| Details | | <p>On the "Detailed Settings" screen, sets to change retry related items in database connection. Refer to "■ "A setup of details" Screen" for more details.</p> |

■ "A setup of details" Screen

A setup of details

Automatic establishment

☐ Node name:

☐ Time:

A setup of a server

Server connection time: Sec.

Retry number of times:

Disconnect Time: Min.

| Setting item | | Setting content |
|-------------------------|------------------------|---|
| Automatic establishment | Node name | If you want to write a node name, check here and enter a field name to write in. |
| | Time | If you want to write time, check here and enter a field name to write in. |
| A setup of a server | Server connection time | Sets communication time-out with the database server. |
| | Retry number of times | Sets the number of communication retries with the database server. |
| | Disconnect Time | Sets the time allowed until connection is cut if it has been set to disconnect when no connection is requested in a certain period. |

9



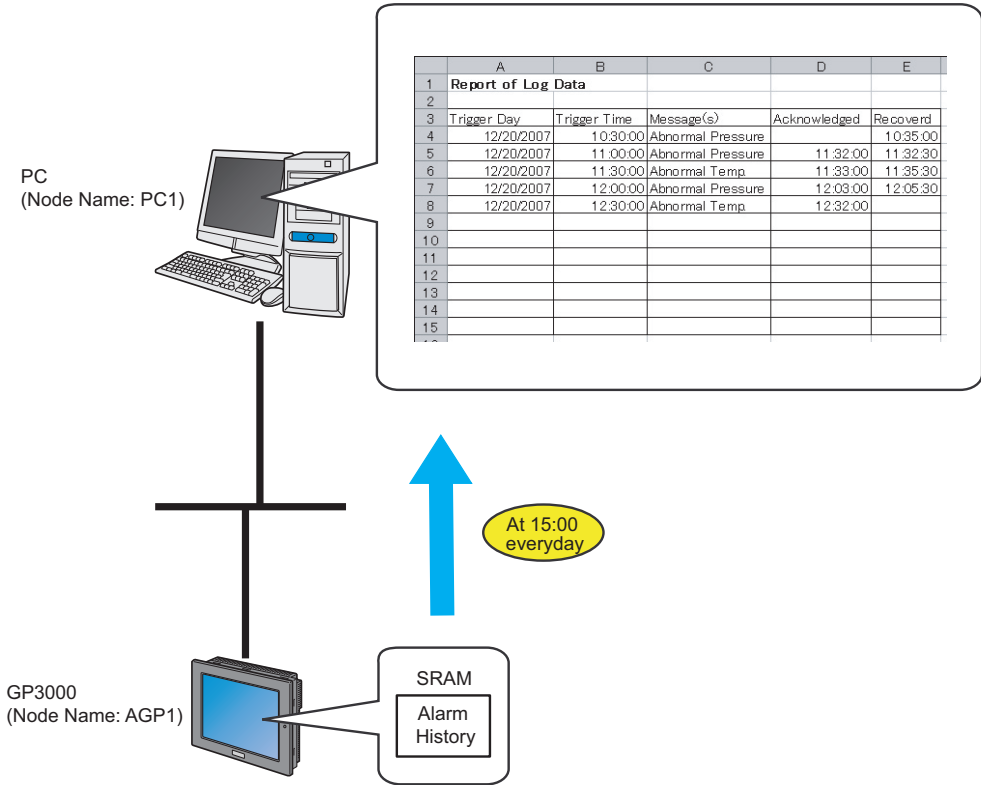
Working with the display unit's Log Data in Excel

| | | |
|-----|--|------|
| 9.1 | Writing the display unit's Log Data to Excel | 9-2 |
| 9.2 | Setting Guide | 9-26 |
| 9.3 | Restrictions | 9-33 |

9.1 Writing the display unit's Log Data to Excel

[Action Example]

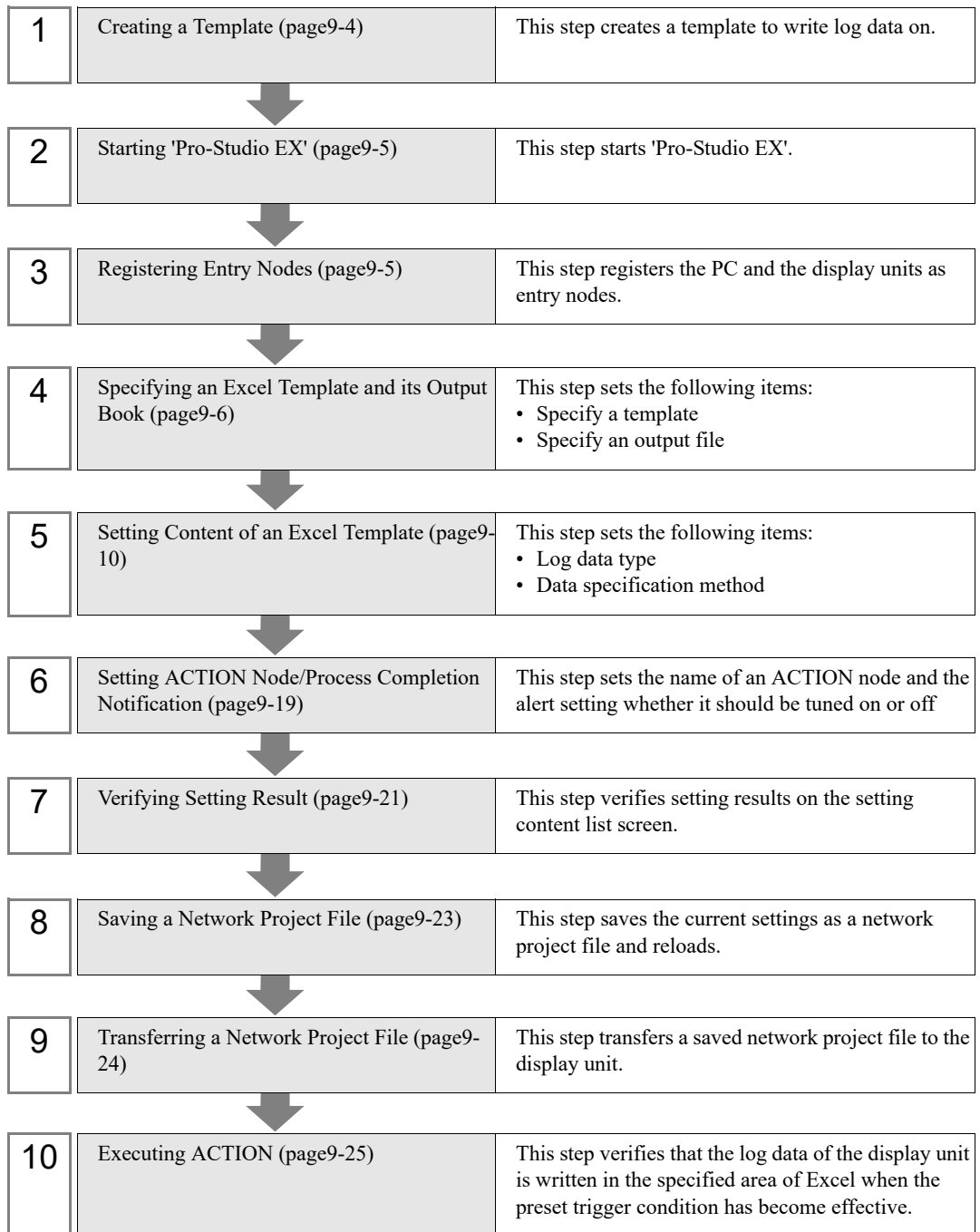
Write the alarm log data stored in SRAM of display unit in an Excel file at 15:00 every day.



This section describes the setting procedures for executing the above action (ACTION) as an example.

NOTE • Refer to the "GP-Pro Ex Reference Manual" for more details about alarms.

[Setting Procedure]



9.1.1 Creating a Template

This step creates a template to write log data on.

- 1 Start Excel and create the sheet below in Sheet 1.

When you execute ACTION, log data will be written in.

| | A | B | C | D | E |
|----|--------------------|--------------|------------|--------------|----------|
| 1 | Report of Log Data | | | | |
| 2 | | | | | |
| 3 | Trigger Day | Trigger Time | Message(s) | Acknowledged | Recoverd |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |

- 2 Save the file on PC desktop naming "template.xlt".

9.1.2 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

9.1.3 Registering Entry Nodes

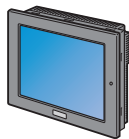
This step registers the PC and the display unit connected with network as nodes.

Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1

IP Address :192.168.0.1



Node Name :AGP1

IP Address :192.168.0.100

Device/PLC Information

Ex.

| Entry node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

9.1.4 Specifying an Excel Template and its Output Book

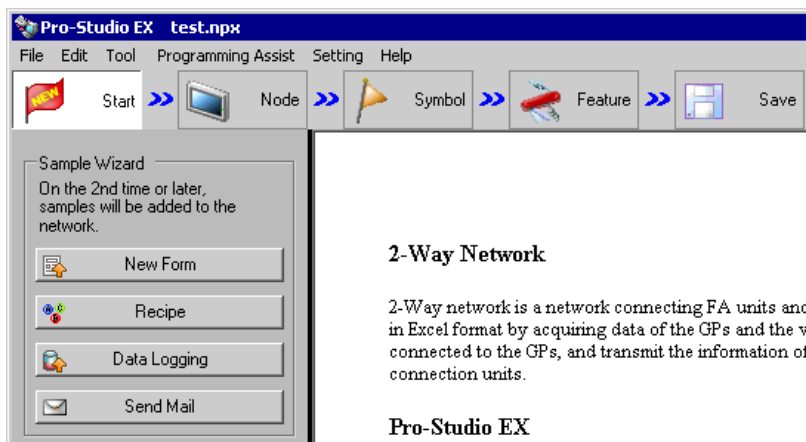
Specify the form template and output book created in (1).

Refer to "9.2 Setting Guide" for more details.

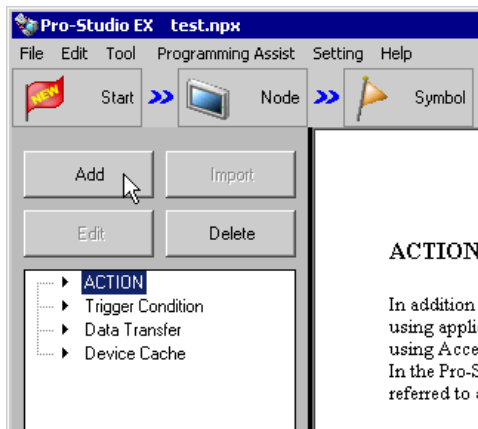
Ex.

| Setting item | | Setting content |
|--------------------|---|---|
| Specify a Template | Template File | C:\Users\<<User name>>\Desktop\template.xls |
| Output File | Folder Name | C:\Users\<<User name>>\Desktop |
| | File Name | GP log data.xls |
| | Start with the output file displayed | Checked |
| | Do not save the output file when ACTION runs. | Not checked |

- 1 Click the [Feature] icon on the status bar.



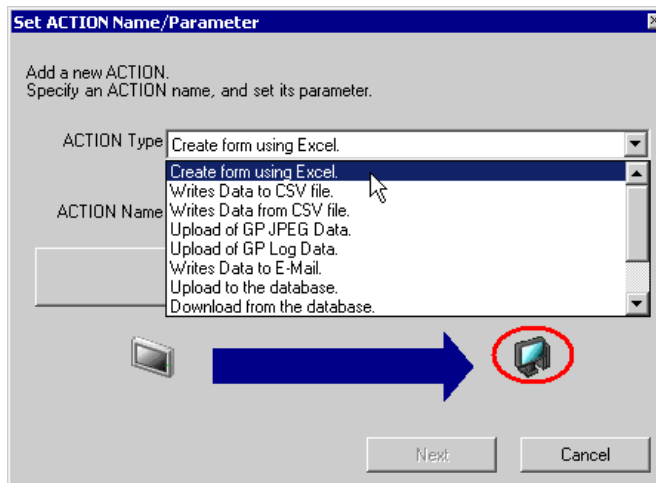
- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.



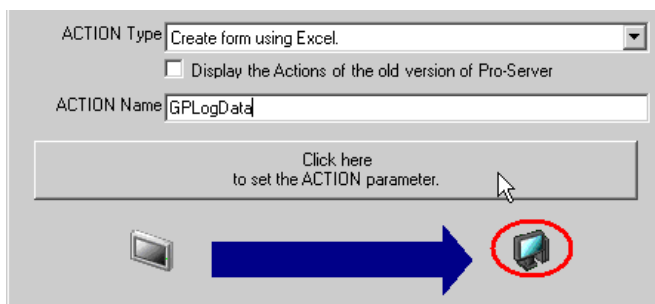
- 3 Click the [ACTION Type] list button, and select "Create form using Excel."

Then, enter the name of ACTION to set in the [ACTION name] field. In this example, enter "GP Log Data".

NOTE • [ACTION Name] can be an arbitrary name.

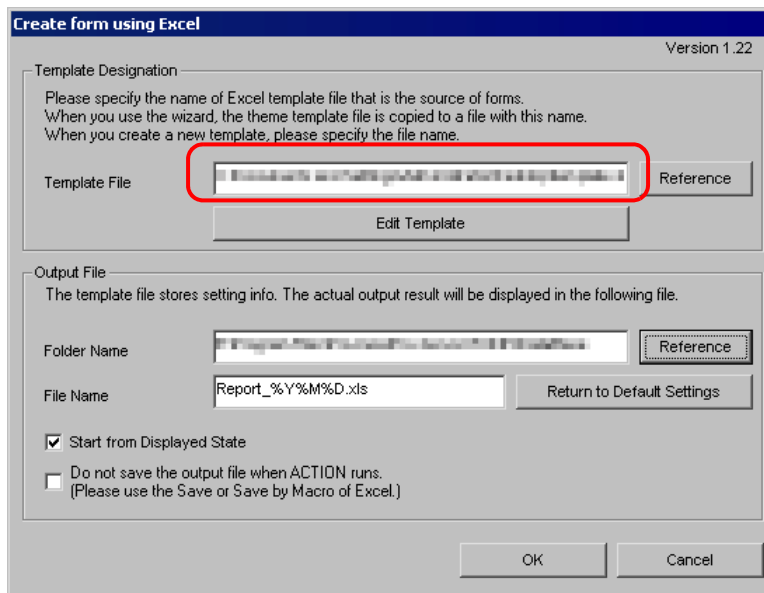


- 4 Click the [Click here to set the ACTION parameter] button.

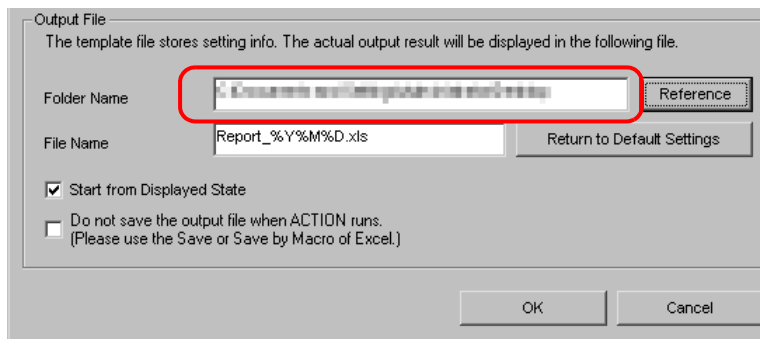


5 Make settings regarding an Excel template and its output file.

- 1) Click the [Reference] button of [Template File] to set the template file "template.xls" which you created.



- 2) Click the [Reference] button of [Folder Name] and specify "Desktop" as a folder to save the output file.



- 3) Set the file name "GP Log Data.xls" in the [File Name] field for the output file to set.

Output File
The template file stores setting info. The actual output result will be displayed in the following file.

Folder Name Reference

File Name Return to Default Settings

☒ Start from Displayed State

☐ Do not save the output file when ACTION runs.
(Please use the Save or Save by Macro of Excel.)

OK Cancel

NOTE

- "%Y%M%D" is preset as "Year/Month/Date". For more details, refer to "37.1 Restrictions on Names".

- 4) Check the [Start from Displayed State] check box.

Output File
The template file stores setting info. The actual output result will be displayed in the following file.

Folder Name Reference

File Name Return to Default Settings

☒ Start from Displayed State

☐ Do not save the output file when ACTION runs.
(Please use the Save or Save by Macro of Excel.)

OK Cancel

NOTE

- If you check [Start from Displayed State], you can read/write data with an output file displayed. This is useful if you need to confirm data immediately.

9.1.5 Setting Content of an Excel Template

This step sets the content of the Excel template for writing log data in Excel.

The example below shows the setting of data write area (Log data area in GP) in a template.

Refer to "9.2 Setting Guide" for more details.

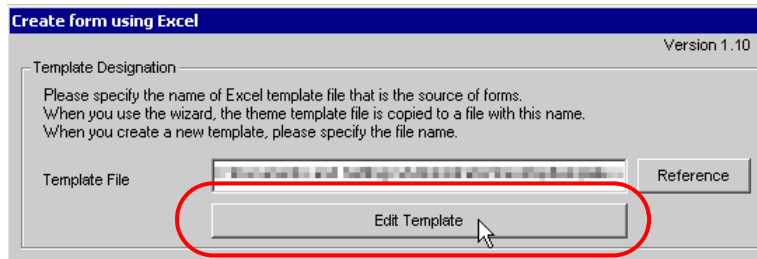
Target Cell Range

| | A | B | C | D | E |
|----|---------------------------|--------------|------------|--------------|----------|
| 1 | Report of Log Data | | | | |
| 2 | | | | | |
| 3 | Trigger Day | Trigger Time | Message(s) | Acknowledged | Recoverd |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

Ex.

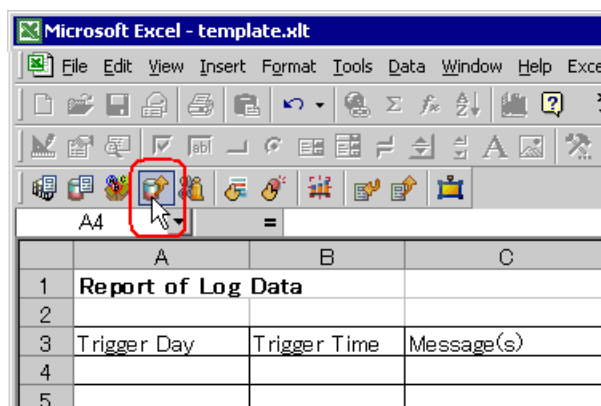
| Setting item | Setting content |
|----------------------------------|-----------------------------|
| Target Cell Range | A4 to E13 |
| Entry Node | AGP1 |
| Data Type | Block 1 Data |
| Alarm Type | Alarm History |
| Specification Method of File No. | Current Data (Data in SRAM) |
| Action when cell gets full | Clear and Overwrite |
| Trigger Condition | Specified Time (15:00) |

- 1 Click the [Edit Template] button.

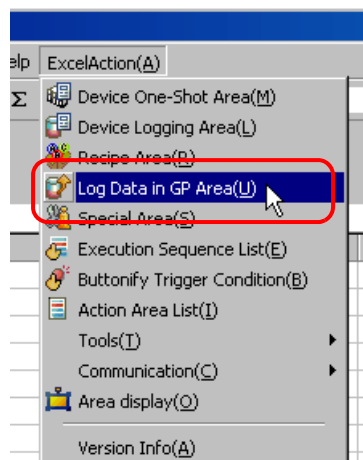


- 2 Set a data write area.

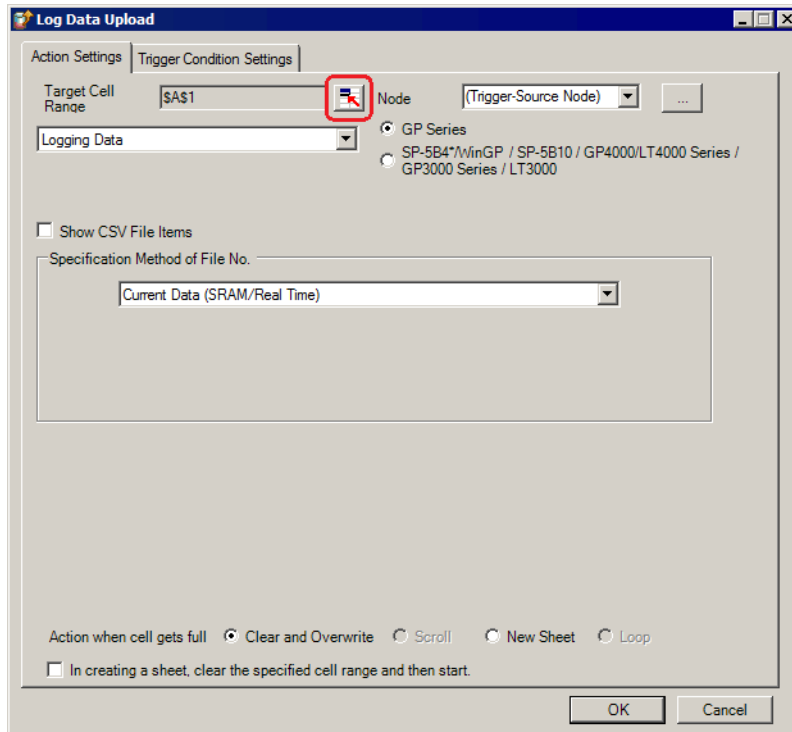
- 1) Click the [Log Data in GP Area] icon on Excel.



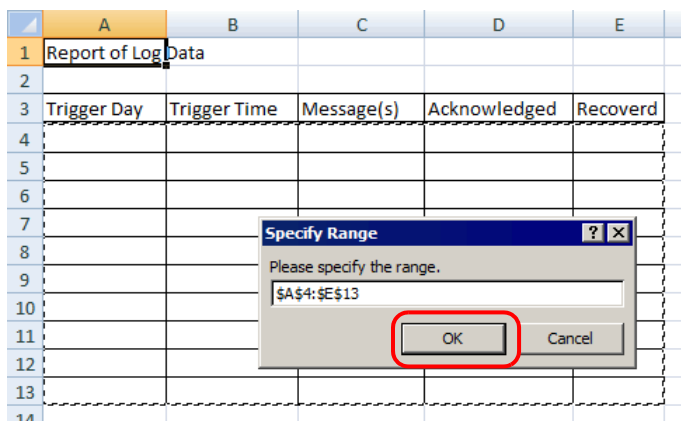
NOTE • Selecting [Log Data in GP Area] from [Excel Action] of the menu displays the same screen.



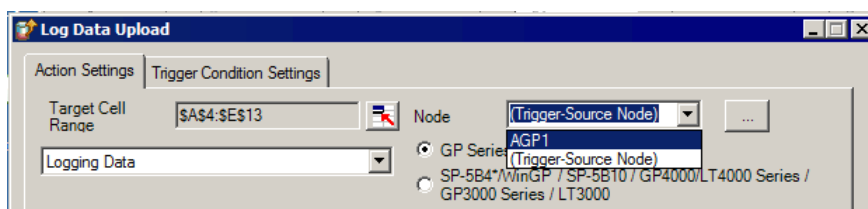
- 2) Click the cell range specify button of [Target Cell Range].



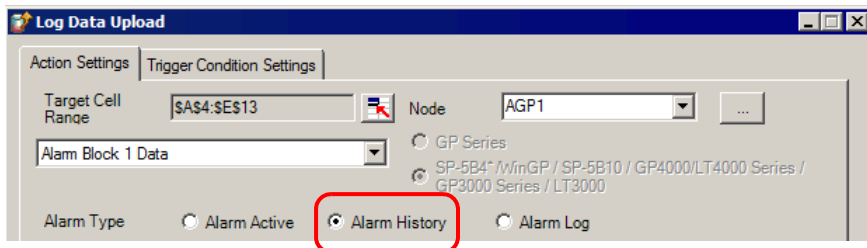
- 3) Drag the mouse to specify the area to use for data logging (cells A4 to E15). Then click the [OK] button.



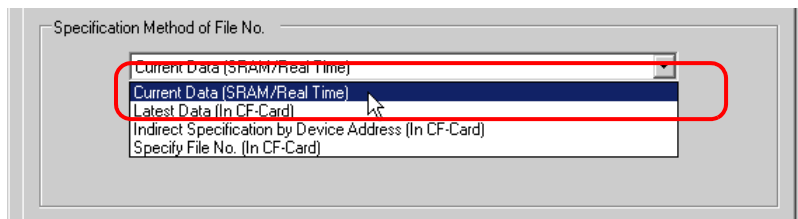
- 4) Click the list button of [Node] and select "AGP1" as a data transfer source node.



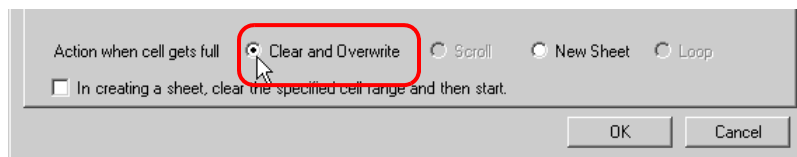
- 5) Select "Alarm Block 1 Data" for the data type and "Alarm History" for the alarm type.



- 6) Select "Current Data (SRAM/Real Time)" in [Specification Method of File No.].

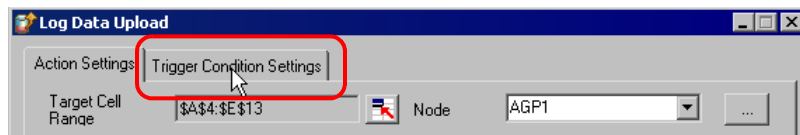


- 7) Select "Clear and Overwrite" in [Action when cell gets full].

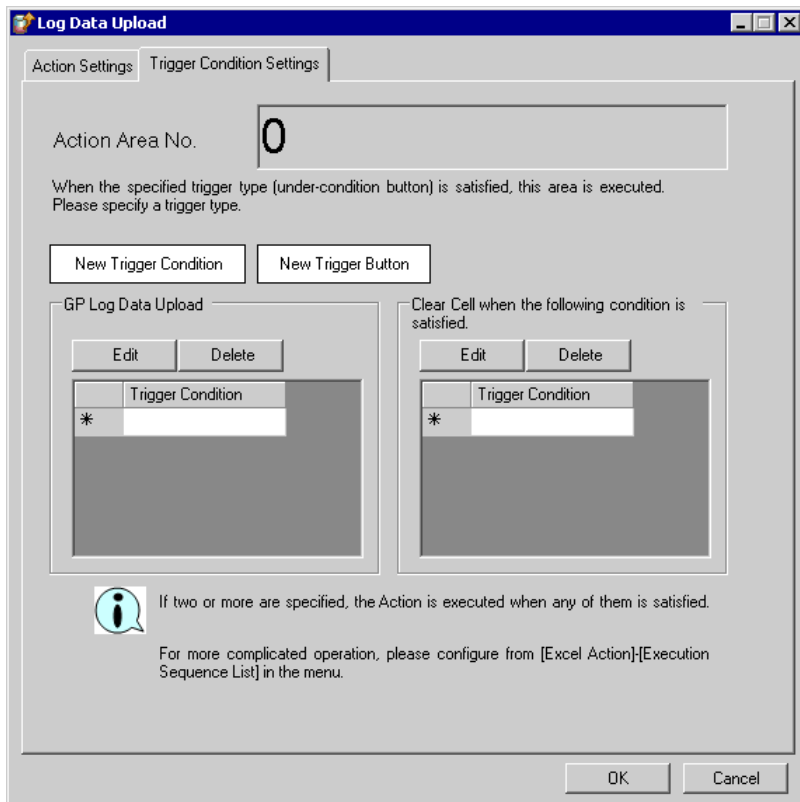


3 Set trigger conditions.

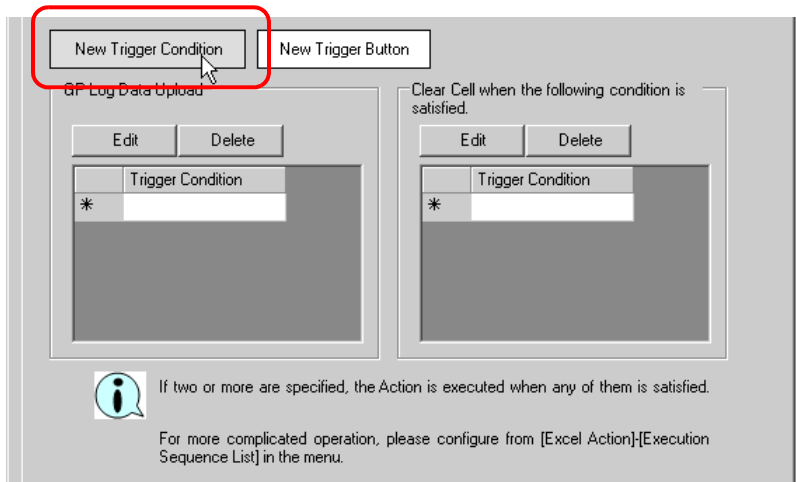
- 1) Click the [Trigger Condition Settings] tab.



The "Trigger Condition Settings" screen will appear.



- 2) Click the [New Trigger Condition] button.



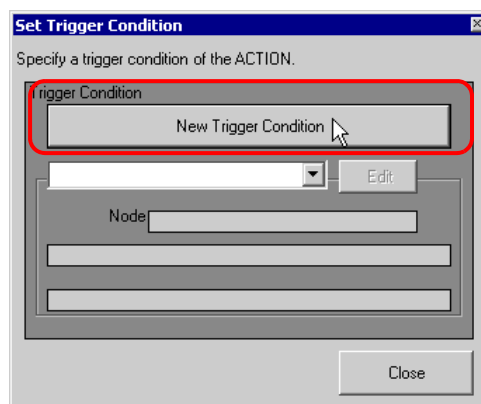
NOTE

- You can create a button on the Excel sheet, and use this as a trigger condition to execute ACTION. Refer to "5.6 Creating Trigger Buttons in a Form" for details.

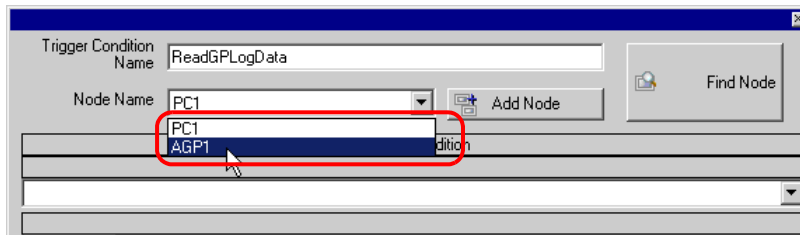
| | A | B | C | D | E | F | G | H |
|----|--------------------|--------------|------------|--------------|----------|---|---|---|
| 1 | Report of Log Data | | | | | | | |
| 2 | | | | | | | | |
| 3 | Trigger Day | Trigger Time | Message(s) | Acknowledged | Recoverd | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |

Excel Form Action

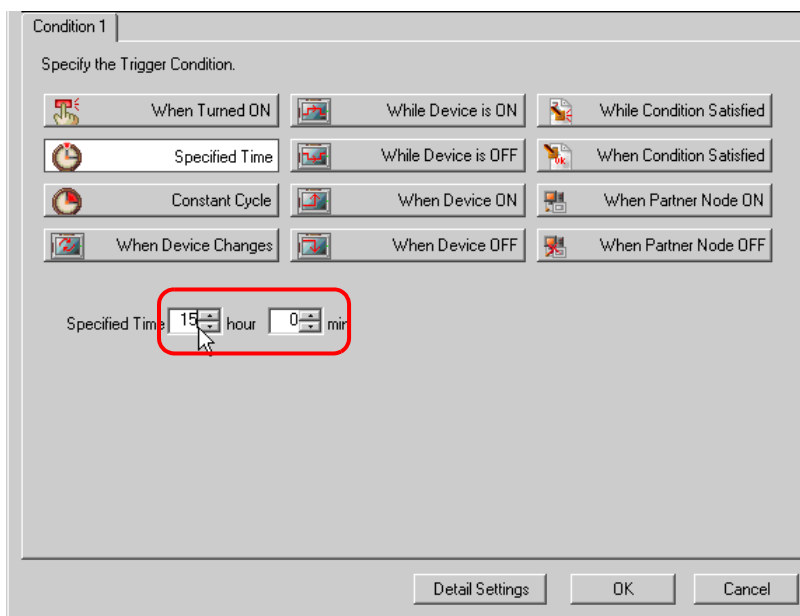
- 3) Click the [New Trigger Condition] button.



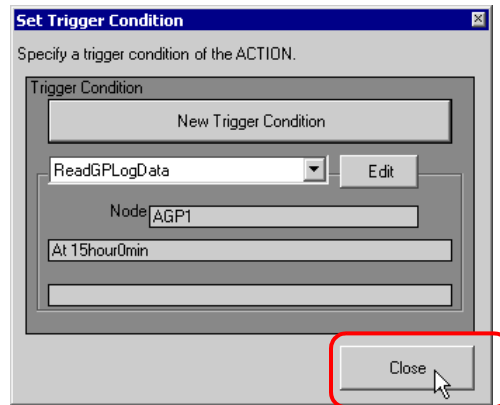
- 4) Enter the trigger condition name "Read GP Log Data" in [Trigger Condition Name], and select "AGP1" in [Node Name] as a name of the data transfer source.



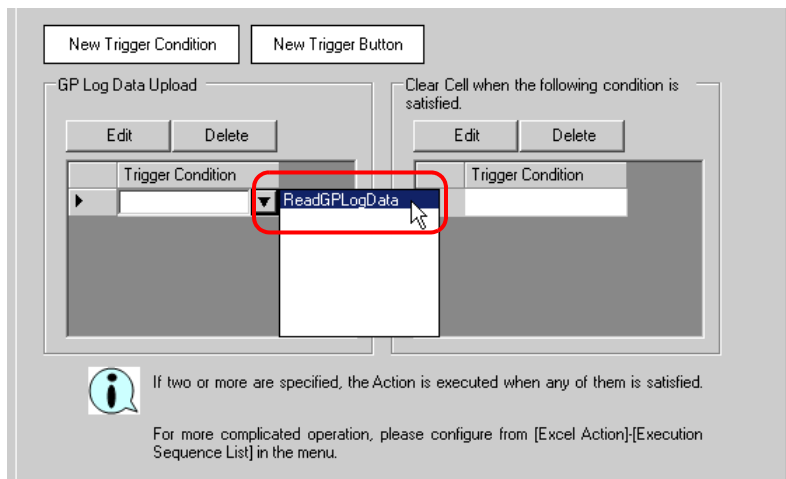
- 5) Click the [Specified Time] button in the [Condition 1] tab, and enter "15" and "0" in [Specified Time]. Then click the [OK] button.



- 6) Click the [Close] button.



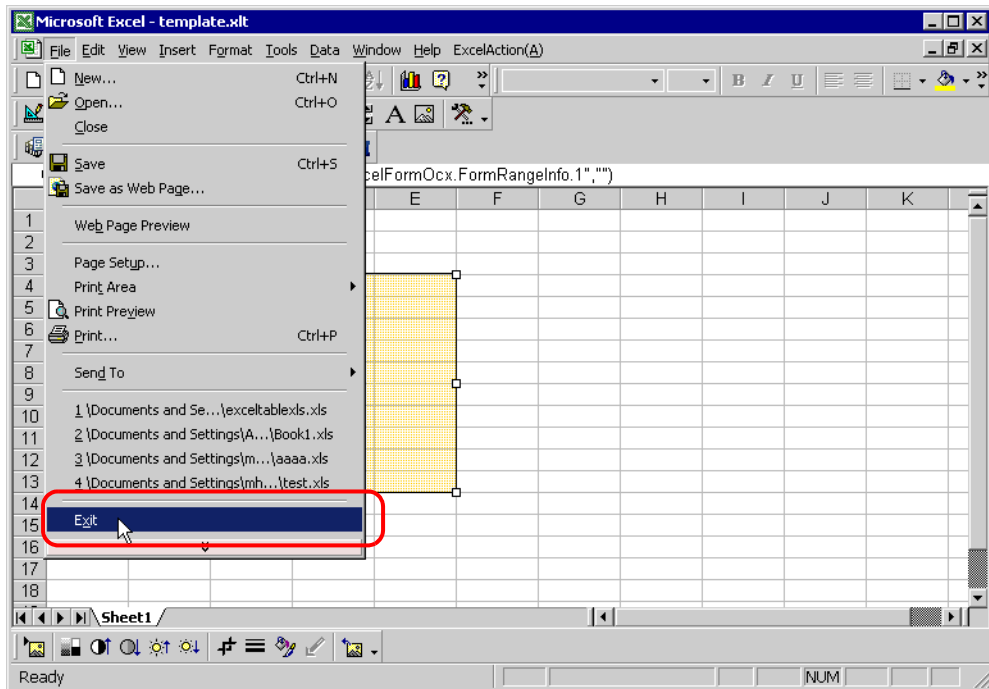
- 7) In [GP Log Data Upload], click the blank line of [Trigger Condition] and select "ReadGPLogData" as a trigger condition.



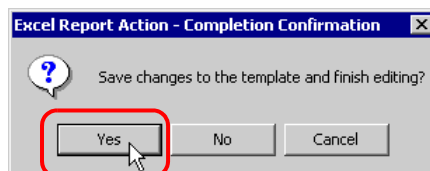
- 8) Click the [OK] button.

This is the end of the content settings of an Excel template.

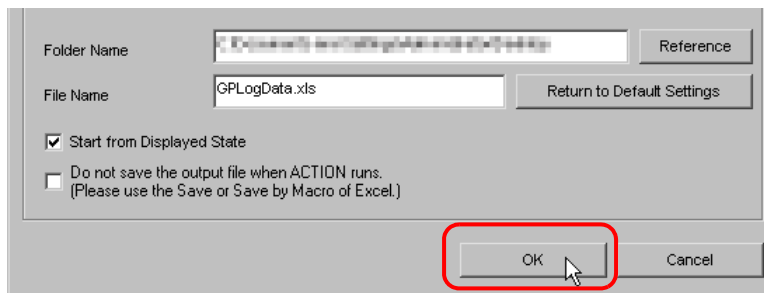
4 Close 'Excel'.



The following dialog box will appear, asking you if you want to save changes before closing. Click the [Yes] button.



5 On the "Create form using Excel" screen, click the [OK] button.



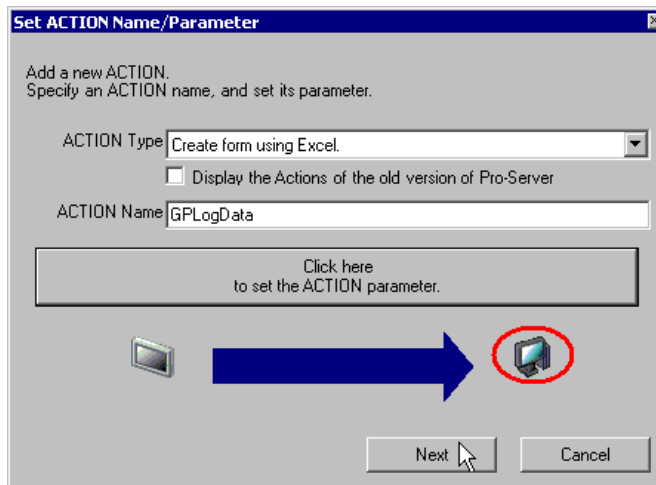
9.1.6 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed.

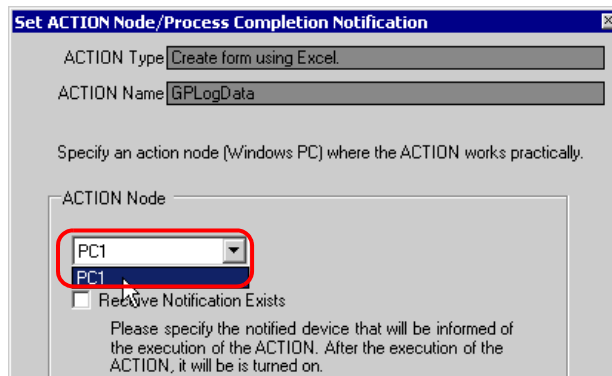
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

1 On the "Set ACTION Name/Parameter" screen, click the[Next] button.



2 Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates.



- 3 Turn off the check box of [Receive Notification Exists], if checked.

NOTE • Do not check "Receive Notification Exists".

- 4 Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the name of ACTION you set will appear.

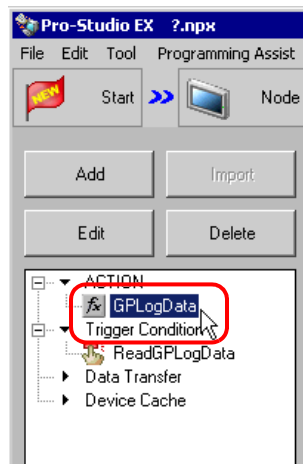
This is the end of the settings of the ACTION node and process completion notification.

9.1.7 Verifying Setting Result

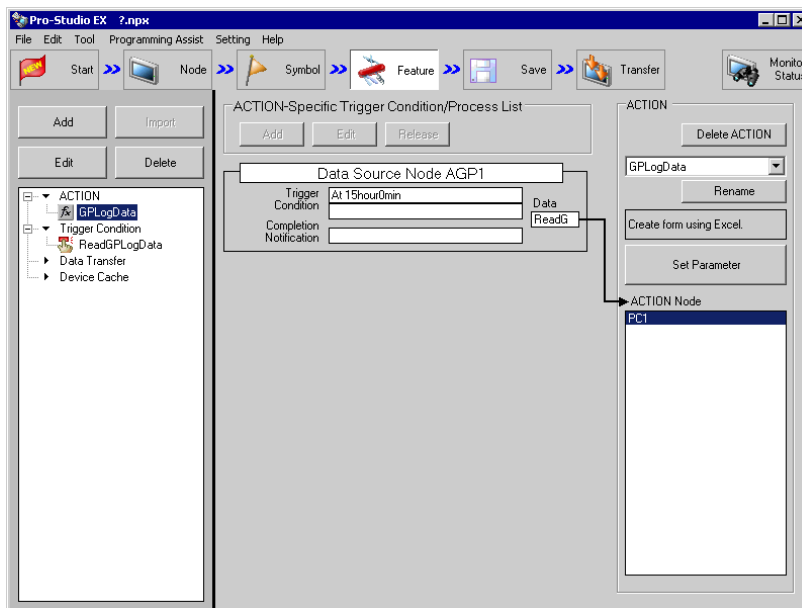
This step verifies setting results on the setting content list screen.

- NOTE**
- In case of the "Excel Report" ACTION, you cannot add, edit or delete trigger conditions from "Trigger Condition/Process List per ACTION". To change the settings, click the [Parameters Settings] button and change the settings in [Edit Template] on Excel.

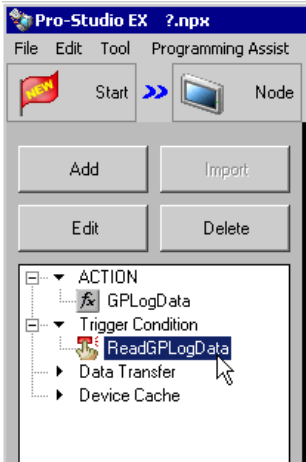
- 1 Select the ACTION name "GP Log Data" from the tree display on the left of the screen.



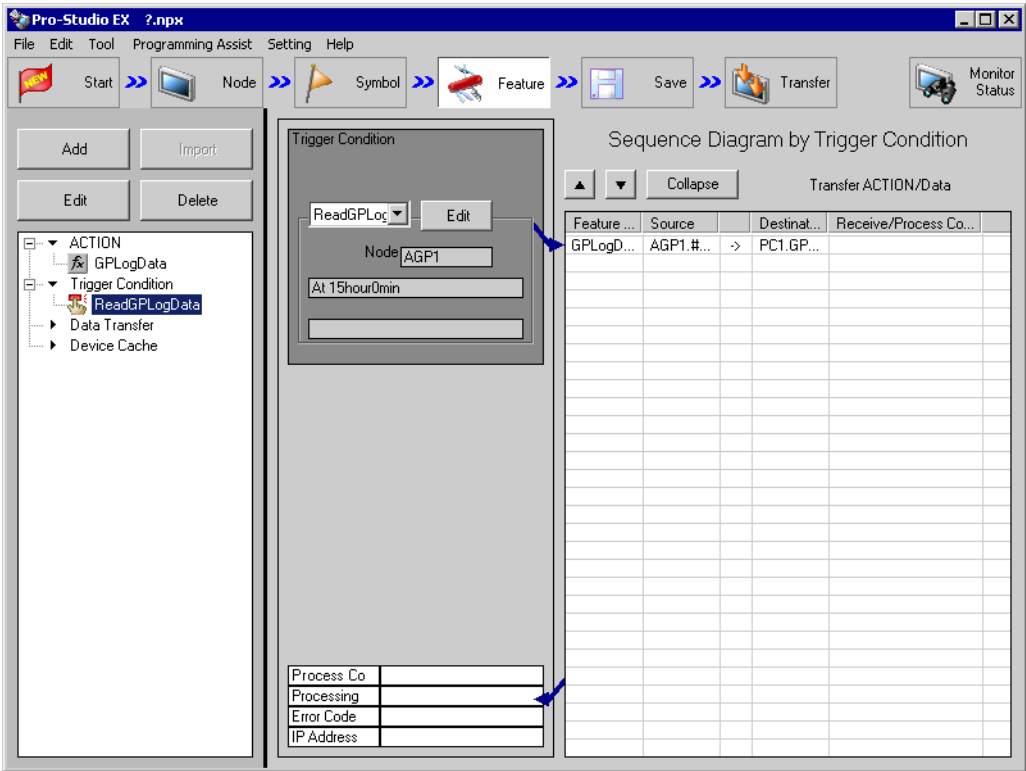
Confirm that the setting content appears on the right of the screen.



- 2 Select the trigger condition name "ReadGPLogData" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

9.1.8 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- "Pro-Server EX" reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
- Be sure to reload the network project file to 'Pro-Server EX'. If not, ACTION will not work.

Ex.

- Path of network project file : Desktop\monitor.npxc
- Title : EXCEL Report ACTION

9.1.9 Test Read

You can check if the settings are correct before transferring a created network project file to entry nodes.

When executing ACTION, the setting data is output to an output file. However, when executing a test read, it is reflected in a template file.

NOTE

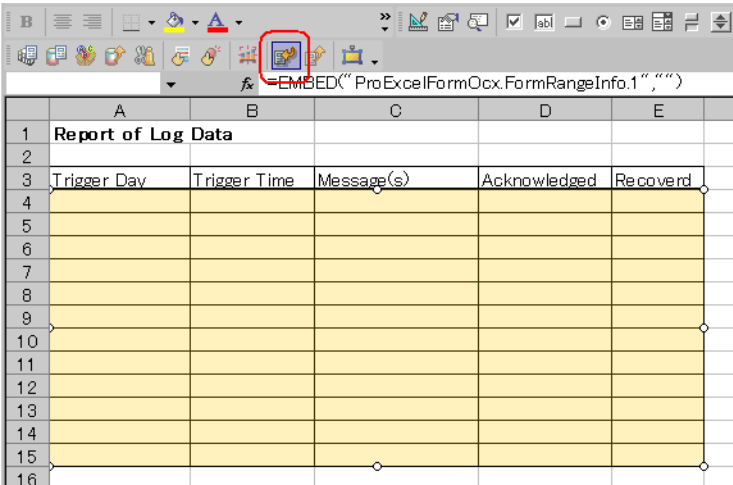
- You do not necessarily have to perform a test read.
If you skip this, proceed to "9.1.10 Transferring a Network Project File".

IMPORTANT

- To perform a test read, it is necessary that 'Pro-Server EX', to which a created network project file has been loaded, is running.

- 1 Click the [Feature] button.
- 2 Click "ACTION" from the tree display on the left of the screen, then click the [Edit] button.
- 3 On the "Set ACTION Name/Parameter" screen, click the [Click here to set the ACTION parameter] button.
- 4 On the "Create form using Excel" screen, click the [Edit Template] button.

5 With the ACTION area selected, click the [Test Read] icon.



The setup contents will be read in the template.

| | |
|-------------|---|
| NOTE | • Refer to "9.3 Restrictions" for details about the restrictions on test reads. |
|-------------|---|

9.1.10 Transferring a Network Project File

This step loads a saved network project file to 'Pro-Server EX' and then transfers to entry nodes.
Refer to "26 Transferring" for details about transferring a network project file.

| | |
|-------------|---|
| NOTE | • Be sure to transfer a network project file. If not, ACTION will not work. |
|-------------|---|

9.1.11 Executing ACTION

This step verifies that enabling a trigger condition activates ACTION, opens an Excel book (file name: "GP error log.xls"), and then writes the log data of display unit in the specified location in Excel.

| | A | B | C | D | E |
|----|---------------------------|--------------|-------------------|--------------|----------|
| 1 | Report of Log Data | | | | |
| 2 | | | | | |
| 3 | Trigger Day | Trigger Time | Message(s) | Acknowledged | Recoverd |
| 4 | 12/20/2007 | 10:30:00 | Abnormal Pressure | | 10:35:00 |
| 5 | 12/20/2007 | 11:00:00 | Abnormal Pressure | 11:32:00 | 11:32:30 |
| 6 | 12/20/2007 | 11:30:00 | Abnormal Temp | 11:33:00 | 11:35:30 |
| 7 | 12/20/2007 | 12:00:00 | Abnormal Pressure | 12:03:00 | 12:05:30 |
| 8 | 12/20/2007 | 12:30:00 | Abnormal Temp | 12:32:00 | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

NOTE

- If error occurs, you can check the log in the Log Viewer. For more details, refer to "28.5 Monitoring System Event Logs".
- If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".

This is the end of the explanation of this ACTION.

9.2 Setting Guide

This section explains how to set the parameters of ACTION.

9.2.1 "Creating form using Excel" Screen

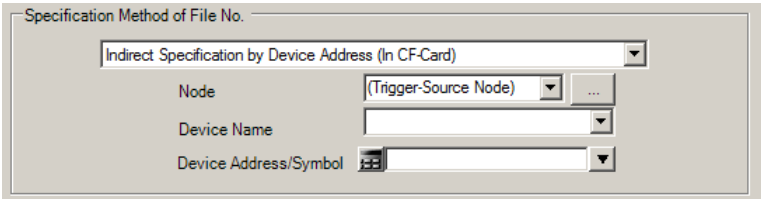
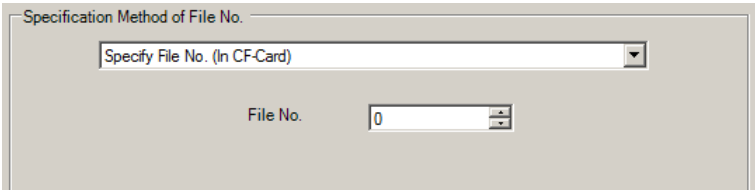
☞ "5.1.2 Setting Guide"

9.2.2 Log Data Upload" Screen

■ "Action Settings" Tab

| Setting item | Setting content |
|-------------------|---|
| Target Cell Range | <p>Specifies the cell range to which data will be written. Clicking the button can select the cell range on Excel.</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">NOTE</div> <ul style="list-style-type: none"> For the process on how to select cell ranges, refer to "■Action Area Settings" in "5.1.2 Setting Guide". The useful function is available to check the specified cell range (Action Area). Refer to "■ Action Area List" in "5.1.2 Setting Guide". |

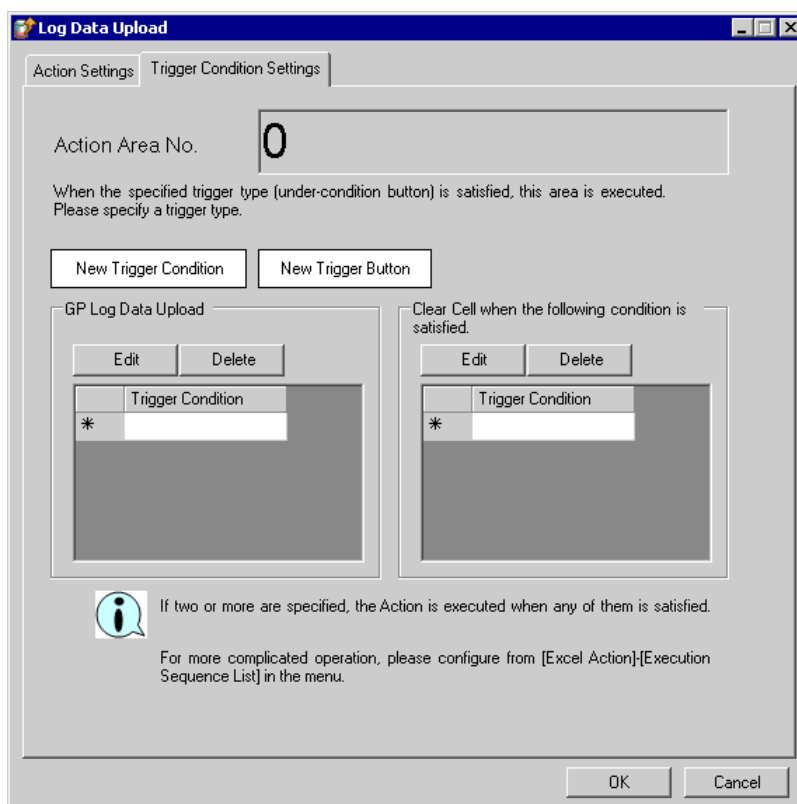
| Setting item | Setting content |
|------------------------|--|
| Node | <p>Selects a node to read log data.</p> <p>NOTE</p> <ul style="list-style-type: none"> Clicking the [...] button can retrieve or add entry nodes. Selecting "(Trigger-Source Node)" will select the entry node that has triggered the action. |
| Data Type | <p>Selects a log data type to write in a form. Selectable log data depends on the type of display units.</p> <p>ST6000 Series, SP-5B**/WinGP, GP4000/LT4000 Series, GP3000 Series, LT3000</p> <ul style="list-style-type: none"> CSV Data (Recipe) Alarm Block 1 Data - Alarm Block 8 Data GP Screen Data (Jpeg) Sampling Data GP-PRO/PB Logging data (compatible) GP-PRO/PB Trend graph data (compatible) GP-PRO/PB Sampling data (compatible) <p>NOTE</p> <ul style="list-style-type: none"> To upload line graph data, sampling data and logging data in a project file converted from 'GP-PRO/PB III for Windows', specify "compatible" of the corresponding data. You cannot write the "GP Screen Data (Jpeg)" log data to models without a CF/SD card slot. When using GP Screen Data (Jpeg), set Excel's Zoom Magnification to 100%. If you save a template file with magnification not at 100%, the image size and position may shift. While the screen update load is high on the display unit and you run GP Screen Data (Jpeg), the display unit may fail to save the screen capture to JPEG and an error may arise. <p>GP Series</p> <ul style="list-style-type: none"> Logging Data Trend Data Alarm Active Alarm History Alarm Log CSV Data (Recipe) Sampling Data Alarm Block 4 Data - Alarm Block 8 Data GP Screen Data (Jpeg) <p>NOTE</p> <ul style="list-style-type: none"> You cannot write the "GP Screen Data (Jpeg)" log data to models without a CF card slot. When using GP Screen Data (Jpeg), set Excel's Zoom Magnification to 100%. If you save a template file with magnification not at 100%, the image size and position may shift. While the screen update load is high on the display unit and you run GP Screen Data (Jpeg), the display unit may fail to save the screen capture to JPEG and an error may arise. |
| Alarm Type | Other than the "GP Series", when you select "Alarm Block * Data", you can select the alarm type from "Alarm Active", "Alarm History", or "Alarm Log". |
| No. of JPEGs (Figures) | When you select "GP Screen Data (Jpeg)", set the number of screens to read into the area. |

| Setting item | Setting content |
|----------------------------------|--|
| Show CSV File Items | <p>Check if you want to display the title content in Excel.</p> <p>NOTE</p> <ul style="list-style-type: none"> This does not appear if you select "CSV Data" or "GP Screen Data (Jpeg)". |
| Specification Method of File No. | <p>Selects where log data to read is stored.</p> <ul style="list-style-type: none"> Current Data (SRAM/Real Time) Reads out current data stored in SRAM of the display unit. Latest Data (in CF-Card) Reads out the latest data from those stored in a CF card (or SD card) of the display unit. Indirect Specification by Device Address (In CF-Card) Reads out a specified number file from data stored in a CF card (or SD card) of the display unit. In this case, the number is specified by device indirectly . Specify Node, Device Name, and Device Address.  <ul style="list-style-type: none"> Specify File No. (In CF-Card) Reads out a specified number file from data stored in a CF card (or SD card) of the display unit. In this case, specify the file number of the CF card (or SD card).  |

| Setting item | Setting content |
|--|---|
| Specification Method of Sampling Group No. | <p>If you select "Sampling Data" for display units other than "GP Series", set how to specify a sampling group No.</p> <ul style="list-style-type: none">• Indirect Specification by Device Address Specify a sampling group No. by device indirectly. In this case, specify Node, Device Name, and Device Address/Symbol. <div><p>Specification Method of Sampling Group No.</p><p>Indirect Specification by Device Address</p><p>Node (Trigger-Source Node) ...</p><p>Device Name</p><p>Device Address/Symbol</p></div> <ul style="list-style-type: none">• Specify Sampling No. Fix and specify a sampling group No. In this case, specify a group No. <div><p>Specification Method of Sampling Group No.</p><p>Specify Sampling No.</p><p>Group No. 1</p></div> |

| Setting item | Setting content | | | | | | | | | | | | | | | | |
|---|--|---|---|--------|---|---|---|---|---|---|--|--|--------|--|--------|--|--------|
| Action when cell gets full | <p>Sets the action when the specified cells have got full.</p> <ul style="list-style-type: none">• Clear and Overwrite Clears data write cells to start writing from first. <p>When adding D to the full cell,</p> <table><tr><td>A</td><td rowspan="3">➔</td><td>D</td></tr><tr><td>B</td><td></td></tr><tr><td>C</td><td></td></tr></table> | A | ➔ | D | B | | C | | | | | | | | | | |
| | A | ➔ | | D | | | | | | | | | | | | | |
| | B | | | | | | | | | | | | | | | | |
| | C | | | | | | | | | | | | | | | | |
| | | <ul style="list-style-type: none">• Scroll Scroll up as a whole to write new data at the bottom. At this time, data at the top will be deleted. You can specify this option when selecting "GP Screen Data" for the data type. <p>When adding D to the full cell,</p> <table><tr><td>A</td><td rowspan="3">➔</td><td>B</td></tr><tr><td>B</td><td>C</td></tr><tr><td>C</td><td>D</td></tr></table> | A | ➔ | B | B | C | C | D | | | | | | | | |
| A | ➔ | B | | | | | | | | | | | | | | | |
| B | | C | | | | | | | | | | | | | | | |
| C | | D | | | | | | | | | | | | | | | |
| | <ul style="list-style-type: none">• New Sheet Continues writing on a new sheet. All the features being output on the sheet will be copied to the new sheet. <p>When adding D to the full cell, Further, adding E,</p> <table><tr><td>A</td><td rowspan="3">➔</td><td>D</td><td rowspan="3">➔</td><td>D</td></tr><tr><td>B</td><td></td><td>E</td></tr><tr><td>C</td><td></td><td></td></tr><tr><td>Sheet1</td><td></td><td>Sheet2</td><td></td><td>Sheet2</td></tr></table> | A | ➔ | D | ➔ | D | B | | E | C | | | Sheet1 | | Sheet2 | | Sheet2 |
| A | ➔ | D | | ➔ | | D | | | | | | | | | | | |
| B | | | | | | E | | | | | | | | | | | |
| C | | | | | | | | | | | | | | | | | |
| Sheet1 | | Sheet2 | | Sheet2 | | | | | | | | | | | | | |
| | <ul style="list-style-type: none">• Loop Overwrites from top in sequence. You can specify this option when selecting "GP Screen Data" for the data type. <p>When adding D to the full cell,</p> <table><tr><td>A</td><td rowspan="3">➔</td><td>D</td></tr><tr><td>B</td><td>B</td></tr><tr><td>C</td><td>C</td></tr></table> | A | ➔ | D | B | B | C | C | | | | | | | | | |
| A | ➔ | D | | | | | | | | | | | | | | | |
| B | | B | | | | | | | | | | | | | | | |
| C | | C | | | | | | | | | | | | | | | |
| In creating a sheet, clear the specified cell range and then start. | Before copying a sheet from the template file, if data are written in the cell range of the sheet, clears the data and starts copying. | | | | | | | | | | | | | | | | |

■ "Trigger Condition Settings" tab



| Setting item | Setting content |
|-----------------------|---|
| Action Area No. | Displays No. allocated to each ACTION area by template. |
| New Trigger Condition | Displays the "Trigger Condition Settings" dialog box. Click here to set a new trigger condition. |
| New Trigger Button | Displays the "Create Trigger Button" dialog box. Refer to "5.6.2 Setting Guide" for more details. |
| GP Log Data Upload | <p>Selects a trigger condition to read log data. Click the blank line of [Trigger Condition] and then the list button to display the registered trigger condition.</p> <p>NOTE</p> <ul style="list-style-type: none"> When plural trigger conditions have been specified, satisfying at least one of those conditions executes ACTION. Clicking the [Edit] button can edit the specified trigger conditions. Clicking the [Delete] button deletes the specified trigger conditions. |

| Setting item | Setting content |
|---|--|
| Clear Cells when the following condition is satisfied | <p>Clears cells if a set trigger condition is satisfied. Click the blank line of [Trigger Condition] and then the list button to display the registered trigger condition.</p> <div>NOTE</div> <ul style="list-style-type: none">• When plural trigger conditions have been specified, satisfying at least one of those conditions clears cells.• Clicking the [Edit] button can edit the specified trigger conditions.• Clicking the [Delete] button deletes the specified trigger conditions. |

9.3 Restrictions

■ Combined Cells

Do not set an ACTION area on combined cells.

For example, if you set an ACTION area in the cells as shown below, correct operation cannot be guaranteed.

| | A | B | C | D |
|---|-------|-------|-------|-------|
| 1 | D1 00 | D1 01 | D1 02 | D1 03 |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |

■ Over-pasted ACTION Areas

When you over-paste plural ACTION areas of different size, read/write will be executed in the pasted order.

■ Excel Window

If the setting screen is hidden behind the Excel window, the screen and task tray windows will blink and notify the user. Blinking will stop automatically when the setting screen comes forward.

■ Operation in ACTION area when error occurs

When you actually write/read in "GP Log" function and exceed the ACTION area, perform the common operation as follows:

1) When performing a test read/ a test write

Error screen is displayed.

2) When executing ACTION in runtime

It will be recorded as ACTION error in the Log Viewer of the 'Pro-Server EX'.

■ Functions which are not executed by a Test Read

The following functions are not executed by a Test Read.

"Action when cell gets full"

"Clear the cell range specified in creating a sheet to start"

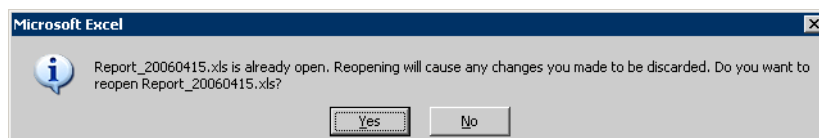
■ In the case of closing the displayed output book

If you have mistakenly closed an output book of Excel Report ACTION, follow these steps to open it again:

Dragging and dropping the book to open will make it read-only and the start button etc. invalid.

1. Double-click the output book.

2. When the following dialog box appears, select "No" to open it.



■ Receive notification

You cannot set the receive notification which indicates the completion of ACTION.

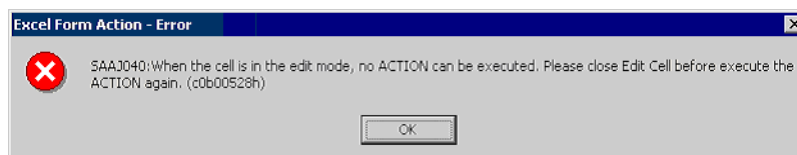
■ When setting "Trigger-Source Node"

When setting "Trigger-Source Node" at node in Excel Report action, node type and device are uncertain. Therefore, the device address is displayed in red. But, it is no problem.

■ Edit the output file

While Excel Report Action is executing, you can not edit the output file.

Therefore, it becomes very difficult to operate Excel at the setting in which the Trigger condition satisfies at a short cycle. Moreover, the following error message is displayed when the Action is executed during editing the output file.



■ Save the output file Do not use

Do not use multiple Excel form actions to save output files to the same destination.

If you set the same destination for file outputs, Pro-Studio and Pro-Server EX may not be able to run.

■ Restrictions on reading Alarm and Sampling Data on the CF Card

- In GP-Pro EX, use "yy/mm/dd" for the date format. When the CSV file on the CF card does not use "yy/mm/dd" for the date format, the wrong date may be output.
When output to Excel, the date uses the "20yy/mm/dd" (or "19yy/mm/dd") format.
- When using a version of GP-Pro EX before V3.12, or a version of Pro-Server EX before V1.32, do not use the [Set number of files in destination folder on external storage] option in GP-Pro EX. You cannot read files stored [Alarm] or [SAMP**] sub-folders.
- If [Multiple Line Message Output (Save Alarm to CSV)] is enabled in GP-Pro EX alarm settings, when opening the CSV file, you will notice that messages with line breaks are output to the next cell down. If [Multiple Line Message Output (Save Alarm to CSV)] is disabled, the message up to the line break only is saved to the CSV file.

■ Restrictions on reading Alarm and Sampling Data in SRAM

- Regardless of the date format defined in GP-Pro EX, dates are handled with the "yy/mm/dd" format. When outputting to Excel, the date format is "20yy/mm/dd" (or "19yy/mm/dd").
- If [Multiple Line Message Output (Save Alarm to CSV)] is enabled in GP-Pro EX alarm settings, each line in a message is output to a different cell.

If [Multiple Line Message Output (Save Alarm to CSV)] is disabled, the message up to the line break only is saved.

■ About the 1500 row limit for Action Area settings

Exceeding 1500 rows for the Action Area could cause the action to run longer. If you use Device One Shot or Device Logging's text conversion, the action could take even longer.

■ Restrictions on Copying or Cutting and Pasting the Action Area

When you paste the Action area using Ctrl+C & Ctrl+V or Ctrl+X & Ctrl+V, specify [Target Cell Range] for the copied Action area.

The Action area just after pasting remains the same [Target Cell Range] as that for the original Action area.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |

■ Excel Auto Save Function

The Excel auto save function does not operate due to the Excel restrictions. To save automatically, create the Excel save macro using the following procedure and execute the created save macro by Action.

- 1 Open a template you want to save automatically using 'Pro-Studio EX'.

Create form using Excel Version 1.22

Template Designation
Please specify the name of Excel template file that is the source of forms.
When you use the wizard, the theme template file is copied to a file with this name.
When you create a new template, please specify the file name.

Template File: Reference

Edit Template

Output File
The template file stores setting info. The actual output result will be displayed in the following file.

Folder Name: Reference

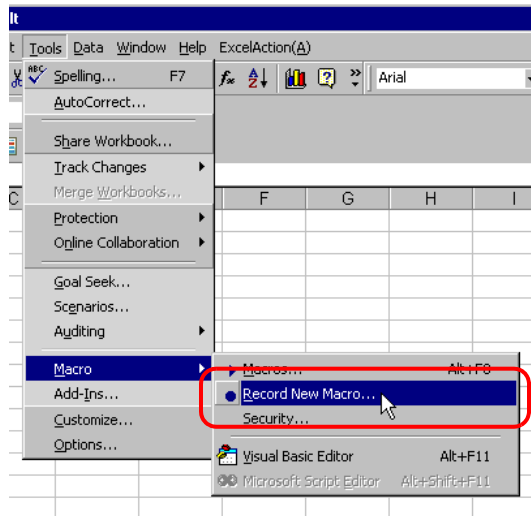
File Name: Return to Default Settings

☒ Start from Displayed State

☐ Do not save the output file when ACTION runs.
(Please use the Save or Save by Macro of Excel.)

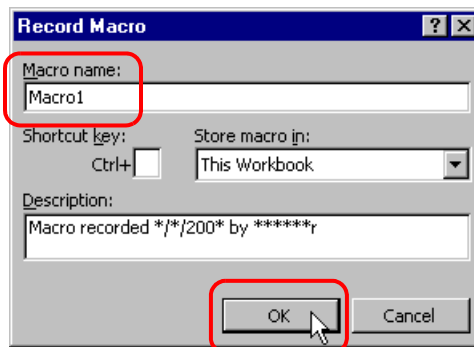
OK Cancel

- 2 Select "Macro" and "Record New Macro" from the "Tools" menu.



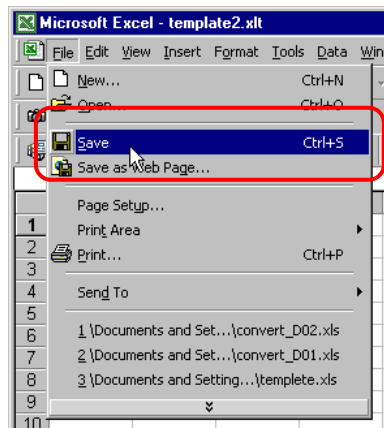
- 3 Enter the macro name "Macro1" and click the [OK] button.

Recording the macro starts.



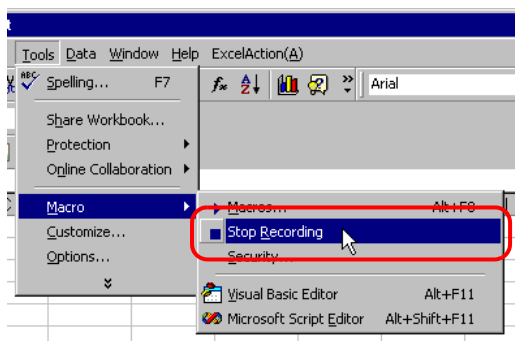
- 4 Select "Save" from the "File" menu.

"Macro1" is recorded in the macro.

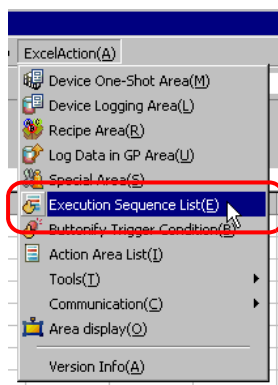


- 5 Select "Macro" and "Stop Recording" from the "Tools" menu.

Recording the macro is complete.

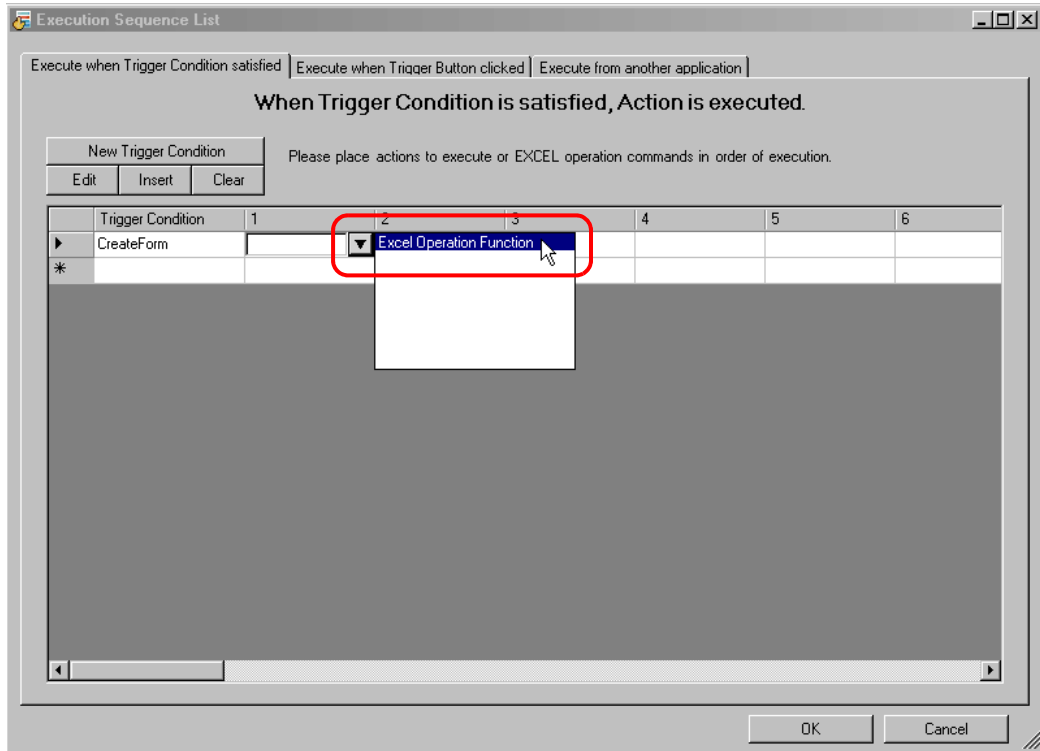


- 6 Select "Execution Sequence List" from the "Excel Action" menu.

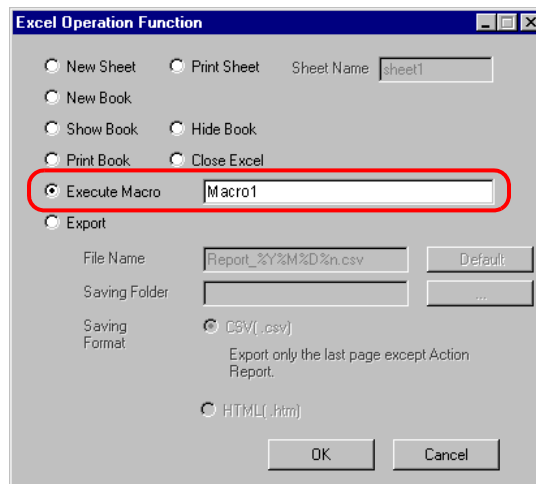


- 7 Create the trigger condition save automatically.

- 8 Select the created trigger condition and "Excel Operation Function".



- 9 Select "Execute Macro" and enter the macro name "Macro1".



- 10 Click the [OK] button.

- 11 Finish editing the template.

- 12 Save/Reload the setting contents.

According to the created trigger condition, the template is automatically saved.

10



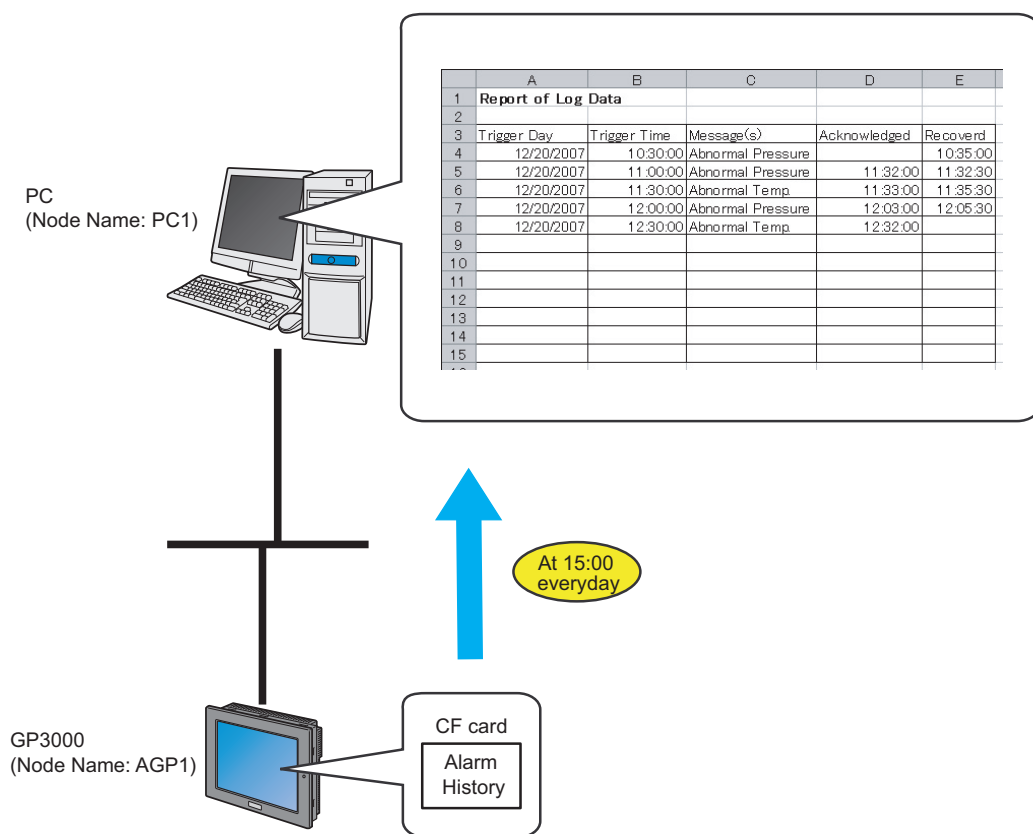
Reading the display unit's log data

| | | |
|------|--|-------|
| 10.1 | Uploading the display unit's log data..... | 10-2 |
| 10.2 | Setting Guide | 10-20 |
| 10.3 | Restrictions | 10-24 |

10.1 Uploading the display unit's log data

[Action Example]

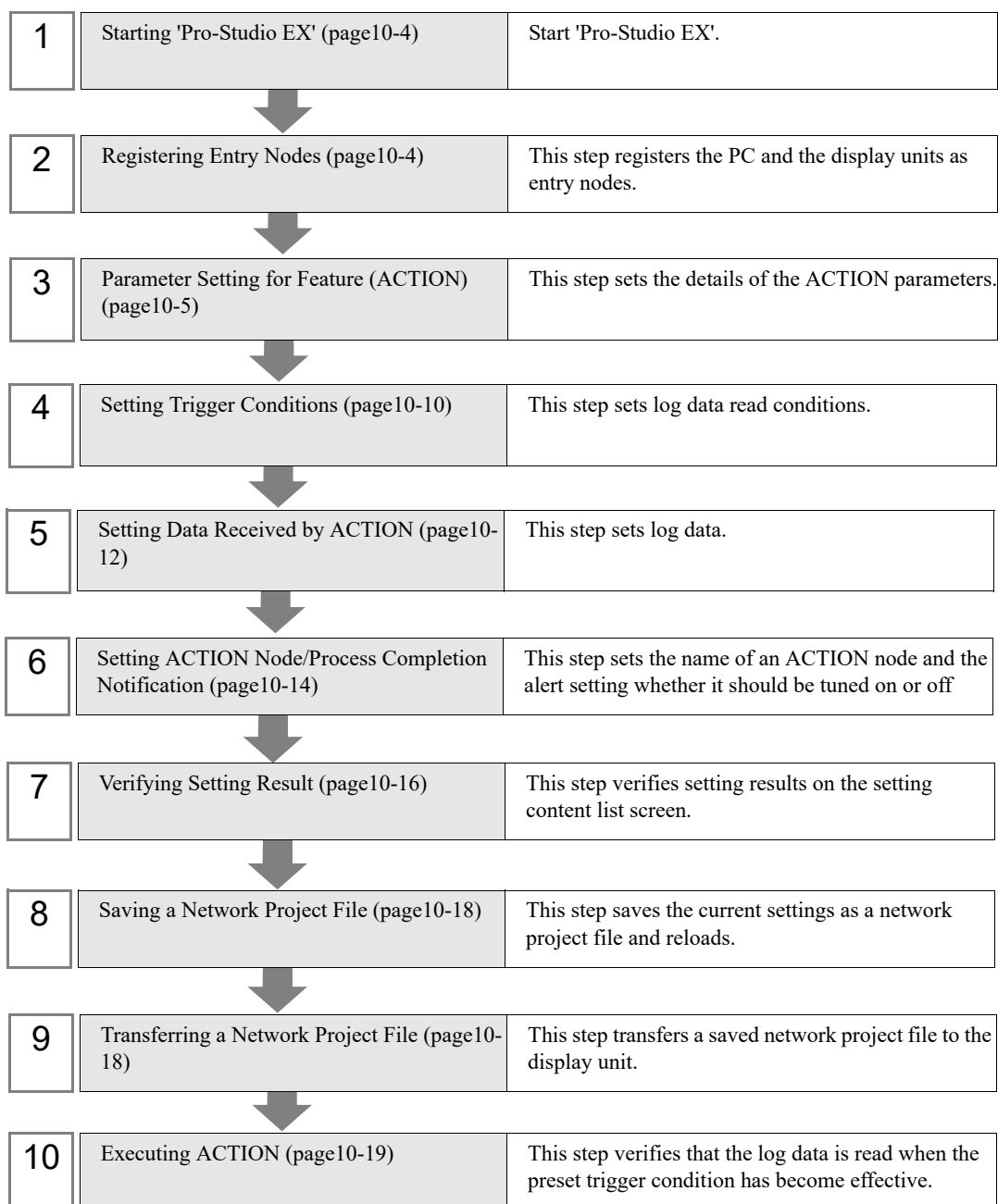
Every day at 15:00, write the display unit's alarm log data stored on the CF Card to CSV file



This section describes the setting procedures for executing the above action (ACTION) as an example.

NOTE • Refer to the 'GP-Pro Ex Reference Manual' for more details about alarms.

[Setting Procedure]



10.1.1 Starting 'Pro-Studio EX'

Start 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for more details on how to start.

10.1.2 Registering Entry Nodes

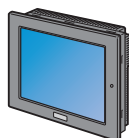
This step registers the PC and the display units connected with a network as nodes.

Refer to "33 Trigger Conditions" for more details on entry nodes.



Node Name :PC1

IP Address :192.168.0.1



Node Name :AGP1

IP Address :192.168.0.100

Device/PLC Information

Ex.

| Node | Setup Item | Description |
|--------------|------------|---------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 Series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

10.1.3 Parameter Setting for Feature (ACTION)

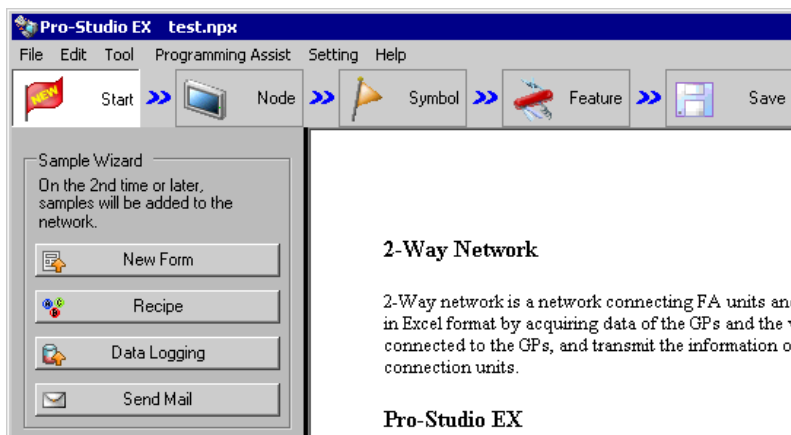
This step makes settings to write data in CSV files. (parameter settings)

Refer to "10.2 Setting Guide" for more details about ACTION parameter.

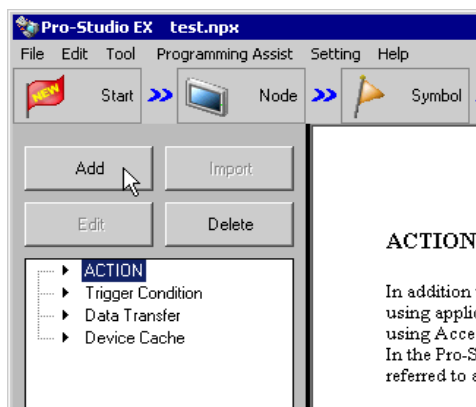
Ex.

| Setup Item | Description |
|------------------------|--|
| ACTION Name | Log Data Upload |
| Reading Source | CF Card Backup Data |
| GP Type | ST6000 Series SP-5B4*/WinGP SP-5B00/5B10/5B90 GP4000/LT4000 Series GP3000 Series LT3000 |
| Select Read Data | Alarm block 1 |
| Save File | Desktop |
| Saved File Name | GP Log Data |
| Zero Suppress | Applied |
| File Save Method | Append Data |
| Data is Currently Open | Do not save data |
| Saving format | CSV Format |

- 1 Click the [Feature] icon on the status bar.

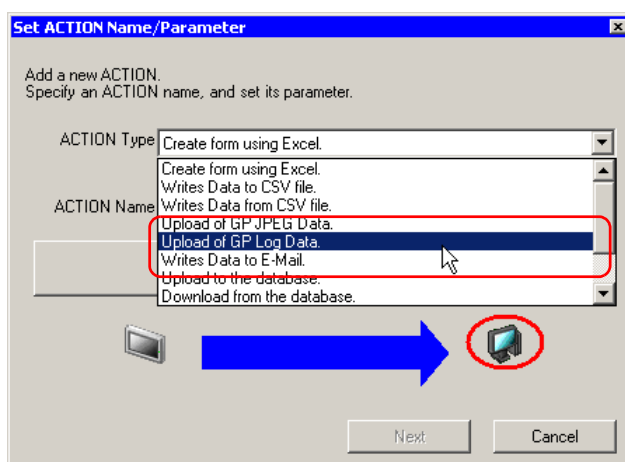


- 2 Select [ACTION] from the tree display on the left of the screen and click the [Add] button.

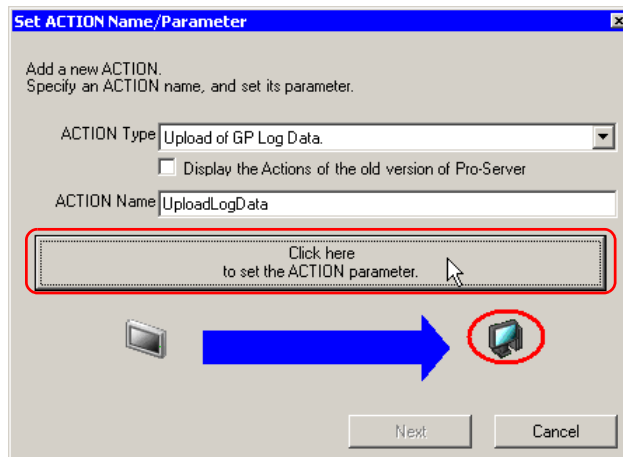


- 3 Click the [ACTION Type] list button, and select 'Upload of GP Log Data'.
Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "UploadLogData ".

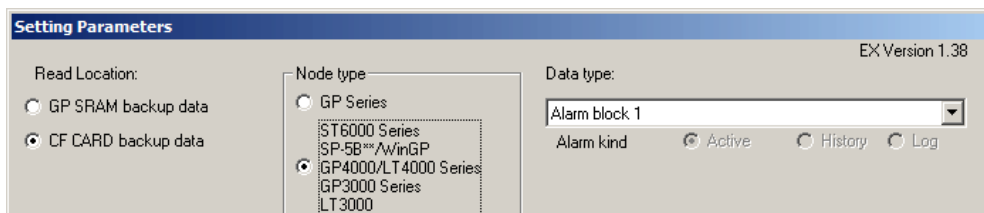
NOTE • [ACTION Name] can be an arbitrary name.



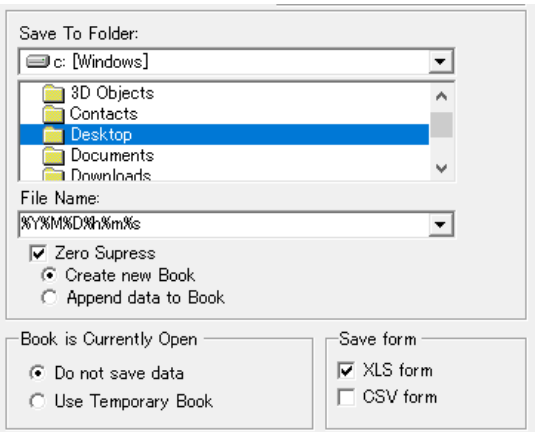
- 4 Click the [Click here to set ACTION parameter] button.



- 5 Set the read options.



6 Set the save options.



| Setup Item | Description |
|------------------------|---------------------------|
| Save To Folder | Desktop |
| File Name | Enter [GP Log Data]. |
| Zero Suppress | Check |
| Append Data to Book | Check |
| Book is Currently Open | Check [Do not save data]. |
| Save form | Check [CSV Form] only. |

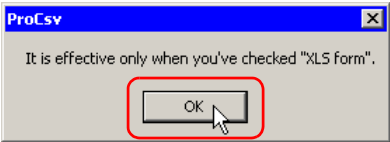
What is %Y%M%D%h%m%s?

Refers to the time when data has been written and this is saved in the format of "Year_Month_Date_Hour/Minute/Second".

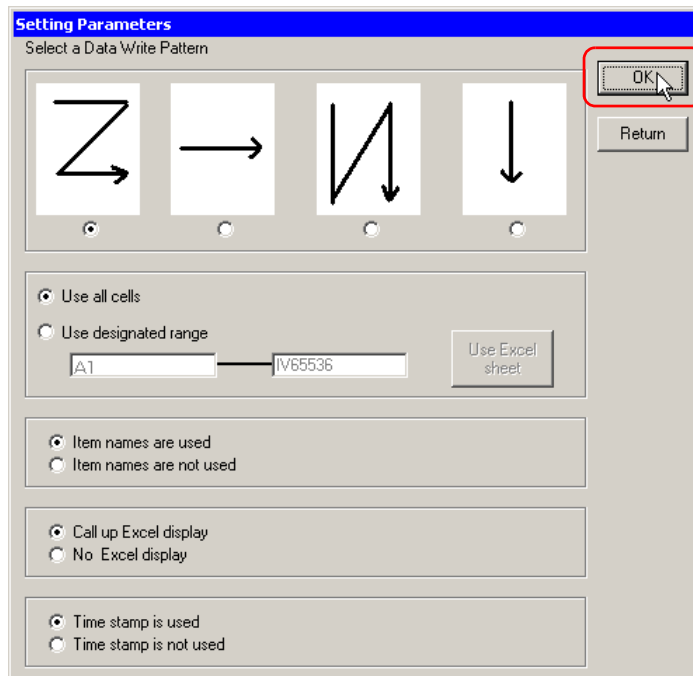
(Example) The file name for which data was written at 9:50:15 on December 15, 2007 becomes "2007_12_15_095015".

Refer to "37.1 Restrictions on Names" for more details.

7 Click the [OK] button.



8 Click the [OK] button without setting anything.



NOTE • This setting screen is used only when reading in Excel format.

This is the end of the feature (ACTION) settings.

10.1.4 Setting Trigger Conditions

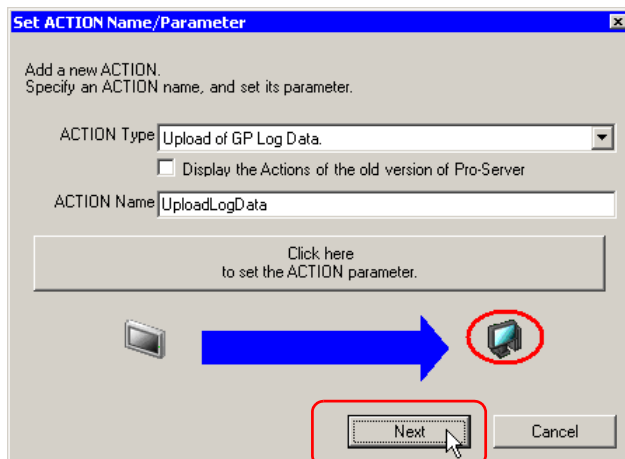
This step sets a trigger condition to read out device data.

Refer to "33 Trigger Conditions" for more details on trigger conditions.

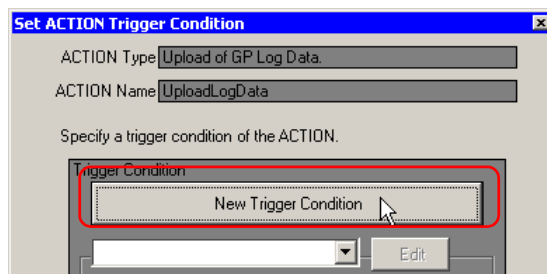
Ex.

- Trigger Condition Name: Collect at constant intervals
- Trigger Condition : 15:00 daily

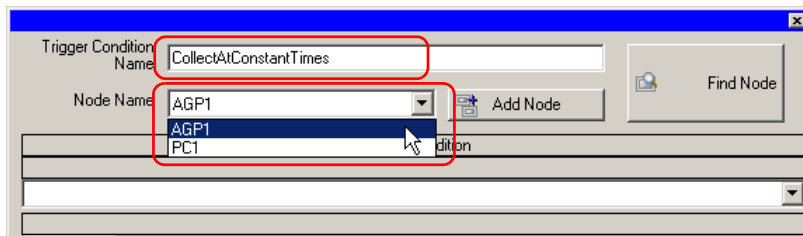
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



2 Click the [New Trigger Condition] button.



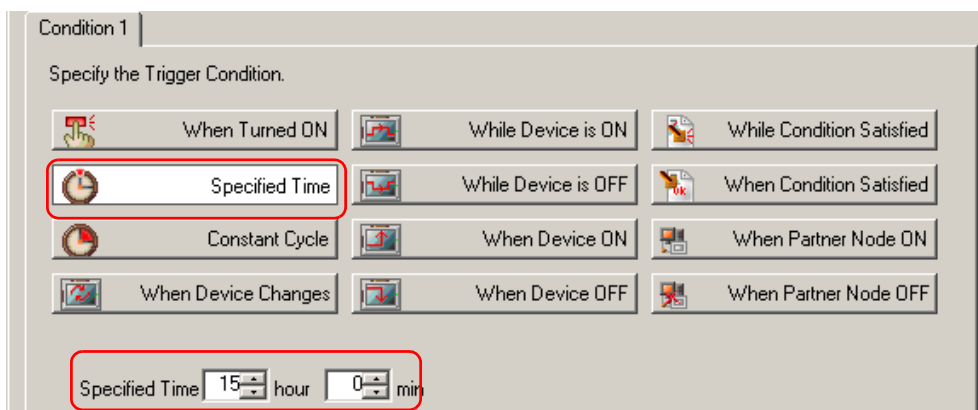
- 3 Enter the trigger condition name "CollectAtConstantTimes" in [Trigger Condition Name], and select "AGP1" in [Node Name] as a name of the data transfer source.



NOTE • Here, you are to specify the node having the device to be the trigger condition or having data to transfer.

☞ "33 Trigger Conditions"

- 4 Click the [Specified Time] button on the [Condition 1] tab, and enter "15:00" in [Specified Time]. Then click the [OK] button.



NOTE • You can also set trigger conditions by combining 2 different types of conditions ("And" condition or "Or" condition).

☞ "33 Trigger Conditions"

This is the end of trigger condition settings.

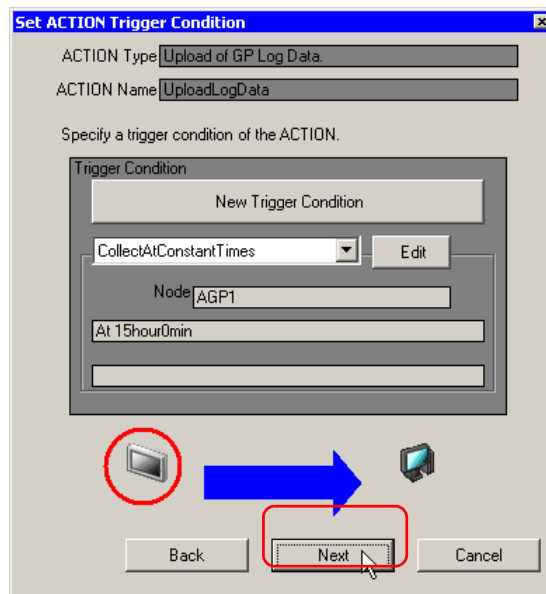
10.1.5 Setting Data Received by ACTION

Specify the data to be transferred during operation of the ACTION.

Ex.

- Constant value to transfer: 1

1 On the "Set ACTION Trigger Condition" screen, click the [Next] button.



- 2 After clicking [Constant Value], enter "1" in the text box for the constant value to transfer and "1" in [Number].

Data settings to be received by ACTION

ACTION Type: Upload of GP Log Data

ACTION Name: UploadLogData

From the trigger node, this ACTION is received as a data to do the ACTION. As the data value, the device value of the trigger node or a constant is available. Specify the data.

File No.:

Transfer Source:

Node

Node: AGP1

Device Name: #INTERNAL

Device Address

Constant Value

Data Type: 16Bit(Signed)

No.:

Back Next Cancel

NOTE • You can transfer stored values as data by specifying a symbol or a device address.

This is the end of the setting of data received by ACTION.

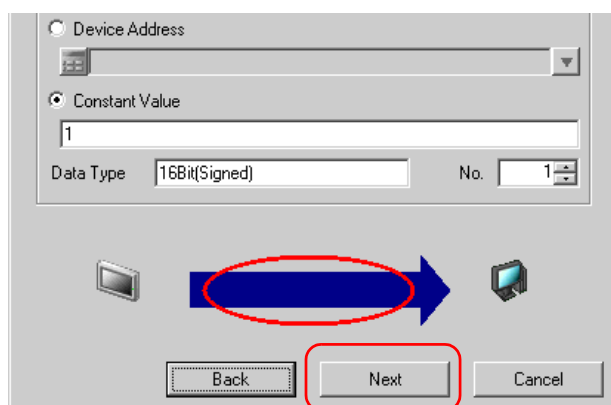
10.1.6 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed.

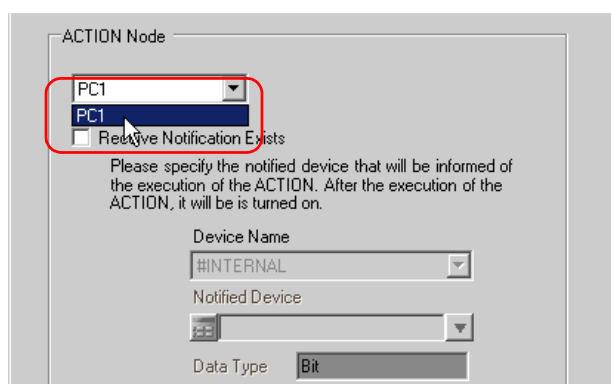
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

1 On the "Set Data Received by ACTION" screen, click the [Next] button.



2 Click the list button of [Action Node] and select "PC1" as a node where ACTION operates. Also, clear the check if [Receive Notification Exists] has been checked.



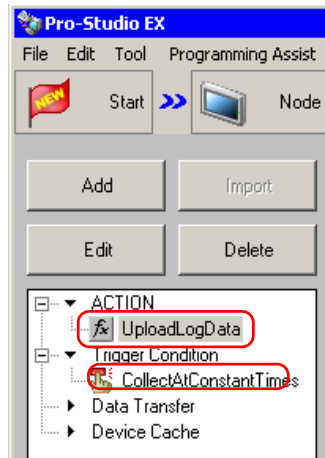
NOTE

- When "Receive Notification" is turned on, the specified bit device will be turned on when the ACTION is completed. This can be used as the trigger condition of the subsequent ACTION when you want to execute two or more ACTIONS sequentially.

☞ "33 Trigger Conditions"

3 Click the [End] button.

The "ACTION Node/Process Completion Notification Settings" screen will disappear. On the left of the screen, the name of ACTION and trigger condition you set will appear.

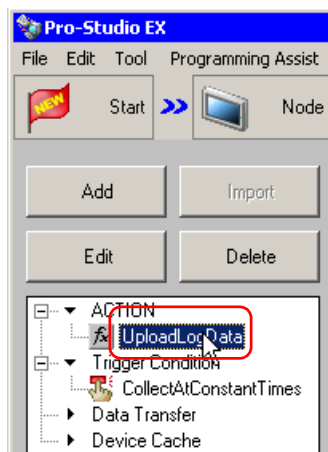


This is the end of the settings of the ACTION node and process completion notification.

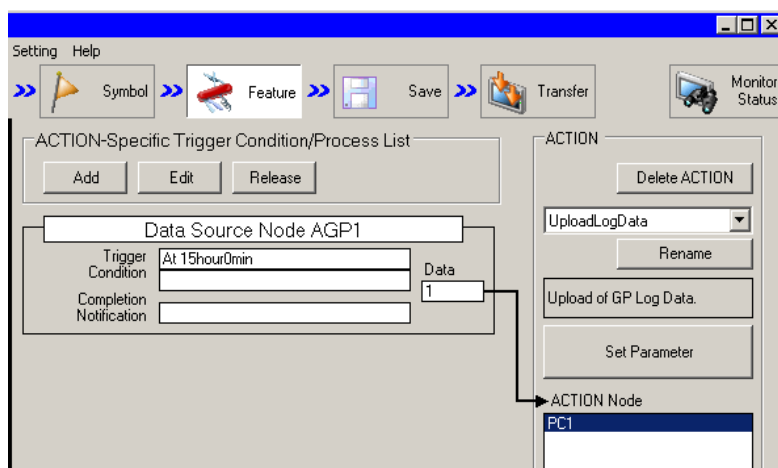
10.1.7 Verifying Setting Result

This step verifies setting results on the setting content list screen.

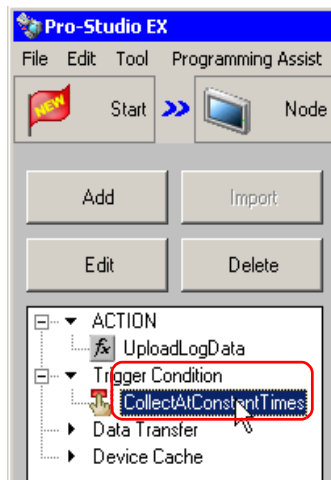
- 1 Select the ACTION name "UploadLogData" from the tree display on the left of the screen.



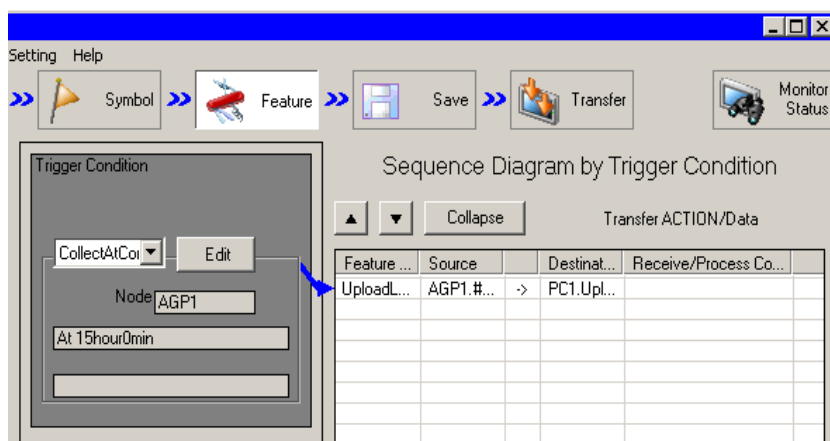
Confirm that the setting content appears on the right of the screen.



- 2 Select the trigger condition name "CollectAtConstantTimes" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

10.1.8 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes Action according to the settings in the file. The settings therefore need be saved in the network project file.
 - Be sure to reload the network project file to "Pro-Server EX" If not, ACTION will not work.
-

Ex.

- Path of network project file : Desktop\gplog_update.npxe
- Title : Upload of GP log data

10.1.9 Transferring a Network Project File

This step loads a saved network project file to 'Pro-Server EX' and then transfers to entry nodes.

Refer to "26 Transferring" for details about transferring a network project file.

NOTE

- Be sure to transfer a network project file. If not, ACTION will not work.
-

10.1.10 Executing ACTION

This step verifies that enabling a trigger condition activates ACTION, opens a CSV file (file name: "GP Log Data.csv"), and then writes the log data of display unit.

| | A | B | C | D | E |
|----|---------------------------|--------------|-------------------|--------------|----------|
| 1 | Report of Log Data | | | | |
| 2 | | | | | |
| 3 | Trigger Day | Trigger Time | Message(s) | Acknowledged | Recoverd |
| 4 | 12/20/2007 | 10:30:00 | Abnormal Pressure | | 10:35:00 |
| 5 | 12/20/2007 | 11:00:00 | Abnormal Pressure | 11:32:00 | 11:32:30 |
| 6 | 12/20/2007 | 11:30:00 | Abnormal Temp | 11:33:00 | 11:35:30 |
| 7 | 12/20/2007 | 12:00:00 | Abnormal Pressure | 12:03:00 | 12:05:30 |
| 8 | 12/20/2007 | 12:30:00 | Abnormal Temp | 12:32:00 | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

NOTE

- If error occurs, you can check the log in the Log Viewer. Refer to "28.5 Monitoring System Event Logs" for more details.
- When output to Excel, the date uses the "20yy/mm/dd" (or "19yy/mm/dd") format. However, when the CSV file on the CF card does not use the "yy/mm/dd" date format, the date format will be different.

This is the end of the explanation of this ACTION.

10.2 Setting Guide

This section explains how to set the parameters of ACTION.

■ Detailed Settings

| Setup Item | Description |
|---------------|--|
| Read Location | <p>Select the location of data to upload.</p> <ul style="list-style-type: none"> GP SRAM backup data Read data on the display unit's SRAM. CF CARD backup data Read data on the display unit's CF/SD Card. |
| Node type | Select the display unit model to read from. |

| Setup Item | Description |
|------------------------|--|
| Data type | <p>Select the data to read.</p> <ul style="list-style-type: none"> For GP Series node <ul style="list-style-type: none"> Logging data Trend data Sampling data Alarm history data Alarm log data Alarm block 1 Alarm block 2 Alarm block 3 Alarm block 4 Alarm block 5 Alarm block 6 Alarm block 7 Alarm block 8 For ST6000 Series, SP-5B**/WinGP, GP4000/LT4000 Series, GP3000 Series, LT3000 node <ul style="list-style-type: none"> Alarm block 1 Alarm block 2 Alarm block 3 Alarm block 4 Alarm block 5 Alarm block 6 Alarm block 7 Alarm block 8 Sampling data GP-PRO/PB Trend graph data (compatible) GP-PRO/PB Sampling data (compatible) GP-PRO/PB Logging data (compatible) |
| Save To Folder | Specify the save destination folder. |
| File Name | Specify the saved file name. %Y%M%D%h%m%s (Year/Month/Day/Hour/Minute/Second) is set as default. File name can be specified indirectly. Refer to "37.1 Restrictions on Names" for more details. |
| Zero Suppress | <p>If you check this option, no zeros are supplemented in the save file name even though the folder name includes any of "%M%D%h%m%s" (month, day, hour, minute, second) data.</p> <p>If you do not check this option, zeros are supplemented in the file name only when the folder name includes any of "%M%D%h%m%s" (month, day, hour, minute, second) and the numeric value is 1 digit.</p> <p>The default is "checked".</p> |
| File Save Method | <p>Select the file save method from the following options.</p> <ul style="list-style-type: none"> Create new Book Append data to Book <p>When using the fixed name to specify the save file name, the data will be written in Sheet2.</p> |
| Book is Currently Open | <p>Check this option when books with the same file name is open when writing data. Select either [Do not save data] or [Use Temporary Book].</p> <p>When you check [Do not save data], the written data will not be saved and deleted. If you check [Use Temporary Book], the written data will be temporarily saved under a separate filename (The temporary filename will be "%Y%M%D%h%m%s.xls").</p> |
| Save form | You can select Excel file format (.xls) or text file format (.csv). You can select both file formats. In that case, files in each format will be created. |

| Setup Item | Description |
|------------------------|---|
| Template File Location | <p>Specify if you use the template or not. When you specify using the template, specify the drive folder of the template and the template file name.</p> <div>NOTE</div> <ul style="list-style-type: none">• The specified template file should contain only Sheet1.• When you specify CF card as the source to be read, you need to specify the uploading file No. |

■ Detailed Settings (Write Settings)

| Setup Item | Description |
|-----------------------------|--|
| Select a Data Write Pattern | Set the write direction of the read data. |
| Write Data Range | Select either [Use all cells] or [Use designated range]. When you select [Use designated range], set the cell range within which data will be written. |
| Item name. | Select either [Item names are used] or [Item names are not used]. When you select [Item names are used], the log data item name will be entered. |
| Call up Excel display | Select either [Call up Excel display] or [No Excel display]. |
| Time Stamp | Select either [Time stamp is used] or [Time stamp is not used]. When you select [Time stamp is used], the time when data is written will be entered. |

NOTE

- When CSV is selected as the data save format, the [Template] and [Data write] patterns cannot be selected. Settings are fixed to [Data write]:[Z] type, [Use all cells], [Item names are not used], and [Time Stamp is not used].

10.3 Restrictions

■ Restrictions on reading Alarm and Sampling Data on the CF Card

- In GP-Pro EX, use "yy/mm/dd" for the date format. When the CSV file on the CF card does not use "yy/mm/dd" for the date format, the wrong date may be output.
When output to Excel, the date uses the "20yy/mm/dd" (or "19yy/mm/dd") format.
- When using a version of GP-Pro EX before V3.12, or a version of Pro-Server EX before V1.32, do not use the [Set number of files in destination folder on external storage] option in GP-Pro EX. You cannot read files stored [Alarm] or [SAMP**] sub-folders.
- If [Multiple Line Message Output (Save Alarm to CSV)] is enabled in GP-Pro EX alarm settings, use the [Save Form] setting to change the output format. If [Save Form] is set to [XLS form], each line of a message with line breaks is output to a different cell. If [Save Form] is set to [CSV form], a message with line breaks is output to a single cell.
If [Multiple Line Message Output (Save Alarm to CSV)] is disabled, the message up to the line break only is saved to the CSV file.

■ Restrictions on reading Alarm and Sampling Data in SRAM

- Regardless of the date format defined in GP-Pro EX, dates are handled with the "yy/mm/dd" format. When outputting to Excel, the date format is "20yy/mm/dd" (or "19yy/mm/dd").
- If [Multiple Line Message Output (Save Alarm to CSV)] is enabled in GP-Pro EX alarm settings, use the [Save Form] setting to change the output format. If [Save Form] is set to [XLS form], each line of a message with line breaks is output to a different cell. If [Save Form] is set to [CSV form], a message with line breaks is output to a single cell.
If [Multiple Line Message Output (Save Alarm to CSV)] is disabled, the message up to the line break only is saved to the CSV file.

■ Item names when reading Sampling Data to Excel

- Select the [Item names are not used] check box to output GP-Pro EX sampling settings without the first row and first column in the [Display/Save in CSV] tab. Accordingly, if the [Item Name (Vertical)] check box is cleared in GP-Pro EX, the [Date] column becomes the first column and the date is not output.
If the [Item Name (Vertical)] check box is cleared, select the [Item names are used] check box.

11



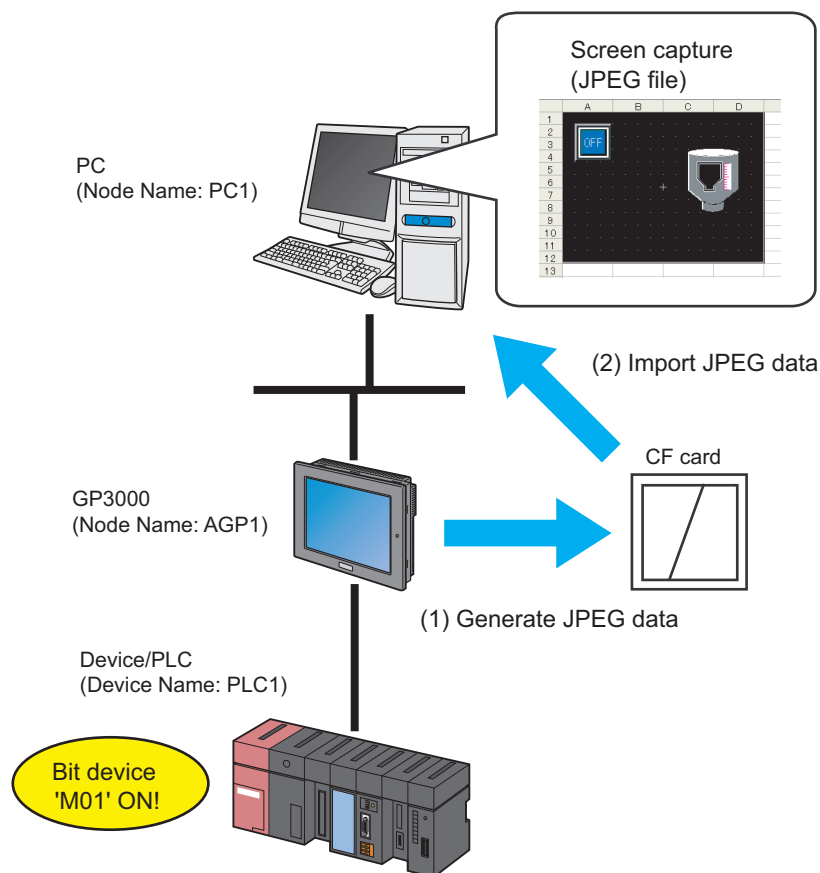
Importing the display unit's Capture Data (JPEG)

| | | |
|------|---------------------------------|-------|
| 11.1 | Capturing at Preset Timing..... | 11-2 |
| 11.2 | Capturing Right Now | 11-22 |
| 11.3 | Restrictions | 11-26 |

11.1 Capturing at Preset Timing

[Action Example]

Detect the rising of the device (bit device: address "M01") of Device/PLC, save captured screens (JPEG data) in a CF card of the display unit, and upload to PC.



This section describes the setting procedures for executing the above action (ACTION) as an example.

NOTE • To capture the screens, install a CF card in the display unit.

[Setting Procedure]

| | | |
|----|---|--|
| 1 | Starting 'Pro-Studio EX' (page11-4) | This step starts 'Pro-Studio EX'. |
| 2 | Registering Entry Nodes (page11-4) | This step registers the PC and the display units as entry nodes. |
| 3 | Registering Symbols (page11-5) | This step registers as a symbol the device of Device/PLC which serves as a trigger condition (trigger). |
| 4 | Parameter Setting for Feature (ACTION) (page11-6) | This step sets the following items: <ul style="list-style-type: none"> • Capture Data Selection • File Specification |
| 5 | Setting Trigger Conditions (page11-10) | This step sets conditions (trigger) for screen captures. |
| 6 | Setting Data Received by ACTION (page11-13) | This step sets data to transfer. |
| 7 | Setting ACTION Node/Process Completion Notification (page11-14) | This step sets the name of an ACTION node and the alert setting whether it should be turned on or off when the ACTION is completed. |
| 8 | Verifying Setting Result (page11-16) | This step verifies setting results on the setting content list screen. |
| 9 | Saving a Network Project File (page11-18) | This step saves the current settings as a network project file and reloads. |
| 10 | Transferring a Network Project File (page11-18) | This step transfers a saved network project file to the display unit. |
| 11 | Executing ACTION (page11-19) | This step verifies that captured data (JPEG) of display unit screens are saved in the specified location when the preset trigger condition has become effective. |

■ Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

■ Registering Entry Nodes

This step registers the PC and the display unit connected with network as nodes.

Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1

IP Address :192.168.0.1



Node Name :AGP1

IP Address :192.168.0.100

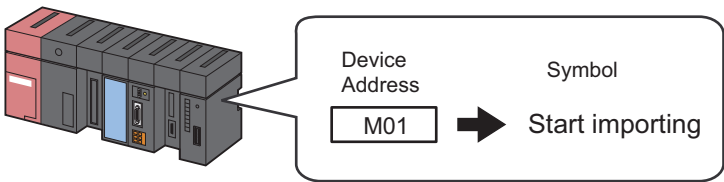
Device/PLC Information

Ex.

| Entry Node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

■ Registering Symbols

This step registers as a symbol the device address of Device/PLC from which data is read.
Refer to "32 Symbol Registration" for details about symbols.



Ex.

| Setting item | Setting content |
|--|---------------------------|
| Symbol Name | Start importing |
| Data Type | Bit |
| Device address for symbol registration | "01" of Device/PLC (PLC1) |
| No. of Devices | 1 |

■ Parameter Setting for Feature (ACTION)

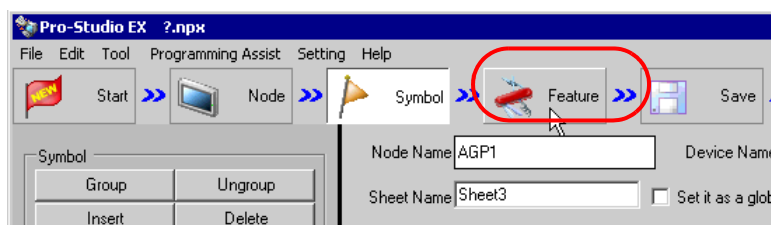
Make settings to capture data. (parameter settings)

Refer to "11.1.1 Setting Guide" for more details about ACTION parameters.

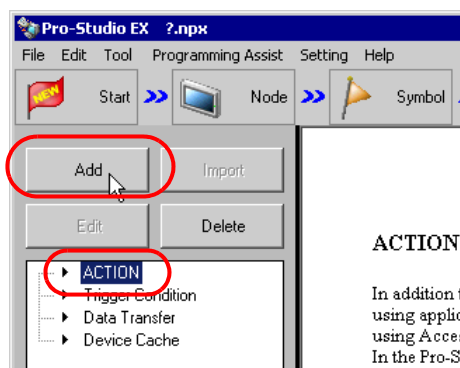
Ex.

| Setting item | Setting content |
|--|--------------------------------|
| Capture Data Selection | GP Capture Data |
| Save File | C:\Users\<<User name>>\Desktop |
| Saved File Name | %NODE%Y%M%D%h%m%s |
| Zero Suppress | OFF |
| When the same file name already exists | Save Rewrite |
| Show Browser | OFF |

- 1 Click the [Feature] icon on the toolbar.

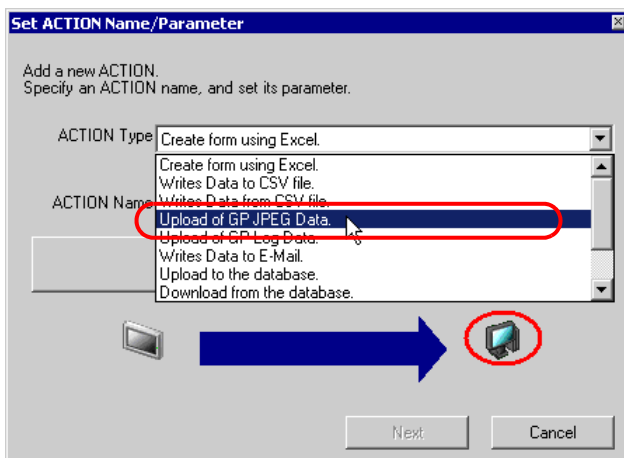


- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.

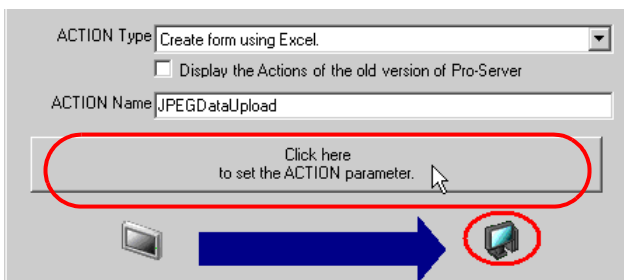


- 3 Click the [ACTION Type] list button, and select "Upload of GP JPEG Data".

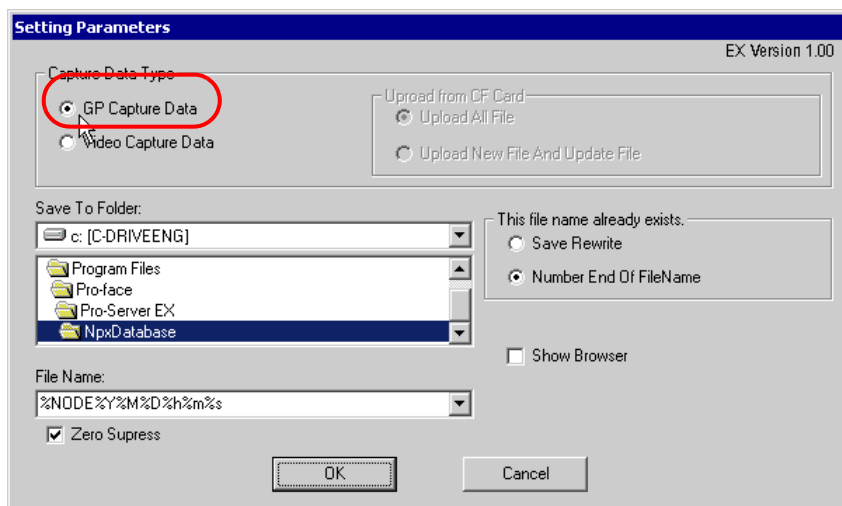
Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "JPEG Data Upload".



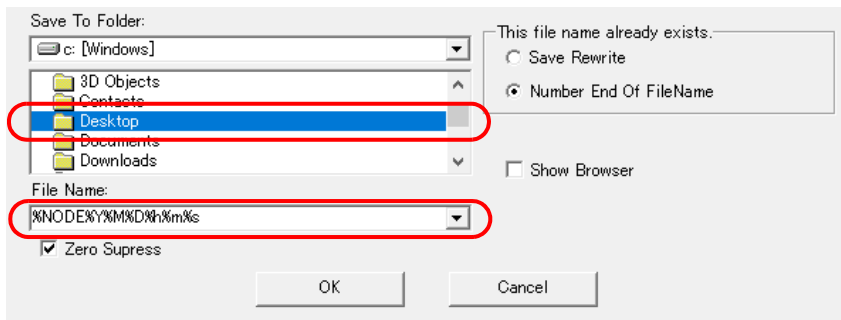
- 4 Click the [Click here to set the ACTION parameter] button.



- 5 Check [GP Capture Data] in [Capture Data Type].



- 6 Set "Desktop" for [Save To Folder] as a folder to store the file to write data in, with the default file name "%NODE%Y%M%D%h%m%s".



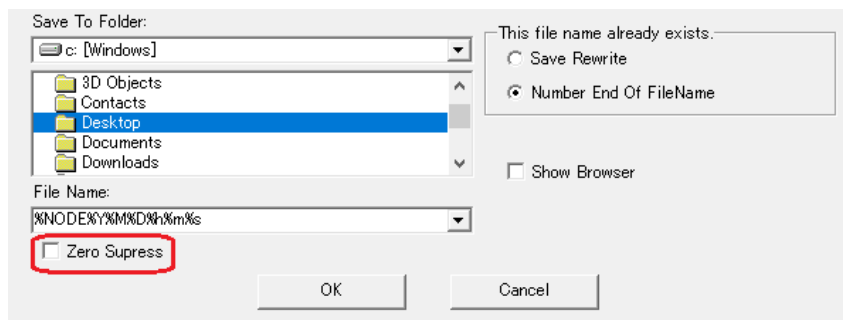
What is %NODE%Y%M%D%h%m%s?

%NODE%Y%M%D%h%m%s refers to the node where and the time when data has been captured and this is saved in the format of "Node_Year_Month_Date_Hour/Minute/Second".

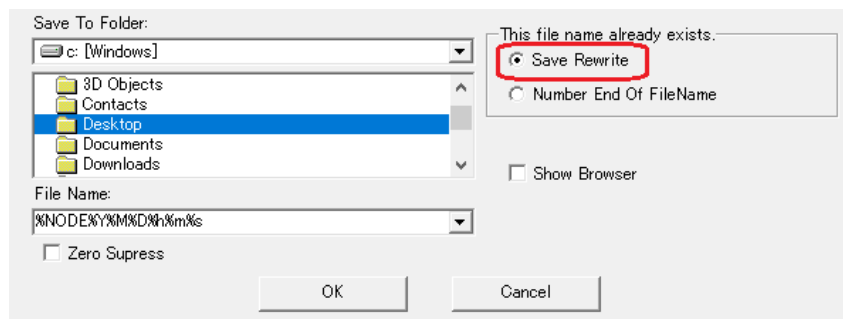
(Example) The file name for which data was captured from the node "AGP1" at 9:50:15 on Feb, 15, 2006 becomes "AGP1_2006_02_15_095015".

Refer to "37.1 Restrictions on Names" for more details.

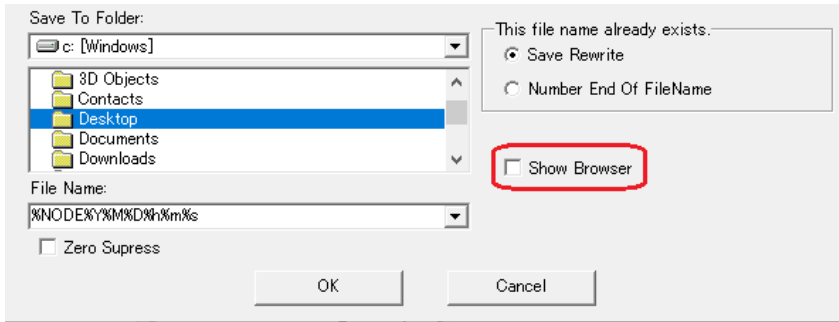
- 7 Turn off the [Zero Suppress] check box, if checked.



- 8 Select [Save Rewrite] in [This file name already exists.].



9 Turn off the [Show Browser] check box, if checked.



10 Click the [OK] button.

This is the end of the feature (ACTION) settings.

■ Setting Trigger Conditions

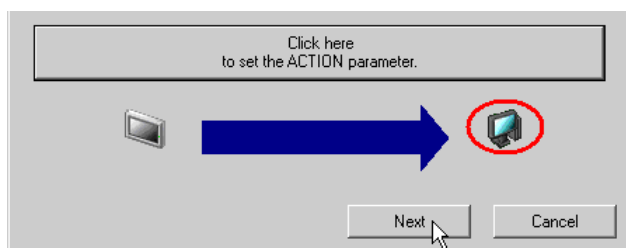
This step sets conditions (trigger bit ON) for screen captures.

Refer to "33 Trigger Conditions" for details about trigger conditions.

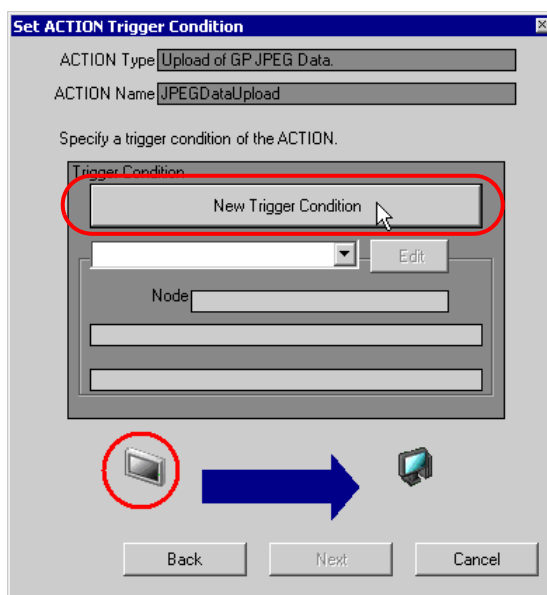
[Setting Example]

- Trigger Condition Name: Turn on capture start bit
- Trigger Condition : When "Start capturing" (M01) is ON

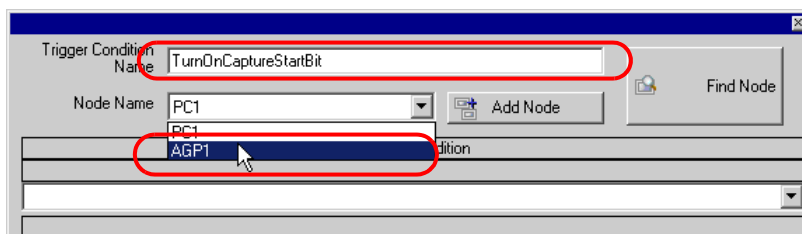
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



2 Click the [New Trigger Condition] button.



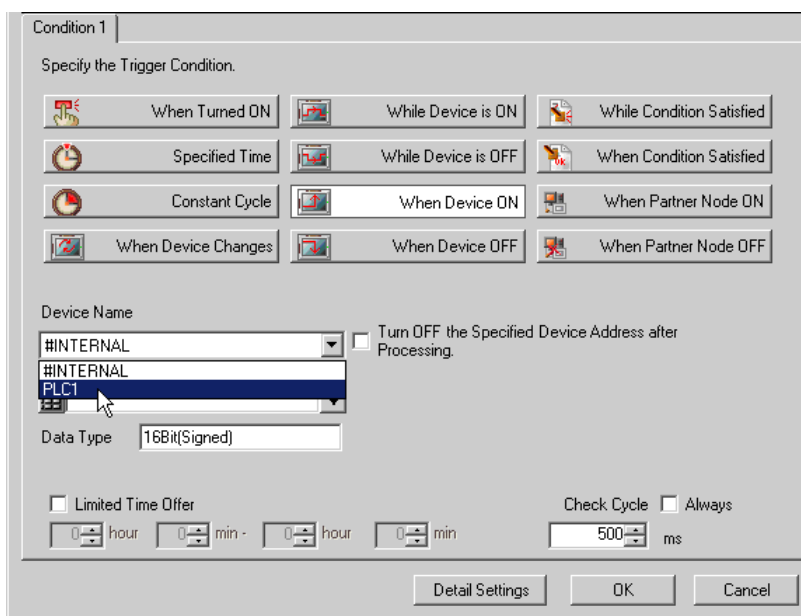
- 3 Enter the trigger condition name "TurnOnCaptureStartBit" in [Trigger Condition Name], and select "AGP1" in [Node Name] which has the device to serve as the trigger condition.

**NOTE**

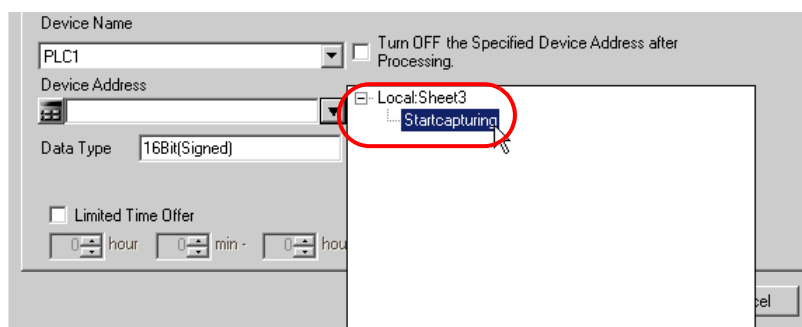
- Here, you are to specify the node having the device to be the trigger condition.

☞ "33 Trigger Conditions"

- 4 Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



- 5 Click the [Device Address] list button and select "Start capturing" for the device symbol name which serves as the trigger.



[Data Type] automatically appears after selection, too.

NOTE

- You can also set trigger conditions by combining 2 different types of conditions ("And" condition or "Or" condition).



"33 Trigger Conditions"

- 6 Click the [OK] button.

This is the end of trigger condition settings.

■ Setting Data Received by ACTION

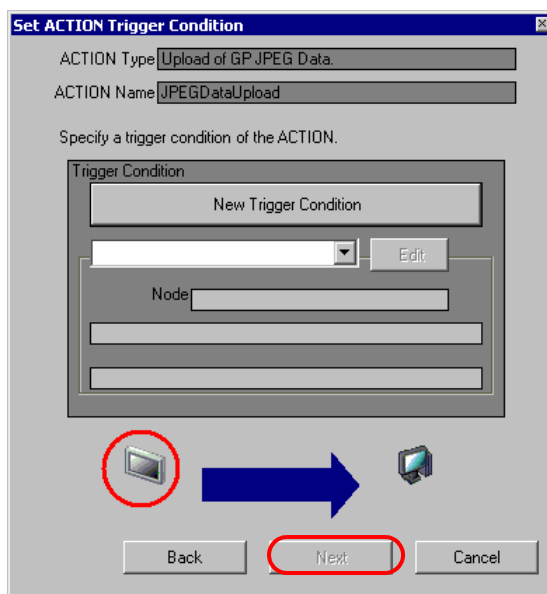
This step sets data to transfer in ACTION.

Any constant value is acceptable as data to transfer.

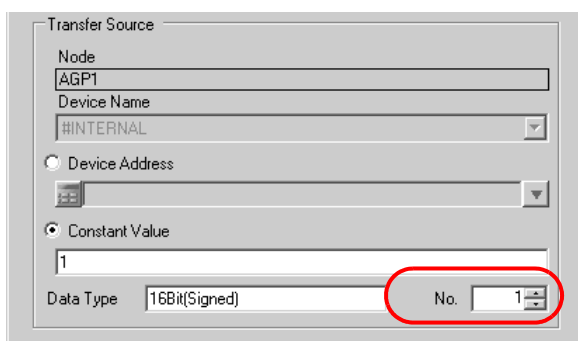
Ex.

- Constant value to transfer: 1

1 On the "Set ACTION Trigger Condition" screen, click the [Next] button.



2 After clicking [Constant Value], enter "1" in the text box for the constant value to transfer and "1" in [No.].



NOTE • You can transfer stored values as data by specifying a symbol or a device address.

This is the end of the setting of data received by ACTION.

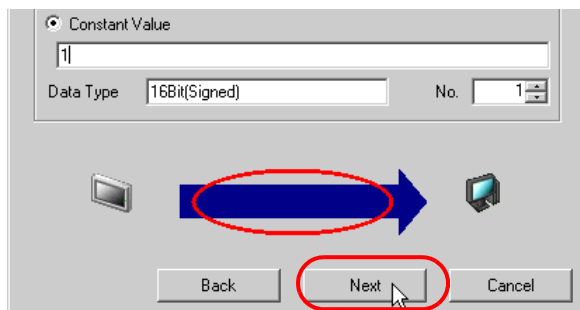
■ Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed.

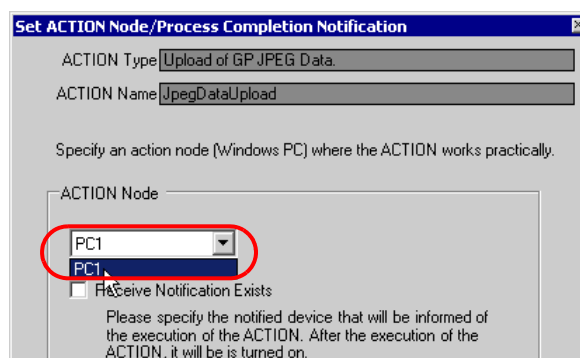
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

1 On the "Data settings to be received by ACTION" screen, click the [Next] button.



2 Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates.



- 3 Turn off the [Receive Notification Exists] check box, if checked.

ACTION Node

PC1

☐ Receive Notification Exists

Please specify the notified device that will be informed of the execution of the ACTION. After the execution of the ACTION, it will be turned on.

Device Name: #INTERNAL

Notified Device:

Data Type: Bit

NOTE

- When "Receive Notification Exists" is turned on, the specified bit device will be turned on when the ACTION is completed. This can be used as a trigger condition (trigger) of the subsequent ACTION when you want to execute two or more ACTIONS sequentially.

☞ "33 Trigger Conditions"

- 4 Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the name of ACTION you set will appear.

Device Name: #INTERNAL

Notified Device:

Data Type: Bit

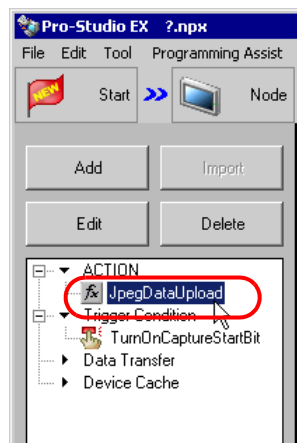
Back Complete Cancel

This is the end of the settings of the ACTION node and process completion notification.

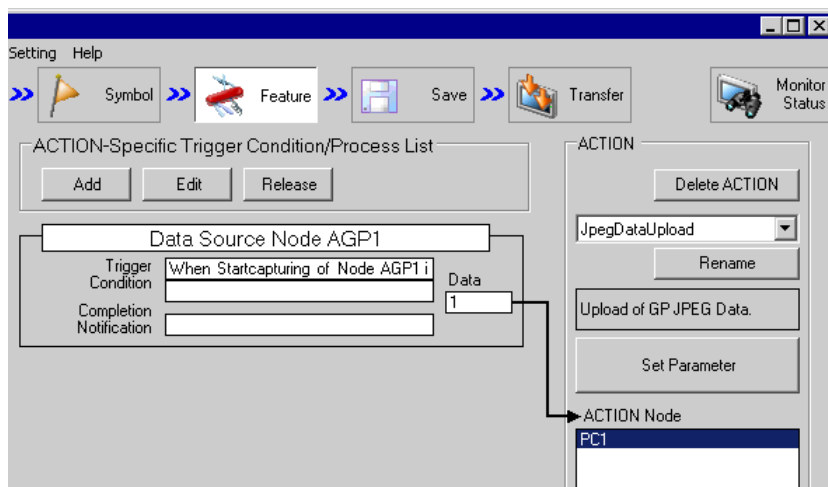
■ Verifying Setting Result

This step verifies setting results on the setting content list screen.

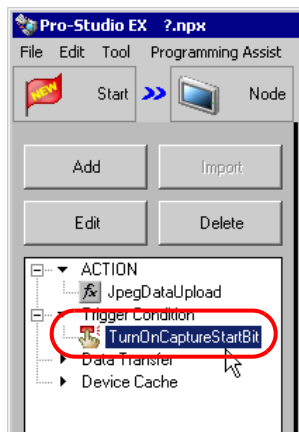
- 1 Select the ACTION name "JPEG Data Upload" from the tree display on the left of the screen.



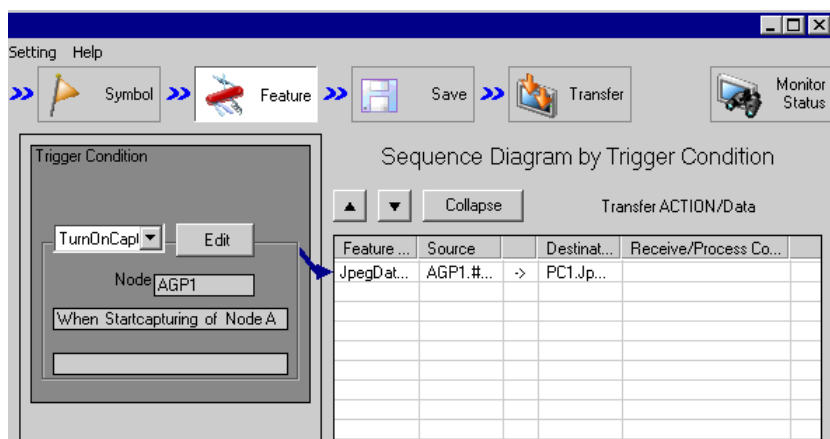
Confirm that the setting content appears on the right of the screen.



- 2 Select the trigger condition name "TurnOnCaptureStartBit" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

■ Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
 - Be sure to reload the network project file to 'Pro-Server EX' If not, ACTION will not work.
-

Ex.

- Path of network project file : Desktop\capture.npxe
- Title : JPEG upload action

■ Transferring a Network Project File

This step loads a saved network project file to 'Pro-Server EX' and then transfers to entry nodes.

Refer to "26 Transferring" for details about transferring a network project file.

NOTE

- Be sure to transfer a network project file. If not, ACTION will not work.
-

■ Executing ACTION

This step verifies that enabling a trigger condition activates ACTION and saves the capture data in the specified location.

IMPORTANT

- To capture the display unit screen, turn ON the bit 0 for internal device LS2076 in the display unit. While capturing, the bit 0 for LS2077 is turned ON. It is turned OFF when capturing finishes.

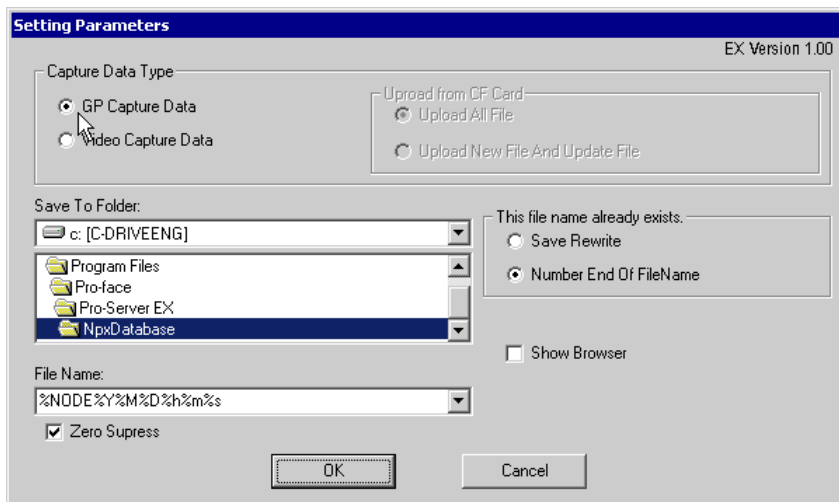
**NOTE**

- If error occurs, you can check the log in the Log Viewer. For more details, refer to "28.5 Monitoring System Event Logs".
- If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".

This is the end of the explanation of this ACTION.

11.1.1 Setting Guide

This section explains how to set the parameters of ACTION.



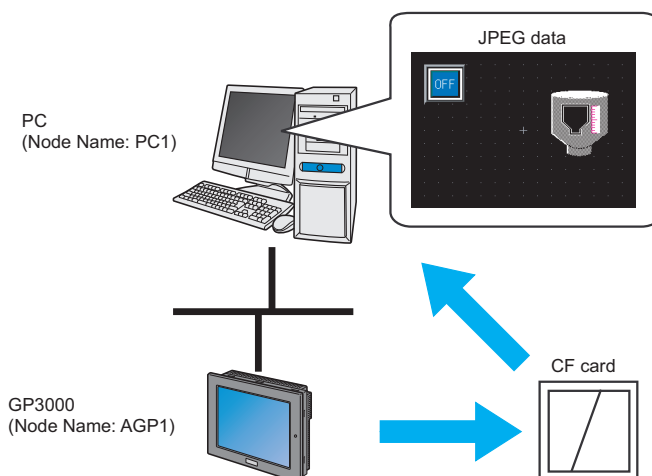
| Setting item | Setting content |
|---------------------|---|
| Capture Data Type | <p>Selects data to capture.</p> <ul style="list-style-type: none"> GP Capture Data Captures a display unit screen and uploads. Video Capture Data Uploads video data which has already been saved in a CF/SD card of display unit. In this case, you cannot set each item of [File Name], [Zero Suppress] and [Show Browser]. Also, you cannot upload more than 32767 JPEG files at one time. |
| Upload from CF-Card | <p>If you select [Video Capture Data] for [Capture Data Selection], you are to select whether to upload all video data in a CF/SD card or only the file(s) not existing or updated in the directory to set in [Save].</p> |
| Save To Folder | <p>Selects a save folder for captured data. C drive (C:) folder is to appear for initial setting. To change the drive to display, click the list button to select new one.</p> |
| File Name | <p>Sets the file name to save. "%NODE%Y%M%D%h%m%s" is to appear for initial setting. ("%NODE" indicates a node name.)</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">NOTE</div> <ul style="list-style-type: none"> By specifying a macro code for the file name to save, you can set the file name as a node name or device data. <p>☞ 37.1 Restrictions on Names</p> |
| Zero Suppress | <p>If you set the save file name as "%NODE%Y%M%D%h%m%s" and check this item, the digit 0 is not displayed. (Example) File name which is written at 7:31 when specifying the save file name as "%h%m" Checked: ..._7_31...xls Not checked: ..._07_31...xls</p> |

| Setting item | Setting content |
|--------------------------------|---|
| This file name already exists. | To overwrite save, check [Save Rewrite]. If not, check [Number End of File Name]. |
| Show Browser | Shows captured data on an exclusive JPEG file browser. |

11.2 Capturing Right Now

[Action Example]

Save capture data displayed on currently operating display unit.



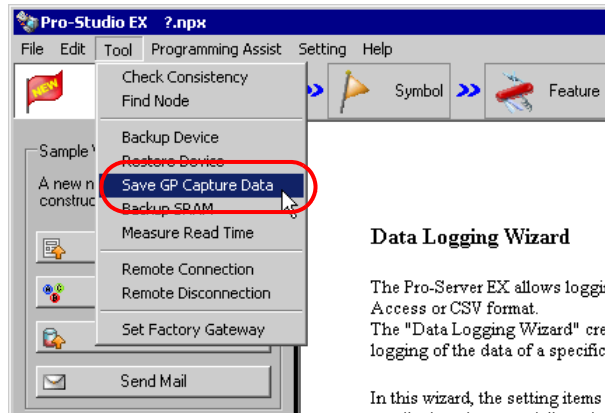
This section describes the setting procedures for executing the above action (ACTION) as an example.

NOTE

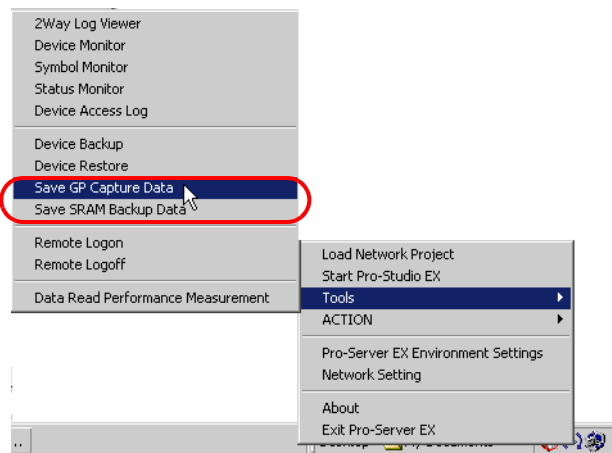
- To capture the screens, install a CF card in the display unit.
- To use this function, you need to set using the network project file which 'Pro-Server EX' loads. You can confirm which network project file is loaded by 'Pro-Server EX' in Status Monitor Menu.

☞ "28.5 Monitoring System Event Logs"

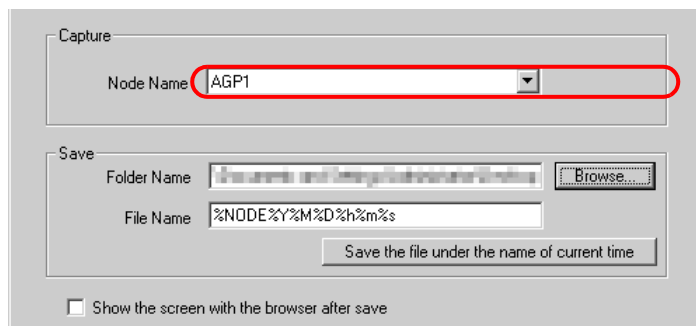
- 1 Click [Save GP Capture Data] from [Tools] on the menu bar.

**NOTE**

- You can also display the "Save GP Capture Data" screen by right-clicking the tasktray icon and then selecting [Save GP Capture Data] from the menu.



- 2 Click the list button and select the display unit in which you save captured data.



- Click the [Browse] button and set a folder in [Folder Name] where captured data is saved.

- Specify a file name in [File Name] for captured data to save.

- Click the [Save] button.

IMPORTANT

- To capture the display unit screen, turn ON the bit 0 for internal device LS2076 in the display unit. While capturing, the bit 0 for LS2077 is turned ON. It is turned OFF when capturing finishes.

11.2.1 Setting Guide

■ "GP Capture Data Saving" Screen

Save GP Capture Data

Capture the screen of the specified node and save it.

Capture

Node Name

Save

Folder Name C:\Program Files\Pro-face\Pro-Server EX\NFXD...

File Name %NODE%Y%M%D%h%m%s

☐ Show the screen with the browser after save

| Setting item | | Setting content |
|---|--|---|
| Capture | Node Name | Selects node name of display unit to capture screens. |
| Save | Folder Name | Selects a save folder for captured data. C drive (C:) folder is to appear for initial setting. To change the drive to display, click the list button to select new one. |
| | File Name | Sets a file name to save. |
| | Save the file under the name of current time | Use current time (%NODE%Y%M%D%h%m%s%) for a file name. ("%NODE" indicates a node name.) |
| Show the screen with the browser after save | | When selected, captured data is displayed in the application associated with JPEG files. |

11.3 Restrictions

- You cannot import the display unit's capture data to models without a CF/SD card slot.
- While the screen update load is high on the display unit and Pro-Server EX tries to get a screen capture, the display unit may fail to save the screen capture to JPEG and an error may arise.

12



Writing Excel Data in Device/PLC

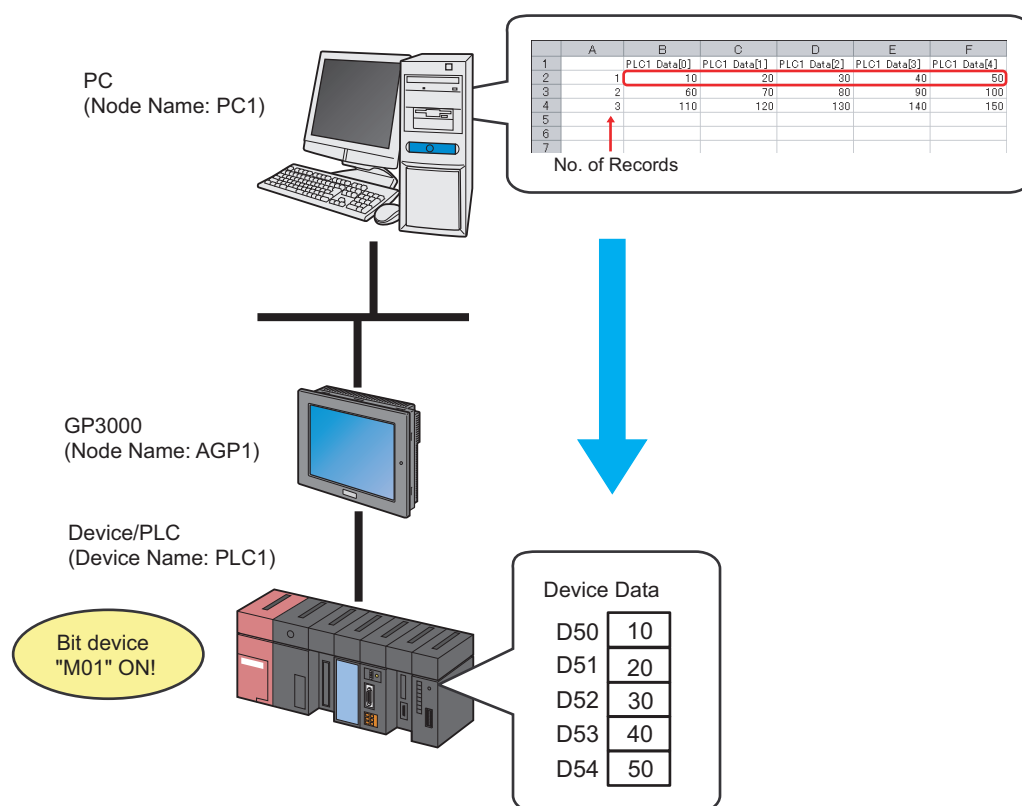
| | | |
|------|--|-------|
| 12.1 | Try to Write Recipe Data in Device/PLC | 12-2 |
| 12.2 | Modifying Recipe Data from the Actual Values | 12-30 |
| 12.3 | Setting Guide | 12-59 |
| 12.4 | Restrictions | 12-67 |

12.1 Try to Write Recipe Data in Device/PLC

[Action Example]

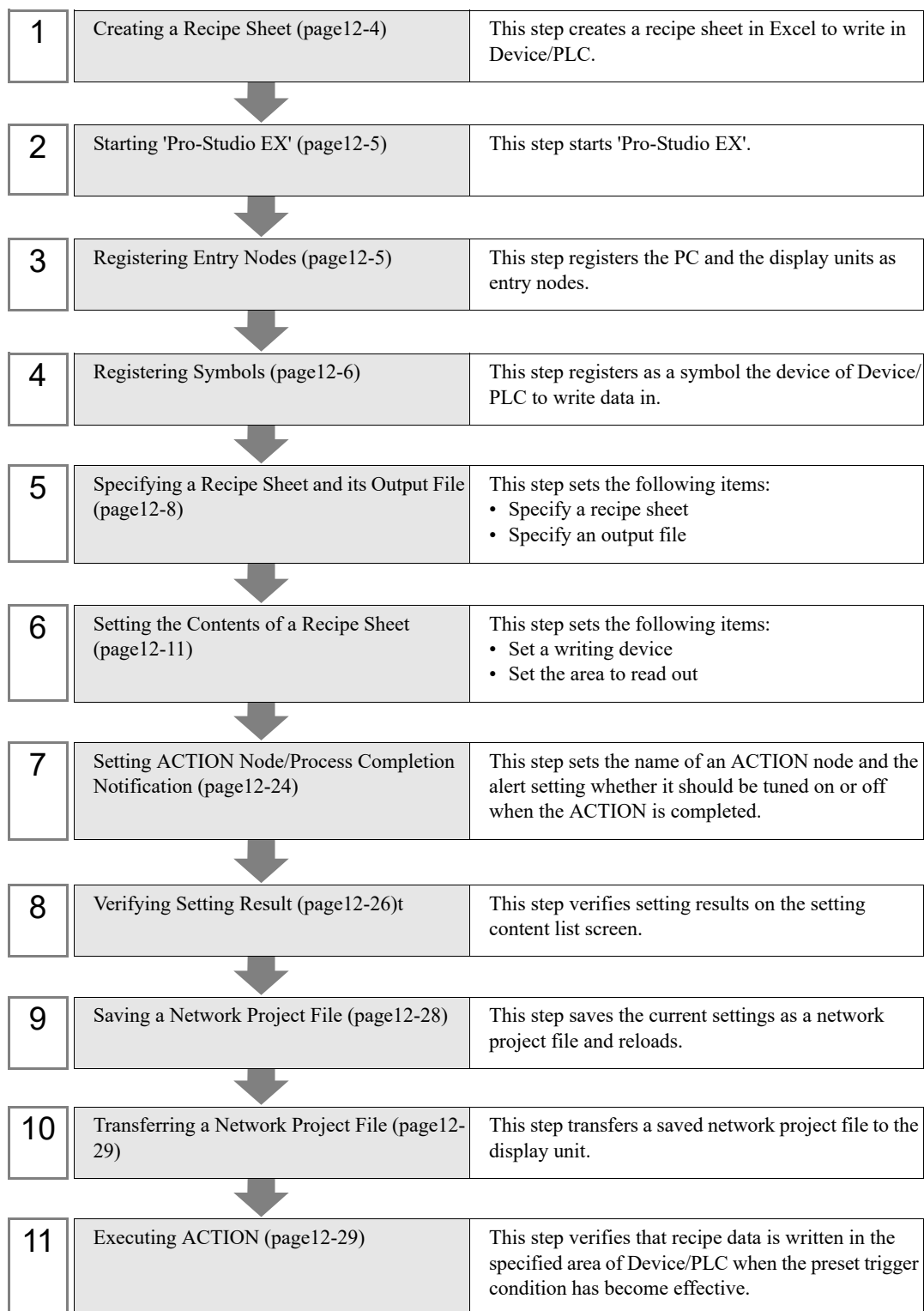
Detect the rising of the trigger device (bit device: "M01") of Device/PLC and write recipe sheet data created in Excel into 5 devices (word device: address "D50" to "D54") of Device/PLC.

(Example) Writing the data of record No. "1" of a recipe sheet.



This section describes the setting procedures for executing the above action (ACTION) as an example.

[Setting Procedure]



12.1.1 Creating a Recipe Sheet

This step creates a recipe sheet where data to write in Device/PLC exists.

- 1 Start Excel and create the recipe sheet below in Sheet 1.

[Creation Example]

"Symbol Name" insert field

| | A | B | C | D | E | F |
|---|---|-----|-----|-----|-----|-----|
| 1 | | | | | | |
| 2 | | 10 | 20 | 30 | 40 | 50 |
| 3 | | 60 | 70 | 80 | 90 | 100 |
| 4 | | 110 | 120 | 130 | 140 | 150 |
| 5 | | | | | | |

"No. of Records" insert field

Recipe data

Leave both spaces for "Symbol Name" (Cells B1 to F1) and those for "Record No." (Cells A2 to A4) blank for these will be automatically allotted and filled in after completing the setting.

NOTE

- You can prepare multiple recipe data on Excel.
Allot a record No. for each recipe to specify data to write in Device/PLC. For details, refer to "12.1.6 Setting the Contents of a Recipe Sheet" mentioned later.

- 2 Save the recipe sheet with the file name "recipe.xls" on PC desktop after creating.

NOTE

- You can create a recipe sheet in the direction (horizontal) as shown below.

"No. of Records" insert field

| | A | B | C | D |
|---|---|----|-----|-----|
| 1 | | | | |
| 2 | | 10 | 60 | 110 |
| 3 | | 20 | 70 | 120 |
| 4 | | 30 | 80 | 130 |
| 5 | | 40 | 90 | 140 |
| 6 | | 50 | 100 | 150 |
| 7 | | | | |

"Symbol Name" insert field

Recipe data

12.1.2 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

12.1.3 Registering Entry Nodes

This step registers the PC and the display unit connected with network as nodes.

Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1

IP Address :192.168.0.1



Node Name :AGP1

IP Address :192.168.0.100

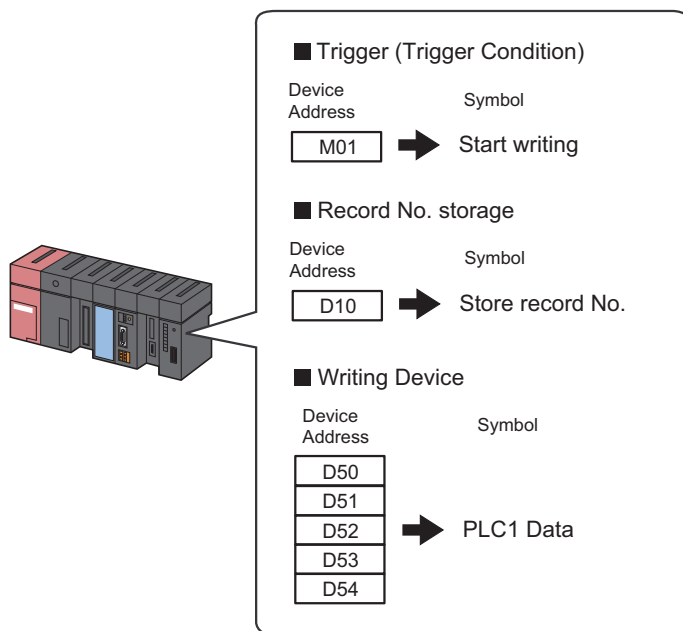
Device/PLC Information

Ex.

| Entry node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

12.1.4 Registering Symbols

This step registers as a symbol the device address of Device/PLC to which device data is written.
Refer to "32 Symbol Registration" for details about symbols.



Ex.

- Trigger (Trigger Condition)

| Setting item | Setting content |
|--|---------------------------|
| Symbol Name | Start writing |
| Data Type | Bit |
| Device address for symbol registration | "01" of Device/PLC (PLC1) |
| No. of Devices | 1 |

- Record No. storage

| Setting item | Setting content |
|--|---------------------------|
| Symbol Name | Record No. Storage |
| Data Type | 16Bit (Unsigned) |
| Device address for symbol registration | "10" of Device/PLC (PLC1) |
| No. of Devices | 1 |

- Writing Device

| Setting item | Setting content |
|--|-------------------------------------|
| Symbol Name | PLC1 data |
| Data Type | 16Bit (Signed) |
| Device address for symbol registration | "D50" to "D54" of Device/PLC (PLC1) |
| No. of Devices | 5 |

12.1.5 Specifying a Recipe Sheet and its Output File

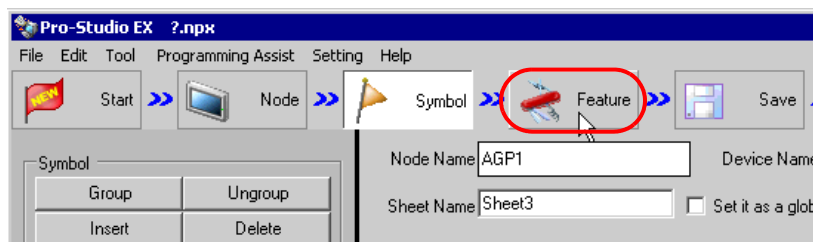
This step specifies the pre-created recipe sheet and its output file.

Refer to "12.3 Setting Guide" for more details.

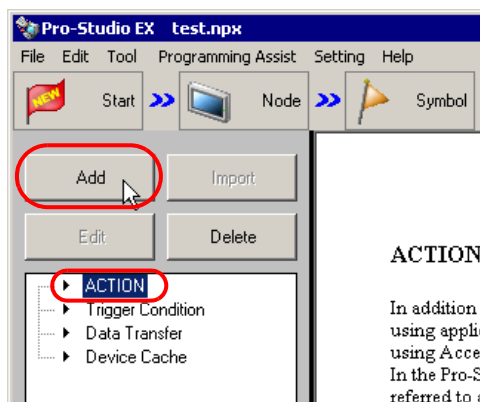
Ex.

| Setting item | | Setting content |
|--------------------|---|---|
| Specify a Template | Template File | C:\Users\<<User name>>\Desktop\recipe.xls |
| Output File | Folder Name | C:\Users\<<User name>>\Desktop |
| | File Name | Recipe write.xls |
| | Start with the output file displayed | Not checked |
| | Do not save the output file when ACTION runs. | Not checked |

- 1 Click the [Feature] icon on the toolbar.



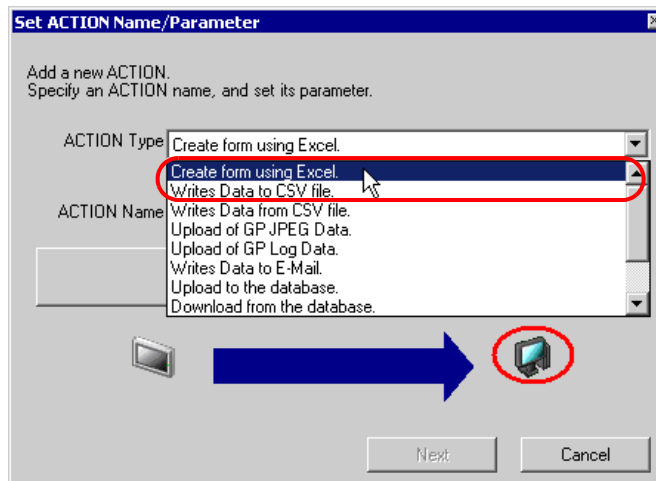
- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.



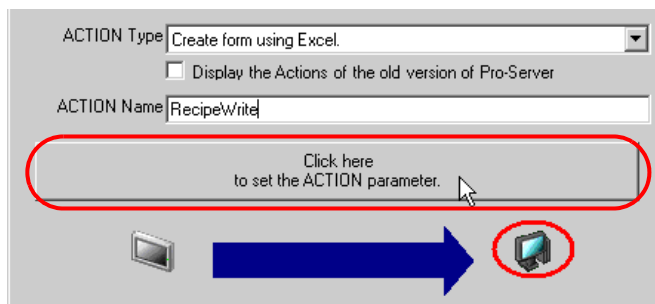
- 3 Click the [ACTION Type] list button, and select "Create form using Excel".

Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "Recipe Write".

NOTE • [ACTION Name] can be an arbitrary name.



- 4 Click the [Click here to set the ACTION parameter] button.



5 Make settings regarding an Excel template and its output file.

- 1) Click the [Reference] button of [Template File] to set the template file "template.xls" which you created.

Template Designation

Please specify the name of Excel template file that is the source of forms.
When you use the wizard, the theme template file is copied to a file with this name.
When you create a new template, please specify the file name.

Template File **Reference**

Edit Template

Output File

The template file stores setting info. The actual output result will be displayed in the following file.

Folder Name **Reference**

File Name **Return to Default Settings**

☒ Start from Displayed State

☐ Do not save the output file when ACTION runs.
(Please use the Save or Save by Macro of Excel.)

OK Cancel

- 2) Click the [Reference] button of [Folder Name] and specify "Desktop" as a folder to save the output file.

Output File

The template file stores setting info. The actual output result will be displayed in the following file.

Folder Name **Reference**

File Name **Return to Default Settings**

☒ Start from Displayed State

☐ Do not save the output file when ACTION runs.
(Please use the Save or Save by Macro of Excel.)

OK Cancel

- 3) Set the file name "Recipe Write.xls" in the [File Name] field for the output file to set.

Output File

The template file stores setting info. The actual output result will be displayed in the following file.

Folder Name **Reference**

File Name **Return to Default Settings**

☒ Start from Displayed State

☐ Do not save the output file when ACTION runs.
(Please use the Save or Save by Macro of Excel.)

OK Cancel

12.1.6 Setting the Contents of a Recipe Sheet

This step sets the contents of a recipe sheet for writing data to Device/PLC.

The example below shows the setting of data write area (recipe area) of a recipe sheet.

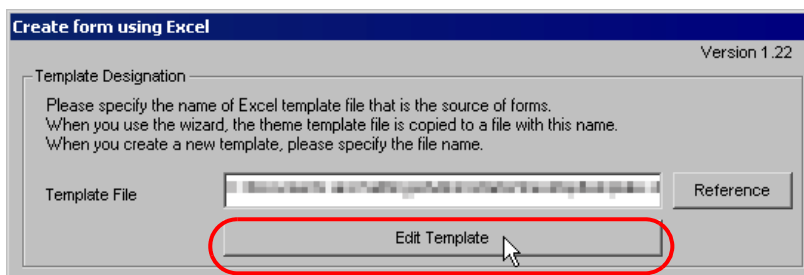
Refer to "12.3 Setting Guide" for more details.

| | A | B | C | D | E | F |
|---|---|-----|-----|-----|-----|-----|
| 1 | | | | | | |
| 2 | | 10 | 20 | 30 | 40 | 50 |
| 3 | | 60 | 70 | 80 | 90 | 100 |
| 4 | | 110 | 120 | 130 | 140 | 150 |
| 5 | | | | | | |

Ex.

| Setting item | Setting content |
|--------------------------------|---|
| Entry Node | AGP1 |
| Device Name | PLC1 |
| Device Address/Symbol Group | PLC1 data |
| Add Device Address/Symbol Name | Checked |
| Target Cell Range | A1 to F4 |
| Data Direction | Specify the direction of record No.s as "Vertical". |
| Trigger Condition Name | Turn on write start bit |
| Trigger Condition | When "Start writing" (M01) is ON |

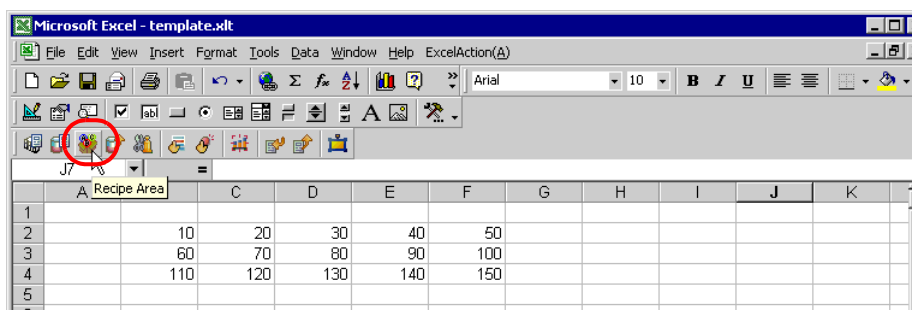
- 1 Click the [Edit Template] button.



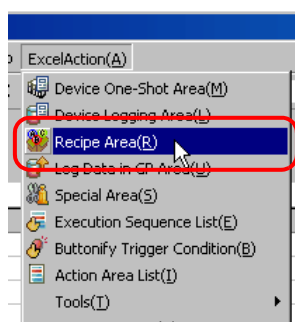
The recipe sheet appears.

2 Set a data write area.

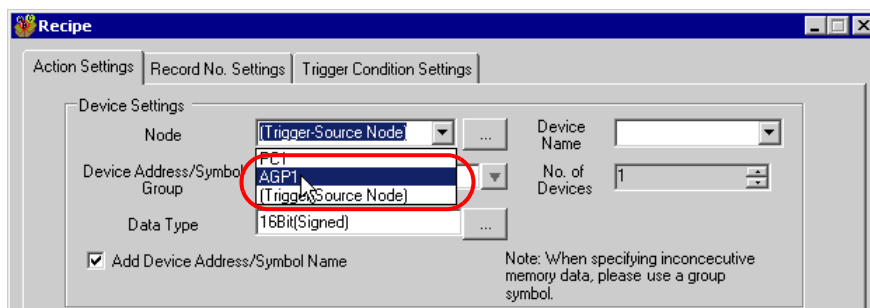
- 1) Click the [Recipe Area] icon on Excel.



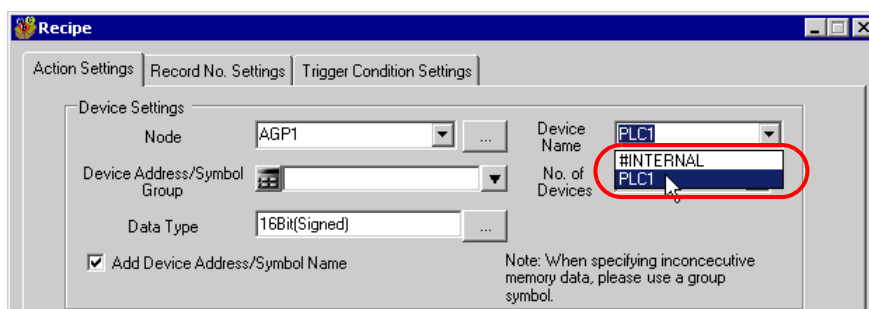
NOTE • Selecting "Recipe Area" from [Excel Action] of the menu displays the same screen.



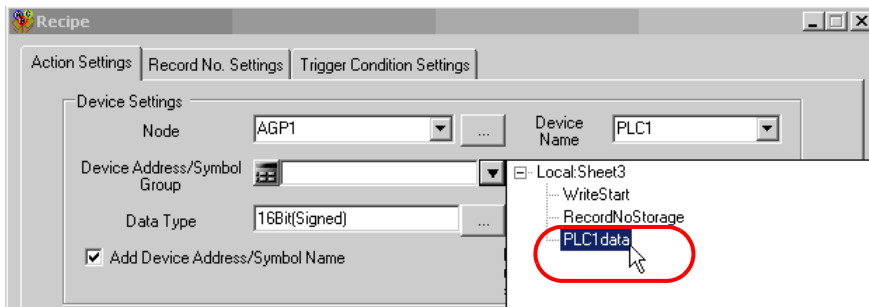
- 2) Click the list button of [Node] and select "AGP1" as a data transfer destination node.



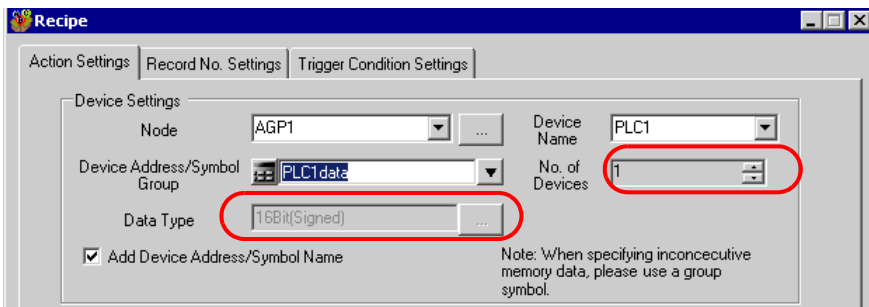
- 3) Click the list button of [Device Name] and select "PLC1" as a data transfer destination device.



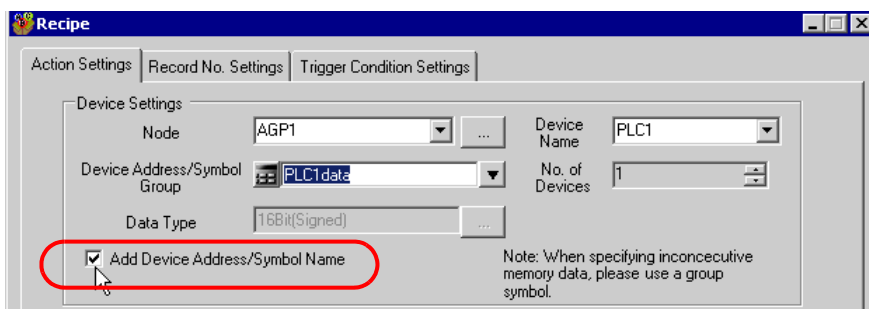
- 4) Click the list button of [Device Address/Symbol Group] and select "PLC1 data" as a symbol of the data to write in.



The device number "1" will be automatically entered in [No. of Devices], and "16Bit(Signed)" in [Data Type].



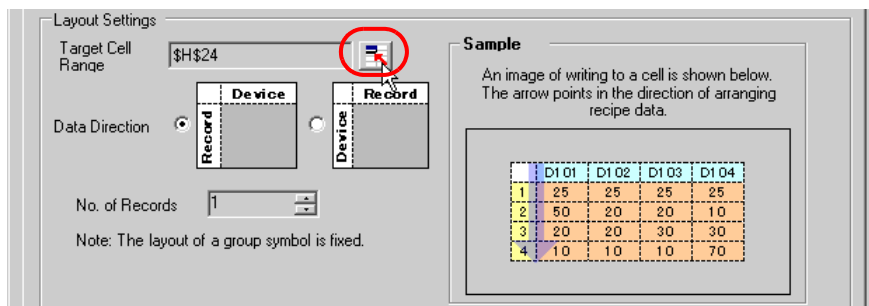
- 5) Check [Add Device Address/Symbol Name].



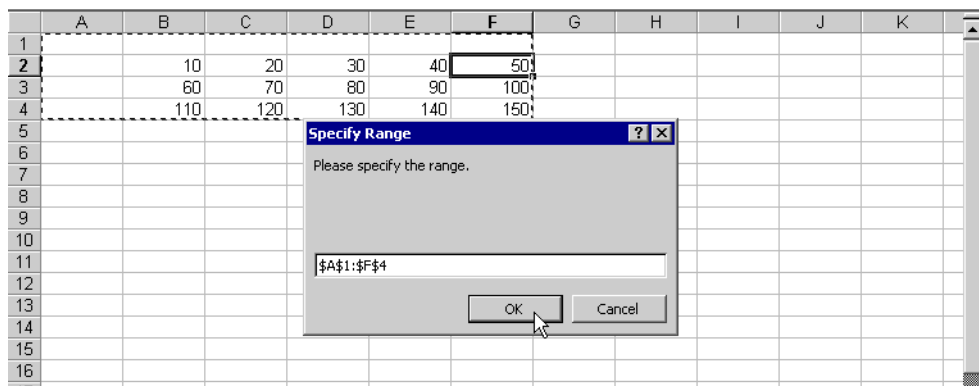
NOTE

- After the procedure of "12.1.9 Saving a Network Project File" described later, open the template again, and open the recipe setting dialog box. After confirming that the "Add Device Address/Symbol Name" checkbox has been checked, click the [OK] button. Then, the device address/symbol name will be reflected in the template.

- 6) Click the cell range specify button of [Target Cell Range].

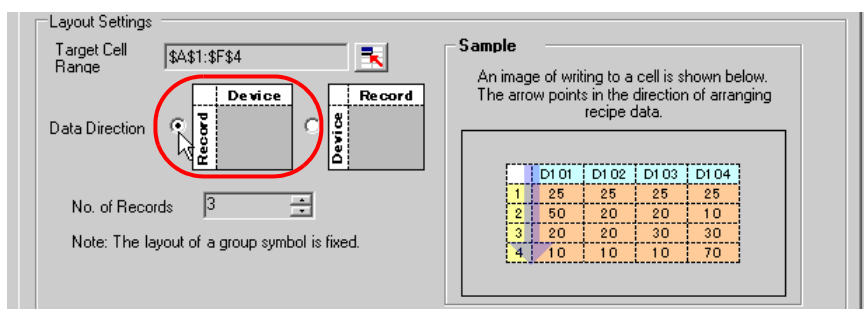


- 7) Drag the mouse to specify the data write area (cells A1 to F4). Then click the [OK] button.

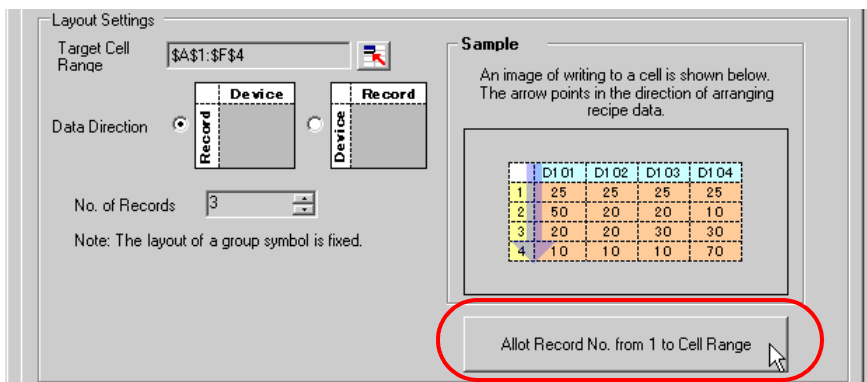


NOTE • When specifying the area, cover the cells to insert record No.s and Device Address/Symbol Names.

- 8) Select "Vertical" of [Data Direction].



9) Click [Allot Record No. from 1 to Cell Range].



- NOTE** • Specify the recipe data to write in Device/PLC with record No.s. This example allots record No.s to the recipe data.

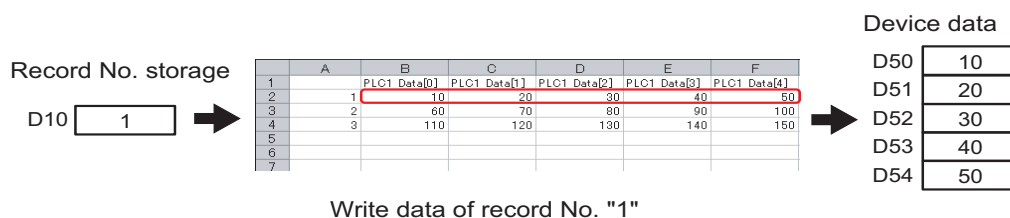
Record No.s and ruled lines are automatically added on the recipe sheet.

| | A | B | C | D | E | F | G |
|---|---|-----|-----|-----|-----|-----|---|
| 1 | | | | | | | |
| 2 | 1 | 10 | 20 | 30 | 40 | 50 | |
| 3 | 2 | 60 | 70 | 80 | 90 | 100 | |
| 4 | 3 | 110 | 120 | 130 | 140 | 150 | |
| 5 | | | | | | | |
| 6 | | | | | | | |

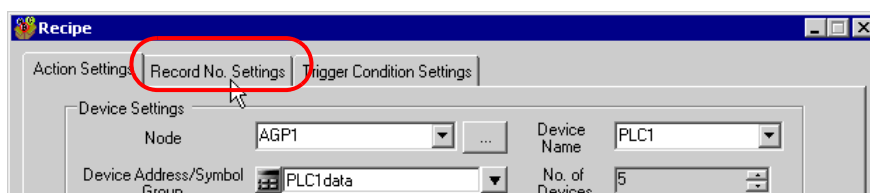
3 Specify a record No.

Specify the recipe data by entering a record No. in the symbol "Record No. storage" from display unit or Device/PLC.

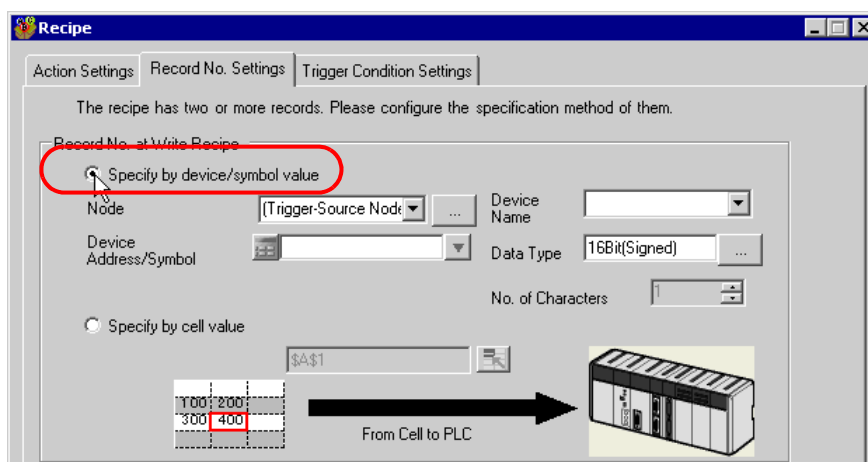
(Example) In case of storing device data "1" in the device "Record No. storage".



- 1) Click the [Record No. Settings] tab.

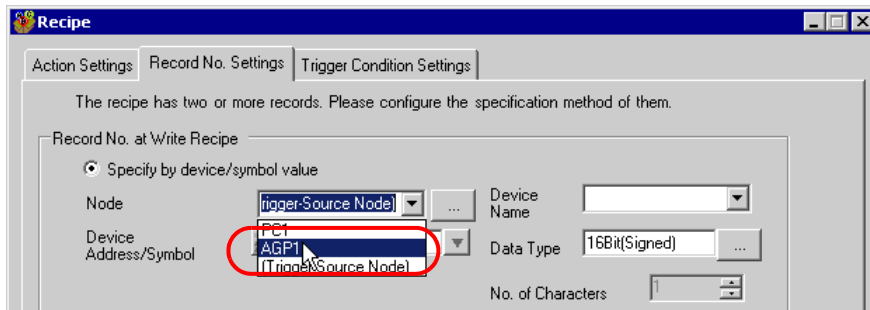


- 2) Click "Specify by device/symbol values" in [Record No. at Write Recipe].

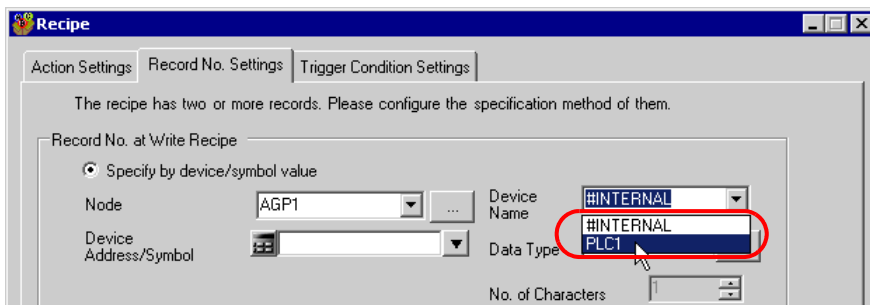


NOTE • If you select [Specify by cell value], specify any cell on Excel. The number entered in the cell is recognized as the record No.
Refer to "12.3 Setting Guide" for more details.

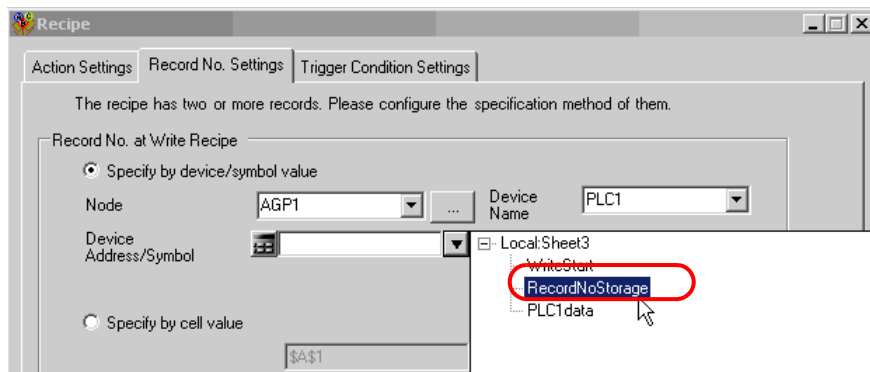
- 3) Click the list button of [Node] and select the node name "AGP1" which has the Device/PLC to store the record No.



- 4) Click the list button of [Device Name] and select the Device/PLC "PLC1" to store the record No.



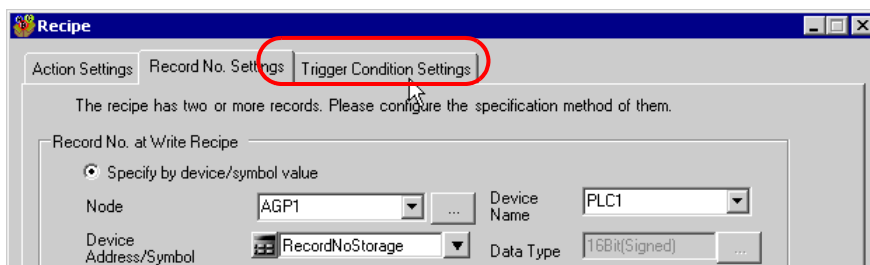
- 5) Click the list button of [Device Address/Symbol] and select the symbol name "Record NoStorage" of the device to store the record No.



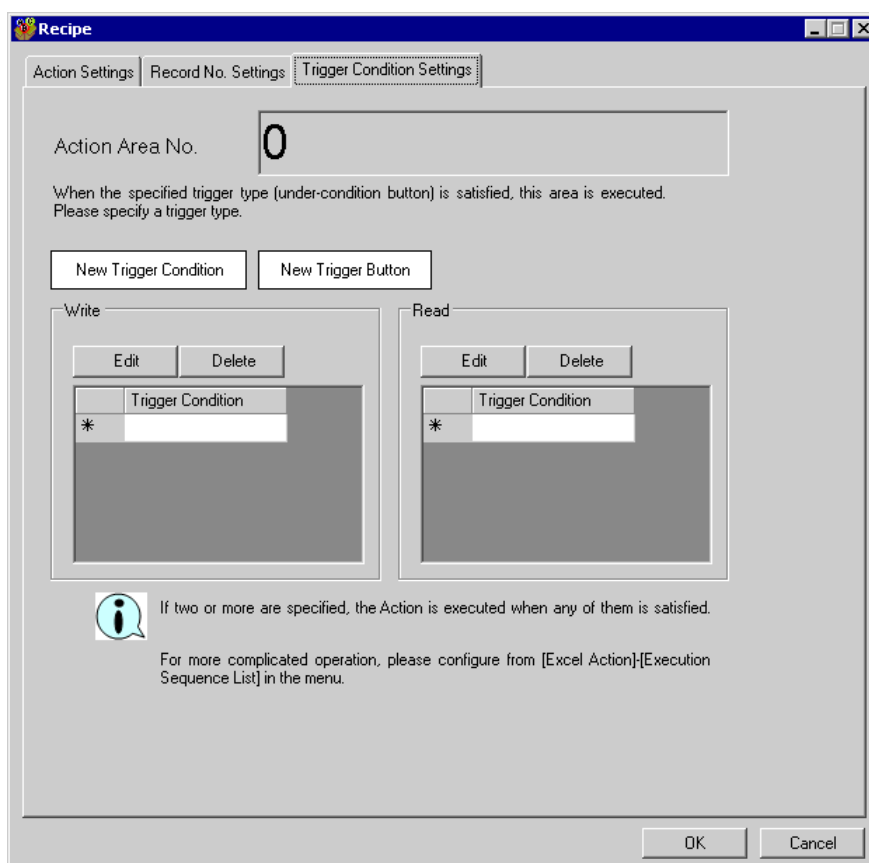
The device data type "16Bit(Unsigned)" will be automatically entered in [Data Type].

4 Set trigger conditions.

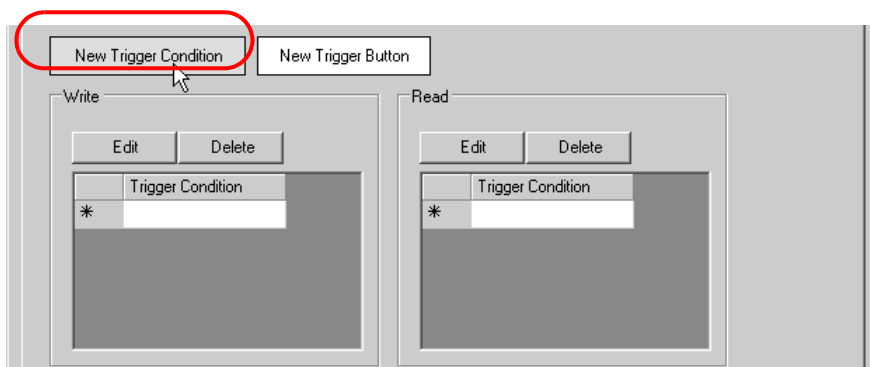
- 1) Click the [Trigger Condition Settings] tab.



The "Trigger Condition Settings" screen will appear.

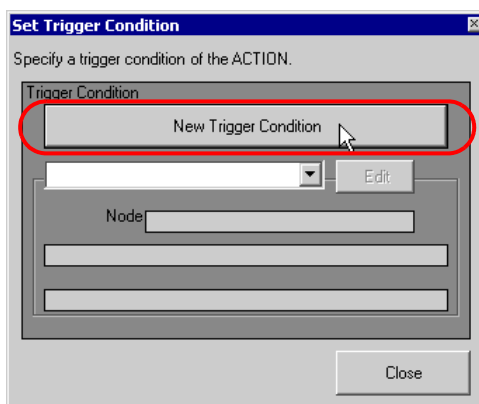


- 2) Click the [New Trigger Condition] button.

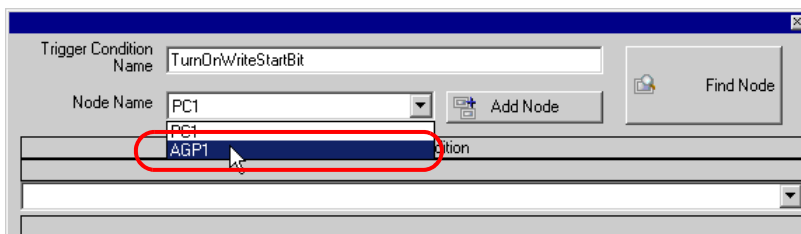

NOTE

- You can also activate ACTION by placing a button on Excel from [New Trigger Button] and clicking it. Refer to "12.3 Setting Guide" for more details.

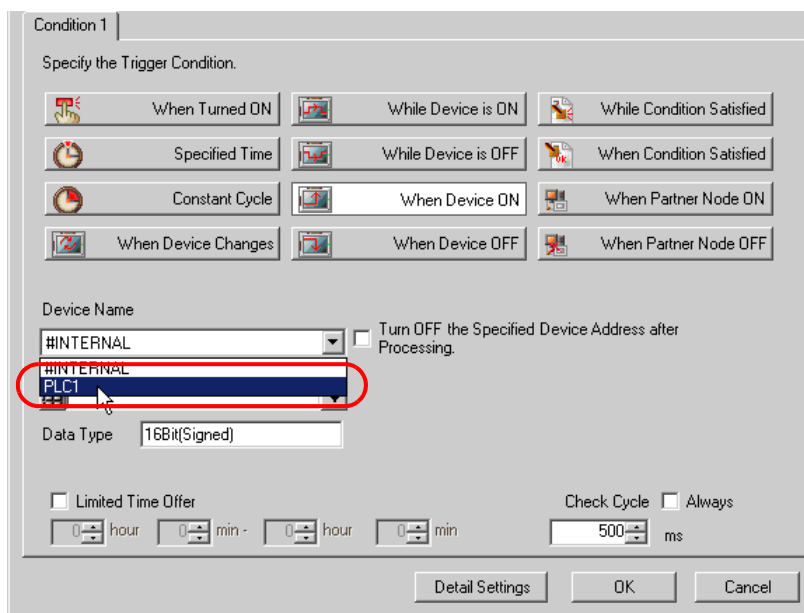
- 3) Click the [New Trigger Condition] button.



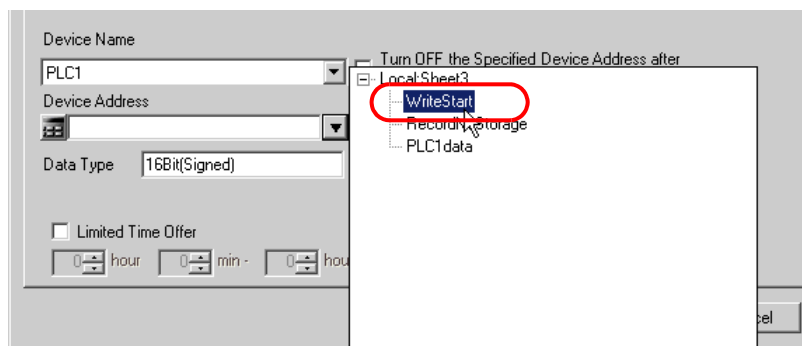
- 4) Enter the trigger condition name "TurnOnWriteStartBit" in [Trigger Condition Name], and select "AGP1" in [Node Name] as a name of the data transfer source.



- 5) Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



- 6) Click the [Device Address] list button and select "WriteStart" for the device symbol name which serves as the trigger.



[Data Type] automatically appears after selection, too.

- 7) Click the [OK] button.

Device Name: PLC1

Device Address: WriteStart

Data Type: Bit

Turn OFF the Specified Device Address after Processing: ☐

Limited Time Offer: ☐

Check Cycle: 500 ms

Buttons: Detail Settings, OK, Cancel

- 8) Click the [Close] button.

Set Trigger Condition

Specify a trigger condition of the ACTION.

Trigger Condition

New Trigger Condition

TurnOnWriteStartBit

Edit

Node: AGP1

When WriteStart of Node AGP1 is Turned ON

Close

- 9) Click the blank line of [Write] and select "TurnOnWriteStartBit" as a trigger condition.

New Trigger Condition

New Trigger Button

Write

Edit

Delete

Trigger Condition

TurnOnWriteStartBit

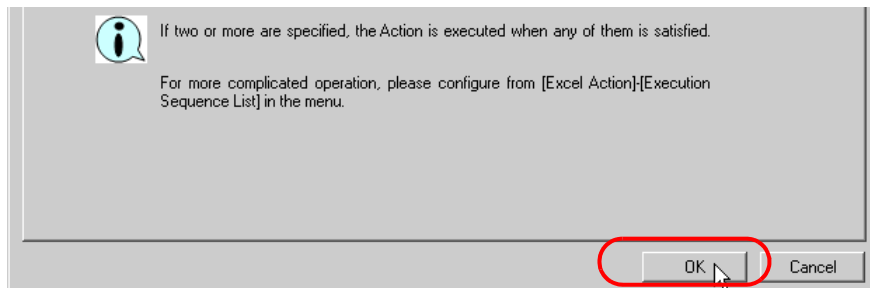
Read

Edit

Delete

Trigger Condition

10) Click the [OK] button.



11) Click the [OK] button.



NOTE

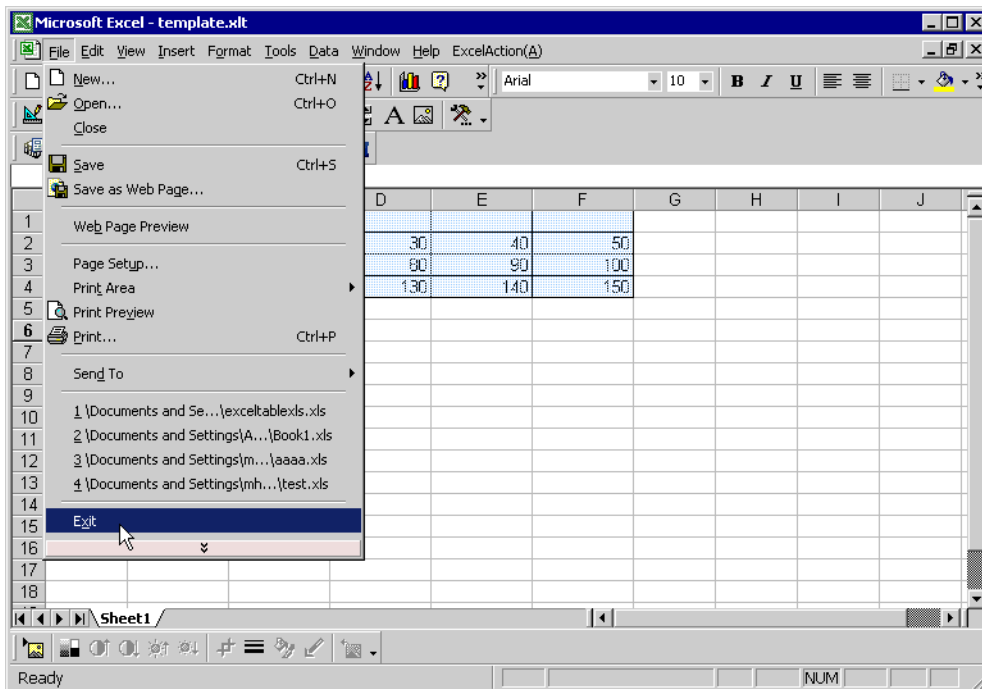
- Here the dialog box will appear because no network project file is loaded to 'Pro-server EX'. This is not a problem, however.
The file will be loaded in "12.1.9 Saving a Network Project File" mentioned later.

This is the end of the content settings of a recipe sheet.

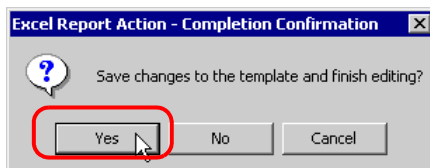
NOTE

- Can display Data/Time on an Excel sheet.
 ☞ "5.2 Writing Date/Time in a Form"
- Can display arrows on an Excel sheet.
 ☞ "5.3 Writing Arrows in a Form"
- Can display a trigger source node on an Excel sheet.
 ☞ "5.4 Writing Trigger Source Node Names in a Form"

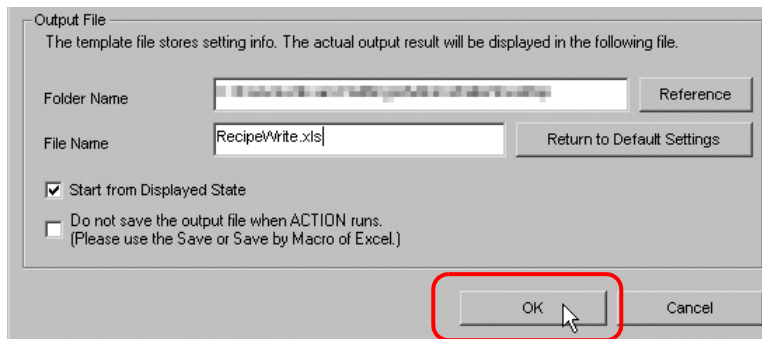
5 Close 'Excel'.



The following dialog box will appear, asking you if you want to save changes before closing. Click the [Yes] button.



6 On the "Create form using Excel" screen, click the [OK] button.



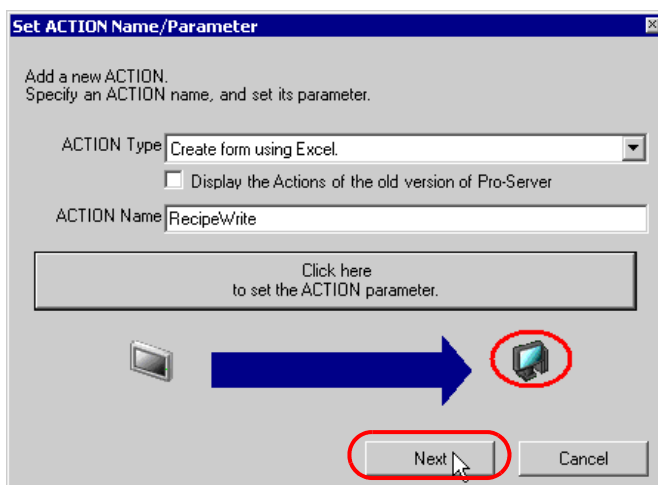
12.1.7 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed.

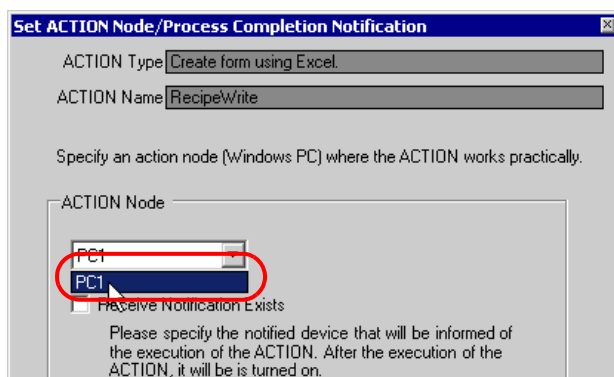
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



2 Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates.



- 3 Turn off the [Receive Notification Exists] check box, if checked.

NOTE • Do not check "Receive Notification Exists".

- 4 Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the name of ACTION you set will appear.

This is the end of the settings of the ACTION node and process completion notification.

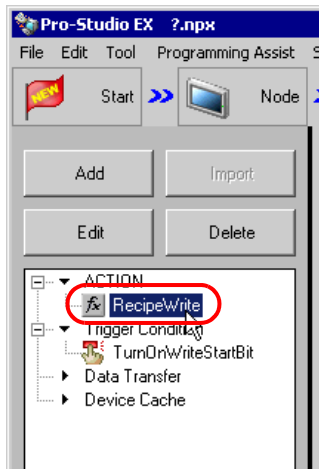
12.1.8 Verifying Setting Result

This step verifies setting results on the setting content list screen.

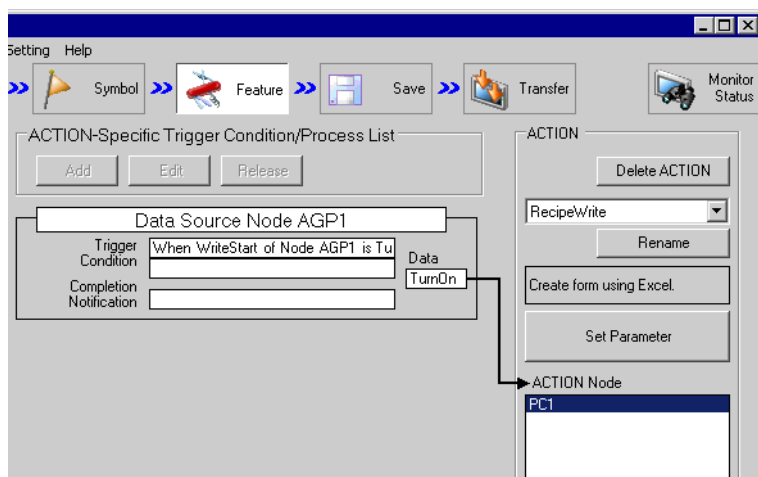
NOTE

- With the "Excel Report" ACTION, you cannot add, edit or delete a trigger condition in "ACTION-specific Trigger Condition/Process List". To change a preset condition, click the [Set Parameter] button, and select [Edit Template] to change data on Excel.

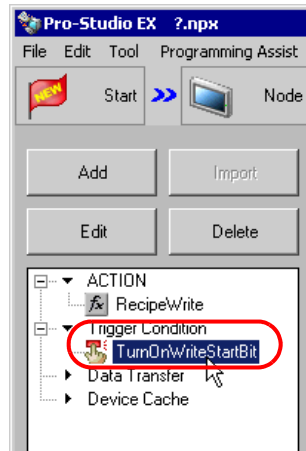
- 1 Select the ACTION name "Recipe Write" from the tree display on the left of the screen.



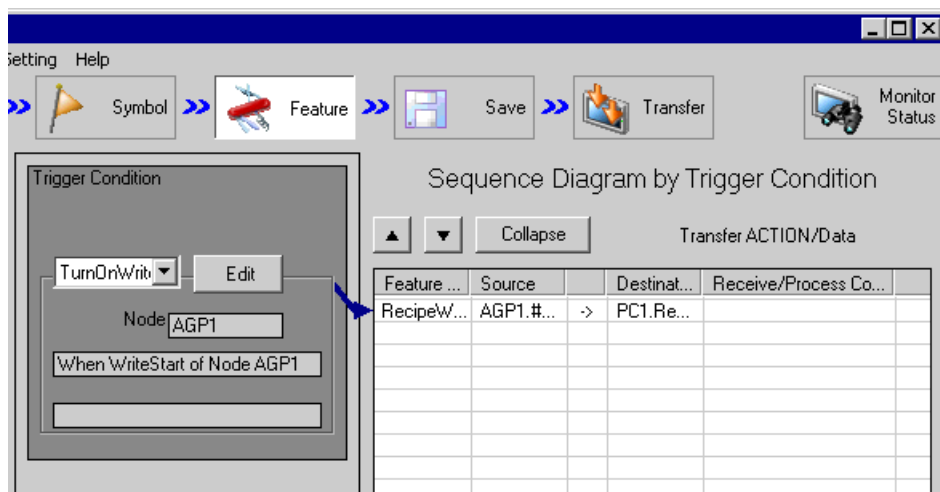
Confirm that the setting content appears on the right of the screen.



- 2 Select the trigger condition name "TurnOnWriteStartBit" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

12.1.9 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
- Be sure to reload the network project file to 'Pro-Server EX' If not, ACTION will not work.

Ex.

- Path of network project file : Desktop\monitor.npxe
- Title : EXCEL Report ACTION

12.1.10 Test Write

You can check if the settings are correct before transferring a created network project file to entry nodes.

NOTE

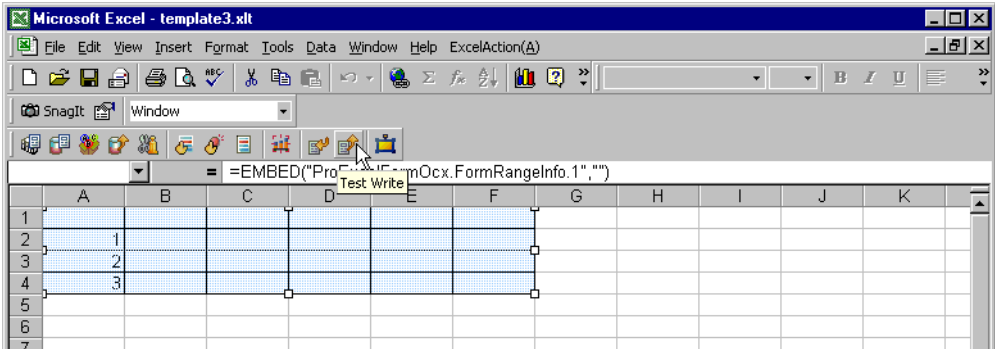
- You do not necessarily have to perform a test write.
If you skip this, proceed to "12.1.11 Transferring a Network Project File".

IMPORTANT

- Note that the data will be actually written in the Device/PLC when you specify the device of Device/PLC as a write destination.
- To perform a test write, it is necessary that 'Pro-Server EX', to which a created network project file has been loaded, is running.

- 1 Click the [Feature] button.
- 2 Click "ACTION" from the tree display on the left of the screen, then click the [Edit] button.
- 3 On the "Set ACTION Name/Parameter" screen, click the [Click here to set the ACTION parameter] button.
- 4 On the "Create form using Excel" screen, click the [Edit Template] button.

5 With the ACTION area selected, click the [Test Write] icon.



At this point, data is written in the Device/PLC.

- NOTE**
- You can check that data is being written on the "Symbol Monitor" screen of "Status Monitor". For more details, refer to "28 Simply Confirming On-site Status".
 - Refer to "12.4 Restrictions" for details about the restrictions on test writes.

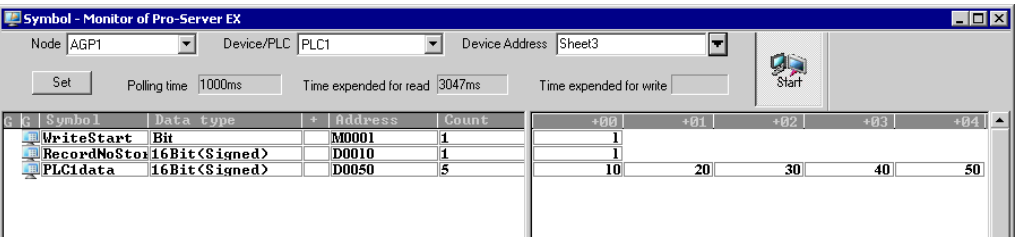
12.1.11 Transferring a Network Project File

This step loads a saved network project file to 'Pro-Server EX' and then transfers to entry nodes.
Refer to "26 Transferring" for details about transferring a network project file.

- NOTE**
- Be sure to transfer a network project file. If not, ACTION will not work.

12.1.12 Executing ACTION

This step verifies that enabling a trigger condition activates ACTION and writes the data of the recipe sheet (File name: "Recipe write.xls") to the specified device of Device/PLC.



- NOTE**
- You can check the write/read status using the symbol or device monitor. For more details, refer to "28 Simply Confirming On-site Status".
 - If error occurs, you can check the log in the Log Viewer. For more details, refer to "28.5 Monitoring System Event Logs".
 - If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".

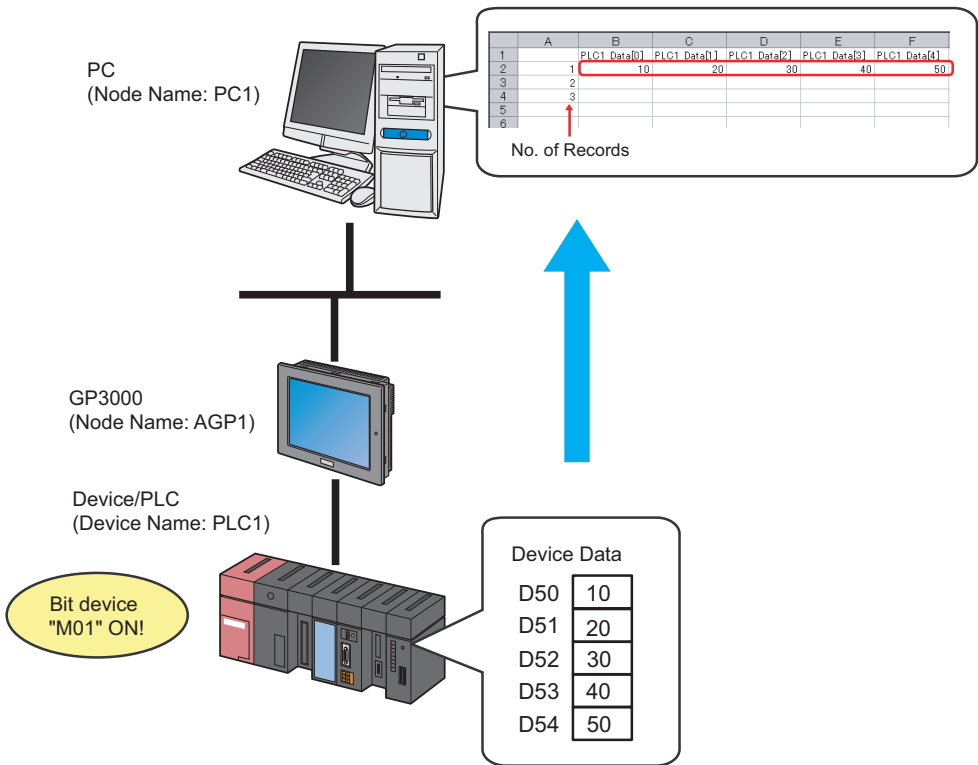
This is the end of the explanation of this ACTION.

12.2 Modifying Recipe Data from the Actual Values

[Action Example]

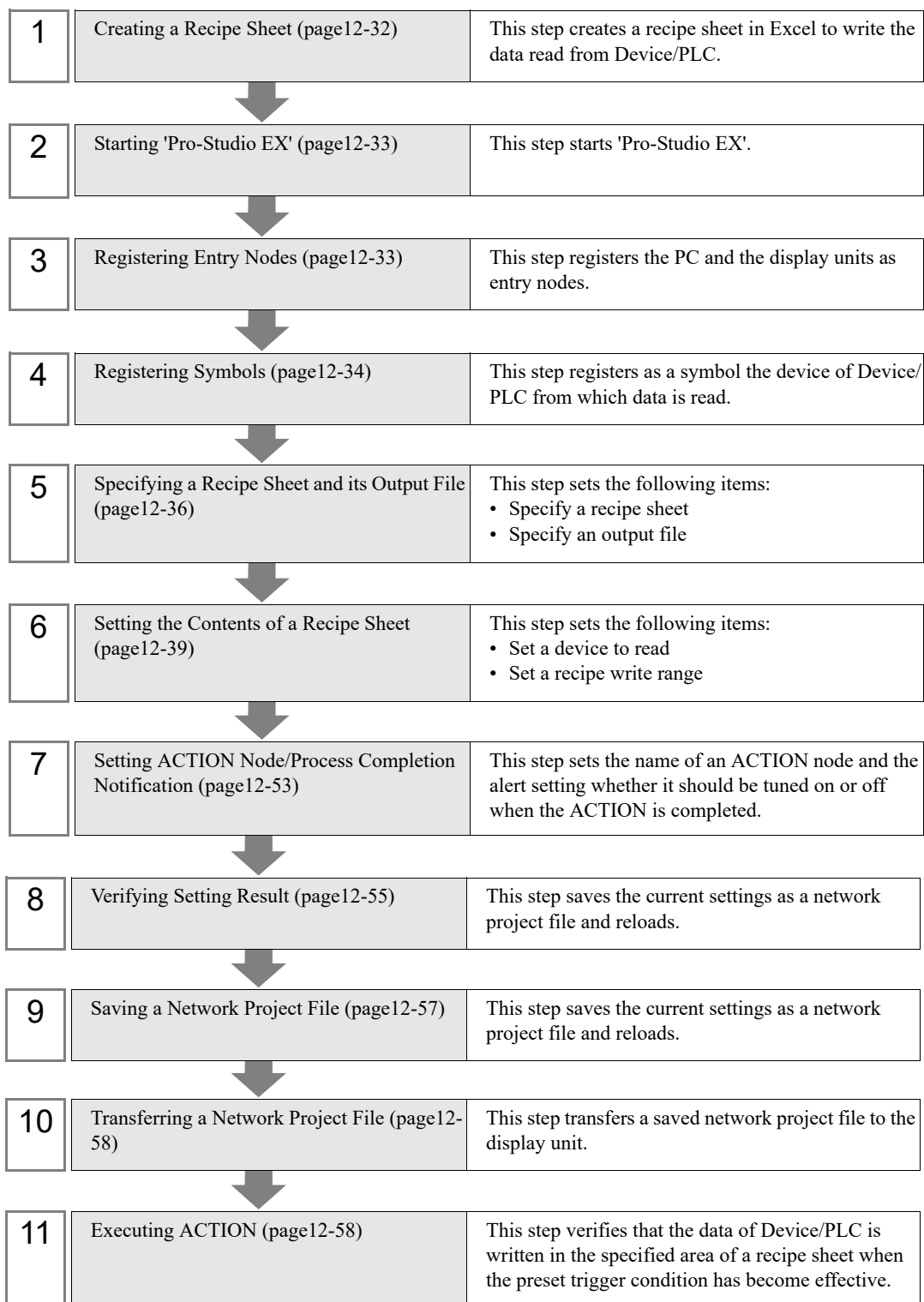
Detect the rising of the trigger device (bit device: "M01") of Device/PLC and read out the data of 5 devices (word device: address "D50" to "D54") of Device/PLC to an Excel recipe sheet.

(Example) Reading out the data to record No. "1" of a recipe sheet.



This section describes the setting procedures for executing the above action (ACTION) as an example.

[Setting Procedure]



12.2.1 Creating a Recipe Sheet

This step creates a recipe sheet to write the data read from Device/PLC.

- 1 Start Excel and create the recipe sheet below in Sheet 1.

[Creation Example]

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |

"Symbol Name" insert field

"No. of Records" insert field

Recipe data

Leave both spaces for "Symbol Name" (Cells B1 to F1) and those for "Record No." (Cells A2 to A4) blank for these will be automatically allotted and filled in after completing the setting.

- 2 Save the recipe sheet with the file name "recipe.xls" on PC desktop after creating.

NOTE • You can create a recipe sheet in the direction (horizontal) as shown below.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |

"No. of Records" insert field

"Symbol Name" insert field

Recipe data

12.2.2 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

12.2.3 Registering Entry Nodes

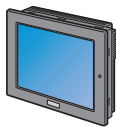
This step registers the PC and the display unit connected with network as nodes.

Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1

IP Address :192.168.0.1



Node Name :AGP1

IP Address :192.168.0.100

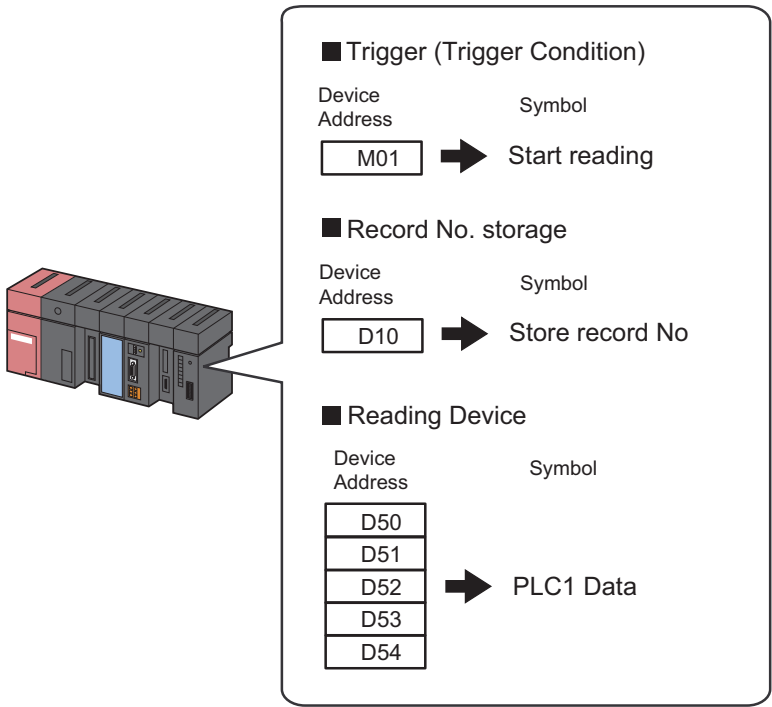
Device/PLC Information

Ex.

| Entry Node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

12.2.4 Registering Symbols

This step registers as a symbol the device address of Device/PLC to which device data is written.
Refer to "32 Symbol Registration" for details about symbols.



Ex.

- Trigger (Trigger Condition)

| Setting item | Setting content |
|--|---------------------------|
| Symbol Name | Start reading |
| Data Type | Bit |
| Device address for symbol registration | "01" of Device/PLC (PLC1) |
| No. of Devices | 1 |

- Record No. Storage

| Setting item | Setting content |
|--|---------------------------|
| Symbol Name | Record No. Storage |
| Data Type | 16Bit (Unsigned) |
| Device address for symbol registration | "10" of Device/PLC (PLC1) |
| No. of Devices | 1 |

- Reading Device

| Setting item | Setting content |
|--|-------------------------------------|
| Symbol Name | PLC1 data |
| Data Type | 16Bit (Signed) |
| Device address for symbol registration | "D50" to "D54" of Device/PLC (PLC1) |
| No. of Devices | 5 |

12.2.5 Specifying a Recipe Sheet and its Output File

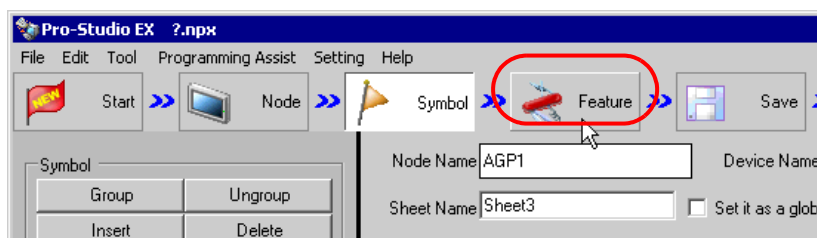
This step specifies the pre-created recipe sheet and its output file.

Refer to "12.3 Setting Guide" for more details.

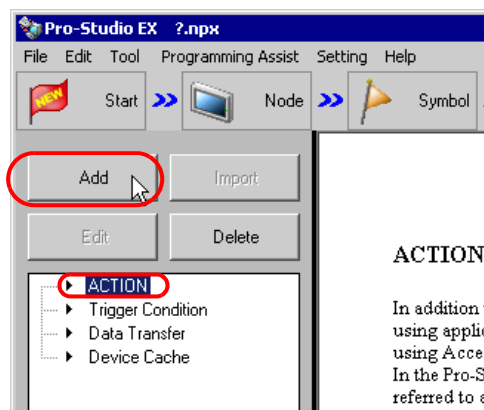
Ex.

| Setting item | | Setting content |
|--------------------|---|---|
| Specify a Template | Template File | C:\Users\<<User name>>\Desktop\recipe.xls |
| Output File | Folder Name | C:\Users\<<User name>>\Desktop |
| | File Name | Recipe read.xls |
| | Start with the output file displayed | Checked |
| | Do not save the output file when ACTION runs. | Not checked |

- 1 Click the [Feature] icon on the status bar.



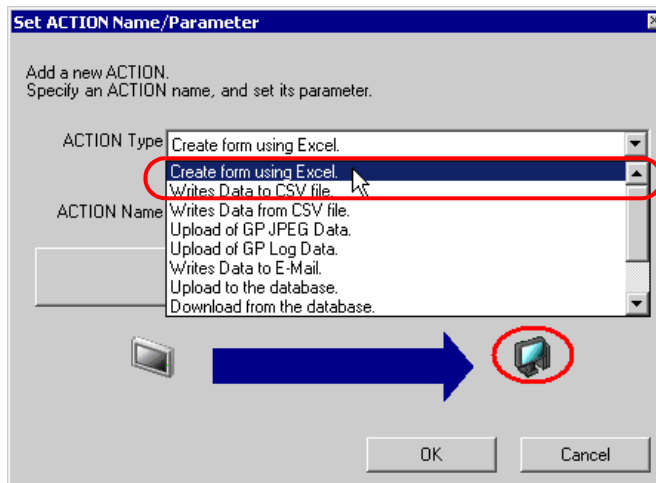
- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.



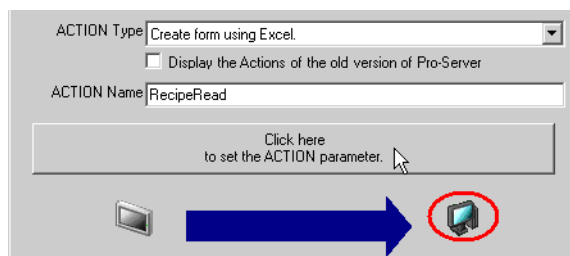
- 3 Click the [ACTION Type] list button, and select "Create form using Excel".

Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "Recipe Read".

NOTE • [ACTION Name] can be an arbitrary name.

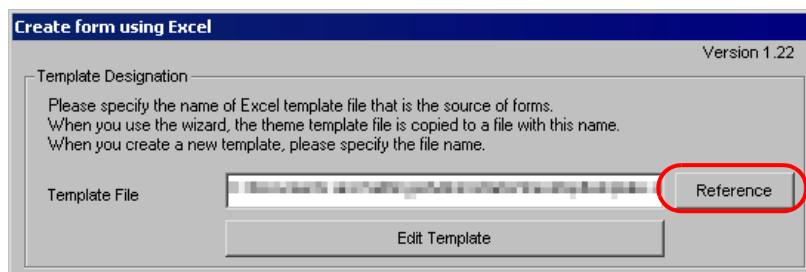


- 4 Click the [Click here to set the ACTION parameter] button.



- 5 Make settings regarding an Excel template and its output file.

- 1) Click the [Reference] button of [Template File] to set the template file "template.xlt" which you created.



- 2) Click the [Reference] button of [Folder Name] and specify "Desktop" as a folder to save the output file.

Output File

The template file stores setting info. The actual output result will be displayed in the following file.

Folder Name Reference

File Name Return to Default Settings

☒ Start from Displayed State

☐ Do not save the output file when ACTION runs.
(Please use the Save or Save by Macro of Excel.)

OK Cancel

- 3) Set the file name "RecipeRead.xls" in the [File Name] field for the output file to set.

Output File

The template file stores setting info. The actual output result will be displayed in the following file.

Folder Name Reference

File Name Return to Default Settings

☒ Start from Displayed State

☐ Do not save the output file when ACTION runs.
(Please use the Save or Save by Macro of Excel.)

OK Cancel

- 4) Check the [Start from Displayed State] check box.

Output File

The template file stores setting info. The actual output result will be displayed in the following file.

Folder Name Reference

File Name Return to Default Settings

☒ Start from Displayed State

☐ Do not save the output file when ACTION runs.
(Please use the Save or Save by Macro of Excel.)

OK Cancel

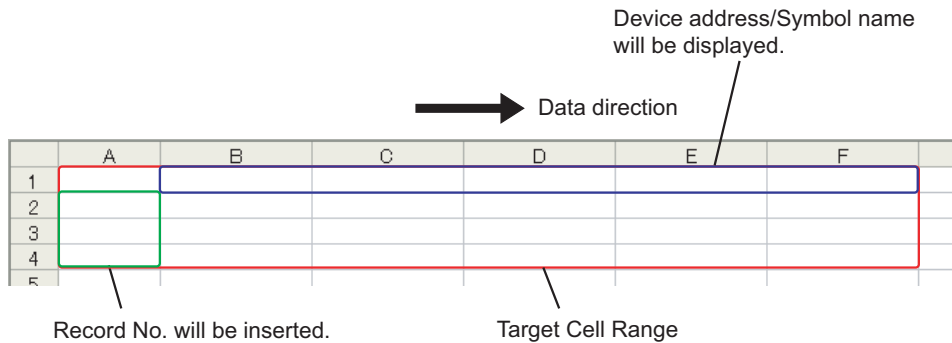
NOTE • If you check [Start from Displayed State], you can read/write data with an output file displayed. This is useful if you need to confirm data immediately.

12.2.6 Setting the Contents of a Recipe Sheet

This step sets the contents of a recipe sheet to write the data read from Device/PLC.

The example below shows the setting of data read area (recipe area) of a recipe sheet.

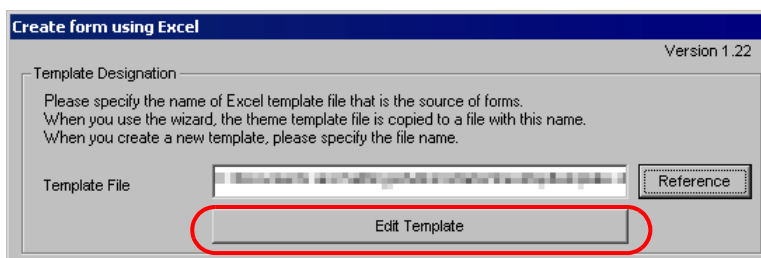
Refer to "12.3 Setting Guide" for more details.



Ex.

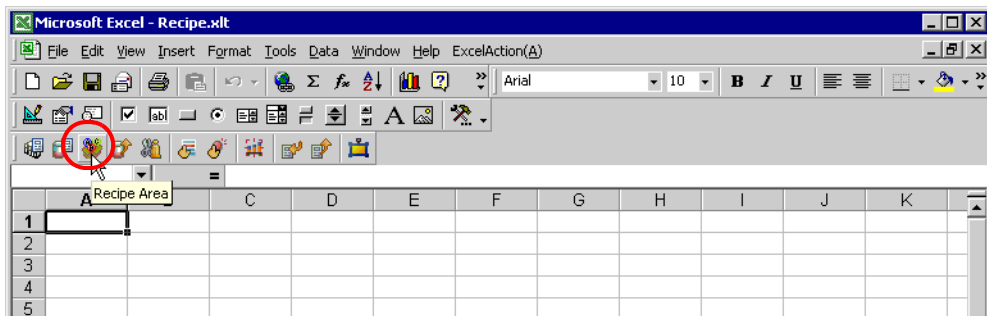
| Setting item | Setting content |
|--------------------------------|---|
| Entry Node | AGP1 |
| Device Name | PLC1 |
| Device Address/Symbol Group | PLC1 data |
| Add Device Address/Symbol Name | Checked |
| Target Cell Range | A1 to F4 |
| Data Direction | Specify the direction of record No.s as "Vertical". |
| Trigger Condition Name | Turn on write start bit |
| Trigger Condition | When "Start writing" (M01) is ON |

- 1 Click the [Edit Template] button.

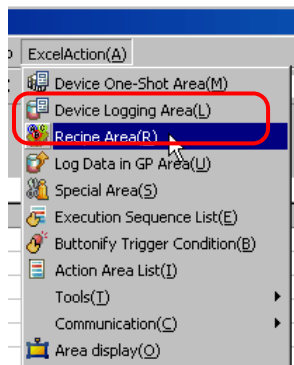


2 Set a data read area.

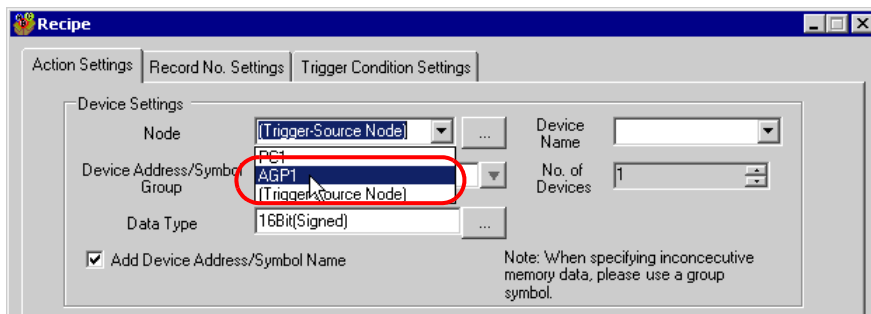
- 1) Click the [Recipe Area] icon on Excel.



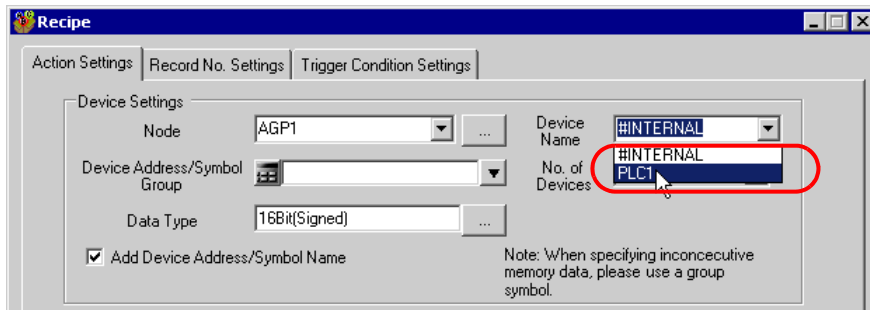
NOTE • Selecting "Recipe Area" from [Excel Action] of the menu displays the same screen.



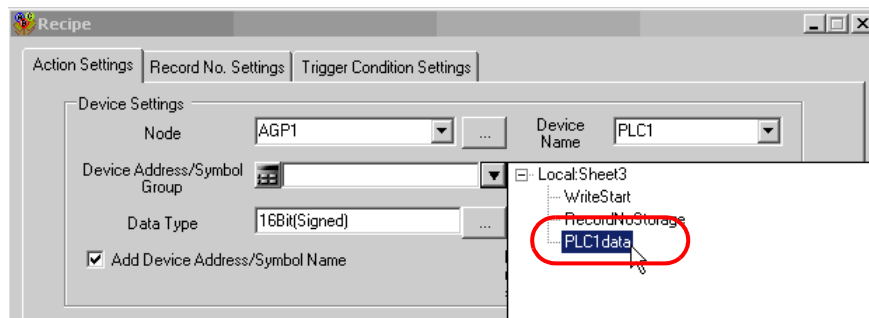
- 2) Click the list button of [Node] and select "AGP1" as a data transfer source node.



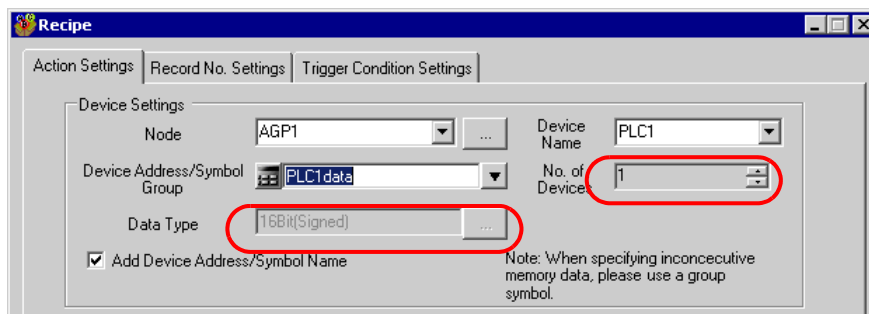
- 3) Click the list button of [Device Name] and select "PLC1" as a data transfer source device.



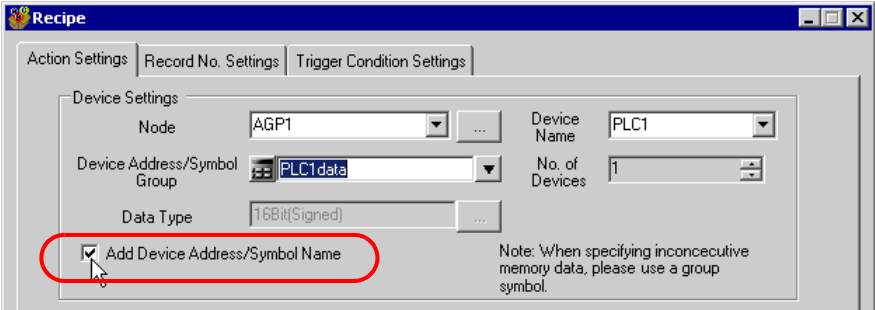
- 4) Click the list button of [Device Address/Symbol Group] and select "PLC1 data" as a symbol of the data to read out.



The device number "1" will be automatically entered in [No. of Devices], and "16Bit(Signed)" in [Data Type].

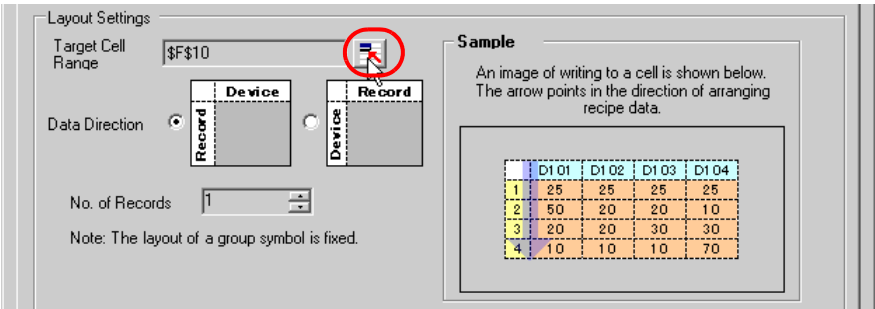


5) Check [Add Device Address/Symbol Name].

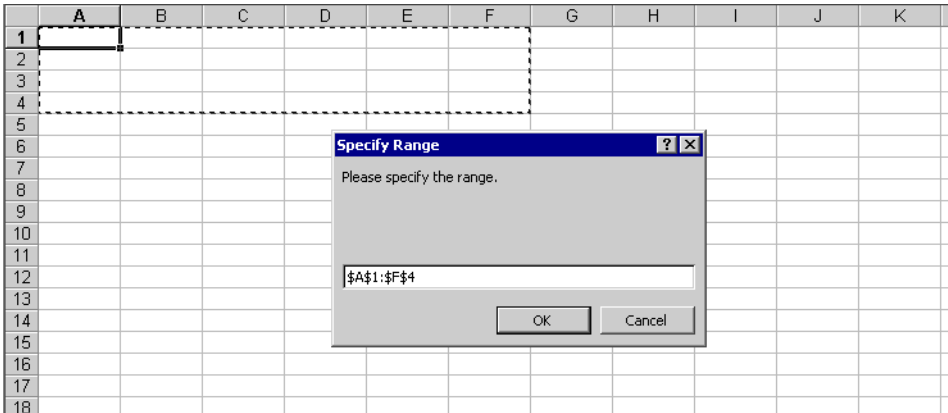


NOTE • After the procedure of "12.2.9 Saving a Network Project File" described later, open the template again, and open the recipe setting dialog box. After confirming that the "Add Device Address/Symbol Name" checkbox has been checked, click the [OK] button. Then, the device address/symbol name will be reflected in the template.

6) Click the cell range specify button of [Target Cell Range].

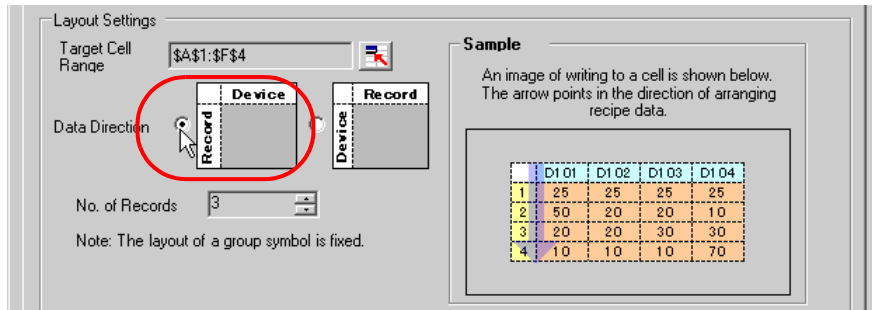


7) Drag the mouse to specify the data read area (cells A1 to F4). Then click the [OK] button.

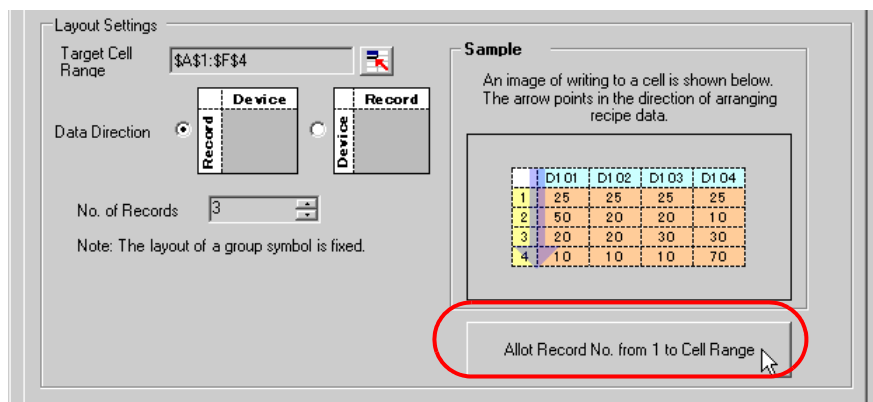


NOTE • When specifying the area, cover the cells to insert record No.s and Device Address/Symbol Names.

- 8) Select "Vertical" of [Data Direction].



- 9) Click [Allot Record No. from 1 to Cell Range].



NOTE • Specify the recipe data to write in Device/PLC with record No.s This example allots record No.s to the recipe data.

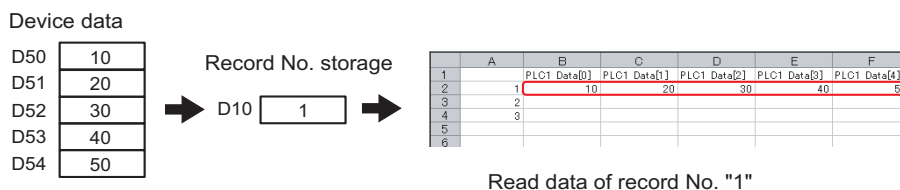
Record No.s and ruled lines are automatically added on the recipe sheet.

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | |
| 2 | 1 | | | | | | |
| 3 | 2 | | | | | | |
| 4 | 3 | | | | | | |
| 5 | | | | | | | |

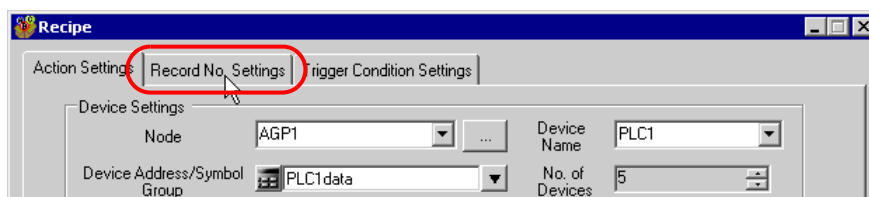
3 Specify a record No.

Specify the recipe data area by entering a record No. in the symbol "Record No. storage" from display unit or Device/PLC.

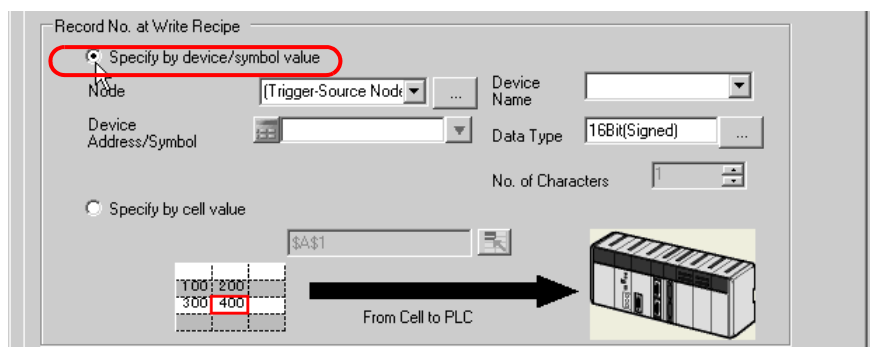
(Example) In case of storing device data "1" in the device "Record No. storage".



- 1) Click the [Record No. Settings] tab.

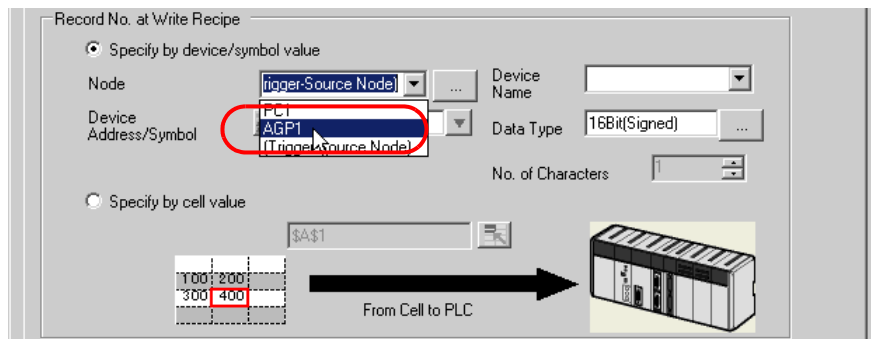


- 2) Click "Specify by device/symbol value" in [Record No. at Write Recipe].

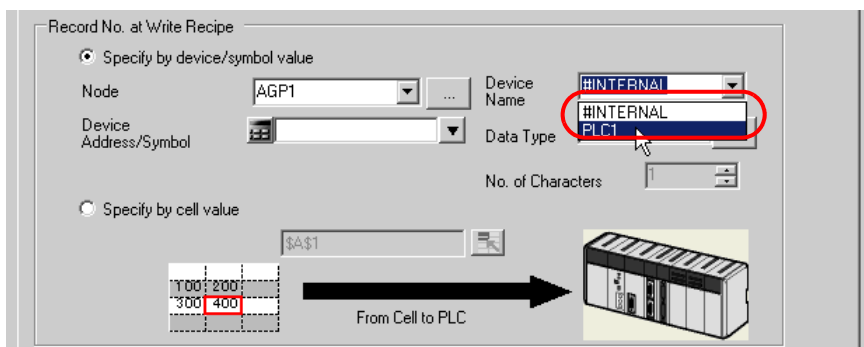


NOTE • If you select [Specify by cell value], specify any cell on Excel. The number entered in the cell is recognized as the record No.
Refer to "12.3 Setting Guide" for more details.

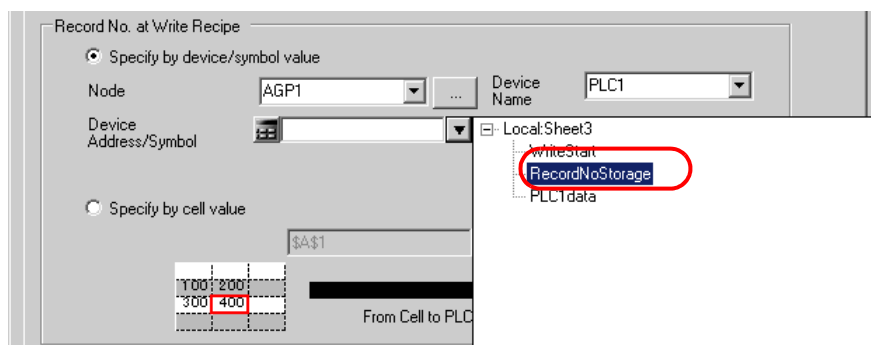
- 3) Click the list button of [Node] and select the node name "AGP1" which has the Device/PLC to store the record No.



- 4) Click the list button of [Device Name] and select the Device/PLC "PLC1" to store the record No.



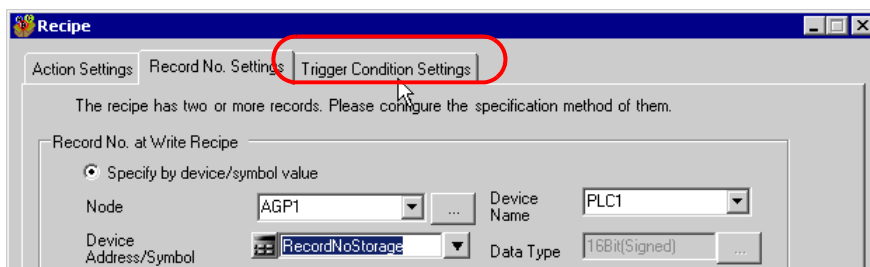
- 5) Click the list button of [Device Address/Symbol] and select the symbol name "Record NoStorage" of the device to store the record No.



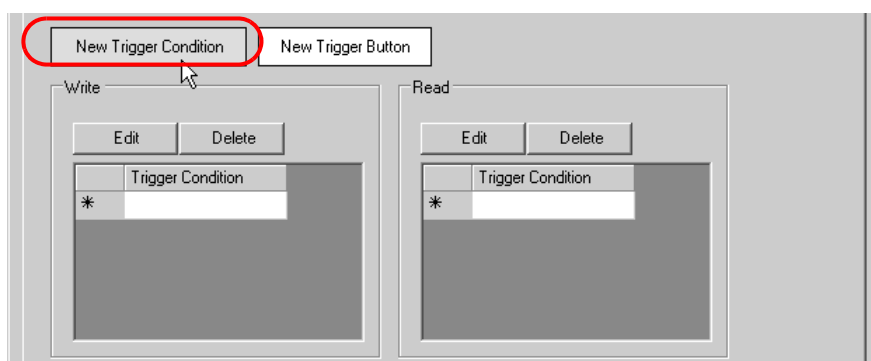
The device data type "16Bit(Unsigned)" will be automatically entered in [Data Type].

4 Set trigger conditions.

- 1) Click the [Trigger Condition Settings] tab.



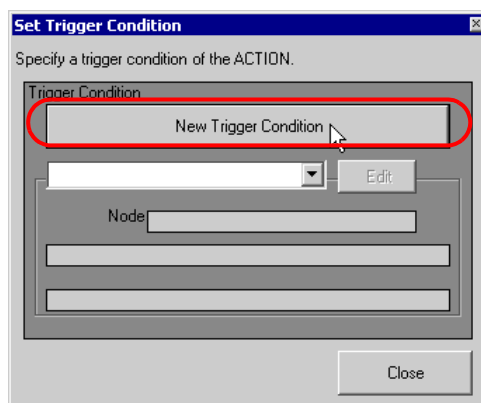
- 2) Click the [New Trigger Condition] button.



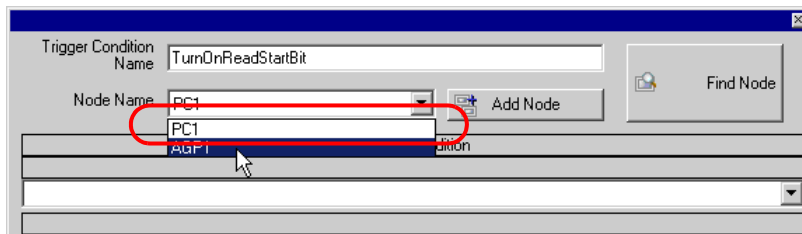
NOTE

- You can also activate ACTION by placing a button on Excel from [New Trigger Button] and clicking it. Refer to "12.3 Setting Guide" for more details.

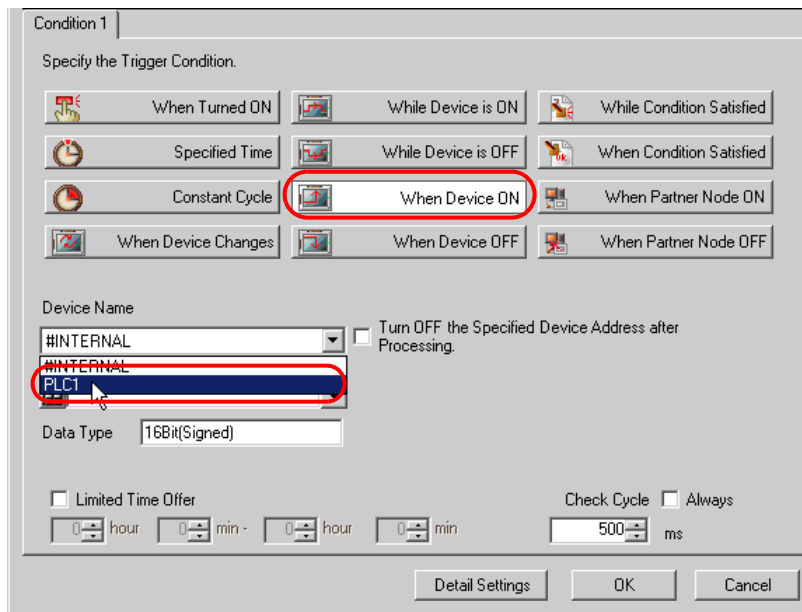
- 3) Click the [New Trigger Condition] button.



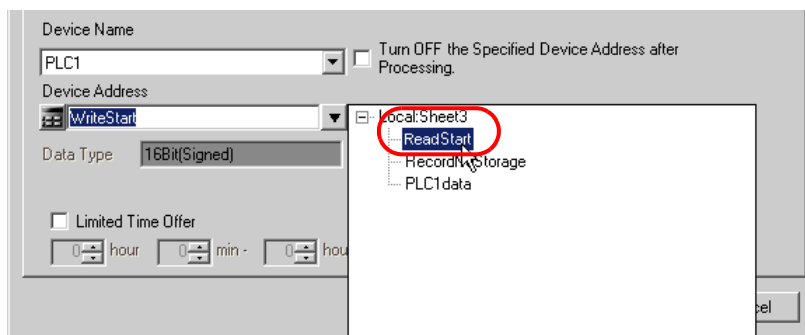
- 4) Enter the trigger condition name "TurnOnReadStartBit" in [Trigger Condition Name], and select "AGPI" in [Node Name] as a name of the data transfer source.



- 5) Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.

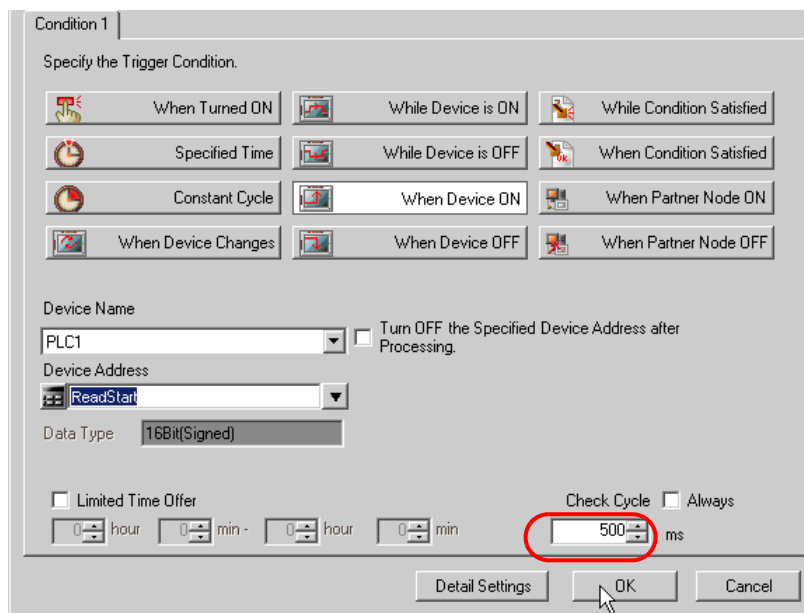


- 6) Click the [Device Address] list button and select "ReadStart" for the device symbol name which serves as the trigger.

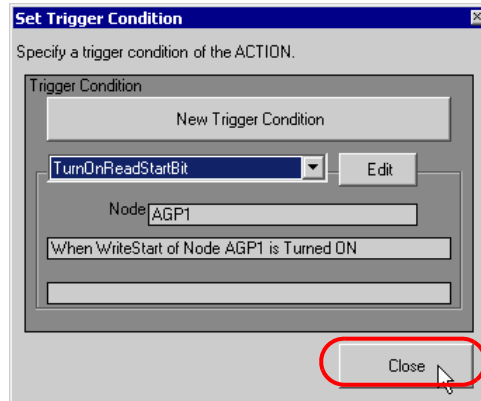


[Data Type] automatically appears after selection, too.

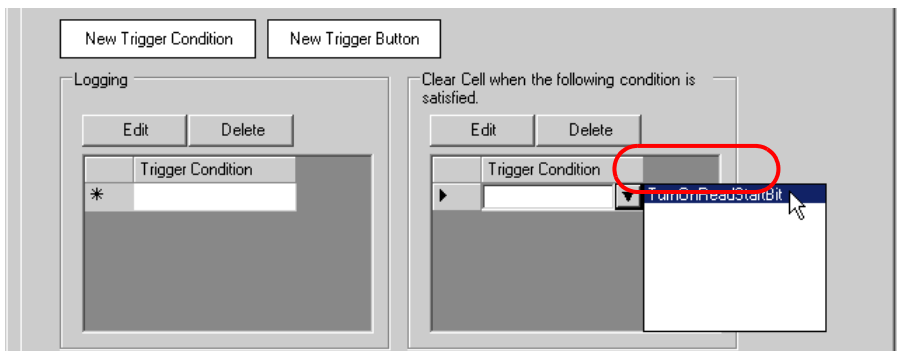
- 7) Click the [OK] button.



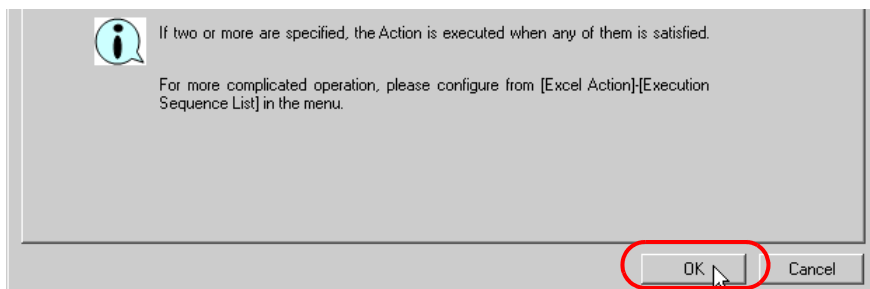
- 8) Click the [Close] button.



- 9) Click the blank line of [Clear Cel when the following condition is satisfied] and select "TurnOnReadStartBit" as a trigger condition.



- 10) Click the [OK] button.



11) Click the [OK] button.



NOTE

- Here the dialog box will appear because no network project file is loaded to 'Pro-server EX'. This is not a problem, however.

The file will be loaded in "12.2.9 Saving a Network Project File" mentioned later.

This is the end of the content settings of a recipe sheet.

NOTE

- Can display Data/Time on an Excel sheet.

☞ "5.2 Writing Date/Time in a Form"

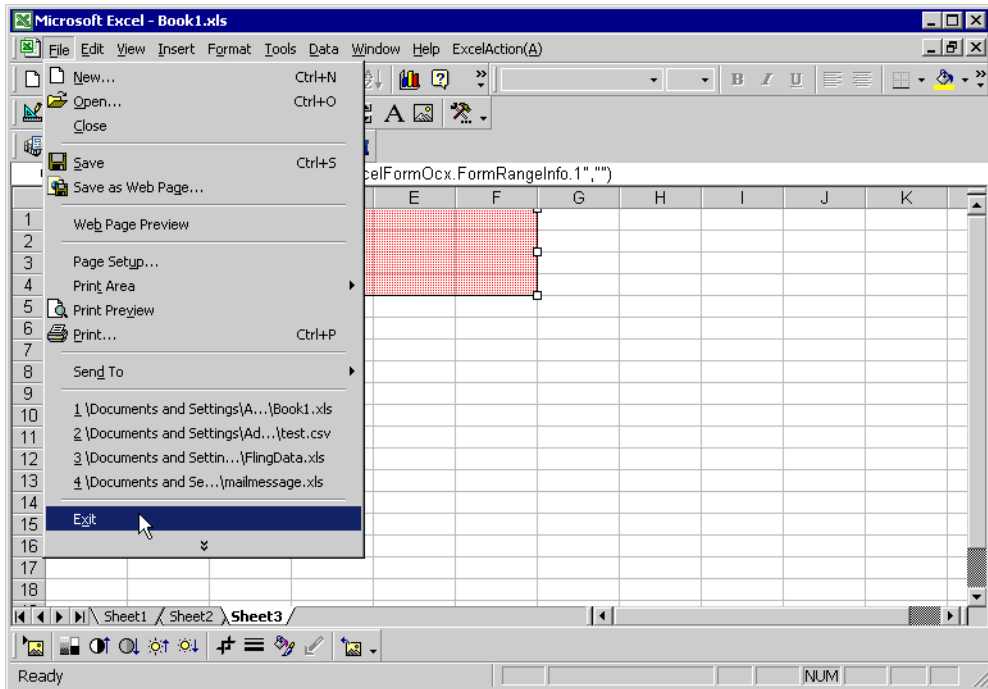
- Can display arrows on an Excel sheet.

☞ "5.3 Writing Arrows in a Form"

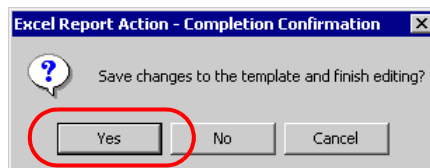
- Can display a trigger source node on an Excel sheet.

☞ "5.4 Writing Trigger Source Node Names in a Form"

5 Close 'Excel'.



The following dialog box will appear, asking you if you want to save changes before closing. Click the [Yes] button.



- 6 On the "Create form using Excel" screen, click the [OK] button.

Create form using Excel Version 1.10

Template Designation

Please specify the name of Excel template file that is the source of forms.
When you use the wizard, the theme template file is copied to a file with this name.
When you create a new template, please specify the file name.

Template File: [C:\Program Files and Settings\Microsoft\Excel\Templates\...]
Reference
Edit Template

Output File

The template file stores setting info. The actual output result will be displayed in the following file.

Folder Name: [C:\Program Files and Settings\Microsoft\Excel\...]
Reference

File Name: RecipeRead.xls
Return to Default Settings

☒ Start from Displayed State
☐ Do not save the output file when ACTION runs.
(Please use the Save or Auto-save function of Excel.)

OK Cancel

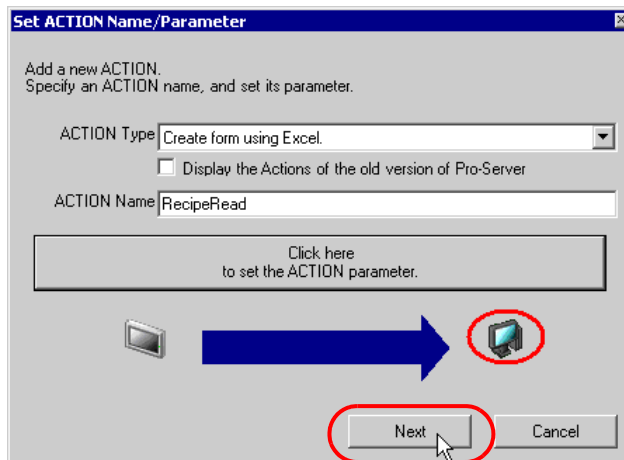
12.2.7 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed.

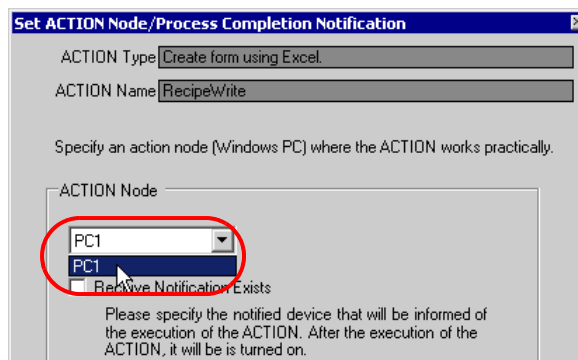
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

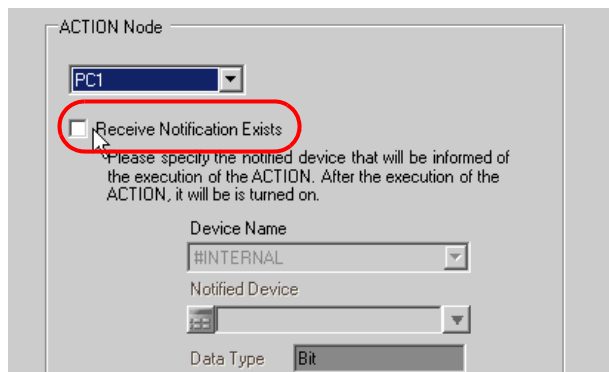
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



2 Click the list button of [Action Node] and select "PC1" as a node where ACTION operates.



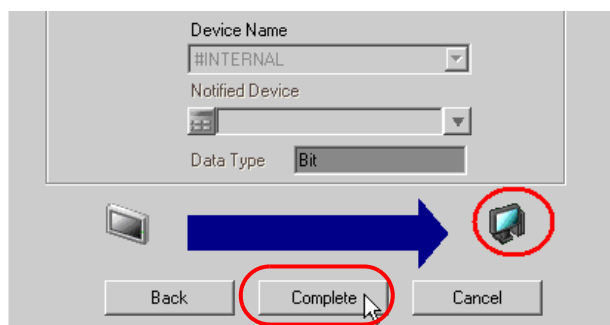
- 3 Turn off the check box of [Receive Notification Exists], if checked.



NOTE • Do not check "Receive Notification Exists".

- 4 Click the [Complete] button.

The "ACTION Node/Process Completion Notification Settings" screen will disappear. On the left of the screen, the name of ACTION you set will appear.



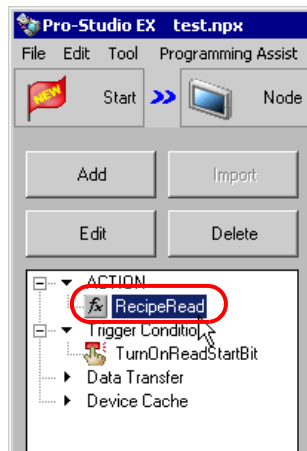
This is the end of the settings of the ACTION node and process completion notification.

12.2.8 Verifying Setting Result

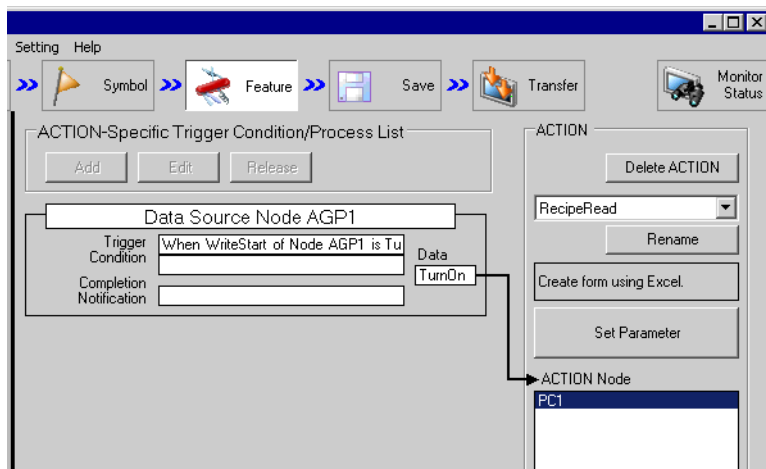
This step verifies setting results on the setting content list screen.

- NOTE**
- In case of the "Excel Report" ACTION, you cannot add, edit or delete trigger conditions from "Trigger Condition/Process List per ACTION". To change the settings, click the [Parameters Settings] button and change the settings in [Edit Template] on Excel.

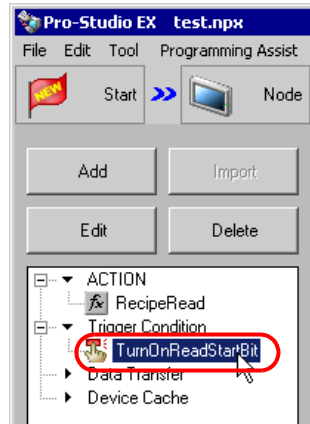
- 1 Select the ACTION name "RecipeRead" from the tree display on the left of the screen.



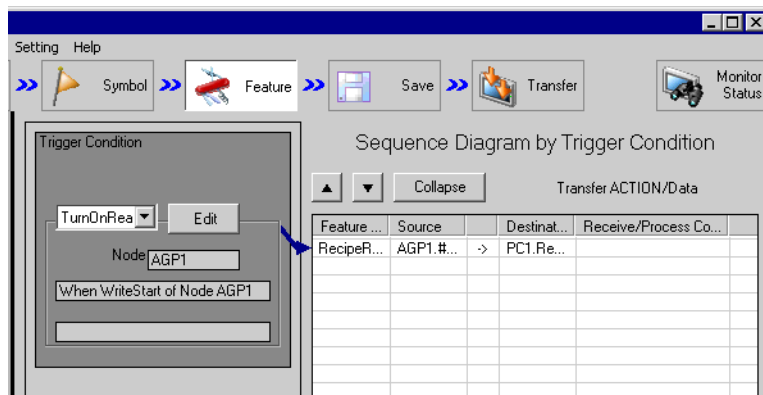
Confirm that the setting content appears on the right of the screen.



- 2 Select the trigger condition name "TurnOnReadStartBit" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

12.2.9 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
- Be sure to reload the network project file to 'Pro-Server EX'. If not, ACTION will not work.

Ex.

- Path of network project file : Desktop\monitor.npxc
- Title : EXCEL Report ACTION

12.2.10 Test Read

You can check if the settings are correct before transferring a created network project file to entry nodes.

When executing ACTION, the setting data is output to an output file. However, when executing a test read, it is reflected in a template file.

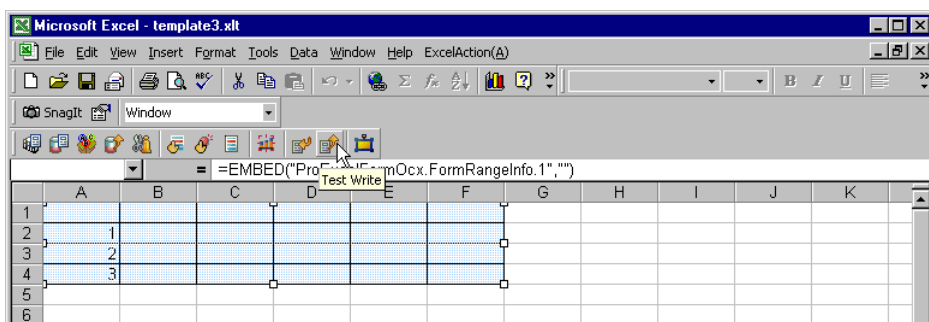
NOTE

- You do not necessarily have to perform a test read.
If you skip this, proceed to "12.2.11 Transferring a Network Project File".

IMPORTANT

- To perform a test read, it is necessary that 'Pro-Server EX', to which a created network project file has been loaded, is running.

- 1 Click the [Feature] button.
- 2 Click "ACTION" from the tree display on the left of the screen, then click the [Edit] button.
- 3 On the "Set ACTION Name/Parameter" screen, click the [Click here to set the ACTION parameter] button.
- 4 On the "Create form using Excel" screen, click the [Edit Template] button.
- 5 With the ACTION area selected, click the [Test Read] icon.



The setup contents will be read in the template.

NOTE

- Refer to "6.4 Restrictions" for details about the restrictions on test reads.

12.2.11 Transferring a Network Project File

This step loads a saved network project file to 'Pro-Server EX' and then transfers to entry nodes.

Refer to "26 Transferring" for details about transferring a network project file.

NOTE

- Be sure to transfer a network project file. If not, ACTION will not work.

12.2.12 Executing ACTION

This step verifies that enabling a trigger condition activates ACTION, opens a recipe sheet (file name: "recipe read.xls"), and then writes the device data in the specified location on the sheet.

| | A | B | C | D | E | F | G |
|---|---|-------------|-------------|-------------|-------------|-------------|---|
| 1 | | PLC1data[0] | PLC1data[1] | PLC1data[2] | PLC1data[3] | PLC1data[4] | |
| 2 | 1 | 10 | 20 | 30 | 40 | 50 | |
| 3 | 2 | | | | | | |
| 4 | 3 | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |

NOTE

- If error occurs, you can check the log in the Log Viewer. For more details, refer to "28.5 Monitoring System Event Logs".
- If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".

This is the end of the explanation of this ACTION.

12.3 Setting Guide

This section explains how to set each screen in detail.

12.3.1 "Creating form using Excel" Screen

☞ ■ "Creating form using Excel" Screen

12.3.2 Recipe" Screen

■ "Action Settings" Tab

Recipe

Action Settings | Record No. Settings | Trigger Condition Settings

Device Settings

Node: (Trigger-Source Node) ... Device Name: ...

Device Address/Symbol Group: ... No. of Devices: 4

Data Type: 16Bit(Signed) ...

☒ Add Device Address/Symbol Name

Note: When specifying inconsecutive memory data, please use a group symbol.

Layout Settings

Target Cell Range: \$B\$1:\$F\$1

Data Direction: ☒ Record ☐ Device

No. of Records: 1

Note: The layout of a group symbol is fixed.

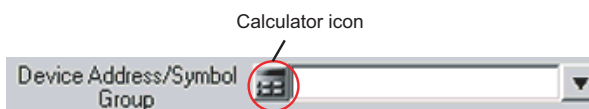

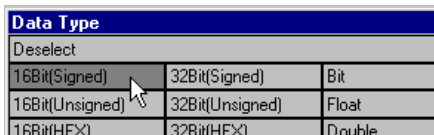
Sample

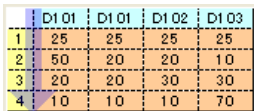
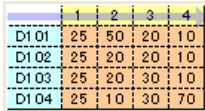
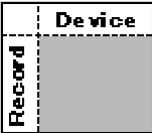
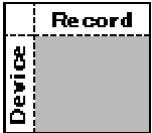
An image of writing to a cell is shown below.
The arrow points in the direction of arranging recipe data.

| | D1 01 | D1 02 | D1 03 | D1 04 |
|---|-------|-------|-------|-------|
| 1 | 25 | 25 | 25 | 25 |
| 2 | 50 | 20 | 20 | 10 |
| 3 | 20 | 20 | 30 | 30 |
| 4 | 10 | 10 | 10 | 70 |

Allot Record No. from 1 to Cell Range

OK Cancel

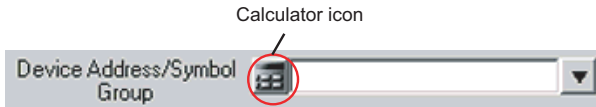

| Setting item | | Setting content | | | | | | | | | | | | | | | |
|-------------------|---|--|-----------|--|--|----------|--|--|---------------|---------------|-----|-----------------|-----------------|-------|------------|------------|--------|
| Device Settings | Node | <p>Selects a node which has a device to read/write data</p> <div>NOTE</div> <ul style="list-style-type: none">Clicking the [...] button can retrieve or add entry nodes.Selecting "(Trigger-Source Node)" will select the entry node that has triggered the action. | | | | | | | | | | | | | | | |
| | Device Name | <p>Selects a node which has a device to read/write data</p> <div>NOTE</div> <ul style="list-style-type: none">It is not necessary to set when the entry nodes are GP Series nodes and Pro-Server EX nodes. | | | | | | | | | | | | | | | |
| | Device Address/ Symbol Group | <p>Sets the device address or symbol to be used.</p> <ul style="list-style-type: none">When specifying a device address: Enter directly from the Calculator icon. <div></div> <p>Calculator icon</p> <ul style="list-style-type: none">When specifying a symbol: Select the symbol by clicking the list button. <div></div> <p>List button</p> <div>NOTE</div> <ul style="list-style-type: none">When setting non-sequential devices, be sure to specify a group symbol. | | | | | | | | | | | | | | | |
| | Data Type | <ul style="list-style-type: none">When specifying a device address: Specify the data type. <div></div> <table><tr><th colspan="3">Data Type</th></tr><tr><td colspan="3">Deselect</td></tr><tr><td>16Bit(Signed)</td><td>32Bit(Signed)</td><td>Bit</td></tr><tr><td>16Bit(Unsigned)</td><td>32Bit(Unsigned)</td><td>Float</td></tr><tr><td>16Bit(HEX)</td><td>32Bit(HEX)</td><td>Double</td></tr></table> <ul style="list-style-type: none">When specifying a symbol: Data type automatically appears. | Data Type | | | Deselect | | | 16Bit(Signed) | 32Bit(Signed) | Bit | 16Bit(Unsigned) | 32Bit(Unsigned) | Float | 16Bit(HEX) | 32Bit(HEX) | Double |
| | Data Type | | | | | | | | | | | | | | | | |
| Deselect | | | | | | | | | | | | | | | | | |
| 16Bit(Signed) | 32Bit(Signed) | Bit | | | | | | | | | | | | | | | |
| 16Bit(Unsigned) | 32Bit(Unsigned) | Float | | | | | | | | | | | | | | | |
| 16Bit(HEX) | 32Bit(HEX) | Double | | | | | | | | | | | | | | | |
| No. of Devices | <p>Displays the number of devices to read/write, automatically calculating it from the selected cell range.</p> <div>NOTE</div> <ul style="list-style-type: none">If a group symbol has been selected, the number will be "1". | | | | | | | | | | | | | | | | |

| Setting item | | Setting content |
|-----------------|--------------------------------|---|
| Device Settings | Add Device Address/Symbol Name | <p>Displays Device Address, Symbol Name, and/or Group Symbol Name above or on the left of the cells where the data is written, serving as a guide to identify the data.</p> <p>For the display location, specify above or left in "Data Direction" mentioned later.</p> <p>NOTE</p> <p>Refer to the image figure shown in the lower right of the dialog box.</p> <ul style="list-style-type: none"> Vertical  <ul style="list-style-type: none"> Horizontal  |
| | Target Cell Range | <p>Specifies the cell range to which data will be written/read.</p> <p>Clicking the button can select the cell range on Excel.</p> <p>NOTE</p> <ul style="list-style-type: none"> For the process on how to select cell ranges, refer to "■ Action Area Settings" in "5.1.2 Setting Guide". The useful function is available to check the specified cell range (Action area). Refer to "■ Action Area List" in "5.1.2 Setting Guide". |
| Layout Settings | Data Direction | <p>Sets the data write direction when selecting multiple cells.</p>  <ul style="list-style-type: none"> (Vertical) Sequentially from top to bottom.  <ul style="list-style-type: none"> (Horizontal) Sequentially from left to right. <p>NOTE</p> <ul style="list-style-type: none"> The write image of the content set in "Layout Settings" appears in [Sample]. |
| | No. of Records | <p>Sets and displays the number of records used for a recipe, automatically calculating it from the specified cell range.</p> |

| Setting item | Setting content |
|---------------------------------------|--|
| Allot Record No. from 1 to Cell Range | <p>Automatically inserts record No.s in the area specified in [Data Direction] of [Target Cell Range].</p> <p>It is possible to enter record No.s directly on Excel, but this could cause erroneous operation due to typing error. For this, we recommend entering with the [Allot Record No. from 1 to Cell Range] button.</p> <div>NOTE</div> <ul style="list-style-type: none">Clicking this button also inserts ruled lines in [Target Cell Range] automatically. |

■ "Record No. Settings" Tab

| Setting item | | Setting content | |
|--|--------------------------------|---|--|
| Record No. at Write Recipe / Record No. at Read Actual Value | Specify by device/symbol value | Specifies the recipe data by entering a record No. in the device or symbol specified by display unit or Device/PLC. | |
| | | Node | Selects a node which has the device where a recipe record No. exists. NOTE <ul style="list-style-type: none"> Clicking the [...] button can retrieve or add entry nodes. Selecting "(Trigger-Source Node)" will select the entry node that has triggered the action. |

| Setting item | | Setting content | | | | | | | | | | | | | | | | |
|--|---|---|--|-----------|--|--|----------|--|--|---------------|---------------|-----|-----------------|-----------------|-------|------------|------------|--------|
| Record No. at Write Recipe / Record No. at Read Actual Value | Specify by device/ symbol value | Device Name | Selects a Device/PLC which has the device where recipe record No.s exist. <div>NOTE</div> <ul style="list-style-type: none">It is not necessary to set when the entry nodes are GP Series nodes and Pro-Server EX nodes. | | | | | | | | | | | | | | | |
| | | Device Address/Symbol | Sets the device address or symbol to be used. <ul style="list-style-type: none">When specifying a device address: Enter directly from the Calculator icon. When specifying a symbol: Select the symbol by clicking the list button.  <div>NOTE</div> <ul style="list-style-type: none">When setting non-sequential devices, be sure to specify a group symbol. | | | | | | | | | | | | | | | |
| | | Data Type | <ul style="list-style-type: none">When specifying a device address: Specify the data type. <table border="1" data-bbox="695 1064 1133 1195"><thead><tr><th colspan="3">Data Type</th></tr></thead><tbody><tr><td colspan="3">Deselect</td></tr><tr><td>16Bit(Signed)</td><td>32Bit(Signed)</td><td>Bit</td></tr><tr><td>16Bit(Unsigned)</td><td>32Bit(Unsigned)</td><td>Float</td></tr><tr><td>16Bit(HEX)</td><td>32Bit(HEX)</td><td>Double</td></tr></tbody></table>When specifying a symbol: Data type automatically appears. | Data Type | | | Deselect | | | 16Bit(Signed) | 32Bit(Signed) | Bit | 16Bit(Unsigned) | 32Bit(Unsigned) | Float | 16Bit(HEX) | 32Bit(HEX) | Double |
| | | Data Type | | | | | | | | | | | | | | | | |
| | Deselect | | | | | | | | | | | | | | | | | |
| 16Bit(Signed) | 32Bit(Signed) | Bit | | | | | | | | | | | | | | | | |
| 16Bit(Unsigned) | 32Bit(Unsigned) | Float | | | | | | | | | | | | | | | | |
| 16Bit(HEX) | 32Bit(HEX) | Double | | | | | | | | | | | | | | | | |
| No. of Characters | Specifies the number of readable characters of a record No. when the specified data type of the record No. is "character string". | | | | | | | | | | | | | | | | | |
| Specify by cell value | | Recognizes the entered value or character string in any specified cell on Excel, as a record No. Therefore, you can select [Specify by cell value] on condition that you use recipe data in such environment as the office having PCs. <div>NOTE</div> <ul style="list-style-type: none">Be sure to place cells to specify record No.s on the same sheet as recipe data. | | | | | | | | | | | | | | | | |

■ "Trigger Condition Settings" tab

Recipe

Action Settings Record No. Settings Trigger Condition Settings

Action Area No. 0

When the specified trigger type (under-condition button) is satisfied, this area is executed.
Please specify a trigger type.

New Trigger Condition New Trigger Button

Write

Edit Delete

| Trigger Condition |
|-------------------|
| * |

Read

Edit Delete

| Trigger Condition |
|-------------------|
| * |

If two or more are specified, the Action is executed when any of them is satisfied.
For more complicated operation, please configure from [Excel Action]-[Execution Sequence List] in the menu.

OK Cancel

| Setting item | Setting content |
|-----------------------|---|
| Action Area No. | Displays No. allocated to each ACTION area by template. |
| New Trigger Condition | Displays the "Trigger Condition Settings" dialog box. Click here to set a new trigger condition. |
| New Trigger Button | Displays the "Create Trigger Button" dialog box. Refer to "5.6.2 Setting Guide" for more details. |
| Write | <p>Selects a trigger condition to write recipe data. Click the blank line of [Trigger Condition] and then the list button to display the registered trigger condition.</p> <p>NOTE</p> <ul style="list-style-type: none"> When plural trigger conditions have been specified, satisfying at least one of those conditions executes ACTION. Clicking the [Edit] button can edit the specified trigger conditions. Clicking the [Delete] button deletes the specified trigger conditions. |

| Setting item | Setting content |
|--------------|--|
| Read | <p>Selects a trigger condition to read recipe data. Click the blank line of [Trigger Condition] and then the list button to display the registered trigger condition.</p> <p>NOTE</p> <ul style="list-style-type: none">• When plural trigger conditions have been specified, satisfying at least one of those conditions executes ACTION.• Clicking the [Edit] button can edit the specified trigger conditions.• Clicking the [Delete] button deletes the specified trigger conditions. |

12.4 Restrictions

■ Changing the Security Settings

To execute the Excel Form Creation Action, you need to change the Excel security settings. If you do not change the settings, the following problems will occur.

- [Tool] → [QC Chart]
Pareto graph tools cannot be used.
- [Tool] → [Insert Sample]
Form templates cannot be used.

The setting change steps vary depending on the Excel version.

Change the security settings according to the following steps.

NOTE • Depending on the Office version you are using, the display and part names may differ. If so, replace the names with those with similar features used in your system configuration.

- 1 From the [File] tab, click [Options].
- 2 From the [Excel Options] dialog box, click [Customize Ribbon].
- 3 From the [Main Tabs] list, select the [Developer] check box.
- 4 Click [Macro Security] on the [Developer] tab.
- 5 Click [Macro Settings] in the [Trust Center] dialog box.
- 6 Check the [Enable VBA macros] option under [Macro Settings].

■ Combined Cells

Do not set an ACTION area on combined cells.

For example, if you set an ACTION area in the cells as shown below, correct operation cannot be guaranteed.

| | A | B | C | D |
|---|-------|-------|-------|-------|
| 1 | D1 00 | D1 01 | D1 02 | D1 03 |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |

■ Over-pasted ACTION Areas

When you over-paste plural ACTION areas of different size, read/write will be executed in the pasted order.

■ Writing Data of Excel in the Device/PLCs

When the data type is "Character string", write null characters (NULL) in empty cells in Excel, and in the other cases write "0".

■ Writing Character String Data

When writing "Character string" data in Excel, format the cell(s) to write data in as "Character string".

■ Excel Window

If the setting screen is hidden behind the Excel window, the screen and task tray windows will blink and notify the user. Blinking will stop automatically when the setting screen comes forward.

■ Operation in ACTION area when error occurs

When you actually write/read in all the functions, such as "Device One-Shot" and "Device Logging", and exceed the ACTION area, perform the common operation as follows:

1) When performing a test read/ a test write

Error screen is displayed.

2) When executing ACTION in runtime

It will be recorded as ACTION error in the log viewer of the 'Pro-Server EX'.

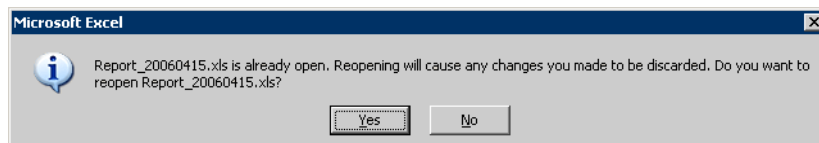
■ In the case of closing the displayed output book

If you have mistakenly closed an output book of Excel Report ACTION, follow these steps to open it again:

Dragging and dropping the book to open will make it read-only and the start button etc. invalid.

1. Double-click the output book.

2. When the following dialog box appears, select "No" to open it.



■ Receive notification

You cannot set the receive notification which indicates the completion of ACTION.

■ When setting "Trigger-Source Node"

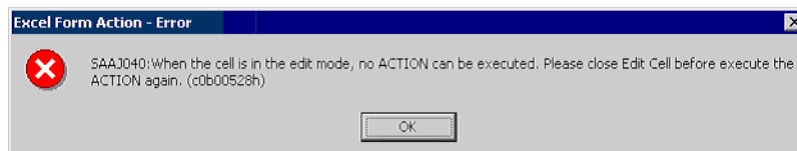
When setting "Trigger-Source Node" at node in Excel Report action, node type and device are uncertain.

Therefore, the device address is displayed in red. But, it is no problem.

■ Edit the output file

While Excel Report Action is executing, you can not edit the output file.

Therefore, it becomes very difficult to operate Excel at the setting in which the Trigger condition satisfies at a short cycle. Moreover, the following error message is displayed when the Action is executed during editing the output file.



■ Save the output file Do not use

Do not use multiple Excel form actions to save output files to the same destination.

If you set the same destination for file outputs, Pro-Studio and Pro-Server EX may not be able to run.

■ About the 1500 row limit for Action Area settings

Exceeding 1500 rows for the Action Area could cause the action to run longer. If you use Device One Shot or Device Logging's text conversion, the action could take even longer.

■ Restrictions on Copying or Cutting and Pasting the Action Area

When you paste the Action area using Ctrl+C & Ctrl+V or Ctrl+X & Ctrl+V, specify [Target Cell Range] for the copied Action area.

The Action area just after pasting remains the same [Target Cell Range] as that for the original Action area.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |

■ Excel Auto Save Function

The Excel auto save function does not operate due to the Excel restrictions. To save automatically, create the Excel save macro using the following procedure and execute the created save macro by Action.

- 1 Open a template you want to save automatically using 'Pro-Studio EX'.

Create form using Excel Version 1.22

Template Designation
Please specify the name of Excel template file that is the source of forms.
When you use the wizard, the theme template file is copied to a file with this name.
When you create a new template, please specify the file name.

Template File Reference

Edit Template

Output File
The template file stores setting info. The actual output result will be displayed in the following file.

Folder Name Reference

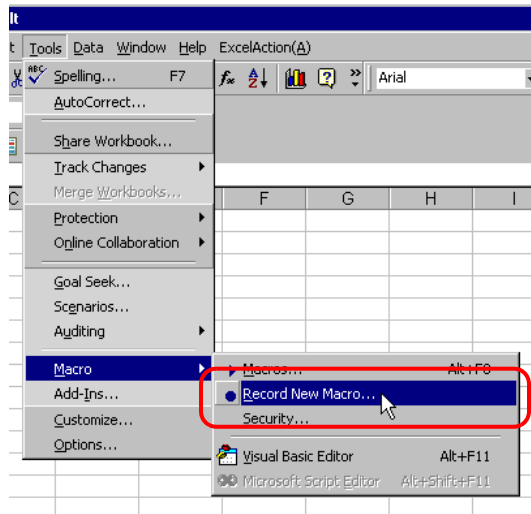
File Name Return to Default Settings

☒ Start from Displayed State

☐ Do not save the output file when ACTION runs.
(Please use the Save or Save by Macro of Excel.)

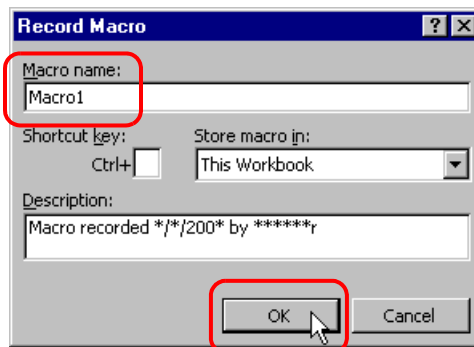
OK Cancel

- 2 Select "Macro" and "Record New Macro" from the "Tools" menu.



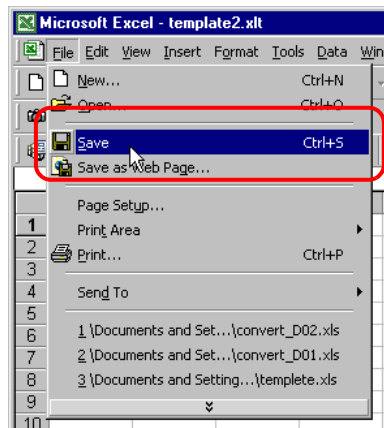
- 3 Enter the macro name "Macro1" and click the [OK] button.

Recording the macro starts.



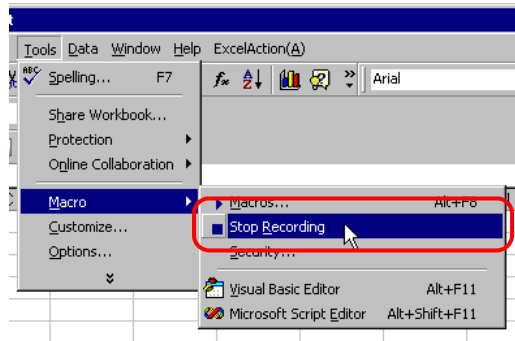
- 4 Select "Save" from the "File" menu.

"Macro1" is recorded in the macro.

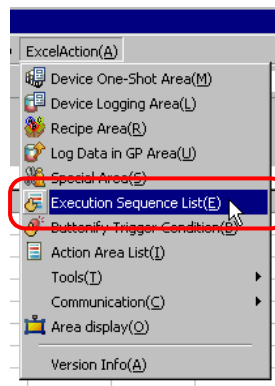


- 5 Select "Macro" and "Stop Recording" from the "Tools" menu.

Recording the macro is complete.

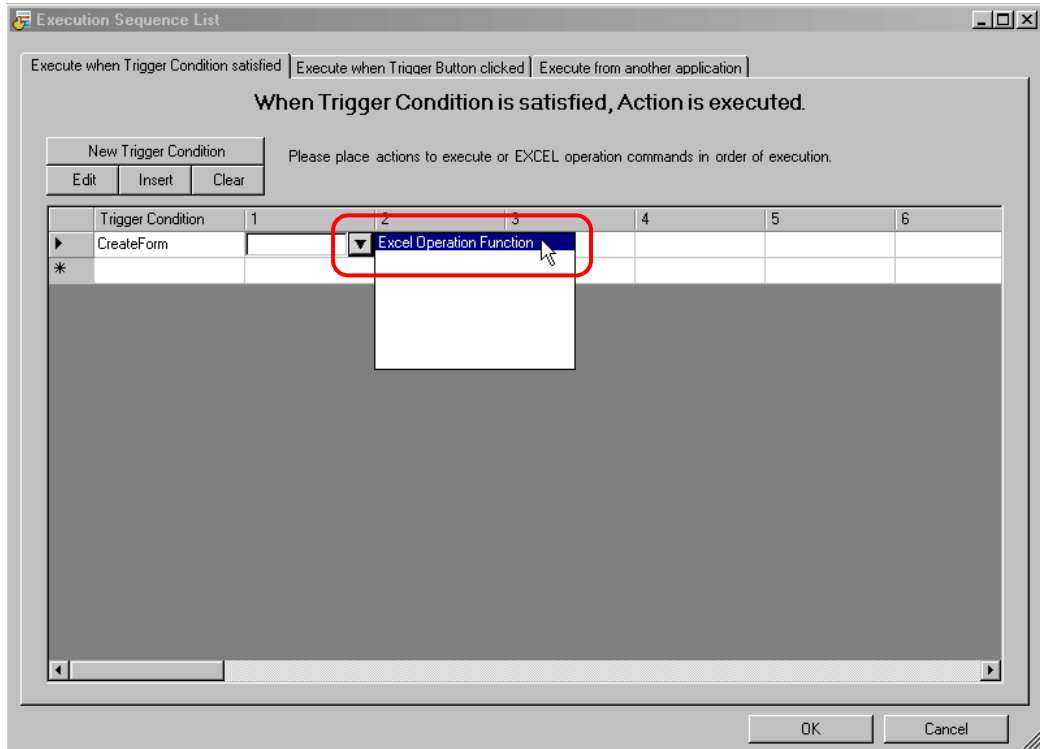


- 6 Select "Execution Sequence List" from the "Excel Action" menu.

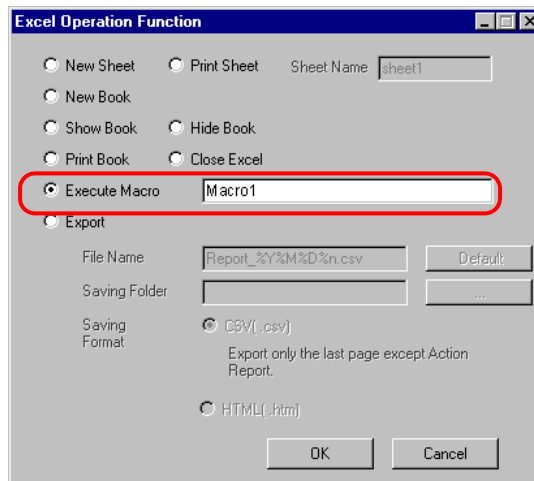


- 7 Create the trigger condition save automatically.

- 8 Select the created trigger condition and "Excel Operation Function".



- 9 Select "Execute Macro" and enter the macro name "Macro1".



- 10 Click the [OK] button.
- 11 Finish editing the template.
- 12 Save/Reload the setting contents.

According to the created trigger condition, the template is automatically saved.

13



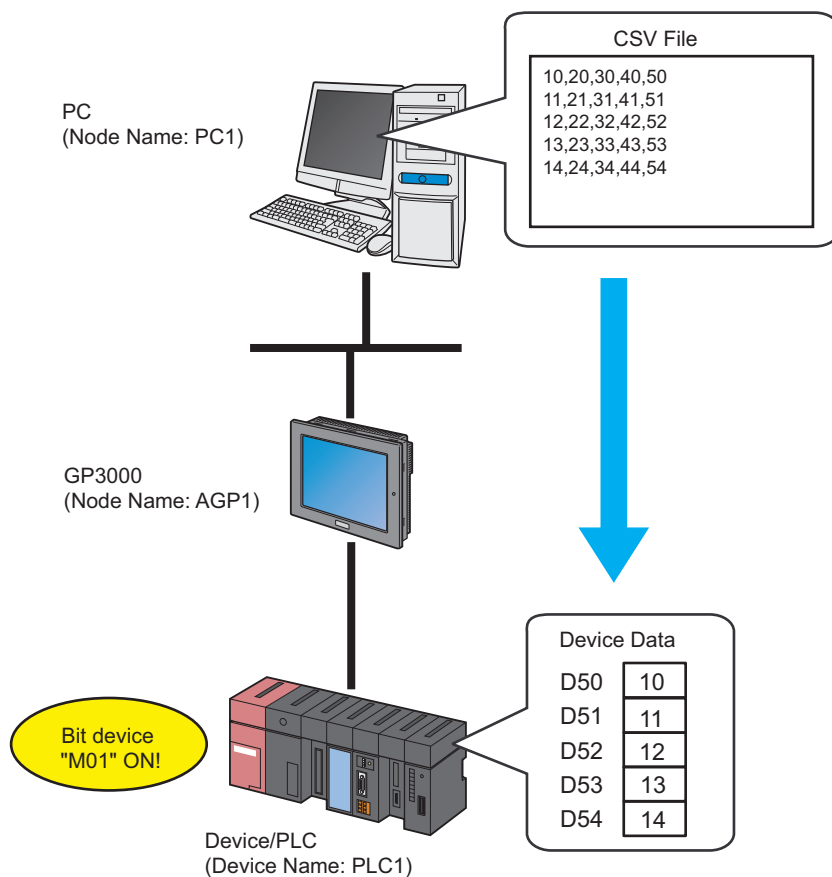
Writing CSV File Data in Device/PLC

| | | |
|------|--|-------|
| 13.1 | Try to Write CSV File Data in Device/PLC | 13-2 |
| 13.2 | Setting Guide | 13-23 |
| 13.3 | Restrictions | 13-27 |

13.1 Try to Write CSV File Data in Device/PLC

[Action Example]

Detect the rising of the device (bit device: "M01") of Device/PLC and write the first column data of a CSV file on PC into the devices (word device: address "D50" to "D54") of Device/PLC.



This section describes the setting procedures for executing the above action (ACTION) as an example.

[Setting Procedure]

| | | |
|----|---|---|
| 1 | Creating a CSV Data File (Recipe) (page13-4) | This step creates a CSV data file containing a recipe to write in a Device/PLC device. |
| 2 | Starting 'Pro-Studio EX' (page13-4) | This step starts 'Pro-Studio EX'. |
| 3 | Registering Entry Nodes (page13-5) | This step registers the PC and the display units as entry nodes. |
| 4 | Registering Symbols (page13-6) | This step registers as a symbol the device of Device/PLC which serves as a trigger condition (trigger) and also a data write destination. |
| 5 | Parameter Setting for Feature (ACTION) (page13-7) | This step sets the following items: Write Destination Readout File Readout Detail Settings |
| 6 | Setting Trigger Conditions (page13-12) | This step sets conditions (trigger) for executing data write. |
| 7 | Setting Data Received by ACTION (page13-15) | This step sets the device of Device/PLC where data is written. |
| 8 | Setting ACTION Node/Process Completion Notification (page13-17) | This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed. |
| 9 | Verifying Setting Result (page13-19) | This step verifies setting results on the setting content list screen. |
| 10 | Saving a Network Project File (page13-21) | This step saves the current settings as a network project file and reloads. |
| 11 | Transferring a Network Project File (page13-21) | This step transfers a saved network project file to the display unit. |
| 12 | Executing ACTION (page13-22) | This step verifies that CSV file data is written in the device of Device/PLC when the preset trigger condition has become effective. |

13.1.1 Creating a CSV Data File (Recipe)

- 1 Create a recipe sheet.

[Creation Example]

```
10, 20, 30, 40, 50  
11, 21, 31, 41, 51  
12, 22, 32, 42, 52  
13, 23, 33, 43, 53  
14, 24, 34, 44, 54
```

- 2 Save it on PC desktop with the file name "CSVdata.csv" after creating.

13.1.2 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

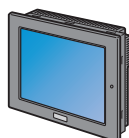
13.1.3 Registering Entry Nodes

This step registers the PC and the display unit connected with network as nodes.

Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1
IP Address :192.168.0.1



Node Name :AGP1
IP Address :192.168.0.100

Device/PLC Information

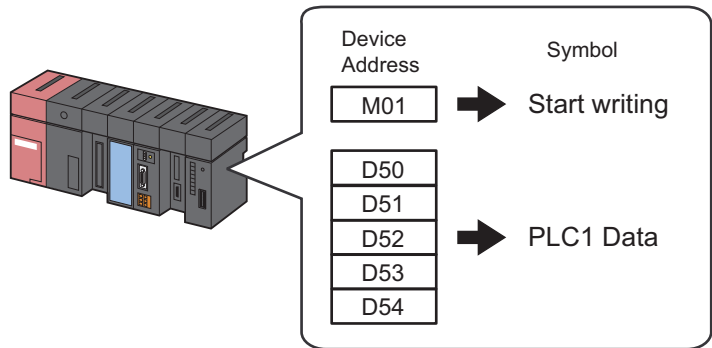
Ex.

| Entry Node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

13.1.4 Registering Symbols

This step registers as a symbol the device of Device/PLC which serves as a trigger condition (trigger) and also a data write destination.

Refer to "32 Symbol Registration" for details about entry nodes.



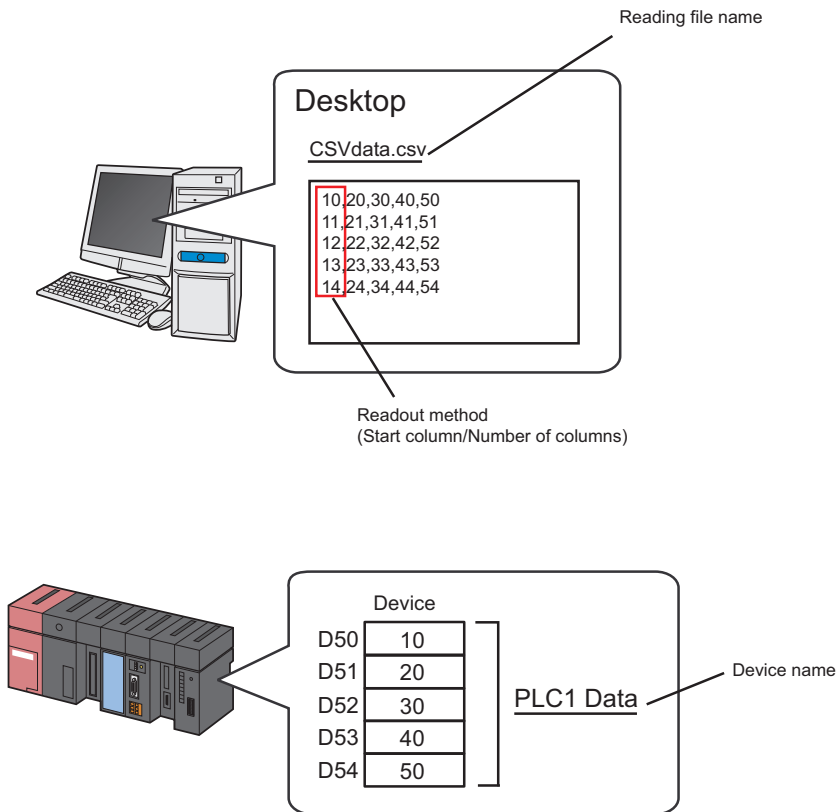
Ex.

| Setting item | Trigger (Trigger Condition) | Writing Device |
|--|-----------------------------|-------------------------------------|
| Symbol Name | Start writing | PLC1 data |
| Data Type | Bit | 16Bit (Signed) |
| Device address for symbol registration | "M01" of Device/PLC (PLC1) | "D50" to "D54" of Device/PLC (PLC1) |
| No. of Devices | 1 | 5 |

13.1.5 Parameter Setting for Feature (ACTION)

This step makes settings to write CSV file data in the device of Device/PLC. (parameter settings)

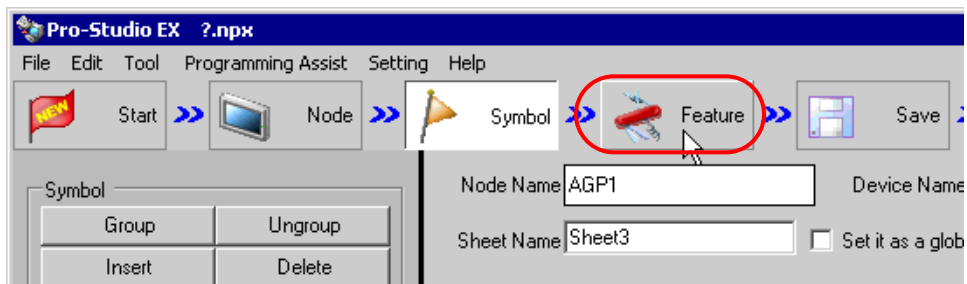
Refer to "13.2 Setting Guide" for more details about ACTION parameter.



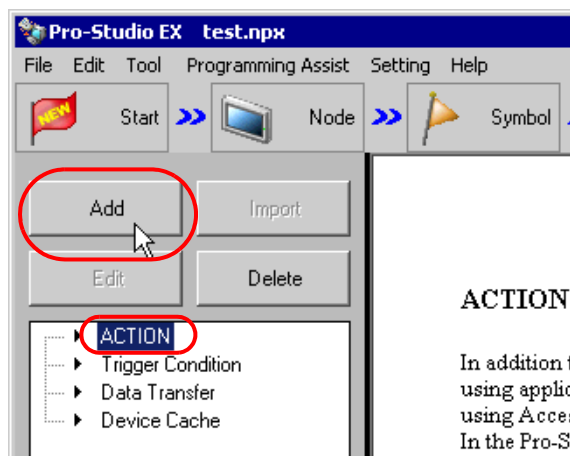
Ex.

| Setting item | | Setting content |
|-------------------|-------------------|-----------------|
| ACTION Name | | CSV download |
| Write Destination | Node Name | AGP1 |
| | Device Name | PLC1 data |
| | Data Type | 16bit (Signed) |
| Readout File | Readout File Name | CSVdata.csv |
| | Readout Method | All the Column |
| | Start Column | 1 |
| | No. of Columns | 1 |

- 1 Click the [Feature] icon on the status bar.



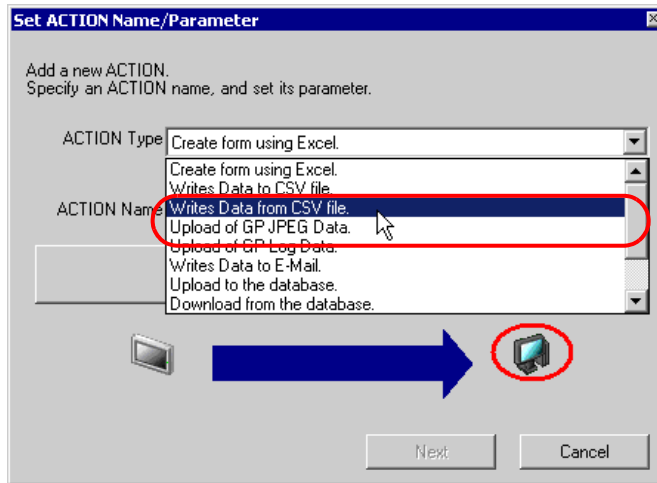
- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.



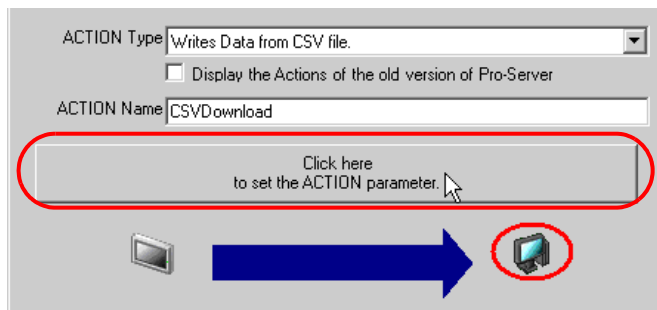
3 Click the [ACTION Type] list button, and select "Writes Data from CSV file".

Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "CSV Download".

NOTE • [ACTION Name] can be an arbitrary name.

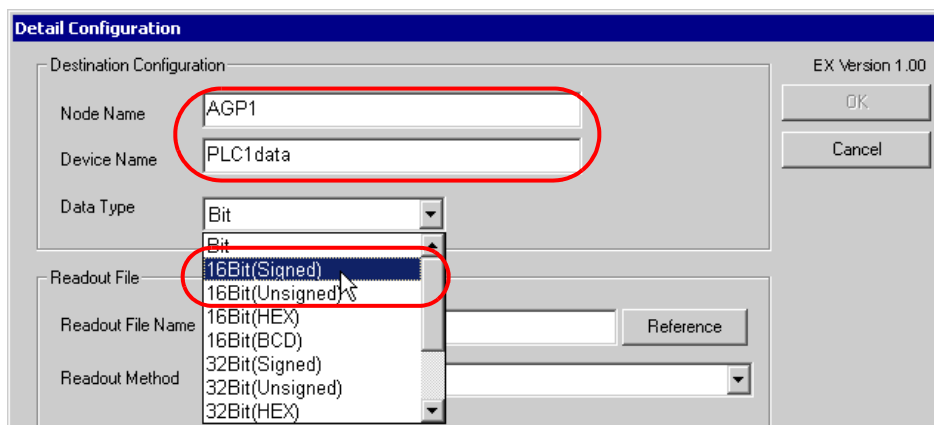


4 Click the [Click here to set the ACTION parameter] button.



5 Make settings regarding the data write destination (device of Device/PLC).

- 1) Enter the node name "AGP1" in [Node Name] for the data write destination. Also, click the [Data Type] list button, and select "16Bit(Signed)" as the data type of "PLC1 data".

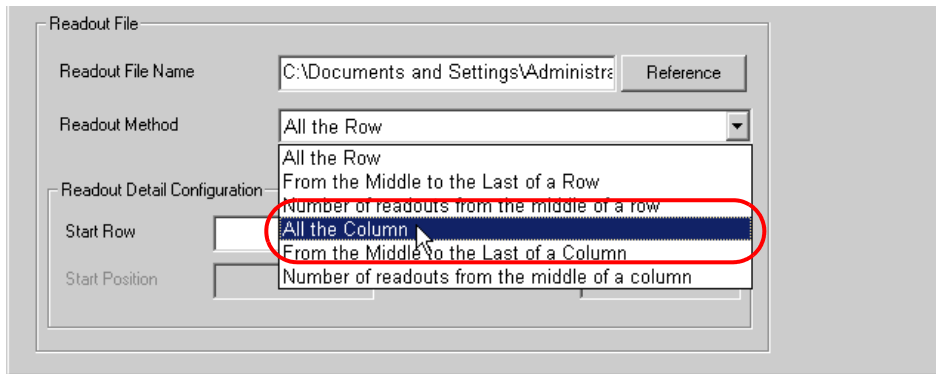


NOTE

- Enter the node name and device name in the text box. You can directly enter the symbol name or device address in [Device Name].
- When you specify the device address of ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, or GP3000 Series node specify the device name together.
(Example) [PLC1]D0100 [#INTERNAL]LS0200 etc.
- When you copy & paste the symbol name from the symbol sheet, copy the symbol name in the [Edit Symbol] dialog box by Ctrl + C.
- If you enter a symbol name in [Device Name], add the Device/PLC name before the symbol name.
(Example) If the symbol name is registered as "MEM1000", enter "[#MEMLINK]MEM1000" in [Device Name].

6 Make settings regarding the CSV file from which data is read out.

- 1) Click the [Reference] button of [Readout File Name] and, on the "Select File" screen, specify the CSV file "CSVdata.csv" to read data from, .
- 2) Click the list button of [Readout Method] and select "All the Column".



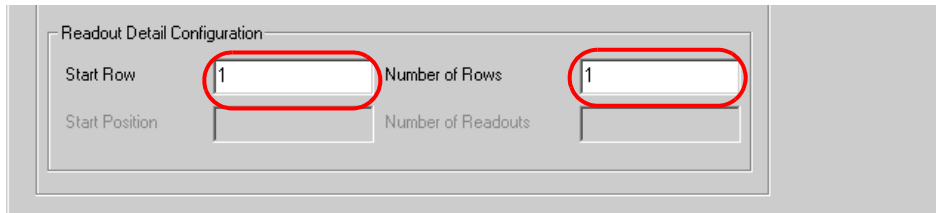
NOTE

- You can choose a data read out method of CSV files among 6 types.



" Readout Method and Detail Settings"

- 3) Enter "1" in [Start Row] of [Readout Detail Configuration] and "1" in [Number of Rows].



NOTE

- Items to set in [Readout Detail Configuration] vary depending on the readout method selected in procedure 2.



" Readout Method and Detail Settings"

7 Click the [OK] button.

This is the end of the feature (ACTION) settings.

13.1.6 Setting Trigger Conditions

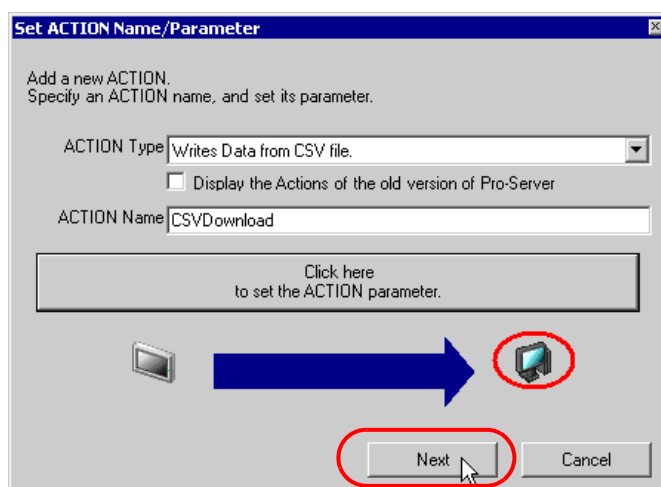
This step sets a trigger condition (trigger bit ON) to read out device data.

Refer to "33 Trigger Conditions" for details about trigger conditions.

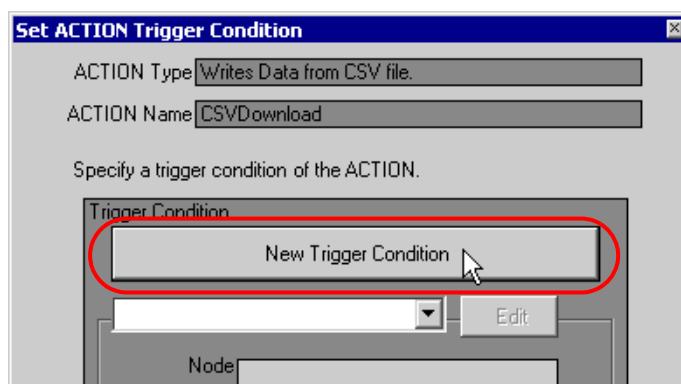
Ex.

- Trigger Condition Name: Turn on write start bit
- Trigger Condition : When "Start writing" (M01) is ON

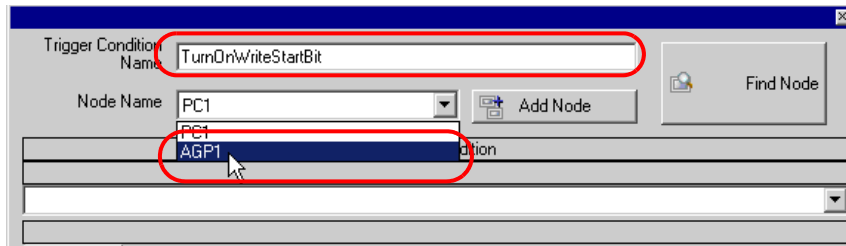
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



2 Click the [New Trigger Condition] button.



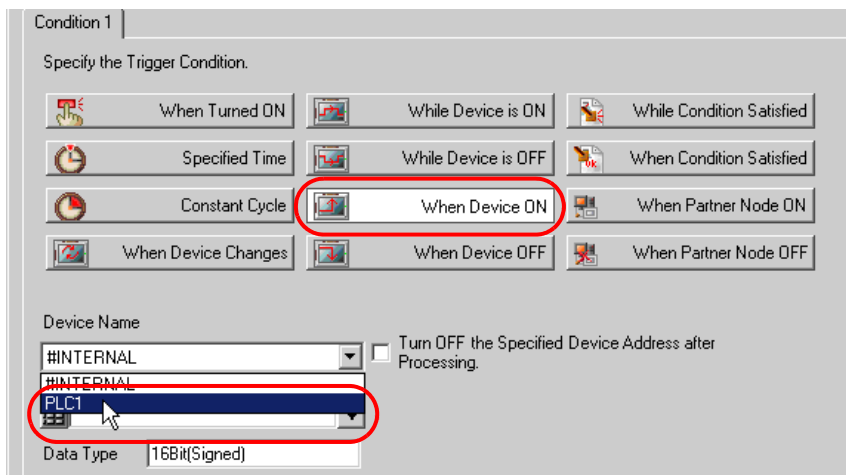
- 3 Enter the trigger condition name "TurnOnWriteStartBit" in [Trigger Condition Name], and select "AGP1" in [Node Name] which has the device to serve as the trigger condition (trigger).

**NOTE**

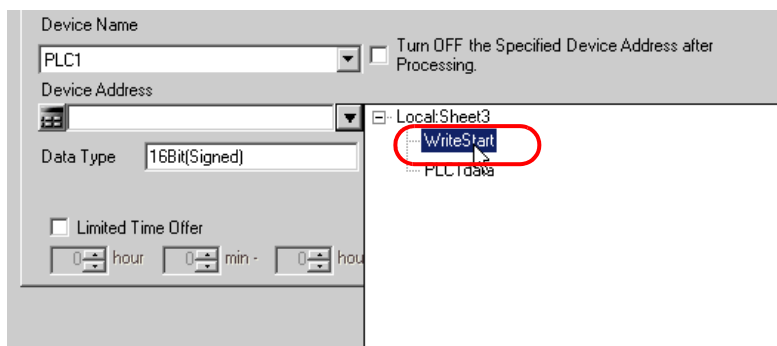
- Here, you are to specify the node having the device to be the trigger condition or having data to transfer.

☞ "33 Trigger Conditions"

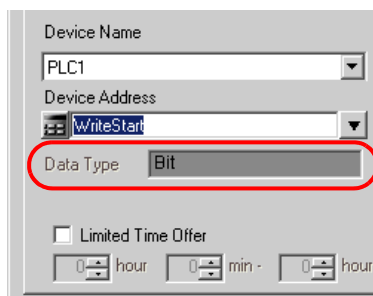
- 4 Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



- 5 Click the [Device Address] list button and select "WriteStart" for the symbol name of the device which serves as the trigger.



[Data Type] automatically appears after selection, too.



NOTE

- You can also set trigger conditions by combining 2 different types of conditions ("And" condition or "Or" condition).

☞ "33 Trigger Conditions"

- 6 Click the [OK] button.

This is the end of trigger condition settings.

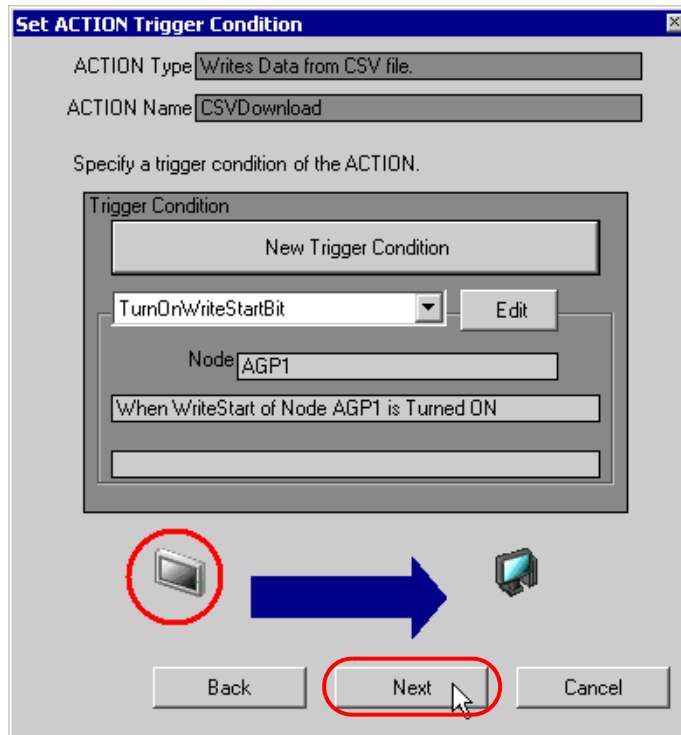
13.1.7 Setting Data Received by ACTION

This step sets data to transfer in ACTION.

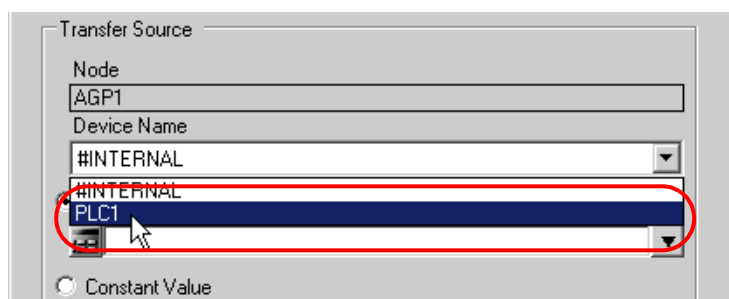
Ex.

- Device Name as Transfer Source: PLC1
- Transfer Destination Device: PLC1 symbol "PLC1 data"

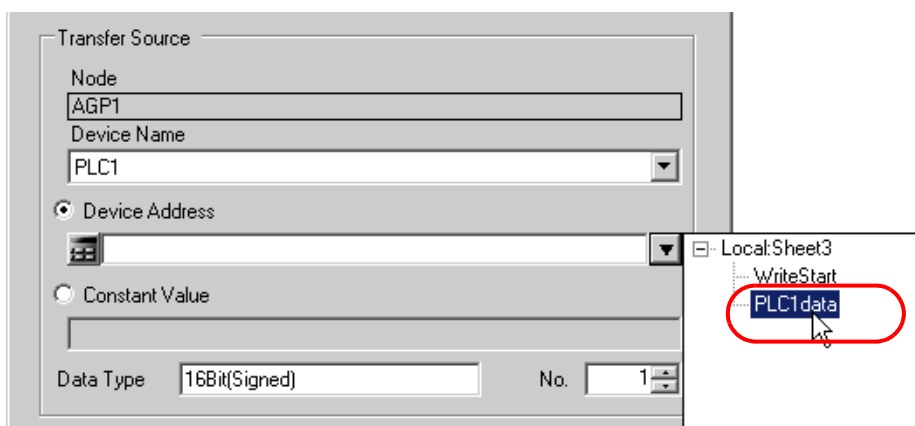
1 On the "Set ACTION Trigger Condition" screen, click the [Next] button.



- 2 Click the list button of [Device Name] and select "PLC1" for the Device/PLC to which data is written.



- 3 Click [Device Address] and then the list button to select "PLC1 data" for the symbol name of the Device/PLC "PLC1" to which data is written.



[Data Type] automatically appears after selection, too.



NOTE • You can transfer any constant number instead of device values.

This is the end of the setting of data received by ACTION.

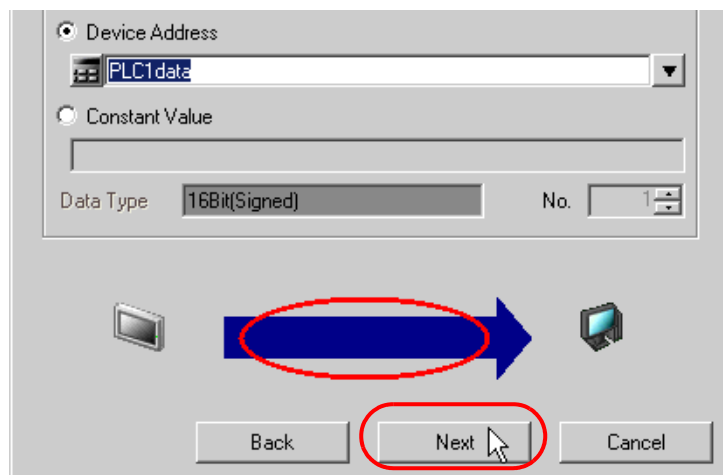
13.1.8 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed.

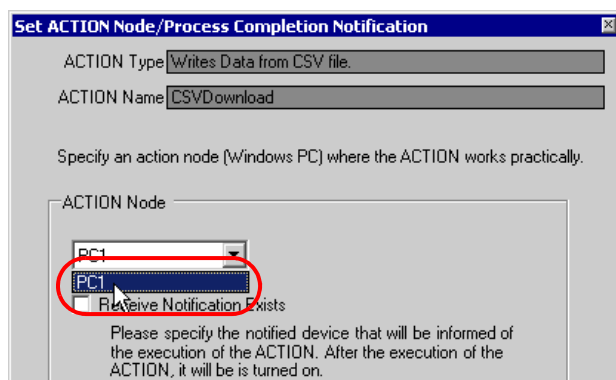
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

1 On the "Data settings to be received by ACTION" screen, click the [Next] button.



- Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates. Also, clear the check if [Receive Notification Exists] has been checked.

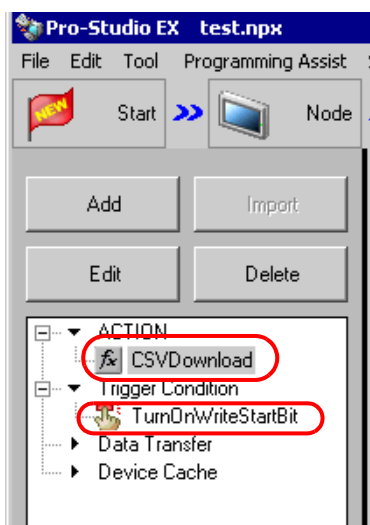


- NOTE** • When "Receive Notification Exists" is turned on, the specified bit device will be turned on when the ACTION is completed. This can be used as a trigger condition (trigger) of the subsequent ACTION when you want to execute two or more ACTIONS sequentially.

☞ "33 Trigger Conditions"

- Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the ACTION and trigger condition names you set will appear.

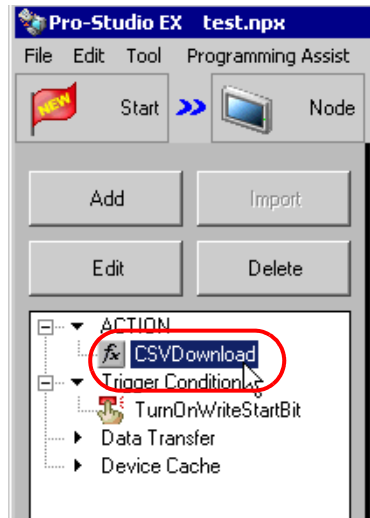


This is the end of the settings of the ACTION node and process completion notification.

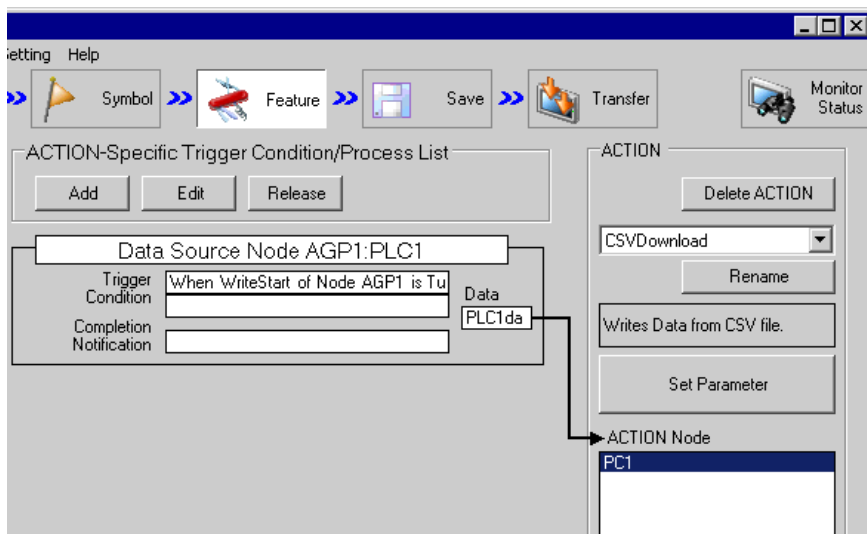
13.1.9 Verifying Setting Result

This step verifies setting results on the setting content list screen.

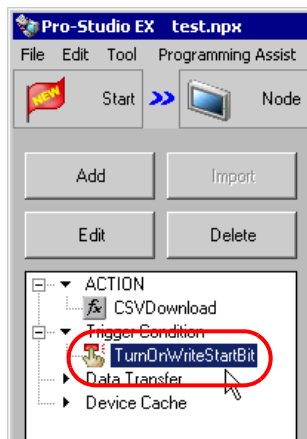
- 1 Select the ACTION name "CSV Download" from the tree display on the left of the screen.



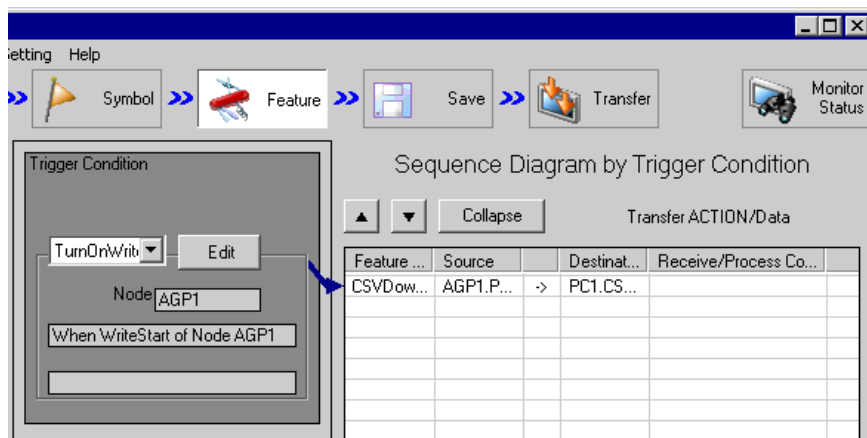
Confirm that the setting content appears on the right of the screen.



- 2 Select the trigger condition name "TurnOnWriteStartBit" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

13.1.10 Saving a Network Project File

This step saves the current settings as a network project file.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
 - Be sure to reload the network project file to 'Pro-Server EX'. If not, ACTION will not work.
-

Ex.

- Path of network project file : Desktop\CSV_download.npxe
- Title : CSV download action

13.1.11 Transferring a Network Project File

This step transfers a saved network project file to entry nodes.

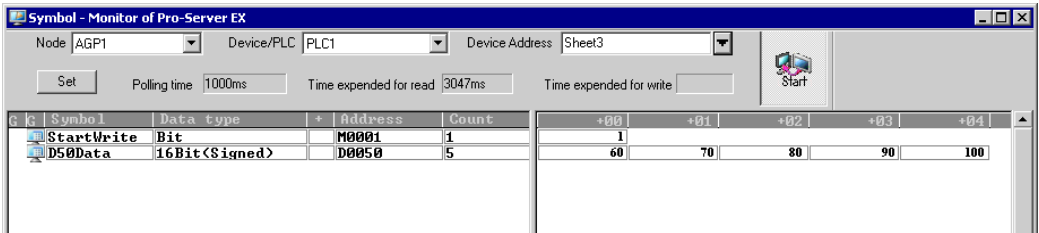
Refer to "26 Transferring" for details about transferring a network project file.

NOTE

- Be sure to transfer a network project file. If not, ACTION will not work.
-

13.1.12 Executing ACTION

This step verifies that data in the first column of a recipe sheet is written in the device of Device/PLC when the preset trigger condition has become effective.



- NOTE**
- Check the actually written values with such function as monitor of rudder creation software.
 - If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".

This is the end of the explanation of this ACTION.

13.2 Setting Guide

This section explains how to set the parameters of ACTION.

| Setting item | | Setting content |
|---------------------------|------------------------------|--|
| Destination Configuration | Node Name | Enter a node name of display unit to write data in. "%NODE" appears for initial setting, and the transfer source node in triggering ACTION becomes the target node in this case. |
| | Device Name | Enter a device address or a symbol name to write data in. You can specify the device name of a transfer source node by specifying "%DEV [Device Address]" through indirect specification. |
| | Data Type | Specify the type of data to write. |
| Readout File | Readout File Name | Sets a CSV file name from which data is read out. Enter directly or specify the file on the "Select File" screen of Windows by clicking the [Reference] button. By specifying a macro code for the readout file name, you can set the file name as a node name or device data. ☞ "37.1 Restrictions on Names" |
| | Readout Method | Selects a CSV file read out method. ☞ "Readout Method and Detail Settings" |
| | Readout Detail Configuration | Set the details like readout start rows, corresponding to the selected readout method. Setting items vary depending on the selected method. ☞ "Readout Method and Detail Settings" |

Readout Method and Detail Settings

The 6 types below are available for readout methods of CSV files.

◆ All the Row

| Readout detail settings | Setting content |
|-------------------------|---|
| Start Row | Specifies a first row. Entering 0 or less sets the last row. |
| Number of Rows | Specifies the number of rows. Entering 0 or less sets the last row. |

The shaded area on the table below indicates readout data from a CSV file, with the readout sequence from (1) to (10).

| | | | | | | | |
|---------------|-----|-----|-----|-----|------|---|----------------|
| | | 1 | 2 | 3 | 4 | 5 | |
| 1 | | | | | | | |
| Start row → 2 | (1) | (2) | (3) | (4) | (5) | | Number of rows |
| 3 | (6) | (7) | (8) | (9) | (10) | | |
| 4 | | | | | | | |
| 5 | | | | | | | |

◆ From the Middle to the Last Column of a Row

| Readout detail settings | Setting content |
|-------------------------|---|
| Start Row | Specifies a first row. Entering 0 or less sets the last row. |
| Number of Rows | Specifies the number of rows. Entering 0 or less sets the last row. |
| Start Position | Specifies a first column. Entering 0 or less sets the last column. |

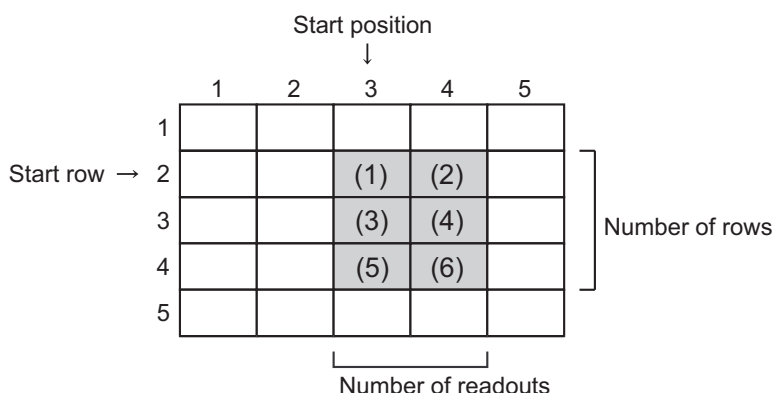
The shaded area on the table below indicates readout data from a CSV file, with the readout sequence from (1) to (6).

| | | | | | | | |
|---------------|--|---|----------------|-----|-----|---|----------------|
| | | | Start position | | | | |
| | | | ↓ | | | | |
| | | 1 | 2 | 3 | 4 | 5 | |
| 1 | | | | | | | |
| Start row → 2 | | | (1) | (2) | (3) | | Number of rows |
| 3 | | | (4) | (5) | (6) | | |
| 4 | | | | | | | |
| 5 | | | | | | | |

◆ The Number of Readouts from the Middle of a Row

| Readout detail settings | Setting content |
|-------------------------|---|
| Start Row | Specifies a first row. Entering 0 or less sets the last row. |
| Number of Rows | Specifies the number of rows. Entering 0 or less sets the last row. |
| Start Position | Specifies a first column. Entering 0 or less sets the last column. |
| Number of Readouts | Specifies data columns to read out. |

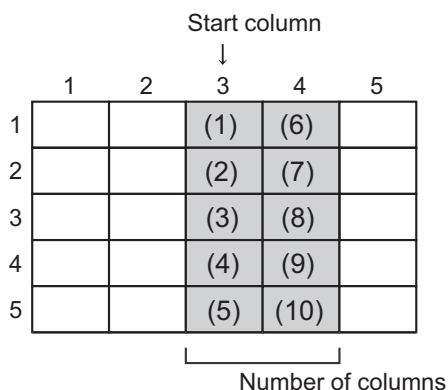
The shaded area on the table below indicates readout data from a CSV file, with the readout sequence from (1) to (6).



◆ All the Column

| Readout detail settings | Setting content |
|-------------------------|---|
| Start Column | Specifies a first column. Entering 0 or less sets the last column. |
| Number of Columns | Specifies the number of columns. Entering 0 or less sets the last column. |

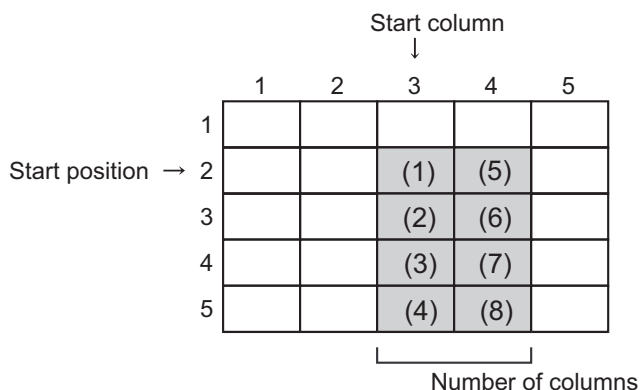
The shaded area on the table below indicates readout data from a CSV file, with the readout sequence from (1) to (10).



◆ From the Middle to the Last Row of a Column

| Readout detail settings | Setting content |
|-------------------------|---|
| Start Column | Specifies a first column. Entering 0 or less sets the last column. |
| Number of Columns | Specifies the number of columns. Entering 0 or less sets the last column. |
| Start Position | Specifies a first row. Entering 0 or less sets the last row. |

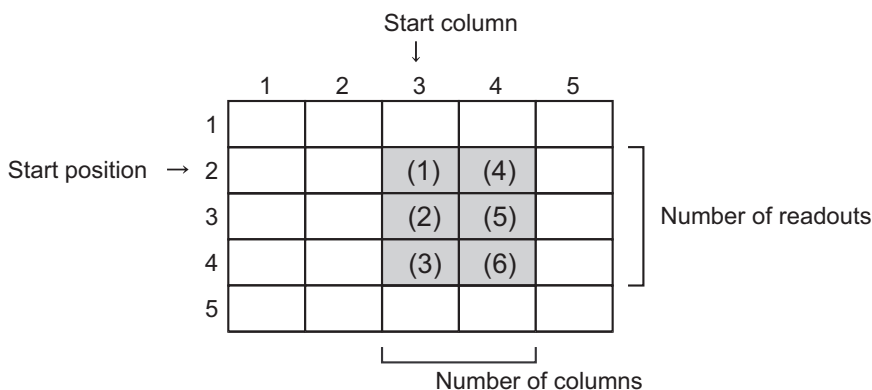
The shaded area on the table below indicates readout data from a CSV file, with the readout sequence from (1) to (8).



◆ The Number of Readouts from the Middle of a Column

| Readout detail settings | Setting content |
|-------------------------|---|
| Start Column | Specifies a first column. Entering 0 or less sets the last column. |
| Number of Columns | Specifies the number of columns. Entering 0 or less sets the last column. |
| Start Position | Specifies a first row. Entering 0 or less sets the last row. |
| Numer of Readouts | Specifies data rows to read out. |

The shaded area on the table below indicates readout data from a CSV file, with the readout sequence from (1) to (6).



13.3 Restrictions

Important information when writing data from CSV file to device

When using this ACTION, keep in mind the following points.

- (1) The data type of a write destination device is fixed to single when setting up ACTION. For example, you cannot write the first 5 rows of CSV data in bits as well as the remaining ones in character strings.
- (2) If there is any row with empty cells, follow these instructions:
 - If the data type is set to "Character string", ignore the empty data and read out.
Ex.) When CSV data is "A,,B,C,,D", write as "A,B,C,D".
 - If the data type is not "Character string", write "0". Ignore the empty data, however, if it exists at the last column.
Ex.) When CSV data is "1,,2,3,,4,,", write as "1,0,2,3,0,4".
- (3) Hex data is written as Dec data.
- (4) To write non-string data except for hexadecimal, use only single-byte symbols ("+", "-", ".") which can be recognized as single-byte numbers or values. Start reading from the left-most digit to the right before the character which cannot be regarded as a number. If the left-most character cannot be treated as a numerical value, the data value is regarded as "0".
- (5) To write hexadecimal, do not use characters other than "0" to "9" and "A" to "F" (including double-byte/single-byte characters and capital/small letters).
- (6) If you want to write values exceeding the preset data type range, the data is once converted into hexadecimal if surpassing 16 or 32 bits. Only the lowest 4 digits (8 digits in case of 32 bits) is written. However, 16 bits (32 bits) hexadecimal causes error.
- (7) Double quotation mark (" ")
 - If a double quotation mark exists in the first position of data, all the data until the next quotation is regarded as one unit of data. If there is no double quotation at the end of data, all the data to the end of the row is regarded as one unit of data. However, if 2 double quotation marks lie side by side like "" at the first position of data, these 2 are recognized as one double quotation of one character.
 - Double quotation marks found in any other position in a row are treated as characters.

(8) The writing of character string data is performed as follows.

Ex. 1) To write single-byte characters "AB,CD,E" in LS100 (word device), these are stored in LS as follows.

| LS100 | LS101 | LS102 |
|-------|-------|-------|
| AB | CD | E |

Ex. 2) To write single-byte characters "ABC,DE" in LS100 (word device), these are stored as follows.

| LS100 | LS101 | LS102 |
|-------|-------|-------|
| AB | C | DE |

Ex. 3) To write the character string "E" from LS103, insert 2 single-byte spaces after the CSV data "CD", like " AB,CD ,E".

| LS100 | LS101 | LS102 | LS103 |
|-------|-------|-------|-------|
| AB | CD | | E |

14



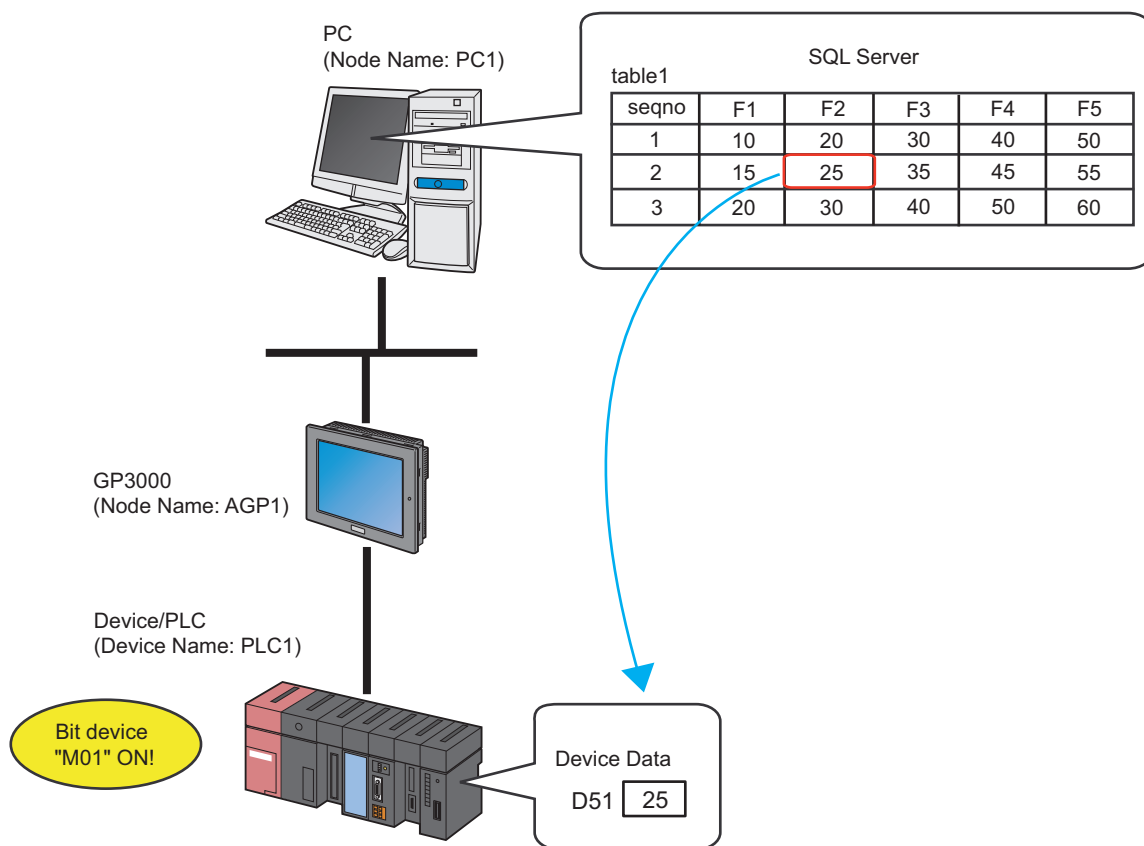
Reading Device/PLC from Database

| | | |
|------|---|-------|
| 14.1 | Try to Read Device/PLC Data from Database | 14-2 |
| 14.2 | Setting Guide | 14-24 |

14.1 Try to Read Device/PLC Data from Database

[Action Example]

Detect the rising of the trigger device (bit device: "M01") of Device/PLC, read data from the field (F2) set for the trigger device in a relational database, and write the data into a specified device address.



This section describes the setting procedures for executing the above action (ACTION) as an example.


[Setting Procedure]

| | | |
|----|---|---|
| 1 | Creating a Table (page14-4) | This step creates a table to specify the database to read data from or the device to write data in. |
| 2 | Creating a Data Table (page14-7) | This step creates a database table containing data to write in the device of Device/PLC. |
| 3 | Starting 'Pro-Studio EX' (page14-8) | This step starts 'Pro-Studio EX'. |
| 4 | Registering Entry Nodes (page14-8) | This step registers the PC and the display units as entry nodes. |
| 5 | Registering Symbols (page14-9) | This step registers as a symbol the device of Device/PLC which serves as a trigger condition (trigger) and a data write destination. |
| 6 | Parameter Setting for Feature (ACTION) (page14-10) | This step sets the following items: <ul style="list-style-type: none"> • Database information • Database/Device address setting file • File location |
| 7 | Setting Trigger Conditions (page14-14) | This step sets conditions (trigger) for executing data write. |
| 8 | Setting Data Received by ACTION (page14-17) | This step sets a constant value to be the sequence No. (seqno) of a database. |
| 9 | Setting ACTION Node/Process Completion Notification (page14-18) | This step sets the name of an ACTION node and the alert setting whether it should be turned on or off when the ACTION is completed. |
| 10 | Verifying Setting Result (page14-20) | This step verifies setting results on the setting content list screen. |
| 11 | Saving a Network Project File (page14-22) | This step saves the current settings as a network project file and reloads. |
| 12 | Transferring a Network Project File (page14-22) | This step transfers a saved network project file to the display unit. |
| 13 | Executing ACTION (page14-23) | This step verifies that database data is written in the device of Device/PLC when the preset trigger condition has become effective. |

14.1.1 Creating a Table

This step creates a table that specifies the database(s) from which data is read and the device(s) to which data is written.

'Pro-Server EX' retrieves database information by referencing transfer data ("Constant Value" of the transfer source specified in "14.1.8 Setting Data Received by ACTION") and rows in the table.



Excel Table

| | A | B | C | D | E |
|---|------------|-------|----------|-------|----------|
| 1 | DATABASE | TABLE | DEVICE | FIELD | DATATYPE |
| 2 | SQL Server | TBL1 | D50 Data | F1 | 2 |
| 3 | SQL Server | TBL1 | D51 Data | F2 | 2 |
| 4 | SQL Server | TBL1 | D52 Data | F3 | 2 |
| 5 | SQL Server | TBL1 | D53 Data | F4 | 2 |
| 6 | SQL Server | TBL1 | D54 Data | F5 | 2 |

You can create a table using the following file formats:

- Excel

| | A | B | C | D | E |
|---|----------|--------|--------|--------|----------|
| 1 | DATABASE | TABLE | DEVICE | FIELD | DATATYPE |
| 2 | DBA | table1 | D1 00 | field1 | 2 |
| 3 | DBA | table1 | D1 01 | field2 | 2 |
| 4 | DBB | table2 | D1 02 | field3 | 2 |

- Access

| | DATABASE | TABLE | DEVICE | FIELD | DATATYPE |
|--|----------|--------|--------|--------|----------|
| | DBA | table1 | D100 | field1 | 2 |
| | DBA | table1 | D101 | field2 | 2 |
| | DBB | table2 | D102 | field3 | 2 |

- CSV

```
DATABASE,TABLE,DEVICE,FIELD,DATATYPE
DBA,table1,D100,field1,2
DBA,table1,D101,field2,2
DBA,table2,D102,field3,2
```

NOTE

- When running an action that repeats, create the table in Excel or CSV.
If created with Access, you cannot run an action that repeats.

The following uses Excel as an example in the descriptions. The same applies when using other file formats.

- 1 Start Excel and create the table below.

| DATABASE | TABLE | DEVICE | FIELD | DATATYPE |
|------------|-------|----------|-------|----------|
| SQL Server | TBL1 | D50 data | F1 | 2 |
| SQL Server | TBL1 | D51 data | F2 | 2 |
| SQL Server | TBL1 | D52 data | F3 | 2 |
| SQL Server | TBL1 | D53 data | F4 | 2 |
| SQL Server | TBL1 | D54 data | F5 | 2 |

Below are the contents of each item of this table.

[DATABASE]

Set the name of the database from which data is read.

[TABLE]

Set the name of the database table from which data is read.

[DEVICE]

Set the device or symbol name of the device to which data is written.

[FIELD]

Set the field of the database table from which data is read.

[DATATYPE]

Set the type of data to write.

Specify the data type as the following table shows.

| Value | Data Type | Value | Data Type |
|-------|---------------------------------|-------|---------------------------------|
| 1 | Bit | 11 | Double-precision floating point |
| 2 | Decimal 16 bit signed | 12 | Character string |
| 3 | Decimal 16 bit unsigned | 13 | Decimal 8 bit signed |
| 4 | Hexadecimal 16 bits | 14 | Decimal 8 bit unsigned |
| 5 | BCD 16 bits | 15 | Hexadecimal 8 bit |
| 6 | Decimal 32 bit signed | 16 | BCD 8 bit |
| 7 | Decimal 32 bit unsigned | 17 | TIME data |
| 8 | Hexadecimal 32 bits | 18 | TIME_OF_DAY Data |
| 9 | BCD 32 bits | 19 | DATE Data |
| 10 | Single precision floating point | - | |

NOTE

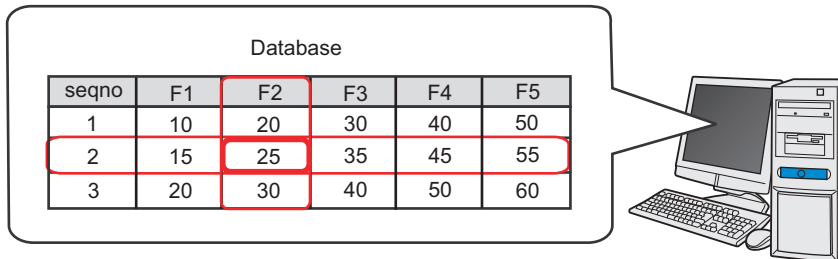
- Do not fail to enter table item names like [DATABASE] or [TABLE] in the first row of Excel sheets.
- When you want to specify two or more Device/PLC devices, set a device name and a device address to [DEVICE].
Example: [PLC1]D100
- There is a sample file (ProDB.xls) of an Excel table in the "PRO-SDK" folder where Pro-Server EX has been installed. Use this as a template when creating a table.
The "PRO-SDK" folder is located in the following path when installed by default.
C:\Program File(x86)\Pro-face\Pro-Server EX\PRO-SDK

2 Save it on PC desktop with the file name "exceltable.xls" after creating.

14.1.2 Creating a Data Table

This step creates a database table to store data to read out (recipe data).

'Pro-Server EX' obtains data in the [FIELD] row specified on an Excel table, referring to data to transfer (which is "Fixed vale" of the transfer source set in "14.1.8 Setting Data Received by ACTION") and "seqno" data on a database table.



Create the table below on a database.

| seqno | F1 | F2 | F3 | F4 | F5 |
|-------|----|----|----|----|----|
| 1 | 10 | 20 | 30 | 40 | 50 |
| 2 | 15 | 25 | 35 | 45 | 55 |
| 3 | 20 | 30 | 40 | 50 | 60 |

NOTE

- Do not use "0" for "seqno" value. If data to transfer is not a character string, the lowest row of the table is searched when the data is "0".
- Do not use any character string containing " ' " (apostrophe) for "seqno" value.
- If you use "DSN", there is a sample file (DataBase.mdb) of a data table available in the "PRO-SDK" folder where Pro-Server EX has been installed. Use this as a template when creating a table.

The "PRO-SDK" folder is located in the following path when installed by default.

C:\Program File(x86)\Pro-face\Pro-Server EX\PRO-SDK

14.1.3 Starting 'Pro-Studio EX'

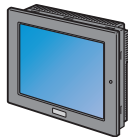
This step starts 'Pro-Studio EX'.
Refer to "3 Trial of Pro-Server EX" for details about starting method.

14.1.4 Registering Entry Nodes

This step registers the PC and the display unit connected with network as nodes.
Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1
IP Address :192.168.0.1



Node Name :AGP1
IP Address :192.168.0.100

Device/PLC Information

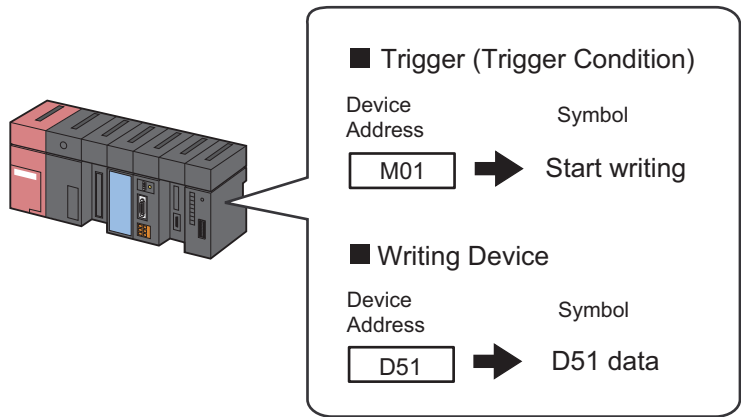
Ex.

| Entry node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

14.1.5 Registering Symbols

This step registers as a symbol the device address of Device/PLC which serves as a trigger condition (trigger) and the device of Device/PLC to write data in.

Refer to "32 Symbol Registration" for details about entry nodes.



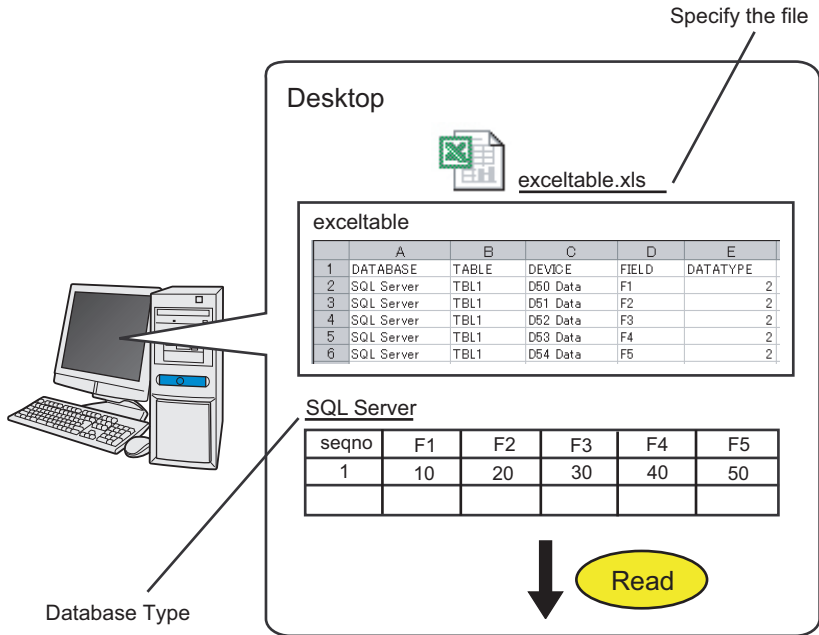
Ex.

| Setting item | Trigger (trigger condition) | Writing device |
|--|-----------------------------|----------------------------|
| Symbol Name | Start writing | D51 data |
| Data Type | Bit | 16Bit (Signed) |
| Device address for symbol registration | "M01" of Device/PLC (PLC1) | "D51" of Device/PLC (PLC1) |
| No. of Devices | 1 | 1 |

14.1.6 Parameter Setting for Feature (ACTION)

This step makes settings to write database data in a device. (parameter settings)

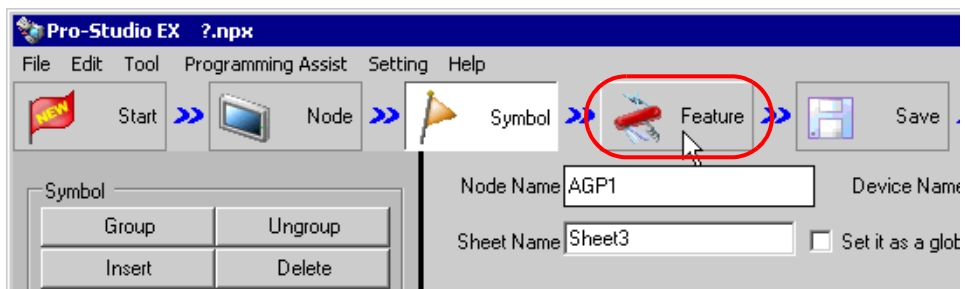
Refer to "14.2 Setting Guide" for more details about ACTION parameter.



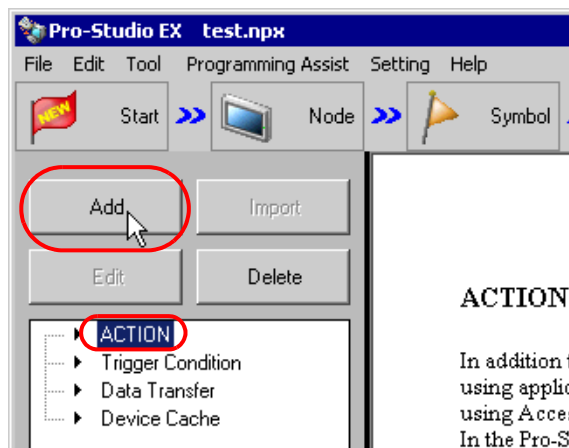
Ex.

| Setting item | Setting content |
|--------------------------------------|---|
| Login Name | login |
| Password | abcde |
| Server Name | server |
| Database Type | SQL Server |
| Database/Device address setting file | Excel |
| File location | C:\Users\<<User name>>\Desktop\exceltable.xls |

- 1 Click the [Feature] icon on the status bar.



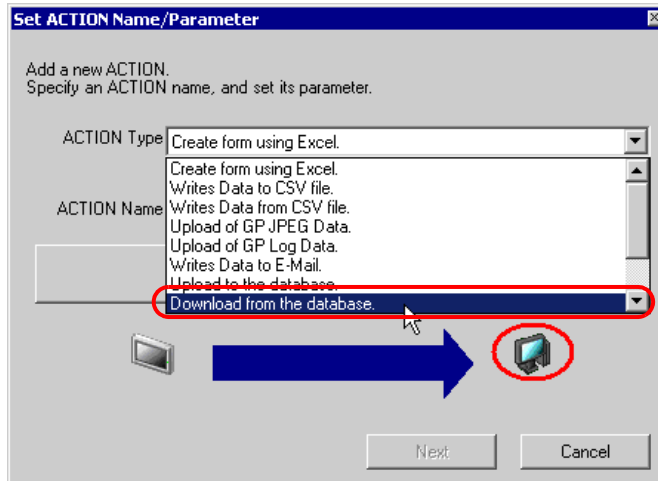
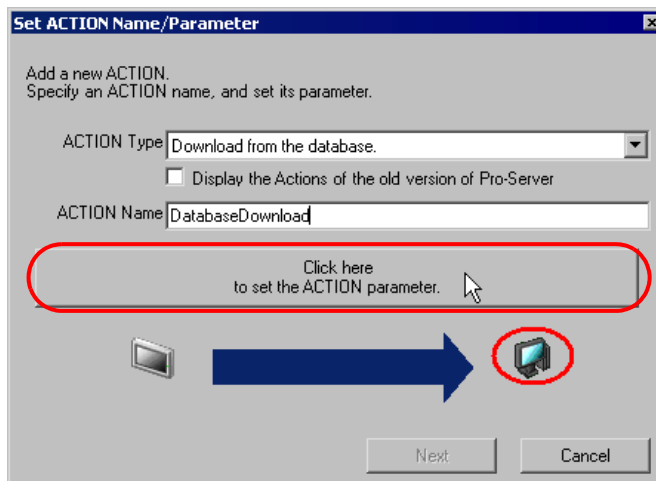
- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.



3 Click the [ACTION Type] list button, and select "Download from the database".

Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "Database Download".

NOTE • [ACTION Name] can be an arbitrary name.

**4** Click the [Click here to set the ACTION parameter] button.

5 Make settings regarding a database.

- 1) Set "login" in [Login name] and "abcde" in [Password] to access the database server with, and "server" in [Server name] for the database server PC name.
- 2) Set "SQL Server" in [Database Type].

NOTE

- If you select "DSN" in [Database Type], you do not have to set [Server name].
- Supports Oracle8, 10g, and 11g. However, cannot run on 64-bit operating systems.

- 3) Set "SQL Server" in [Driver name].

6 In [Database/Device address setting file], set up with Excel (access database directly).

7 Make settings regarding a file (a table).

- 1) Set "Desktop" as the destination to save in the upper list box.
- 2) Select the Excel table file name "exceltable.xls".

8 Click the [OK] button.

This is the end of the feature (ACTION) settings.

14.1.7 Setting Trigger Conditions

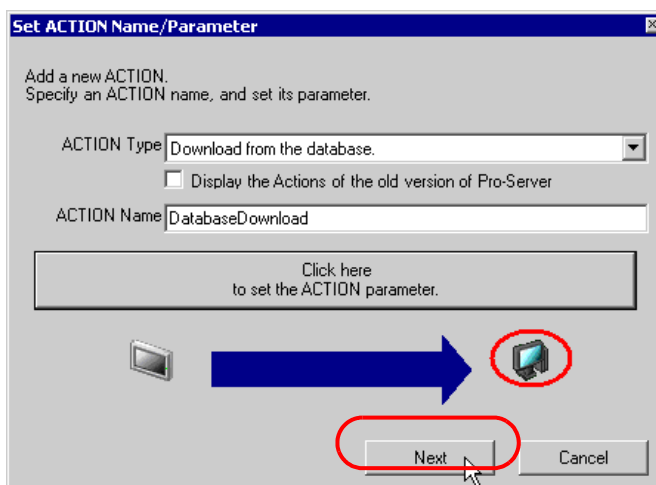
This step sets a trigger condition (trigger bit ON) to read out device data.

Refer to "33 Trigger Conditions" for details about trigger conditions.

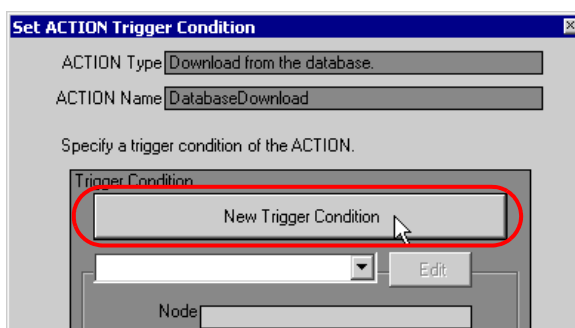
Ex.

- Trigger Condition Name: Turn on write start bit
- Trigger Condition : When "Start writing" (M01) is ON

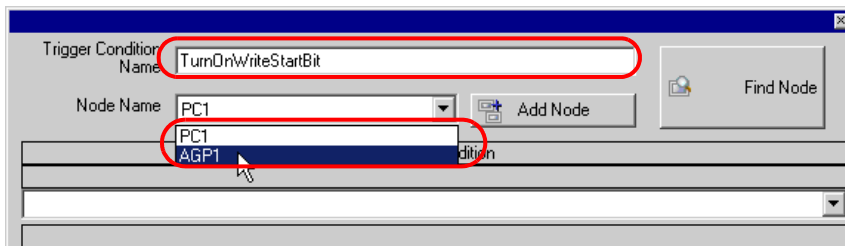
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



2 Click the [New Trigger Condition] button.



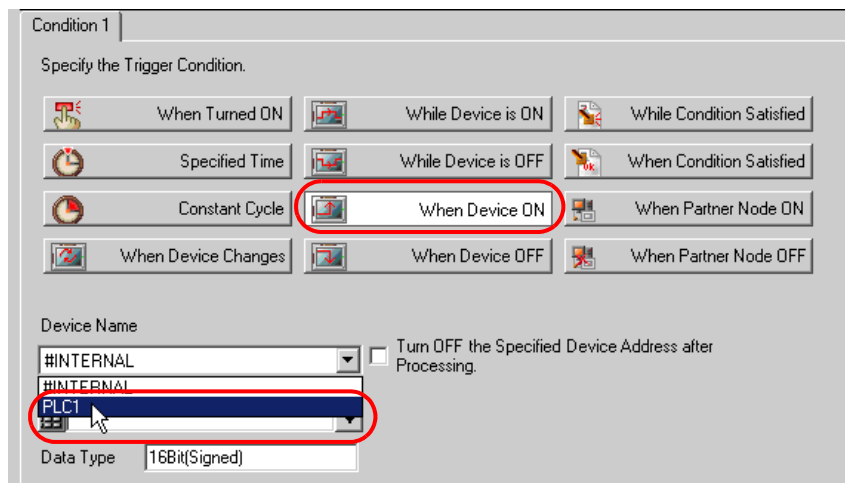
- 3 Enter the trigger condition name "TurnOnWriteStartBit" in [Trigger Condition Name], and select "AGP1" in [Node Name] which has the device to serve as the trigger condition (trigger).

**NOTE**

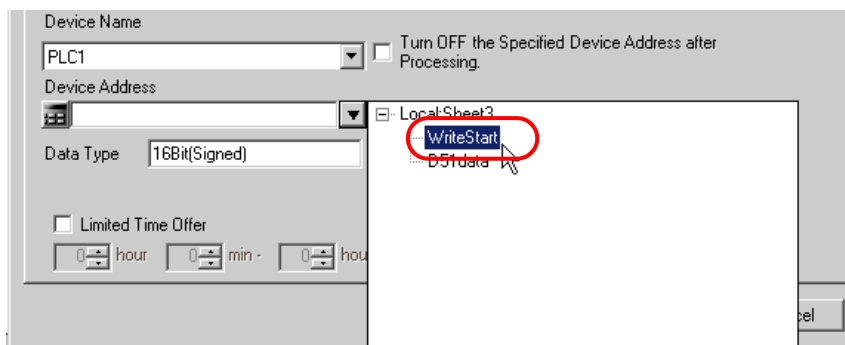
- Here, you are to specify the node having the device to be the trigger condition or having data to transfer.

☞ "33 Trigger Conditions"

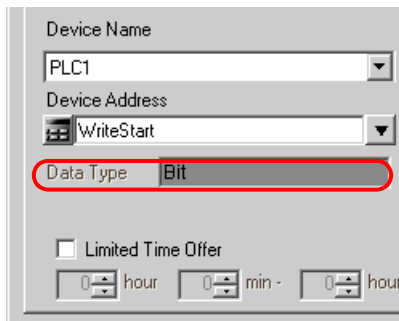
- 4 Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



- 5 Click the [Device Address] list button and select "WriteStart" for the symbol name of the device which serves as the trigger.



[Data Type] automatically appears after selection, too.



NOTE

- You can also set trigger conditions by combining 2 different types of conditions ("And" condition or "Or" condition).

☞ "33 Trigger Conditions"

6 Click the [OK] button.

This is the end of trigger condition settings.

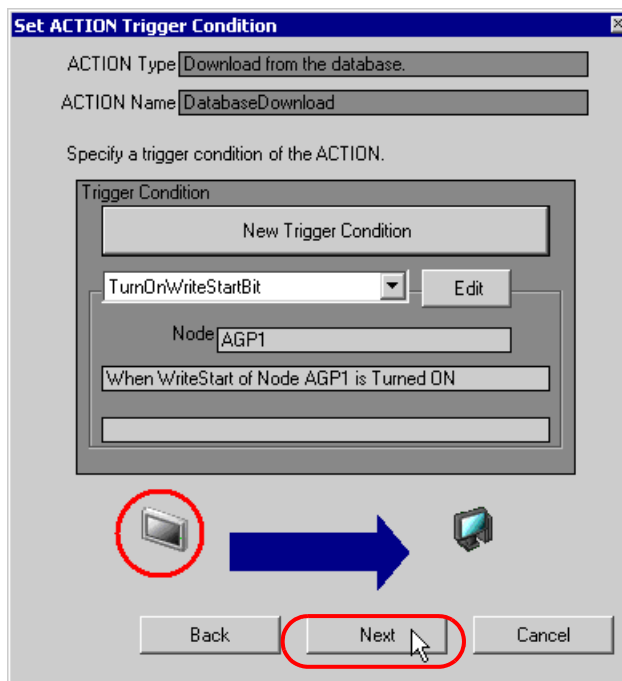
14.1.8 Setting Data Received by ACTION

This step sets a constant value (seqno) to be the sequence No. of a data table in ACTION .

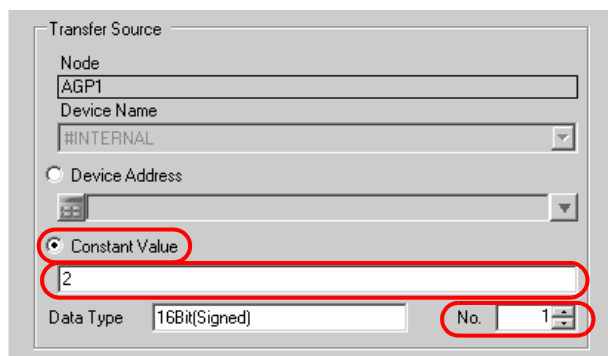
Ex.

- Constant value to transfer : 2

1 On the "Set ACTION Trigger Condition" screen, click the [Next] button.



2 After clicking [Constant Value], enter "2" in the text box for the constant value to transfer and "1" in [No.].



This is the end of the setting of data received by ACTION.

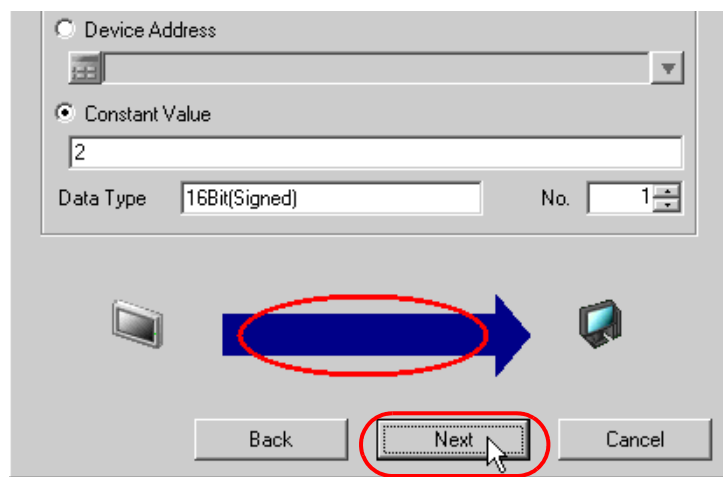
14.1.9 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be turned on or off when the ACTION is completed.

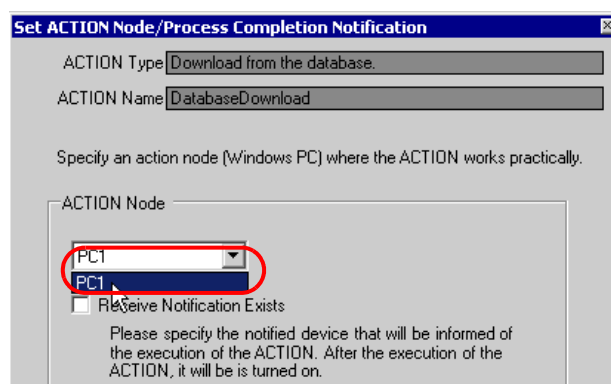
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

1 On the "Data settings to be received by ACTION" screen, click the [Next] button.



2 Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates. Also, clear the check if [Receive Notification Exists] has been checked.



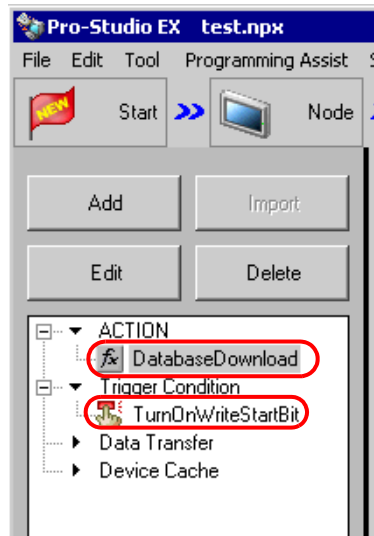
NOTE

- When "Receive Notification Exists" is turned on, the specified bit device will be turned on when the ACTION is completed. This can be used as the trigger condition (trigger) of the subsequent ACTION when you want to execute two or more ACTIONS sequentially.

☞ "33 Trigger Conditions"

3 Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the ACTION and trigger condition names you set will appear.

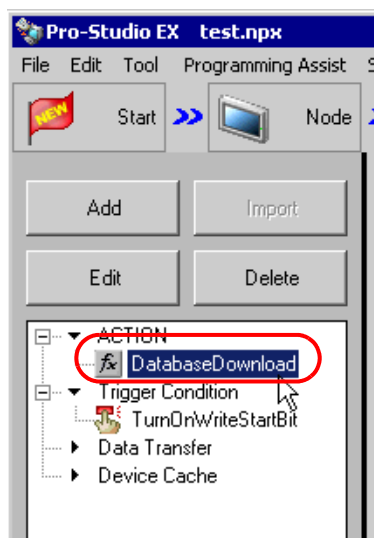


This is the end of the settings of the ACTION node and process completion notification.

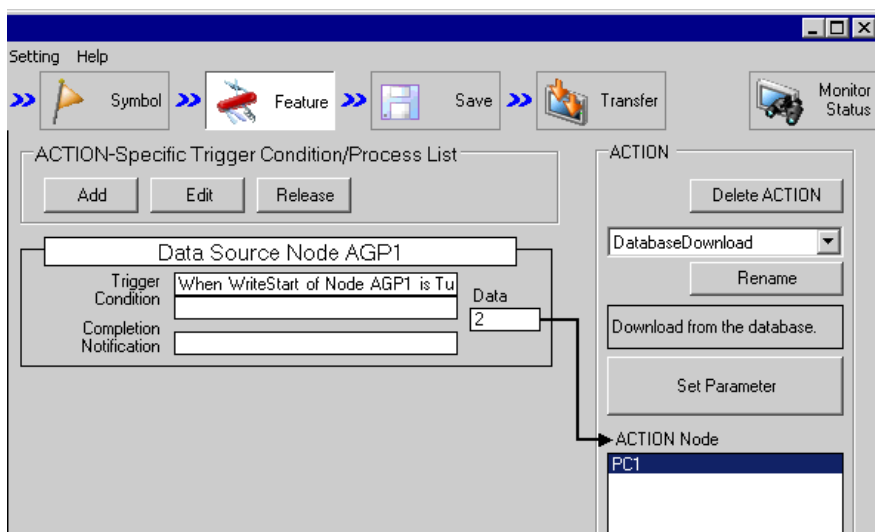
14.1.10 Verifying Setting Result

This step verifies setting results on the setting content list screen.

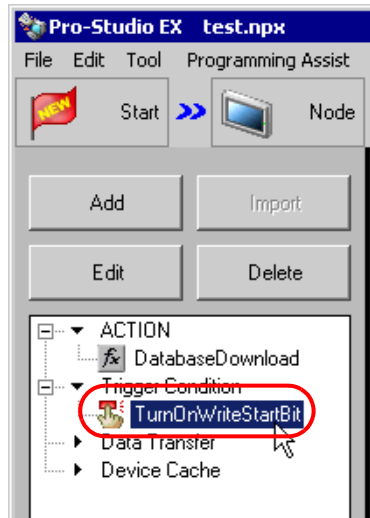
- 1 Select the ACTION name "Database Download" from the tree display on the left of the screen.



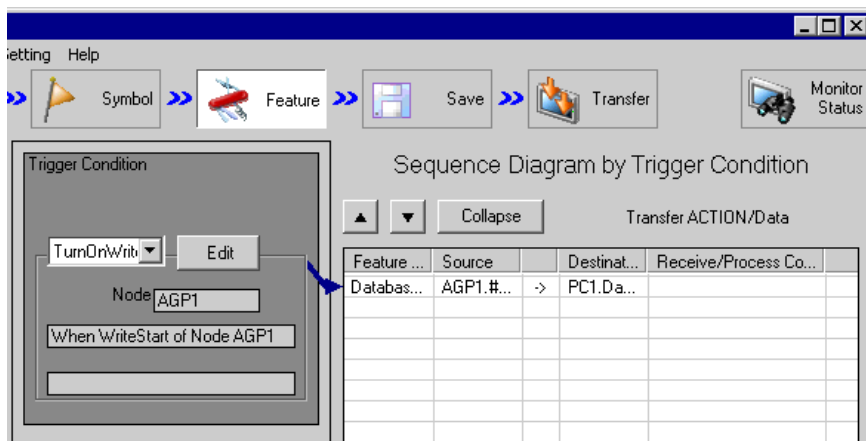
Confirm that the setting content appears on the right of the screen.



- 2 Select the trigger condition name "TurnOnWriteStartBit" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

14.1.11 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
 - Be sure to reload the network project file to 'Pro-Server EX'. If not, ACTION will not work.
-

Ex.

- Path of network project file : Desktop\Database_download.npxe
- Title : Database download action

14.1.12 Transferring a Network Project File

This step transfers a saved network project file to entry nodes.

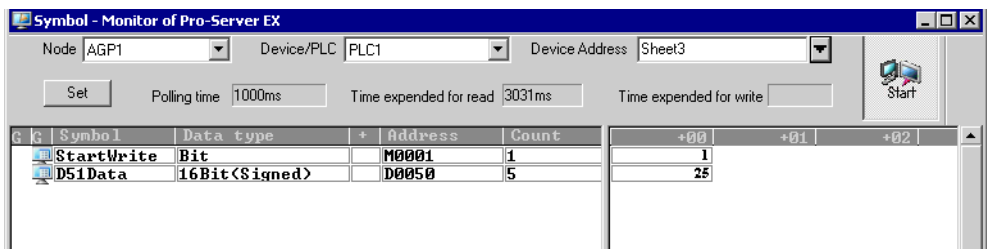
Refer to "26 Transferring" for details about transferring a network project file.

NOTE

- Be sure to transfer a network project file. If not, ACTION will not work.
-

14.1.13 Executing ACTION

This step verifies that database data is written in the device of Device/PLC when the preset trigger condition has become effective.



NOTE

- Check the actually written values with such function as monitor of rudder creation software.
- If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".

This is the end of the explanation of this ACTION.

14.2 Setting Guide

This section explains how to set the parameters of ACTION.

Download from the database EX Version 1.36

Database information

Login name:

Password:

Server name:

Database Type:

Driver name:

☐ Normally connected to server

☐ If connection request is not received within standard time period, connection is terminated. Min.

Database/Device address settings file

☒ Use Excel

☐ Use Access

☐ Use CSV

File location

c:

Pro-face

Pro-Server EX

NpxDatabase

OK Cancel Details

| Setting item | | Setting content |
|----------------------|---------------|---|
| Database Information | Login name | Sets a login name to access the database server with. |
| | Password | Sets a password to access the database server with. |
| | Server name | Enters "PC Name" or "IP Address" of the database server. NOTE <ul style="list-style-type: none">If you select "DSN" in [Database Type], you do not have to enter this. |
| | Database Type | Selects a database type between [SQL Server], [Oracle], and [DSN]. |
| | Driver name | Selects a driver depending on the selected database type. NOTE <ul style="list-style-type: none">If you select "DSN" in [Database Type], you do not have to enter this. |

| Setting item | | Setting content |
|--------------------------------------|--|--|
| Database Information | Normally connected to server | <p>Connects with the server at all times.</p> <p>NOTE</p> <ul style="list-style-type: none"> If you connect with the server frequently, an always-on connection is useful to reduce the time to open your database. |
| | If connection request is not received within standard time period, connection is terminated. | <p>Disconnects when no connection is requested in a certain period in case of always-on connection to the server.</p> |
| Database/Device address setting file | | <p>Select the file format for the setting (parameter) that defines how to write database data to the device.</p> <p>For parameter details, refer to "14.1.1 Creating a Table".</p> <p>Excel Access</p> <ul style="list-style-type: none"> When using files with extension .accdb, Microsoft^(R) Access^(R) must be installed first. <p>CSV</p> |
| File location | | <p>Specify the save folder of the file including a table.</p> <p>After you specify the folder, select the file name from the list and the sheet name including a table.</p> <p>NOTE</p> <ul style="list-style-type: none"> When the file name exceeds 255 single-byte characters, the file may not display. (Note that a double-byte character is regarded as 2 single-byte characters.) |
| [Details] Button | | <p>Clicking this button displays the "A setup of details" screen.</p> <p>Refer to "■ "A setup of details" Screen" Screen" for more details.</p> |

■ "A setup of details" Screen

A setup of details

A setup of a server

Server connection time: 10 Sec.

Retry number of times: 3

Disconnect Time: 5 Min.

OK Cancel

| Setting item | | Setting content |
|---------------------|------------------------|---|
| A setup of a server | Server connection time | Sets communication time-out with the database server. |
| | Retry number of times | Sets the number of communication retries with the database server. |
| | Disconnect Time | Sets the time allowed until connection is cut if it has been set to disconnect when no connection is requested in a certain period. |

15



Reporting Alarm by E-mail

| | | |
|------|-------------------------------------|-------|
| 15.1 | Try to Report Alarm by E-mail | 15-2 |
| 15.2 | Setting Guide | 15-27 |
| 15.3 | Restrictions | 15-30 |

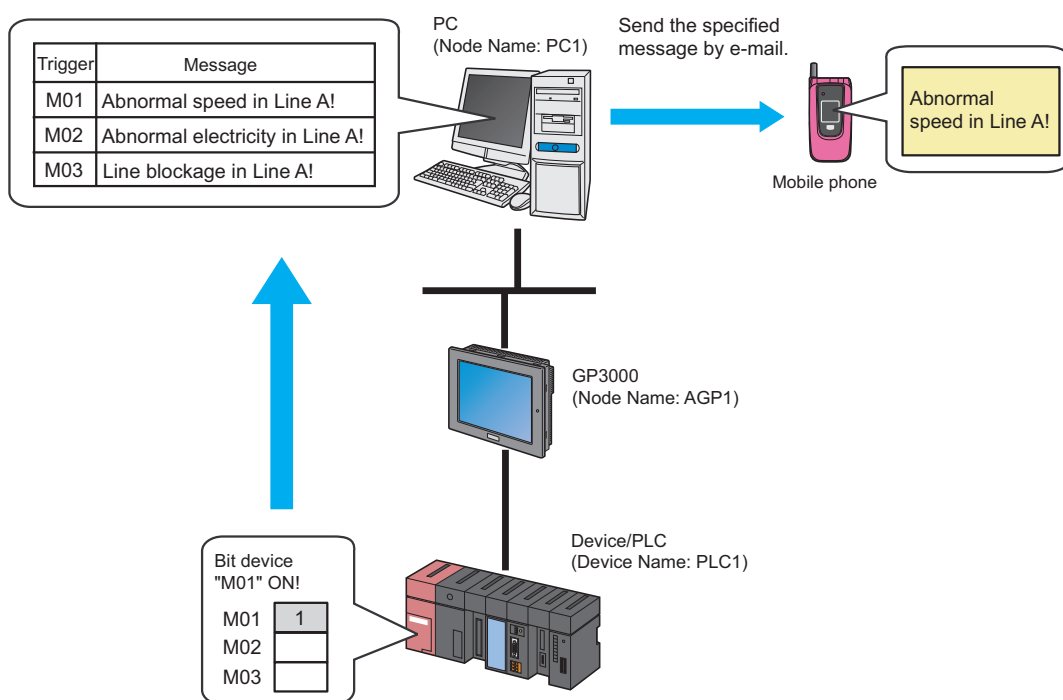
15.1 Try to Report Alarm by E-mail

[Action Example]

Detect the rising of the trigger device (bit device: "M01", "M02", and "M03") of Device/PLC and send a message, which was set in an Excel message sheet corresponding with the trigger device, to A's cellular phone.

| Trigger device | Message |
|----------------|-----------------------------------|
| "M01" | "Abnormal speed in Line A!" |
| "M02" | "Abnormal electricity in Line A!" |
| "M03" | "Line blockage in Line A!" |

(Example) When sending a message saying "Abnormal speed in Line A!" with the trigger device set to "M01".



This section describes the setting procedures for executing the above action (ACTION) as an example.

NOTE

- Refer to "36 Error Information" for details about errors occurring in 'Pro-Server EX'.

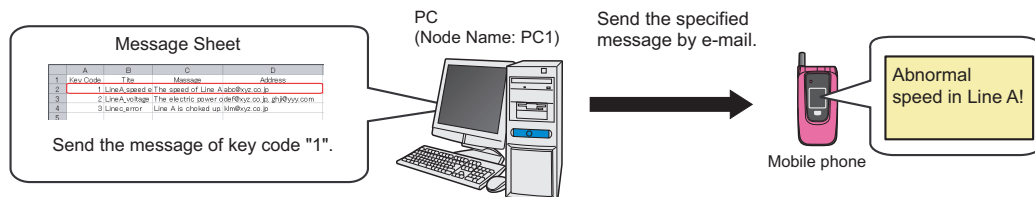
[Setting Procedure]

| | | |
|----|---|---|
| 1 | Creating a Message Sheet (page15-4) | This step creates a message sheet containing messages to send in Excel. |
| 2 | Starting 'Pro-Studio EX' (page15-5) | This step starts 'Pro-Studio EX'. |
| 3 | Registering Entry Nodes (page15-5) | This step registers the PC and the display units as entry nodes. |
| 4 | Registering Symbols (page15-6) | This step registers as a symbol the device of Device/PLC which serves as a trigger condition (trigger). |
| 5 | Parameter Setting for Feature (ACTION) (page15-7) | This step sets the following items: <ul style="list-style-type: none"> • Login Information • Mail Contents • Message Sheet Specification |
| 6 | Setting Trigger Conditions (page15-12) | This step sets conditions (trigger) for e-mailing. |
| 7 | Setting Data Received by ACTION (Trigger Condition 1) (page15-18) | This step sets a constant value to be a keycord of trigger condition 1. |
| 8 | Setting ACTION Node/Process Completion Notification (page15-19) | This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed. |
| 9 | Setting Data Received by ACTION (Trigger Condition 2 and 3) | This step sets constant values to be keycords of trigger condition 2 and 3. |
| 10 | Verifying Setting Result (page15-23) | This step verifies setting results on the setting content list screen. |
| 11 | Saving a Network Project File (page15-25) | This step saves the current settings as a network project file and reloads. |
| 12 | Transferring a Network Project File (page15-25) | This step transfers a saved network project file to the display unit. |
| 13 | Executing ACTION (page15-26) | This step verifies that an e-mail is sent to a specified email address when the preset trigger condition has become effective. |

15.1.1 Creating a Message Sheet

This step executes the "Key_Code" row corresponding with transfer data.

For details about transfer data, refer to "15.1.7 Setting Data Received by ACTION (Trigger Condition 1)" later mentioned.



- 1 Start Excel and create the message sheet below in Sheet 1.

[Creation Example]

| | A | B | C | D |
|---|----------|---------------|---------------------|-----------------------------|
| 1 | Key_Code | Title | Message | Address |
| 2 | 1 | LineA_speed | The speed of Line A | abc@xyz.co.jp |
| 3 | 2 | LineA_voltage | The electric power | odef@xyz.co.jp, ghj@yvy.com |
| 4 | 3 | LineC_error | Line A is choked up | klm@xyz.co.jp |
| 5 | | | | |

You can register data of the same keycode up to 5 units.

- 2 Save it on PC desktop with the file name "mailmessage.xls" after creating.

NOTE

- You can send not only those prepared in Excel for each case but also a fixed message or data in the device of Device/PLC as a message.

[Mail Contents]

☐ Always send the same message

Outgoing Message:

☒ Send the data sent from the trigger NODE as a message

☐ Send a message prepared in an Excel sheet

(You can specify a message and its destination from Device/PLCs)

15.1.2 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

15.1.3 Registering Entry Nodes

This step registers as entry nodes the PC and the display units which serve as trigger conditions (trigger).

Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1

IP Address :192.168.0.1



Node Name :AGP1

IP Address :192.168.0.100

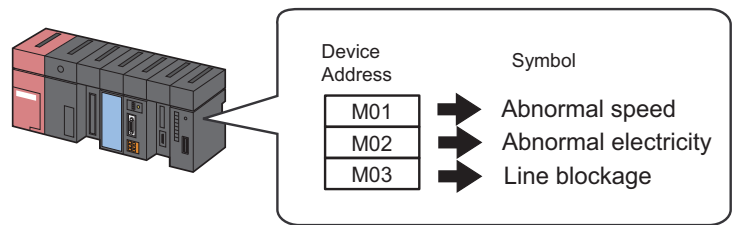
Device/PLC Information

Ex.

| Entry node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

15.1.4 Registering Symbols

This step registers as a symbol the device address of Device/PLC from which data is read.
Refer to "32 Symbol Registration" for details about entry nodes.



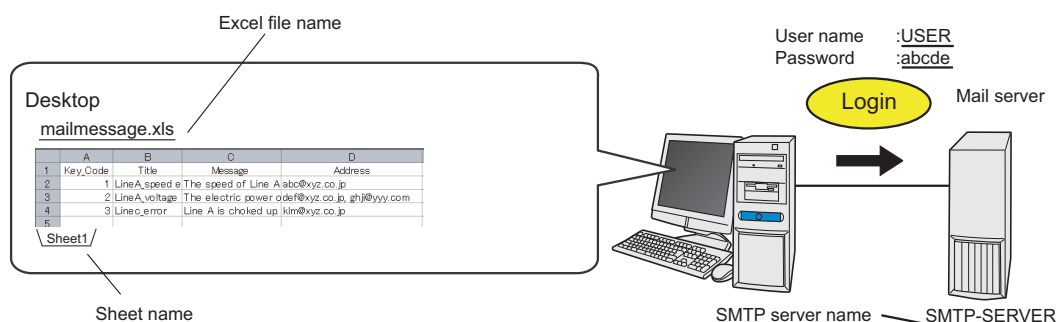
Ex.

| Setting item | Setting content | | |
|--|----------------------------|----------------------------|----------------------------|
| Symbol Name | Abnormal Speed | Abnormal Electricity | Line Blockage |
| Data Type | Bit | | |
| Device address for symbol registration | "M01" of Device/PLC (PLC1) | "M02" of Device/PLC (PLC1) | "M03" of Device/PLC (PLC1) |
| No. of Devices | 1 | 1 | 1 |

15.1.5 Parameter Setting for Feature (ACTION)

This step makes settings to send a message by e-mail. (parameter settings)

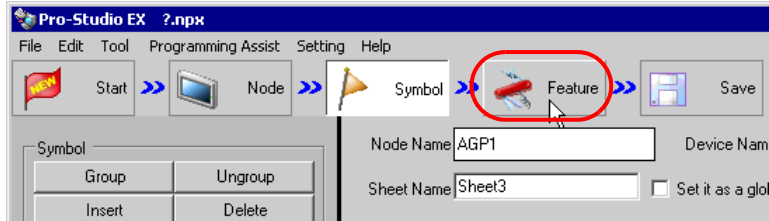
Refer to "15.2 Setting Guide" for more details about ACTION parameter.



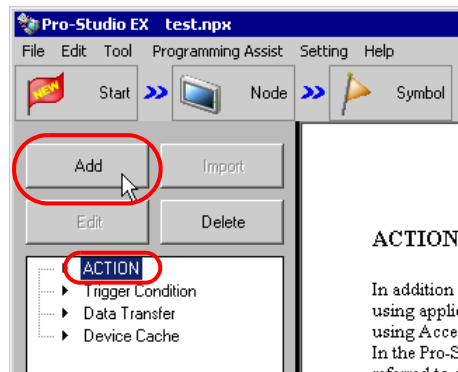
Ex.

| Setting item | | Setting content |
|-------------------|---------------------------------------|---|
| ACTION Name | | Send Mail |
| Login Information | SMTP Server Name | SMTP-SERVER |
| | SMTP port number | 465 |
| | Use secure connection (SMTP over SSL) | enable |
| | SMTP Authentication | enable |
| | User Name | USER |
| | Password | abcde |
| | POP Authorization | disable |
| | Mail Source Address | user@aaa.or.jp |
| Mail Contents | | Send a message prepared in an Excel sheet |
| Message Sheet | Where to Save Message Sheet | C:\Users\<<User name>>\Desktop |
| | Excel File Name | Mailmessage.xls |
| | Sheet Name | Sheet1 |

- 1 Click the [Feature] icon on the status bar.



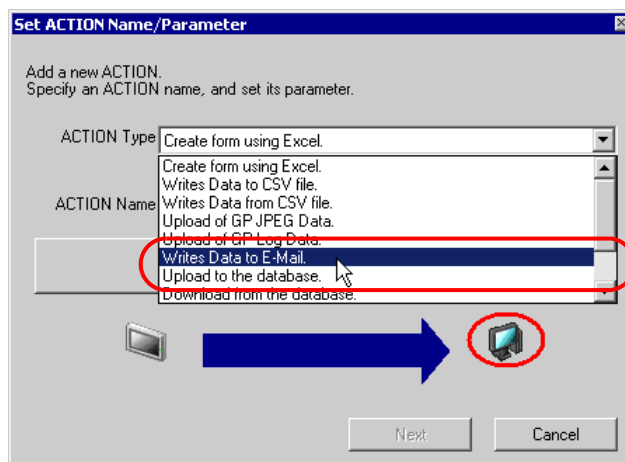
- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.



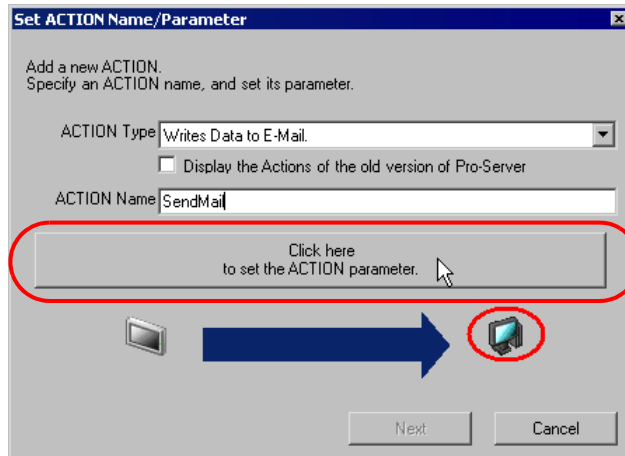
- 3 Click the [ACTION Type] list button, and select "Writes Data to E-Mail".

Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "Send Mail".

NOTE • [ACTION Name] can be an arbitrary name.



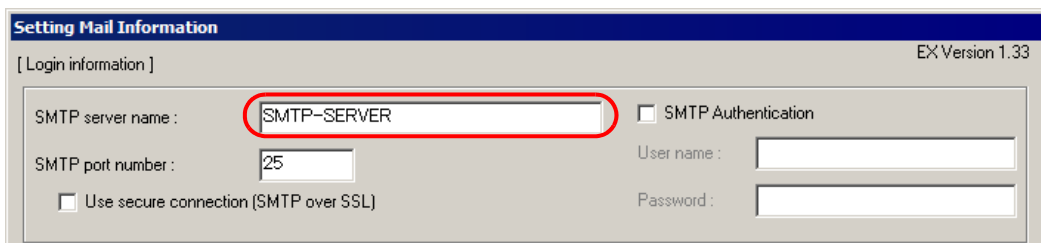
- 4 Click the [Click here to set the ACTION parameter] button.



- 5 Set login information.

NOTE • For more details about login information setting, contact with your network administrator.

- 1) Enter "SMTP-SERVER" as the connecting SMTP server name in [SMTP server name].



What is SMTP server?

Refers to a server for delivering e-mail messages complying with SMTP (Simple Mail Transfer Protocol), a mail transfer protocol (standard for data communication). E-mail messages are sent or received through a computer called "Server" that is always on the Internet. There are two types of servers: for sending and for receiving. SMTP server is typically used to send messages. SMTP server receives an e-mail sent by a user, searches for SMTP server operating on the network of the user to receive the message, and transfers it there.

- 2) Select the [Use secure connection (SMTP over SSL)] check box.

NOTE • Make sure your SMTP server supports the encryption method "SMTP over SSL". If you are planning to use an SMTP server that does not support the encryption method, you will not be able to send encrypted mail.

- 3) Select the [SMTP Authentication] check box..

NOTE

- Make sure your SMTP server supports the SMTP authentication method "AUTH-LOGIN". If you are planning to use an SMTP server that does not support the encryption method, you will not be able to send encrypted mail.

- 4) Enter "USER" in [User name] as a user name for SMTP authorization, and "abcde" in [Password] as a user set password.

The screenshot shows the 'Setting Mail Information' dialog box with the following details:

- Title bar: Setting Mail Information
- Version: EX Version 1.33
- Section: [Login information]
- SMTP server name: SMTP-SERVER
- SMTP port number: 465
- Use secure connection (SMTP over SSL): ☒
- SMTP Authentication: ☒ (This section is circled in red)
- User name: USER (This field is circled in red)
- Password: ***** (This field is circled in red)

NOTE

- "*****" appears when entering a password.

- 5) In the [SMTP port number] field, enter "465".

- 6) Enter the sender's email address "user@aaa.com" in [Sender's Mail address].

The screenshot shows the 'Sender's Mail address' field with the text 'user@aaa.com' entered. The field is circled in red.

- 7) Set [Send Mail address].

NOTE

- If [Use secure connection (SMTP over SSL)] or [SMTP Authentication] is enabled, you can enter multiple addresses by separating each with a comma (,).
- In the [Mail Contents], if you select [Send a message prepared in an Excel sheet] and the destination addresses are defined in the Excel worksheet, contents of the [Send Mail address] field are ignored.

6 Make settings regarding mail contents.

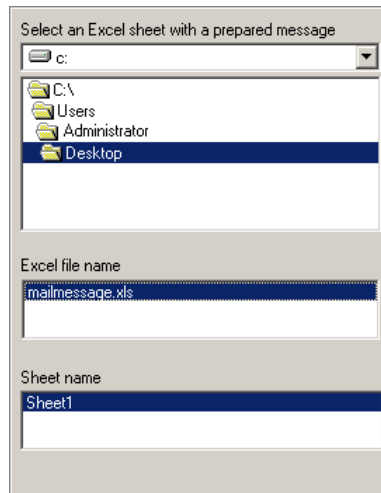
Check [Send a message prepared in an Excel sheet].

The screenshot shows the '[Mail Contents]' dialog box with the following details:

- Section: [Mail Contents]
- Always send the same message: ☐
- Outgoing Message: (Empty text field)
- Send the data sent from the trigger NODE as a message: ☐
- Send a message prepared in an Excel sheet: ☒ (This option is circled in red)
- Footer: (You can specify a message and its destination from Device/PLCs)
- Buttons: OK, Cancel

7 Make settings regarding a message sheet.

Select "Desktop" to save the message sheet, and select "mailmessage.xls" in [Excel file name] as the message sheet file name, and then "Sheet1" in [Sheet name] as a reference sheet in the message sheet .

**8** Click the [OK] button.

This is the end of the feature (ACTION) settings.

15.1.6 Setting Trigger Conditions

This step sets conditions (trigger bit ON) for e-mailing.

Here, we'll set 3 patterns of trigger conditions.

Refer to "33 Trigger Conditions" for details about trigger conditions.

Ex.

◆ Trigger Condition 1 (Abnormal Speed)

- Trigger Condition Name: Send the Abnormal Speed message
- Trigger Condition : When "Abnormal Speed" (M01) is ON

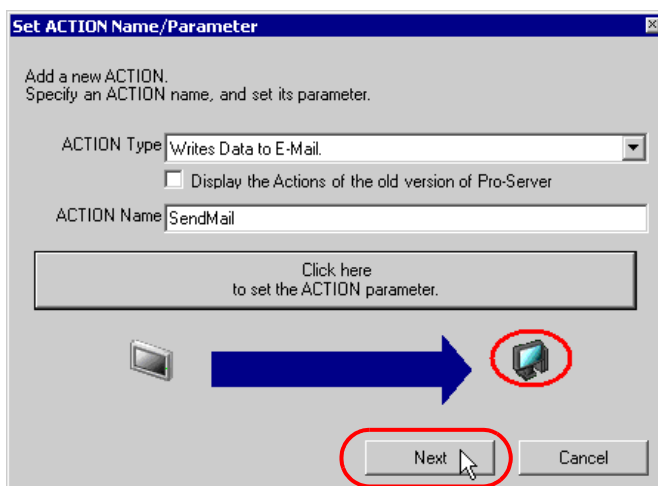
◆ Trigger Condition 2 (Abnormal Electricity)

- Trigger Condition Name: Send the Abnormal Electricity message
- Trigger Condition : When "Abnormal Electricity" (M02) is ON

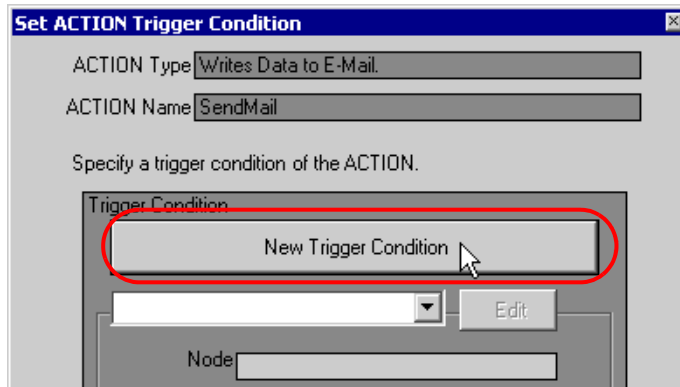
◆ Trigger Condition 3 (Line Blockage)

- Trigger Condition Name: Send the Line Blockage message
- Trigger Condition : When "Line Blockage" (M03) is ON

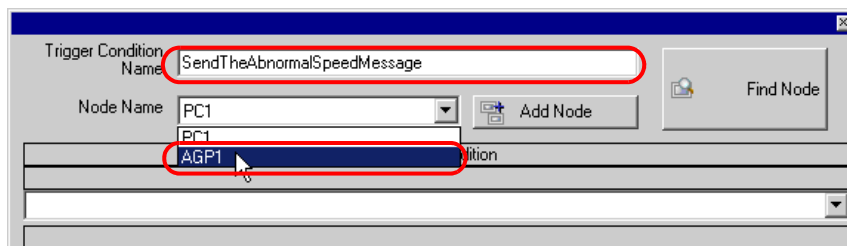
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



- 2 Click the [New Trigger Condition] button.



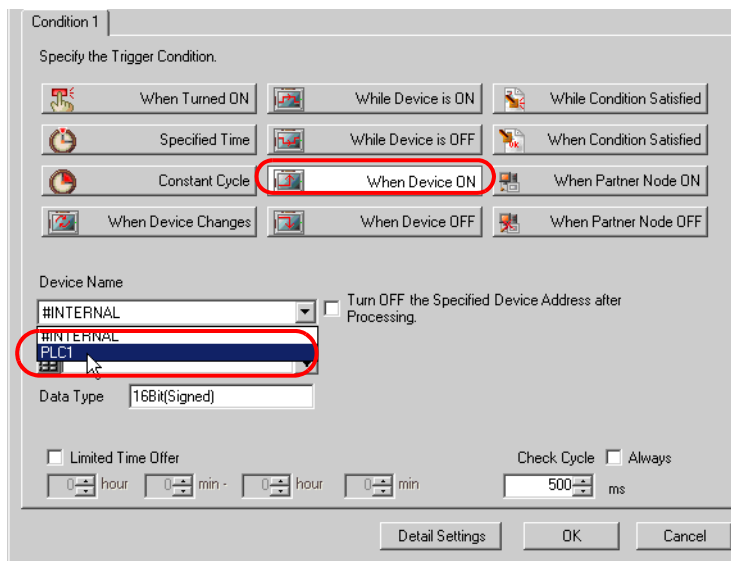
- 3 Enter the trigger condition name "SendTheAbnormalSpeedMessage" in [Trigger Condition Name], and select "AGP1" in [Node Name] which has the device to serve as the trigger condition (trigger).



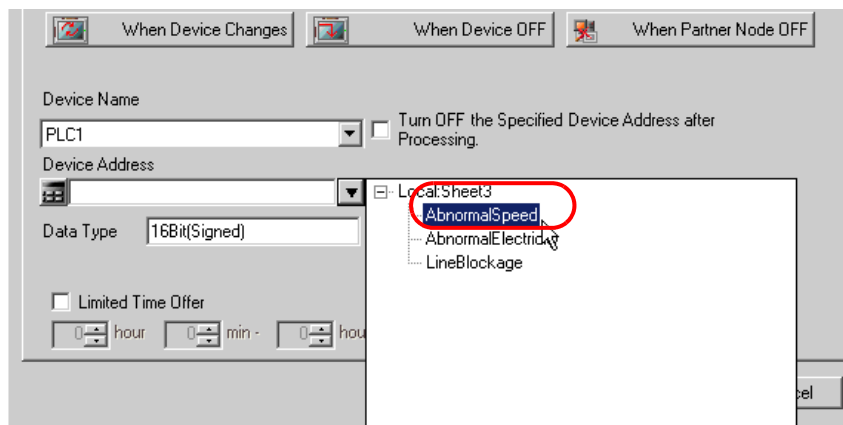
NOTE • Here, you are to specify the node having the device to be the trigger condition or having data to transfer.

☞ "33 Trigger Conditions"

- 4 Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



- 5 Click the [Device Address] list button and select "Abnormal Speed" for the symbol name of the device which serves as the trigger.



[Data Type] automatically appears after selection, too.

NOTE

- You can also set trigger conditions by combining 2 different types of conditions ("And" condition or "Or" condition).

☞ "33 Trigger Conditions"

6 Click the [OK] button.

7 Click the [New Trigger Condition] button to add trigger condition 2.

8 Set the items below in the same way as condition 1 and click the [OK] button.

- Trigger Condition Name: SendTheAbnormalElectricityMessag
- Node Name: AGP1
- Trigger Condition: When the device is ON
- Device Name: PLC1
- Device Address: Abnormal Electricity

The screenshot shows a configuration window titled 'Trigger Condition'. At the top, there is a text field for 'Trigger Condition Name' containing 'SendTheAbnormalElectricityMessag' and a 'Find Node' button. Below this is a 'Node Name' dropdown menu set to 'AGP1' and an 'Add Node' button. A section labeled 'Trigger Condition' contains a text field with the text 'When AbnormalElectricity of Node AGP1 is Turned ON'. Below this is a 'Condition 1' tab. Under the tab, it says 'Specify the Trigger Condition.' and displays a grid of 12 buttons with icons and labels: 'When Turned ON', 'While Device is ON', 'While Condition Satisfied', 'Specified Time', 'While Device is OFF', 'When Condition Satisfied', 'Constant Cycle', 'When Device ON', 'When Partner Node ON', 'When Device Changes', 'When Device OFF', and 'When Partner Node OFF'. Below the grid, there is a 'Device Name' dropdown menu set to 'PLC1', a checkbox labeled 'Turn OFF the Specified Device Address after Processing.' which is unchecked, a 'Device Address' dropdown menu set to 'AbnormalElectricity', and a 'Data Type' dropdown menu set to 'Bit'.

9 Click the [New Trigger Condition] button to add trigger condition 3, set the items below in the same way as trigger condition 1, and then click the [OK] button.

- Trigger Condition Name: SendTheLineBlockageMessage
- Node Name: AGP1
- Trigger Condition: When the device is ON
- Device Name: PLC1
- Device Address: Line Blockage

The screenshot shows a 'Trigger Condition' configuration window. At the top, the 'Trigger Condition Name' is set to 'SendTheLineBlockageMessage' and the 'Node Name' is 'AGP1'. There are 'Add Node' and 'Find Node' buttons. Below this, the 'Trigger Condition' is set to 'When LineBlockage of Node AGP1 is Turned ON'. A section labeled 'Condition 1' contains a grid of trigger condition options. The 'When Device ON' option is selected. Below the grid, the 'Device Name' is 'PLC1', the 'Device Address' is 'LineBlockage', and the 'Data Type' is 'Bit'. There is also a checkbox for 'Turn OFF the Specified Device Address after Processing' which is currently unchecked.

This is the end of trigger condition settings.

15.1.7 Setting Data Received by ACTION (Trigger Condition 1)

This step sets data (constant value) to transfer in ACTION.

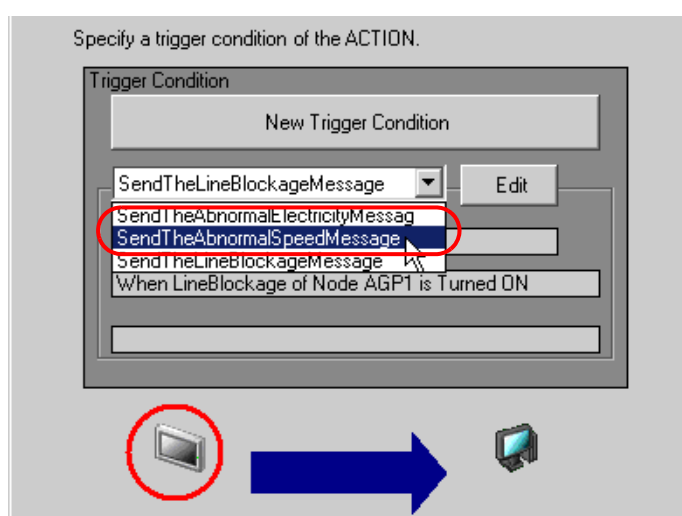
NOTE

- On this screen, you are to set the constant value "1" only for trigger condition 1. You can add those for conditions 2 and 3 after ACTION settings.

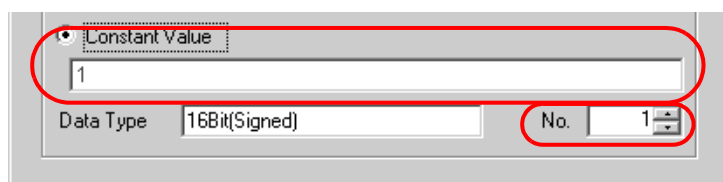
Ex.

- Constant value to transfer: 1

- On the "Set ACTION Trigger Condition" screen, click the [Trigger Condition] list button to select "SendTheAbnormalSpeedMessage", and then click the [Next] button.



- After clicking [Constant Value], enter "1" in the text box for the constant value to transfer and "1" in [No.].



This is the end of data settings for condition 1.

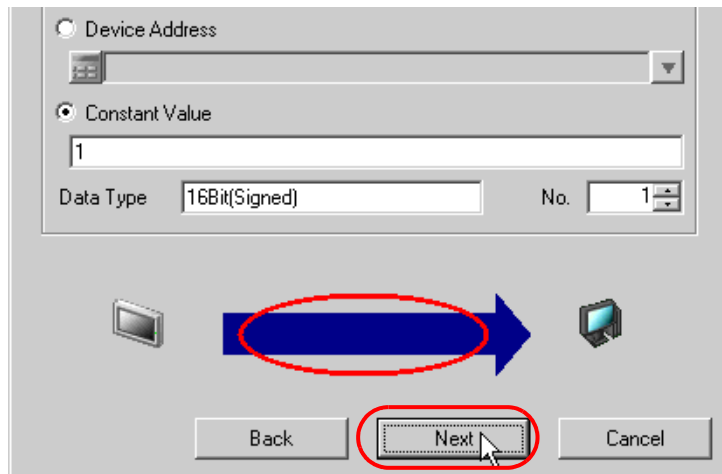
15.1.8 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be turned on or off when the ACTION is completed.

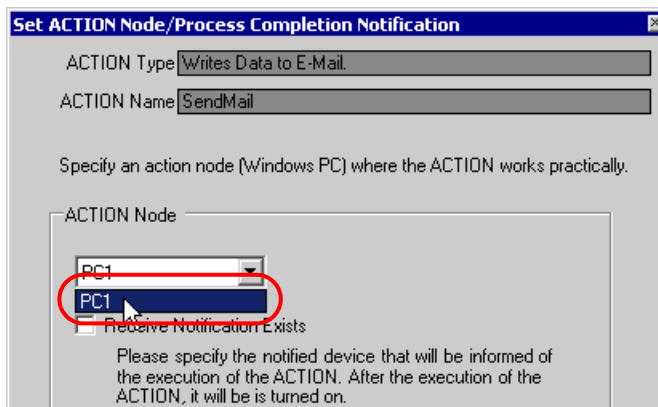
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

1 On the "Data settings to be received by ACTION" screen, click the [Next] button.



2 Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates. Also, clear the check if [Receive Notification Exists] has been checked.

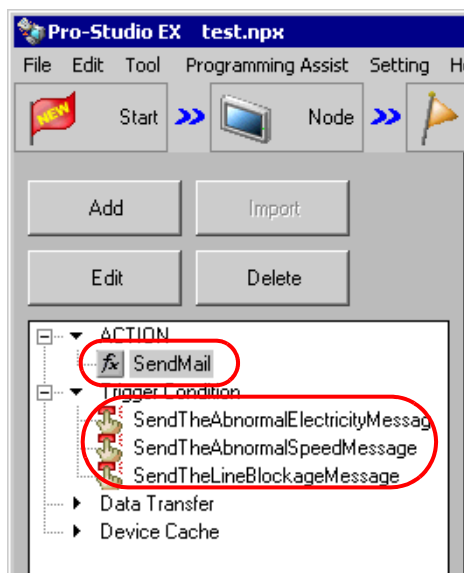


- NOTE**
- When "Receive Notification Exists" is turned on, the specified bit device will be turned on when the ACTION is completed. This can be used as the trigger condition (trigger) of the subsequent ACTION when you want to execute two or more ACTIONs sequentially.

☞ "33 Trigger Conditions"

3 Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the ACTION and trigger condition names you set will appear.



This is the end of the settings of the ACTION node and process completion notification.

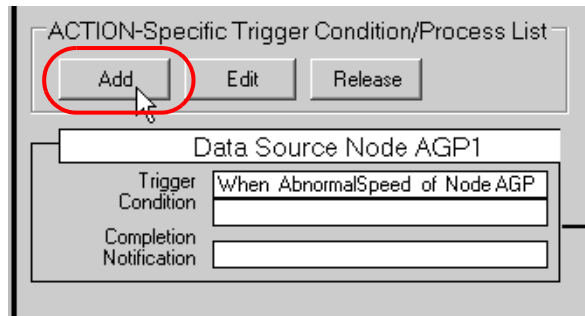
15.1.9 Setting Data Received by ACTION (Trigger Condition 2 and 3)

This step sets the constant values of trigger condition 2 and 3.

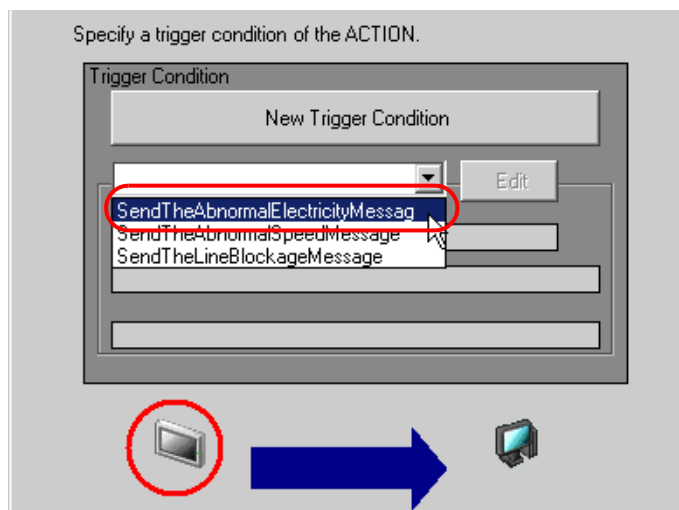
Ex.

- Device name as transfer source PLC1
- Constant value to transfer of trigger condition 1: 2
- Constant value to transfer of trigger condition 2: 3

1 Click the [Add] button.



2 Click the [Trigger Condition] list button to select "SendTheAbnormalElectricityMessage", and then click the [Next] button.



- 3 Click [Constant Value] to enter "2", and click the [Next] button.

- 4 After selecting "PC1" in [ACTION Node], click the [End] button.

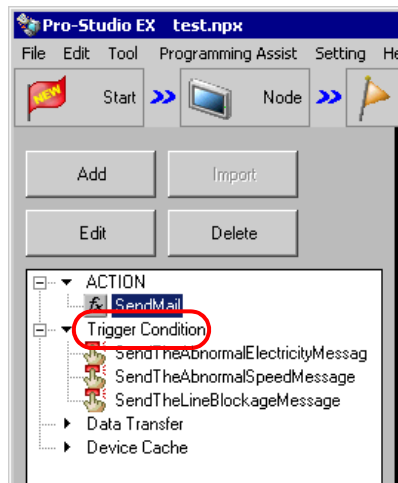
- 5 Click the [Trigger Condition] button to select "SendTheLineBlockageMessage" from the list button, and then set the constant value "3" in the same way.

This is the end of data settings for condition 2 and 3.

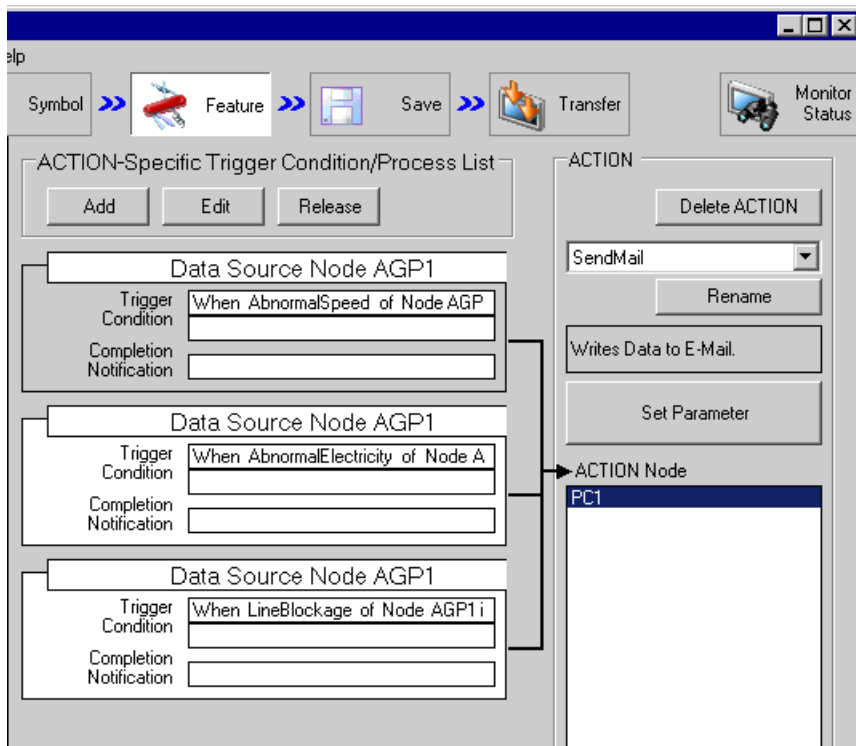
15.1.10 Verifying Setting Result

This step verifies setting results on the setting content list screen.

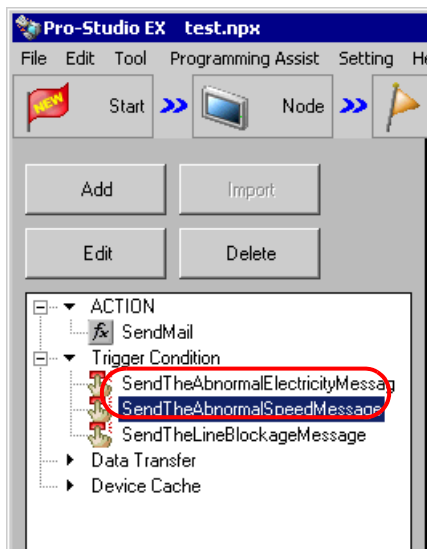
- 1 Click the ACTION name "Send Mail" from the tree display on the left of the screen.



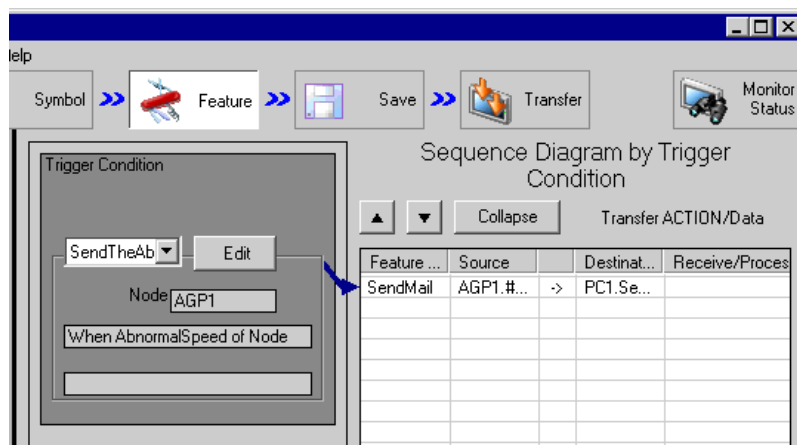
Confirm that the setting content appears on the right of the screen.



- Click each trigger condition name from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

15.1.11 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
 - Be sure to reload the network project file to 'Pro-Server EX'. If not, ACTION will not work.
-

Ex.

- Path of network project file : Desktop\Mail_send.npxc
- Title : Send Mail ACTION

15.1.12 Transferring a Network Project File

This step transfers a saved network project file to entry nodes.

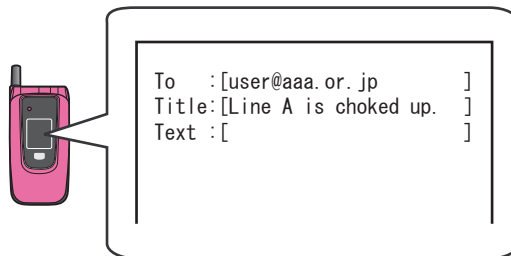
Refer to "26 Transferring" for details about transferring a network project file.

NOTE

- Be sure to transfer a network project file. If not, ACTION will not work.
-

15.1.13 Executing ACTION

This step verifies that enabling a trigger condition activates ACTION, and sends the message corresponding to the trigger condition to the preset address.



This is the end of the explanation of this ACTION.

NOTE

- If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".
-

15.2 Setting Guide

This section explains how to set the parameters of ACTION.

Setting Mail Information EX Version 1.33

[Login information]

SMTP server name :

SMTP port number :

☐ Use secure connection (SMTP over SSL)

☐ SMTP Authentication

User name :

Password :

☐ POP before SMTP

POP3 server name :

POP3 port number :

User name :

Password :

Sender's Mail address :

Send Mail address :

[Mail Contents]

☐ Always send the same message

Outgoing Message:

☒ Send the data sent from the trigger NODE as a message

☐ Send a message prepared in an Excel sheet

(You can specify a message and its destination from Device/PLCs)

Select an Excel sheet with a prepared message

c: \

C:\

Pro-face

Pro-Server EX

NpxDatabase

Excel file name

Sheet name

OK Cancel

| Setting item | Setting content |
|---------------------------------------|---|
| SMTP server name | Enter the address of the connected SMTP server (Mail Sending Server) with single-byte alphabet or numerical values. |
| SMTP port number | Enter the port number of the SMTP server in use. If the [Use secure connection (SMTP over SSL)] check box is selected, usually set this field to "465". If the [SMTP Authentication] check box is selected, usually set this field to "587". If neither is selected, usually set this field to "25". |
| Use secure connection (SMTP over SSL) | Sends mail using the "SMTP over SSL" encryption method. |
| SMTP Authentication | Sends mail using SMTP authentication. The authentication method is "AUTH-LOGIN". |
| User name | Set the user name for logging in to the SMTP server. |
| Password | Use single-byte alphanumeric characters and symbols to set the password for logging in to the SMTP server. |
| POP before SMTP | Select this check box to perform POP authentication before sending mail. |
| POP3 server name | Enter the server (POP3 server) address for POP authorization with single-byte alphabet or numerical values. |
| POP3 port number | Define the port number of the POP3 server in use. Normally set to "110". Normally enter "110". |
| User name | Enter the user name for POP authorization. |

| Setting item | Setting content |
|-----------------------|--|
| Password | Enter the password set by the user who performs POP authorization. |
| Sender's Mail address | Enter the mail source address with single-byte alphabet or numerical value. |
| Send Mail address | <p>Use single-byte alphanumeric characters to define the destination mail address. If [Use secure connection (SMTP over SSL)] or [SMTP Authentication] is enabled, you can enter multiple addresses by separating each with a comma (.). The limit for the number of addresses depends on the SMTP server in use.</p> <p>NOTE</p> <ul style="list-style-type: none"> • If [Use secure connection (SMTP over SSL)] and [SMTP Authentication] are both disabled, you can set one address only. • In the [Mail Contents], if you select [Send a message prepared in an Excel sheet] and the destination addresses are defined in the Excel worksheet, contents of the [Send Mail address] field are ignored. |
| Mail Contents | <ul style="list-style-type: none"> • Always send the same message] Sends the message entered in [Outgoing Message:]. <div data-bbox="551 691 1105 765" data-label="Form"> </div> <p>NOTE</p> <ul style="list-style-type: none"> • The content of [Outgoing Message:] is sent as the title (subject) of the message. <div data-bbox="655 896 1015 1078" data-label="Text"> <pre> To :[user@aaa.or.jp] Title :[Abnormal speed in Line A!] Text :[] </pre> </div> |

| Setting item | Setting content | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|----------|-------|---------|---------|---|---|----------|-------|---------|---------|---|--|--|--|--|---|--|--|--|--|---|--|--|--|--|
| Mail Contents | <ul style="list-style-type: none">Send the data sent from the trigger NODE as a message Sends Device/PLC data transferred in "Set ACTION data" as a message. Date type of "String" only can be transferred as a message. | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div><div>Transfer Source</div><div><div>Node</div><div>AGP1</div></div><div><div>Device Name</div><div>PLC1</div></div><div><div><input checked="" type="radio"/> Device Address</div><div><div>D50Data</div></div></div><div><div><input type="radio"/> Constant Value</div><div></div></div><div><div>Data Type</div><div>String</div></div><div><div>No.</div><div>10</div></div></div> <div><div>NOTE</div><ul style="list-style-type: none">The content of the outgoing message (Device/PLC data) is sent as the title (subject) of the message. (Example) When the character string data of "ALART" is stored in Device "50"</div> <div><div>To :[user@aaa.or.jp]</div><div>Title :[ALART]</div><div>Text :[]</div></div> <ul style="list-style-type: none">Send a message prepared in an Excel sheet Sends a preset message in a message sheet. <div><div>◆ Message format prepared in Excel</div><table><tr><th></th><th>A</th><th>B</th><th>C</th><th>D</th></tr><tr><td>1</td><td>Key Code</td><td>Title</td><td>Message</td><td>Address</td></tr><tr><td>2</td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td></tr></table></div> <div><div>NOTE</div><ul style="list-style-type: none">To enter more than one destination, separate addresses with a comma (,).When e-mail addresses are not set up on the message sheet, a message is sent to the address defined in the [Send Mail Address] field only.</div> | | A | B | C | D | 1 | Key Code | Title | Message | Address | 2 | | | | | 3 | | | | | 4 | | | | |
| | | A | B | C | D | | | | | | | | | | | | | | | | | | | | | |
| | 1 | Key Code | Title | Message | Address | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Folder | Sets the location where a message sheet is stored. | | | | | | | | | | | | | | | | | | | | | | | | | |
| Excel file name | Selects a message sheet file from the Excel file list in a specified folder. | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sheet name | Selects a sheet name to refer in a message sheet. | | | | | | | | | | | | | | | | | | | | | | | | | |

15.3 Restrictions

■ Encryption method

- If your SMTP server does not support the "SMTP over SSL" encryption method, you cannot send encrypted mail.

■ Authentication method

- If your SMTP server does not support "AUTH-LOGIN" SMTP authentication, you cannot send SMTP authenticated mail.

■ If mail cannot be sent

If the "Unable to send portion of mail." error message appears, it may be due to one of the following.

- Incorrect settings
Check that [SMTP server name], [SMTP port number], [Use secure connection (SMTP over SSL)], [SMTP Authentication], [User name], and [Password] settings are correct.
- Connections to the SMTP server and port number are not allowed in the network environment
Change the firewall and security settings so that connections are allowed to the SMTP server and port number in use.
- Sending mail was refused by the mail server
Check the [Sender's Mail address], [Send Mail address], and the subject and body of the mail.

16



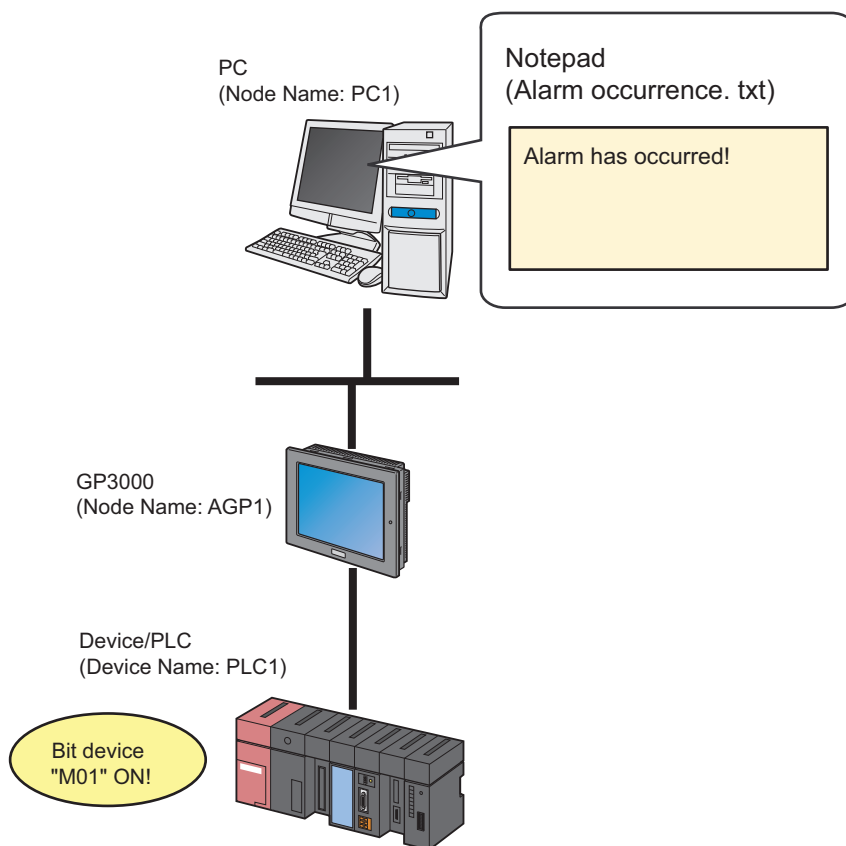
Starting Optional Application

| | | |
|------|--|-------|
| 16.1 | Try to Start Optional Application..... | 16-2 |
| 16.2 | Setting Guide | 16-21 |
| 16.3 | Restrictions | 16-22 |

16.1 Try to Start Optional Application

[Action Example]

Detect the rising of the trigger device (bit device: "M01") of Device/PLC and start the application software of PC, "Notepad" (File name: Alarm occurrence.txt).



This section describes the setting procedures for executing the above action (ACTION) as an example.

[Setting Procedure]

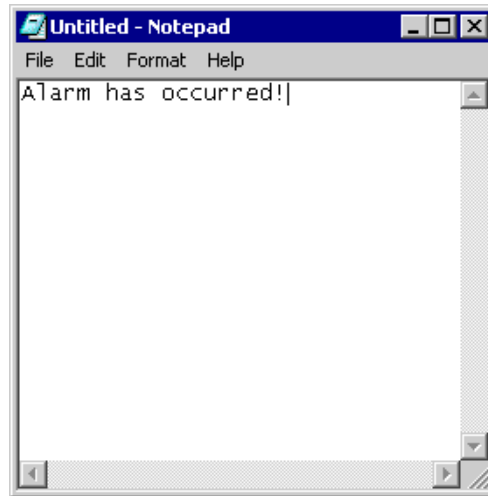
| | | |
|----|---|--|
| 1 | Creating Text (page16-4) | This step creates text (message) to display on "Notepad". |
| 2 | Starting 'Pro-Studio EX' (page16-4) | This step starts 'Pro-Studio EX'. |
| 3 | Registering Entry Nodes (page16-5) | This step registers the PC and the display units as entry nodes. |
| 4 | Registering Symbols (page16-6) | This step registers as a symbol the device of Device/ PLC which serves as a trigger condition (trigger). |
| 5 | Parameter Setting for Feature (ACTION) (page16-7) | This step sets the following items: <ul style="list-style-type: none"> • Application name • Startup option • Current folder |
| 6 | Setting Trigger Conditions (page16-11) | This step sets conditions (trigger) for starting application software. |
| 7 | Setting Data Received by ACTION (page16-14) | This step sets a constant value to transfer. |
| 8 | Setting ACTION Node/Process Completion Notification (page16-15) | This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed. |
| 9 | Verifying Setting Result (page16-17) | This step verifies setting results on the setting content list screen. |
| 10 | Saving a Network Project File (page16-19) | This step saves the current settings as a network project file and reloads. |
| 11 | Transferring a Network Project File (page16-19) | This step transfers a saved network project file to the display unit. |
| 12 | Executing ACTION (page16-20) | This step verifies that a specified piece of application software starts when the preset trigger condition has become effective. |

16.1.1 Creating Text

This step creates text (message) to display on "Notepad".

- 1 Start "Notepad" to create the text shown below.

[Creation Example]



- 2 Save it on PC desktop with the file name "Alarm occurrence.txt" after creating.

16.1.2 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

16.1.3 Registering Entry Nodes

This step registers the PC and the display unit connected with network as nodes.

Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1
IP Address :192.168.0.1



Node Name :AGP1
IP Address :192.168.0.100

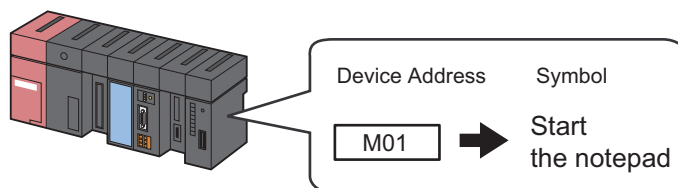
Device/PLC Information

Ex.

| Entry node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

16.1.4 Registering Symbols

This step registers as a symbol the device address of Device/PLC which serves as a trigger condition.
Refer to "32 Symbol Registration" for details about entry nodes.



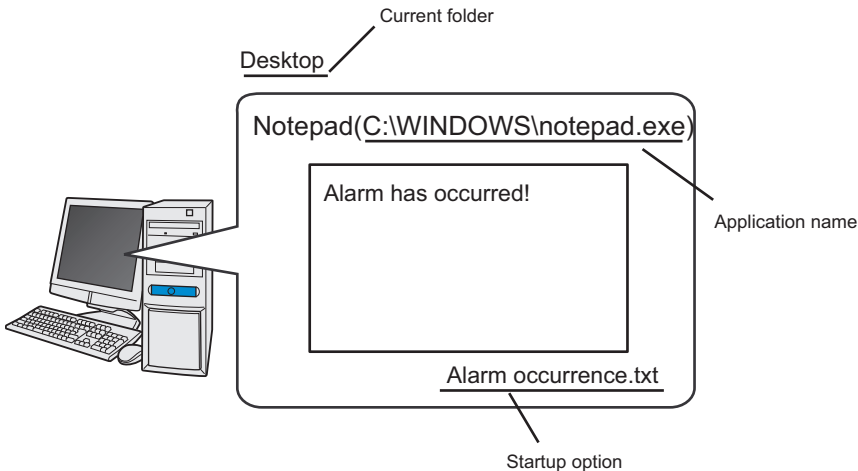
Ex.

| Setting item | Setting content |
|--|----------------------------|
| Symbol Name | Start Notepad |
| Data Type | Bit |
| Device address for symbol registration | "M01" of Device/PLC (PLC1) |
| No. of Devices | 1 |

16.1.5 Parameter Setting for Feature (ACTION)

This step makes settings to start application software. (Parameter settings)

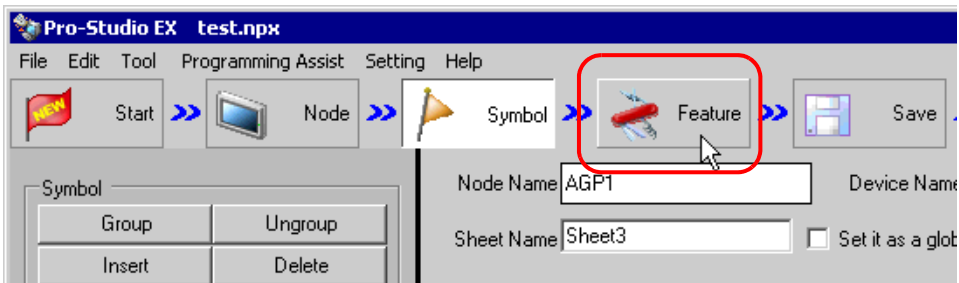
Refer to "16.2 Setting Guide" for more details about ACTION parameters.



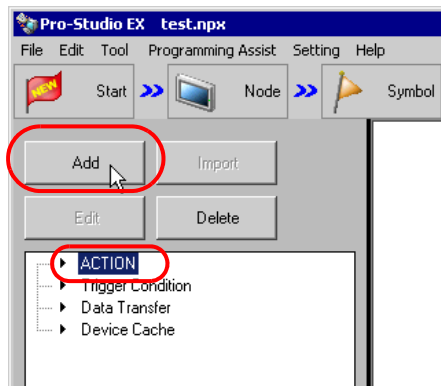
Ex.

| Setting item | Setting content |
|------------------|--------------------------------|
| ACTION Name | Start Notepad |
| Application Name | C:\WINDOWS\notepad.exe |
| Startup Option | Alarm occurrence |
| Current folder | C:\Users\<<User name>>\Desktop |

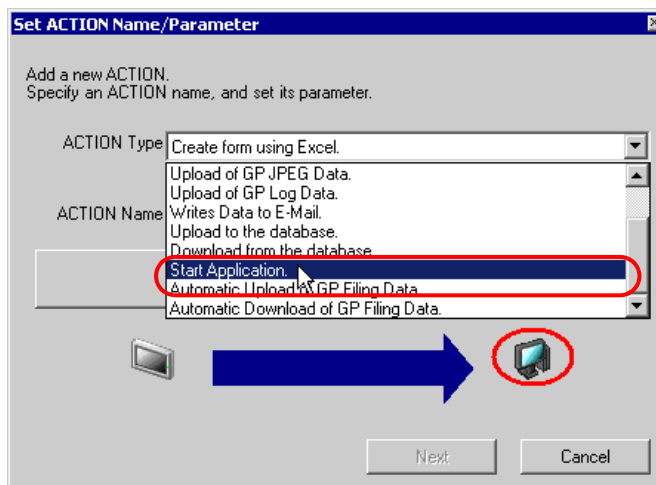
1 Click the [Feature] icon on the status bar.



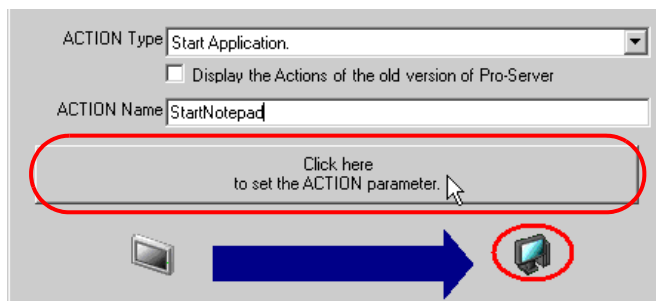
- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.



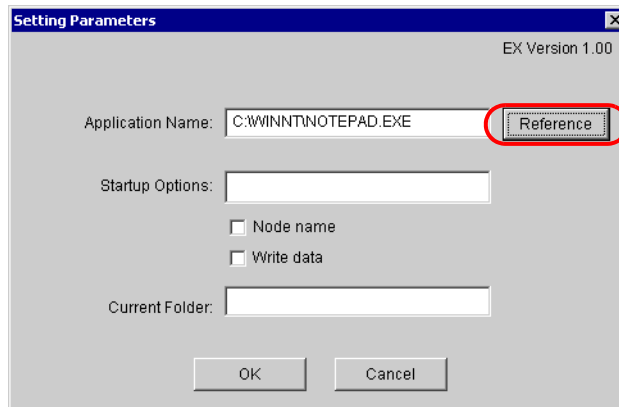
- 3 Click the [ACTION Type] list button, and select "Start Application".
Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "Start Notepad".



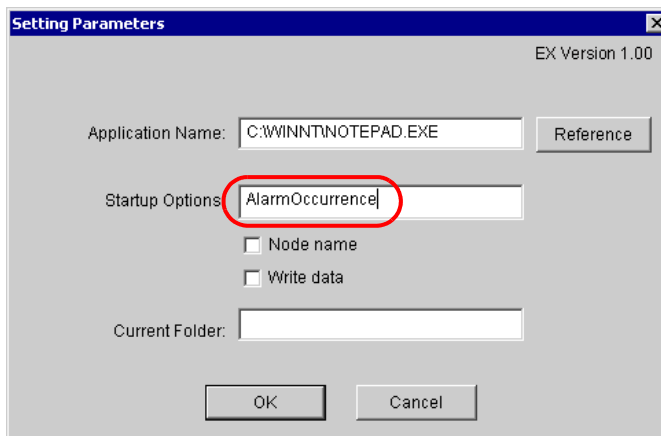
- 4 Click the [Click here to set the the ACTION parameter] button.



- 5 Click the [Reference] button of [Application Name] and specify the "Notepad" startup file "C:\WINDOWS\notepad.exe".



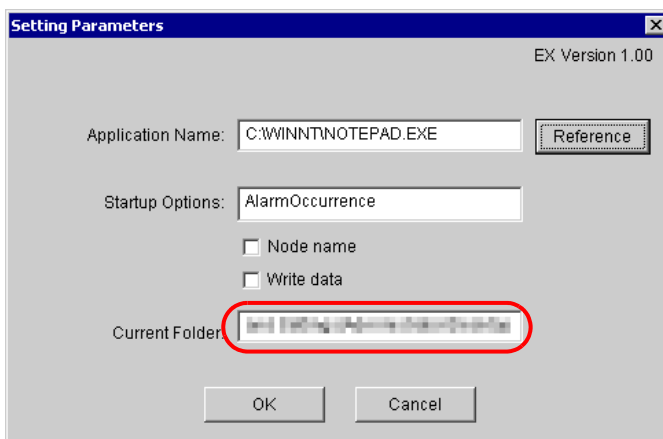
- 6 Enter "Alarm Occurrence" in [Startup Options] as a Notepad' file name to start.

**NOTE**

- To start only application software without specifying any file, you do not have to specify [Startup Options] and [Current Folder].
- You can specify appropriate file names among multiple files by utilizing "Node name" or "Write data".

☞ "16.2 Setting Guide"

- 7 Enter "C:\Users\<<User name>>\Desktop" as a current folder name of the "Notepad" file "Alarm Occurrence" to start.



- 8 Click the [OK] button.

This is the end of the feature (ACTION) settings.

16.1.6 Setting Trigger Conditions

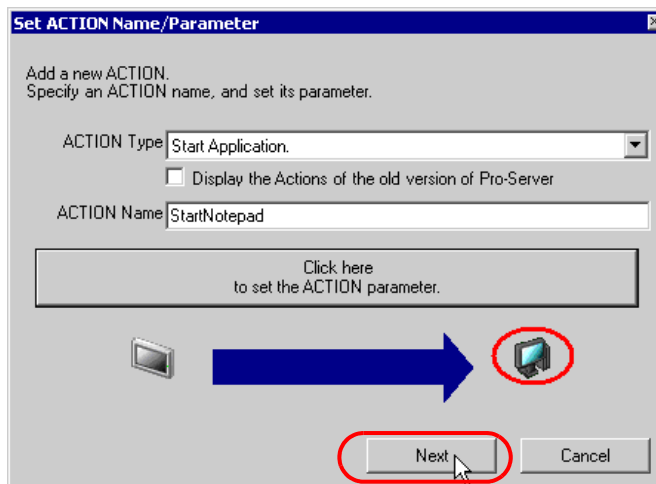
This step sets conditions (trigger bit ON) for starting application software.

Refer to "33 Trigger Conditions" for details about trigger conditions.

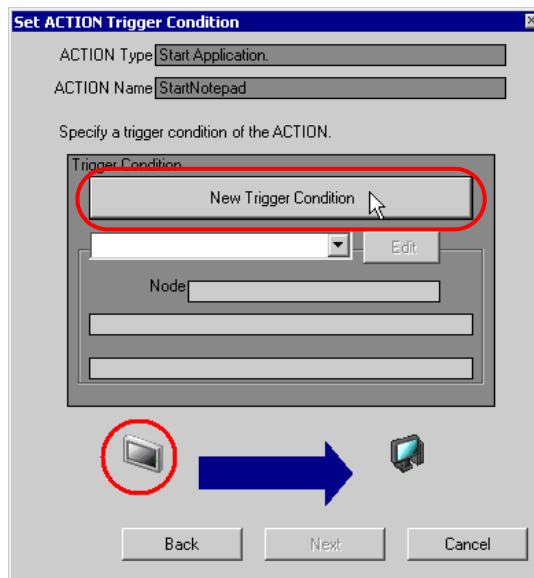
Ex.

- Trigger Condition Name: Turn on Notepad start bit
- Trigger Condition: When "Start Notepad" (M01) is ON

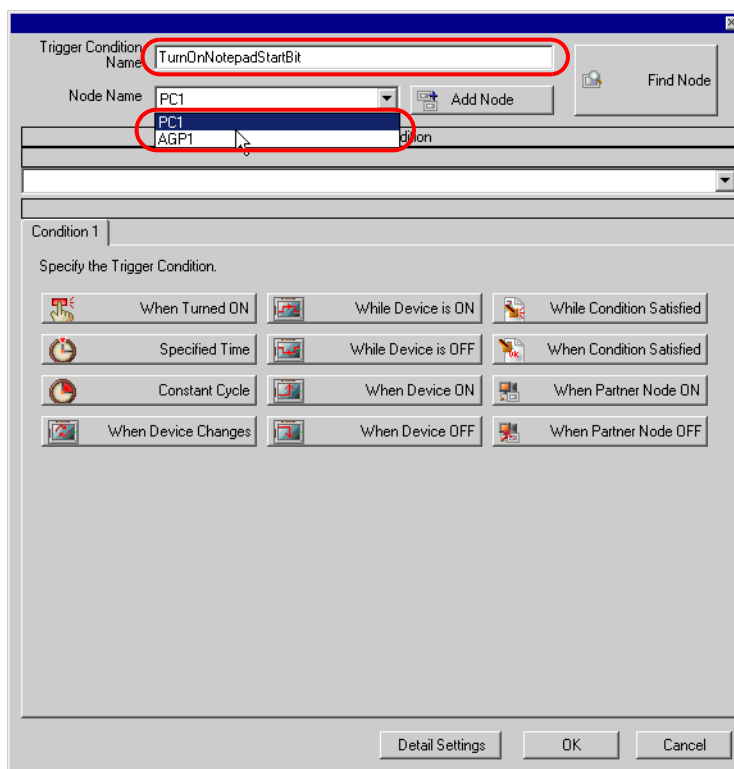
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



2 Click the [New Trigger Condition] button.



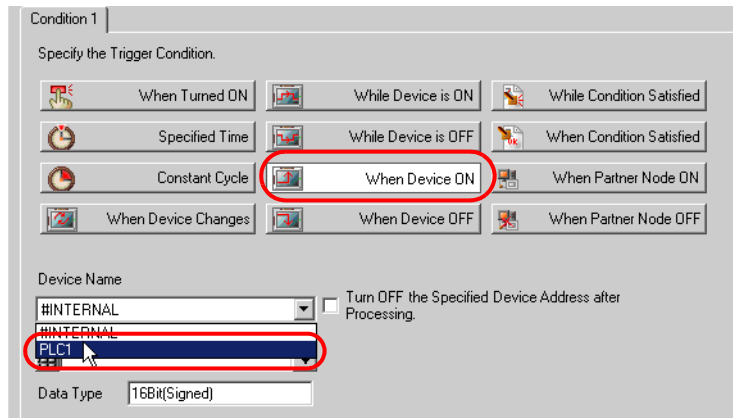
- 3 Enter the trigger condition name "TurnOnNotepadStartBit" in [Trigger Condition Name], and select "AGP1" in [Node Name] which has the device to serve as the trigger condition (trigger).

**NOTE**

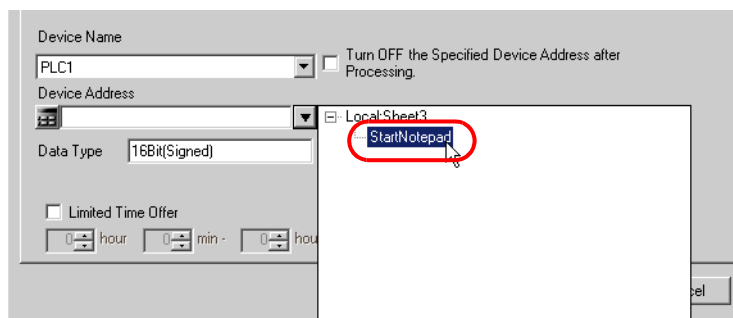
- Here, you are to specify the node having the device to be the trigger condition or having data to transfer.

☞ "33 Trigger Conditions"

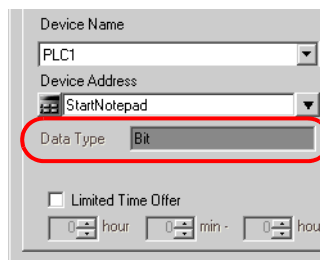
- 4 Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



- 5 Click the [Device Address] list button and select "StartNotepad" for the symbol name of the device which serves as the trigger condition.



[Data Type] automatically appears after selection, too.



NOTE • You can also set trigger conditions by combining 2 different types of conditions ("And" condition or "Or" condition).

☞ "33 Trigger Conditions"

- 6 Click the [OK] button.

This is the end of trigger condition settings.

16.1.7 Setting Data Received by ACTION

You can use transfer data to deliver parameters dynamically to a startup application.

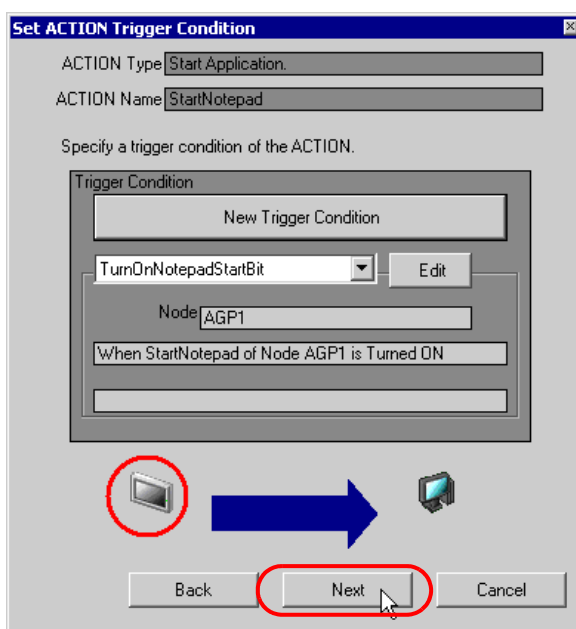
As for fixed parameters, specify them in ACTION settings. ("16.2 Setting Guide")

If not, any transfer data (constant value) is acceptable.

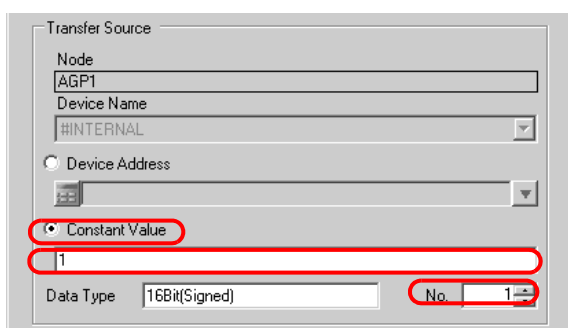
Ex.

- Constant Value to Transfer:1 (Any value is acceptable)

1 On the "Set ACTION Trigger Condition" screen, click the [Next] button.



2 After clicking [Constant Value], enter "1" in the text box for the constant value to transfer and "1" in [No.].



This is the end of the setting of data received by ACTION.

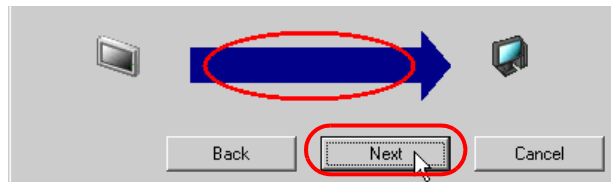
16.1.8 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be turned on or off when the ACTION is completed.

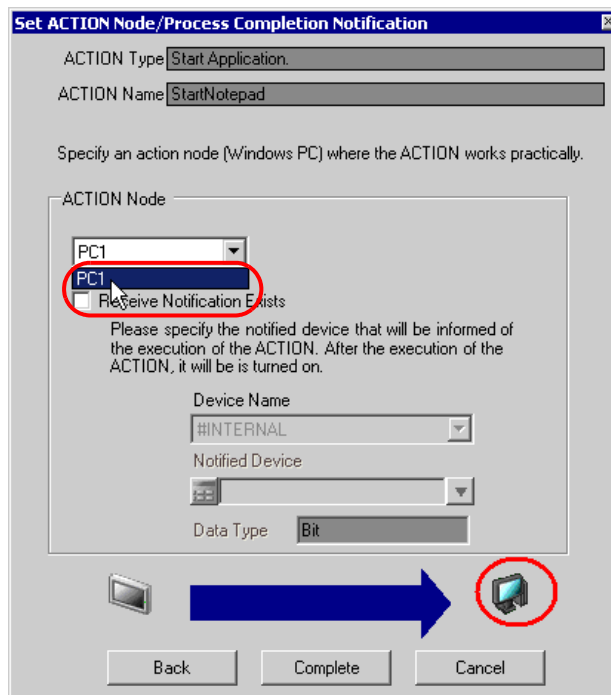
Ex.

- ACTION Node: PC1
- Receive Notification: OFF

1 On the "Data settings to be received by ACTION" screen, click the [Next] button.



2 Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates. Also, clear the check if [Receive Notification Exists] has been checked.

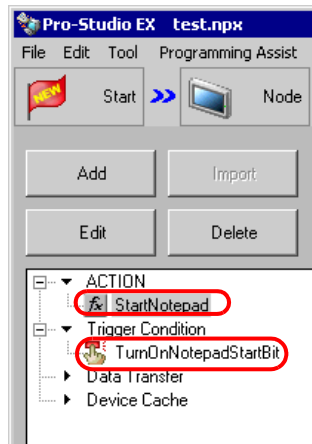


NOTE • When "Receive Notification Exists" is turned on, the specified bit device will be turned on when the ACTION is completed. This can be used as the trigger condition of the subsequent ACTION when you want to execute two or more ACTIONS sequentially.

☞ "33 Trigger Conditions"

3 Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the ACTION and trigger condition name you set will appear.

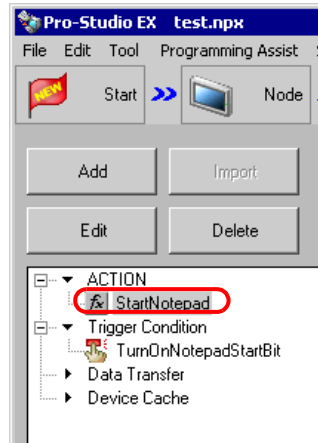


This is the end of the settings of the ACTION node and process completion notification.

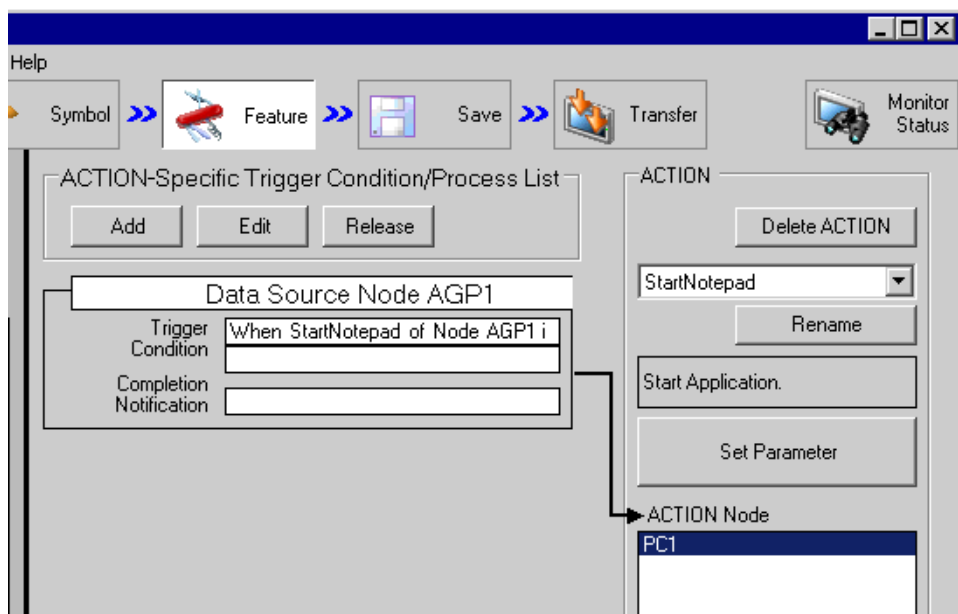
16.1.9 Verifying Setting Result

This step verifies setting results on the setting content list screen.

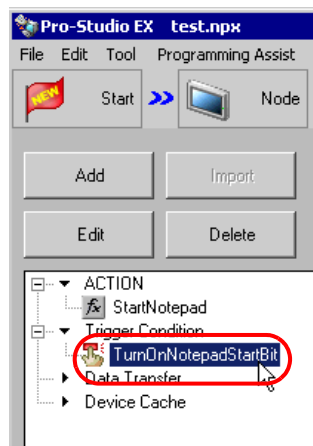
- 1 Click the ACTION name "StartNotepad" from the tree display on the left of the screen.



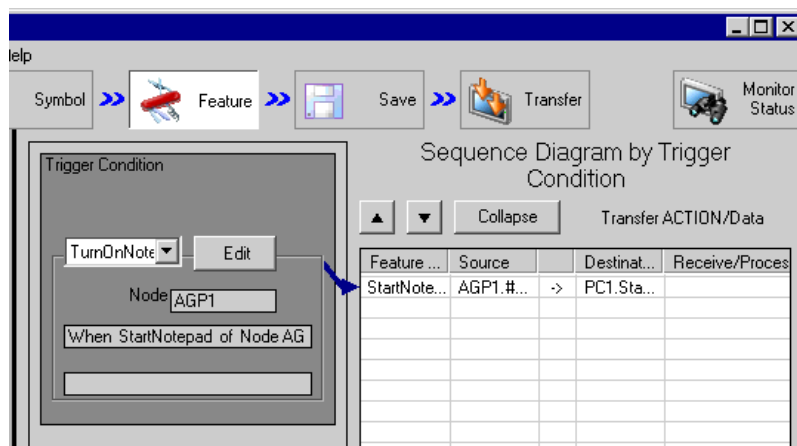
Confirm that the setting content appears on the right of the screen.



- Click the trigger condition name "TurnOnNotepadStartBit" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

16.1.10 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
 - Be sure to reload the network project file to 'Pro-Server EX'. If not, ACTION will not work.
-

Ex.

- Path of network project file : Desktop\Appli_run.npxe
- Title : Application Startup ACTION

16.1.11 Transferring a Network Project File

This step transfers a saved network project file to entry nodes.

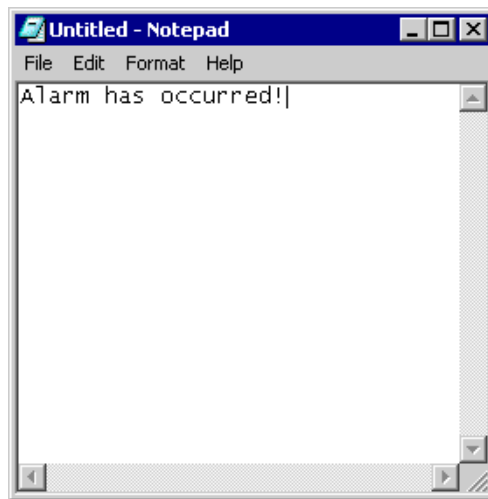
Refer to "26 Transferring" for details about transferring a network project file.

NOTE

- Be sure to transfer a network project file. If not, ACTION will not work.
-

16.1.12 Executing ACTION

This step verifies that enabling a trigger condition activates ACTION and starts "Notepad".



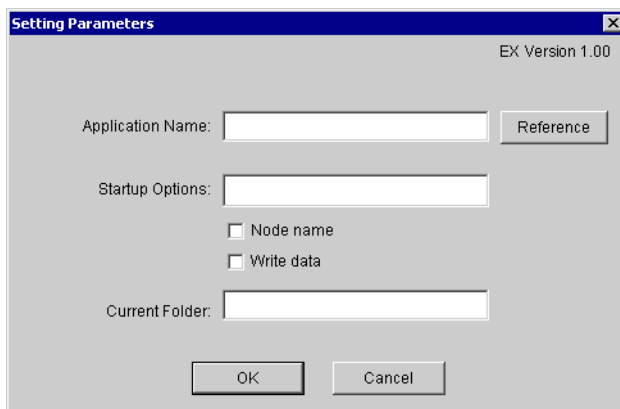
This is the end of the explanation of this ACTION.

NOTE

- If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".
-

16.2 Setting Guide

This section explains how to set the parameters of ACTION.



| Setting item | Setting content |
|------------------|--|
| Application Name | <p>Sets a startup file name (*.exe, *.com, and so on) of application software in full path. Enter directly or specify the file on the "Open File" screen by clicking the [Reference] button.</p> <p>NOTE</p> <ul style="list-style-type: none"> You can also start user-created application software. This depends on the version of the application software. |
| Startup Options | <p>Can execute specific functions or processes by adding the parameters specified here to an action file. For example, you can start application software by specifying a file name.</p> <p>NOTE</p> <ul style="list-style-type: none"> Refer to the manual of each application software about startup options. |
| Node name | <p>Check when you want to add a node name to a startup option name. A single-byte space and a node name are added automatically after the startup option name. Example) When specifying a file name in [Startup Options] and the transfer source node name is "AGP1" Starts the application software by specifying the file "File Name AGP1".</p> |
| Write data | <p>Check if you want to add transferred data (write data) to a startup option name. Example) When specifying a file name in [Startup Options] and the transfer data is "3" Starts the application software by specifying the file "File Name 3".</p> <p>NOTE</p> <ul style="list-style-type: none"> If there are multiple transferred data, single-byte space and transfer data are added in turn. |
| Current Folder | <p>Sets a current folder of the startup application software. When you want to specify the file which the startup application software opens, you do not have to specify the file name in full path by specifying a current folder here.</p> <p>NOTE</p> <ul style="list-style-type: none"> Even though a current folder has been set here, it forcibly changes to its own current folder according to the application software. |

16.3 Restrictions

■ When Starting an Optional Application

The [User Account Control] dialog box may appear before starting an optional application. When this happens, 'Pro-Server EX' operations will cease operations from when the dialog box is displayed until the [Allow] button is clicked.

■ Startup Condition

Do not set the startup condition to [When Partner Node OFF]. If the [When Partner Node OFF] option is selected, on starting or exiting Pro-Server EX, you may not be able to run Pro-Studio EX or Pro-Server EX.

17



Writing the display unit's Filing Data to Excel

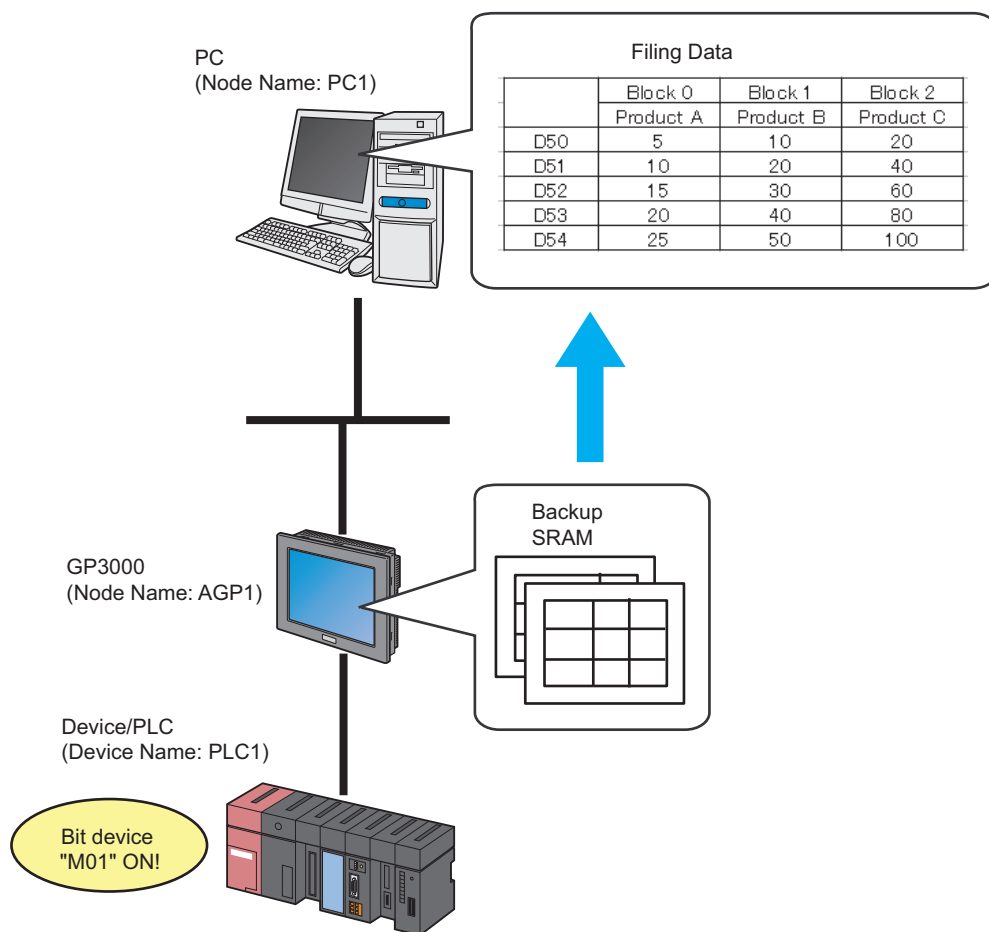
| | | |
|------|--|-------|
| 17.1 | Uploading the display unit's Filing Data | 17-2 |
| 17.2 | Setting Guide | 17-21 |

17.1 Uploading the display unit's Filing Data

NOTE • Refer to the 'GP-Pro Ex Reference Manual' for more details about filing data.

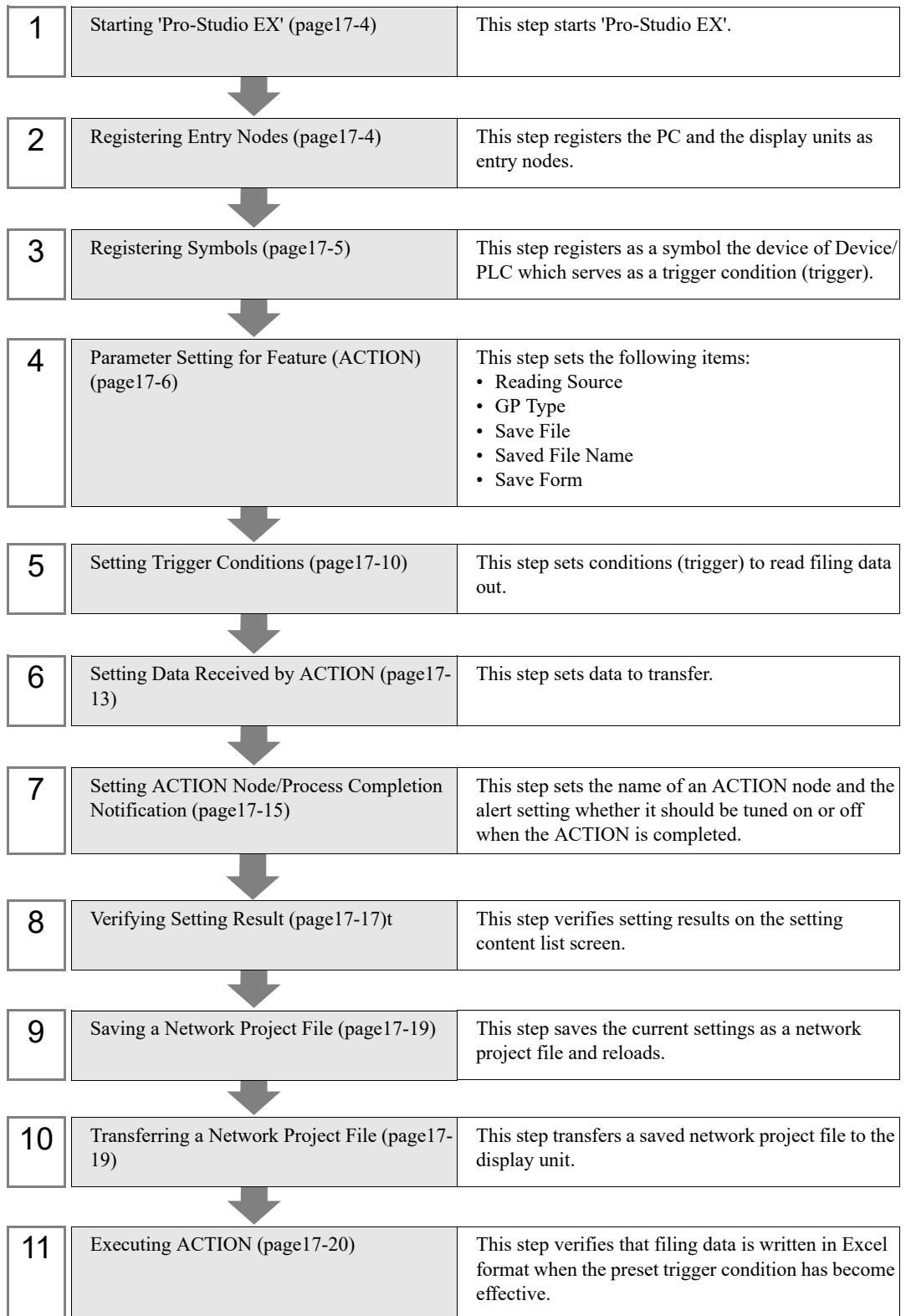
[Action Example]

Detect the rising of the trigger device (bit device: "M01") of Device/PLC, read filing data saved in the backup SRAM of display unit, and write the data into an Excel file.



This section describes the setting procedures for executing the above action (ACTION) as an example.

[Setting Procedure]



17.1.1 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

17.1.2 Registering Entry Nodes

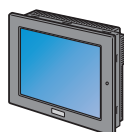
This step registers the PC and the display unit connected with network as nodes.

Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1

IP Address :192.168.0.1



Node Name :AGP1

IP Address :192.168.0.100

Device/PLC Information

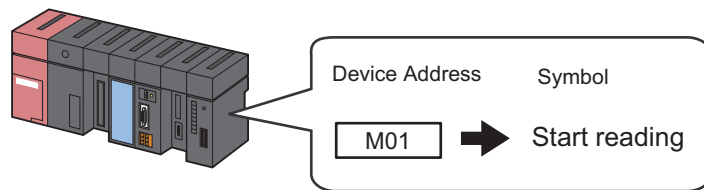
Ex.

| Entry node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

17.1.3 Registering Symbols

This step registers as a symbol the device address of Device/PLC which serves as a trigger condition.

Refer to "32 Symbol Registration" for details about entry nodes.



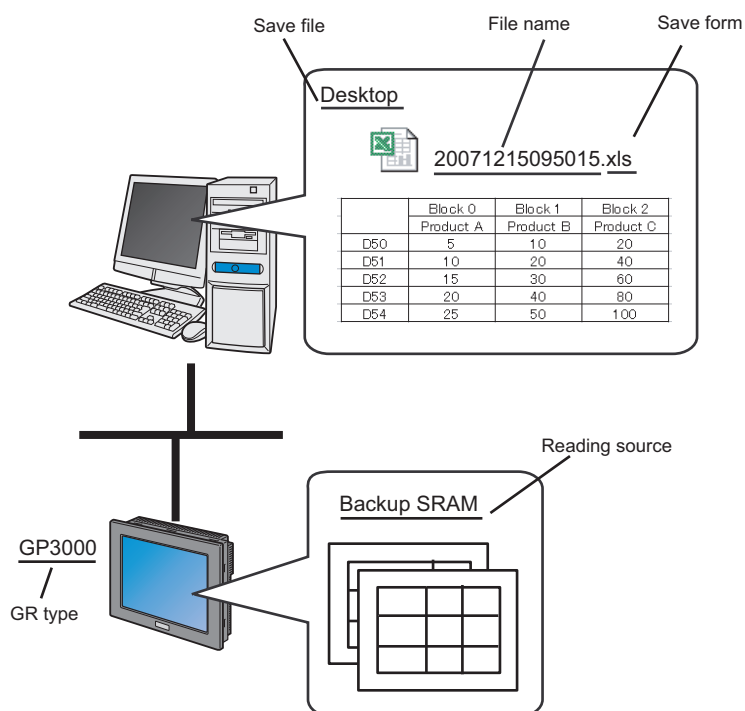
Ex.

| Setting item | Setting content |
|--|----------------------------|
| Symbol Name | Start reading |
| Data Type | Bit |
| Device address for symbol registration | "M01" of Device/PLC (PLC1) |
| No. of Devices | 1 |

17.1.4 Parameter Setting for Feature (ACTION)

This step makes settings to read filing data out. (Parameter settings)

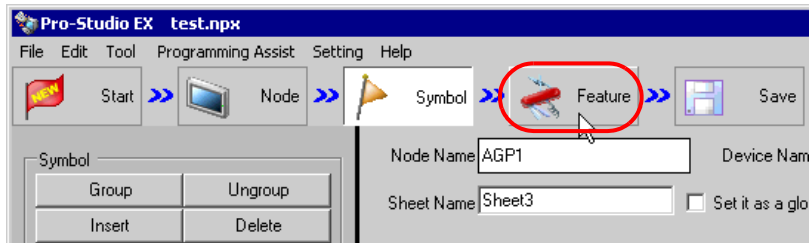
Refer to "17.2 Setting Guide" for more details about ACTION parameters.



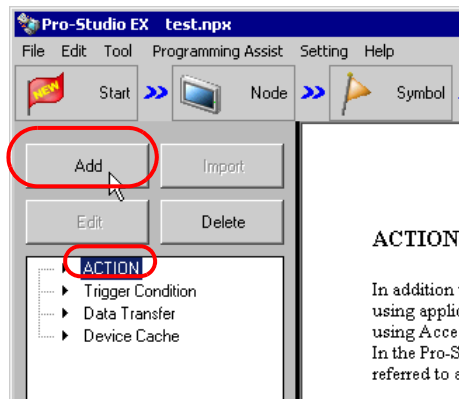
Ex.

| Setting item | Setting content |
|-----------------|--|
| ACTION Name | Filing data upload |
| Reading Source | Filing data in the backup SRAM of GP |
| GP Type | GP3000 series |
| Save File | PC Desktop |
| Saved File Name | %Y%M%D%h%m%s (Year/Month/Day/Hour/Minute/Second) |
| Zero Suppress | OFF |
| Save Form | Excel file (.xls) |

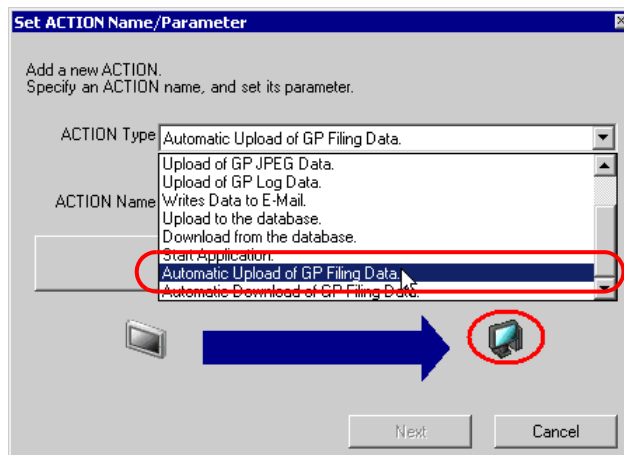
- 1 Click the [Feature] icon on the status bar.



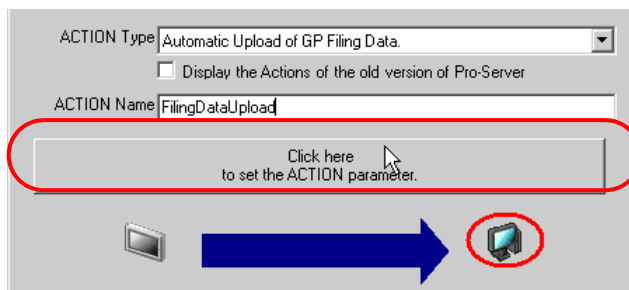
- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.



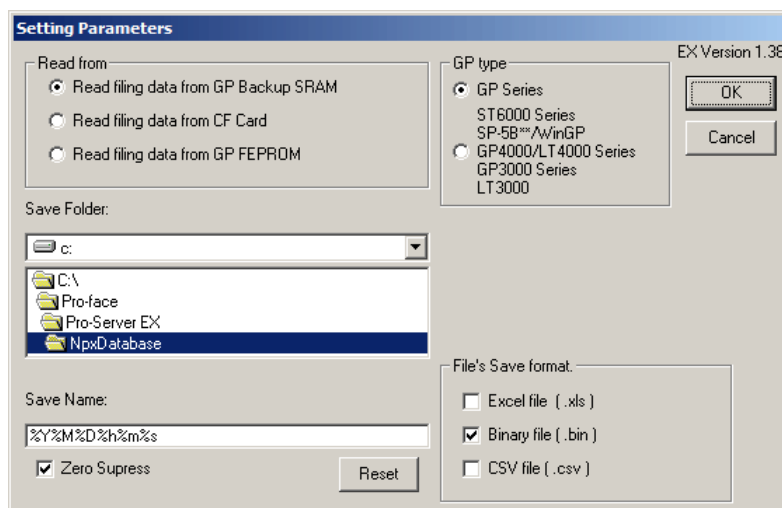
- 3 Click the [ACTION Type] list button, and select "Automatic Upload of GP Filing Data".
Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "Filing Data Upload".



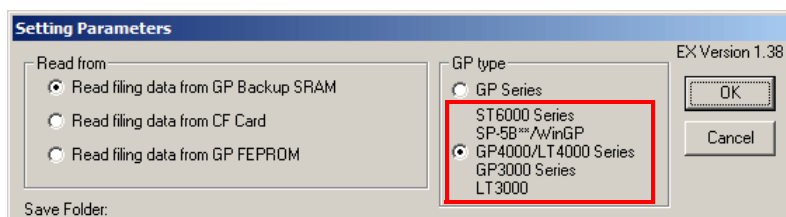
- 4 Click the [Click here to set the ACTION parameter] button.



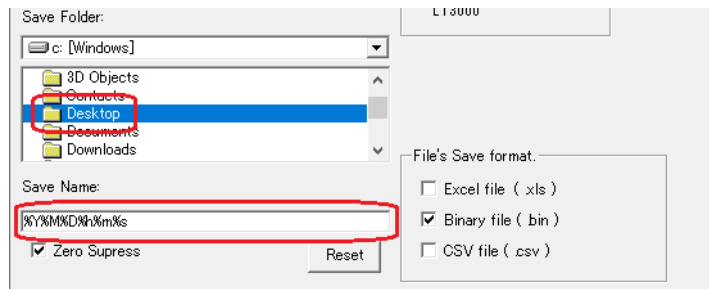
- 5 Check [Read filing data from GP Backup SRAM] in [Read from].



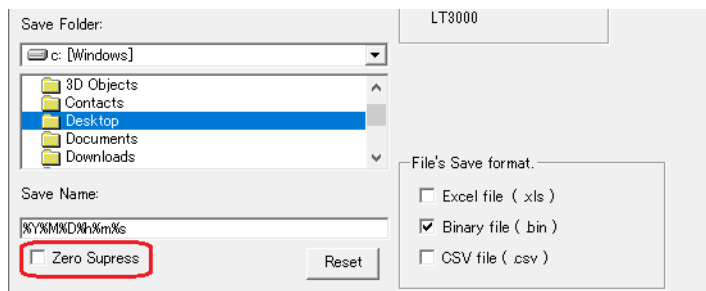
- 6 In the [GP type] area, select the [ST6000 Series, SP-5B**/WinGP, GP4000/LT4000 Series, GP3000 Series, LT3000] option.



- 7 Set "Desktop" for [Save Folder] as a folder to store the file to write data in, with the default file name "%Y%M%D%h%m%s".



- 8 Turn off the [Zero Suppress] check box, if checked.



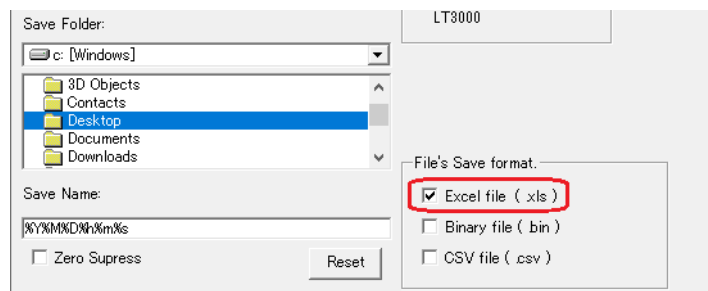
What is %Y%M%D%h%m%s?

Refers to the time when data has been written and this is saved in the format of "YearMonthDateHour/Minute/Second".

(Example) The file name for which data was written at 9:50:15 on Dec. 15, 2007 becomes "20071215095015".

Refer to "37.1 Restrictions on Names" for more details.

- 9 Check [Excel file (.xls)] in [File's Save format.] for the format of the file to which data is written.



- 10 Click the [OK] button.

This is the end of the feature (ACTION) settings.

17.1.5 Setting Trigger Conditions

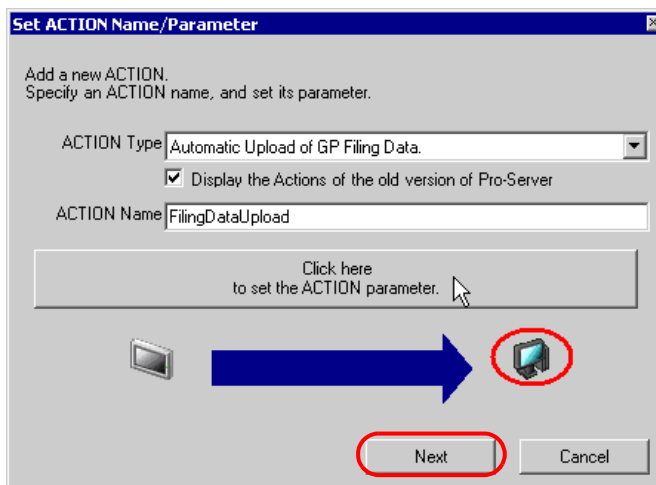
This step sets conditions (trigger bit ON) to read filing data out.

Refer to "33 Trigger Conditions" for details about trigger conditions.

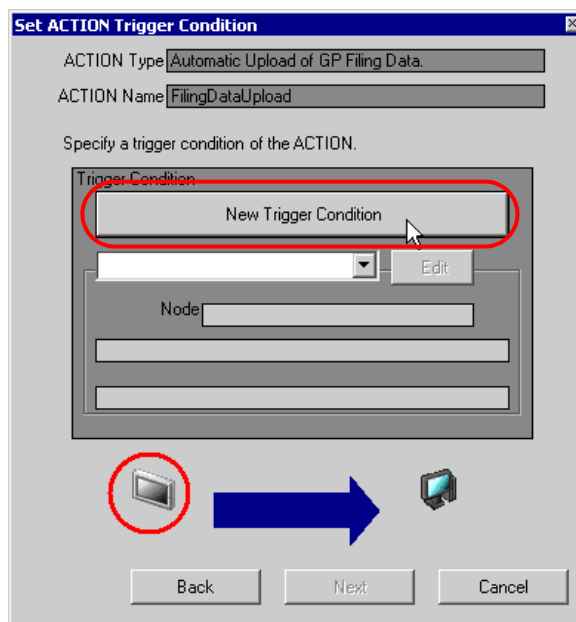
Ex.

- Trigger Condition Name: Turn on read start bit
- Trigger Condition : When "Start reading" (M01) is ON

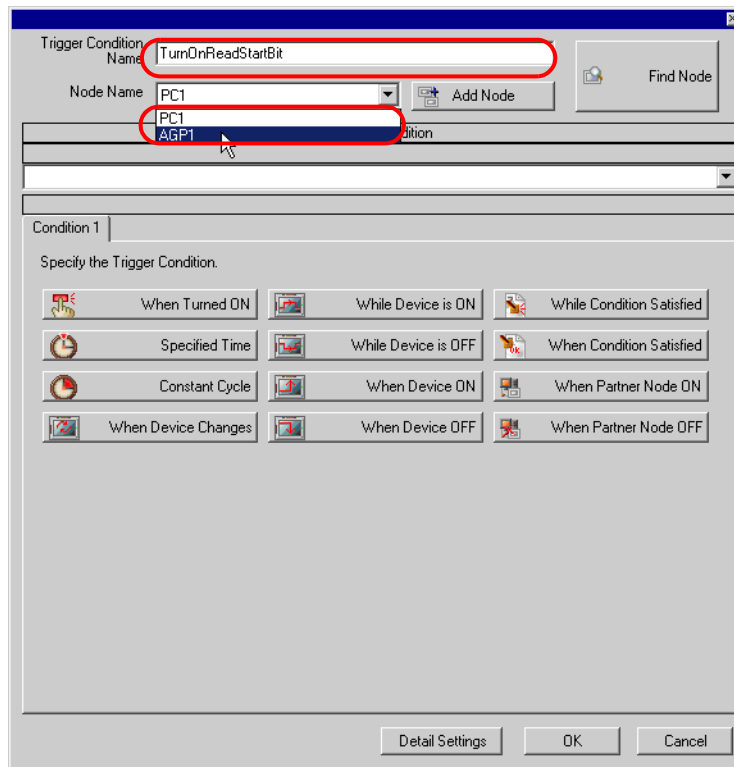
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



2 Click the [New Trigger Condition] button.



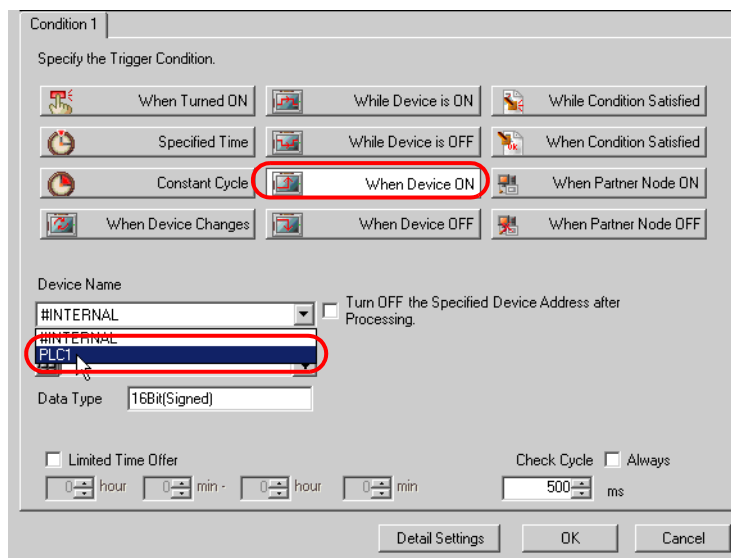
- 3 Enter the trigger condition name "TurnOnReadStartBit" in [Trigger Condition Name], and select "AGP1" in [Node Name] which has the device to serve as the trigger condition.



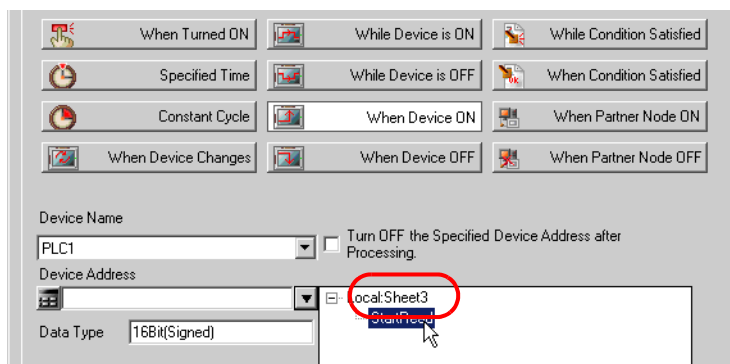
NOTE • Here, you are to specify the node having the device to be the trigger condition.

☞ "33 Trigger Conditions"

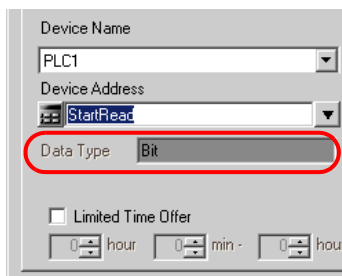
- 4 Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



- Click the [Device Address] list button and select "StartRead" for the symbol name of the device which serves as the trigger.



[Data Type] automatically appears after selection, too.



NOTE • You can also set trigger conditions by combining 2 different types of conditions ("And" condition or "Or" condition).

☞ "33 Trigger Conditions"

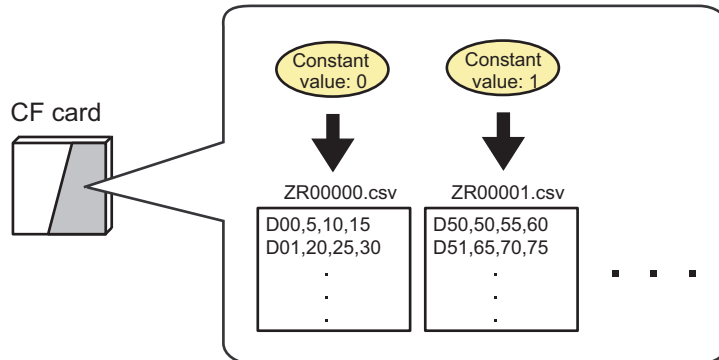
- Click the [OK] button.

This is the end of trigger condition settings.

17.1.6 Setting Data Received by ACTION

This step sets data to transfer in ACTION.

- NOTE** • If a data reading source is of a CF card or FEPROM, the transfer data set here is to be the file No. of the CF card or FEPROM. The file No. refers to the numerical value of ***** of "ZR*****.csv".

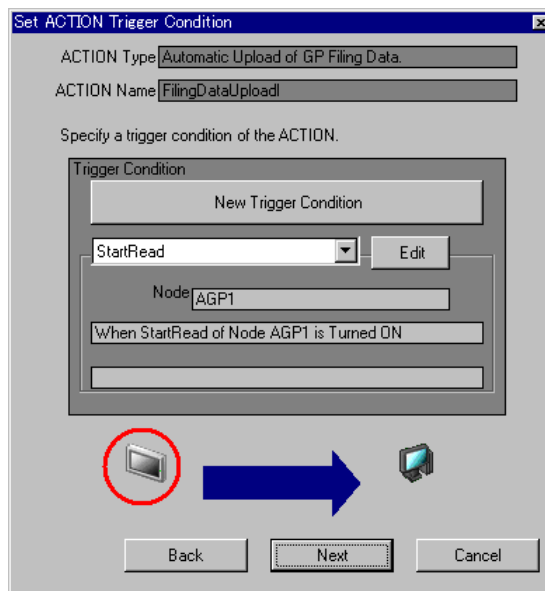


If you read from the backup SRAM, you can use any value for transfer data.

Ex.

- Constant value to transfer: 1

1 On the "Set ACTION Trigger Condition" screen, click the [Next] button.



- 2 After clicking [Constant Value], enter "1" in the text box for the constant value to transfer and "1" in [No.].

Data settings to be received by ACTION

ACTION Type: Automatic Upload of GP Filing Data

ACTION Name: FilingDataUpload

From the trigger node, this ACTION

Data of action

is received as a data to do the ACTION. As the data value, the device value of the trigger node or a constant is available. Specify the data.

Transfer Source

Node

AGP1

Device Name

#INTERNAL

☐ Device Address

☒ Constant Value

1

Data Type: 16Bit(Signed) No. 1

Back Next Cancel

NOTE • You can transfer stored values as data by specifying a symbol or a device address.

This is the end of the setting of data received by ACTION.

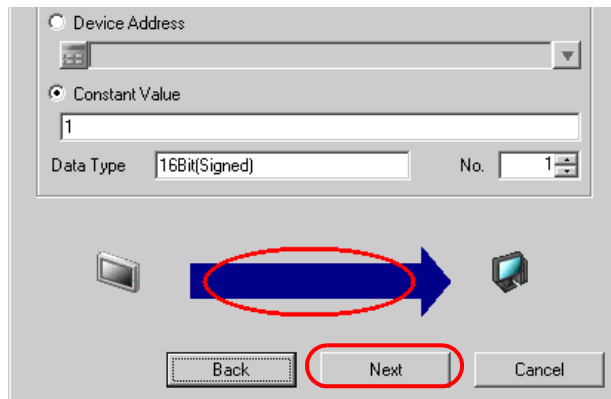
17.1.7 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed.

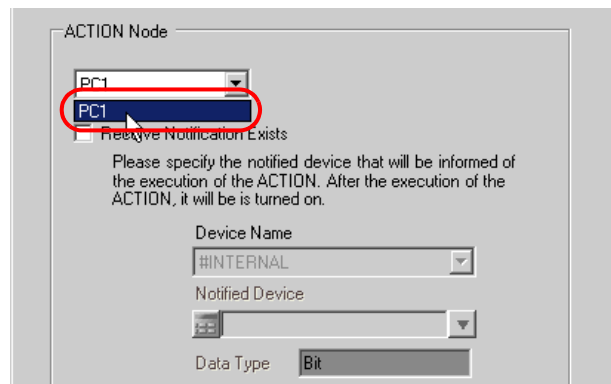
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

1 On the "Data settings to be received by ACTION" screen, click the [Next] button.



2 Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates. Also, clear the check if [Receive Notification Exists] has been checked.

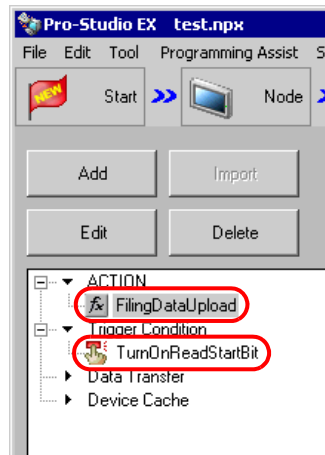


- NOTE**
- When "Receive Notification Exists" is turned on, the specified bit device will be turned on when the ACTION is completed. This can be used as the trigger condition of the subsequent ACTION when you want to execute two or more ACTIONs sequentially.

☞ "33 Trigger Conditions"

3 Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the ACTION and trigger condition name you set will appear.

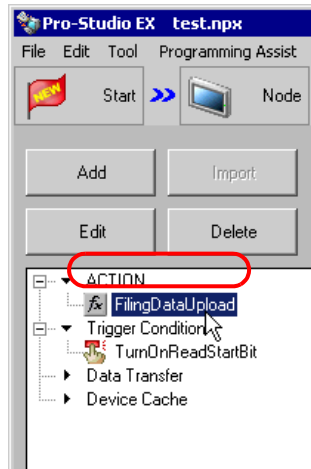


This is the end of the settings of the ACTION node and process completion notification.

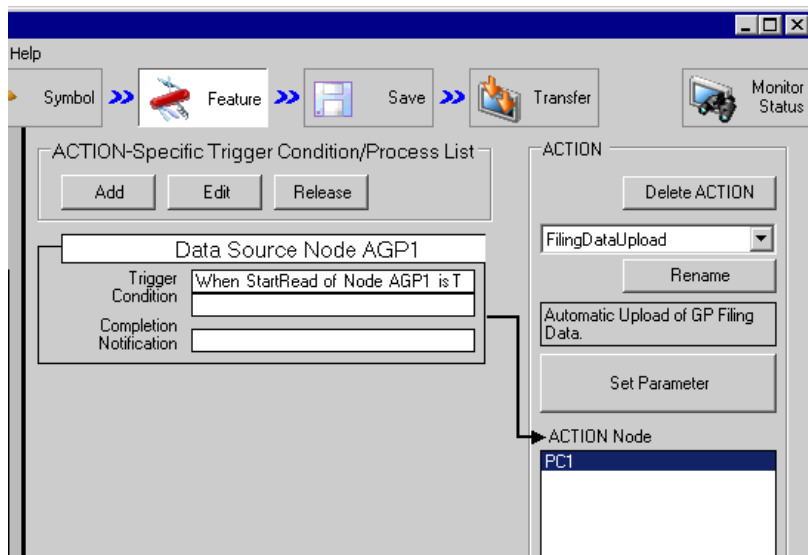
17.1.8 Verifying Setting Result

This step verifies setting results on the setting content list screen.

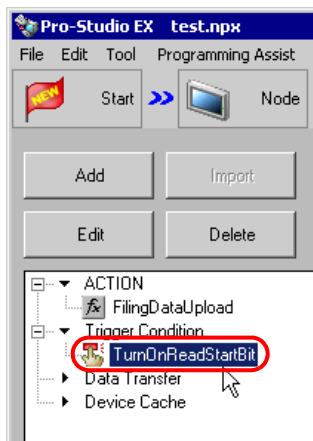
- 1 Select the ACTION name "FilingDataUpload" from the tree display on the left of the screen.



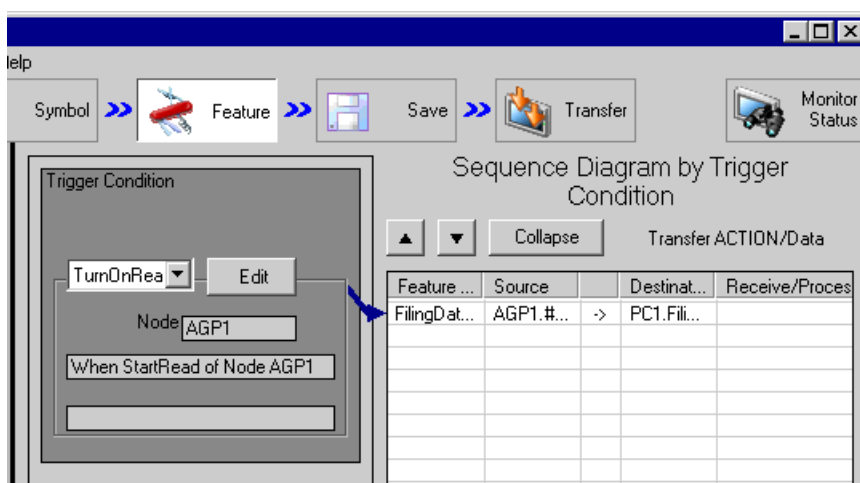
Confirm that the setting content appears on the right of the screen.



- 2 Select the trigger condition name "TurnOnReadStartBit" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

17.1.9 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
 - Be sure to reload the network project file to 'Pro-Server EX' If not, ACTION will not work.
-

Ex.

- Path of network project file : Desktop\FilingData_upload.npxe
- Title : Filing data upload action

17.1.10 Transferring a Network Project File

This step transfers a saved network project file to entry nodes.

Refer to "26 Transferring" for details about transferring a network project file.

NOTE

- Be sure to transfer a network project file. If not, ACTION will not work.
-

17.1.11 Executing ACTION

This step verifies that enabling a trigger condition activates ACTION and writes the filing data in backup SRAM of display unit on PC desktop as an Excel file.

| | A | B | C | D | |
|----|------------------------|----------|----------|---|--|
| 1 | FILING DATA | | | | |
| 2 | Description File no. 1 | | | | |
| 3 | No of Data | 3 | | | |
| 4 | No of Data | 5 | | | |
| 5 | | | | | |
| 6 | Data Forme | 0 | | | |
| 7 | Display For | 0 | | | |
| 8 | Code | 0 | | | |
| 9 | Block0 | Block1 | Block2 | | |
| 10 | ProductA | ProductB | ProductC | | |
| 11 | 5 | 10 | 20 | | |
| 12 | 10 | 20 | 40 | | |
| 13 | 15 | 30 | 60 | | |
| 14 | 20 | 40 | 80 | | |
| 15 | 25 | 50 | 100 | | |
| 16 | | | | | |
| 17 | | | | | |

This is the end of the explanation of this ACTION.


NOTE

- If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".

17.2 Setting Guide

This section explains how to set the parameters of ACTION.

| Setting item | Setting content |
|--------------|--|
| Read from | <p>Select where to read the filing data from.</p> <ul style="list-style-type: none"> • Read filing data from GP Backup SRAM Read filing data on the display unit's backup memory (SRAM). • Read filing data from CF Card Read filing data on the display unit's CF/SD Card. Transfer data defines the folder number. For example, when the transfer data is "2", read data from "ZE0002.BIN" on the CF Card. • Read filing data from GP FEPRM Read filing data from the display unit's internal memory (screen area). Transfer data defines the folder number. For example, when the transfer data is "2", read data from folder "2" in internal memory. <p>NOTE</p> <ul style="list-style-type: none"> • When the GP Type is ST6000 Series, SP-5B**/WinGP, GP4000/LT4000 Series, GP3000 Series, LT3000, you cannot select [Read filing data from GP FEPRM]. • For models without a CF/SD Card slot, even if you select [Read filing data from CF Card", you cannot read filing data. |
| GP Type | Select the display unit network node whose filing data you are reading. |
| Save Folder | <p>Selects a folder to save read out filing data.</p> <p>C drive (C:) folder is to appear for initial setting.</p> <p>To change the drive to display, click the list button to select new one.</p> |

| Setting item | Setting content |
|--------------------|--|
| Save Name | <p>Sets a file name to save. "%Y%M%D%h%m%s" is to appear for initial setting. If you do not change the file name, time data of PC is to set for "%" position.</p> <p>NOTE</p> <ul style="list-style-type: none"> By specifying a macro code for the file name to save, you can set the file name as a node name or device data. <p> "37.1 Restrictions on Names"</p> |
| Zero Suppress | <p>If you set the save file name as "%Y%M%D%h%m%s" and check this item, the digit 0 in "%" is not displayed. (Example) The file name which is written at 7:31 when specifying the save file name as "%h%m" Checked: ••731••.xls Not checked: ••0731••.xls</p> |
| Reset | Returns [Saved File Name] to default ("%Y%M%D%h%m%s"). |
| File's Save format | <p>Selects the saving format of read out filing data.</p> <ul style="list-style-type: none"> Excel file (.xls) Saves in Excel book format. Binary file (.bin) Saves in binary file format. However, you cannot edit data saved in this format. CSV file (.csv) Saves in CSV file format. <p>NOTE</p> <ul style="list-style-type: none"> When saving in CSV file format, a PFG file storing the header information of a CSV file will be created in the folder where filing data is stored. An uploaded CSV file is saved in the folder of the same name as the PFG file. |

18



Returning Filing Data to the display unit

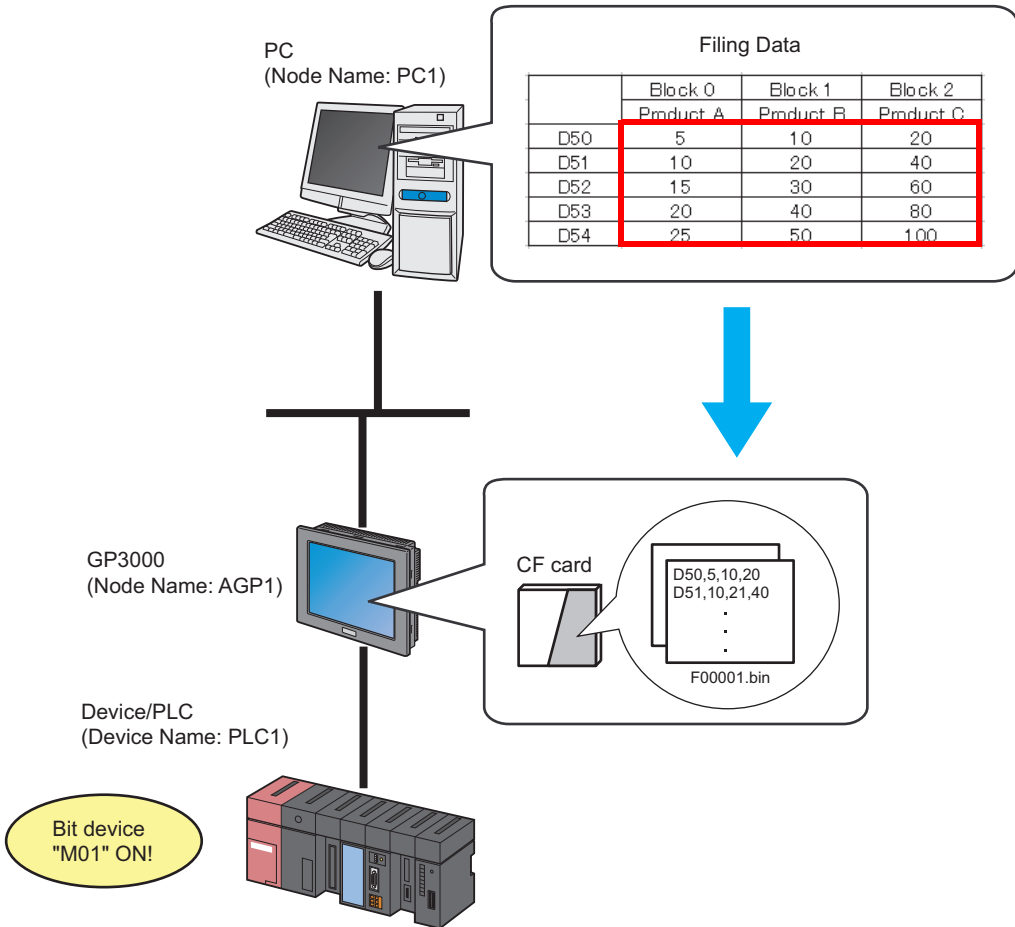
| | | |
|------|---|-------|
| 18.1 | Downloading Filing Data to the display unit | 18-2 |
| 18.2 | Setting Guide | 18-20 |
| 18.3 | Restrictions | 18-21 |

18.1 Downloading Filing Data to the display unit

NOTE • Refer to the 'GP-Pro Ex Reference Manual' for more details about filing data.

[Action Example]

Detect the rising of the trigger device (bit device: "M01") of Device/PLC, read out once read Excel filing data, and write the data to the file "F00001.bin" in a CF card of display unit.



This section describes the setting procedures for executing the above action (ACTION) as an example.

NOTE • You can download only uploaded data from the display unit.
• You can return filing data to the display unit after correction.

[Setting Procedure]

| | | |
|----|---|--|
| 1 | Starting 'Pro-Studio EX' (page18-4) | This step starts 'Pro-Studio EX'. |
| 2 | Registering Entry Nodes (page18-4) | This step registers the PC and the display units as entry nodes. |
| 3 | Registering Symbols (page18-5) | This step registers as a symbol the device of Device/PLC which serves as a trigger condition (trigger). |
| 4 | Parameter Setting for Feature (ACTION) (page18-6) | This step sets the following items: <ul style="list-style-type: none"> • Save Folder • File name • GP type • Write Destination |
| 5 | Setting Trigger Conditions (page18-10) | This step sets conditions (trigger) for writing filing data in. |
| 6 | Setting Data Received by ACTION (page18-13) | This step sets a constant value to be the folder No. of a CF card to which data is written. |
| 7 | Setting ACTION Node/Process Completion Notification (page18-15) | This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed. |
| 8 | Verifying Setting Result (page18-17) | This step verifies setting results on the setting content list screen. |
| 9 | Saving a Network Project File (page18-19) | This step saves the current settings as a network project file and reloads. |
| 10 | Transferring a Network Project File (page18-19) | This step transfers a saved network project file to the display unit. |
| 11 | Executing ACTION (page18-19) | This step writes Excel filing data to a CF card of display unit when the preset trigger condition has become effective. |

18.1.1 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

18.1.2 Registering Entry Nodes

This step registers the PC and the display unit connected with network as nodes.

Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1

IP Address :192.168.0.1



Node Name :AGP1

IP Address :192.168.0.100

Device/PLC Information

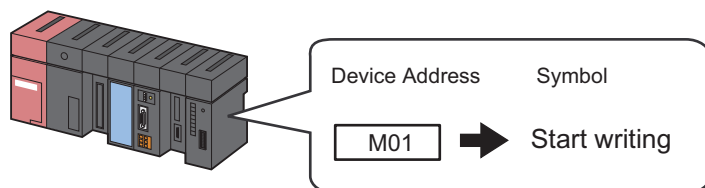
Ex.

| Entry node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

18.1.3 Registering Symbols

This step registers as a symbol the device address of Device/PLC which serves as a trigger condition.

Refer to "32 Symbol Registration" for details about symbols.



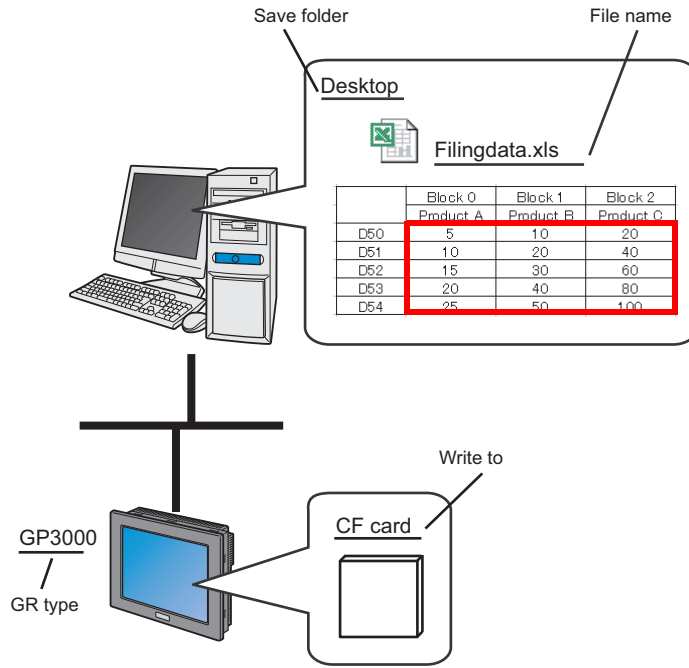
Ex.

| Setting item | Setting content |
|--|----------------------------|
| Symbol Name | Start writing |
| Data Type | Bit |
| Device address for symbol registration | "M01" of Device/PLC (PLC1) |
| No. of Devices | 1 |

18.1.4 Parameter Setting for Feature (ACTION)

This step makes settings to write filing data in. (parameter settings)

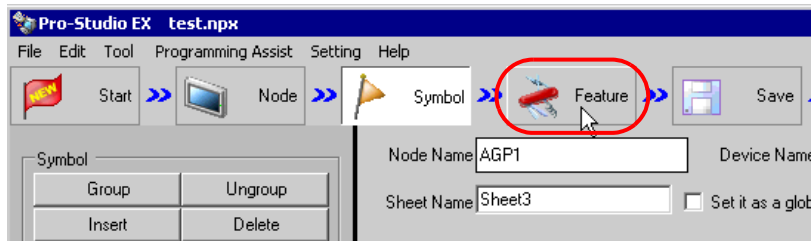
Refer to "18.2 Setting Guide" for more details about ACTION parameters.



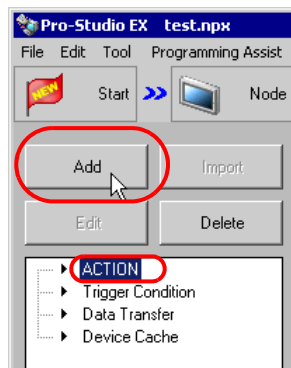
Ex.

| Setting item | Setting content |
|-------------------|----------------------|
| ACTION Name | Filing data download |
| Save Folder | PC desktop |
| File name | Filingdata.xls |
| GP type | GP3000 |
| Write Destination | CF card |

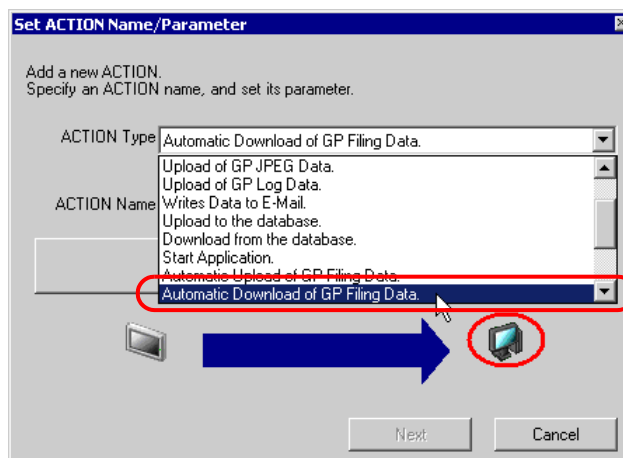
- 1 Click the [Feature] icon on the status bar.



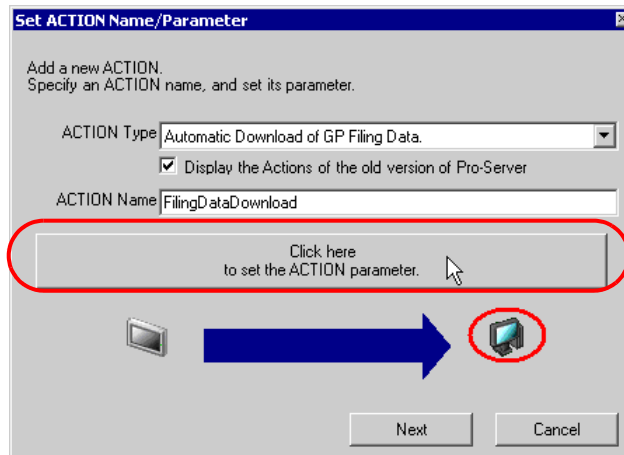
- 2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.



- 3 Click the [ACTION Type] list button, and select "Automatic Download of GP Filing Data".
Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "Filing Data Download".

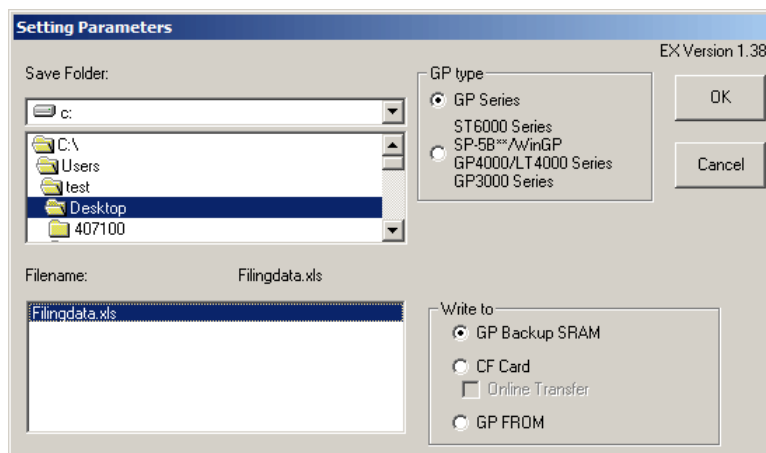


- 4 Click the [Click here to set the ACTION parameter] button.

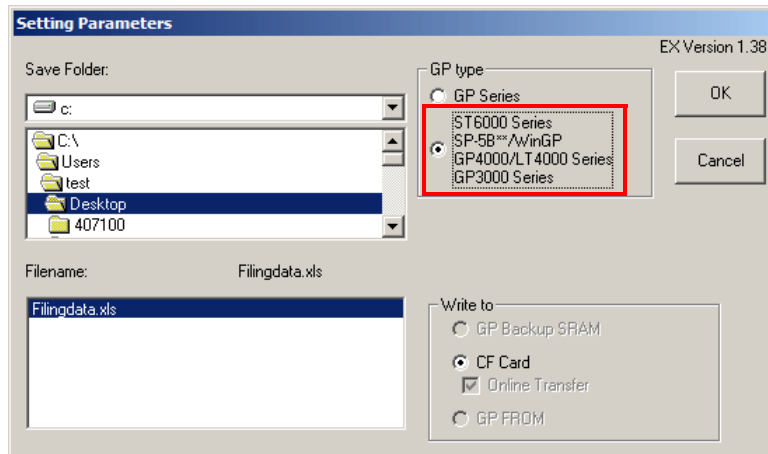


- 5 Select filing data to download.

Set "Desktop" for [Save Folder] as a folder to store the file to read data from, with the file name "Filingdata.xls".



- 6 Check [ST6000 Series, SP-5B**/WinGP, GP4000/LT4000 Series, GP3000 Series] in [GP type].



Write Destination is automatically set to [CF Card].

- 7 Click the [OK] button.

This is the end of the feature (ACTION) settings.

18.1.5 Setting Trigger Conditions

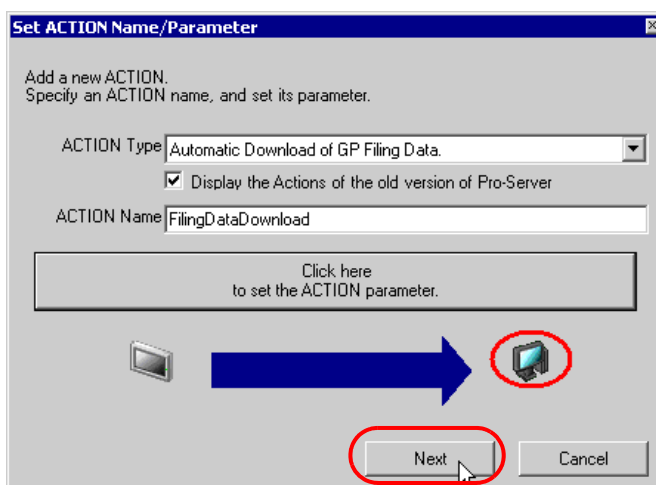
This step sets conditions (trigger bit ON) for writing filing data in.

Refer to "33 Trigger Conditions" for details about trigger conditions.

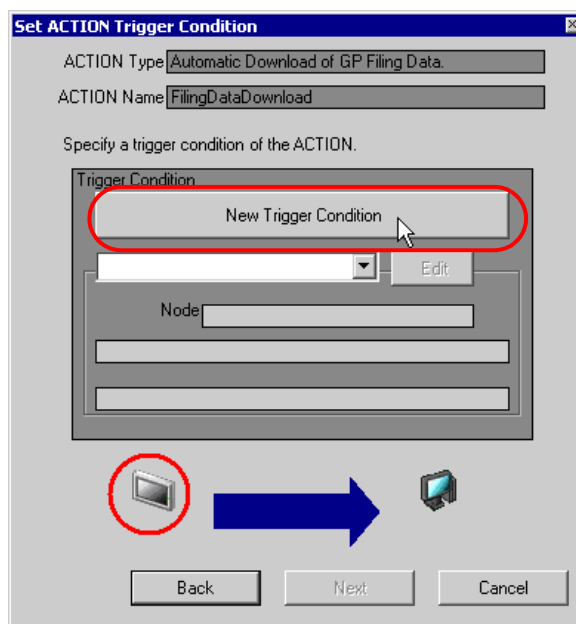
Ex.

- Trigger Condition Name: Turn on write start bit
- Trigger Condition : When "Start writing" (M01) is ON

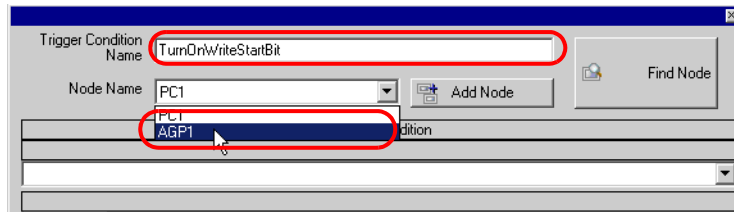
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



2 Click the [New Trigger Condition] button.

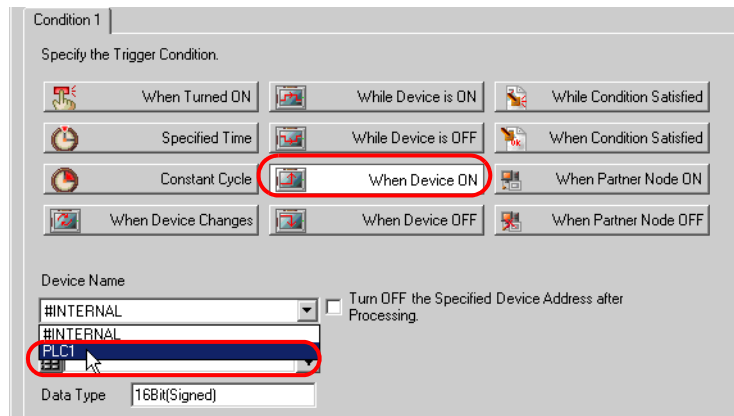


- 3 Enter the trigger condition name "TurnOnWriteStartBit" in [Trigger Condition Name], and select "AGP1" in [Node Name] which has the device to serve as the trigger condition.

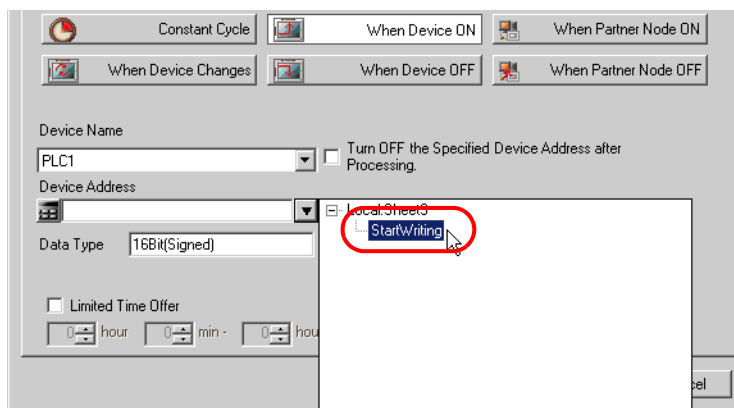


NOTE • Here, you are to specify the node having the device to be the trigger condition.
 ➞ "33 Trigger Conditions"

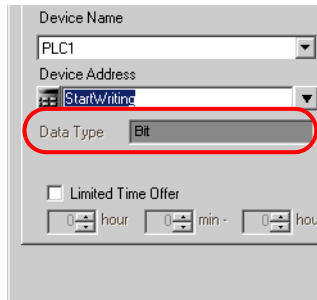
- 4 Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



- 5 Click the [Device Address] list button and select "StartWriting" for the symbol name of the device which serves as the trigger condition.



[Data Type] automatically appears after selection, too.



NOTE

- You can also set trigger conditions by combining 2 different types of conditions ("And" condition or "Or" condition).



"33 Trigger Conditions"

6 Click the [OK] button.

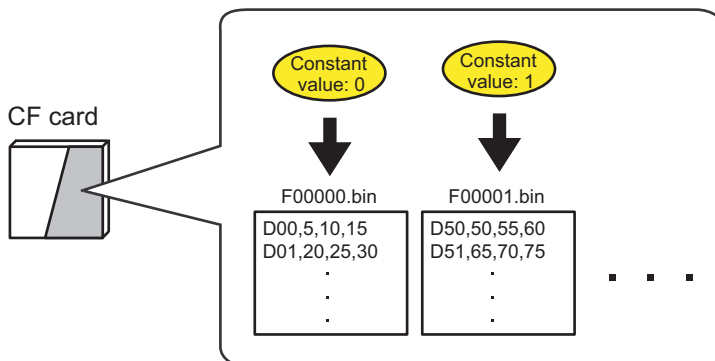
This is the end of trigger condition settings.

18.1.6 Setting Data Received by ACTION

This step sets data to transfer in ACTION.

NOTE

- If a data write destination is of a CF card or FEPRM, the transfer data set here is to be the file No. of the CF card or FEPRM. The file number refers to the numerical value of ***** of "F*****.bin".

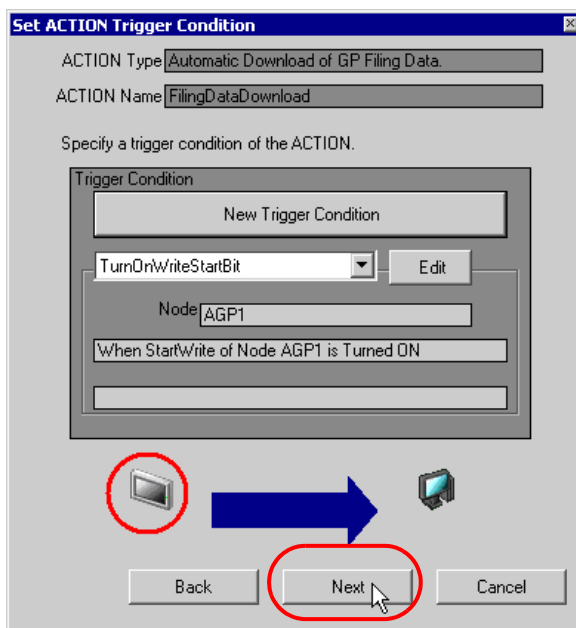


If you write into the backup SRAM, you can use any value for transfer data.

Ex.

- Constant value to transfer: 1

1 On the "Set ACTION Trigger Condition" screen, click the [Next] button.



- 2 After clicking [Constant Value], enter "1" in the text box for the constant value to transfer and "1" in [No.].

Data settings to be received by ACTION

ACTION Type: Automatic Download of GP Filing Data.

ACTION Name: FilingDataDownload

From the trigger node, this ACTION

File No.

is received as a data to do the ACTION. As the data value, the device value of the trigger node or a constant is available. Specify the data.

Transfer Source

Node: AGP1

Device Name: #INTERNAL

Device Address: Constant Value

Constant Value: 1

Data Type: 16Bit(Signed) No.: 1

Back Next Cancel

NOTE • You can transfer stored values as data by specifying a symbol or a device address.

This is the end of the setting of data received by ACTION.

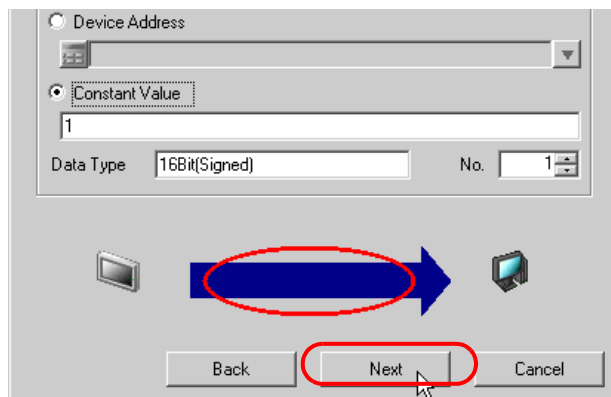
18.1.7 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed.

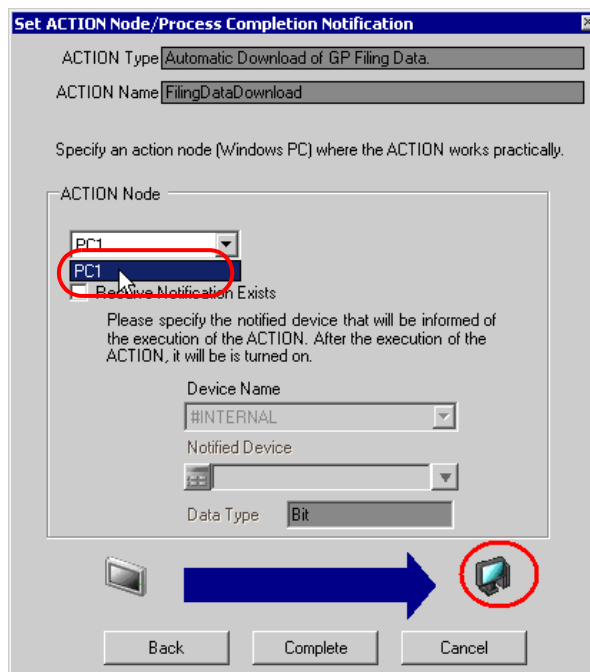
Ex.

- ACTION Node : PC1
- Receive Notification: OFF

1 On the "Data settings to be received by ACTION" screen, click the [Next] button.



2 Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates. Also, clear the check if [Receive Notification Exists] has been checked.



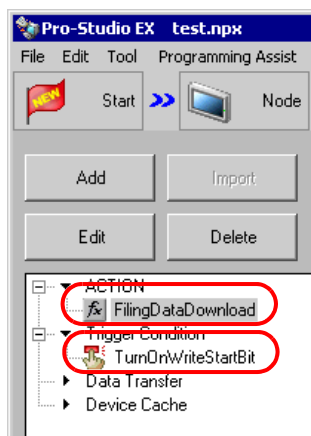
NOTE

- When "Receive Notification Exists" is turned on, the specified bit device will be turned on when the ACTION is completed. This can be used as the trigger condition of the subsequent ACTION when you want to execute two or more ACTIONS sequentially.

☞ "33 Trigger Conditions"

3 Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the ACTION and trigger condition name you set will appear.

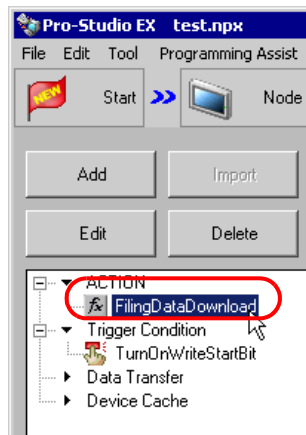


This is the end of the settings of the ACTION node and process completion notification.

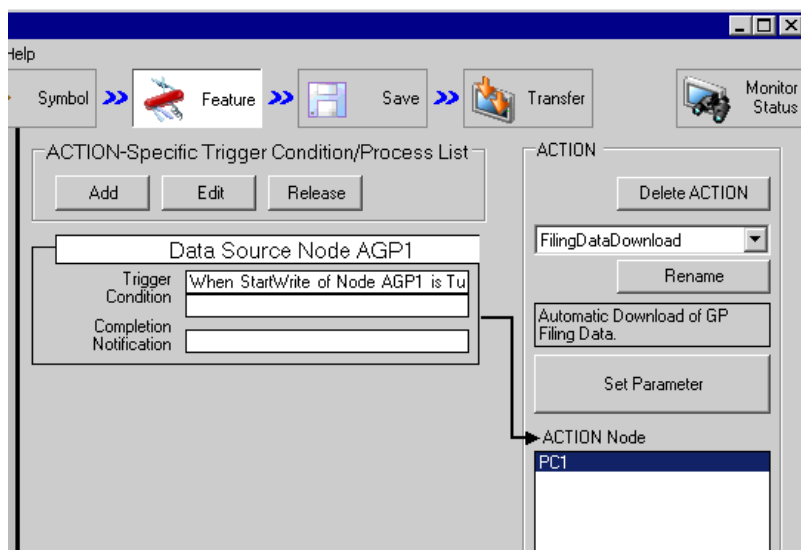
18.1.8 Verifying Setting Result

This step verifies setting results on the setting content list screen.

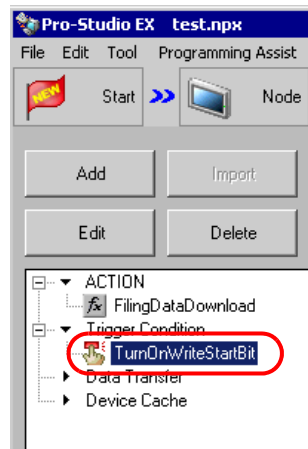
- 1 Select the ACTION name "FilingDataDownload" from the tree display on the left of the screen.



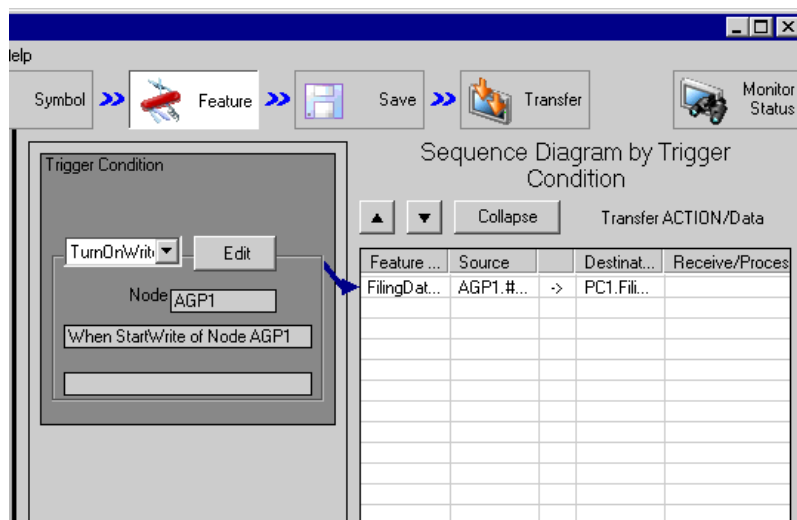
Confirm that the setting content appears on the right of the screen.



- 2 Select the trigger condition name "TurnOnWriteStartBit" from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

18.1.9 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
- Be sure to reload the network project file to 'Pro-Server EX'. If not, ACTION will not work.

Ex.

- Path of network project file : Desktop\FilingData_download.npxe
- Title : Filing data download action

18.1.10 Transferring a Network Project File

This step transfers a saved network project file to entry nodes.

Refer to "26 Transferring" for details about transferring a network project file.

NOTE

- Be sure to transfer a network project file. If not, ACTION will not work.

18.1.11 Executing ACTION

This step activates ACTION to write filing data into File Folder in a CF card of display unit when the preset trigger condition has become effective.

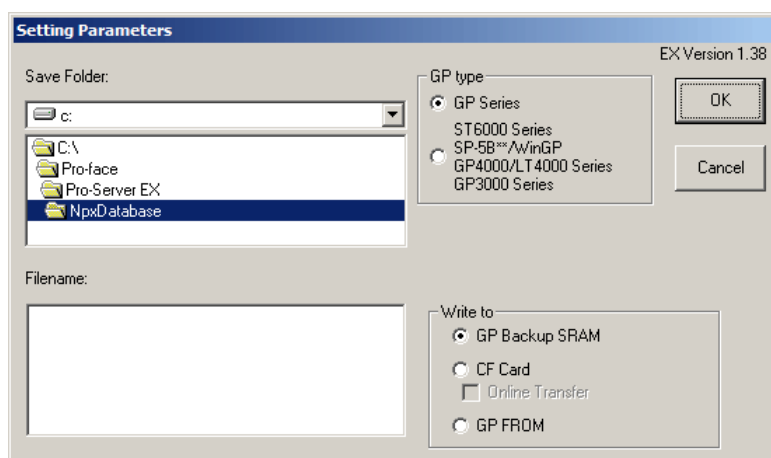
This is the end of the explanation of this ACTION.

NOTE

- If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".

18.2 Setting Guide

This section explains how to set the parameters of ACTION.



| Setting item | Setting content |
|--------------|---|
| Save Folder | Selects the folder where filing data to download will be stored. C drive (C:) folder is to appear for initial setting. To change the drive to display, click the list button to select new one. |
| File name | Sets the file name of filing data to download. |
| GP type | Selects the display unit model for writing filing data. |
| Write to | <p>Selects where to write filing data.</p> <ul style="list-style-type: none"> • GP Backup SRAM Write data is to the display unit's backup memory (SRAM). • CF Card Write data to the display unit's CF/SD Card. When the [Online Transfer] check box is selected, you can write filing data even while the Display is in operation. When the [Online Transfer] check box is cleared, during the write operation the Display switches to the Transfer screen and stops all other communication. After transfer is complete, returns to the initial screen. • GP FEPROM Writes data to the display unit's internal memory (SRAM). During the write operation the Display switches to the Transfer screen and stops all other communication. After transfer is complete, returns to the initial screen. <p>NOTE</p> <ul style="list-style-type: none"> • When the GP Type is [ST6000 Series, SP-5B**/WinGP, GP4000/LT4000 Series, GP3000 Series], you cannot select [GP Backup SRAM] or [GP FEPROM]. The [CF Card] and [Online Transfer] options become selected. • For models without a CF /SD Card slot, even if you select [CF Card] you will not be able to download filing data. |

18.3 Restrictions

- You cannot download each sheet of an uploaded Excel file after saving in a CSV file.
- You cannot put together uploaded CSV files in an Excel file when downloading.

19



Sending Data between Devices

| | | |
|------|---------------------------------------|-------|
| 19.1 | Try to Send Data between Devices..... | 19-2 |
| 19.2 | Setting Guide | 19-34 |
| 19.3 | Restrictions | 19-44 |

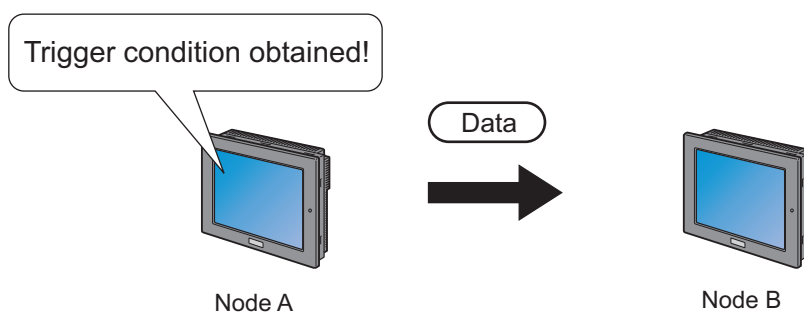
19.1 Try to Send Data between Devices

There are two types of methods for exchanging data between devices: the distribution type and the collection type.

- Distribute Type

Transfers data from the node where the trigger condition has been satisfied to the other node.

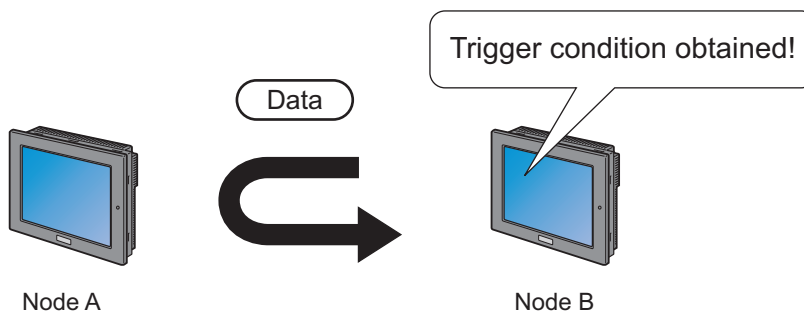
☞ "19.1.1 Distributing Data"



- Collection Type

Collects data from the other node to the node where the trigger condition has been satisfied.

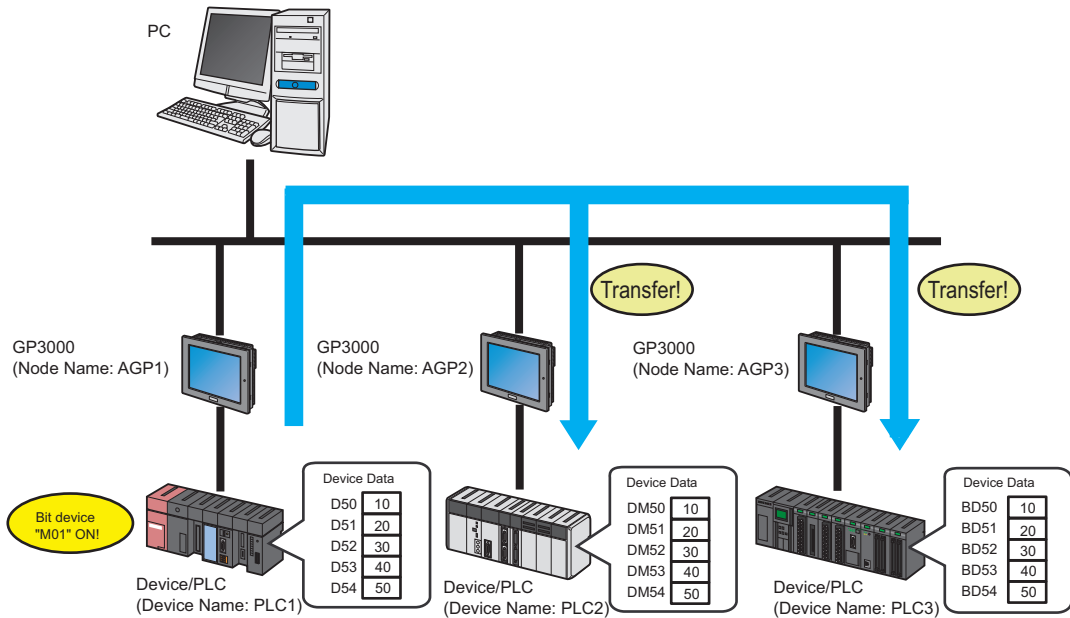
☞ "19.1.2 Collecting Data"



19.1.1 Distributing Data

[Action Example 1]

Detect the rising of the device of the Device/PLC (PLC1) (bit device: address "M01") and transfer the data of the device of the Device/PLC (PLC1) (word device: addresses "M50" to "M54") to the other two Device/PLCs (PLC2 and PLC3) (word device: addresses "DM50" to "DM54", and addresses "BD50" to "BD54").



This section describes the setting procedures for executing the above action as an example.

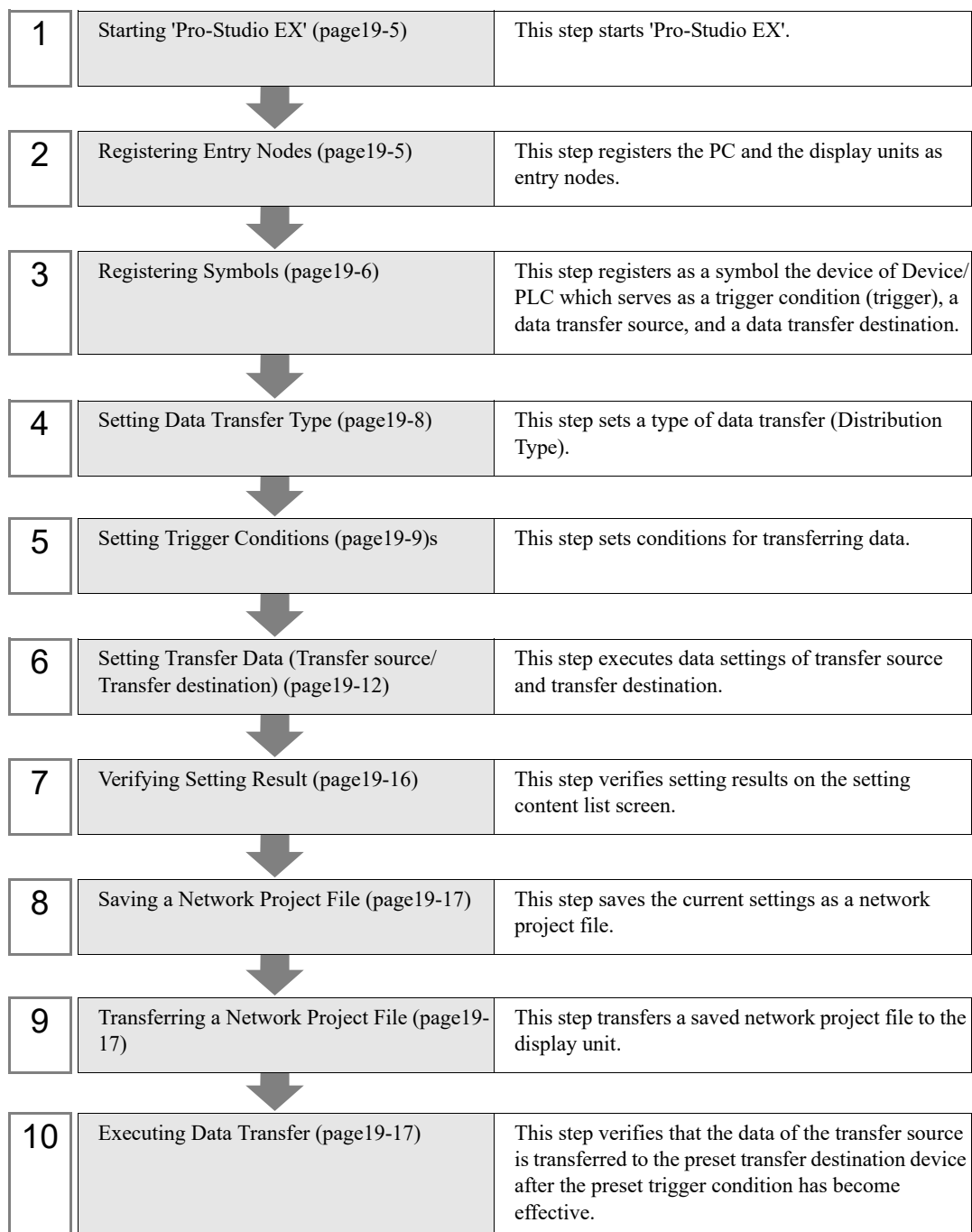
NOTE

- After the transfer of the network project is completed, it is not necessary to use the PC in providing data.
- Refer to [Action Example 2] for the action example of "Collection Type".

☞ "19.1.2 Collecting Data"

- When [Network project ID] is selected under [Compare the network project on Connection] on the [Option Settings] screen, you need to transfer the network project to all nodes, including those which are not affected by the changes. When [Network project changes] is selected, you can transfer the network project only to nodes that are affected by the changes, unless the changes of the network project affect target items for comparison. This makes the transfer procedure easier in large-scale systems. Refer to the following section for more details on [Compare the network project on Connection].
- When you change selection of [Compare the network project on Connection] on the [Option Settings] screen, execute the transfer to all nodes.
- If tags are set up on transfer destination or transfer source nodes, you can transfer data to GP4000/LT4000 Series and WinGP nodes.

[Setting Procedure]



■ Starting 'Pro-Studio EX'

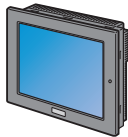
This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

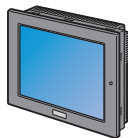
■ Registering Entry Nodes

This step registers the display units connected with a network as nodes.

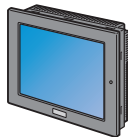
Refer to "31 Node Registration" for details about entry nodes.



Node Name :AGP1
IP Address :192.168.0.100
Device/PLC Information



Node Name :AGP2
IP Address :192.168.0.101
Device/PLC Information



Node Name :AGP3
IP Address :192.168.0.102
Device/PLC Information

Ex.

Transfer Source

- Entry Node : GP3000 series
- Node Name : AGP1
- IP Address : 192.168.0.100

Transfer Destination 1

- Entry Node : GP3000 series
- Node Name : AGP2
- IP Address : 192.168.0.101

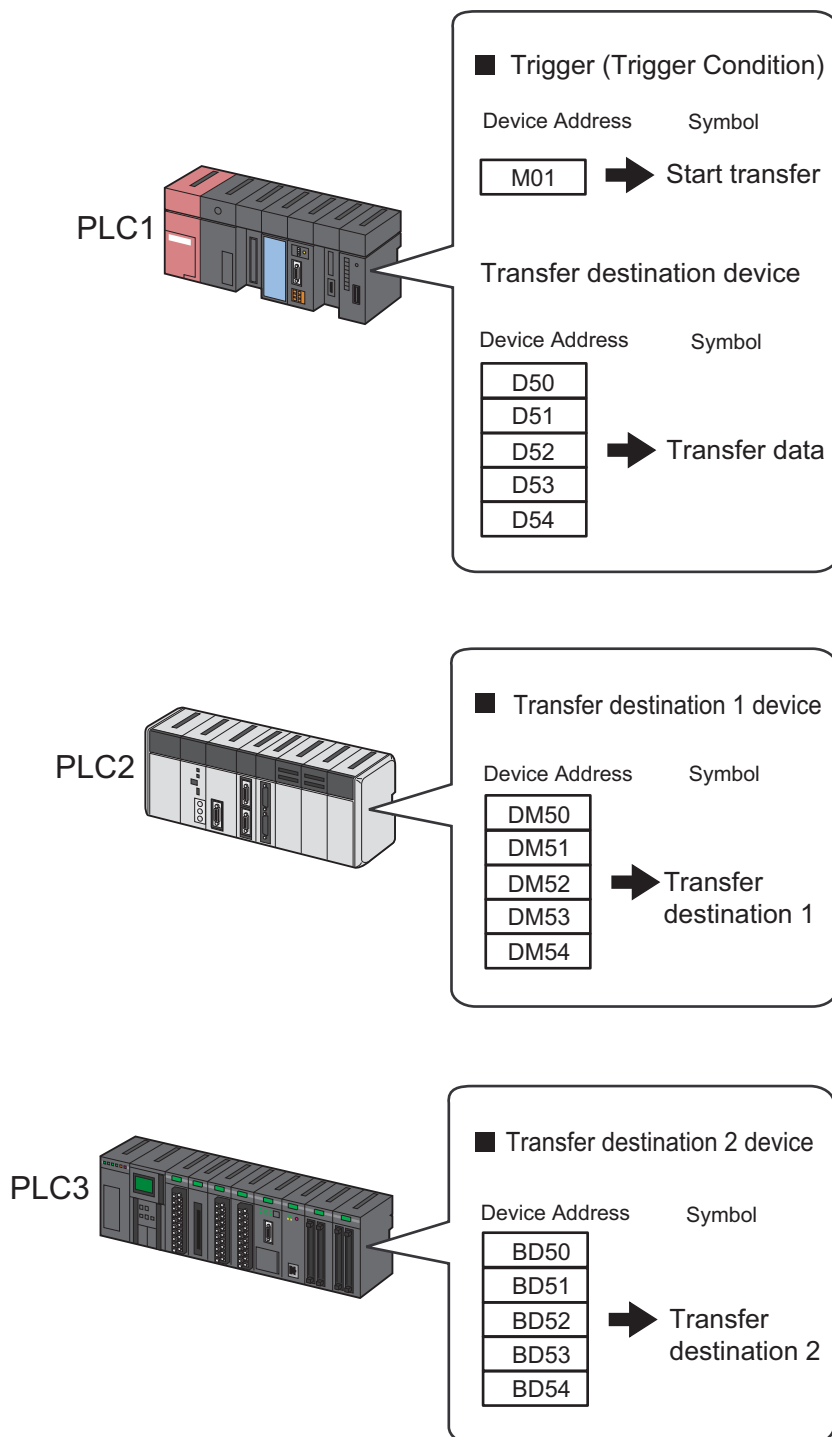
Transfer Destination 2

- Entry Node : GP3000 series
- Node Name : AGP3
- IP Address : 192.168.0.102

■ Registering Symbols

This step registers as a symbol the device of Device/PLC which serves as a trigger condition (trigger), a data transfer source, and a data transfer destination.

Refer to "32 Symbol Registration" for details about symbols.



Ex.

- Trigger (trigger condition)

| Setting item | Setting content |
|--|----------------------------|
| Symbol Name | Start transfer |
| Data Type | Bit |
| Device address for symbol registration | "M01" of Device/PLC (PLC1) |
| No. of Devices | 1 |

- Transfer Source Device

| Setting item | Setting content |
|--|-------------------------------------|
| Symbol Name | Transfer data |
| Data Type | 16Bit (Signed) |
| Device address for symbol registration | "D50" to "D54" of Device/PLC (PLC1) |
| No. of Devices | 5 |

- Transfer Destination Device

| Setting item | Setting content | |
|--|---------------------------------------|---------------------------------------|
| Symbol Name | Transfer Destination 1 | Transfer Destination 2 |
| Data Type | 16Bit (Signed) | |
| Device address for symbol registration | "DM50" to "DM54" of Device/PLC (PLC2) | "BD50" to "BD54" of Device/PLC (PLC3) |
| No. of Devices | 5 | 5 |

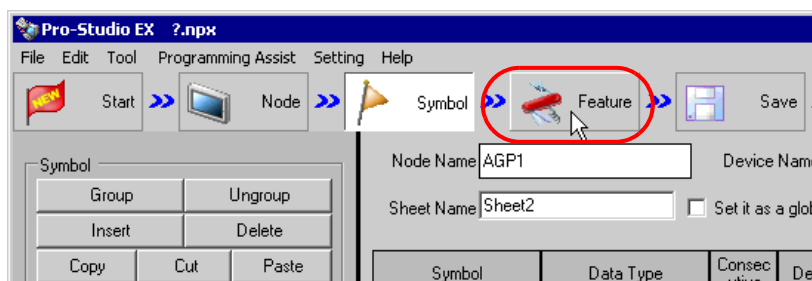
■ Setting Data Transfer Type

This step sets a type of data transfer (Distribute Type).

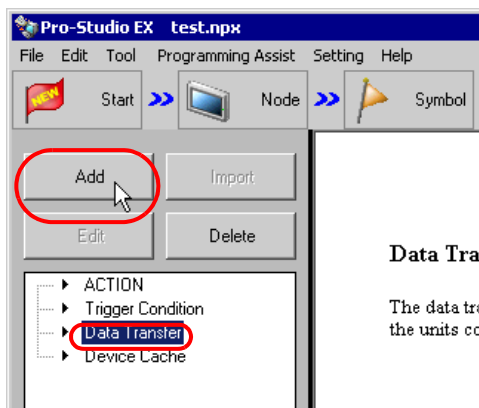
Ex.

| Setting item | Setting content |
|--------------------|-----------------|
| Data Transfer Name | Data transfer |
| Transfer Type | Distribute type |

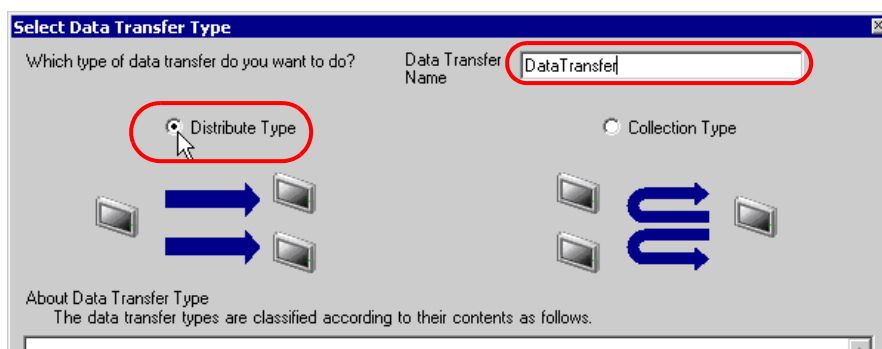
- 1 Click the [Feature] icon on the status bar.



- 2 Select [Data Transfer] from the tree display on the left of the screen, then click the [Add] button.



- 3 Enter "Data Transfer" in [Data Transfer Name] as a data transfer name to set, and then check [Distribute Type].

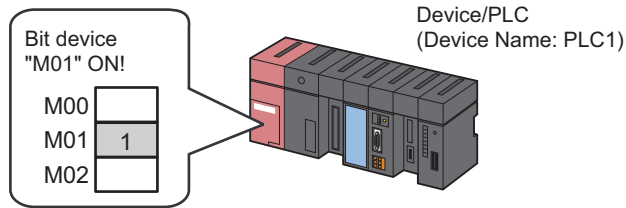


This is the end of data transfer type settings.

■ Setting Trigger Conditions

This step sets conditions (trigger bit ON) for transferring data.

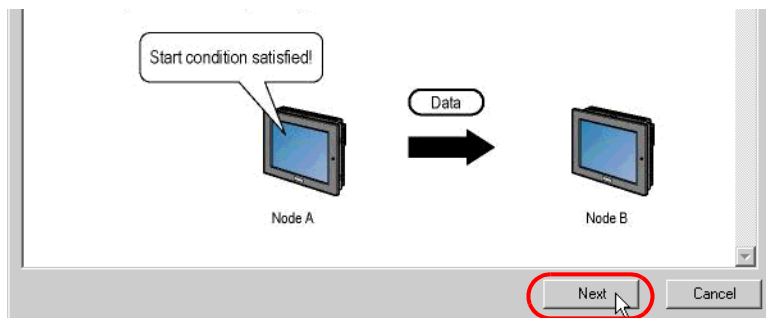
Refer to "33 Trigger Conditions" for details about trigger conditions.



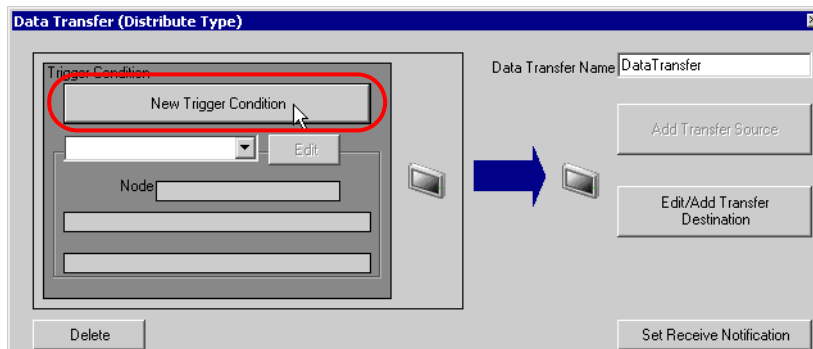
Ex.

- Trigger Condition Name: Turn on data transfer bit
- Trigger Condition: When "Transfer start" (M01) is ON

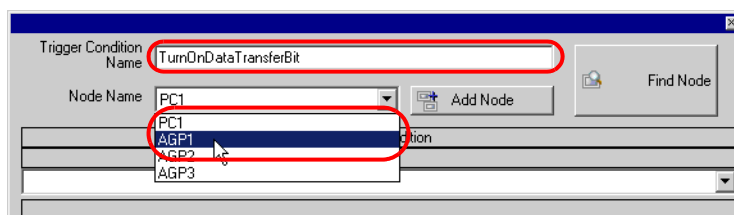
1 On the "Select Data Transfer Type" screen, click the [Next] button.



2 Click the [New Trigger Condition] button.



- 3 Enter the trigger condition name "TurnOnDataTransferBit" in [Trigger Condition Name], and select "AGP1" in [Node Name] which has the device to serve as the trigger condition (trigger).

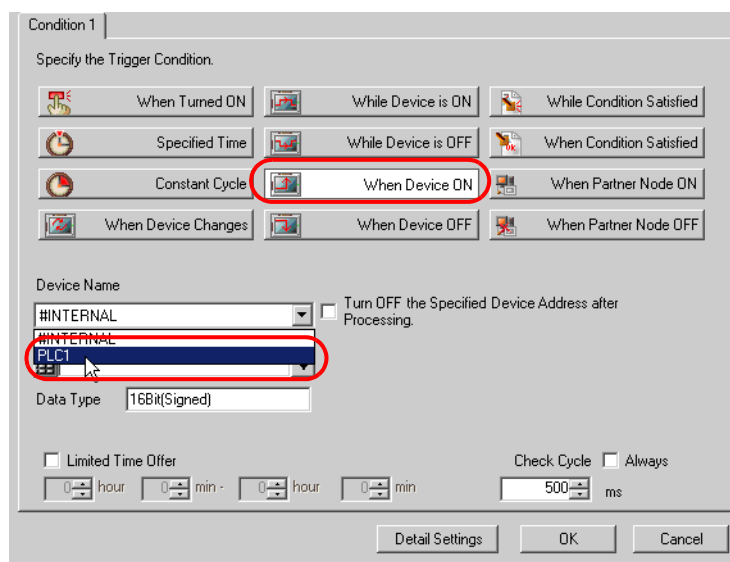
**NOTE**

- Here, you are to specify the node having the device to be the trigger condition.

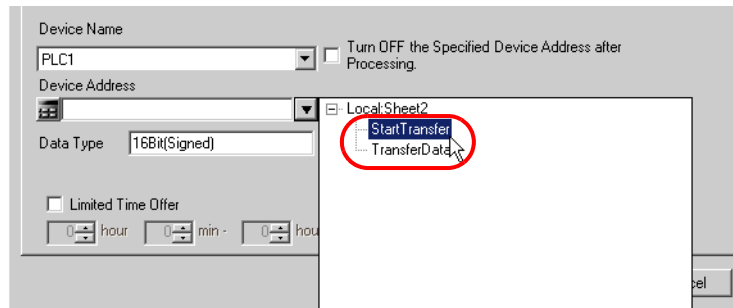


"33 Trigger Conditions"

- 4 Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



- 5 Click the [Device Address] list button and select "StartTransfer" for the symbol name of the device which serves as the trigger.


NOTE

- You can also set trigger conditions by combining 2 different types of conditions ("And" condition or "Or" condition).



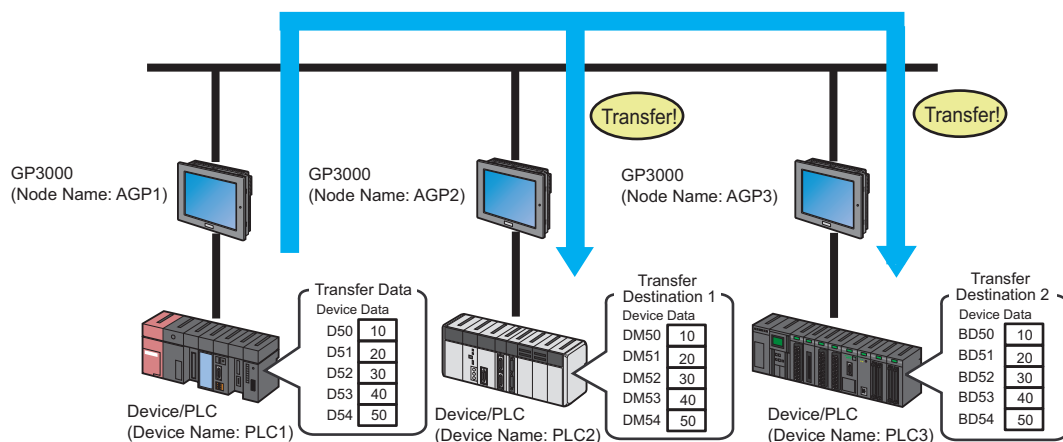
"33 Trigger Conditions"

- 6 Click the [OK] button.

This is the end of trigger condition settings.

■ Setting Transfer Data (Transfer source/Transfer destination)

This step sets data of transfer source and transfer destination.



NOTE

- When tags are set up in the transfer source node, for the transfer destination you can specify Pro-Server EX, ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, and GP4000/LT4000 Series nodes.

When tags are set up in the transfer destination node, for the transfer source node you can specify Pro-Server EX, ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, and GP4000/LT4000 Series nodes.

Ex.

- Transfer Source

Device Name : PLC1

Device : Transfer Data

- Transfer Destination 1

Node Name : AGP2

Device Name : PLC2

Device : Transfer Destination 1

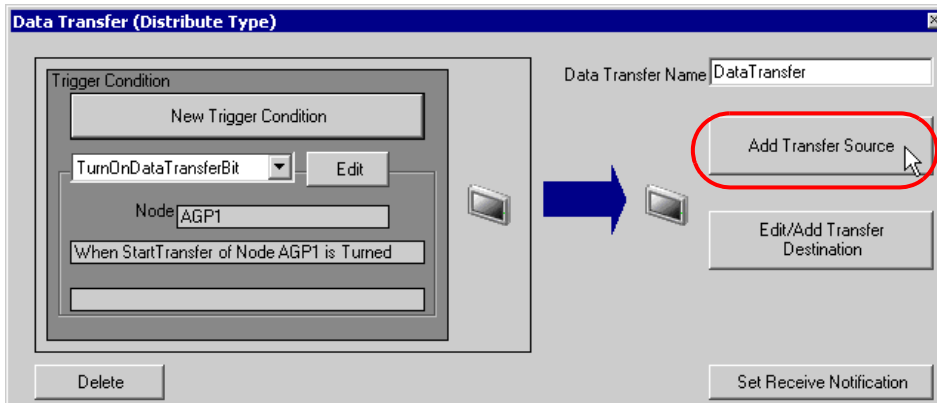
- Transfer Destination 2

Node Name : AGP3

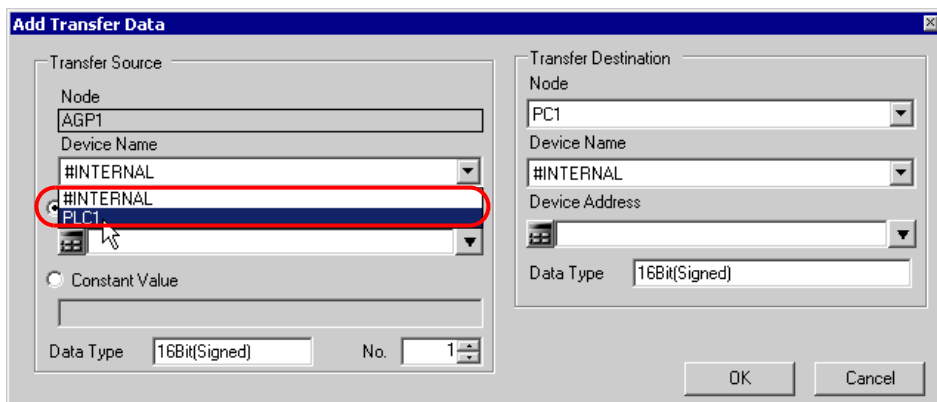
Device Name : PLC3

Device : Transfer Destination 2

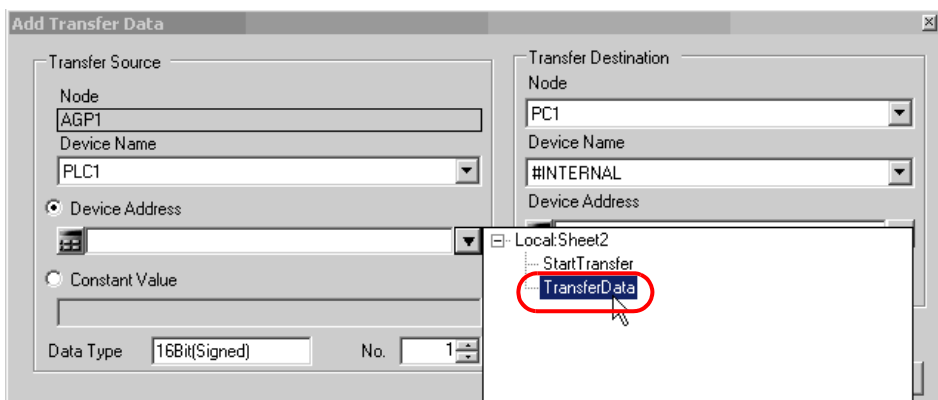
- 1 On the "Data Transfer (Distribute Type)" screen, click the [Add Transfer Source] button.



- 2 In [Transfer Source], click the list button of [Device Name] and select "PLC1" as a Device/PLC to be a data transfer source.

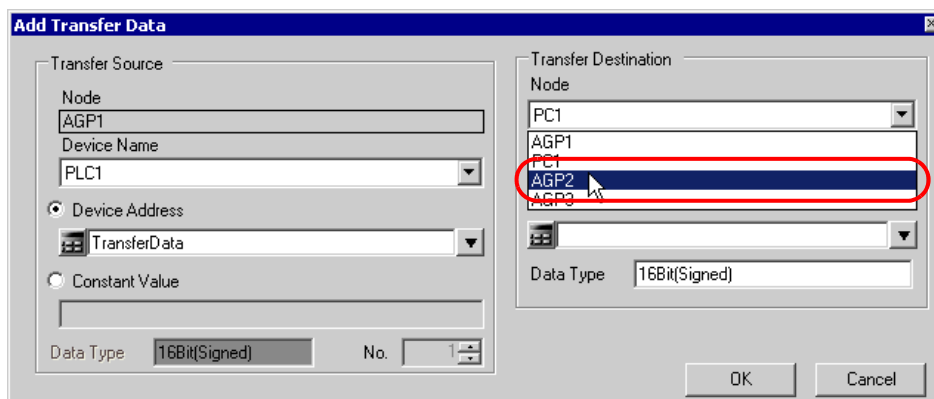


- 3 Click [Device Address] and then click the list button. Select "Transfer Data" as a symbol name of a device to be a transfer source.

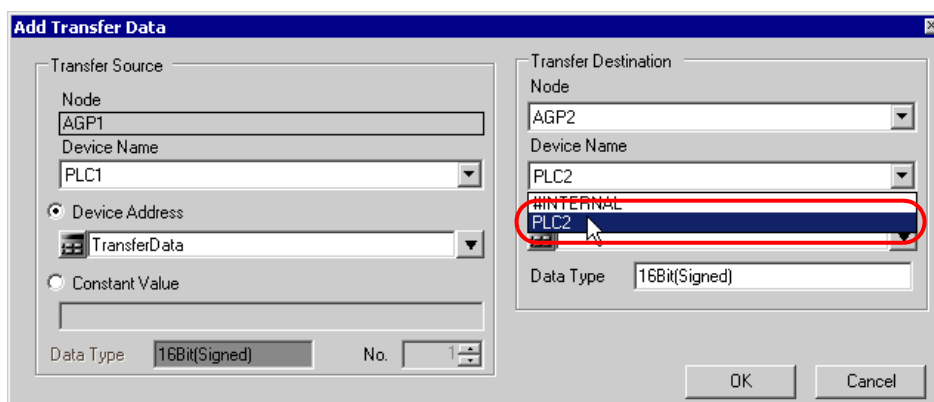


This is the end of the data settings of a transfer source.
Proceed to the data settings of transfer destination 1.

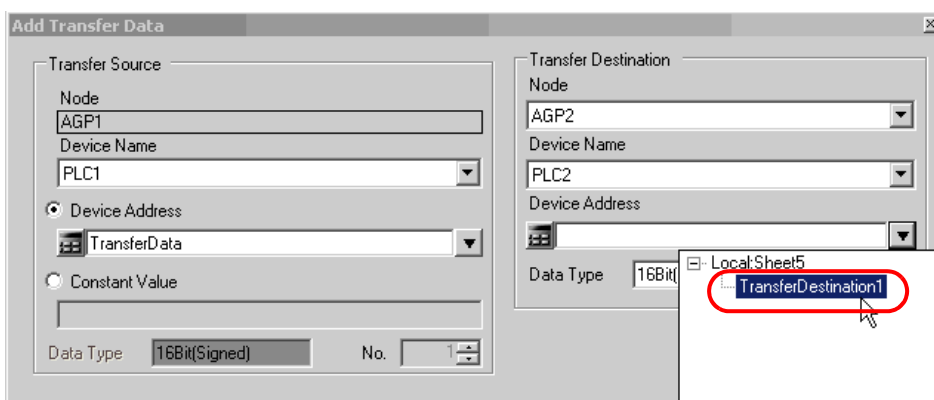
- 4 In [Transfer Destination], click the list button of [Node] and then select "AGP2" as an entry node to be a data transfer destination.



- 5 Click the list button of [Device Name] and select "PLC2" as a Device/PLC to be a data transfer destination.



- 6 Click the list button of [Device Address] and select "Transfer Destination 1" as a symbol name of a device to be a transfer destination

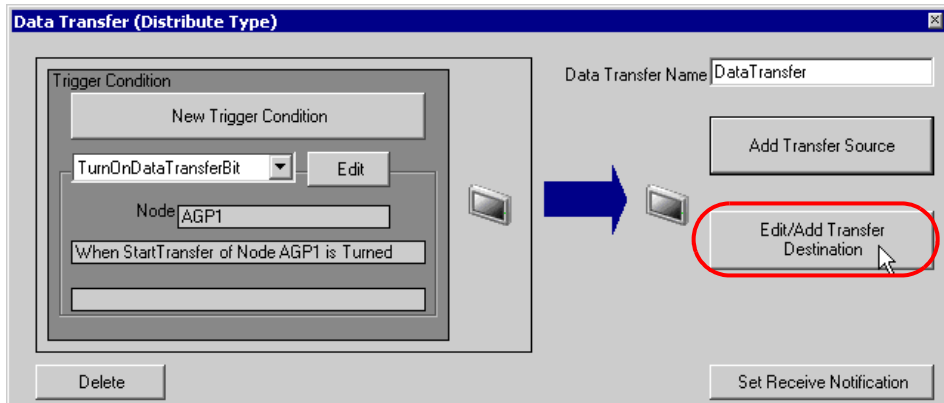


- 7 Click the [OK] button.

This is the end of the data settings of transfer destination 1.

Proceed to the data settings of transfer destination 2.

- 8 Click the [Edit/Add Transfer Destination] button.

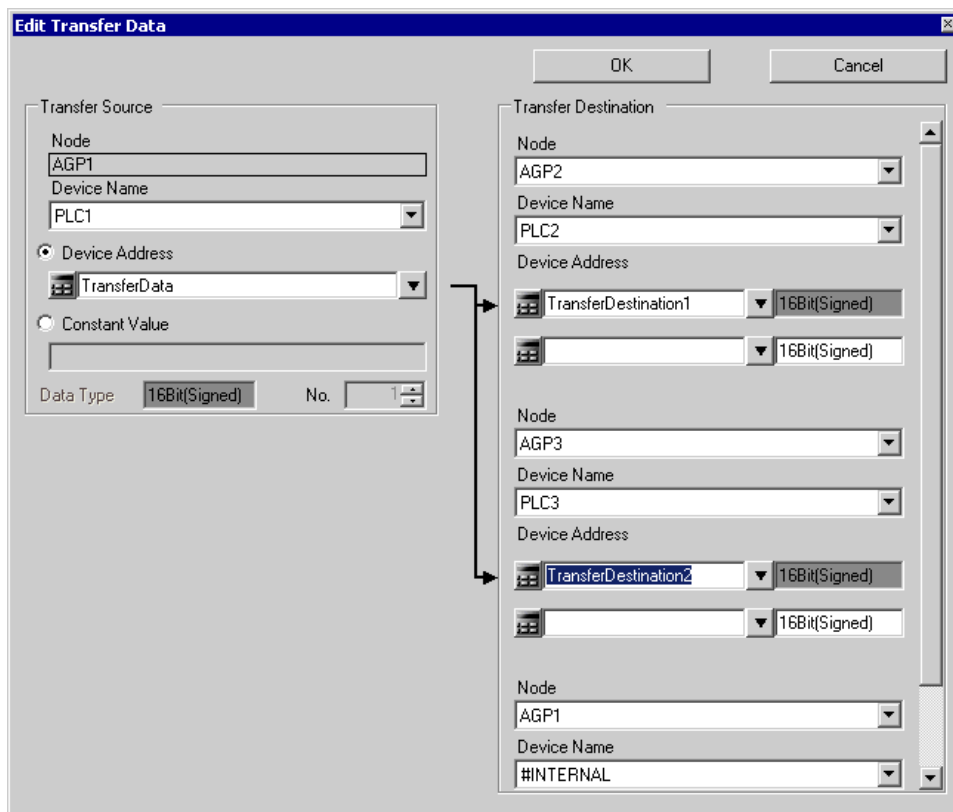


- 9 On the "Edit Transfer Data" screen, enter the following contents of transfer destination 2 in the fields to set a new transfer destination, and then click the [OK] button.

Entry node of transfer destination: AGP3

Device name of transfer destination: PLC3

Device of transfer destination: Transfer Destination 2



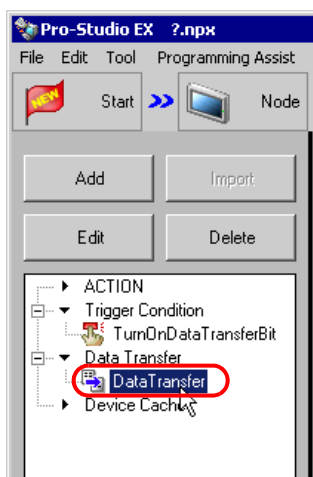
10 Click the [OK] button.

This is the end of the transfer data settings.

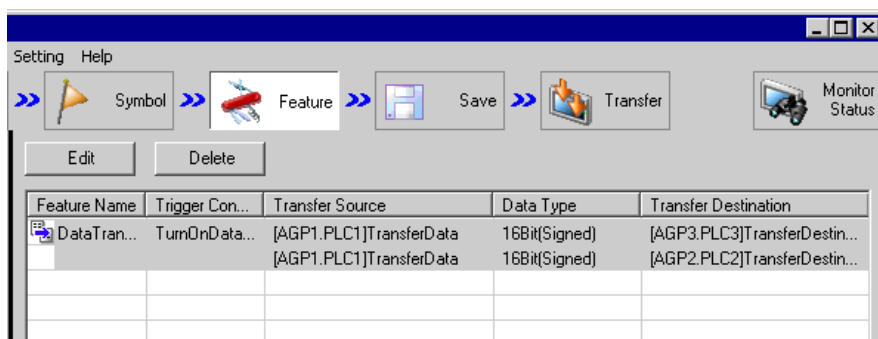
■ Verifying Setting Result

This step verifies setting results on the setting content list screen.

1 Select "Data Transfer" as a data transfer name from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

■ Saving a Network Project File

This step saves the current settings as a network project file.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes data transfer according to the settings in the file. The settings therefore need be saved in the network project file.

Ex.

- Path of network project file : Desktop\Datatrans_delivery.npxe
- Title : Data Transfer

■ Transferring a Network Project File

This step transfers a saved network project file to entry nodes.

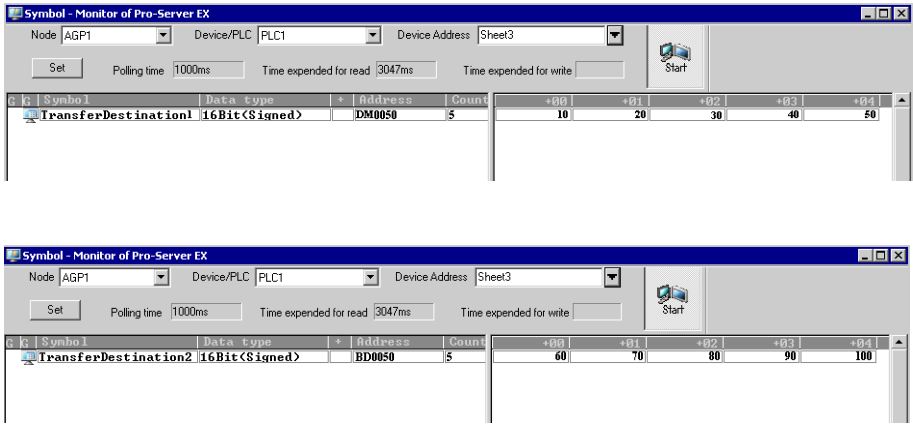
Refer to "26 Transferring" for details about transferring a network project file.

NOTE

- Be sure to transfer a network project file. If not, the data transfer feature will not work.
- It is not necessary to reload the network project file during data transfer since the PC is not active then.

■ Executing Data Transfer

This step verifies that the data of the transfer source is transferred to the preset transfer destination device after the preset trigger condition has become effective.



NOTE

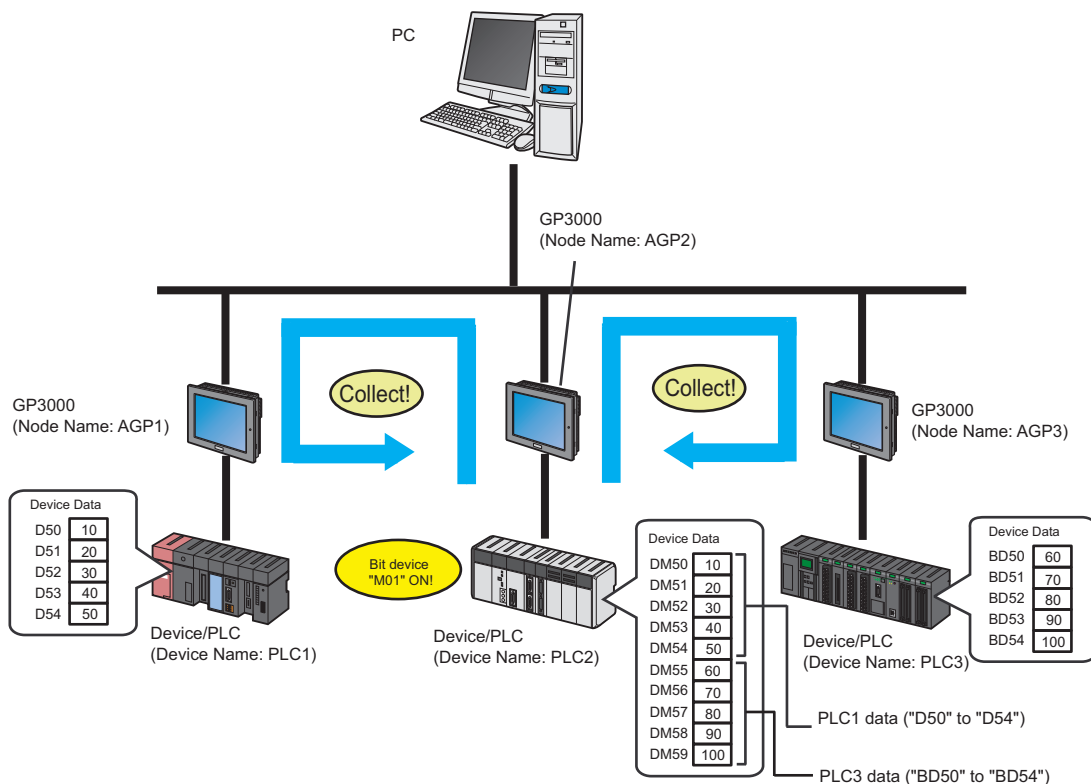
- Check the actually written values with such function as monitor of rudder creation software.

This is the end of the explanation of data transfer (distribution type).

19.1.2 Collecting Data

[Action Example 2]

Detect the rising of the device of the Device/PLC (PLC2) (bit device: address "01"), collect the data of the device of the Device/PLCs (PLC1 and PLC 3) (word device: addresses "D50" to "D54" and addresses "BD50" to "BD54"), and then write the collected data in the device of the Device/PLC (PLC 2) (word device: addresses "DM50" to "DM59").



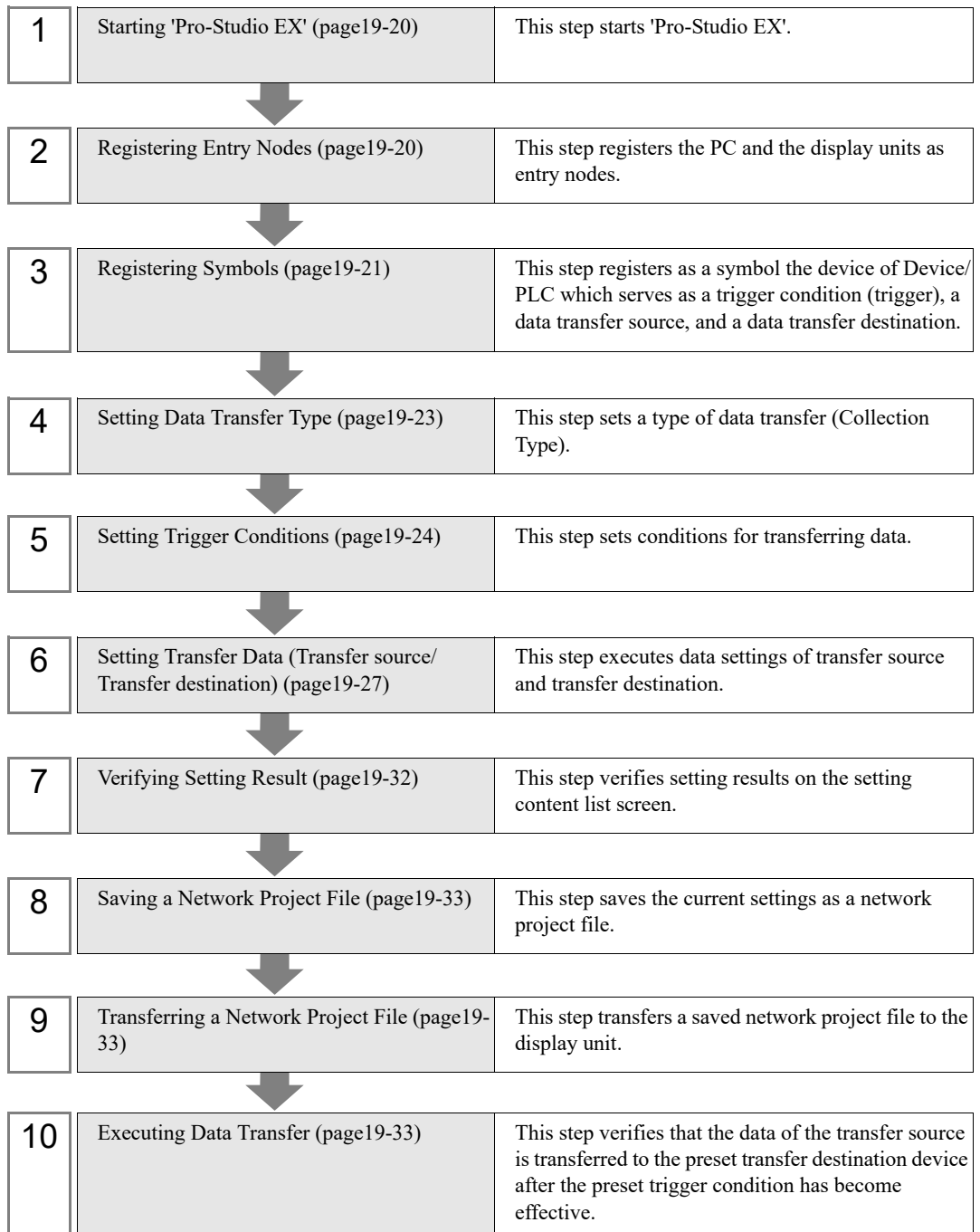
This section describes the setting procedures for executing the above action as an example.

NOTE

- When the transfer of the network project is completed, the PC is not necessary for operation.
- Refer to [Action Example 1] for the action example of "Distribution Type".

☞ "19.1.1 Distributing Data"

[Setting Procedure]



■ Starting 'Pro-Studio EX'

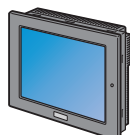
This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

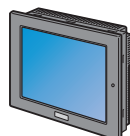
■ Registering Entry Nodes

This step registers the display units connected with a network as nodes.

Refer to "31 Node Registration" for details about entry nodes.



Node Name :AGP1
IP Address :192.168.0.100
Device/PLC Information



Node Name :AGP2
IP Address :192.168.0.101
Device/PLC Information



Node Name :AGP3
IP Address :192.168.0.102
Device/PLC Information

Ex.

Transfer Source 1

- Entry Node : GP3000 series
- Node Name : AGP1
- IP Address : 192.168.0.100

Transfer Destination

- Entry Node : GP3000 series
- Node Name : AGP2
- IP Address : 192.168.0.101

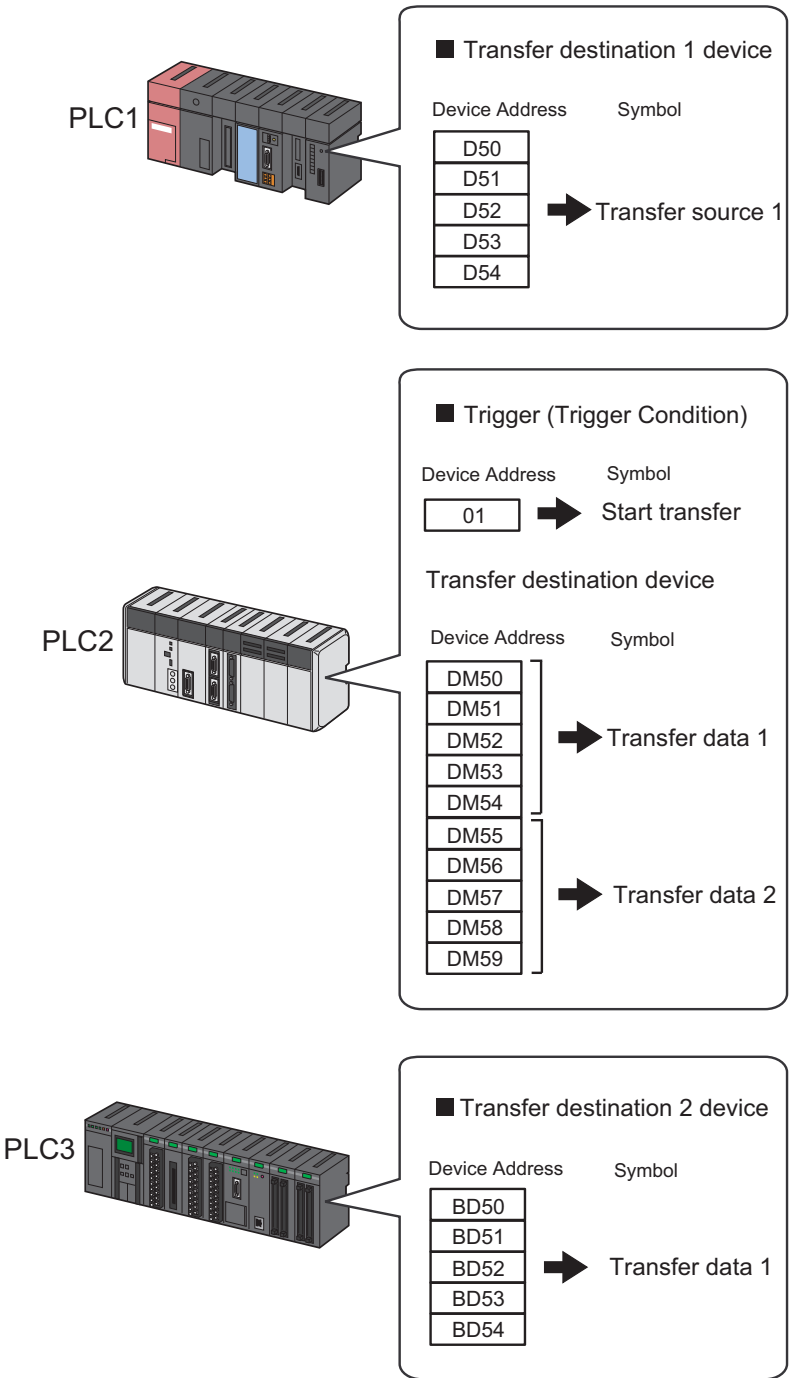
Transfer Source 2

- Entry Node : GP3000 series
- Node Name : AGP3
- IP Address : 192.168.0.102

■ Registering Symbols

This step registers as a symbol the device of Device/PLC which serves as a trigger condition (trigger), a data transfer source, and a data transfer destination.

Refer to "32 Symbol Registration" for details about symbols.



Ex.

- Trigger (trigger condition)

| Setting item | Setting content |
|--|---------------------------|
| Symbol Name | Start transfer |
| Data Type | Bit |
| Device address for symbol registration | "01" of Device/PLC (PLC2) |
| No. of Devices | 1 |

- Transfer Source Device

| Setting item | Setting content | |
|--|---------------------------------------|---------------------------------------|
| Symbol Name | Transfer Source 1 | Transfer Source 2 |
| Data Type | 16Bit (Signed) | |
| Device address for symbol registration | "DM50" to "DM54" of Device/PLC (PLC1) | "BD50" to "BD54" of Device/PLC (PLC3) |
| No. of Devices | 5 | 5 |

- Transfer Destination Device

| Setting item | Setting content | |
|--|---------------------------------------|---------------------------------------|
| Symbol Name | Transfer Data 1 | Transfer Data 2 |
| Data Type | 16Bit (Signed) | |
| Device address for symbol registration | "DM50" to "DM54" of Device/PLC (PLC2) | "DM55" to "DM59" of Device/PLC (PLC2) |
| No. of Devices | 5 | 5 |

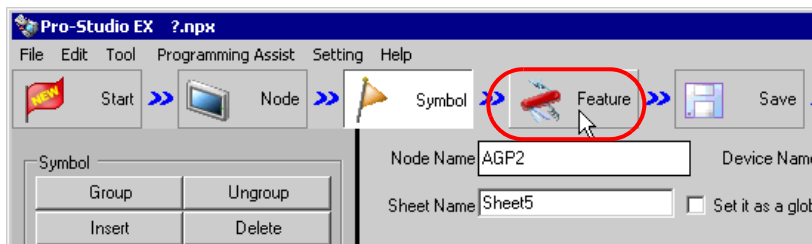
■ Setting Data Transfer Type

This step sets a type of data transfer (Collection Type).

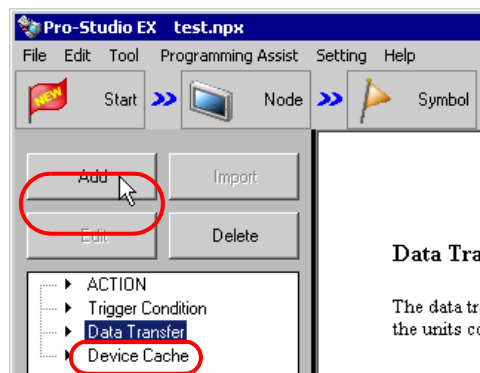
Ex.

| Setting item | Setting content |
|--------------------|-----------------|
| Data Transfer Name | Data transfer |
| Transfer Type | Collection type |

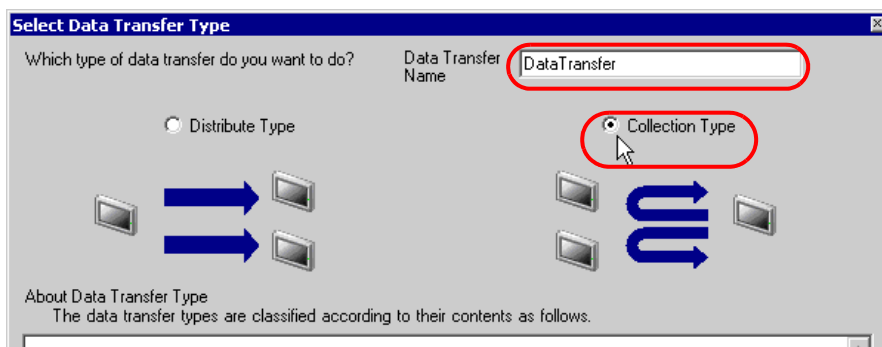
- 1 Click the [Feature] icon on the status bar.



- 2 Select [Data Transfer] from the tree display on the left of the screen, then click the [Add] button.



- 3 Enter "Data Transfer" in [Data Transfer Name] as a data transfer name to set, and then check [Collection Type].

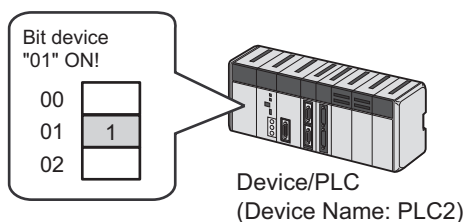


This is the end of data transfer type settings.

■ Setting Trigger Conditions

This step sets conditions (trigger bit ON) for transferring data.

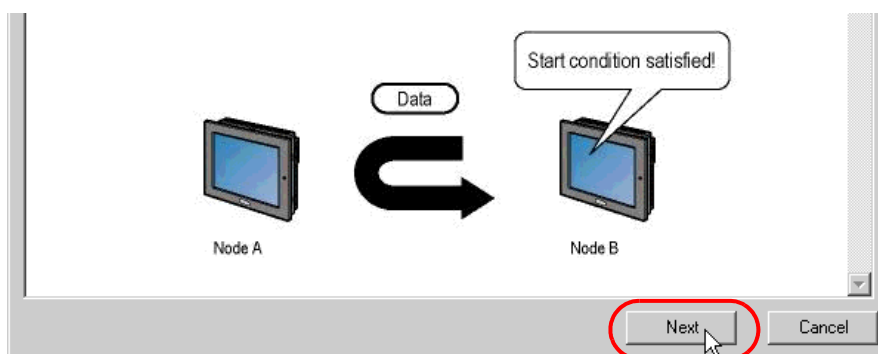
Refer to "33 Trigger Conditions" for details about trigger conditions.



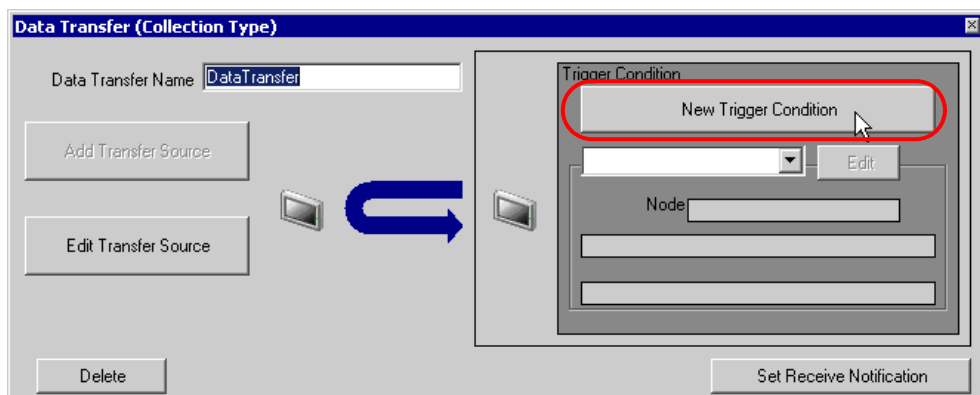
Ex.

- Trigger Condition Name: Turn on data transfer bit
- Trigger Condition: When "Transfer start" (01) is ON

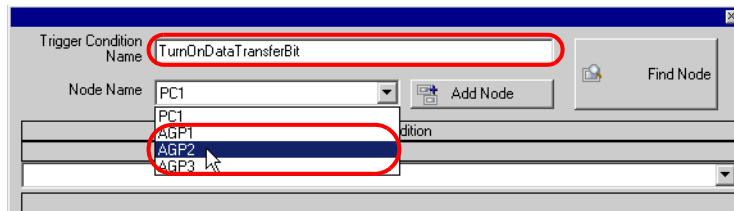
1 On the "Select Data Transfer Type" screen, click the [Next] button.



2 Click the [New Trigger Condition] button.



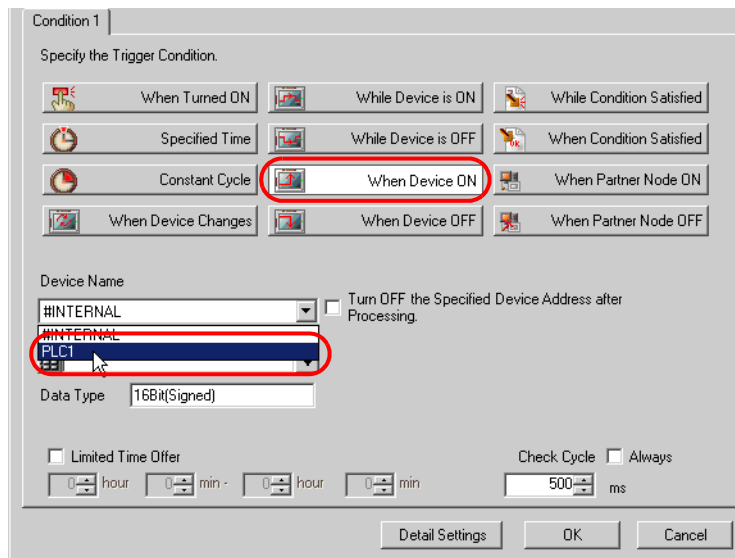
- 3 Enter the trigger condition name "TurnOnDataTransferBit" in [Trigger Condition Name], and select "AGP2" in [Node Name] which has the device to serve as the trigger condition (trigger).

**NOTE**

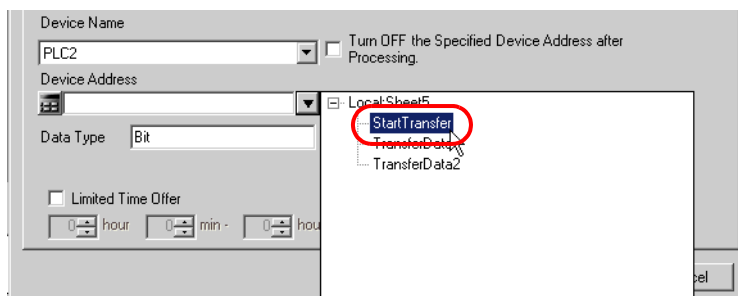
- Here, you are to specify the node having the device to be the trigger condition.

☞ "33 Trigger Conditions"

- 4 Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



- 5 Click the [Device Address] list button and select "StartTransfer" for the symbol name of the device which serves as the trigger.



NOTE

- You can also set trigger conditions by combining 2 different types of conditions ("And" condition or "Or" condition).

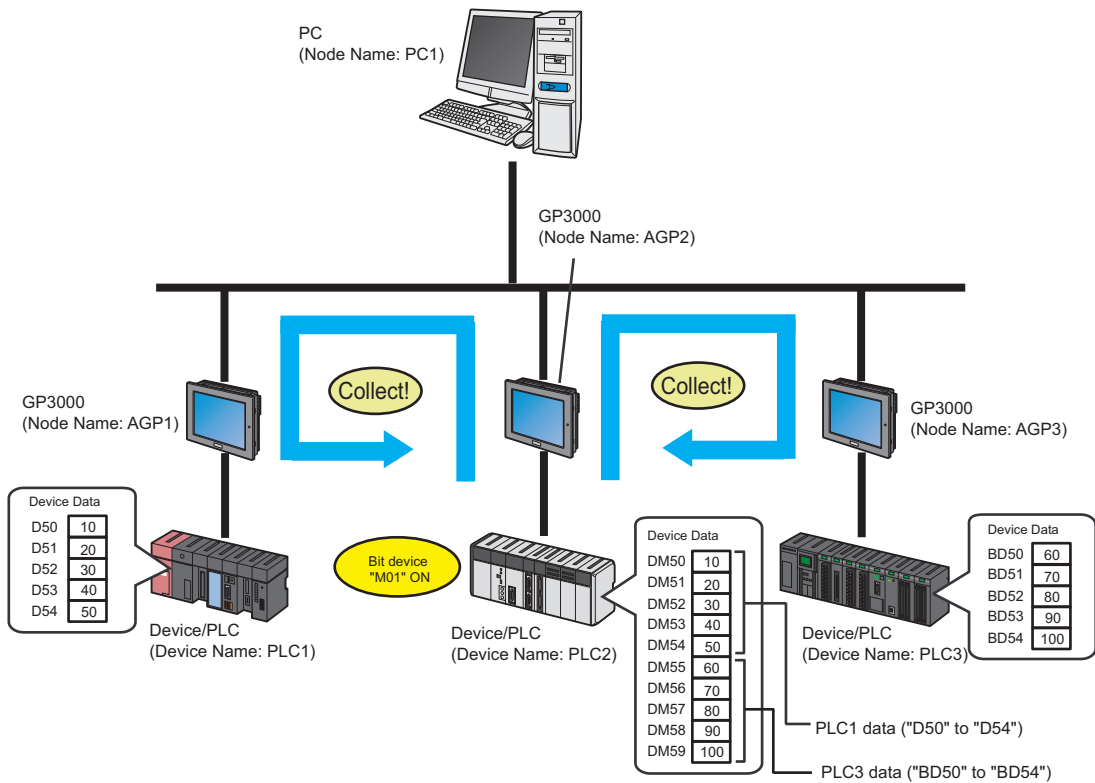
☞ "33 Trigger Conditions"

- 6 Click the [OK] button.

This is the end of trigger condition settings.

■ Setting Transfer Data (Transfer source/Transfer destination)

This step sets data of transfer source and transfer destination.



NOTE

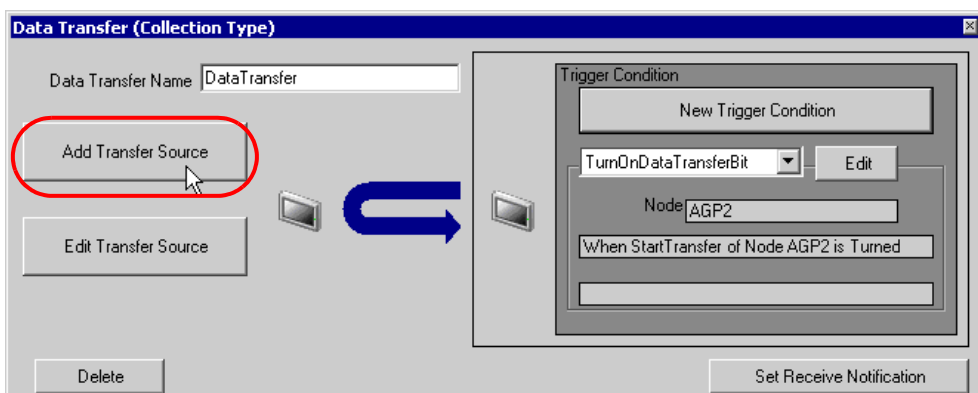
- When tags are set up in the transfer source node, for the transfer destination you can specify Pro-Server EX, ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, and GP4000/LT4000 Series nodes.

When tags are set up in the transfer destination node, for the transfer source node you can specify Pro-Server EX, ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, and GP4000/LT4000 Series nodes.

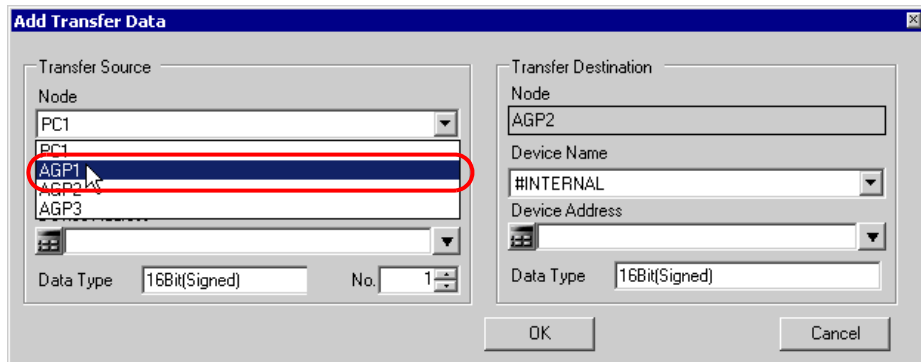
Ex.

- Transfer Source 1
Node Name : AGP1
Device Name : PLC1
Device : Transfer Source 1
- Transfer Source 2
Node Name : AGP3
Device Name : PLC3
Device : Transfer Source 2
- Transfer Destination 1
Node Name : AGP2
Device Name : PLC2
Device : Transfer Data 1
- Transfer Destination 2
Node Name : AGP2
Device Name : PLC2
Device : Transfer Data 2

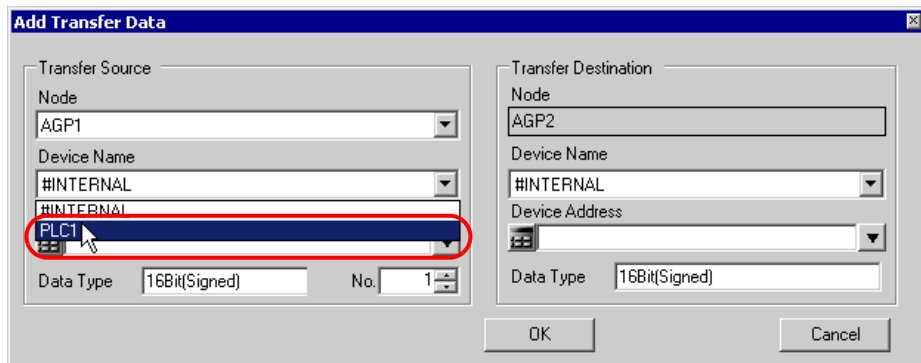
1 On the "Data Transfer (Collection Type)" screen, click the [Add Transfer Source] button.



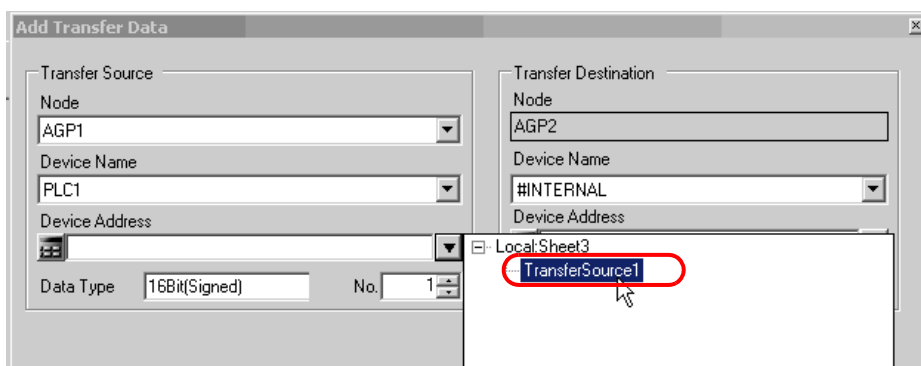
- 2 In [Transfer Source], click the list button of [Node] and then select "AGP1" as an entry node to be a data transfer source.



- 3 Click the list button of [Device Name] and select "PLC1" as a Device/PLC to be a data transfer source.



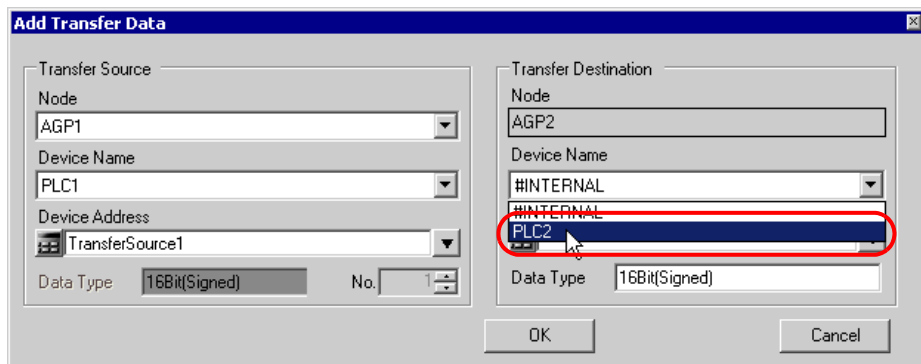
- 4 Click [Device Address] and then click the list button. Select "Transfer Source 1" as a symbol name of a device to be a transfer source.



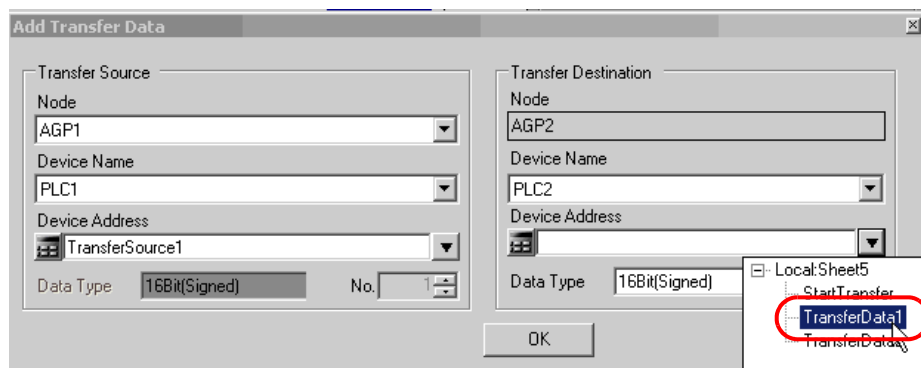
This is the end of the data settings of transfer source 1.

Proceed to the data settings of transfer destination 1.

- 5 Click the list button of [Device Name] and select "PLC2" as a Device/PLC to be a data transfer destination.



- 6 Click the list button of [Device Address] and select "Transfer Data 1" as a symbol name of a device to be a transfer destination.

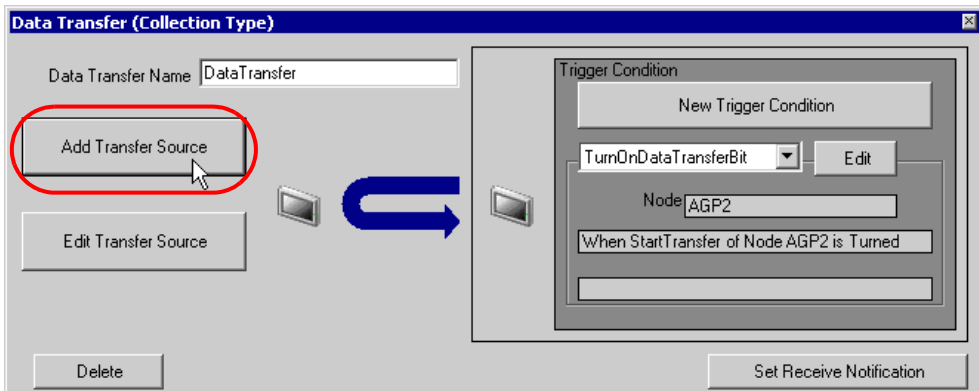


- 7 Click the [OK] button.

This is the end of the data settings of transfer destination 1.

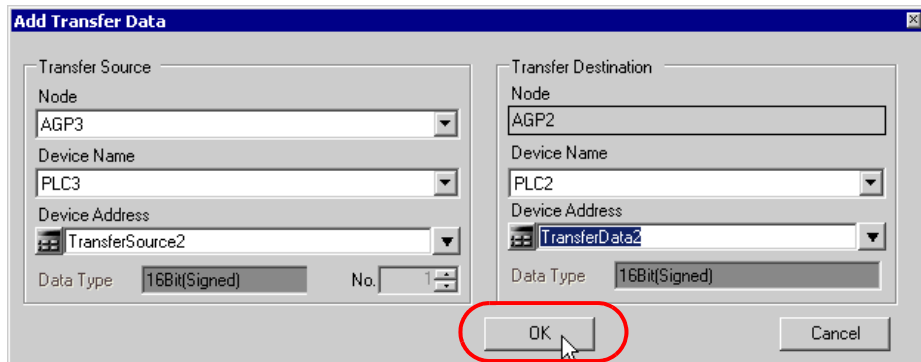
Proceed to the data settings of transfer source 2 and transfer destination 2.

- 8 Click the [Add Transfer Source] button.



- 9 Set the items below in the same way as transfer source 1 and click the [OK] button.

Entry node of transfer source: AGP3
 Device name of transfer source: PLC3
 Device of transfer source: Transfer Source 2
 Entry node of transfer destination: AGP2
 Device name of transfer destination: PLC2
 Device of transfer destination: Transfer Data 2



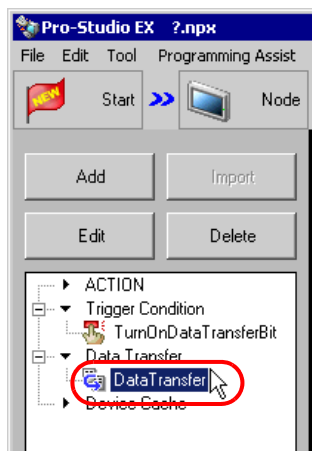
- 10 Click the [OK] button.

This is the end of the transfer data settings.

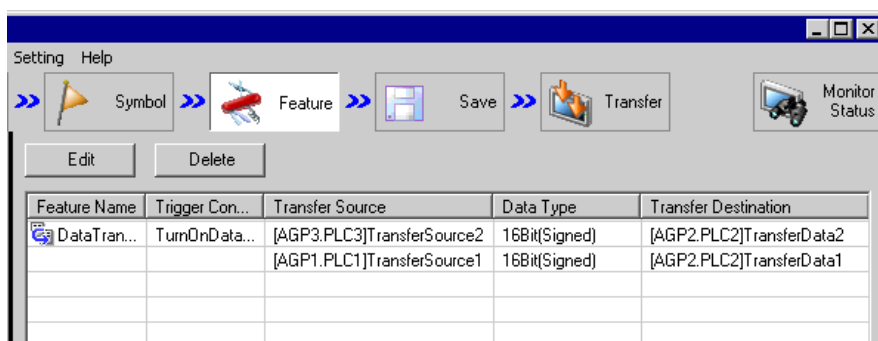
■ Verifying Setting Result

This step verifies setting results on the setting content list screen.

- 1 Select "Data Transfer" as a data transfer name from the tree display on the left of the screen.



Confirm that the setting content appears on the right of the screen.



This is the end of the verification of the settings.

■ Saving a Network Project File

This step saves the current settings as a network project file.
 Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes data transfer according to the settings in the file. The settings therefore need be saved in the network project file.

Ex.

- Path of network project file : Desktop\Datatrans_collect.npxc
- Title : Data Transfer

■ Transferring a Network Project File

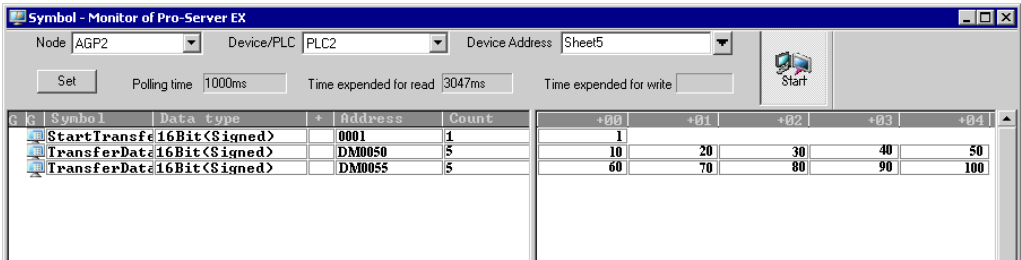
This step transfers a saved network project file to entry nodes.
 Refer to "26 Transferring" for details about transferring a network project file.

NOTE

- Be sure to transfer a network project file. If not, the data transfer feature will not work.
- It is not necessary to reload the network project file during data transfer since the PC is not active then.

■ Executing Data Transfer

This step verifies that the data of the transfer source is transferred to the preset transfer destination device after the preset trigger condition has become effective.



NOTE

- Check the actually written values with such function as monitor of rudder creation software.
- If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".

This is the end of the explanation of data transfer (collection type).

19.2 Setting Guide

This section explains how to set each setting screen in detail.

19.2.1 Distribute Type

■ "Data Transfer (Distribute Type)" Screen

| Setting item | Setting content |
|--------------------------------|--|
| Trigger Condition | Click the [New Trigger Condition] button and enter a new trigger condition (trigger) for transferring data. Alternatively, click the list button and specify an existing trigger condition. ☞ "33 Trigger Conditions" |
| Data Transfer Name | Displays the name of the data transfer that you set on the "Select Data Transfer Type" screen. |
| Add Transfer Source | Displays the "Add Data Transfer" screen. Refer to "■"Add Transfer Data" Screen (Distribution Type)" for more details. |
| Edit/Add Transfer Destination | Displays the "Edit Data Transfer" screen. Refer to "■"Edit Transfer Data" Screen (Distribution Type)" for more details. |
| Set Receive Notification | Displays the receive notification settings screen. Refer to "■ Receive Notification Settings Screen" for more details. |
| Setting Content Display Window | Displays information of transfer source on the left side, and information of transfer destination on the right side. |
| Delete | Deletes selected contents. |

■ "Add Transfer Data" Screen (Distribution Type)

Add Transfer Data

Transfer Source

Node

PC1

Device Name

#INTERNAL

Device Address

Constant Value

Data Type

16Bit(Signed)

No.

1

Transfer Destination

Node

PC1

Device Name

#INTERNAL

Device Address

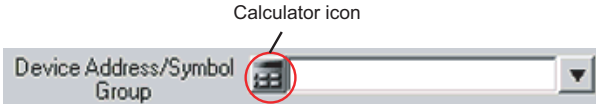

Data Type

16Bit(Signed)

OK

Cancel

| Setting item | | Setting content |
|-----------------|----------------|---|
| Transfer Source | Node | Displays an entry node (recognized automatically as a transfer source) that includes a device to cause a trigger condition (trigger) that you set in the step of trigger condition settings. |
| | Device Name | Specify a Device/PLC to be a data transfer source. |
| | Device Address | <div>Check this to transfer device values.<ul style="list-style-type: none">When specifying a device address: Enter directly from the Calculator icon.<div><div>Device Address/Symbol Group</div><div><div></div><div></div></div><div>List button</div></div><ul style="list-style-type: none">When specifying a symbol: Select the symbol by clicking the list button.<div><div>Device Address/Symbol Group</div><div><div></div><div></div></div><div>Calculator icon</div></div><div><div>NOTE</div><div><ul style="list-style-type: none">You can set up the device address when using 8 bit, TIME, TIME_OF_DAY, or DATE tags.</div></div></div> |

| Setting item | | Setting content |
|----------------------|----------------|--|
| Transfer Source | Constant Value | <p>Check this to transfer a constant value. Type the constant value in the text box.</p> <p>NOTE</p> <ul style="list-style-type: none"> (1) Specifying a numeral: Specify the numeral itself. Insert a space to specify two or more numerals. (Example) 10 11 12 13 14 15 (2) Specifying a character string: Specify the string itself if typable from the keyboard (except for []). (Example) When specifying ABC: ABC Specify an untypable string such as a control code by representing its character code in hexadecimal notation, and enclosing it in square brackets []. (Example) When specifying ABC followed by Carriage return and Line field: ABC[0C][0A] Specify [by enclosing it in square brackets [[]. (Example) To specify the string "[ABC]", type [[ABC]] |
| | Data Type | <p>Displayed automatically according to the device (symbol) entered in the Device Address.</p> <p>NOTE</p> <ul style="list-style-type: none"> When the symbol has been imported from 'GP-Pro EX', it is necessary to specify the data type. |
| | No. | <p>Displayed automatically according to the device (symbol) entered in the Device Address.</p> <p>NOTE</p> <ul style="list-style-type: none"> When the symbol has been imported from 'GP-Pro EX', or when created in 'Pro-Server V4.X', it is necessary to specify the number. |
| Transfer Destination | Node | Selects an entry node to be a data transfer destination. |
| | Device Name | Selects a Device/PLC to be a data transfer destination. |
| | Device Address | <ul style="list-style-type: none"> When specifying a device address: Enter directly from the Calculator icon.  <ul style="list-style-type: none"> When specifying a symbol: Select the symbol by clicking the list button.  |
| | Data Type | <p>Displayed automatically according to the device (symbol) entered in the Device Address.</p> <p>NOTE</p> <ul style="list-style-type: none"> When the symbol has been imported from 'GP-Pro EX', it is necessary to specify the data type. |

■ "Edit Transfer Data" Screen (Distribution Type)

Edit Transfer Data

Transfer Source

Node: AGP1

Device Name: #INTERNAL

☒ Device Address

☐ Constant Value

Data Type: 16Bit(UnSigned) No.: 1

Transfer Destination

Node: AGP1

Device Name: PLC1

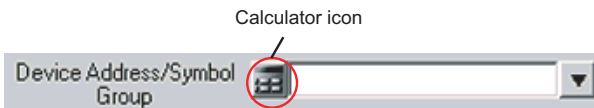

Device Address: 16Bit(Signed)

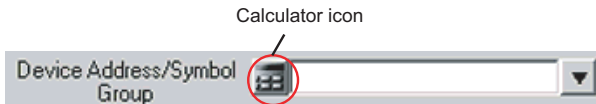

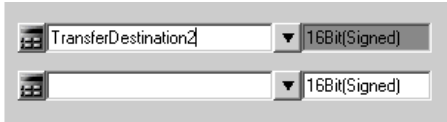

Node: AGP2

Device Name: PLC2

Device Address: 16Bit(Signed)

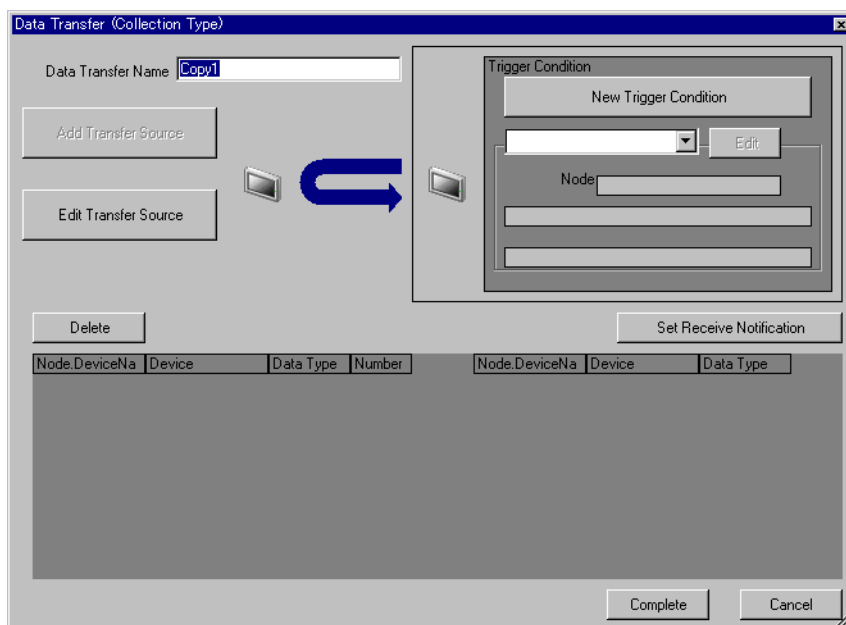
| Setting item | | Setting content |
|-----------------|-------------|--|
| Transfer Source | Node | Displays an entry node (recognized automatically as a transfer source) that includes a device to cause a trigger condition (trigger) that you set in the step of trigger condition settings. |
| | Device Name | Specify a Device/PLC to be a data transfer source. |

| Setting item | | Setting content |
|-----------------|----------------|--|
| Transfer Source | Device Address | <p>Check this to transfer device values.</p> <ul style="list-style-type: none"> When specifying a device address: Enter directly from the Calculator icon.  <ul style="list-style-type: none"> When specifying a symbol: Select the symbol by clicking the list button.  |
| | Constant Value | <p>Check this to transfer a constant value. Type the constant value in the text box.</p> <p>NOTE</p> <ul style="list-style-type: none"> Specifying a numeral: Specify the numeral itself. Insert a space to specify two or more numerals. (Example) 10 11 12 13 14 15 Specifying a character string: Specify the string itself if typable from the keyboard (except for []). (Example) When specifying ABC: ABC <p>Specify an untypable string such as a control code by representing its character code in hexadecimal notation, and enclosing it in square brackets []. (Example) When specifying ABC followed by Carriage return and Line field: ABC[0C][0A]</p> <p>Specify [by enclosing it in square brackets [[]]. (Example) To specify the string "[ABC]", type [[]ABC[]]</p> |
| | Data Type | <p>Displayed automatically according to the device (symbol) entered in the Device Address.</p> <p>NOTE</p> <ul style="list-style-type: none"> When the symbol has been imported from 'GP-Pro EX', it is necessary to specify the data type. |
| | No. | <p>Displayed automatically according to the device (symbol) entered in the Device Address.</p> <p>NOTE</p> <ul style="list-style-type: none"> When the symbol has been imported from 'GP-Pro EX', or when created in 'Pro-Server V4.X', it is necessary to specify the number. |

| Setting item | | Setting content |
|----------------------------|---------------------------------------|---|
| Transfer Destination | Node | Selects an entry node to be a data transfer destination. |
| | Device Name | Selects a Device/PLC to be a data transfer destination. |
| | Device Address | <ul style="list-style-type: none"> When specifying a device address: Enter directly from the Calculator icon.  <ul style="list-style-type: none"> When specifying a symbol: Select the symbol by clicking the list button.  |
| | Device Address (Add) | <p>To add a device to be a transfer destination, enter the address or symbol of the device to add in the blank field below.</p>  |
| Transfer Destination (Add) | Node Device Name Device Address | <p>To add a new entry node or Device/PLC in the Transfer Destination, enter the address or symbol of the transfer destination to add in the blank field below.</p>  |


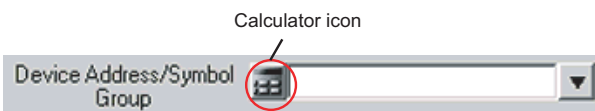
19.2.2 Collection Type

■ "Data Transfer (Collection Type)" Screen



| Setting item | Setting content |
|--------------------------------|--|
| Trigger Condition | Click the [New Trigger Condition] button and enter a new trigger condition (trigger) for transferring data. Alternatively, click the list button and specify an existing trigger condition. ☞ "33 Trigger Conditions" |
| Data Transfer Name | Displays the name of the data transfer that you set on the "Select Data Transfer Type" screen. |
| Add Transfer Source | Displays the "Add Data Transfer" screen. Refer to "■"Add Transfer Data" Screen / "Edit Transfer Data" Screen (Collection Type)" for more details. |
| Edit Transfer Source | Displays the "Edit Data Transfer" screen. Refer to "■"Add Transfer Data" Screen / "Edit Transfer Data" Screen (Collection Type)" for more details. |
| Set Receive Notification | Displays the receive notification settings screen. Refer to "■ Receive Notification Settings Screen" for more details. |
| Setting Content Display Window | Displays information of transfer source on the left side, and information of transfer destination on the right side. |
| Delete | Deletes selected contents. |

■ "Add Transfer Data" Screen / "Edit Transfer Data" Screen (Collection Type)

| Setting item | | Setting content |
|----------------------|----------------|---|
| Transfer Source | Node | Selects an entry node to be a data transfer source. |
| | Device Name | Selects a Device/PLC to be a data transfer source. |
| | Device Address | <ul style="list-style-type: none">When specifying a device address: Enter directly from the Calculator icon.  <ul style="list-style-type: none">When specifying a symbol: Select the symbol by clicking the list button.  |
| | Data Type | Displayed automatically according to the device (symbol) entered in the Device Address. NOTE <ul style="list-style-type: none">When the symbol has been imported from 'GP-Pro EX', it is necessary to specify the data type. |
| Transfer Destination | Node | Displays the entry node (recognized automatically as a transfer destination) that you set in the step of trigger condition settings. |
| | Device Name | Selects a Device/PLC to be a data transfer destination. |

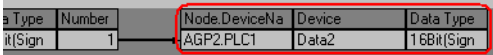
| Setting item | | Setting content |
|----------------------|----------------|---|
| Transfer Destination | Device Address | <div><ul style="list-style-type: none">When specifying a device address: Enter directly from the Calculator icon.<div><div>Calculator icon</div><div>Device Address/Symbol Group</div><div></div></div><ul style="list-style-type: none">When specifying a symbol: Select the symbol by clicking the list button.<div><div>Device Address/Symbol Group</div><div>List button</div><div></div></div></div> |
| | Data Type | <div>Displayed automatically according to the device (symbol) entered in the Device Address.</div> <div><div>NOTE</div><ul style="list-style-type: none">When the symbol has been imported from 'GP-Pro EX', it is necessary to specify the data type.</div> |

■ Receive Notification Settings Screen

Bit device notifying completion of a copy at the copy destination
(When completed, it turns ON).


| Receive Notification Destination | | | |
|---------------------------------------|-------------|----------------|-----------|
| Device Address that received the data | Device Name | Device Address | Data Type |
| [AGP2.PLC1]TransferDestination2 | #INTERNAL | | Bit |

OK Cancel

| Setting item | | Setting content |
|---------------------------------------|----------------|---|
| Device Address that received the data | | <p>Displays the device address (symbol) you set.</p>  |
| Receive Notification Destination | Device Name | Selects a Device/PLC to be a receive notification destination. |
| | Device Address | <p>When the "Receive Notification" is turned on, the specified bit device will be turned on when data transfer is completed. Enter a device address itself of the Device/PLC, or alternatively, click the list button to select a symbol.</p> <p>NOTE</p> <ul style="list-style-type: none"> To execute ACTION sequentially after the data transfer is completed, this can be used as a trigger condition (trigger) of the subsequent ACTION. |

19.3 Restrictions

■ Restrictions on Data Transfer

- (1) In the case of data transfer of collection type, the transfer destination must not be the one selected from GP Series nodes.
 - (2) If the transfer source node or transfer destination node is a GP Series node, you cannot specify a group as the device address.
 - (3) When General Broadcast is set, you cannot transfer to the SP-5B4*/WinGP node.
 - (4) A GP Series node can process up to three times of transfer and reception operations when one trigger condition has been satisfied. Consequently the maximum registration number is three when you specify the same GP Series node as transfer source nodes or transfer destination nodes.
 - (5) In the case when the transfer source and the transfer destination are the ones selected from GP Series nodes and the devices are the ones with physical size of 32 bits, the data type must not be of 16 bits width.
 - (6) In the case when the specified transfer source and the specified transfer destination of transfer data are of BCD type, BCD conversion will not be executed. The BCD data will be handled as binary data.
In the case when BCD code is used for trigger conditions (trigger) or for the computing equation of trigger conditions (trigger), it will be recognized after the conversion of BCD code to binary code. In the case of access via Pro-Easy API, BCD conversion will be executed.
-  "37.2 Restrictions on Pro-Server EX"
- (7) In the case when the number of data of the specified symbols is different between the transfer source and the transfer destination, the number of data equal to that of the transfer source will be transferred.
 - (8) Maximum registerable number of data transfer, the total number of data transfer destination plus ACTION, must be 3000.
 - (9) To transfer the data from the GP Series node to the SP-5B4*/WinGP node, update the 2Way driver version to 4.55 or later.
 - (10) The transferable data type depends on the type of entry node. The following shows combination of the transferable data types and entry nodes.
Data transfer is possible even between different types of data. The explanation about data conversion rule and restrictions in this case is given below.

- When the transfer source node or transfer destination node includes a GP Series node

Transferable only when the transfer source and the transfer destination are of same data type.

- When the transfer source node or transfer destination node does not include a GP Series node

| | | The data type of transfer destination | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|-------------------|---------------------------------------|----------------|------------------|-------------|-------------|-----------------|-------------------|--------------|--------------|-----------------|-------------------|--------------|--------------|------|-------------|------|---------------|-------|--------|----------|-----------|-----------|---|---|
| | | Bit | 8 Bit (Signed) | 8 Bit (Unsigned) | 8 Bit (HEX) | 8 Bit (BCD) | 16 Bit (Signed) | 16 Bit (Unsigned) | 16 Bit (HEX) | 16 Bit (BCD) | 32 Bit (Signed) | 32 Bit (Unsigned) | 32 Bit (HEX) | 32 Bit (BCD) | TIME | TIME_OF_DAY | DATE | DATE_AND_TIME | Float | Double | String | Group | | | |
| The data type of transfer source | Bit | ○ | × | × | × | × | ○ EX.1 | | | | ○ Ex.2 | | | | × | × | × | × | × | × | ○ *1 | × | | | |
| | 8 Bit (Signed) | × | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | | | |
| | 8 Bit (Unsigned) | × | × | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | | | |
| | 8 Bit (HEX) | × | × | × | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | | | |
| | 8 Bit (BCD) | × | × | × | × | ○ | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | | | |
| | 16 Bit (Signed) | ○ Ex.1 | × | × | × | × | ○ *2 | | | ○ Ex.3 | | | ○ *3 | × | × | × | × | × | × | × | ○ *4 | ○ Ex.4 | | | |
| | 16 Bit (Unsigned) | | × | × | × | × | | | | | | | | × | × | × | × | | | | | | | | |
| | 16 Bit (HEX) | | × | × | × | × | | | | | | | | × | × | × | × | | | | | | | | |
| | 16 Bit (BCD) | | × | × | × | × | ○ *5 | ○ *6 | | | ○ *8 | × | × | × | × | × | × | × | | | × | × | | | |
| | 32 Bit (Signed) | ○ Ex.2 | × | × | × | × | ○ Ex.5 | | | ○ *7 | | | ○ *8 | × | × | | | | × | × | | ○ *9 | ○ Ex.6 | | |
| | 32 Bit (Unsigned) | | × | × | × | × | | | | | | | | × | × | | | | × | × | | | | | |
| | 32 Bit (HEX) | | × | × | × | × | | | | | | | | × | × | | | | × | × | | | | | |
| | 32 Bit (BCD) | | × | × | × | × | ○ *10 | ○ *11 | | | ○ | × | × | × | × | × | × | × | × | × | | | | | |
| | TIME | × | × | × | × | × | × | × | × | × | × | × | × | ○ | × | | | | | × | × | × | × | × | |
| | TIME_OF_DAY | × | × | × | × | × | × | × | × | × | × | × | × | × | × | | | | | ○ | × | × | × | × | × |
| | DATE | × | × | × | × | × | × | × | × | × | × | × | × | × | × | | | | | × | ○ | × | × | × | × |
| | DATE_AND_TIME | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | ○ | × | × | × | × | | | |
| | Float | × | × | × | × | × | × | | | | × | | | | × | × | × | × | ○ | × | × | × | | | |
| | Double | × | × | × | × | × | × | | | | × | | | | × | × | × | × | × | ○ | × | × | | | |
| | String | ○ *12 | × | × | × | × | ○ Ex.7 | | | × | ○ Ex.8 | | | × | × | × | × | × | × | × | ○ *13 | × | | | |
| | Group | × | × | × | × | × | ○ Ex.4 | | | | ○ Ex.6 | | | | × | × | × | × | × | × | × | ○ Ex.9 | | | |

○: Transferable

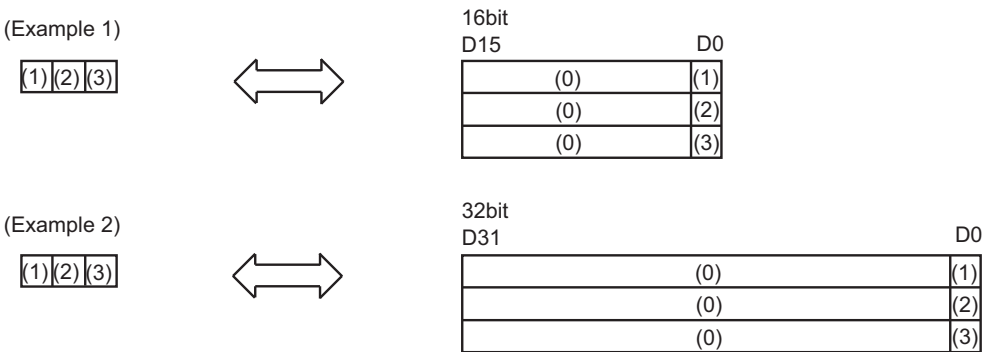
X: Not Transferable

- *1 Expands each bit of the bit string to 8 bits. For example, writes 0 if 0, writes 0xff if 1.
- *2 In 16-bit unit, converts binary code to BCD code and writes.
- *3 Converts two 16-bit data from binary code to BCD code and copies them as a BCD data of 32 bits.
- *4 Copies 16-bit data without conversion.
- *5 In 16-bit unit, converts BCD code to binary code and writes.
- *6 In 16-bit unit, converts BCD code to binary code and copies two 16-bit data as a 32-bit data.

- *7 In 32-bit unit, converts binary code to BCD code and writes a 32-bit data as two 16-bit data.
- *8 In 32-bit unit, converts binary code to BCD code and writes.
- *9 Copies 32-bit data without conversion.
- *10 In 32-bit unit, converts BCD code to binary code and copies a 32-bit data as two 16-bit data.
- *11 In 32-bit unit, converts BCD code to binary code and writes.
- *12 In 8-bit unit, writes 0 if 0, and creates and writes one-bit string if not 0. (Conversion in character string mode not executed)
- *13 Converts data in character string mode both in the transfer source and the transfer destination, and copies. Refer to "Data Conversion Example" for explanations about Example 1 to Example 9.

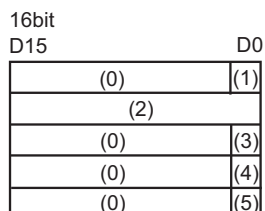
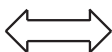
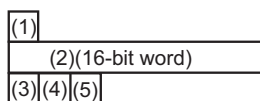
Data Conversion Example

1) In the case of transferring data of bit symbol or bit device itself and of each data type.

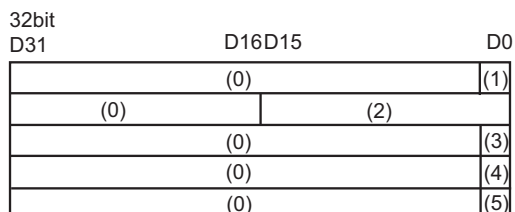
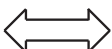
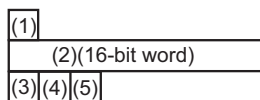


- 2) In the case of transferring data using the group symbol with the following structure (A combination of bit symbol, word symbol and bit symbol; the number of data of which are 1, 1, and 3, respectively).

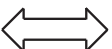
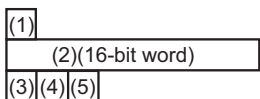
(Example 4)



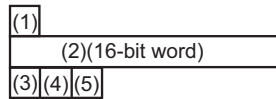
(Example 6)



(Example 9)

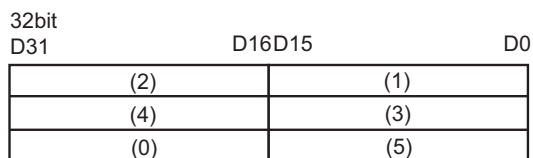
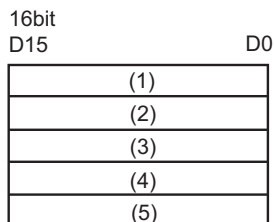


Same type of group



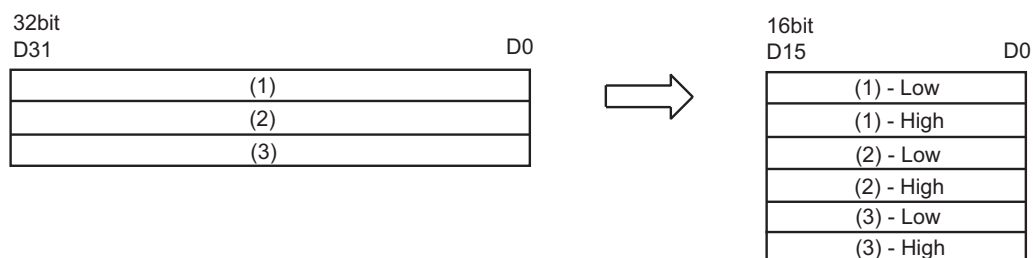
- 3) In the case of transferring 16-bit data

(Example 3)



4) In the case of transferring 32-bit data

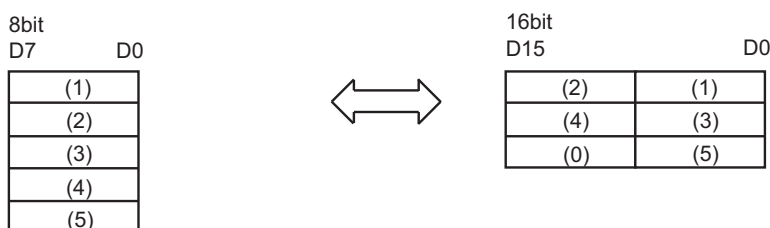
(Example 5)



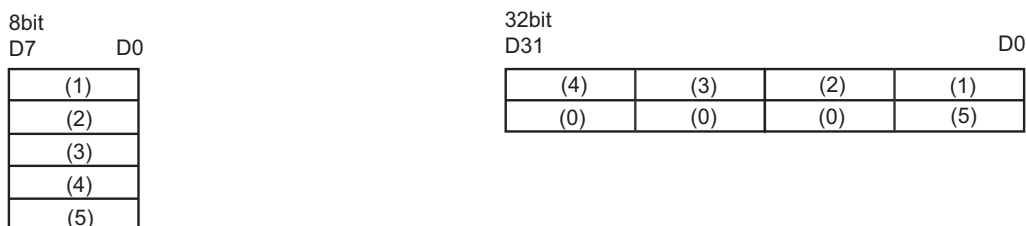
NOTE • The order of Low and High on the 16-bit side depends on the type of the Device/PLC. Refer to 'GP-Pro EX Device/PLC Connection Manual' or 'GP-Pro PBIII Device/PLC Connection Manual' for more details.

5) In the case of transferring character string data

(Example 7)



(Example 8)



NOTE • When the transfer destination is of character string, the conversion method depends on the physical size of the transfer destination; 16 bits or 32 bits.
• The order of the character string depends on the character string mode.

20



Checking SRAM Data on the display unit

| | | |
|------|---------------------------|------|
| 20.1 | Uploading SRAM Data | 20-2 |
| 20.2 | Setting Guide | 20-6 |
| 20.3 | Restrictions | 20-8 |

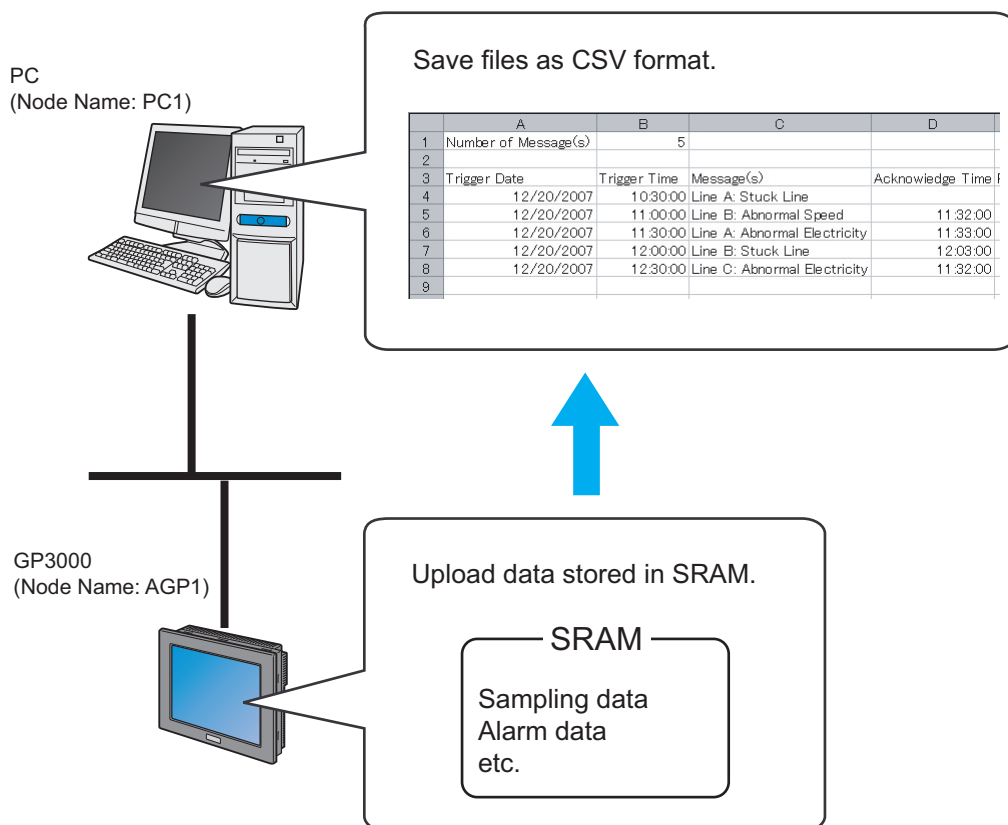
20.1 Uploading SRAM Data

The backup data in the SRAM of each display unit can be easily uploaded in CSV format.

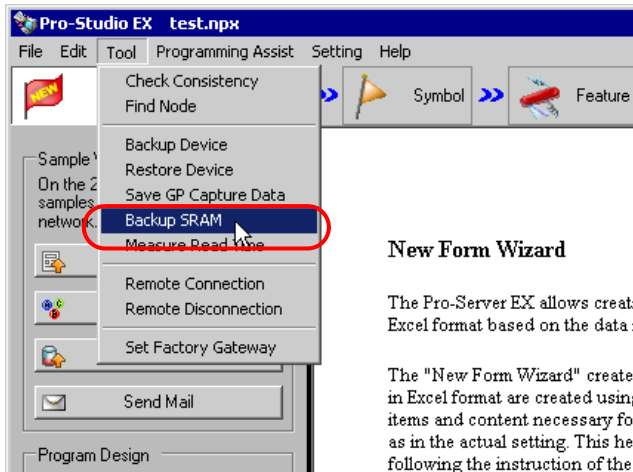
This SRAM backup function is available for logging data, alarm data, and others.

NOTE

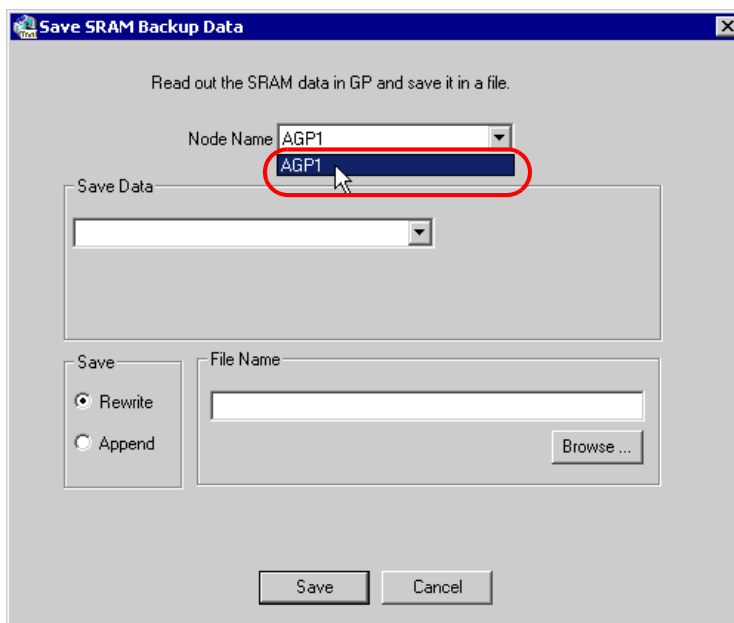
- You cannot use this backup function on Pro-Server EX.
- The SRAM data you can backup differs depending on the type of display unit you are using. For the details, please refer to "20.2 Setting Guide".



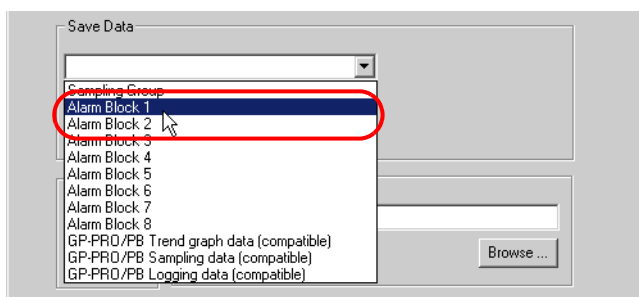
- 1 Click [Backup SRAM] from [Tool] on the menu bar.



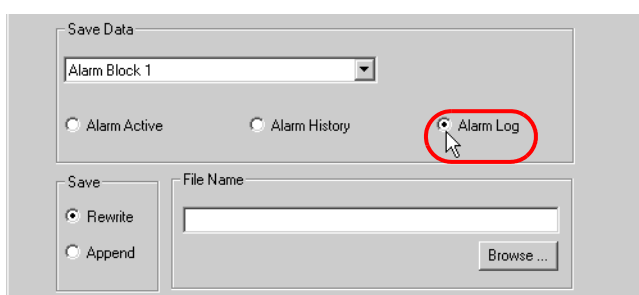
- 2 Click the list button of [Node Name] and select "AGP1" as the entry node in which the data is uploaded.



- 3 Click the list button of [Save Data] and select the data you wish to save (ex. Alarm Block 1).

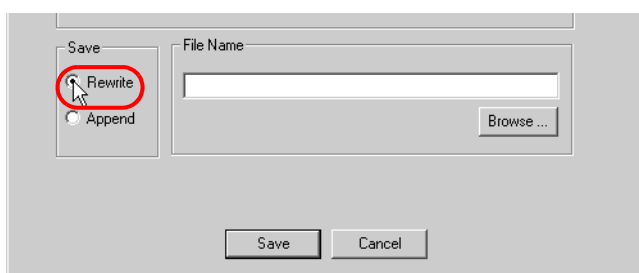


- 4 Select the type of alarm data.

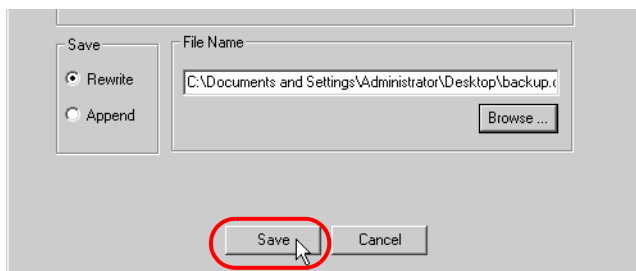


NOTE • When [Sampling Block] is selected in Step 3, enter the sampling No. For the details, please refer to "20.2 Setting Guide".

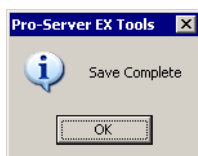
- 5 Check [Rewrite] in [Save].



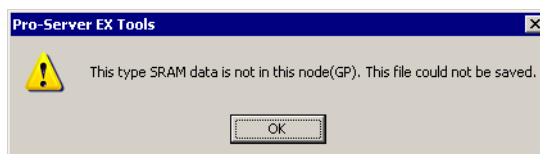
- 6 Click the [Browse] button of [File Name] and set the saving destination and file name, then click the [Save] button.



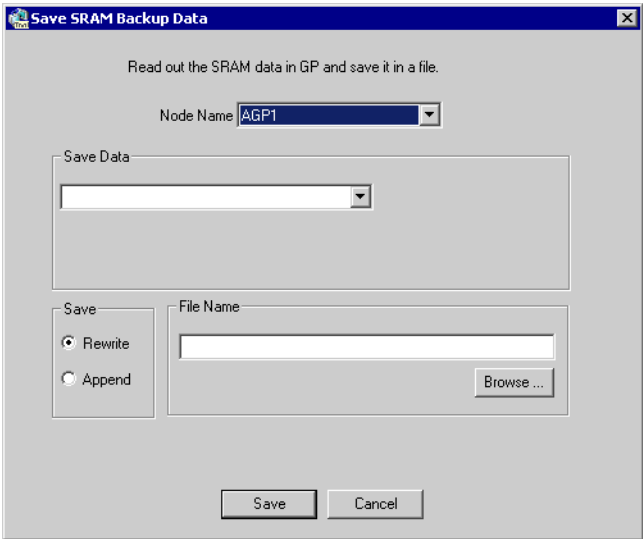
When the saving process has been completed successfully, the message of "Save Complete" appears. Click the [OK] button to finish the saving process.

**NOTE**

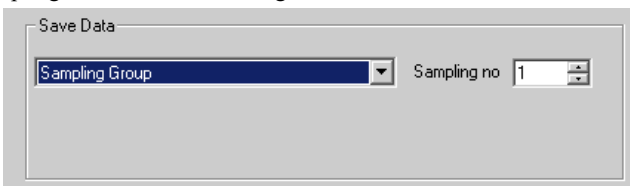
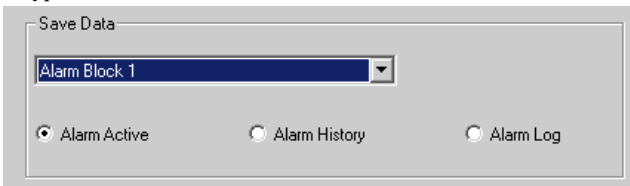
- When you cannot find the specified backup data in SRAM, the following message will appear.



20.2 Setting Guide



| Setting item | Setting content |
|--------------|--|
| Node Name | <p>Select the node reading the SRAM Backup data.</p> <p>NOTE</p> <ul style="list-style-type: none">The list indicates the nodes registered in the network project file under loading. |

| Setting item | Setting content |
|--------------|--|
| Save Data | <p>Select the type of saved data. The type of saved data differs display unit nodes.</p> <p>GP Series Node</p> <ul style="list-style-type: none"> • Logging Data • Trend Data • Sampling Data • Alarm History Data • Alarm Log Data • Alarm block 1 to Alarm block 8 <p>ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, and LT3000 nodes</p> <ul style="list-style-type: none"> • Sampling Group Enter the sampling No. in "1" to "64" range.  <ul style="list-style-type: none"> • Alarm block 1 to Alarm block 8 Select the data type.  <ul style="list-style-type: none"> • GP-PRO/PB Trend graph data (compatible) • GP-PRO/PB Sampling data (compatible) • GP-PRO/PB Logging data (compatible) <p>NOTE</p> <ul style="list-style-type: none"> • When using project data converted from "GP-Pro/PBIII for Windows" on a ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, and LT3000 nodes to upload trend graph, sampling, or logging data, select "compatible" for the associated data. • When reading Alarm data or sampling data, the date format is "yy/mm/dd". |
| Save | <p>Select the saving method to save data in an existing data file.</p> <ul style="list-style-type: none"> • Rewrite Overwrite the data and save. Select this option when creating a new file or overwriting data in the existing data file. • Append Add the current data to the existing data file and save. |
| File Name | <p>Set the data saving destination and the file name. If you select [Append], click the [Browse] button to select the existing file.</p> |

20.3 Restrictions

- If [Multiple Line Message Output (Save Alarm to CSV)] is enabled in GP-Pro EX alarm settings, messages with line breaks are output to a single cell. If [Multiple Line Message Output (Save Alarm to CSV)] is disabled, the message up to the line break only is saved.

21



Saving Device Data Backup

| | | |
|------|--------------------------------------|------|
| 21.1 | Try to Save Device Data Backup | 21-2 |
| 21.2 | Setting Guide | 21-5 |

21.1 Try to Save Device Data Backup

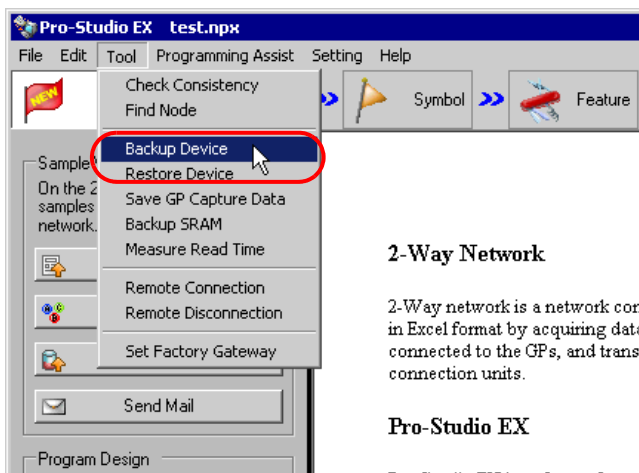
The device data in Device/PLC can be easily backed up with simple settings.

The data subjected to backup is limited to sequential devices, however, you are recommended to use this function for backup or editing the data partially on the occasion of maintenance.

NOTE

- The data backed up or edited can be stored in Device/PLC. For the procedures, please refer to "22 Restoring Backup Device Data".

- Click [Backup Device] from [Tool] on the menu bar.

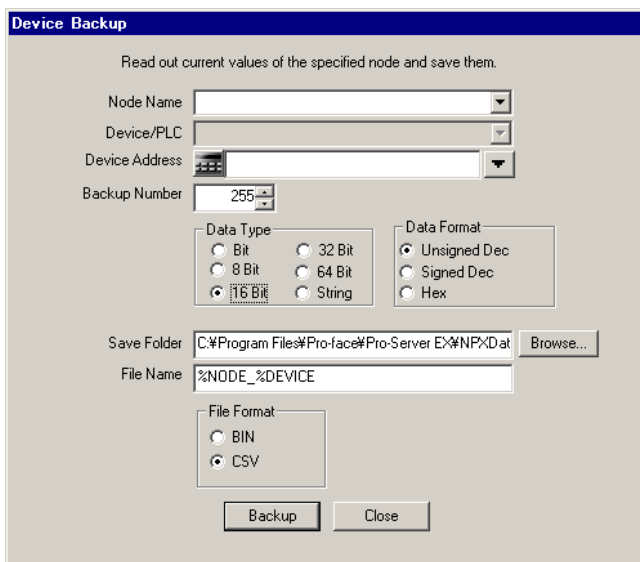


2-Way Network

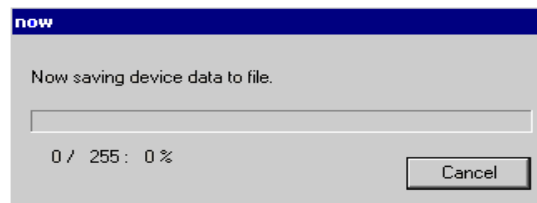
2-Way network is a network con in Excel format by acquiring data connected to the GPs, and trans connection units.

Pro-Studio EX

- Set all items in the "Device Backup" screen and click the [Backup] button.



The "now" screen is displayed, indicating the processing status of backup.

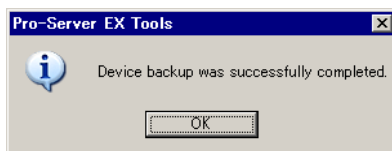

NOTE

- The set contents in the "Device Backup" screen are incorrect, the following message appears:

| Message | Required action |
|---|--|
| Designate number up to 255 for data backup in the BIT format. | Reset the value in the [Backup Number] in the range of 1 to 255, and then execute backup. |
| You cannot execute bit-type symbol backup other than in the BIT format. | If you designated a BIT symbol in the [Device Address] field, you cannot execute backup in formats other than BIT. Reset the format to "BIT", and then execute backup. |
| You cannot execute symbol backup other than a bit-type in the BIT format. | If you designated a symbol other than a bit-type in the [Device Address] field, you cannot execute backup in BIT. Reset the format to something else but "BIT", and then execute backup. |
| Amount of backup data is incorrect. | Please set up back up data only up to the maximum limit and run backup again. The amount of data you can back up is different depending on the device data type, and so on. |
| The specified device is an undefined symbol or an invalid address. | Set up an accessible device address or symbol. Also, set up an acceptable data type and run back up again. |

When the saving process has been completed successfully, the message of "Device backup was successfully completed" appears.

Click the [OK] button to finish the process.



Below are the data contents for CSV device data.

Node name, (Node name for backup)

Device/PLC name (Device/PLC of backup source)

Device name, (Device address to start backup)

Number, (Number of backup data)

Device length, (Bit length of the backup device)

Data type, (one of the following: bit, unsigned decimal, signed decimal, hexadecimal, or string)

Date, (Backup date)

Data, comment

(Value of the first device address), (Name of the first device address)

(Value of the second device address), (Name of the second device address)

NOTE

- The backup date should be written in a format of "(year)/(month)/(day) (space) (hour):(minute)". Note that if only (minute) shows one digit, use 0 (zero) in the second digit.
 - TIME, TIME_OF_DAY, DATE, DATE_AND_TIME formatted values are stored as binary values.
 - For information on displaying as text, refer to '27.8 Binary Date and Time / Text Display Conversion'.
-

21.2 Setting Guide

| Setting item | Setting content |
|----------------|---|
| Node Name | Select the node reading the Device Backup data. The list indicates the nodes registered in the network project file under loading. |
| Device/PLC | Select the Device/PLC reading the Device data. |
| Device Address | Enter the leading device address or symbol in the device from which you read the data. NOTE <ul style="list-style-type: none"> When you set the [File Format] to [Bin], make sure the file path does not exceed 255 single-byte characters. Backup is not possible if you exceed 255 characters. |
| Backup Number | Enter the number of backup device. NOTE <ul style="list-style-type: none"> The maximum number of device that you can backup depends on the device data type. This is automatically set up when you select a symbol in the [Device Address] field. To back up a STRING device, specify the number of bytes to back up. |
| Data Format | Select the type of saved data. Refer to " ■ Accessible Tag data formats" for accessible tag data formats NOTE <ul style="list-style-type: none"> This is automatically set up when you select a symbol in the [Device Address] field. When you set the [Data Type] to [String] and the [Data Format] to [CSV], note the following. <ul style="list-style-type: none"> The string up to the NULL termination character is backed up. Backup is not possible when the device contains control codes (other than NULL). If the last byte in a device, or the last byte in a range, contains the first byte of a double-byte character, the string up to (but not including) the last byte is backed up. |
| Data notation | When [CSV] is selected on [File Format], set the data notation. |

| Setting item | Setting content |
|--------------|--|
| Save Folder | Set the folder that you wish to save file. Click the [Browse] button or enter the folder name directly to select the folder. |
| File Name | Enter the file name to be saved. By default, the file name will vary depending on the node name, the device address, the saved type and the data type you select. |
| File Format | Select the data saving format. <ul style="list-style-type: none"> • BIN Save as binary data. Suited for saving large volumes of data. But you cannot confirm or edit the backup data on PC. • CSV Save as CSV data. You can confirm or edit the backup data on PC. |

■ Accessible Tag data formats

| | | Device Size or Tag data format | | | | | | | | |
|--|---------|--------------------------------|-----------------------|---------------------|--------------------------------|------|------|-------------|---------------|--------|
| | | 1 | 8 | 16 | 32 | | | | 64 | STRING |
| | | BOOL | BYTE SINT USINT | WORD INT UINT | DWORD DINT UDINT REAL | DATE | TIME | TIME_OF_DAY | DATE_AND_TIME | |
| Data formats you can define for device backup | Bit | o | x | o*1 | o*1 | x | x | x | x | x |
| | 8 bits | x | o | x | x | x | x | x | x | x |
| | 16 bits | x | x | o | o | x | x | x | x | x |
| | 32 bits | x | x | o | o | o | o | o | x | x |
| | 64 bits | x | x | x | x | x | x | x | o | x |
| | Text | x | x | o | o | x | x | x | x | o |

*1 Availability depends on the driver in use.

22



Restoring Backup Device Data

| | | |
|------|---|------|
| 22.1 | Try to Restoring Backup Device Data | 22-2 |
| 22.2 | Setting Guide | 22-4 |

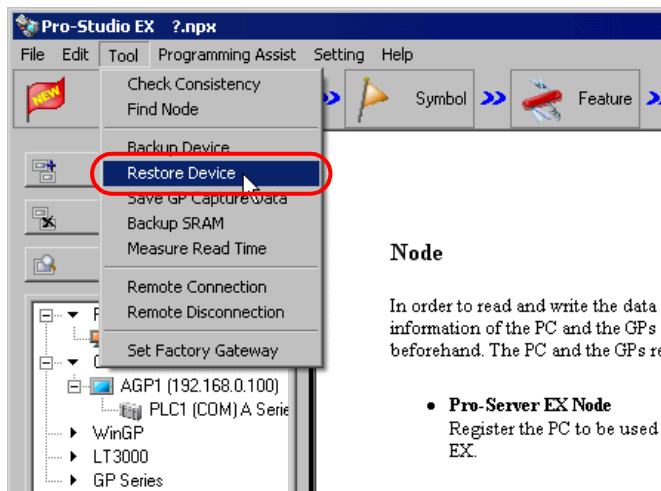
22.1 Try to Restoring Backup Device Data

You can restore the backup device data to the source device.

NOTE

- Restoring is available for the sequential device data.
- For the details of device data backup, please refer to "21 Saving Device Data Backup".

- 1 Click [Restore Device] from [Tool] on the menu bar.

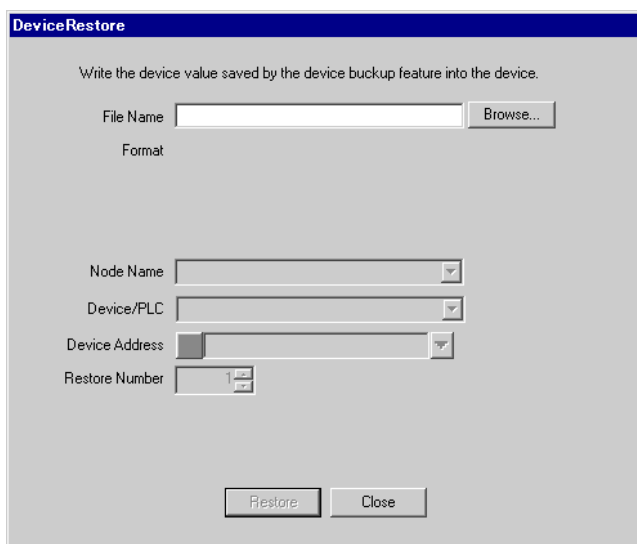


Node

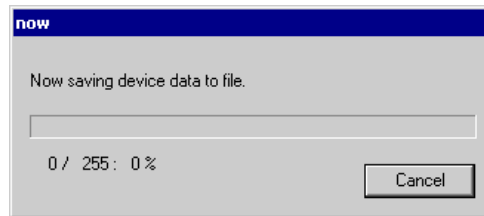
In order to read and write the data information of the PC and the GPs beforehand. The PC and the GPs re

- **Pro-Server EX Node**
Register the PC to be used:
EX.

- 2 Set all items in the "Device Restore" screen and click the [Restore] button.



The "now" screen is displayed, indicating the processing status of restoration.



NOTE • The set contents in the "Device Restore" screen are incorrect, the following message appears:

| Message | Required action |
|---|--|
| You cannot designate a bit-type symbol to data restoration other than in the BIT format | If you designated a BIT symbol in the [Device Address] field, you cannot restore data in formats other than BIT. Reset the symbol other than in "BIT" in the [Device Address] field, and then restore. |
| You cannot designate a symbol other than in BIT to data restoration in the BIT format. | If you designated a symbol in formats other than BIT in the [Device Address] field, you cannot restore BIT data. Reset the BIT symbol in the [Device Address] field, and then restore. |
| The designated file is incorrect. | If you designate a Bit backup data file by 'Pro-Server' of the older version (V4.0) in the [File Name] field, you cannot restore it. Reset other file in the [File Name] field, and then restore. |
| The amount of data to restore is incorrect. | Please set up restore devices only up to the maximum limit and run restore again. The amount of data you can restore is different depending on the device data type, and so on. |
| Device address is not valid. Or designed access type is not supported. | Set up an accessible device address or symbol and run restore again. |

When the saving process has been completed successfully, the message of "Device restore was successfully completed." appears.

Click the [OK] button to finish the process.



22.2 Setting Guide

DeviceRestore

Write the device value saved by the device backup feature into the device.

File Name

Browse...

Format

Node Name

Device/PLC

Device Address

Restore Number

Restore

Close

| Setting item | Setting content |
|--------------|--|
| File Name | Set the file name where the device data is backed up. Click the [Browse] button or enter the file name directly to select the file. |

| Setting item | Setting content | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|---|------------------|--------------------------|--------------|---------|-----|-----|---|-----|--------|---|--------|---------|---|---------|---------|---|---------|---------|---|---------|--------|---|------|-----|-----|---|-----|--------|------------------|-------------------------|----------------|-----------------------|-------------|--------------------|---------|------------------|--------------------------|----------------|------------------------|-------------|---------------------|---------|------------------|--------------------------|----------------|------------------------|-------------|---------------------|---------|------------------|--------------------------|----------------|------------------------|-------------|---------------------|--------|---|------|
| Format | <p>If you designate a file in the [File Name] field, the following table showing formats corresponding to files will appear.</p> <table><tr><th>File format</th><th>Data format</th><th>Write format</th><th>Display</th></tr><tr><td rowspan="6">BIN</td><td>Bit</td><td>-</td><td>Bit</td></tr><tr><td>8 bits</td><td>-</td><td>8 bits</td></tr><tr><td>16 bits</td><td>-</td><td>16 bits</td></tr><tr><td>32 bits</td><td>-</td><td>32 bits</td></tr><tr><td>64 bits</td><td>-</td><td>64 bits</td></tr><tr><td>String</td><td>-</td><td>Text</td></tr><tr><td rowspan="14">CSV</td><td>Bit</td><td>-</td><td>Bit</td></tr><tr><td rowspan="3">8 bits</td><td>Unsigned decimal</td><td>8 bits unsigned decimal</td></tr><tr><td>Signed decimal</td><td>8 bits signed decimal</td></tr><tr><td>Hexadecimal</td><td>8 bits hexadecimal</td></tr><tr><td rowspan="3">16 bits</td><td>Unsigned decimal</td><td>16 bits unsigned decimal</td></tr><tr><td>Signed decimal</td><td>16 bits signed decimal</td></tr><tr><td>Hexadecimal</td><td>16 bits hexadecimal</td></tr><tr><td rowspan="3">32 bits</td><td>Unsigned decimal</td><td>32 bits unsigned decimal</td></tr><tr><td>Signed decimal</td><td>32 bits signed decimal</td></tr><tr><td>Hexadecimal</td><td>32 bits hexadecimal</td></tr><tr><td rowspan="3">64 bits</td><td>Unsigned decimal</td><td>64 bits unsigned decimal</td></tr><tr><td>Signed decimal</td><td>64 bits signed decimal</td></tr><tr><td>Hexadecimal</td><td>64 bits hexadecimal</td></tr><tr><td>String</td><td>-</td><td>Text</td></tr></table> | File format | Data format | Write format | Display | BIN | Bit | - | Bit | 8 bits | - | 8 bits | 16 bits | - | 16 bits | 32 bits | - | 32 bits | 64 bits | - | 64 bits | String | - | Text | CSV | Bit | - | Bit | 8 bits | Unsigned decimal | 8 bits unsigned decimal | Signed decimal | 8 bits signed decimal | Hexadecimal | 8 bits hexadecimal | 16 bits | Unsigned decimal | 16 bits unsigned decimal | Signed decimal | 16 bits signed decimal | Hexadecimal | 16 bits hexadecimal | 32 bits | Unsigned decimal | 32 bits unsigned decimal | Signed decimal | 32 bits signed decimal | Hexadecimal | 32 bits hexadecimal | 64 bits | Unsigned decimal | 64 bits unsigned decimal | Signed decimal | 64 bits signed decimal | Hexadecimal | 64 bits hexadecimal | String | - | Text |
| | File format | Data format | Write format | Display | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BIN | Bit | - | Bit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 8 bits | - | 8 bits | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 16 bits | - | 16 bits | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 32 bits | - | 32 bits | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 64 bits | - | 64 bits | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | String | - | Text | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSV | Bit | - | Bit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 8 bits | Unsigned decimal | 8 bits unsigned decimal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Signed decimal | 8 bits signed decimal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Hexadecimal | 8 bits hexadecimal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 16 bits | Unsigned decimal | 16 bits unsigned decimal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Signed decimal | 16 bits signed decimal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Hexadecimal | 16 bits hexadecimal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 32 bits | Unsigned decimal | 32 bits unsigned decimal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Signed decimal | 32 bits signed decimal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Hexadecimal | 32 bits hexadecimal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 64 bits | Unsigned decimal | 64 bits unsigned decimal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Signed decimal | 64 bits signed decimal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Hexadecimal | 64 bits hexadecimal | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | String | - | Text | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <div><div>NOTE</div><div><ul style="list-style-type: none">When restoring the CSV file when the data format is [String], if the number of characters for the string is less than the size of the destination device, the NULL character is appended. If the number of characters exceeds the size of the destination device, you cannot restore the string.</div></div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Node Name | Select the node name of restoring destination. The list indicates the nodes registered in the network project file under loading. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Device/PLC | Select the Device/PLC of restoring destination. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Device Address | Enter the device address (or symbol) to start the restoration. By default, the leading address saved in the file is displayed when you set the file name. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Restore Number | Enter the number of restoration data. By default, the number of data saved in the file is displayed when you set the file name. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

23



Enhancing Security

| | | |
|------|---|-------|
| 23.1 | Blocking Unauthorized Access with Password | 23-2 |
| 23.2 | Blocking Unauthorized Editing with Password | 23-7 |
| 23.3 | Blocking Unauthorized Transfer with Password..... | 23-15 |
| 23.4 | Restrictions | 23-17 |

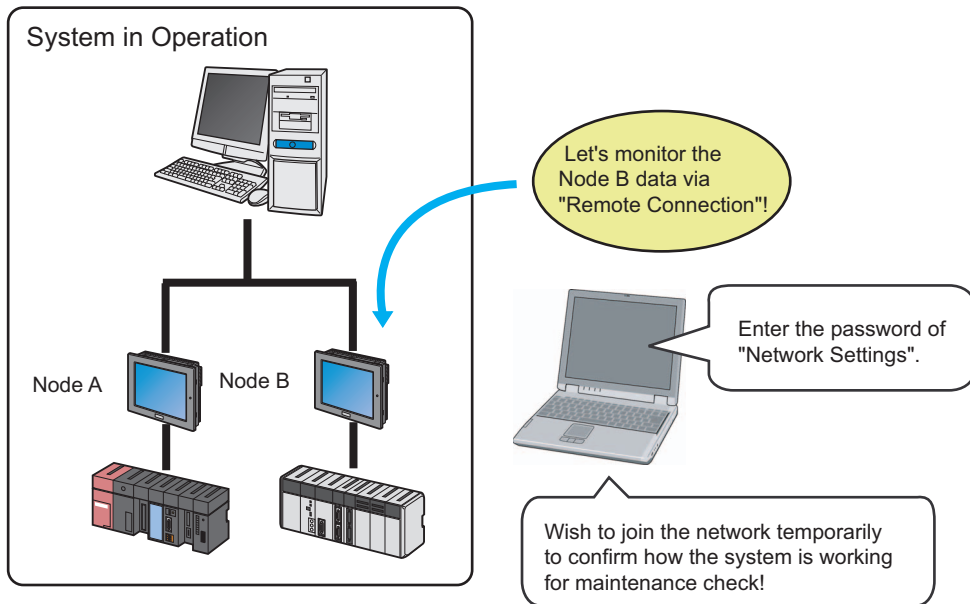
23.1 Blocking Unauthorized Access with Password

In order to prevent unauthorized access by a node that has not been registered on the network, you can set a password for the network to enhance the security.

☞ "34.2 Network Setup"

Access from a personal computer outside of the network by entering a password is called "Remote Access".

Remote access allows to access to the node in the network, which is protected by this security function.



The procedures of remote access and cutting are explained below.

NOTE

- 'Pro-Server EX' has 3 security functions as follows:

(1) Protect a device access from a node that has not been registered on the network.

☞ "23.1 Blocking Unauthorized Access with Password"

(2) Protect unauthorized access when saving a network project file.

Set password protection from [Enter password when saving] on the save screen.

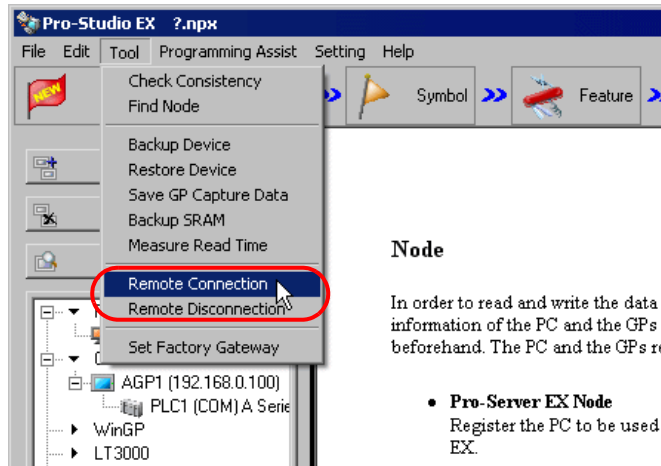
☞ "23.2 Blocking Unauthorized Editing with Password"

(3) Protect unauthorized access when transferring a network project file to display unit.

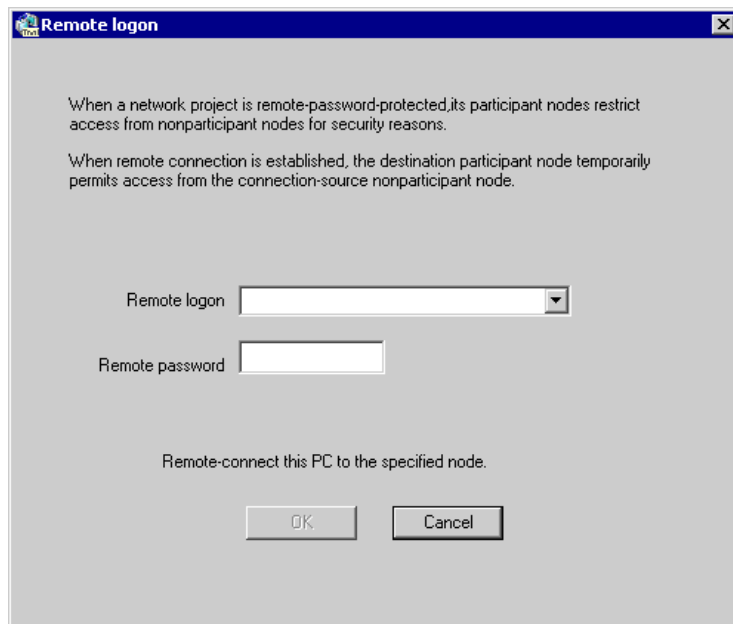
☞ "23.3 Blocking Unauthorized Transfer with Password" or 'GP-Pro EX Reference Manual'

23.1.1 Remote Access

- 1 Click [Remote Connection] from [Tool] on the menu bar.



The "Remote login" screen will appear.



- 2 Click the list button of [Remote logon] and enter the node for remote access and the password.

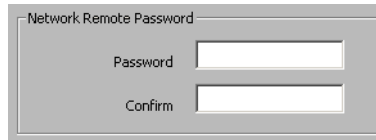


Remote logon AGP1

Remote password *****

NOTE

- "*****" appears when entering a password.
- The password to be entered is that set in [Setting/Set Network].

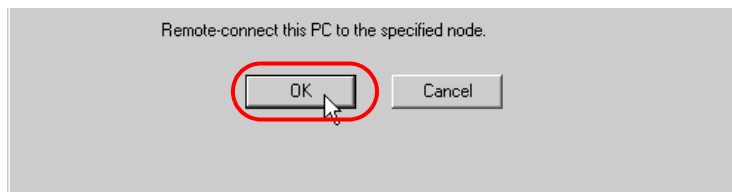


Network Remote Password

Password

Confirm

- 3 Click the [OK] button.



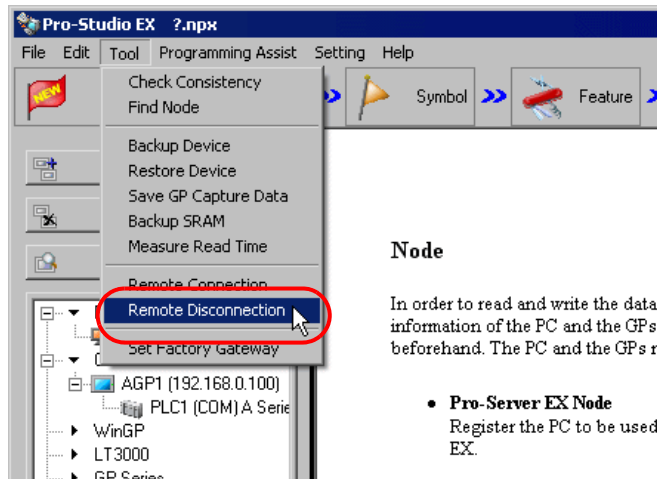
Remote-connect this PC to the specified node.

OK Cancel

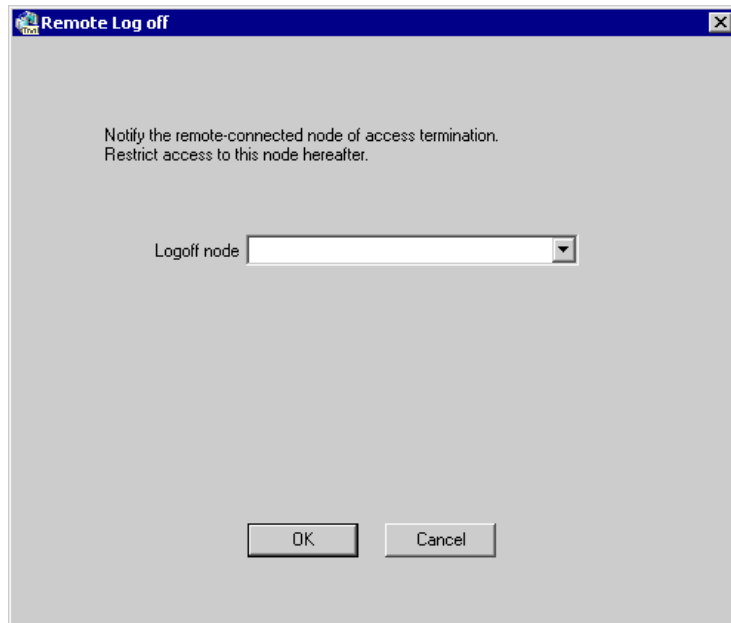
Remote access is performed to the specified node.

23.1.2 Remote Cutting

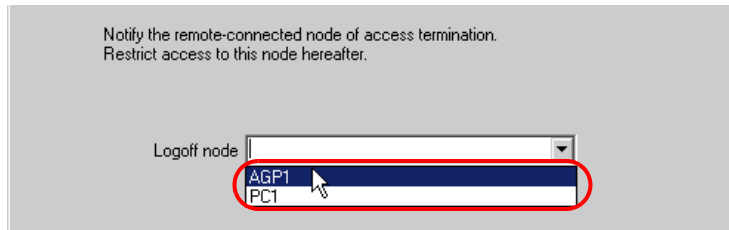
- 1 Click [Remote Disconnection] from [Tool] on the menu bar.



The "Remote Logoff" screen will appear.



- 2 Click the list button of [Logoff node] and select the node for remote cutting. Then click the [OK] button.



Remote access to the specified node is cut.

NOTE

- When Pro-Server EX node and WinGP node work with 1 PC, when remote connection is cut off, because also connection with the WinGP node is cut off in addition to the participation node which is appointed please note.
-

23.2 Blocking Unauthorized Editing with Password

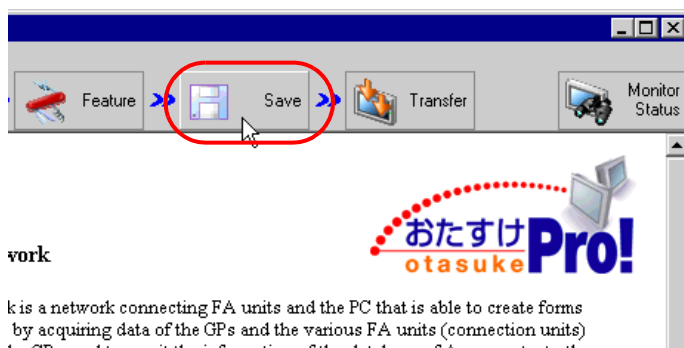
To protect the contents of a network project file, you can set a password when saving a created network project file.

Once a password is set, a password entry screen will appear when saving a network project file after editing. In this case, you cannot save the network project file without entering the correct password.

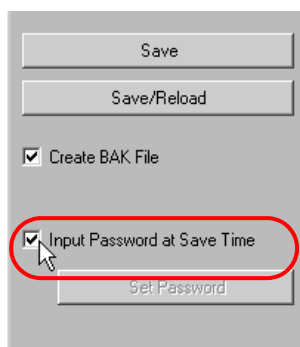
23.2.1 Password Setting for File Saving

This step sets a password when saving a new network project file.

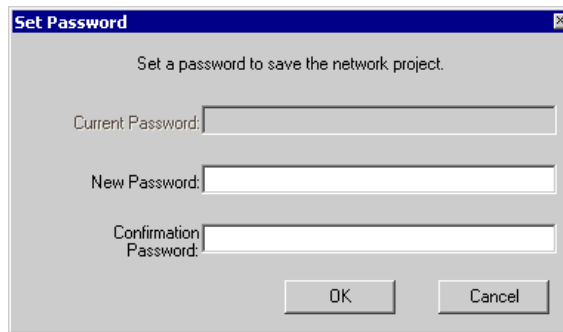
- 1 Create a network project file.
- 2 Click the [Save] icon on the toolbar.



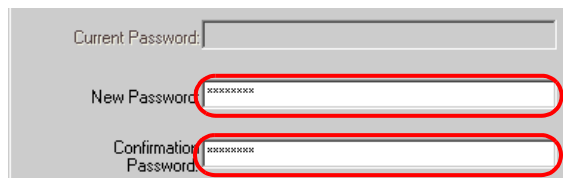
- 3 Check [Input Password at Save Time].



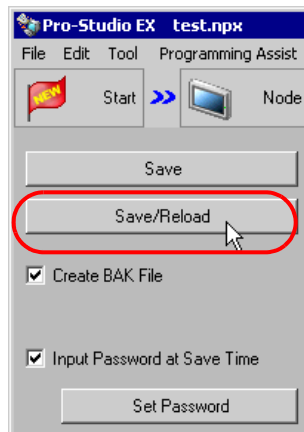
The "Set Password" screen will appear.



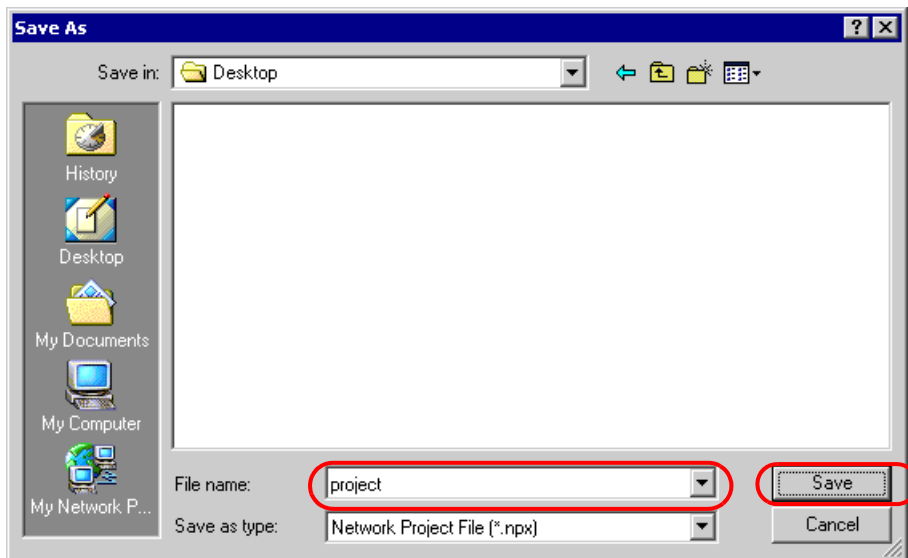
- 4 Enter a password to be set in [New Password] and the same password in [Confirmation Password], and click the [OK] button.



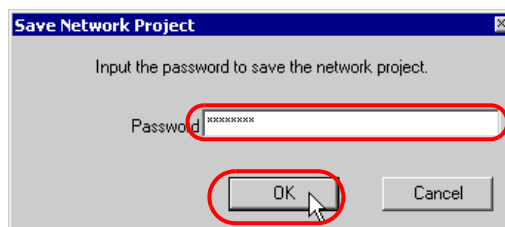
- 5 Click the [Save] or [Save/Reload] button.



- 6 Enter a file name and click the [Save] button.



- 7 Enter the password registered and click the [OK] button.

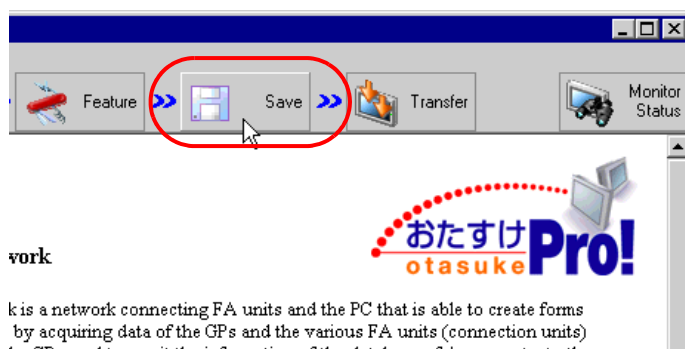


The network project file secured by the password is saved.

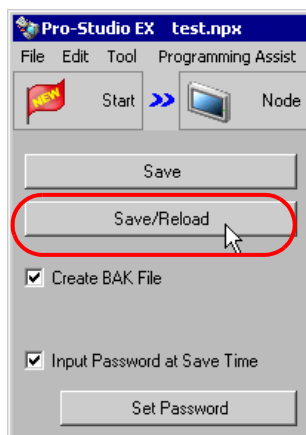
23.2.2 Editing and Saving Network Project having Password Setting

This step edits and saves a network project file having password setting.

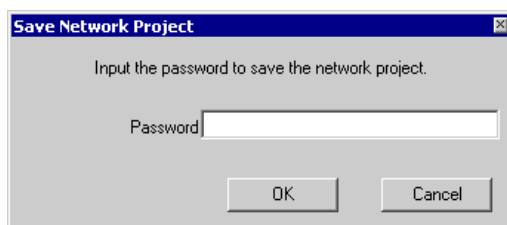
- 1 Edit a network project file.
- 2 Click the [Save] icon on the status bar.



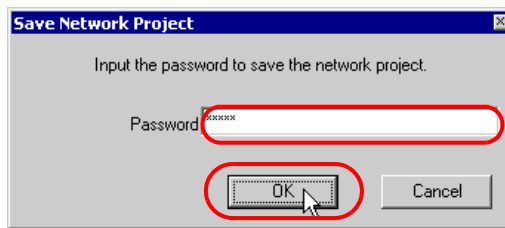
- 3 Click the [Save] or [Save/Reload] button.



The "Save Network Project" screen will appear.



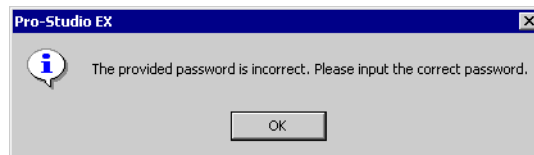
- 4 Enter the password registered and click the [OK] button.



The edited network project file is saved.

NOTE

- If an incorrect password is entered, the following dialog box will appear.
Click the [OK] button and enter the correct password.



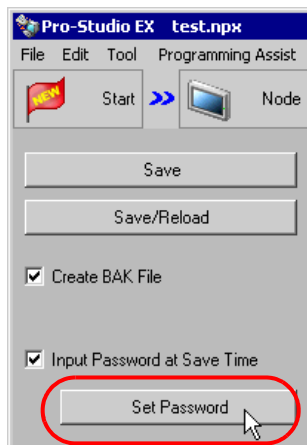
23.2.3 Changing Passwords

This step changes the password specified for a network project file.

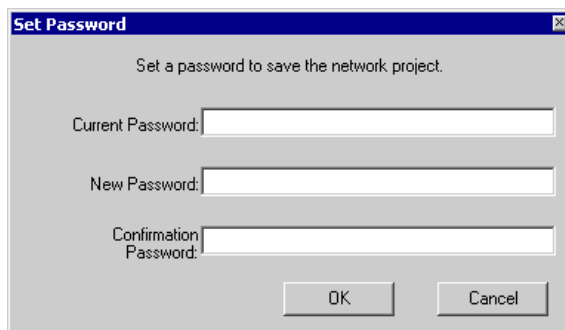
- 1 Open a network project file and click the [Save] button on the toolbar.



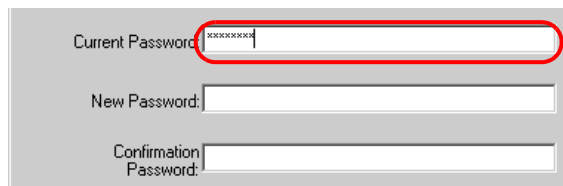
- 2 Click the [Set Password] button.



The "Set Password" screen will appear.



- 3 Enter the currently registered password in [Current Password].

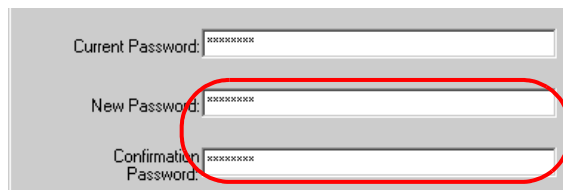


Current Password: [xxxxxxxx]

New Password: []

Confirmation Password: []

- 4 Enter a new password to be set in [New Password] and the same password in [Confirmation Password], and click the [OK] button.

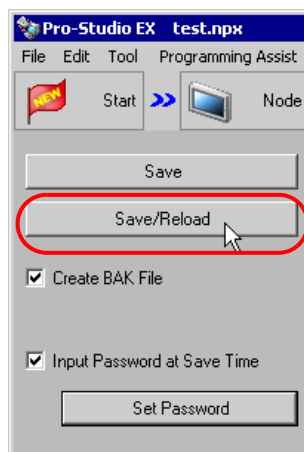


Current Password: []

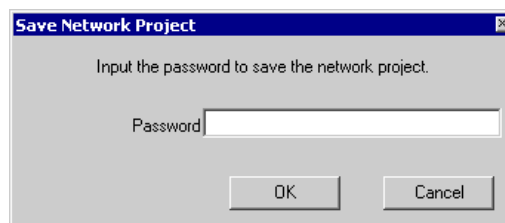
New Password: [xxxxxxxx]

Confirmation Password: [xxxxxxxx]

- 5 Click the [Save] or [Save/Reload] button.



The "Save Network Project" screen will appear.



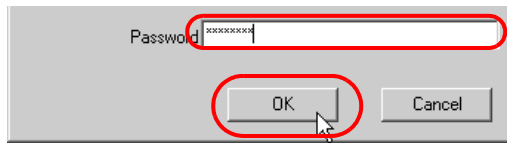
Save Network Project

Input the password to save the network project.

Password: []

OK Cancel

- 6 Enter the new password and click the [OK] button.



The network project file secured by the new password is saved.

23.3 Blocking Unauthorized Transfer with Password

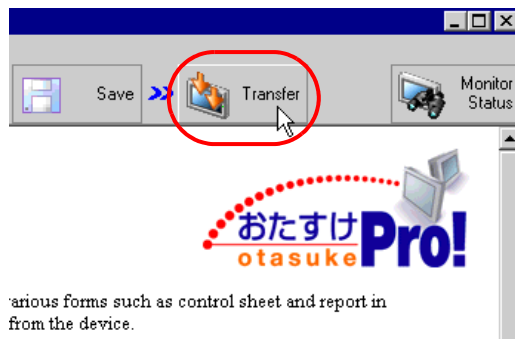
When a network project file is transferred to display unit, enter the password to access if the display unit has password protection.

Refer to 'GP-Pro EX Reference Manual' about the display unit password setting.

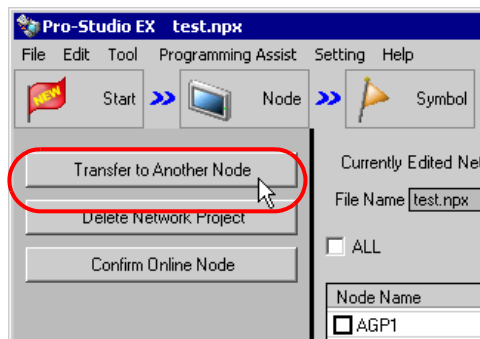
23.3.1 Access to display unit Secured by Password

This step enters a password when transferring a network project file.

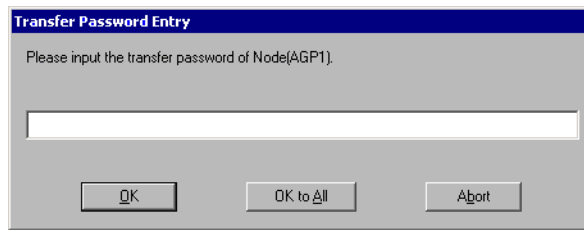
- 1 Create and save a network project file.
- 2 Click the [Transfer] icon on the status bar.



- 3 Specify the node to which the network project file is transferred and click the [Transfer to Another Node] button.



- 4 Enter the password set for display unit and click the [OK] button.



The network project file is transferred to the display unit secured by the password.

NOTE

- Click the [OK to All] button to apply the password entered here to all the nodes to which the network project file is transferred.
 - Click the [Abort] button to stop password entering and transfer processing.
-

23.4 Restrictions

- When using the Remote Password and GP-Pro EX's Ethernet Multilink features simultaneously, register the slave Displays as reference nodes in the Pro-Server EX network project set up with the Multilink feature, and then transfer to the master Display.

If the slave Displays are not registered as reference nodes, communication is not possible with the master Display.

You do not need to transfer the network project to the slave Display.

- When using GP-Viewer EX to access a Display that uses the Remote Password feature, register the GP-Viewer EX operation environment as a reference node in the Pro-Server EX network project, and then transfer to the Display.

If the operation environment is not registered as a reference node, communication is not possible between GP-Viewer EX and the Display.

Also, select the reference node type as [Pro-Server EX].

24



Connecting with Factory Gateway

| | | |
|------|---|-------|
| 24.1 | Try to connect with Factory Gateway | 24-2 |
| 24.2 | Setting Guide | 24-11 |
| 24.3 | Restrictions | 24-17 |

24.1 Try to connect with Factory Gateway

To use the Factory Gateway, it is necessary to transfer protocols of Device/PLC in advance from 'Factory Gateway Configuration Tool' or 'GP-PRO/PB III for Windows'.

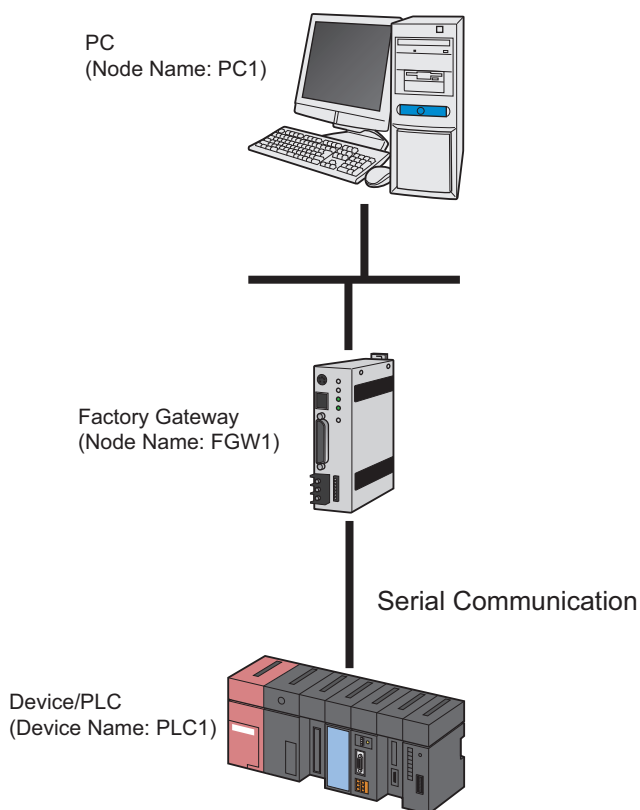
After protocol transfer, you can register nodes in the same way as display unit.

NOTE

- Once protocols have been transferred, it is unnecessary to activate 'Factory Gateway Configuration Tool' unless you change them

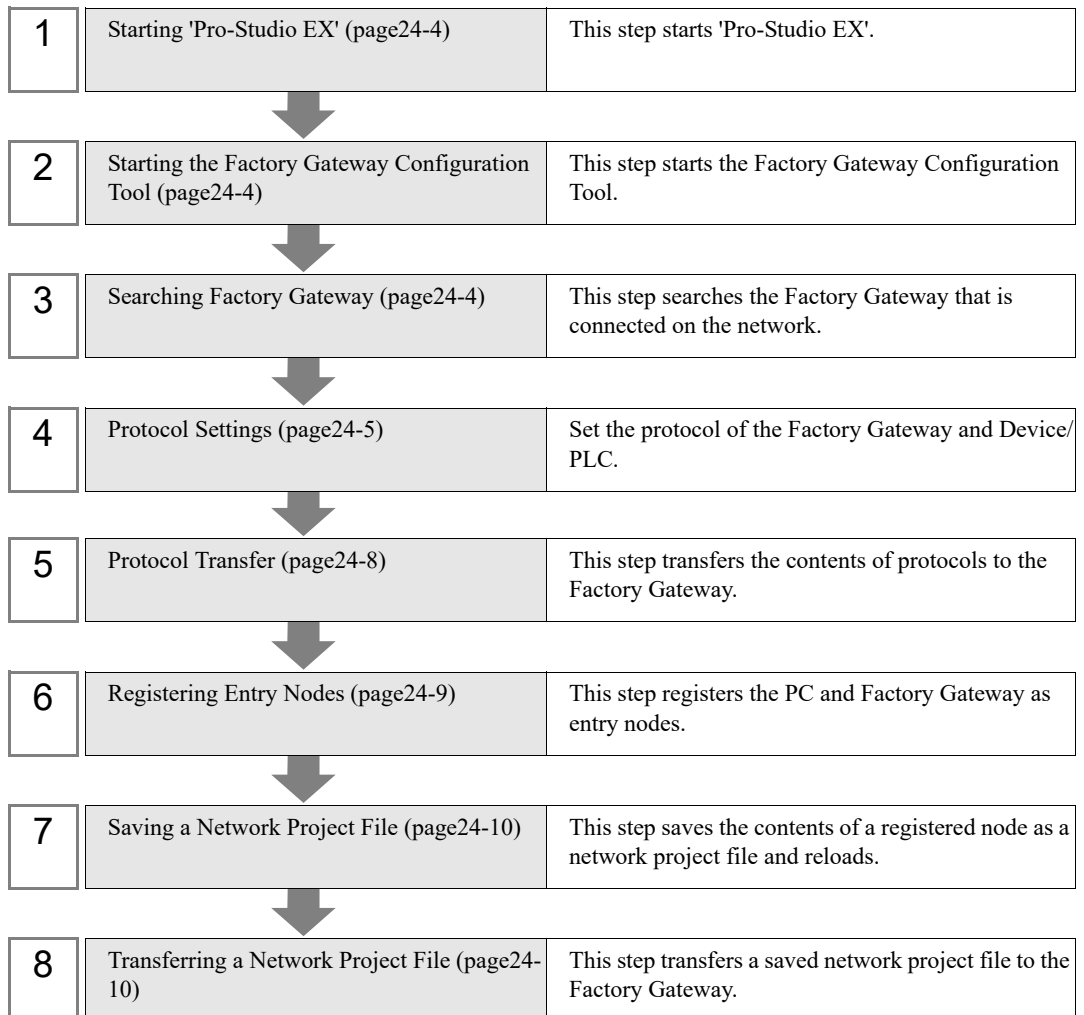
[Connection Sample]

To connect the Factory Gateway (FGW) which is under serial communication, to Device/PLC.



This section describes the setting procedures for making the above connection as an example.

[Setting Procedure]



24.1.1 Starting 'Pro-Studio EX'

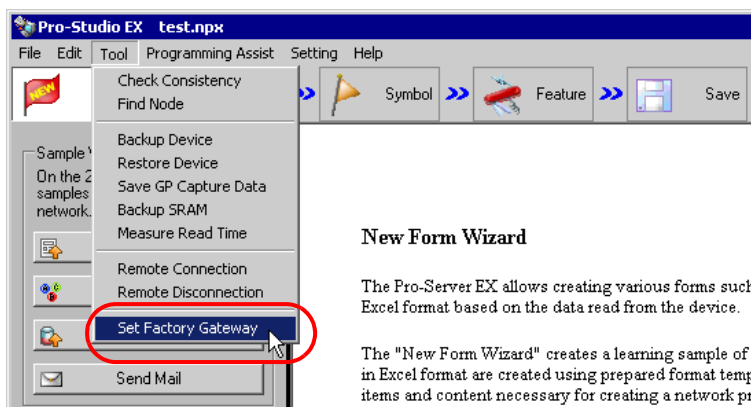
This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

24.1.2 Starting the Factory Gateway Configuration Tool

This step starts the Factory Gateway Configuration Tool from 'Pro-Server EX'.

- 1 Click [Set Factory Gateway] of [Tool] on the menu bar.

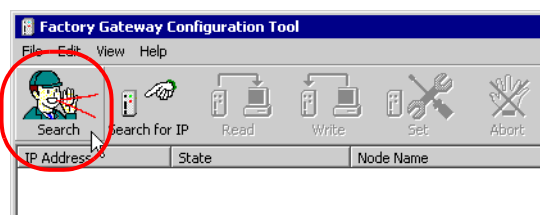


The Factory Gateway Configuration Tool starts.

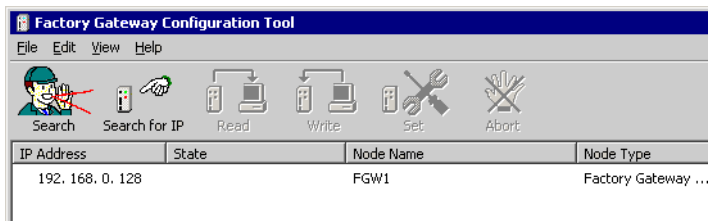
24.1.3 Searching Factory Gateway

This step searches the Factory Gateway that is connected on the network.

- 1 Click the [Search] button.



The connected Factory Gateway will appear.

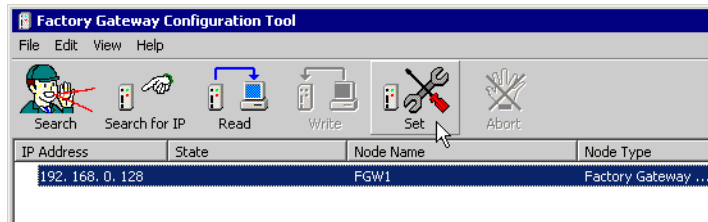

NOTE

- When you know the IP address set for the Factory Gateway in advance, click the [Search for IP] button to search.
- In addition to the Factory Gateway, the display unit and the PC where 'Pro-Server EX' is running are displayed in the list, but this configuration tool is available only for protocol setting of the Factory Gateway.
- When a protocol has not been transferred to the Factory Gateway, [PLC Type] will be blank.
- If the Factory Gateway and the PC executing 'Pro-Server EX' is not located in the same subnet mask, searching the Factory Gateway will not be carried out properly.

24.1.4 Protocol Settings

This step sets the protocol of the Factory Gateway and Device/PLC.

- 1 Select the Factory Gateway to which a protocol is transferred and click the [Set] button.



Protocol setup information of Device/PLC is read out, and the setup screen of communication protocol appears.

192.168.0.128 Setup

PLC Setup

PLC Type: OMRON SYSMAC-C SERIES

Station No: 0

Link Type: 1 : 1

☒ Send the protocol to the Factory Gateway.

Note: Sending driver.
Before change : MEMORY LINK SIO Type (V1.47)
After change : OMRON SYSMAC-C SERIES (V1.42)

Communication Setup

Speed: 19200 bps

Type: RS232C

Data Length: 7bits

Parity: Even

Stop Bit: 2bits

Flow Control: ER

Time Setup

Wait To Send: 0 msec

Timeout: 10 sec

Retry Count: 2

Extended Setup

String Mode: 3

☐ Send the ZWay Driver to the Factory Gateway. (ZWay Driver version up)

Note: Unable to send the ZWay Driver.

OK Cancel Use Defaults Help

NOTE • When the protocol setup information has been already read out by clicking the [Read] button, the setup screen appears without reading.

2 Select the Device/PLC connected to the Factory Gateway in [PLC Type].

192.168.0.128 Setup

PLC Setup

PLC Type: OMRON SYSMAC-C SERIES

Station No: KOYO KOSTAC SR21/22 SERIES

Link Type: KEYENCE KV-10_80RW/TW SERIES

☒ Send the protocol to the Factory Gateway.

Note: Sending driver.
Before change : MEMORY LINK SIO Type (V1.47)
After change : OMRON SYSMAC-C SERIES (V1.42)

Communication Setup

Speed: 19200 bps

Type: RS232C

Data Length: 7bits

Parity: Even

Stop Bit: 2bits

Flow Control: ER

Time Setup

Wait To Send: 0 msec

Timeout: 10 sec

Retry Count: 2

Extended Setup

String Mode: 3

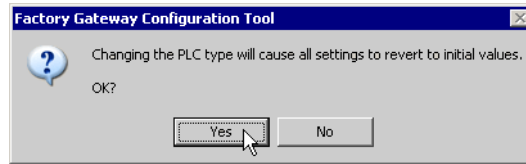
☐ Send the ZWay Driver to the Factory Gateway. (ZWay Driver version up)

Note: Unable to send the ZWay Driver.

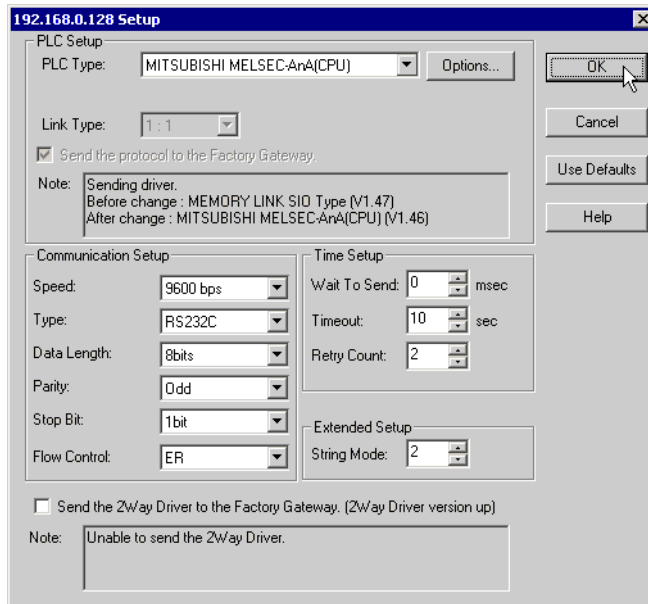
OK Cancel Use Defaults Help

3 All the set items will turn to the default values when the [PLC] type is changed.

Check if the PLC type is correct and click the [Yes] button.



4 Set the protocol on the protocol setup screen, and click the [OK] button.



NOTE

- The setup items displayed vary according to the PLC type selected.

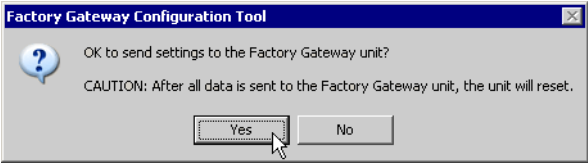
☞ "■ Protocol Setup Screen (Serial)"

☞ "■ Protocol Setup Screen (Ethernet)"

24.1.5 Protocol Transfer

This step transfers the contents of the set protocol to the Factory Gateway.

- 1 The protocol transfer confirmation dialog box will appear. Click the [Yes] button.



The "Now performing data write" message is displayed in the [State] field.

| IP Address | State | Node Name | Node Type |
|--------------------|---------------------------|-----------|---------------------|
| ↓ 192. 168. 0. 128 | Now performing data write | FGW1 | Factory Gateway ... |

When the writing is completed, a status icon indicating completion appears.

| IP Address | State | Node Name | Node Type |
|--------------------|-------|-----------|---------------------|
| 🟢 192. 168. 0. 128 | | FGW1 | Factory Gateway ... |

Now, the protocol has been written to the Factory Gateway.

NOTE

- During protocol transfer, the Factory Gateway cuts communication with Device/PLC. When the transfer is completed, the Factory Gateway is reset and becomes ready to communicate with Device/PLC.
- If you click the [No] button, the protocol setup is established but not transferred to the Factory Gateway. Click the [Write] button if you wish to transfer the setup contents (not transferred at this step) later.
- If multiple Factory Gateways are connected, repeat the steps of Protocol Settings and of Protocol Transfer.

- 2 Click [Exit] from [File] on the menu bar.

The Factory Gateway Configuration Tool exits.

NOTE

- You can save the set contents by selecting [Save] or [Save as] of the [File] menu. The contents possible to be saved are the searched node information and protocol setup contents.

24.1.6 Registering Entry Nodes

This step registers the PC and Factory Gateway connected with a network, as nodes.

Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1
IP Address :192.168.0.1
Subnet Mask :255.255.255.0



Node Name :FGW1
IP Address :192.168.0.100
Subnet Mask :255.255.255.0

Device/PLC Information

Ex.

| Entry node | Setting item | Setting example |
|-----------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| | Subnet Mask | 255.255.255.0 |
| Factory Gateway | Type | GP Series |
| | Node Name | FGW1 |
| | IP Address | 192.168.0.100 |
| | Subnet Mask | 255.255.255.0 |

NOTE

- You can set the IP address of the Factory Gateway with the rotary switch located on the right side of the Factory Gateway unit. Refer to 'Factory Gateway User's Manual' about the setting method.
- The Ethernet related setting available on the Factory Gateway is IP address only. The "Node Name", "Subnet Mask" and "Gateway" settings can be made on the entry node setting screen.

24.1.7 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
 - Be sure to reload the network project file to 'Pro-Server EX' If not, ACTION will not work.
-

Ex.

- Path of network project file : Desktop\FGWconnect
- Title : FGW connection

24.1.8 Transferring a Network Project File

This step transfers a saved network project file to the Factory Gateway.

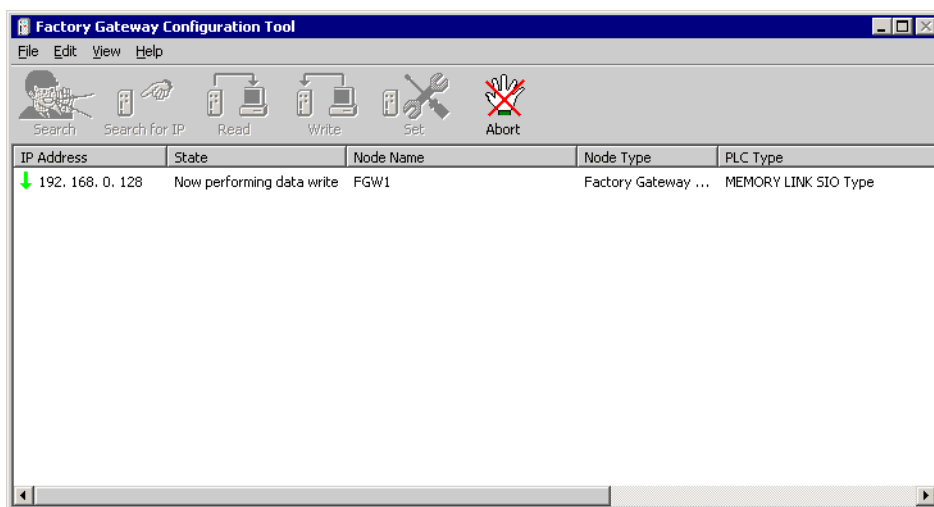
Refer to "26 Transferring" for details about transferring a network project file.

NOTE


- Be sure to transfer a network project file. If not, ACTION will not work.
-

24.2 Setting Guide

This section describes the names and functions of the main screen of the Factory Gateway Configuration Tool.



| Setting item | | Setting content |
|--------------|---------------|--|
| Icon | Search | Search the Factory Gateway connected on the network. |
| | Search for IP | Specify the IP address of the Factory Gateway to search. |
| | Read | Read the setup information of the protocol of a selected Factory Gateway. |
| | Write | Write a protocol and its setup information to a selected Factory Gateway. |
| | Set | Open the window to set the protocol of a selected Factory Gateway. |
| | Abort | Cancel searching, reading and writing processing. |
| IP Address | | <p>Displays the IP address of a searched Factory Gateway."Status Icon" indicating the status appears on the left side of the IP address.</p> <p>The details of "Status Icon" are as follows:</p> <p>(Blank): Searched only</p> <p> :In the process of reading protocol setup information</p> <p> :Protocol setup information has been read.</p> <p> :Protocol and its setup information have been set (changed).</p> <p> :In the process of writing (changing) protocol and its setup information</p> <p> :Protocol and its setup information have been written (changed).</p> |

| Setting item | Setting content |
|----------------------|---|
| State | <p>Displays Factory Gateway status.</p> <p>(Blank): Not operated</p> <p>Search waiting: Waiting for the order to read node information.</p> <p>Now searching: In the process of reading node information.</p> <p>Read waiting: Waiting for reading protocol setup information.</p> <p>Now reading: In the process of reading protocol setup information.</p> <p>Write waiting: Waiting for writing protocol setup information.</p> <p>Now writing: In the process of writing protocol setup information</p> <p>Now setting up: In the process of setting up the protocol.</p> <p>Transfer available: In the status that the transfer is possible</p> <p>(Other errors): Error is displayed.</p> <p> "36 Error Information"</p> |
| Node Name | Displays the node name on the Factory Gateway. |
| Node Type | Displays the Factory Gateway type. |
| PLC Type | Displays the protocol specified for the Factory Gateway. |
| 2-Way Driver Version | Displays the version of the 2-way driver installed on the Factory Gateway. |

■ Protocol Setup Screen (Serial)

192.168.0.128 Setup

PLC Setup

PLC Type: OMRON SYSMAC-C SERIES

Station No.: 0

Link Type: 1 : 1

☒ Send the protocol to the Factory Gateway.

Note: Sending driver.
Before change : MEMORY LINK SIO Type (V1.47)
After change : OMRON SYSMAC-C SERIES (V1.42)

Communication Setup

Speed: 19200 bps

Type: RS232C

Data Length: 7bits

Parity: Even

Stop Bit: 2bits

Flow Control: ER

Time Setup

Wait To Send: 0 msec

Timeout: 10 sec

Retry Count: 2

Extended Setup

String Mode: 3

☐ Send the ZWay Driver to the Factory Gateway. (ZWay Driver version up)

Note: Unable to send the ZWay Driver.

OK Cancel Use Defaults Help

| Setting item | | Setting content |
|---------------------|--|---|
| PLC Setting | PLC Type | Specifies a PLC type. NOTE • The [Option] button may appear according to the PLC type selected. You can specify the optional items by clicking this button. |
| | Station No. | Specifies the device No. of PLC (Link unit). |
| | Link Type | Displays the link type of the Factory Gateway, either 1:1 connection or n:1 (multi-link) connection. |
| | Send the protocol to the Factory Gateway | Checks if the protocol is transferred to the Factory Gateway. NOTE • When the PLC type is changed, this set content becomes invalid and the protocol is essentially transferred. |
| | Note | Displays if the protocol is changed during the writing process. Displays the protocol name and version before and after change if the protocol is transferred. |
| Communication Setup | Speed | Specifies the transmission speed of serial communication. |
| | Type | Specifies the method of serial communication. |
| | Data Length | Specifies the data length (bit configuration) for data transfer. |
| | Parity | Specifies the parity check method. |
| | Stop Bit | Specifies the bit number of stop bits. |
| | Flow Control | Specifies the communication control method to prevent the overflow of sent or received data. |

| Setting item | | Setting content |
|---|--------------|---|
| Time Setup | Wait To Send | Specifies the waiting time to send the next command after receiving response from PLC. |
| | Timeout | Specifies the receiving timeout span of the Factory Gateway during the communication with PLC. |
| | Retry Count | Specifies the number of retry times (to send the command again) of the Factory Gateway in the case of PLC communication error. |
| Extended Setup | String Mode | <p>Specifies the text mode.</p> <p>NOTE</p> <ul style="list-style-type: none"> Particular change is not required since the text mode is automatically selected according to the PLC type. |
| Send the 2Way Driver to the Factory Gateway | | <p>Checks if you transfer the 2-way driver to the Factory Gateway.</p> <p>NOTE</p> <ul style="list-style-type: none"> When the 2-way driver is transferred, the set contents of [Communication Setup] are also transferred. |
| Note | | <p>Displays whether or not the 2-way driver is transferred in the process of writing. If the driver is transferred, displays the version of the 2-way driver before and after change.</p> |

-
- NOTE** • The above explanation is just an example. The setup items displayed vary according to the PLC type selected.
-

■ Protocol Setup Screen (Ethernet)

192.168.0.128 Setup

PLC Setup

PLC Type: **MITSUBISHI MELSEC-A(ETHER)** Options... OK Cancel Use Defaults Help

☒ Send the protocol to the Factory Gateway.

Note: Sending driver.
Before change : OMRON SYSMAC-C SERIES (V1.42)
After change : MITSUBISHI MELSEC-A(ETHER) (V1.65)

Communication Setup

Source IP Address: 92.168.0.128
Source IP Port No.: 1024
Destination IP Address: 0.0.0.0
Destination IP Port No.: 1024
Protocol Type: ☒ UDP ☐ TCP

Extended Setup
String Mode: 2

☐ Send the ZWay Driver to the Factory Gateway. (ZWay Driver version up)

Note: Unable to send the ZWay Driver.

| Setting item | | Setting content |
|---------------------|--|---|
| PLC Setup | PLC Type | Specifies a PLC type. NOTE <ul style="list-style-type: none"> The [Options] button may appear according to the PLC type selected. You can specify the optional items by clicking this button. |
| | Send the protocol to the Factory Gateway | Checks if the protocol is transferred to the Factory Gateway. NOTE <ul style="list-style-type: none"> When the PLC type is changed, this set content becomes invalid and the protocol is essentially transferred. |
| | Note | Displays if the protocol is changed during the writing process. Displays the protocol name and version before and after change if the protocol is transferred. |
| Communication Setup | Source IP Address | Specifies the IP address of the Factory Gateway. |
| | Source IP Port No. | Specifies the port number of the Factory Gateway. |
| | Destination IP Address | Specifies the IP address of the PLC. |
| | Destination IP Port No. | Specifies the PLC port number. |
| | Protocol Type | Selects the protocol type. |

| Setting item | | Setting content |
|---|-------------|---|
| Extended Setup | String Mode | <p>Specifies the text mode.</p> <p>NOTE</p> <ul style="list-style-type: none"> Particular change is not required since the text mode is automatically selected according to the PLC type. |
| Send the 2Way Driver to the Factory Gateway | | <p>Checks if you transfer the 2-way driver to the Factory Gateway.</p> <p>NOTE</p> <ul style="list-style-type: none"> When the 2-way driver is transferred, the set contents of [Communication Setting] are also transferred. |
| Note | | <p>Displays whether or not the 2-way driver is transferred in the process of writing.</p> <p>If the driver is transferred, displays the version of the 2-way driver before and after change.</p> |

-
- NOTE** • The above explanation is just an example. The setup items displayed vary according to the PLC type selected.
-

24.3 Restrictions

24.3.1 PLC Type Compatible with the Factory Gateway

The PLC types compatible with the Factory Gateway are listed below.

| Manufacturer | PLC Type |
|---------------------------|-----------------------------------|
| Mitsubishi Electric Corp. | MELSEC-AnN(LINK) |
| | MELSEC-AnN(CPU) |
| | MELSEC-AnA(LINK) |
| | MELSEC-AnA(CPU) |
| | MELSEC-A(ETHER) |
| | MELSEC-F2 series |
| | MELSEC-FX(CPU) |
| | MELSEC-FX2(LINK) |
| | MELSEC-QnA(LINK) |
| | MELSEC-QnA(CPU) |
| | MELSEC-Q(CPU) |
| | MELSEC-Q(ETHER) |
| | FREQROL series |
| | MELSEC-FX 1:n communication (CPU) |
| | MELSEC-FX(CPU2) |
| Omron Corp. | SYSMAC-C series |
| | SYSMAC-C 1:n communication |
| | SYSMAC-CV series |
| | SYSMAC-CS1 series |
| | THERMAC NEO series |
| Sharp Corp. | SHARP New Satellite JW Series |
| Yokogawa Electric Corp. | FACTORY ACE 1:1 communication |
| | FACTORY ACE 1:n communication |
| | FA-M3(ETHER) |
| Fuji Electric Co., Ltd. | MICREX-F series |
| | MICREX-F series (FLT) |
| | FLEX-PC(LINK) |
| | FLEX-PC(CPU) |
| | FUJI INVERTER |
| | FUJI TEMPERATURE PXR |

| Manufacturer | PLC Type |
|--|--------------------------------|
| Toyoda Machine Works, Ltd. | TOYOPUC-PC2 series |
| | TOYOPUC-PC2 1:n communication |
| | TOYOPUC-PC3J series |
| | TOYOPUC-PC3J 1:n communication |
| Yaskawa Electric Corp. | Memocon-SC series |
| | GL120/130 series |
| | PROGIC8 series |
| | MP900/CP9200SH series |
| | MP2000/920(ETHER) |
| | Inverter |
| Hitachi, Ltd. | HIDIC-S10 α series |
| | HIZAC-EC series |
| Hitachi Industrial Equipment Systems Co., Ltd. | HIDIC-H series |
| | HIDIC-H2 series |
| | SJ300/L300P series |
| Toshiba Corp. | PROSEC-EX2000 series |
| | PROSEC-T series |
| | PROSEC-T(ETHER) |
| | SCHNEIDER inverter |
| Matsushita Electric Works, Ltd. | MEWNET-FP series |
| Koyo Electronics Industries Co., Ltd | KOSTAC-SG8 series |
| | KOSTAC SR21/22 series |
| | DL-305 series |
| | DL-205/405 series |
| Toshiba Machine Co., Ltd | TC200 series |
| | TC200-S series |
| GE FANUC Automation | 90SNP-X |
| | 90-30/70 SNP |
| Fanuc Ltd. | Power Mate series |
| IDEC Izumi Corp. | IDEC_1 |
| | IDEC_2 |
| | IDEC_3 |
| | MICRO3 |
| | FC3/FC4A series |

| Manufacturer | PLC Type |
|--|---------------------------|
| SIEMENS AG | S5 90-115 series |
| | S5 135-155 series |
| | S5 3964(R) protocol |
| | S7-200PPI |
| | S7-300/400 via MPI |
| | S7 via 3964/RK512 |
| | 545/555 CPU |
| Rockwell (Allen Bradley) | PLC-5 series |
| | SLC500 series |
| | Control Logix DF1 |
| Keyence Corp. | KZ300 series |
| | KZ-A500(CPU) |
| | KZ-A500(LINK) |
| | KZ-10_80R/T series |
| | KV-10_80A/D series |
| | KV-700 series (CPU) |
| Shinko Electric Co., Ltd. | SELMART series |
| Matsushita Electric Industrial Co., Ltd. | MINAS-A/S series |
| | Panadac 7000 series |
| Modicon Corp. | Modbus(MASTER) |
| | Modbus(SLAVE) |
| FACON | FACON FB |
| ORIM VEXTA | ORIM VEXTA E1 series |
| Azbil Corporation | YAMATAKE SDC SERIES |
| Toho Electronics Inc. | TTM series |
| RKC Instrument Inc. | CB/SR-Mini(MODBUS) |
| | CB/REX-F/LE100(RKC) |
| Shinko Technos Co., Ltd. | SHINKO TECHNOS INDICATING |
| Fenwal Controls of Japan, Ltd. | FENWALI AL SERIES |
| JT Engineering Inc. | JTE Analyzer |
| SHIMADEN Co., Ltd. | CONTROLLER |
| CHINO Corp. | CONTROLLER (MODBUS) |
| Meidensha Corp. | Ethernet |
| Ubon | UPZ series |
| Others | Memory link Ethernet type |
| | Memory link SIO type |

24.3.2 Restrictions on the Use of the Factory Gateway

There are some restrictions on Factory Gateway use with 'Pro-Server EX' in comparison with display unit use.

■ Restrictions related to the Factory Gateway unit

- Setting date and time

You cannot change the date and time set inside the Factory Gateway with the Factory Gateway unit. Please change these set contents from the device monitor of 'Pro-Studio EX'. (The time information cannot be specified in seconds. When the setting is changed, the second becomes "0".)

The storage location of these data differs according to the protocol that has been transferred.

- Protocol restrictions

The Factory Gateway does not apply to a protocol that requires the communication expansion unit.

■ Restrictions related to the 'Pro-Server EX' functions

Among the 'Pro-Server EX' functions, the followings are not available on the Factory Gateway:

- Saving backup data in SRAM

The Factory Gateway has no backup SRAM function. Contents are not saved though a new file is created.

- Saving GP screens

The Factory Gateway does not save GP screens, as it has no screen. In addition, the Factory Gateway has no CF card I/F where the data is temporarily saved.

- Changing port numbers (TCP/UDP port No.)

You cannot change the port number (that the Factory Gateway uses on 'Pro-Server EX') by 'Pro-Server EX' or the Factory Gateway Configuration Tool. Please change such a port number by transferring a network project file from 'Pro-Server EX'.

It is recommended to use the default port number "8000" for 'Pro-Server EX' unless there is inconvenience.

■ Restrictions related to ACTION contents

Among the 'Pro-Server EX' ACTION contents, the followings are not available on the Factory Gateway:

- Upload of GP log data
- Automatic upload of GP filing data
- Automatic download of GP filing data
- Upload of GP JPEG data

These 4 ACTIONS are the functions requiring a backup SRAM or CF card, and unavailable on the Factory Gateway.

■ Restrictions related to the Factory Gateway Configuration Tool

The Factory Gateway Configuration Tool has the following functional restrictions:

- Setting protocols of multi-link (n:1) type

You can neither set nor transfer protocols of multi-link (n:1) type from the Factory Gateway Configuration Tool. Please set and transfer them from 'GP-Pro EX'.

However, it is possible to transfer another protocol to the Factory Gateway in which a protocol of multi-link (n:1) type is specified.

- Password setting

You cannot set a password for the protocol to be transferred with the Factory Gateway Configuration Tool. It is possible to obtain a password for protecting possible protocol overwriting by setting (from the [Transfer] screen, [Settings (S)], and [Password (P)]) and transferring with 'C-Package'.

When you attempt to read password-protected protocol data of the Factory Gateway, a dialog box appears asking the password. By entering the password, you can set up, change and transfer the protocol. The password set in the Factory Gateway will be deleted by transferring the protocol again from the Factory Gateway Configuration Tool.

- Provider information at protocol change

You cannot delete the provider information in the Factory Gateway by changing and transferring the protocol. Please create and transfer a network project file for a new protocol with 'Pro-Studio EX'.

- Display Help Menu

The Help menu does not display on Windows Vista and Windows Server 2008 or later operating systems. Please go to Microsoft's home page and download "WinHlp32.exe".

25 | Saving

| | | |
|------|---------------------------------------|------|
| 25.1 | Setting Guide | 25-2 |
| 25.2 | Import/Export Nodes and Symbols | 25-7 |

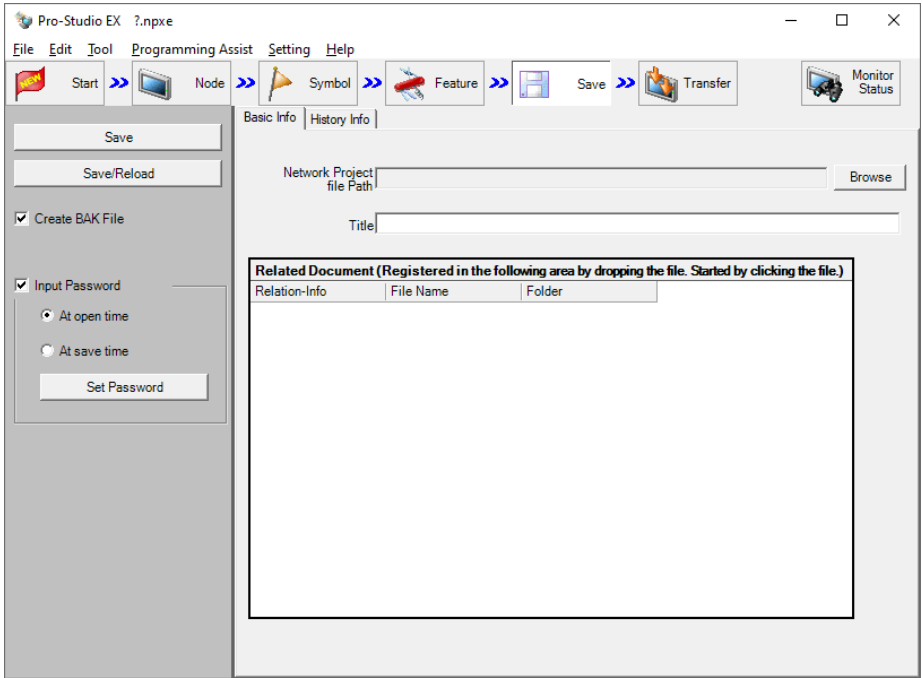
25.1 Setting Guide

When you finish the settings of the entry node(s), symbol(s) and function(s), save these set data as a "Network Project File".

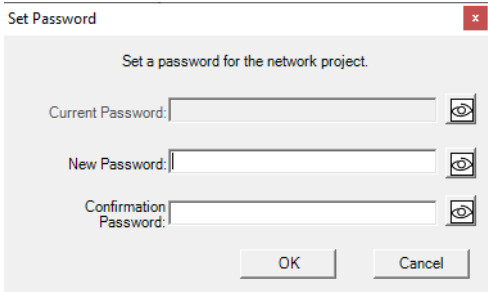
'Pro-Server EX' reads (or reloads) this network project file, and then executes each ACTION.

Therefore, it is required to save and reload the data specified on 'Pro-Studio EX' as a network project file.

■ "Basic Info" Tab

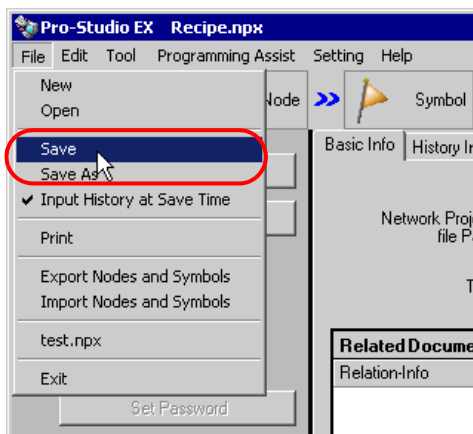


| Setting item | Setting content |
|-----------------|---|
| Save | <p>Saves a network project file.</p> <p>NOTE</p> <ul style="list-style-type: none"> When overwriting the data in an existing network project file, no dialog box confirming the overwriting appears. |
| Save/Reload | <p>Saves a network project file and reloads.</p> <p>'Pro-Server EX' reads the contents stored in a network project file and performs operation according to the specification in this file.</p> |
| Create BAK File | <p>Check this when you wish to create the backup file of a network project file.</p> <p>NOTE</p> <ul style="list-style-type: none"> A backup file is created with the "*.npxe.bak" or "*.npx.bak" extension in the same location as the network project file. It is possible to edit the backup file but you cannot save the contents. Change the name and extension to save the file after editing. |

| Setting item | Setting content |
|---------------------------|--|
| Input Password | <p>Select this check box to prompt for a password whenever saving or opening a network project file.</p> <p>When this setting is enabled, the password entry screen below appears when saving or opening a network project file.</p> <p>Select when to prompt for the password, from the [At save time] and [At open time] options.</p>  <p>IMPORTANT</p> <ul style="list-style-type: none"> • Network project files that require the password "at open time" cannot be opened with Pro-Studio EX versions before 1.37.300. <p>NOTE</p> <ul style="list-style-type: none"> • This setting protects the unauthorized overwriting of network project files for security. |
| Set Password | <p>The "Set Password" screen appears.</p> <p>You can newly set or change a password on this screen.</p> <p>Refer to "■ "Set Password" Screen" for more details.</p> |
| Network Project file Path | <p>Specifies the saving destination and file name of a network project file.</p> <p>Clicking the [Browse] button displays the "Save As" screen, where you can specify the saving destination and file name of the network project file to save by clicking the [Save] button.</p> <p>NOTE</p> <ul style="list-style-type: none"> • For the saving destination and file name of the network project file, a semicolon (;) cannot be used. |
| Title | Enter a network project file title. |
| Related Document | <p>You can register an optional related document file in the network project file to be saved. You can register the file name and folder name by dragging and dropping a file to be registered into this area. Click the [Relation-Info] field and enter the related information (comment).</p> <p>Clicking the file name opens the file.</p> <p>NOTE</p> <ul style="list-style-type: none"> • The related document is controlled with a file path. When this file is moved after the registration, you must register it again. • You cannot edit the document [File name] or [Folder]. • To cancel registration, select the [Relation-Info] field and press the [Delete] key. |

NOTE

- It is also possible to save a network project file by selecting [Save] or [Save as] from the [File] menu.



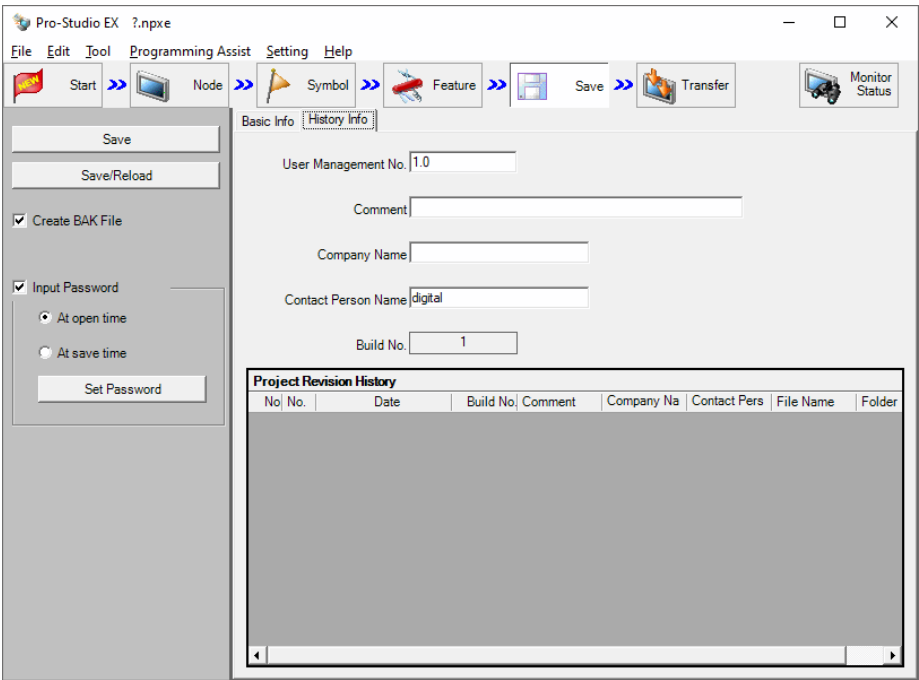
If you have checked [Input History at Save Time] in the following dialog box or of the [File] menu, the "Register File-Related Info" screen appears each time you save a network project file from the [File] menu.

The contents of this screen are the same as those in the [History Info] tab shown in the next section. Specify the necessary items and click the [Register] button to save the file.

You can also select whether or not the "Register File-Related Info" screen appears when saving a file from the menu, using the [Input History at Save Time] check box on this screen.

A screenshot of the 'Register File-Related Info' dialog box. It contains the following fields and controls: 'User Management No.' with the value '1.0', 'Comment' with the value 'First Data', 'Company Name' with the value 'Pro-face', and 'Contact Person Name' which is empty. At the bottom, there is a 'Build No.' field with the value '2' and a checked checkbox labeled 'Input History at Save Time'. There are 'Register' and 'Cancel' buttons at the bottom right.

■ "History Info" Tab



| Setting item | Setting content |
|--------------------------|--|
| User Management No. | <p>Enter an optional control number (like a version).</p> <div>NOTE</div> <ul style="list-style-type: none">User management number is intended for optional version control of network project file by users. And the version upgrading and downgrading are not automatically controlled. |
| Comment | <p>Enter comments related to history.</p> |
| Company Name | <p>Enter a company name.</p> <div>NOTE</div> <ul style="list-style-type: none">By default, displays the name of the company registered at OS installation. |
| Contact Person Name | <p>Enter the name of a contact person.</p> <div>NOTE</div> <ul style="list-style-type: none">By default, displays the user name registered at OS installation. |
| Build No. | <p>This number is determined automatically in a network project file, and increases by 1 count each time you save a network project file after changing the contents.</p> <div>NOTE</div> <ul style="list-style-type: none">Build numbers are repeated in the range of 1 to 2147483646. |
| Project Revision History | <p>Displays the revision history of the information in a network project file. If there is any change to User Management Number, Comment, Company Name, Contact Person Name, File Name or Folder, the history data is to be added.</p> |

■ "Set Password" Screen

Set Password

Set a password for the network project.

Current Password:

New Password:

Confirmation Password:

OK Cancel

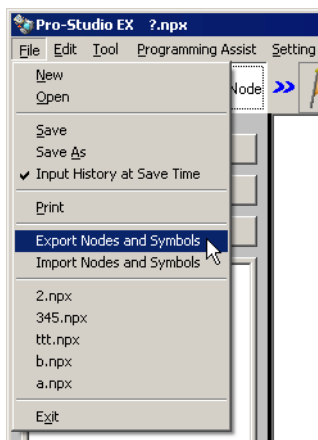
| Setting item | Setting content |
|-----------------------|--|
| Current Password | <p>Displays the currently set password in "*****".</p> <p>NOTE</p> <ul style="list-style-type: none"> Click the icon to display the entered text. |
| New Password | <p>Enter up to 32 characters for the new or edited password.</p> <p>NOTE</p> <ul style="list-style-type: none"> If you leave this field blank, password protection becomes invalid. For enhanced security, passwords should meet the following requirements: <ul style="list-style-type: none"> At least 8 characters long. ? At least one of each of the following four types of characters: Lowercase letters (a-z), uppercase letters (A-Z), numbers (0-9), and special characters (SPACE!"#\$%&'()*+,-./:;<=>? @[\]^_`{ }~). |
| Confirmation Password | Enter the same password as that in [New Password] for confirmation. |

25.2 Import/Export Nodes and Symbols

Nodes and Symbols can be imported / exported in csv form. It is convenient to check the case where many symbols are edited, Nodes and Symbols by list in order to export in csv form using Excel.

You can click [Export Nodes and Symbols] from the [File] menu to output the node and symbol information in a CSV format file.

To import the edited CSV file, click [Import Nodes and Symbols] from the [File] menu and specify the corresponding CSV file.



It is outputted in the following form.

| | A | B | C | D | E |
|----|--------------------|---------------------------------|----------------------------|----------------------------|----------------|
| 1 | <NPX> | Format4 | ProjectID 1194992173 | Version 5.2.0 | |
| 2 | | | | | |
| 3 | <GlobalDefinition> | Constant Name | Value | Comment | |
| 4 | | Global1 | 100 | Comment1 | |
| 5 | | Global2 | 200 | Comment2 | |
| 6 | | | | | |
| 7 | <NodeProperty> | Node Name | IP Address | Subnet Mask | Gateway |
| 8 | | PC1 | 192.168.0.1 | 0.0.0.0 | 0.0.0.0 |
| 9 | | | | | |
| 10 | <NodeProperty> | Node Name | IP Address | Subnet Mask | Gateway |
| 11 | | AGP1 | 192.168.0.100 | 0.0.0.0 | 0.0.0.0 |
| 12 | <ConnectDriver> | Maker Name | Device Type | Port Type | Port No. |
| 13 | | Mitsubishi Electric Corporation | A Series CPU Direct | COM | 1 |
| 14 | <ConnectPLC> | Device Name | Model | Outline of Device Settings | Device/PLC Se |
| 15 | | PLC1 | | Series=AnA Series | [node]\nnode |
| 16 | | | | | |
| 17 | | | | | |
| 18 | <SymbolSheet> | Symbol Sheet Name | Symbol Type (Global/Local) | Node Name | Device/PLC Na |
| 19 | | Sheet1 | Local | PC1 | #INTERNAL |
| 20 | <Symbol> | Attribute (Begin/End/Symbol) | Symbol Name | Data Type (1-12) | Consecutive or |
| 21 | | | | | |
| 22 | <SymbolSheet> | Symbol Sheet Name | Symbol Type (Global/Local) | Node Name | Device/PLC Na |
| 23 | | Sheet2 | Local | AGP1 | #INTERNAL |

NOTE

- When using GP4000/LT4000 Series nodes, the node type is output as "GP4000 Series".
- If you cannot import, refer to "■ CSV Format File".

■ CSV Format File

If you select [Export Nodes and Symbols], CSV files (comma-delimited text) including the following information are exported.

NOTE

- To support Ethernet/IP of Rockwell Automation, the CSV format has changed from that in the old version (V1.22 or earlier) of 'Pro-Studio EX'. When you import the CSV format file exported using the old version, refer to the following and correct the CSV file.

| Network Project Information | | | | Global Constant Information | | Node and Device/ PLC Information | |
|-----------------------------|--------------------|---------------------------------|----------------------------|-----------------------------|--|-------------------------------------|---|
| | A | B | C | D | | | E |
| 1 | <NPX> | Format4 | ProjectID 1194992173 | Version 5.2.0 | | | |
| 2 | | | | | | | |
| 3 | <GlobalDefinition> | Constant Name | Value | Comment | | | |
| 4 | | Global1 | | 100 Comment1 | | | |
| 5 | | Global2 | | 200 Comment2 | | | |
| 6 | | | | | | | |
| 7 | <NodeProperty> | Node Name | IP Address | Subnet Mask | | Gateway | |
| 8 | | PC1 | 192.168.0.1 | 0.0.0.0 | | 0.0.0.0 | |
| 9 | | | | | | | |
| 10 | <NodeProperty> | Node Name | IP Address | Subnet Mask | | Gateway | |
| 11 | | AGP1 | 192.168.0.100 | 0.0.0.0 | | 0.0.0.0 | |
| 12 | <ConnectDriver> | Maker Name | Device Type | Port Type | | Port No. | |
| 13 | | Mitsubishi Electric Corporation | A Series CPU Direct | COM | | | 1 |
| 14 | <ConnectPLC> | Device Name | Model | Outline of Device Settings | | Device/PLC Setting Info | |
| 15 | | PLC1 | | 0 Series=AnA Series | | [node]\nmodel=0 | |
| 16 | | | | | | | |
| 17 | | | | | | | |
| 18 | <SymbolSheet> | Symbol Sheet Name | Symbol Type (Global/Local) | Node Name | | Device/PLC Name | |
| 19 | | Sheet1 | Local | PC1 | | #INTERNAL | |
| 20 | <Symbol> | Attribute (Begin/End/Symbol) | Symbol Name | Data Type (1-12) | | Consecutive or Bit Specif | |
| 21 | | | | | | | |
| 22 | <SymbolSheet> | Symbol Sheet Name | Symbol Type (Global/Local) | Node Name | | Device/PLC Name | |
| 23 | | Sheet2 | Local | AGP1 | | #INTERNAL | |
| 24 | <Symbol> | Attribute (Begin/End/Symbol) | Symbol Name | Data Type (1-12) | | Consecutive or Bit Specif | |
| 25 | | | | | | | |
| 26 | <SymbolSheet> | Symbol Sheet Name | Symbol Type (Global/Local) | Node Name | | Device/PLC Name | |

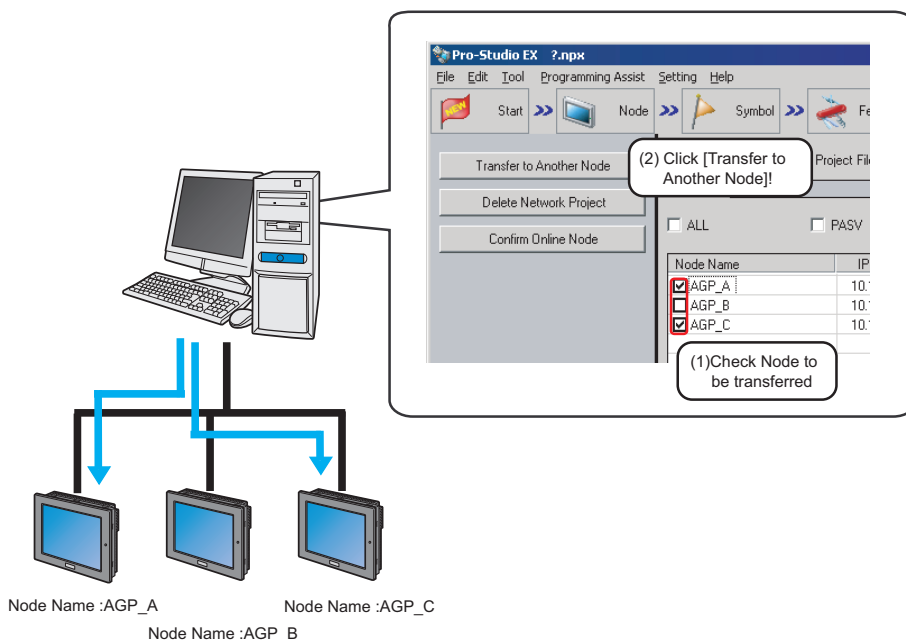
Symbol Information

26 | Transferring

| | | |
|------|---------------------|------|
| 26.1 | Setting Guide | 26-2 |
| 26.2 | Restrictions | 26-6 |

26.1 Setting Guide

This step transfers a network project file to a specified entry node, making ACTION and data transfer available.



NOTE

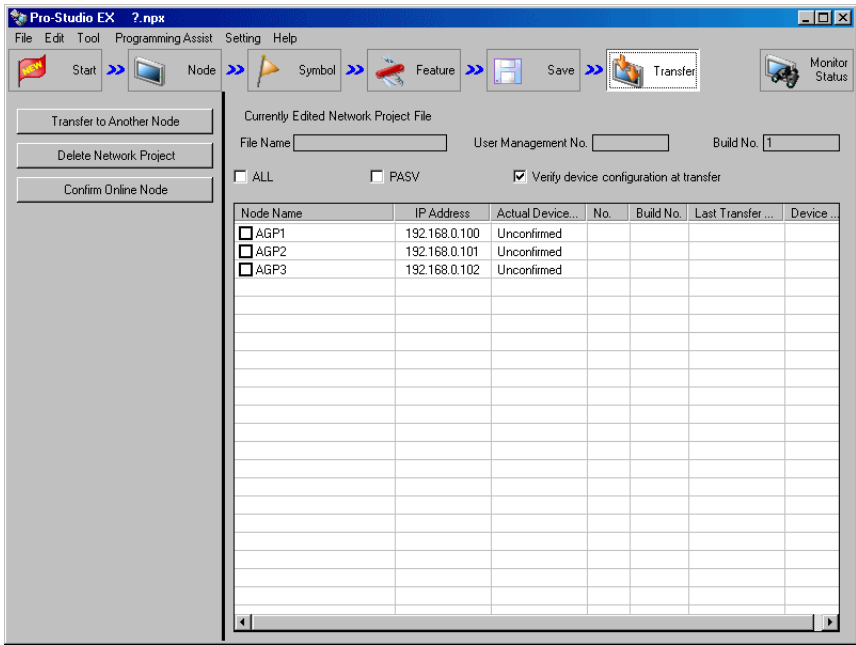
- Please make sure to save the network project file before transferring.

☞ "25 Saving"

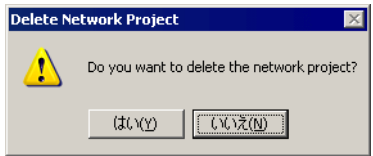
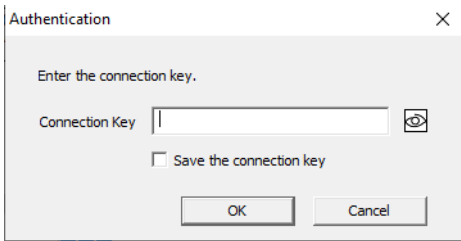
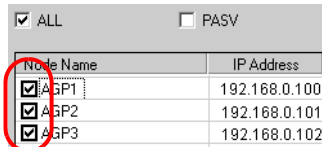
- When transferring a network project to the display unit, although the display unit is restarted, data in backup SRAM is not erased and remains in the same state as before the transfer operation.
- When [Network project ID] is selected under [Compare the network project on Connection] on the [Option Settings] screen, you need to transfer the network project to all nodes, including those which are not affected by the changes. When [Network Project changes] is selected, you can transfer the network project only to nodes that are affected by the changes, unless the changes of the network project affect target items for comparison. This makes the transfer procedure easier in large-scale systems. Refer to the following section for more details on [Compare the network project on Connection].

☞ "34 Setting Up Environment"

- When you change selection of [Compare the network project on Connection] on the [Option Settings] screen, execute the transfer to all nodes.
- You cannot upload the network project file from the display unit to the computer.
- Back up the network project file transferred to the display unit.



| Setting item | Setting content |
|--------------------------|---|
| Transfer to Another Node | <p>Transfers a network project file to a specified node. When the file transfer is executed, the "Transfer Network Project" screen appears to show the results of network project compilation, transfer status to each node and completion message.</p> <p>NOTE</p> <ul style="list-style-type: none">• The display unit turns to offline mode when a network project file is transferred, and restarts after the transfer is completed.• When transferred to multiple nodes, a network project file is transferred to each node in order. If error occurs during the transfer to one of the nodes, the transfer process is cancelled without transferring to the rest of the nodes. Click [Transfer to other nodes] to continue the file transfer.• When the connected node's [Verify device configuration at transfer] is enabled in the [Connection key] setting, the connection key must be entered when transferring a network project. Configure the [Connection Key] setting in offline mode from the [Security Settings] screen. <div><div>Authentication</div><div>Enter the connection key.</div><div>Connection Key</div><div><input type="text"/></div><div><input type="checkbox"/> Save the connection key</div><div>OK</div><div>Cancel</div></div> |

| Setting item | Setting content |
|---------------------------------------|--|
| Delete Network Project | <p>Deletes the network project of the node specified. The "Delete Network Project" screen will appear. Click [Yes] or [No].</p>  <p>NOTE</p> <ul style="list-style-type: none"> When the connected node's [Verify device configuration at transfer] is enabled in the [Connection key] setting, the connection key must be entered when transferring a network project. Configure the [Connection Key] setting in offline mode from the [Security Settings] screen.  |
| Confirm Online Node | Obtains the information for the network project that was transferred to the specified node and updates the displayed contents of the node list. |
| Currently Edited Network Project File | Displays File Name, User Management Number, and Build Number of the network project file being edited. |
| ALL | <p>Checks all the nodes displayed.</p>  |
| PASV | <p>Transfers in passive mode. This is effective only for transferring a network project file to ST6000 Series node, SP-5B4*/WinGP node, SP-5B00/5B10/5B90 node, GP4000/LT4000 Series node, GP3000 Series node, or LT3000 node.</p> <p>NOTE</p> <ul style="list-style-type: none"> Transfer in passive mode is useful for the file transfer under the circumstance where the network filters FTP commands with the firewall setting. |

| Setting item | | Setting content |
|--------------|-------------------------|--|
| Node List | Node Name | Displays registered node names. Check the check box to specify a node. |
| | IP Address | Displays IP addresses of nodes. |
| | Actual Device Status | When [Confirm Online Node] is executed, the file name of the network project file that was transferred to the display unit is displayed. GP Series node: You can confirm the existence of the file. |
| | No. | When [Confirm Online Node] is executed, the user management number of the network project file that was transferred to the display unit is displayed. This is not displayed for GP Series nodes. |
| | Build No. | When [Confirm Online Node] is executed, the build number of the network project file that was transferred to the display unit is displayed. This is not displayed for GP Series nodes. |
| | Last Transfer Date/Time | When [Confirm Online Node] is executed, the date and time when the network project file was last transferred to the display unit is displayed. This is not displayed for GP Series nodes. |
| | Device/PLC | <p>Displays if the Device/PLC information of the screen project file transferred to the display unit is same as that of the network project file on the 'Pro-Server EX'. Click the [Confirm Online Node] button to update the latest information.</p> <ul style="list-style-type: none"> • Match: The Device/PLC information of the screen project in the node matches that of the transferred network project file (editing network project file before transfer). • Match After Transfer: The Device/PLC information of the screen project in the node varies from that of the transferred network project file, but it will operate normally if you transfer the editing network project file. • Not Match: The Device/PLC information varies among the screen project in the node, the transferred network project file, and the editing network project file. Match the Device/PLC information between the editing network project file and the screen project in the node, and transfer the former for normal operation. • (Blank): Nothing is displayed before verifying the Device/PLC information (before confirming the online node or transferring the network project file). <p>NOTE</p> <ul style="list-style-type: none"> • "Device/PLC" (Device/PLC verification) is not available in GP Series node. |

26.2 Restrictions

- When [Network project ID] is selected under [Compare the network project on Connection] on the [Option Settings] screen, you need to transfer the network project to all nodes, including those which are not affected by the changes. When [Network Project changes] is selected, you can transfer the network project only to nodes that are affected by the changes, unless the changes of the network project affect target items for comparison. This makes the transfer procedure easier in large-scale systems. Refer to the following section for more details on [Compare the network project on Connection].



34.3 Option Settings

- When you change selection of [Compare the network project on Connection] on the [Option Settings] screen, execute the transfer to all nodes.

27



Designing Your Own Program

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27.1 Using API Functions

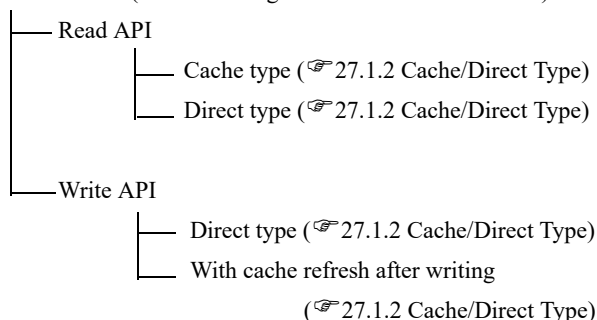
By using the Pro-Server EX API, you can create a VB (Visual Basic), VC (Visual C++), VB .NET, or C# user application to access an address on a display unit or device/PLC.

NOTE

- For user applications you can use, refer to "■ User Application Development Environment".

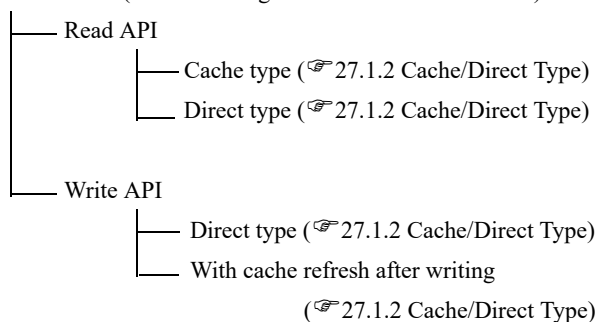
■ Reading and writing a Device/PLC

Single-handle functions (☞ 27.1.1 Single-/Multi-Handle Functions)



■ PLC communication with multiple devices

Multi-handle functions (☞ 27.1.1 Single-/Multi-Handle Functions)



■ For effective communication

- Group symbol access (☞ 27.1.4 Group Access)
- Queuing access (☞ 27.1.5 Queuing Access)

■ Other functions

- System APIs (→27.1.7 System APIs)
- SRAM Data Access APIs (→27.1.8 SRAM Data Access APIs)
- CF Card and SD Card APIs (→27.1.9 CF Card and SD Card APIs)
- Other APIs (→27.9 Other APIs)

27.1.1 Single-/Multi-Handle Functions

Single-Handle APIs

This API is used for sequential communications with target devices. During a call of an API, you cannot call another API.

To call an API, however, you need not perform a troublesome procedure such as 'Pro-Server EX' access handle acquisition.

Multi-Handle APIs

This API enables simultaneous use of single-handle API features for multiple devices. For differentiation from Single-Handle APIs, Multi-Handle APIs are identified with a capital "M" at the end of each API name.

For example, a Multi-Handle API that provides the same feature as a Single-Handle API "ReadDeviceVariant()" is named "ReadDeviceVariantM()".

Multi-Handle APIs can be used for multi-thread applications, or for simultaneous access to multiple Devices/PLCs.

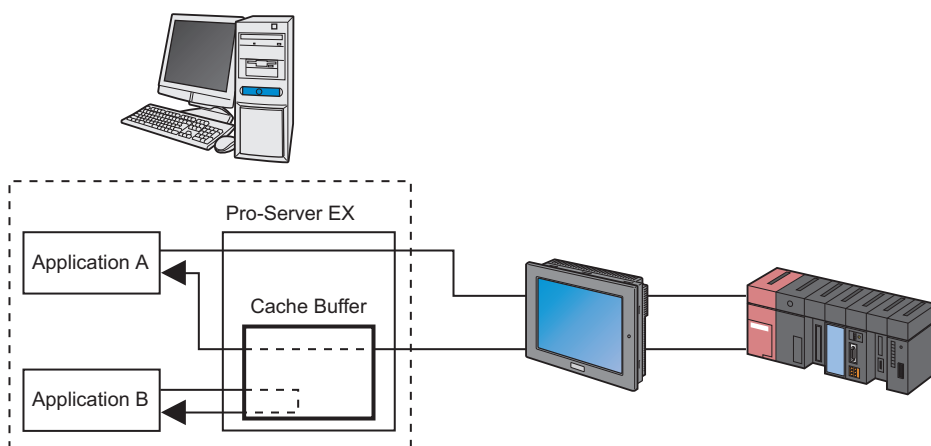
27.1.2 Cache/Direct Type

Cache Read

When multiple applications send reading requests to the same device/PLC, it takes time if 'Pro-Server EX' accesses the Device/PLC to meet individual applications' reading request one by one.

With the Cache Read feature, however, when two applications A and B send reading requests to the same Device/PLC, 'Pro-Server EX' reads data from the Device/PLC according to the request of Application A first, stores the read data into the internal cache buffer, and sends the data to Application A in response to the reading request. Then, according to the request of Application B, 'Pro-Server EX' sends the data stored in the cache buffer to Application B, since the response data are already stored together with the data for Application A.

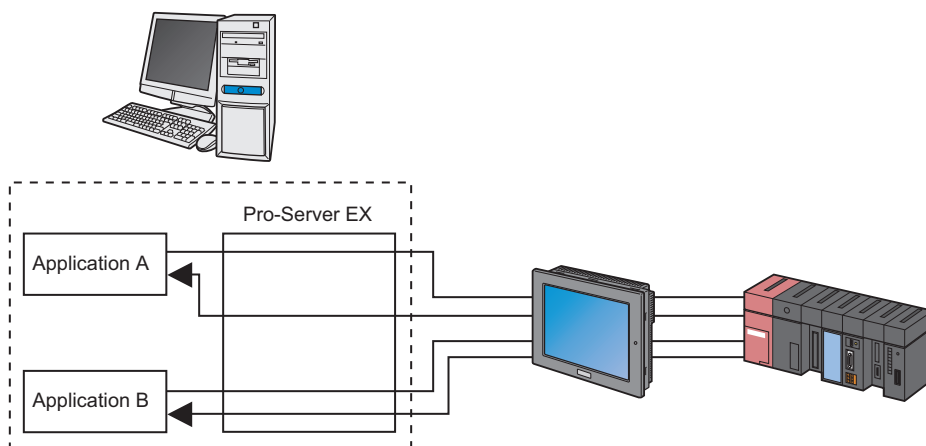
'Pro-Server EX' also provides cache buffer control APIs. Refer to "27.3 Cache Buffer Control APIs" for more details.



Direct Read

This feature always reads latest data from a Device/PLC, regardless of cache status.

Direct Read APIs are identified with a capital "D" or "DM" at the end of each API name.



Direct Write

This API writes values. Direct Write APIs are identified with a capital "D" or "DM" at the end of each API name.

Write with Cache Refresh

When caching data from a device, 'Pro-Server EX' rereads the relevant device data after writing values, to refresh the cache data.

The processing speed of this API is lower than that of Direct Write APIs. When 'Pro-Server EX' has cache-read device data, use Write with Cache Refresh.

27.1.3 Cache Buffer Control APIs

Cache Buffer Control APIs allow you to know whether cache data for a target device has been updated or not.

-
- NOTE** • Cache Buffer Control APIs are not intended to rewrite a network project file, but used to add data to or change data in the internal memory of 'Pro-Server EX'.
-

■ Cache Buffer

When caching device data, 'Pro-Server EX' manages multiple devices as a whole. The unit of the management is called "cache buffer".

- (1) One cache buffer is comprised of multiple records.
- (2) One record can be specified by direct specification of addresses of consecutive multiple devices, by symbol specification, or by group symbol specification.
- (3) You can assign a unique name to each cache buffer.

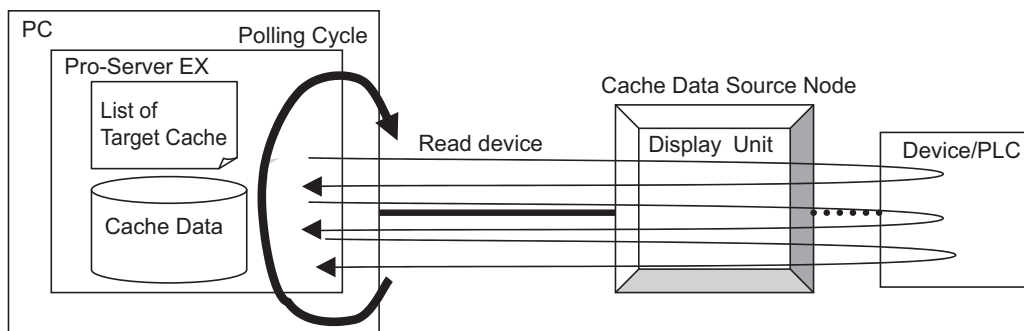
-
- NOTE** • For cache buffer registration, the following two methods are available:
- (1) Registration using 'Pro-Studio EX' (Create a cache buffer in "Device Cache" on the feature screen, and register it in a network project file.)
 - (2) Registration using API
-

■ Cache buffer updating procedure

To update a cache buffer, "Polling" and "Constant monitoring" methods are available.

◆ The principle of polling method

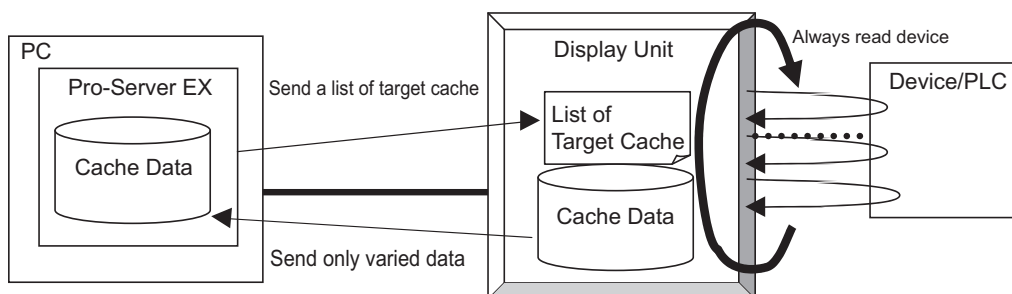
According to a list of target devices in the cache buffer, 'Pro-Server EX' reads device data to update the cache buffer when the cycle specified in cache buffer registration is reached.



◆ The principle of constant monitoring method

At the start of cache buffer updating, 'Pro-Server EX' sends a list of target devices to a data source node. According to the list, the data source node constantly reads device data (as fast as possible), and sends only changed data to 'Pro-Server EX'.

'Pro-Server EX' receives the data, and handles it as cache data.



NOTE

- When the cache data source node is in the GP Series, the constant monitoring method cannot be used.

■ Selecting constant monitoring method or polling method

If a large volume of device data are monitored with the constant monitoring method, then 'Pro-Server EX' is engaged in monitoring, resulting in deterioration of the whole system performance.

To prevent this, it is recommended to select the constant monitoring method only for highly-urgent items, and to use the polling method for other items.

With the polling method, the cache buffer may not be updated according to the update cycle, depending on your PC or network conditions, types of Device/PLCs, and performance of your system. In this case, use Direct Read APIs.

As standard data volume acceptable with each method, the constant monitoring method can handle up to tens of bytes to hundreds of bytes, and the polling method can handle up to several kilobytes. For a larger data volume, use Direct Read APIs.

Note that the allowable number of bytes varies depending on performance of your system.

■ Starting and Stopping Caching

'Pro-Server EX' caching start/stop timing is described below.

(1) Caching starts or stops by cache buffer.

(2) To register a cache buffer in a network project file with 'Pro-Studio EX', the following three types of registration methods can be selected for each cache buffer. The caching start timing for each method is as follows.

1) At start of 'Pro-Server EX'

After 'Pro-Server EX' starts and a network project is loaded, 'Pro-Server EX' starts caching.

When a network project is reloaded, 'Pro-Server EX' also starts caching.

2) Starting caching automatically when a pre-registered device is read

When a Device Read API is issued for a cache device registered in the cache buffer, 'Pro-Server EX' starts caching.

Even if reading is executed for some of the devices registered in the cache buffer, 'Pro-Server EX' starts caching for all registered devices.

Caching can be started by all the reading methods as well as Device Read APIs. (For example, when a device is specified as a data source for a data transfer function, or when a device is subjected to start condition check, caching starts.)

However, only when caching is started with the method 2), 'Pro-Server EX' stops caching if there is no access to the target device in the cache buffer for a specified period.

3) Starting caching with a program using Cache Buffer Start API (PS_StartCache)

(3) In the following conditions, 'Pro-Server EX' stops caching.

1) When 'Pro-Server EX' is closed, the cache buffer stops, and discards cache data.

2) Immediately before a network project is reloaded, the cache buffer stops, and discards cache data.

3) When the function of "Automatically start when a registered device is read" is enabled, and the cache buffer is not accessed within a specified stop time after start of caching, the cache buffer stops. (Cache data will not be discarded.)

4) When the cache buffer is stopped with a program by using the Cache Stop API (PS_StopCache).

27.1.4 Group Access

Some APIs use a group symbol to specify a device address.

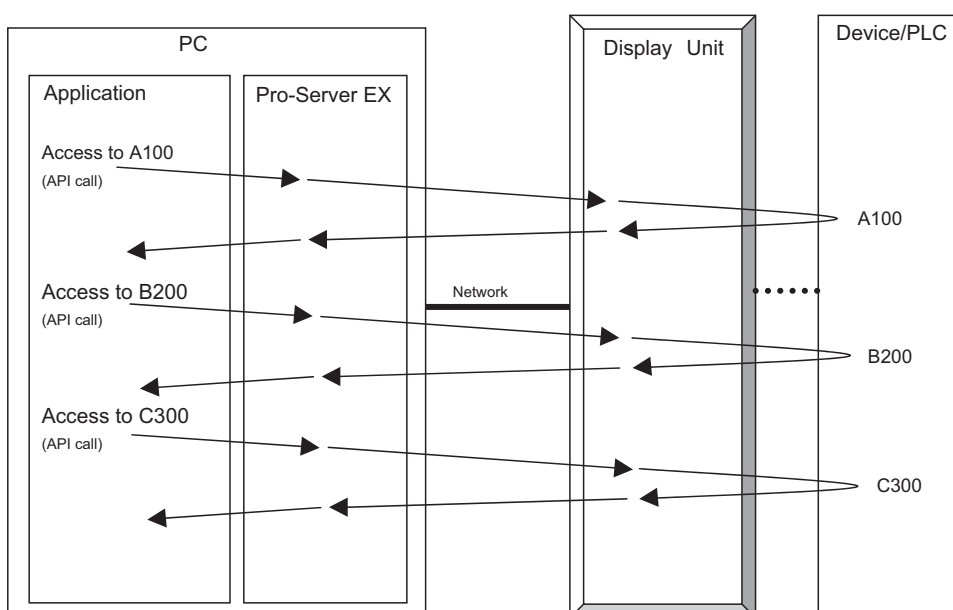
With a group symbol, 'Pro-Server EX' can efficiently access multiple devices with a single call of an API.

NOTE

- When 'Pro-Server EX' accesses devices by using a group symbol comprised of multiple devices, each access speed becomes high, and 'Pro-Server EX' and display unit internally optimize the processing. Therefore, you cannot specify the device access order. (The registration order of symbols in group symbol registration does not mean the access order.)
If an access error occurs with any one of the multiple devices, the processing will stop. 'Pro-Server EX' recognizes it as the whole group access error, and will not execute access to the remaining devices.
- The maximum group symbol data size available with a single call of an API is 1 Mbyte.

◆ When calling API individually for each device:

Every time the API is called, 'Pro-Server EX' communicates with the device.

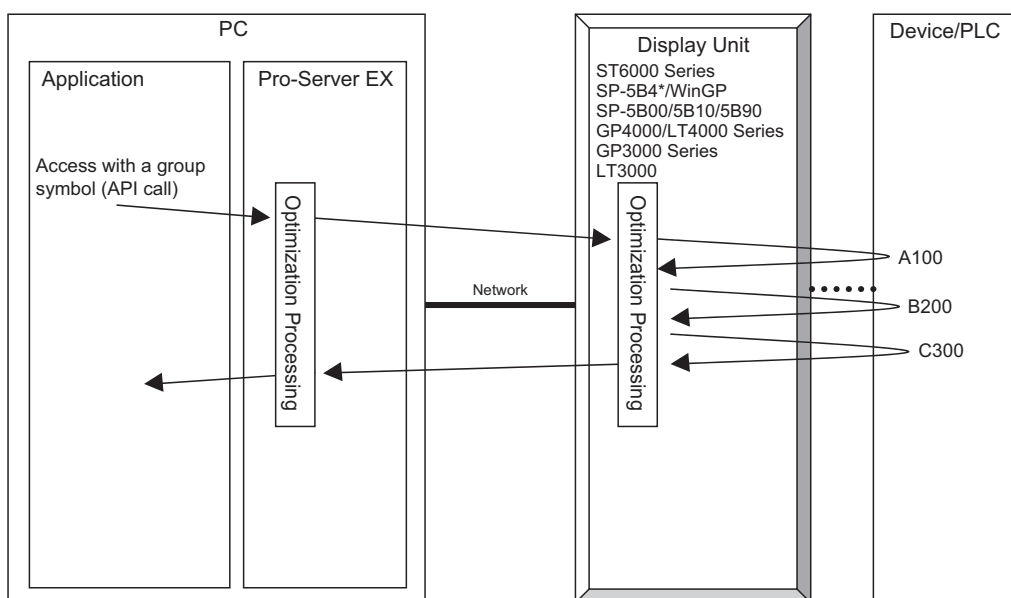


◆ When accessing group symbols

Operation differs depending on the type of node.

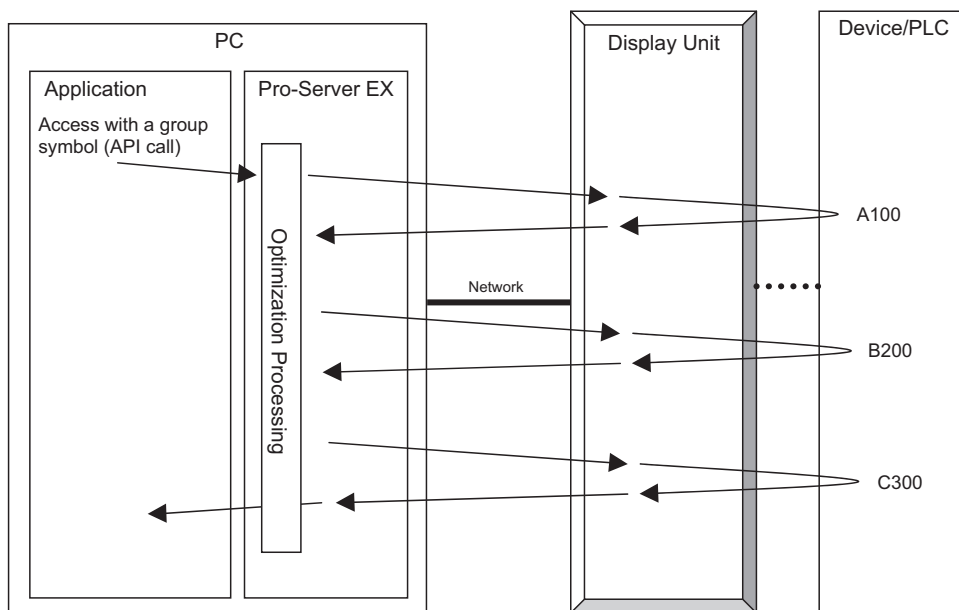
- For ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, and LT3000 nodes

'Pro-Server EX' sends a request for each node only once. The node internally divides the request to access each device separately. Thus, 'Pro-Server EX' can efficiently communicate with the devices on the network.



- For GP Series node

The API is called only once, and 'Pro-Server EX' internally divides the request to access each GP Series node separately. However, if the group has several consecutive symbols, 'Pro-Server EX' accesses these symbols at once.



■ Data structure for group symbol access

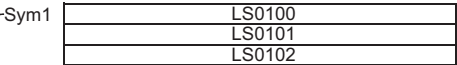
When 'Pro-Server EX' accesses devices via a group symbol, the data buffer structure varies depending on the symbol type or size of the group. The data buffer structure by group symbol type is as follows:

| Group symbol data type | Secured data size |
|---------------------------------|--|
| Bit Data | <ul style="list-style-type: none"> • For bit symbol Data buffer is secured in multiples of 16 bits. • For bit offset symbol No data buffer is secured. |
| 8-bit (Signed) Data | Data buffer of 1 byte/device is secured. Binary value is used. |
| 8-bit (Unsigned) Data | |
| 8-bit (HEX) Data | |
| 8-bit (BCD) Data | Data buffer of 1 byte/device is secured. During access to a device, 'Pro-Server EX' executes BCD-Binary conversion. |
| 16-bit (Signed) Data | Data buffer of 2 bytes/device is secured. Binary value is used. |
| 16-bit (Unsigned) Data | |
| 16-bit (HEX) Data | |
| 16-bit (BCD) Data | Data buffer of 2 bytes/device is secured. During access to a device, 'Pro-Server EX' executes BCD-Binary conversion. |
| 32-bit(Signed)Data | Data buffer of 4 bytes/device is secured. Binary value is used. |
| 32-bit(Unsigned)Data | |
| 32-bit(HEX)Data | |
| 32-bit(BCD)Data | Data buffer of 4 bytes/device is secured. During access to a device, 'Pro-Server EX' executes BCD-Binary conversion. |
| Single-precision floating point | Data buffer of 4 bytes/device is secured. The value is handled as a single-precision floating point value. |
| Double-precision floating point | Data buffer of 8 bytes/device is secured. The value is handled as a single-precision floating point value. |
| Character string data | Data buffer of 1 byte/character is secured. The data is handled as a NULL-terminated character string. |
| TIME Data | Data buffer of 1 device/4 bytes is secured. When accessing actual device, binary value with internal format is converted to value with external device format. |
| TIME_OF_DAY Data | |
| DATE Data | |
| DATE_AND_TIME Data | Data buffer of 1 device/8 bytes is secured. When accessing actual device, binary value with internal format is converted to value with external device format. |

Examples of the data buffer structures are shown below.

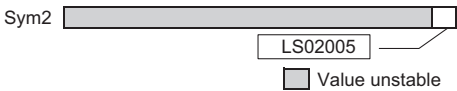
Simple word symbol

Data is simply aligned.
(1 box equivalent to 2 bytes)

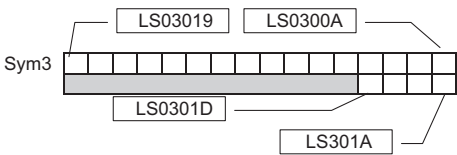


Bit symbol

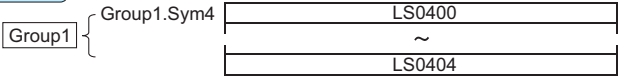
Bit data is aligned to the right in 16-bit



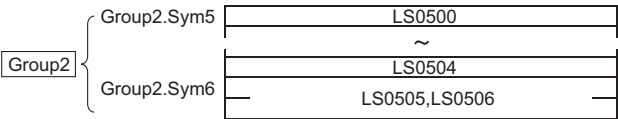
20 bits requires the work for 4 bytes.



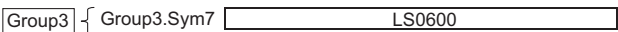
Simple group including 1 member



Group including 2 members

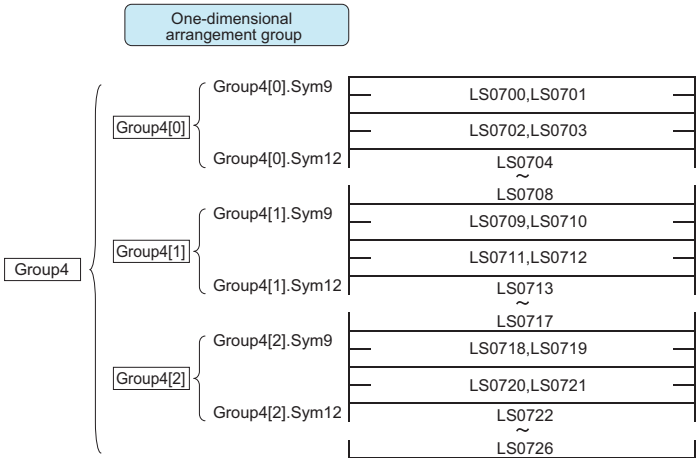


Group including word symbol and bit offset symbol



Note: Bit offset symbol (Sym8) does not have the work for group access. However, it accepts unit access. The work at that time is same as that for bit symbol.

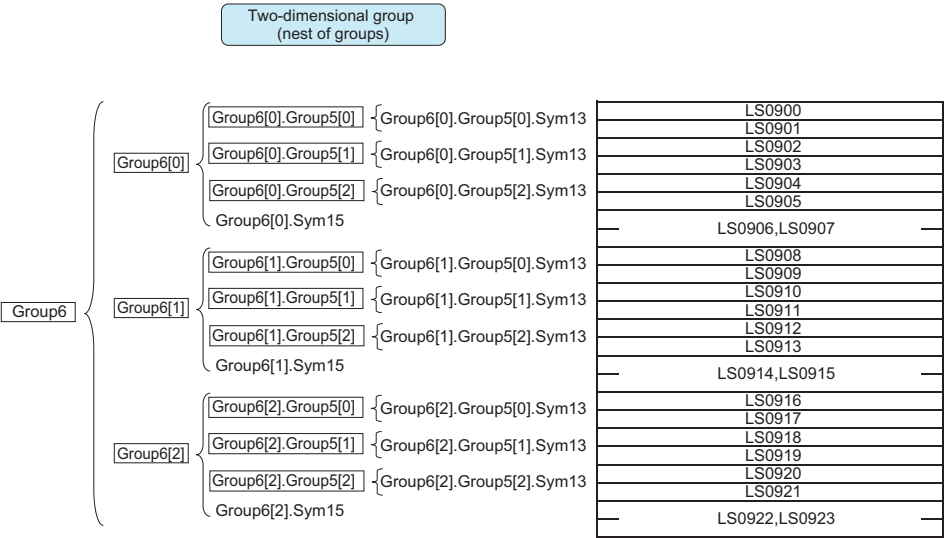




Note: Bit offset symbols (Sym10, Sym11) do not have the work for group access. However, they accept unit access. The works at that time are same as that for bit symbol.

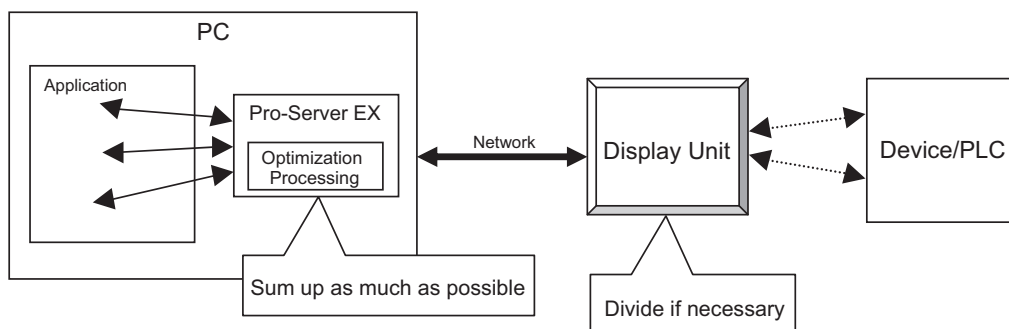


Device addresses for Group4[1].Sym10 and Group4[1].Sym11 are LS07090 and LS07091 respectively.
Device addresses for Group4[2].Sym10 and Group4[2].Sym11 are LS0718 and LS07181 respectively.



27.1.5 Queuing Access

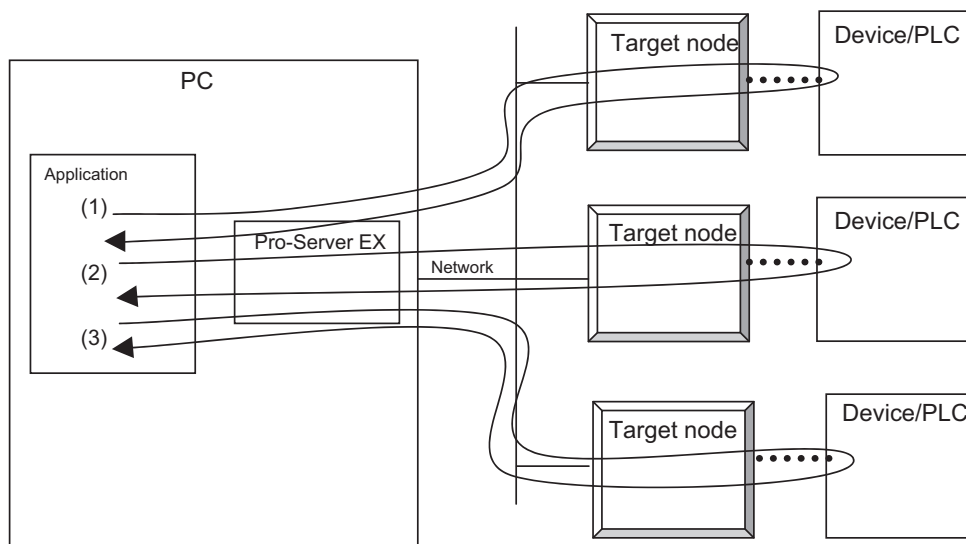
'Pro-Server EX' stores a device access request every time an API is called, and then optimizes the stored requests to access individual devices at once.



The principle of queuing access

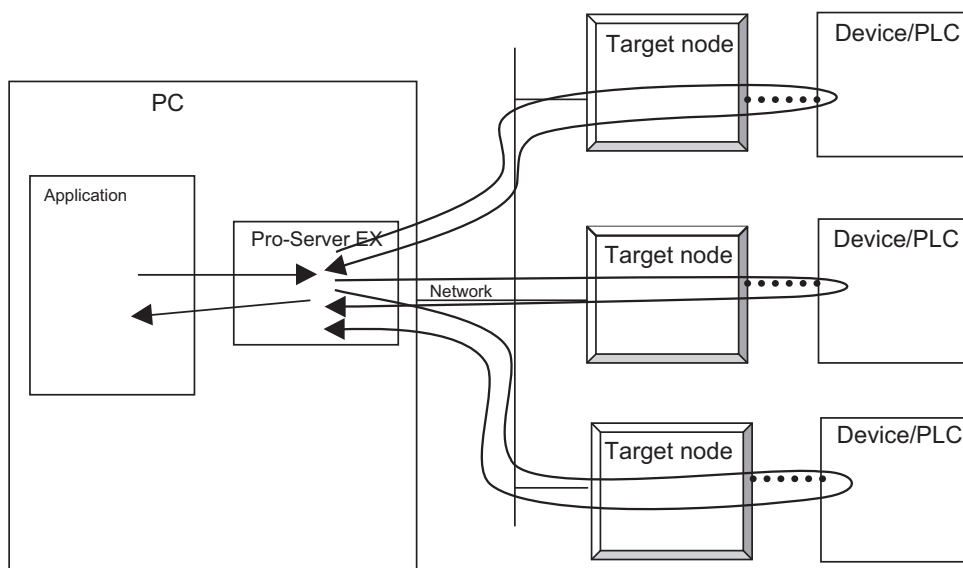
◆ Simple API access

'Pro-Server EX' executes sequential processing.



◆ Queuing access

'Pro-Server EX' executes parallel processing for individual nodes.



Procedures for use

(1) Declare start of queuing access. (Call `BeginQueuingRead()` or `BeginQueuingWrite()`.)

(2) Call a Device Read or Device Write API.

(For example, call `ReadDevice16()` or `WriteDevice16()`.)

If the argument is normal, the API is returned soon, and 'Pro-Server EX' stores the device access request only.

This step is called "Access request registration".

(3) To execute the stored device access request actually, call `ExecuteQueuingAccess()`. In this step, 'Pro-Server EX' optimizes the device access request, and tries to communicate with the devices efficiently.

If 'Pro-Server EX' successfully accesses all specified devices, `ExecuteQueuingAccess()` returns a success code. If 'Pro-Server EX' fails to access any device, on the other hand, `ExecuteQueuingAccess()` returns an access error code.

If you wish to know whether each device access request has been successfully executed or not, call

`IsQueuingAccessSucceeded()` to check the result.

IMPORTANT

- During "Access request registration", 'Pro-Server EX' stores the access data buffer address (address only, excluding data).

Therefore, when running "Access request registration", the data buffer address passed to each API must continue to exist until `ExecuteQueuingAccess()` returns a value after it is called.

Otherwise, 'Pro-Server EX' will access an invalid address and forcibly exit.

Also, when queuing access is used again, the data buffer must remain in the address specified in "access request registration".

NOTE

- When registering access requests, 'Pro-Server EX' remembers the data buffer's address that was used for access. (Remembers the address only, not the data.)

As a result,

- When using queuing access, you cannot register read access and write access simultaneously. For example, after declaration of start of queuing access for read access, write access cannot be registered. Also, after declaration of start of queuing access for write access, read access cannot be registered.

However, since queuing access is registered for each Pro-Server handle, you can register write access and read access separately for different Pro-Server handles.

- Once an access request is registered, you need not re-register it when you try to access the same device with the same method.

Since 'Pro-Server EX' stores an access request per Pro-Server handle, it will be executed repeatedly based on the stored data, every time `ExecuteQueuingAccess()` is called.

Access request registration memory will be cleared in the following cases:

- (1) When a stored Pro-Server handle is discarded.
- (2) When new queuing access registration is started.
- (3) When existing queuing access registration is cancelled (`CancelQueuingAccess()` is called). If a function other than Converting error code into character string(`EasyLoadErrorMessage` etc.) is executed after execution of `ExecuteQueuingAccess()`, 'Pro-Server EX' cancels existing queuing data, and starts new queuing access registration.

27.1.6 Bit Data Access

To access bit devices, 'Pro-Server EX' provides the following three types of bit data handling methods:

(1) Handling bit data in multiples of 16 bits: Bit devices are handled as bit strings in multiples of 16 bits.

A specified quantity of bit data are stored and used from bit D0 (right end).

Even if only one device is specified, a 16-bit data buffer is required. Data buffers are required in multiples of 16 bits, depending on the specified number of devices.

(Example) Data buffer storing order for 20 bit devices

| D15 | D14 | D13 | D12 | D11 | D10 | D9 | D8 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|
| 16 | 15 | 14 | 13 | 12 | 10 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 3 | 2 | 1 |
| * | * | * | * | * | * | * | * | * | * | * | * | 20 | 19 | 18 | 17 |

< Applicable API >

When data type "1" (EASY_AppKind_Bit) is specified for ReadDeviceBit/WriteDeviceBit(), ReadDevice/WriteDevice() or ReadDeviceVariant/WriteDeviceVariant();

When a bit symbol, or a group including a bit symbol is specified for ReadSymbol/WriteSymbol()

(2) Handling bit data as Variant BOOL data: One bit is handled as Variant BOOL data.

The data buffer handles one piece of Variant BOOL data for one bit. BOOL data alignments as many as the specified number of devices are provided.

< Applicable API >

When data type "0x201" (EASY_AppKind_BOOL) is specified for ReadDeviceVariant/WriteDeviceVariant();

When a bit symbol, or a group including a bit symbol is specified for ReadSymbolVariant/WriteSymbolVariant()

(3) Handling bit offset symbol for group symbol access

If you access a device by directly specifying a bit offset symbol, the data buffer handles "Strings in multiples of 16 bits", or "Variant BOOL data", as described in the above section.

However, when you access a device by using a group symbol that includes a bit offset symbol, a data area for the bit offset symbol is not secured in the data buffer.

A bit offset symbol cannot exist by itself without a word symbol, or a parent symbol. The data area is secured for this parent symbol, and you can use a part of that area for the bit offset symbol.

Refer to "27.1.4 Group Access" for more details.

27.1.7 System APIs

System APIs are intended for system control, such as starting or closing 'Pro-Server EX', loading network project files and so on.

The system APIs are classified into the following categories:

Single-Handle APIs

You can use the 'Pro-Server EX' features without specifying a Pro-Server handle.

With this method, multiple APIs cannot be simultaneously used. (If you try to use multiple APIs simultaneously, the double-call error occurs.)

Multi-Handle APIs

You can use the 'Pro-Server EX' features by specifying a Pro-Server handle.

You can use multiple APIs simultaneously by specifying different Pro-Server handles.

27.1.8 SRAM Data Access APIs

The SRAM incorporated in the display unit Series stores various data depending on the display unit setup and operating conditions.

The following APIs are intended to access data stored in the SRAM.

All SRAM Data Access APIs support both Single-Handle and Multi-Handle functions.

This section describes Single-Handle APIs. Multi-Handle APIs are identified with "M" at the end of each API name, and a Pro-Server handle is added to the first argument.

27.1.9 CF Card and SD Card APIs

API for accessing data on CF and SD cards.

Like SRAM, stores various data depending on the display unit setup and operating conditions.

27.2 Device Access APIs

■ Single-Handle Cache Read APIs

| Function | Bit data |
|--|--------------------------------------|
| INT WINAPI ReadDeviceBit(LPCSTR sNodeName,LPCSTR sDeviceName,WORD* owData,WORD wCount); | |
| Function | 8-bit data |
| INT WINAPI ReadDevice8(LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* obData,WORD wCount); | |
| Function | 16-bit data |
| INT WINAPI ReadDevice16(LPCSTR sNodeName,LPCSTR sDeviceName,WORD* owData,WORD wCount); | |
| Function | 32-bit data |
| INT WINAPI ReadDevice32(LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* odwData,WORD wCount); | |
| Function | 8-bit BCD data |
| INT WINAPI ReadDeviceBCD8(LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* obData,WORD wCount); | |
| Function | 16-bit BCD data |
| INT WINAPI ReadDeviceBCD16(LPCSTR sNodeName,LPCSTR sDeviceName,WORD* owData,WORD wCount); | |
| Function | 32-bit BCD data |
| INT WINAPI ReadDeviceBCD32(LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* odwData,WORD wCount); | |
| Function | Single-precision floating point data |
| INT WINAPI ReadDeviceFloat(LPCSTR sNodeName,LPCSTR sDeviceName,FLOAT* oflData,WORD wCount); | |
| Function | Double-precision floating point data |
| INT WINAPI ReadDeviceDouble(LPCSTR sNodeName,LPCSTR sDeviceName,DOUBLE* odbData,WORD wCount); | |
| Function | Character string data |
| INT WINAPI ReadDeviceStr(LPCSTR sNodeName,LPCSTR sDeviceName,LPSTR psData,WORD wCount); | |
| Function | General-use data |
| INT WINAPI ReadDevice(LPCSTR sNodeName,LPCSTR sDeviceName,LPVOID pData,WORD wCount,WORD wAppKind); | |
| Function | General-use data (Variant-type) |
| INT WINAPI ReadDeviceVariant(LPCSTR sNodeName,LPCSTR sDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind); | |
| Function | Group symbol |
| INT WINAPI ReadSymbol(LPCSTR sNodeName,LPCSTR sSymbolName,LPVOID oReadBufferData); | |
| Function | Group symbol (Variant-type) |
| INT WINAPI ReadSymbolVariant(LPCSTR sNodeName,LPCSTR sSymbolName,LPVARIANT pData); | |
| Function | TIME data |
| INT WINAPI ReadDeviceTIME(LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* odwData, WORD wCount); | |

| Function | DATE data |
|--|--------------------|
| INT WINAPI ReadDeviceDATE(LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* odwData, WORD wCount); | |
| Function | TIME_OF_DAY data |
| INT WINAPI ReadDeviceTIME_OF_DAY(LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* odwData, WORD wCount); | |
| Function | DATE_AND_TIME data |
| INT WINAPI ReadDeviceDATE_AND_TIME(LPCSTR sNodeName, LPCSTR sDeviceName, QWORD* oqwData, WORD wCount); | |

- * For each parameter, please refer to "■ Parameters of read/write functions".
- * You can convert binary values read from TIME, DATE, TIME_OF_DAY, and DATE_AND_TIME data to text format. For information about text conversion, refer to "27.8 Binary Date and Time / Text Display Conversion".

■ Single-Handle Direct Read APIs

| Function | Bit data |
|---|--------------------------------------|
| INT WINAPI ReadDeviceBitD(LPCSTR sNodeName,LPCSTR sDeviceName,WORD* owData,WORD wCount); | |
| Function | 8-bit data |
| INT WINAPI ReadDevice8D(LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* obData,WORD wCount); | |
| Function | 16-bit data |
| INT WINAPI ReadDevice16D(LPCSTR sNodeName,LPCSTR sDeviceName,WORD* owData,WORD wCount); | |
| Function | 32-bit data |
| INT WINAPI ReadDevice32D(LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* odwData,WORD wCount); | |
| Function | 8-bit BCD data |
| IINT WINAPI ReadDeviceBCD8D(LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* obData,WORD wCount); | |
| Function | 16-bit BCD data |
| INT WINAPI ReadDeviceBCD16D(LPCSTR sNodeName,LPCSTR sDeviceName,WORD* owData,WORD wCount); | |
| Function | 32-bit BCD data |
| INT WINAPI ReadDeviceBCD32D(LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* odwData,WORD wCount); | |
| Function | Single-precision floating point data |
| INT WINAPI ReadDeviceFloatD(LPCSTR sNodeName,LPCSTR sDeviceName,FLOAT* oflData,WORD wCount); | |
| Function | Double-precision floating point data |
| INT WINAPI ReadDeviceDoubleD(LPCSTR sNodeName,LPCSTR sDeviceName,DOUBLE* odbData,WORD wCount); | |
| Function | Character string data |
| INT WINAPI ReadDeviceStrD(LPCSTR sNodeName,LPCSTR sDeviceName,LPSTR psData,WORD wCount); | |
| Function | General-use data |
| INT WINAPI ReadDeviceD(LPCSTR sNodeName,LPCSTR sDeviceName,LPVOID pData,WORD wCount,WORD wAppKind); | |
| Function | General-use data (Variant-type) |
| INT WINAPI ReadDeviceVariantD(LPCSTR sNodeName,LPCSTR sDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind); | |
| Function | Group symbol |
| INT WINAPI ReadSymbolD(LPCSTR sNodeName,LPCSTR sSymbolName,LPVOID oReadBufferData); | |
| Function | Group symbol (Variant-type) |
| INT WINAPI ReadSymbolVariantD(LPCSTR sNodeName,LPCSTR sSymbolName,LPVARIANT pData); | |
| Function | TIME data |
| INT WINAPI ReadDeviceTIMED(LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* odwData, WORD wCount); | |
| Function | DATE data |
| INT WINAPI ReadDeviceDATED(LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* odwData, WORD wCount); | |

| Function | TIME_OF_DAY data |
|---|--------------------|
| INT WINAPI ReadDeviceTIME_OF_DAYD(LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* odwData, WORD wCount); | |
| Function | DATE_AND_TIME data |
| INT WINAPI ReadDeviceDATE_AND_TIMED(LPCSTR sNodeName, LPCSTR sDeviceName, QWORD* oqwData, WORD wCount); | |

- * For each parameter, please refer to "■ Parameters of read/write functions".
- * You can convert binary values read from TIME, DATE, TIME_OF_DAY, and DATE_AND_TIME data to text format. For information about text conversion, refer to "27.8 Binary Date and Time / Text Display Conversion".

■ Single-Handle Direct Write APIs

| Function | Bit data |
|--|--------------------------------------|
| INT WINAPI WriteDeviceBitD(LPCSTR sNodeName,LPCSTR sDeviceName,WORD* pwData,WORD wCount); | |
| Function | 8-bit data |
| INT WINAPI WriteDevice8D(LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* pbData,WORD wCount); | |
| Function | 16-bit data |
| INT WINAPI WriteDevice16D(LPCSTR sNodeName,LPCSTR sDeviceName,WORD* pwData,WORD wCount); | |
| Function | 32-bit data |
| INT WINAPI WriteDevice32D(LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* pdwData,WORD wCount); | |
| Function | 8-bit BCD data |
| INT WINAPI WriteDeviceBCD8D(LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* pbData,WORD wCount); | |
| Function | 16-bit BCD data |
| INT WINAPI WriteDeviceBCD16D(LPCSTR sNodeName,LPCSTR sDeviceName,WORD* pwData,WORD wCount); | |
| Function | 32-bit BCD data |
| INT WINAPI WriteDeviceBCD32D(LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* pdwData,WORD wCount); | |
| Function | Single-precision floating point data |
| INT WINAPI WriteDeviceFloatD(LPCSTR sNodeName,LPCSTR sDeviceName,FLOAT* pflData,WORD wCount); | |
| Function | Double-precision floating point data |
| INT WINAPI WriteDeviceDoubleD(LPCSTR sNodeName,LPCSTR sDeviceName,DOUBLE* pdbData,WORD wCount); | |
| Function | Character string data |
| INT WINAPI WriteDeviceStrD(LPCSTR sNodeName,LPCSTR sDeviceName,LPCSTR psData,WORD wCount); | |
| Function | General-use data |
| INT WINAPI WriteDeviceD(LPCSTR sNodeName,LPCSTR sDeviceName,LPVOID pData,WORD wCount,WORD wAppKind); | |
| Function | General-use data (Variant-type) |
| INT WINAPI WriteDeviceVariantD(LPCSTR sNodeName,LPCSTR sDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind); | |
| Function | Group symbol |
| INT WINAPI WriteSymbolD(LPCSTR sNodeName,LPCSTR sSymbolName,LPVOID pWriteBufferData); | |
| Function | Group symbol (Variant-type) |
| INT WINAPI WriteSymbolVariantD(LPCSTR sNodeName,LPCSTR sSymbolName,LPVARIANT pData); | |
| Function | TIME data |
| INT WINAPI WriteDeviceTIMED(LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* pdwData, WORD wCount); | |
| Function | DATE data |
| INT WINAPI WriteDeviceDATED(LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* pdwData, WORD wCount); | |

| Function | TIME_OF_DAY data |
|--|--------------------|
| INT WINAPI WriteDeviceTIME_OF_DAYD(LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* pdwData, WORD wCount); | |
| Function | DATE_AND_TIME data |
| INT WINAPI WriteDeviceDATE_AND_TIMED(LPCSTR sNodeName, LPCSTR sDeviceName, QWORD* pqwData, WORD wCount); | |

- * For each parameter, please refer to "■ Parameters of read/write functions".
- * You can convert binary values written to TIME, DATE, TIME_OF_DAY, and DATE_AND_TIME data from text format. For information about text conversion, refer to "27.8 Binary Date and Time / Text Display Conversion".

■ Single-Handle Write APIs with Cache Refresh after Writing

| Function | Bit data |
|---|--------------------------------------|
| INT WINAPI WriteDeviceBit(LPCSTR sNodeName,LPCSTR sDeviceName,WORD* pwData,WORD wCount); | |
| Function | 8-bit data |
| INT WINAPI WriteDevice8(LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* pbData,WORD wCount); | |
| Function | 16-bit data |
| INT WINAPI WriteDevice16(LPCSTR sNodeName,LPCSTR sDeviceName,WORD* pwData,WORD wCount); | |
| Function | 32-bit data |
| INT WINAPI WriteDevice32(LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* pdwData,WORD wCount); | |
| Function | 8-bit BCD data |
| INT WINAPI WriteDeviceBCD8(LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* pbData,WORD wCount); | |
| Function | 16-bit BCD data |
| INT WINAPI WriteDeviceBCD16(LPCSTR sNodeName,LPCSTR sDeviceName,WORD* pwData,WORD wCount); | |
| Function | 32-bit BCD data |
| INT WINAPI WriteDeviceBCD32(LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* pdwData,WORD wCount); | |
| Function | Single-precision floating point data |
| INT WINAPI WriteDeviceFloat(LPCSTR sNodeName,LPCSTR sDeviceName,FLOAT* pflData,WORD wCount); | |
| Function | Double-precision floating point data |
| INT WINAPI WriteDeviceDouble(LPCSTR sNodeName,LPCSTR sDeviceName,DOUBLE* pdbData,WORD wCount); | |
| Function | Character string data |
| INT WINAPI WriteDeviceStr(LPCSTR sNodeName,LPCSTR sDeviceName,LPCSTR psData,WORD wCount); | |
| Function | General-use data |
| INT WINAPI WriteDevice(LPCSTR sNodeName,LPCSTR sDeviceName,LPVOID pData,WORD wCount,WORD wAppKind); | |
| Function | General-use data (Variant-type) |
| INT WINAPI WriteDeviceVariant(LPCSTR sNodeName,LPCSTR sDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind); | |
| Function | Group symbol |
| INT WINAPI WriteSymbol(LPCSTR sNodeName,LPCSTR sSymbolName,LPVOID pWriteBufferData); | |
| Function | Group symbol (Variant-type) |
| INT WINAPI WriteSymbolVariant(LPCSTR sNodeName,LPCSTR sSymbolName,LPVARIANT pData); | |
| Function | TIME data |
| INT WINAPI WriteDeviceTIME(LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* pdwData, WORD wCount); | |
| Function | DATE data |
| INT WINAPI WriteDeviceDATE(LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* pdwData, WORD wCount); | |

| Function | TIME_OF_DAY data |
|---|--------------------|
| INT WINAPI WriteDeviceTIME_OF_DAY(LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* pdwData, WORD wCount); | |
| Function | DATE_AND_TIME data |
| INT WINAPI WriteDeviceDATE_AND_TIME(LPCSTR sNodeName, LPCSTR sDeviceName, QWORD* pqwData, WORD wCount); | |

- * For each parameter, please refer to "■ Parameters of read/write functions".
- * You can convert binary values written to TIME, DATE, TIME_OF_DAY, and DATE_AND_TIME data from text format. For information about text conversion, refer to "27.8 Binary Date and Time / Text Display Conversion".

■ Multi-Handle Cache Read APIs

| Function | Bit data |
|---|--------------------------------------|
| INT WINAPI ReadDeviceBitM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,WORD* owData,WORD wCount); | |
| Function | 8-bit data |
| INT WINAPI ReadDevice8M(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* obData,WORD wCount); | |
| Function | 16-bit data |
| INT WINAPI ReadDevice16M(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,WORD* owData,WORD wCount); | |
| Function | 32-bit data |
| INT WINAPI ReadDevice32M(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* odwData,WORD wCount); | |
| Function | 8-bit BCD data |
| INT WINAPI ReadDeviceBCD8M(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* obData,WORD wCount); | |
| Function | 16-bit BCD data |
| INT WINAPI ReadDeviceBCD16M(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,WORD* owData,WORD wCount); | |
| Function | 32-bit BCD data |
| INT WINAPI ReadDeviceBCD32M(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* odwData,WORD wCount); | |
| Function | Single-precision floating point data |
| INT WINAPI ReadDeviceFloatM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,FLOAT* oflData,WORD wCount); | |
| Function | Double-precision floating point data |
| INT WINAPI ReadDeviceDoubleM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,DOUBLE* odbData,WORD wCount); | |
| Function | Character string data |
| INT WINAPI ReadDeviceStrM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,LPSTR psData,WORD wCount); | |
| Function | General-use data |
| INT WINAPI ReadDeviceM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,LPVOID pData,WORD wCount,WORD wAppKind); | |
| Function | General-use data (Variant-type) |
| INT WINAPI ReadDeviceVariantM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind); | |
| Function | Group symbol |
| INT WINAPI ReadSymbolM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sSymbolName,LPVOID oReadBufferData); | |

| Function | Group symbol (Variant-type) |
|--|-----------------------------|
| INT WINAPI ReadSymbolVariantM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sSymbolName,LPVARIANT pData); | |
| Function | TIME data |
| INT WINAPI ReadDeviceTIMEM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* odwData, WORD wCount); | |
| Function | DATE data |
| INT WINAPI ReadDeviceDATEM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* odwData, WORD wCount); | |
| Function | TIME_OF_DAY data |
| INT WINAPI ReadDeviceTIME_OF_DAYM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* odwData, WORD wCount); | |
| Function | DATE_AND_TIME data |
| INT WINAPI ReadDeviceDATE_AND_TIMEM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, QWORD* oqwData, WORD wCount); | |

* For each parameter, please refer to "■ Parameters of read/write functions".

* You can convert binary values read from TIME, DATE, TIME_OF_DAY, and DATE_AND_TIME data to text format. For information about text conversion, refer to "27.8 Binary Date and Time / Text Display Conversion".

■ Multi-Handle Direct Read APIs

| Function | Bit data |
|--|--------------------------------------|
| INT WINAPI ReadDeviceBitDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,WORD* owData,WORD wCount); | |
| Function | 8-bit data |
| INT WINAPI ReadDevice8DM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* obData,WORD wCount); | |
| Function | 16-bit data |
| INT WINAPI ReadDevice16DM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,WORD* owData,WORD wCount); | |
| Function | 32-bit data |
| INT WINAPI ReadDevice32DM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* odwData,WORD wCount); | |
| Function | 8-bit BCD data |
| INT WINAPI ReadDeviceBCD8DM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* obData,WORD wCount); | |
| Function | 16-bit BCD data |
| INT WINAPI ReadDeviceBCD16DM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,WORD* owData,WORD wCount); | |
| Function | 32-bit BCD data |
| INT WINAPI ReadDeviceBCD32DM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* odwData,WORD wCount); | |
| Function | Single-precision floating point data |
| INT WINAPI ReadDeviceFloatDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,FLOAT* oflData,WORD wCount); | |
| Function | Double-precision floating point data |
| INT WINAPI ReadDeviceDoubleDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,DOUBLE* odbData,WORD wCount); | |
| Function | Character string data |
| INT WINAPI ReadDeviceStrDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,LPSTR psData,WORD wCount); | |
| Function | General-use data |
| INT WINAPI ReadDeviceDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,LPVOID pData,WORD wCount,WORD wAppKind); | |
| Function | General-use data (Variant-type) |
| INT WINAPI ReadDeviceVariantDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind); | |
| Function | Group symbol |
| INT WINAPI ReadSymbolDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sSymbolName,LPVOID oReadBufferData); | |
| Function | Group symbol (Variant-type) |
| INT WINAPI ReadSymbolVariantDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sSymbolName,LPVARIANT pData); | |

| Function | TIME data |
|---|--------------------|
| INT WINAPI ReadDeviceTIMEDM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* odwData, WORD wCount); | |
| Function | DATE data |
| INT WINAPI ReadDeviceDATEDM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* odwData, WORD wCount); | |
| Function | TIME_OF_DAY |
| INT WINAPI ReadDeviceTIME_OF_DAYDM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* odwData, WORD wCount); | |
| Function | DATE_AND_TIME data |
| INT WINAPI ReadDeviceDATE_AND_TIMEDM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, QWORD* oqwData, WORD wCount); | |

* For each parameter, please refer to "■ Parameters of read/write functions".

* You can convert binary values read from TIME, DATE, TIME_OF_DAY, and DATE_AND_TIME data to text format. For information about text conversion, refer to "27.8 Binary Date and Time / Text Display Conversion".

■ Multi-Handle Direct Write APIs

| Function | Bit data |
|---|--------------------------------------|
| INT WINAPI WriteDeviceBitDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,WORD* pwData,WORD wCount); | |
| Function | 8-bit data |
| INT WINAPI WriteDevice8DM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* pbData,WORD wCount); | |
| Function | 16-bit data |
| INT WINAPI WriteDevice16DM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,WORD* pwData,WORD wCount); | |
| Function | 32-bit data |
| INT WINAPI WriteDevice32DM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* pdwData,WORD wCount); | |
| Function | 8-bit BCD data |
| INT WINAPI WriteDeviceBCD8DM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* pbData,WORD wCount); | |
| Function | 16-bit BCD data |
| INT WINAPI WriteDeviceBCD16DM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,WORD* pwData,WORD wCount); | |
| Function | 32-bit BCD data |
| INT WINAPI WriteDeviceBCD32DM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* pdwData,WORD wCount); | |
| Function | Single-precision floating point data |
| INT WINAPI WriteDeviceFloatDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,FLOAT* pflData,WORD wCount); | |
| Function | Double-precision floating point data |
| INT WINAPI WriteDeviceDoubleDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,DOUBLE* pdbData,WORD wCount); | |
| Function | Character string data |
| INT WINAPI WriteDeviceStrDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,LPCSTR psData,WORD wCount); | |
| Function | General-use data |
| INT WINAPI WriteDeviceDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,LPVOID pData,WORD wCount,WORD wAppKind); | |
| Function | General-use data (Variant-type) |
| INT WINAPI WriteDeviceVariantDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind); | |
| Function | Group symbol |
| INT WINAPI WriteSymbolDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sSymbolName,LPVOID pWriteBufferData); | |
| Function | Group symbol (Variant-type) |
| INT WINAPI WriteSymbolVariantDM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sSymbolName,LPVARIANT pData); | |

| Function | TIME data |
|--|--------------------|
| INT WINAPI WriteDeviceTIMEDM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* pdwData, WORD wCount); | |
| Function | DATE data |
| INT WINAPI WriteDeviceDATEDM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* pdwData, WORD wCount); | |
| Function | TIME_OF_DAY data |
| INT WINAPI WriteDeviceTIME_OF_DAYDM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* pdwData, WORD wCount); | |
| Function | DATE_AND_TIME data |
| INT WINAPI WriteDeviceDATE_AND_TIMEDM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, QWORD* pqwData, WORD wCount); | |

* For each parameter, please refer to "■ Parameters of read/write functions".

* You can convert binary values written to TIME, DATE, TIME_OF_DAY, and DATE_AND_TIME data from text format. For information about text conversion, refer to "27.8 Binary Date and Time / Text Display Conversion".

■ Multi-Handle Write APIs with Cache Refresh after Writing

| Function | Bit data |
|--|--------------------------------------|
| INT WINAPI WriteDeviceBitM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,WORD* pwData,WORD wCount); | |
| Function | 8-bit data |
| INT WINAPI WriteDevice8M(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* pbData,WORD wCount); | |
| Function | 16-bit data |
| INT WINAPI WriteDevice16M(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,WORD* pwData,WORD wCount); | |
| Function | 32-bit data |
| INT WINAPI WriteDevice32M(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* pdwData,WORD wCount); | |
| Function | 8-bit BCD data |
| INT WINAPI WriteDeviceBCD8M(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,BYTE* pbData,WORD wCount); | |
| Function | 16-bit BCD data |
| INT WINAPI WriteDeviceBCD16M(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,WORD* pwData,WORD wCount); | |
| Function | 32-bit BCD data |
| INT WINAPI WriteDeviceBCD32M(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,DWORD* pdwData,WORD wCount); | |
| Function | Single-precision floating point data |
| INT WINAPI WriteDeviceFloatM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,FLOAT* pflData,WORD wCount); | |
| Function | Double-precision floating point data |
| INT WINAPI WriteDeviceDoubleM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,DOUBLE* pdbData,WORD wCount); | |
| Function | Character string data |
| INT WINAPI WriteDeviceStrM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,LPCSTR psData,WORD wCount); | |
| Function | General-use data |
| INT WINAPI WriteDeviceM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,LPVOID pData,WORD wCount,WORD wAppKind); | |
| Function | General-use data (Variant-type) |
| INT WINAPI WriteDeviceVariantM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind); | |
| Function | Group symbol |
| INT WINAPI WriteSymbolM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sSymbolName,LPVOID pWriteBufferData); | |
| Function | Group symbol (Variant-type) |
| INT WINAPI WriteSymbolVariantM(HANDLE hProServer,LPCSTR sNodeName,LPCSTR sSymbolName,LPVARIANT pData); | |

| Function | TIME data |
|---|--------------------|
| INT WINAPI WriteDeviceTIMEM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* pdwData, WORD wCount); | |
| Function | DATE data |
| INT WINAPI WriteDeviceDATEM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* pdwData, WORD wCount); | |
| Function | TIME_OF_DAY data |
| INT WINAPI WriteDeviceTIME_OF_DAYM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, DWORD* pdwData, WORD wCount); | |
| Function | DATE_AND_TIME data |
| INT WINAPI WriteDeviceDATE_AND_TIMEM(HANDLE hProServer, LPCSTR sNodeName, LPCSTR sDeviceName, QWORD* pqwData, WORD wCount); | |

* For each parameter, please refer to "■ Parameters of read/write functions".

* You can convert binary values written to TIME, DATE, TIME_OF_DAY, and DATE_AND_TIME data from text format. For information about text conversion, refer to "27.8 Binary Date and Time / Text Display Conversion".

■ Parameters of read/write functions

< Argument >

bsNodeName : Pointer to node name (character string)

Specify the entry node name or the IP address registered in 'Pro-Studio EX' directly.

Ex. 1) When specifying node name: "AGP"

Ex. 2) When specifying IP address directly: "192.9.201.1"

bsDeviceName : Pointer to the symbol (character string) subjected to Read/Write function

Specify the symbol name or the device address registered in 'Pro-Studio EX' directly.

Ex. 1) When specifying symbol name: "SWITCH1"

Ex. 2) When specifying device address directly: "M100"

| Function | Symbol data type | | | | | | | | | | | | | |
|------------------------|------------------|---------|-----|---------|-----|---------|-----|-------|--------|--------|------|------|-------------|---------------|
| | Bit | 8 bits | | 16 bits | | 32 bits | | Float | Double | String | TIME | DATE | TIME_OF_DAY | DATE_AND_TIME |
| | | S/U/HEX | BCD | S/U/HEX | BCD | S/U/HEX | BCD | | | | | | | |
| XXXDeviceBit | 0 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| XXXDevice8 | - | 0 | - | - | - | - | - | - | - | - | - | - | - | - |
| XXXDevice16 | - | - | - | 0 | - | - | - | - | - | - | - | - | - | - |
| XXXDevice32 | - | - | - | - | - | 0 | - | - | - | - | - | - | - | - |
| XXXDeviceBCD8 | - | - | 0 | - | - | - | - | - | - | - | - | - | - | - |
| XXXDeviceBCD16 | - | - | - | - | 0 | - | - | - | - | - | - | - | - | - |
| XXXDeviceBCD32 | - | - | - | - | - | - | 0 | - | - | - | - | - | - | - |
| XXXDeviceFloat | - | - | - | - | - | - | - | 0 | - | - | - | - | - | - |
| XXXDeviceDouble | - | - | - | - | - | - | - | - | 0 | - | - | - | - | - |
| XXXDeviceStr | - | - | - | - | - | - | - | - | - | 0 | - | - | - | - |
| XXXDevice | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| XXXDeviceTIME | - | - | - | - | - | - | - | - | - | - | 0 | - | - | - |
| XXXDeviceDATE | - | - | - | - | - | - | - | - | - | - | - | 0 | - | - |
| XXXDeviceTIME_OF_DAY | - | - | - | - | - | - | - | - | - | - | - | - | 0 | - |
| XXXDeviceDATE_AND_TIME | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |

pxxData : Pointer to read/write target data

Accessible data types and corresponding argument types are listed below.

| Accessible data type | Argument type |
|--------------------------------------|------------------|
| Bit data | WORD * pwData |
| 8-bit data | BYTE * pbData |
| 16-bit data | WORD * pwData |
| 32-bit data | DWORD * pdwData |
| 8-bit BCD data | BYTE * pbData |
| 16-bit BCD data | WORD * pwData |
| 32-bit BCD data | DWORD * pdwData |
| Single-precision floating point data | FLOAT * pflData |
| Double-precision floating point data | DOUBLE * pdbData |
| Character string data | LPTSTR psData |
| General-use data | LPVOID pData |
| General-use data (for VB) | LPVARIANT pData |
| TIME data | DWORD * pdwData |
| DATE data | DWORD * pdwData |
| TIME_OF_DAY data | DWORD * pdwData |
| DATE_AND_TIME data | QWORD * pdwData |

wCount : Quantity of read/write target data

With the Read/WriteDeviceStr function, character string data is counted as the number of bytes. For a device symbol with 16-bit width, specify multiples of two characters; for a device symbol with 32-bit width, specify multiples of four characters.

The maximum data quantities subjected to read/write functions are as follows:

| Accessible data type | Read | Write |
|--------------------------------------|-------------------------------|-------------------------------|
| Bit data | 255 | 255 |
| 8-bit data | 1020 | 1020 |
| 16-bit data | 1020 | 1020 |
| 32-bit data | 510 | 510 |
| 8-bit BCD data | 1020 | 1020 |
| 16-bit BCD data | 1020 | 1020 |
| 32-bit BCD data | 510 | 510 |
| Single-precision floating point data | 510 | 510 |
| Double-precision floating point data | 255 | 255 |
| Character string data | 2040 characters (single-byte) | 2040 characters (single-byte) |
| TIME data | 510 | 510 |
| DATE data | 510 | 510 |
| TIME_OF_DAY data | 510 | 510 |
| DATE_AND_TIME data | 255 | 255 |

wAppKind : Data type specification

| Value | Data type | Value | Data type |
|-------|------------------|-------|-------------------|
| 1 | Bit | 11 | Double |
| 2 | Signed 16 bits | 12 | String |
| 3 | Unsigned 16 bits | 13 | Signed 8 bit |
| 4 | HEX 16 bits | 14 | Unsigned 8 bit |
| 5 | BCD 16 bits | 15 | HEX 8 bit |
| 6 | Signed 32 bits | 16 | BCD 8 bit |
| 7 | Unsigned 32 bits | 17 | TIME |
| 8 | HEX 32 bits | 18 | DATE |
| 9 | BCD 32 bits | 19 | TIME_OF_DAY |
| 10 | Float | 20 | DATE_AND_TIME (*) |

* Unable to use with VB functions.

With the Read/Write Device function, the data type is specified by parameter. Therefore, the data type can be dynamically changed.

< Return value >

Normal end: 0

Abnormal end: Error code

< Special Note >

When using the Read/WriteDeviceBit function:

pwData stores a quantity of data specified with wCount, consecutively from the D0 bit.

Example: When wCount is "20"

| | F | E | D | C | B | A | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|----------|----|----|----|----|----|----|----|---|---|---|---|---|----|----|----|----|
| PwData | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| PwData+1 | * | * | * | * | * | * | * | * | * | * | * | * | 20 | 19 | 18 | 17 |

When reading/writing multiple consecutive bit data, it is more efficient to use Read/Write/Device 8, 16, and 32 functions than Read/WriteDeviceBit functions.

The bit indicated with "*" (asterisk) stores an undefined value. Mask these areas in your application program.

When using Read/WriteDeviceBCD8, Read/WriteDeviceBCD16 or Read/WriteDeviceBCD32 functions:

If the target device/PLC handles BCD data, you can use these functions. However, the data passed with these functions (contents of pxxData) are handled as binary data, not BCD data. ('Pro-Server EX' internally executes BCD conversion.) A negative value cannot be handled.

| Function | Decimal expression | Hexadecimal expression |
|-----------------------|--------------------|------------------------|
| Read/WriteDeviceBCD8 | 0 to 99 | 00 to 63 |
| Read/WriteDeviceBCD16 | 0 to 9999 | 0000 to 270F |
| Read/WriteDeviceBCD32 | 0 to 99999999 | 00000000 to 05F5E0FF |

When using the string data functions:

To receive character string data for variables, secure sufficient data storing area.

27.3 Cache Buffer Control APIs

| Function | Creating cache buffer | |
|---|--------------------------------------|---|
| <p>To increase the device read processing speed, 'Pro-Server EX' incorporates the device data caching function (with copy function). This API is used to create a cache buffer.</p> <p>This API only defines a cache buffer. To define which device to cache, use PS_EntryCacheRecord().</p> <p>Single</p> <p>INT WINAPI PS_CreateCache(LPCSTR sCacheName, DWORD dwPollingTime);</p> <p>Multi</p> <p>INT WINAPI PS_CreateCacheM(HANDLE hProServer, LPCSTR sCacheName, DWORD dwPollingTime);</p> | | |
| <p>Argument</p> <p>sCacheName: (In) Cache buffer name</p> <p>dwPollingTime: (In) To select the constant monitoring method, specify "0".</p> <p> The cache buffer is updated as fast as possible.</p> <p> If you specify any value other than "0", the polling method is selected.</p> <p>Specify the polling cycle (cache updating cycle) by the millisecond.</p> | | <p>Return value</p> <p>Normal end: 0</p> <p>Abnormal end: Error code</p> |
| <p>Special Note</p> <ul style="list-style-type: none">• Up to 1000 cache buffers can be created for a single 'Pro-Server EX' program.• You can directly use the cache buffer which has been registered when creating a network project file with 'Pro-Studio EX'. It is unnecessary to re-create it with this API. | | |
| Function | Registering record into cache buffer | |
| <p>Registers a caching device (cache source device) into the cache buffer created with PS_CreateCache().</p> <p>For a GP Series node or Pro-Server EX node, 'Pro-Server EX' does not support the constant monitoring method to update a cache buffer.</p> <p>Therefore, if you specify a GP Series node or Pro-Server EX node with this API for a cache buffer subjected to the constant monitoring method (if dwPollingTime is set to "0" when a cache buffer is created with PS_CreateCache()), an error occurs.</p> <p>Single</p> <p>INT WINAPI PS_EntryCacheRecord(LPCSTR sCacheName, LPCSTR sNodeName, LPCSTR sDevice, WORD wAppKind, WORD wCount);</p> <p>Multi</p> <p>INT WINAPI PS_EntryCacheRecordM(HANDLE hProServer, LPCSTR sCacheName, LPCSTR sNodeName, LPCSTR sDevice, WORD wAppKind, WORD wCount);</p> | | |

| <p>Argument</p> <p>sCacheName: (In) Cache buffer name Register a cache source device into the cache buffer specified with this name.</p> <p>sNodeName: (In) Entry node name with cache source Device/PLC name</p> <p>sDevice:(In) Cache source device To specify a cache source device, you can directly specify the device address, or specify a symbol or group registered with 'Pro-Studio EX'. If you specify a group, multiple symbols can be registered at once.</p> <p>wAppKind: (In) Source device data type Available data types vary depending on the cache source device designation method.</p> <p>a) When device address of cache source device is directly specified: Specify a data type (1 to 20) available with 'Pro-Server EX'. "0" cannot be specified.</p> <table><tr><th>Value</th><th>Data type</th><th>Value</th><th>Data type</th></tr><tr><td>1</td><td>Bit</td><td>11</td><td>Double-precision floating point</td></tr><tr><td>2</td><td>16 bits, Signed decimal</td><td>12</td><td>Character string</td></tr><tr><td>3</td><td>16 bits, Unsigned decimal</td><td>13</td><td>8 bit (Signed) data</td></tr><tr><td>4</td><td>16 bits, Hexadecimal</td><td>14</td><td>8 bit (Unsigned) data</td></tr><tr><td>5</td><td>16 bits, BCD</td><td>15</td><td>8 bit (HEX) data</td></tr><tr><td>6</td><td>32 bits, Signed decimal</td><td>16</td><td>8 bit (BCD) data</td></tr><tr><td>7</td><td>32 bits, Unsigned decimal</td><td>17</td><td>TIME data</td></tr><tr><td>8</td><td>32 bits, Hexadecimal</td><td>18</td><td>TIME_OF_DAY data</td></tr><tr><td>9</td><td>32 bits, BCD</td><td>19</td><td>DATE data</td></tr><tr><td>10</td><td>Single-precision floating point</td><td>20</td><td>DATE_AND_TIME data</td></tr></table> <p>b) When symbol is specified for cache source device: Specify a data type (0 to 20) available with 'Pro-Server EX'. If you specify "0", the symbol type specified in symbol definition is used.</p> <p>c) When group is specified for cache source device: Fixed to "0". The symbol type is registered for all symbols in the specified group.</p> <p>wCount: (In) Device data quantity subjected to caching Available values vary depending on the cache source device specification method.</p> <p>a) When device address of cache source device is directly specified: Data quantity (1 to 2040) according to the device type can be used. (The maximum value varies depending on the device type.)</p> <p>b) When symbol is specified for cache source device: If you specify "0", the quantity specified in symbol definition is used. If you specify any value other than 0, data quantity (1 to 2040) according to the device type can be used. (The maximum value varies depending on the device type.)</p> <p>c) When group is specified for cache source device: Fixed to "0". All symbols in the specified group are subjected to caching.</p> | Value | Data type | Value | Data type | 1 | Bit | 11 | Double-precision floating point | 2 | 16 bits, Signed decimal | 12 | Character string | 3 | 16 bits, Unsigned decimal | 13 | 8 bit (Signed) data | 4 | 16 bits, Hexadecimal | 14 | 8 bit (Unsigned) data | 5 | 16 bits, BCD | 15 | 8 bit (HEX) data | 6 | 32 bits, Signed decimal | 16 | 8 bit (BCD) data | 7 | 32 bits, Unsigned decimal | 17 | TIME data | 8 | 32 bits, Hexadecimal | 18 | TIME_OF_DAY data | 9 | 32 bits, BCD | 19 | DATE data | 10 | Single-precision floating point | 20 | DATE_AND_TIME data | <p>Return value</p> <p>Normal end: 0 Abnormal end: Error code</p> |
|--|---------------------------------|-----------|---------------------------------|-----------|---|-----|----|---------------------------------|---|-------------------------|----|------------------|---|---------------------------|----|---------------------|---|----------------------|----|-----------------------|---|--------------|----|------------------|---|-------------------------|----|------------------|---|---------------------------|----|-----------|---|----------------------|----|------------------|---|--------------|----|-----------|----|---------------------------------|----|--------------------|--|
| Value | Data type | Value | Data type | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Bit | 11 | Double-precision floating point | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 16 bits, Signed decimal | 12 | Character string | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 16 bits, Unsigned decimal | 13 | 8 bit (Signed) data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 16 bits, Hexadecimal | 14 | 8 bit (Unsigned) data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 16 bits, BCD | 15 | 8 bit (HEX) data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 32 bits, Signed decimal | 16 | 8 bit (BCD) data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 32 bits, Unsigned decimal | 17 | TIME data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 32 bits, Hexadecimal | 18 | TIME_OF_DAY data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 32 bits, BCD | 19 | DATE data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Single-precision floating point | 20 | DATE_AND_TIME data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Special Note</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Function | Starting caching | |
|--|-------------------------|---|
| Starts caching. | | |
| Single INT WINAPI PS_StartCache(LPCSTR sCacheName); Multi INT WINAPI PS_StartCacheM(HANDLE hProServer, LPCSTR sCacheName); | | |
| Argument sCacheName: (In) Name of cache buffer to start A cache buffer name registered with 'Pro-Studio EX' can be also specified. | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |
| Function | Stopping caching | |
| Temporarily stops caching. Caching stops, but definition of the cache buffer is retained. To restart caching, call PS_StartCache(). | | |
| Single INT WINAPI PS_StopCache(LPCSTR sCacheName); Multi INT WINAPI PS_StopCacheM(HANDLE hProServer, LPCSTR sCacheName); | | |
| Argument sCacheName: (In) Name of cache buffer to stop A cache buffer name registered with 'Pro-Studio EX' can be also specified. | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |
| Function | Checking caching status | |
| Checks caching status. | | |
| Single INT WINAPI PS_GetCacheStatus(LPCSTR sCacheName); Multi INT WINAPI PS_GetCacheStatusM(HANDLE hProServer, LPCSTR sCacheName); | | |
| Argument sCacheName: (In) Name of cache buffer to be checked A cache buffer name registered with 'Pro-Studio EX' can be also specified. | | Return value 0 : The cache buffer has been created, but not started yet. 1: Caching in progress 2: Caching under suspension XX: Error code |
| Special Note | | |

| Function | Discarding cache buffer | |
|---|--|--|
| Stops caching, and discards the cache buffer. | | |
| Single INT WINAPI PS_DestroyCache(LPCSTR sCacheName); Multi INT WINAPI PS_DestroyCacheM(HANDLE hProServer, LPCSTR sCacheName); | | |
| Argument sCacheName: (In) Name of cache buffer to be discarded A cache buffer name registered with 'Pro-Studio EX' can be also specified. | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |
| Function | Setting cache update notification function | |
| Sets the function to notify cache buffer update status to a specified window. | | |
| When a device is cache-read from an application, there will be no change without updating the cache data even if the device is frequently cache-read. 'Pro-Server EX' can send a message to a specified window, when cache data is updated (when at least one target device has a change with the constant monitoring method, or when one polling cycle is completed with the polling method). If your system is built so as to execute cache-reading of a device after receiving this message, the system efficiency can be improved. This API allows you to set "Target cache buffer name", "Window to receive the message", and "Contents of the message" in 'Pro-Server EX'. After these settings are normally completed, the API returns the ID that identifies the currently-set notification function. | | |
| Single INT WINAPI PS_SetNotifyFromCache(LPCSTR sCacheName, HWND hWnd, UINT message, WPARAM WParam, LPARAM LParam, HANDLE* ohCacheNotifyID); Multi INT WINAPI PS_SetNotifyFromCacheM(HANDLE hProServer, LPCSTR sCacheName, HWND hWnd, UINT message, WPARAM WParam, LPARAM LParam, HANDLE* ohCacheNotifyID); | | |
| Argument sCacheName: (In) Cache buffer name A cache buffer name registered with 'Pro-Studio EX' can be also specified. hWnd: (In) Handle for the window to receive the message message: (In) Message ID to be sent to the window wParam: (In) WPARAM value to be sent to the window together with message ID LPARAM: (In) LPARAM value to be sent to the window together with message ID ohCacheNotifyID: (Out) Returns the ID that identifies the currently set notification function. | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note If the returned handle is not necessary, discard it with PS_KillNotifyFromCache(). After the cache buffer is updated, call PostMessage() to send the message (specified with the second argument), wParam value (specified with the third argument), and LPARAM value (specified with the fourth argument) to the target window (hWnd). For details of PostMessage(), refer to the Windows API Manual. | | |

| Function | Accepting next cache update notification | |
|---|--|--|
| Accepts the next cache update notification. | | |
| <p>'Pro-Server EX' provides the function to send a message to a specified window when a cache buffer is updated. However, once this notification function is executed, 'Pro-Server EX' will not send a message until this API is called again, even if the cache buffer is updated next. This is because in case it has taken a long time in processing with the notification routine, a multiple-call error can occur with the relevant routine when 'Pro-Server EX' sends the next cache update message. (If the notification routine receives the next message before completion of the processing, a multiple-call error occurs with the routine.)</p> <p>To prevent this error, this API explicitly informs 'Pro-Server EX' that it can send the next message. By calling this API at the end of the processing of the notification routine, you can build a system that enables continuous processing every time a cache buffer is updated.</p> | | |
| Single INT WINAPI PS_AcceptNextNotifyFromCache(HANDLE hCacheNotifyID); | | |
| Multi INT WINAPI PS_AcceptNextNotifyFromCacheM(HANDLE hProServer, HANDLE hCacheNotifyID); | | |
| Argument hCacheNotifyID: (In) ID of next message acceptance notification function ID obtained with PS_SetNotifyFromCache() | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |
| Function | Canceling cache update notification | |
| Cancels the function for sending a cache buffer update message to a specified window. | | |
| <p>After cancellation, 'Pro-Server EX' will not send a cache buffer update message to the relevant window, even if the cache buffer related with hCacheNotifyID is updated.</p> | | |
| Single INT WINAPI PS_KillNotifyFromCache(HANDLE hCacheNotifyID); | | |
| Multi INT WINAPI PS_KillNotifyFromCacheM(HANDLE hProServer, HANDLE hCacheNotifyID); | | |
| Argument hCacheNotifyID: (In) ID of the notification function to be canceled ID obtained with PS_SetNotifyFromCache() | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note This API will not fetch and discard a message sent from 'Pro-Server EX', even if the message remains in the window. Therefore, if 'Pro-Server EX' has sent a message to a window and the application has not fetched the message from the window before this API is called, the application can fetch the message from the window even after this API is called. (Depending on the timing, the notification routine may be called even after this API is called.) | | |

| Function | Acquiring cache buffer update count | |
|--|-------------------------------------|--|
| Returns a cache buffer update count. | | |
| By monitoring the update count on the program, you can check if a cache buffer has been updated or not. Using this function, you can omit unnecessary calls of device cache read APIs. (Even if a device cache read API is called for a device with no change, the value will not be changed.) | | |
| Single INT WINAPI PS_GetUpdateCounter(LPCSTR sCacheName, DWORD* odwCount); | | |
| Multi INT WINAPI PS_GetUpdateCounterM(HANDLE hProServer, LPCSTR sCacheName, DWORD* odwCount); | | |
| Argument sCacheName: (In) Name of cache buffer to be monitored A cache buffer name registered with 'Pro-Studio EX' can be also specified. odwCount: (Out) Cache buffer update count Counts the number of updates from 0 to 4294967295 endlessly. (After the count reaches 4294967295, it returns to"0".) | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |

27.4 Queuing Access Control APIs

| Function | Starting the queuing of device read request |
|---|--|
| <p>After this API is called, 'Pro-Server EX' queues device read requests until ExecuteQueuingAccess() is called. Queuing is executed for each Pro-Server handle.</p> <p>Single INT WINAPI BeginQueuingRead();</p> <p>Multi INT WINAPI BeginQueuingReadM(HANDLE hProServer);</p> | |
| Argument | Return value Normal end: 0 Abnormal end: Error code |
| <p>Special Note</p> <ul style="list-style-type: none"> Do not call a Device Write API until you call ExecuteQueuingAccess() after BeginQueuingRead(). After BeginQueuingRead() is called, 'Pro-Server EX' queues cache read or direct read requests. However, cache read and direct read requests cannot be queued together. To discard a request in queue, call CancelQueuingAccess(). Queuing is available up to 1500 requests and a data size of 1 Mbyte. | |
| Function | Starting the queuing of device write request |
| <p>After this API is called, 'Pro-Server EX' queues device write requests until ExecuteQueuingAccess() is called. Queuing is executed for each Pro-Server handle.</p> <p>Single INT WINAPI BeginQueuingWrite();</p> <p>Multi INT WINAPI BeginQueuingWriteM(HANDLE hProServer);</p> | |
| Argument | Return value Normal end: 0 Abnormal end: Error code |
| <p>Special Note</p> <ul style="list-style-type: none"> Do not call a Device Read API until you call ExecuteQueuingAccess() after BeginQueuingWrite(). After BeginQueuingWrite() is called, 'Pro-Server EX' queues cache write or direct write requests. However, cache write and direct write requests cannot be queued together. To discard a request in queue, call CancelQueuingAccess(). Queuing is available up to 1500 requests and a data size of 1 Mbyte. | |
| Special Note | |

| Function | Executing device read/write request in queue | |
|---|---|---|
| Accesses device data according to the device read/write request in queue. | | |
| Single INT WINAPI ExecuteQueuingAccess(); Multi INT WINAPI ExecuteQueuingAccessM(HANDLE hProServer); | | |
| Argument | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note <ul style="list-style-type: none">• If 'Pro-Server EX' successfully accesses all specified devices, ExecuteQueuingAccess() returns a success code. If 'Pro-Server EX' fails to access any device, on the other hand, ExecuteQueuingAccess() returns an access error code. If you wish to know whether each device access request has been successfully executed or not, call IsQueuingAccessSucceeded() to check the result.• You cannot register ACTIONs in queuing access. | | |
| Function | Discarding device read/write request in queue | |
| Discards the device read/write request in queue. | | |
| Single INT WINAPI CancelQueuingAccess(); Multi INT WINAPI CancelQueuingAccessM(HANDLE hProServer); | | |
| Argument | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note <p>After BeginQueuingWrite() or BeginQueuingRead() is called, 'Pro-Server EX' queues device access requests until ExecuteQueuingAccess() is called.</p> <p>If a request in queue becomes unnecessary for any reason, call this API. 'Pro-Server EX' discards the request in queue, and quits queuing.</p> | | |

| Function | Checking the run result of device read/write request in queue | |
|--|---|---|
| <p>Checks whether or not each device access request has been successfully executed, after ExecuteQueuingAccess() is called.</p> <p>Single INT WINAPI IsQueuingAccessSucceeded(INT iIndex);</p> <p>Multi INT WINAPI IsQueuingAccessSucceededM(HANDLE hProServer,INT iIndex);</p> | | |
| <p>Argument</p> <p>iIndex: (In) Number of request to be checked</p> <p>After BeginQueuingWrite() or BeginQueuingRead() is called, Device Access APIs are called several times to queue device access requests until ExecuteQueuingAccess() is called. Note that you cannot know an actual device access result until execution of ExecuteQueuingAccess().</p> <p>If you wish to know a result of each device access request, execute ExecuteQueuingAccess() first, and then specify the number (from 0) of the request for the target device.</p> | | <p>Return value</p> <p>XX: Error code</p> <p>0: Indicates that the device access request of the specified number has been successfully executed.</p> |
| <p>Special Note</p> <p>(Example)</p> <p>BeginQueuingWrite();</p> <p>WriteDevice16("Node1","LS100",Data,10);</p> <p>WriteDevice16("Node1","LS200",Data,10);</p> <p>WriteDevice16("Node1","LS300",Data,10);</p> <p>ExecuteQueuingAccess()</p> <p>To check if the "Node1" access to "LS200" has been successfully executed, use IsQueuingAccessSucceeded(1). If the return value is "0", this access has been successfully executed.</p> | | |

27.5 System APIs

| Function | Creating Pro-Server handle | |
|--|------------------------------|---|
| Obtains a Pro-Server handle for use of a Multi-Handle function. | | |
| HANDLE WINAPI CreateProServerHandle(); | | |
| Argument | | Return value Normal end: Other than 0 (Handle code) Abnormal end: 0 |
| Special Note | | |
| Function | Releasing Pro-Server handle | |
| Releases an obtained Pro-Server handle. | | |
| INT WINAPI DeleteProServerHandle(HANDLE hProServer); | | |
| Argument hProServer: (In) Pro-Server handle to be released | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |
| Function | Loading network project file | |
| Loads the network project file specified with the argument. | | |
| Single INT WINAPI EasyLoadNetworkProject(LPCSTR sDBName,DWORD dwSetOrAdd = TRUE); Multi INT WINAPI EasyLoadNetworkProjectM(HANDLE hProServer,LPCSTR sDBName,DWORD dwSetOrAdd = TRUE); | | |
| Argument sDBName: Specify the full path of a network project file to be loaded. dwSetOrAdd: Reserve (Fixed to "1") hProServer: Pro-Server handle | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |

| Function | Converting error code into character string | |
|---|---|---|
| <p>Converts an error code returned by each API of 'Pro-Server EX' into an error message. EasyLoadErrorMessage() returns a multibyte character string (ASCII) as a message. EasyLoadErrorMessageW() returns a wide character string (UNICODE) as a message.</p> <p>BOOL WINAPI EasyLoadErrorMessage(INT iErrorCode,LPSTR osErrorMessage); BOOL WINAPI EasyLoadErrorMessageW(INT iErrorCode,LPWSTR owsErrorMessage);</p> | | |
| Argument iErrorCode: (In) Error code returned by 'Pro-Server EX' function osErrorMessage: (Out) Pointer to the converted character string (multibyte character string) storing area. (To call this API, secure a storing area with at least 512 bytes.) osErrorMessage: (Out) Pointer to the converted character string (multibyte character string) storing area. (To call this API, secure a storing area with at least 1024 bytes.) | | Return value Normal end: Other than 0 Failure in character string conversion (ex. Undefined code): 0 |
| Special Note <ul style="list-style-type: none">• This API is intended to ensure compatibility with older versions of 'Pro-Server'.• Using EasyLoadErrorMessageEx() enables conversion into a more detailed error message. We recommend you to use EasyLoadErrorMessageEx(). | | |
| Function | Converting error code into character string (with status information) | |
| <p>Converts an error code returned by each API of 'Pro-Server EX' into an error message. 'Pro-Server EX' then returns the error message together with the error occurrence condition and other information, if possible.</p> <p>EasyLoadErrorMessage() always returns the same error message relative to a specified error code. On the other hand, EasyLoadErrorMessageEx() returns more detailed error information including a name of communication target device, error occurrence place and so on, depending on the error occurrence condition. Thus, EasyLoadErrorMessageEx() may return a different error message relative to the same error code, depending on the situation.</p> <p>EasyLoadErrorMessageEx() and EasyLoadErrorMessageExM() return a multibyte character string (ASCII) as a message.</p> <p>EasyLoadErrorMessageExW() and EasyLoadErrorMessageExWM() return a wide character string (UNICODE) as a message.</p> <p>Single</p> <p>BOOL WINAPI EasyLoadErrorMessageEx(INT iErrorCode,LPSTR osErrorMessage); BOOL WINAPI EasyLoadErrorMessageExW(INT iErrorCode,LPWSTR owsErrorMessage);</p> <p>Multi</p> <p>BOOL WINAPI EasyLoadErrorMessageExM(HANDLE hProServer,INT iErrorCode,LPSTR osErrorMessage); BOOL WINAPI EasyLoadErrorMessageExWM(HANDLE hProServer,INT iErrorCode,LPWSTR owsErrorMessage);</p> | | |
| Argument iErrorCode: (In) Error code returned by 'Pro-Server EX' function osErrorMessage: (Out) Pointer to the converted character string (multibyte character string) storing area.(To call this API, secure a storing area with at least 1024 bytes.) owsErrorMessage: (Out) Pointer to the converted character string (wide character string) storing area. (To call this API, secure a storing area with at least 2048 bytes.) | | Return value Normal end: Other than 0 Failure in character string conversion (ex. Undefined code): 0 |
| Special Note <ul style="list-style-type: none">• EasyLoadErrorMessage() is used to convert an error code into a message, assuming a case where an API of 'Pro-Server EX' is called and then the API returns an error code.• 'Pro-Server EX' can store only one piece of error status information per handle. Therefore, if you call another API between the API that causes an error and EasyLoadErrorMessage(),EasyLoadErrorMessage() will not return error status information because stored error status information is rewritten. For this reason, when using EasyLoadErrorMessageM(), you must specify the same Pro-Server handle as the handle used when the relevant API was called. | | |

| Function | Initializing Pro-Server API | |
|---|-----------------------------|---|
| Initializes a Pro-Server EX API, and declares use of the API internally. If you execute EasyInit() without starting 'Pro-Server EX', 'Pro-Server EX' will automatically start. INT WINAPI EasyInit(); | | |
| Argument | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |

| Function | Ending Pro-Server API | |
|--|-----------------------|--------------|
| INT WINAPI EasyTerm(); | | |
| Argument | | Return value |
| Special Note This API is intended to ensure compatibility with older versions of 'Pro-Server'. With 'Pro-Server EX', you need not call this API. (Even if you call this API, it will not be executed.) | | |

| Function | Closing Pro-Server EX | |
|---|-----------------------|---|
| Closes 'Pro-Server EX'. After calling this API, do not call any API of 'Pro-Server EX'. Before calling this API, be sure to discard Pro-Server handles etc. INT WINAPI EasyTermServer(); | | |
| Argument | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |

| Function | Pro-Server EX closing notice |
|---|---|
| <p>This API allows you to know the 'Pro-Server EX' closing status.</p> <p>When 'Pro-Server EX' starts closing processing, it sends a specified message to the window registered with this API by using PostMessage() of Windows API.</p> <p>For details of PostMessage(), refer to Windows APIs.</p> <p>When the application receives the message from the window, it recognizes that 'Pro-Server EX' will be immediately closed.</p> <p>Single INT WINAPI EasyNotifyFromServerEnd(HWND hReceivedWnd,UINT uMessage,WPARAM WParam = 0, LPARAM LParam = 0);</p> <p>Multi INT WINAPI EasyNotifyFromServerEndM(HANDLE hProServer,HWND hReceivedWnd,UINT uMessage,WPARAM WParam = 0, LPARAM LParam = 0);</p> | |
| <p>Argument</p> <p>hReceivedWnd: (In) Window that receives a closing message.</p> <p>uMessage: (In) Message ID to be sent as a closing message. This ID will be sent to the window specified with hReceivedWnd when Pro-Server EX is being closed.</p> <p>WParam: (In) WPARAM to be sent together with the message (Value of WPARAM in PostMessage())</p> <p>Lparam: (In) LPARAM to be sent together with the message (Value of LPARAM in PostMessage())</p> | <p>Return value</p> <p>Normal end: 0</p> <p>Abnormal end: Error code</p> |
| <p>Special Note</p> <p>This API is useful to build an application that closes at the same time when 'Pro-Server EX' is closed.</p> <p>For example, if you specify the application main window for hReceivedWnd, and WM_QUIT for uMessage to call this API, 'Pro-Server EX' sends WM_QUIT to the application main window when 'Pro-Server EX' is being closed.</p> <p>Generally, an application uses WM_QUIT as an application closing signal. Therefore, you can build an application that closes at the same time when 'Pro-Server EX' is closed.</p> | |
| Function | Inhibiting message processing |
| <p>Most of the Pro-Server EX APIs (functions) process Windows messages during the processing of a function if the processing time would be long. This API can specify whether to execute or inhibit the Windows message processing.</p> <p>When Windows message processing is inhibited, the relevant Windows message is stored in the message queue, and will not be processed during execution of a function.</p> <p>As a result, you will not call a function over again by clicking the icon during execution of the function.</p> <p>In this case, however, the processing of all the Windows messages as well as an "icon click" message, will be inhibited, and the processing of important messages for timer and window re-drawing is also disabled.</p> <p>You can specify whether to execute or inhibit the processing of Windows messages for each Pro-Server EX handle.</p> <p>With the default setting, message processing has been set to "Execute".</p> <p>Single INT EasySetWaitType(DWORD dwMode);</p> <p>Multi INT EasySetWaitTypeM(HANDLE hProServer,DWORD dwMode);</p> | |
| <p>Argument</p> <p>hProServerHandle: (In) Pro-Server handle subjected to processing mode change</p> <p>dwMode: (In) To execute message processing, specify "1". To inhibit message processing, specify "2".</p> | <p>Return value</p> <p>Normal end: 0</p> <p>Abnormal end: Error code</p> |
| <p>Special Note</p> | |

| Function | Acquiring message processing mode | |
|--|-----------------------------------|---|
| Acquires the current message processing mode during a call of a Pro-Server EX API. The Multi-Handle API returns the current message processing mode for each handle. | | |
| Single INT EasyGetWaitType(); Multi INT EasyGetWaitTypeM(HANDLE hProServerHandle); | | |
| Argument HANDLE hProServerHandle: (In) Handle subjected to status acquisition | | Return value 1: Executes message processing. 2: Inhibits message processing. |
| Special Note | | |

| Function | Adding log into log viewer | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----------------------------|-------------------------------|-------------------|------------|--------------------------|------|----------------|------------------------|------|----------------------|------------------------|------|----------------------------|------------------------|------|-------------------------------|----------------------|------|------------------------------|--------------------------|------|------------------------------|---------------------------|------|-------------------------------|---------------------------|------|-------------------------------|---|
| <p>If a specific event ('Pro-Server EX' start/closing, error, etc.) occurs with internal processing, 'Pro-Server EX' can record the event.</p> <p>You can see the recorded information through the log viewer. (See "28.5 Monitoring System Event Logs")</p> <p>With this API, 'Pro-Server EX' records a specific message by using this function. This API is available for application debugging.</p> <p>INT WINAPI EasyOutputLog(BYTE bLevel,LPCSTR sPrompt,LPCSTR sMessage);</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Argument</p> <p>bLevel: (In) Event type</p> <p>Recording all messages may result in performance deterioration. To prevent this, 'Pro-Server EX' provides a filtering function for recording messages by event type. Specify the event type that the current recording message belongs to. The event types are listed below.</p> <table><tr><th>Definition</th><th>Hexadecimal value</th><th>Event type</th></tr><tr><td>EASY_LogLevel_SysMessage</td><td>0x01</td><td>System message</td></tr><tr><td>EASY_LogLevel_SysError</td><td>0x02</td><td>System error message</td></tr><tr><td>EASY_LogLevel_AppError</td><td>0x04</td><td>User program error message</td></tr><tr><td>EASY_LogLevel_AppStart</td><td>0x08</td><td>User program starting message</td></tr><tr><td>EASY_LogLevel_AppEnd</td><td>0x10</td><td>User program closing message</td></tr><tr><td>EASY_LogLevel_AppWarning</td><td>0x20</td><td>User program warning message</td></tr><tr><td>EASY_LogLevel_AppMessage1</td><td>0x40</td><td>User program detail message 1</td></tr><tr><td>EASY_LogLevel_AppMessage2</td><td>0x80</td><td>User program detail message 2</td></tr></table> <p>sPrompt: (In) Character string indicating event occurrence position (NULL-terminated)</p> <p>sMessage: (In) Character string of the message to be recorded (NULL-terminated)</p> <p>The actually recorded message is a simple combination of two character strings (sPrompt and sMessage).</p> | | Definition | Hexadecimal value | Event type | EASY_LogLevel_SysMessage | 0x01 | System message | EASY_LogLevel_SysError | 0x02 | System error message | EASY_LogLevel_AppError | 0x04 | User program error message | EASY_LogLevel_AppStart | 0x08 | User program starting message | EASY_LogLevel_AppEnd | 0x10 | User program closing message | EASY_LogLevel_AppWarning | 0x20 | User program warning message | EASY_LogLevel_AppMessage1 | 0x40 | User program detail message 1 | EASY_LogLevel_AppMessage2 | 0x80 | User program detail message 2 | <p>Return value</p> <p>Normal end: 0</p> <p>Abnormal end: Error code</p> |
| Definition | Hexadecimal value | Event type | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EASY_LogLevel_SysMessage | 0x01 | System message | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EASY_LogLevel_SysError | 0x02 | System error message | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EASY_LogLevel_AppError | 0x04 | User program error message | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EASY_LogLevel_AppStart | 0x08 | User program starting message | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EASY_LogLevel_AppEnd | 0x10 | User program closing message | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EASY_LogLevel_AppWarning | 0x20 | User program warning message | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EASY_LogLevel_AppMessage1 | 0x40 | User program detail message 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EASY_LogLevel_AppMessage2 | 0x80 | User program detail message 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Special Note</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Function | Clearing log from log viewer | |
|---|------------------------------|--|
| Clears the information recorded by EasyOutputLog(). This API is available for application debugging. INT WINAPI EasyOutputLogClear(); | | |
| Argument HANDLE hProServerHandle: (In) Handle subjected to status acquisition | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |

27.6 SRAM Data Access APIs

| Function | Reading SRAM backup data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----------------------------------|--|-------|----------------------------------|--|--------|-------------|-------------|--------|--------------|---------------------------------------|--------|-----------------|--|--------|---------------|--------|---------------|---------------|--------|-----------------------------------|---------------|--------|----------------------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|--------|-----------|-----------|
| Reads the following data stored in the SRAM of display unit, and saves the data into a file on the PC. Filing data are saved in binary format, and other types of data are saved in CSV format. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INT WINAPI EasyBackupDataRead(LPCSTR sSaveFileName,LPCSTR sNodeName,INT iBackupDataType,INT iSaveMode); | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Argument sSaveFileName: (In) File path of the file to save read data. (String pointer) sNodeName: (In) Name of read data source node (String pointer) Pro-Server EX nodes cannot be specified. iBackupDataType: (In) Type of data to be read | | Return value Normal end: 0 Abnormal end: Error code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><th>Value</th><th>Data source node in GP Series</th><th>Data source node other than GP Series</th></tr><tr><td>0x0001</td><td>Filing data</td><td>Filing data</td></tr><tr><td>0x0002</td><td>Logging data</td><td>Sampling data of sampling group No. 1</td></tr><tr><td>0x0003</td><td>Line graph data</td><td rowspan="2">Data of all sampling groups other than sampling group No. 1</td></tr><tr><td>0x0004</td><td>Sampling data</td></tr><tr><td>0x0005</td><td>Alarm block 1</td><td>Alarm block 1</td></tr><tr><td>0x0006</td><td>Alarm history or Alarm block 2</td><td>Alarm block 2</td></tr><tr><td>0x0007</td><td>Alarm log or Alarm block 3</td><td>Alarm block 3</td></tr><tr><td>0x0008</td><td>Alarm block 4</td><td>Alarm block 4</td></tr><tr><td>0x0009</td><td>Alarm block 5</td><td>Alarm block 5</td></tr><tr><td>0x000A</td><td>Alarm block 6</td><td>Alarm block 6</td></tr><tr><td>0x000B</td><td>Alarm block 7</td><td>Alarm block 7</td></tr><tr><td>0x000C</td><td>Alarm block 8</td><td>Alarm block 8</td></tr><tr><td>Others</td><td>(Reserve)</td><td>(Reserve)</td></tr></table> | | | Value | Data source node in GP Series | Data source node other than GP Series | 0x0001 | Filing data | Filing data | 0x0002 | Logging data | Sampling data of sampling group No. 1 | 0x0003 | Line graph data | Data of all sampling groups other than sampling group No. 1 | 0x0004 | Sampling data | 0x0005 | Alarm block 1 | Alarm block 1 | 0x0006 | Alarm history or Alarm block 2 | Alarm block 2 | 0x0007 | Alarm log or Alarm block 3 | Alarm block 3 | 0x0008 | Alarm block 4 | Alarm block 4 | 0x0009 | Alarm block 5 | Alarm block 5 | 0x000A | Alarm block 6 | Alarm block 6 | 0x000B | Alarm block 7 | Alarm block 7 | 0x000C | Alarm block 8 | Alarm block 8 | Others | (Reserve) | (Reserve) |
| Value | Data source node in GP Series | Data source node other than GP Series | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x0001 | Filing data | Filing data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x0002 | Logging data | Sampling data of sampling group No. 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x0003 | Line graph data | Data of all sampling groups other than sampling group No. 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x0004 | Sampling data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x0005 | Alarm block 1 | Alarm block 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x0006 | Alarm history or Alarm block 2 | Alarm block 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x0007 | Alarm log or Alarm block 3 | Alarm block 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x0008 | Alarm block 4 | Alarm block 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x0009 | Alarm block 5 | Alarm block 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x000A | Alarm block 6 | Alarm block 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x000B | Alarm block 7 | Alarm block 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0x000C | Alarm block 8 | Alarm block 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Others | (Reserve) | (Reserve) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>When the data source node is in the ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, LT3000 node, and the data type is Alarm block 1 to 8, one alarm block stores up to three types of data (active data, history data and log data) depending on the settings of 'GP-Pro EX'. However, this API checks if the alarm block contains valid data or not according to the following order of precedence, and reads valid data if any.</p> <p>(1) Alarm history (2) Alarm log (3) Alarm active</p> <p>If there is no valid data, an error occurs.</p> <p>iSaveMode: (In) Saving mode</p> <p>0: New (If a file with the same name already exists, 'Pro-Server EX' deletes the file, and overwrites it.) 1: Add (The read data is added to the end of an existing file. If there is no file to save the data, 'Pro-Server EX' creates a new file.) Others: Reserve</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Special Note

- When reading Alarm or Sampling data, the date format is "yy/mm/dd".
- If [Multiple Line Message Output (Save Alarm to CSV)] is enabled in GP-Pro EX alarm settings, messages with line breaks are output to a single cell. If [Multiple Line Message Output (Save Alarm to CSV)] is disabled, the message up to the line break only is saved.

| Function | Reading extended SRAM backup data | |
|--|-----------------------------------|--|
| <p>Reads the following data stored in the SRAM of display unit, and saves the data into a file on the PC. Filing data are saved in binary format, and other types of data are saved in CSV format. Unlike EasyBackupDataRead(), this API enables access to extended data for the ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series and LT3000 node.</p> <p>INT WINAPI EasyBackupDataReadEx(LPCSTR sSaveFileName, LPCSTR sNodeName, INT iBackupDataType, INT iSaveMode, INT iNumber = 0, INT iStringTable = 0x0000);</p> | | |
| <p>Argument</p> <p>sSaveFileName: (In) File path of the file to save read data. (String pointer) sNodeName: (In) Name of read data source node (String pointer) Pro-Server EX nodes cannot be specified. iBackupDataType: (In) Type of data to be read</p> | | <p>Return value</p> <p>Normal end: 0 Abnormal end: Error code</p> |
| Value | Data source node in GP Series | Data source node other than GP Series |
| 0x0001 | Filing data | Filing data |
| 0x0002 | Logging data | Sampling data of sampling group No. 1 |
| 0x0003 | Line graph data | Data of all sampling groups other than sampling group No. 1 |
| 0x0004 | Sampling data | |
| 0x0005 | Alarm block 1 | Alarm block 1 |
| | | Specify iNumber for alarm type. |
| 0x0006 | Alarm history or Alarm block 2 | Alarm block 2 |
| | | Specify iNumber for alarm type. |
| 0x0007 | Alarm log or Alarm block 3 | Alarm block 3 |
| | | Specify iNumber for alarm type. |
| 0x0008 | Alarm block 4 | Alarm block 4 |
| | | Specify iNumber for alarm type. |
| 0x0009 | Alarm block 5 | Alarm block 5 |
| | | Specify iNumber for alarm type. |
| 0x000A | Alarm block 6 | Alarm block 6 |
| | | Specify iNumber for alarm type. |
| 0x000B | Alarm block 7 | Alarm block 7 |
| | | Specify iNumber for alarm type. |
| 0x000C | Alarm block 8 | Alarm block 8 |
| | | Specify iNumber for alarm type. |
| 0x8002 | (Reserve) | Sampling group of a specific group number Specify iNumber for group number. |

iSaveMode: (In) Saving mode

0: New (If a file with the same name already exists, 'Pro-Server EX' deletes the file, and overwrites it.)

1: Add (The read data is added to the end of an existing file. If there is no file to save the data, 'Pro-Server EX' creates a new file.)

Others: Reserve

iNumber: (In) This argument is ignored when sSaveFileName specifies a GP Series file.

In addition, the meaning of this argument varies depending on the value of iBackupDataType.

| Value of iBackupDataType | Description | | | | | | | | | | |
|--|---|--|-------------|---|--|---|--------------------------|---|---------------------------|---|-----------------------|
| 0x0005 to 0x000C | Three types of alarm data (active, history and log) are available. Specify a target alarm type. | | | | | | | | | | |
| | <table><tr><th>Value of iNumber</th><th>Description</th></tr><tr><td>0</td><td>'Pro-Server EX' checks if the alarm block contains valid data or not according to the following order of precedence, and reads valid data if any. (1) Alarm history (2) Alarm log (3) Alarm active If there is no valid data, an error occurs.</td></tr><tr><td>1</td><td>Reads alarm active data.</td></tr><tr><td>2</td><td>Reads alarm history data.</td></tr><tr><td>3</td><td>Reads alarm log data.</td></tr></table> | Value of iNumber | Description | 0 | 'Pro-Server EX' checks if the alarm block contains valid data or not according to the following order of precedence, and reads valid data if any. (1) Alarm history (2) Alarm log (3) Alarm active If there is no valid data, an error occurs. | 1 | Reads alarm active data. | 2 | Reads alarm history data. | 3 | Reads alarm log data. |
| | Value of iNumber | Description | | | | | | | | | |
| | 0 | 'Pro-Server EX' checks if the alarm block contains valid data or not according to the following order of precedence, and reads valid data if any. (1) Alarm history (2) Alarm log (3) Alarm active If there is no valid data, an error occurs. | | | | | | | | | |
| | 1 | Reads alarm active data. | | | | | | | | | |
| | 2 | Reads alarm history data. | | | | | | | | | |
| | 3 | Reads alarm log data. | | | | | | | | | |
| If the target data type does not exist in the alarm block specified with iBackupDataType, an error occurs. | | | | | | | | | | | |
| 0x8002 | Group number of sampling group to be read Any value from 1 to 64 | | | | | | | | | | |
| Others | (Reserve) | | | | | | | | | | |

iStringTable: (In) Reserve

Always specify "0".

Special Note

- When reading Alarm or Sampling data, the date format is "yy/mm/dd".
- If [Multiple Line Message Output (Save Alarm to CSV)] is enabled in GP-Pro EX alarm settings, messages with line breaks are output to a single cell. If [Multiple Line Message Output (Save Alarm to CSV)] is disabled, the message up to the line break only is saved.

| Function | Writing SRAM backup data | |
|--|--------------------------|--|
| Writes specified filing data in binary format into the SRAM of a GP Series node. | | |
| INT WINAPI EasyBackupDataWrite(LPCSTR sSourceFileName,LPCSTR sNodeName,INT iBackupDataType); | | |
| Argument sSourceFileName: (In) File path of binary-formatted filing data to be written (String pointer) sNodeName: (In) Name of entry node to write data (String pointer) You can specify GP Series nodes only. BackupDataType: (In) Fixed to "1". ("1" indicates filing data.) | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |

27.7 CF Card / SD Card APIs

- NOTE

- API for accessing CF card and SD card data. You cannot use this with models that do not have a CF card or SD card slot.
 - For models that support an SD card or CFast card, references to "CF" or "CF Card" apply to the memory card you are using.
 - You can use the CF card API functions to read from and write to a SD card.
Similarly, you can use the SD card API functions to read from and write to a CF card.

| Function | Reading CF card status | | |
|---|------------------------|--|---|
| Acquires connection status of the CF card in a connected the display unit. | | | |
| Single CF Card: INT WINAPI EasyIsCFCard(LPCSTR sNodeName); SD Card: INT WINAPI EasyIsSDCard(LPCSTR sNodeName); Multi CF Card: INT WINAPI EasyIsCFCardM(HANDLE hProServer,LPCSTR sNodeName); SD Card: INT WINAPI EasyIsSDCardM(HANDLE hProServer,LPCSTR sNodeName); | | | |
| Argument hProServer: Pro-Server handle sNodeName: Name of node to read status (This node name must be pre-registered in a network project.) | Return value | | |
| | Function return value | For GP Series node | Other than GP Series node |
| | 0x00000000 | Normal | Normal |
| | 0x10000001 | No CF card | No CF card, or CF card slot cover is opened (regardless of presence/absence of CF card) |
| | 0x10000002 | Detection of device incompatible with CF card driver | |
| | 0x10000004 | Detection of CF card error | Detection of CF card error |
| | 0x10000008 | CF card not initialized | |
| | Others | Error without relation to CF card | |
| | Special Note | | |

| Function | Reading file list from CF card (Optional folder name) |
|--|---|
| <p>Outputs a list of files from the CF card inserted in a display unit node into a file specified with the parameter. You can specify an optional file to save the file list.</p> <p>CF Card: INT WINAPI EasyGetListInCfCard(LPCSTR sNodeName, LPCSTR sDirectory, INT* oiCount, LPCSTR sSaveFileName);</p> <p>SD Card: INT WINAPI EasyGetListInSdCard(LPCSTR sNodeName, LPCSTR sDirectory, INT* oiCount, LPCSTR sSaveFileName);</p> | |
| <p>Argument</p> <p>sNodeName: Name of node to output file list</p> <p>sDirectory: Name of folder to receive file list (All capitals)</p> <p>oiCount: Number of output files</p> <p>sSaveFileName: Name of file to save output directory information. The specified file stores binary data of the alignment type specified with stEasyDirInfo, in the quantity specified with the return value of oiCount.</p> <pre> struct stEasyDirInfo { BYTE bFileName[8+1];// File name (Terminated with "0") BYTE bExt[3+1];// File extension (Terminated with "0") BYTE bDummy[3];// Dummy DWORD dwFileSize;// File size BYTE bFileTimeStamp[8+1];// File timestamp (Terminated with "0") BYTE bDummy2[3];// Dummy 2 }; </pre> | <p>Return value</p> <p>Normal end: 0</p> <p>Abnormal end: Error code</p> |

Special Note

"bFileTimeStamp" is the date and time in MS-DOS format stored as 8 bytes of data.

The time is stored in the top 4 bytes, the date in the bottom 4 bytes, in hexadecimal text format. Readout of hexadecimal text, whether as upper or lowercase letters, differ depending on the destination unit for the readout.

The MS-DOS time/date format is as follows:

(Example: For 71E54B9F, 4B9F is the date in hexadecimal format, 71E5 is the time in hexadecimal format, resulting in a time stamp of 2017/12/31 14:15:10.)

| Bit | Description |
|---------|---|
| 0 to 4 | Day (1 to 31) |
| 5 to 8 | Month (1 = January, 2 = February , 12 = December) |
| 9 to 15 | Year: Expressed with the number of elapsed years from 1980. The actual year is the sum of 1980 and a value of these bits. |

Specify time in the MS-DOS format. Time is packed in 16 bits in the following format:

| Bit | Description |
|----------|--|
| 0 to 4 | Number of seconds divided by two (0 to 29) |
| 5 to 10 | Minute (0 to 59) |
| 11 to 15 | Hour (0 to 23, on 24-hour basis) |

If the file name is longer than 9 characters or the file extension is longer than 4 characters, it is not included in the read file list.

When reading the file list, file names shorter than 8 characters or file extensions shorter than 3 characters are displayed as bFileName[8+1] or bExt[3+1] respectively, as shown below.

| Read Source Node | Other than GP series node | GP series node |
|------------------|--|--|
| bFileName[8+1] | When the file name is shorter than 8 characters, null (0x00) is stored at the end of the original file name, and undefined values are stored after null. | When the file name is shorter than 8 characters, single-byte spaces (0x20) are stored after the original file name, with null (0x00) as the final character. |
| bExt[3+1] | When the file extension is shorter than 3 characters, null (0x00) is stored at the end of the original file extension, and undefined values are stored after null. | When the file extension is shorter than 3 characters, single-byte spaces (0x20) are stored after the original file extension, with null (0x00) as the final character. |

(Example) When ABC.D is the file name and file extension

Other than GP series node

| | |
|----------------|--|
| bFileName[8+1] | 0x410x420x430x00***** (**** indicate an undefined value) |
| bExt[3+1] | 0x440x00***** (**** indicate an undefined value) |

GP series node

| | |
|----------------|--------------------------------------|
| bFileName[8+1] | 0x410x420x430x200x200x200x200x200x00 |
| bExt[3+1] | 0x440x200x200x00 |

| Function | Reading file list from CF card (including the sub-folders or below in an optional folder name) |
|--|--|
| <p>Outputs a list of files from the CF card inserted in a display unit node into a file specified with the parameter. You can specify an optional file to save the file list. Optionally, you can define the folder with the list of files you want to get. The file list to read is defined by searching the folder passed by the parameter, including sub-folders, for any files.</p> <p>CF Card: INT WINAPI EasyGetListRecursivelyInCfCard(LPCSTR sNodeName, LPCSTR sDirectory, INT* oiCount, LPCSTR sSaveFileName); SD Card: INT WINAPI EasyGetListRecursivelyInSdCard(LPCSTR sNodeName, LPCSTR sDirectory, INT* oiCount, LPCSTR sSaveFileName);</p> | |
| <p>Argument</p> <p>sNodeName: Name of node to output file list sDirectory: Name of folder to receive file list (All capitals) oiCount: Number of output files sSaveFileName: Name of file to save output directory information. The specified file stores binary data of the alignment type specified with stEasyRecursivelyDirInfo, in the quantity specified with the return value of oiCount.</p> <pre> struct stEasyRecursivelyDirInfo { BYTE bFileName[8+1];// File name (Terminated with "0") BYTE bExt[3+1];// File extension (Terminated with "0") BYTE bDummy[3];// Dummy DWORD dwFileSize;// File size BYTE bFileTimeStamp[8+1];// File timestamp (Terminated with "0") BYTE bFolderName[260+1];// Folder name (Terminated with "0", "0" is also stored in remaining portions. BYTE bDummy2[2];// Dummy 2 } ; </pre> | <p>Return value</p> <p>Normal end: 0 Abnormal end: Error code</p> |

Special Note

If you select a GP Series node with this API, an error is generated.

"bFileTimeStamp" is the date and time in MS-DOS format stored as 8 bytes of data.

The time is stored in the top 4 bytes, the date in the bottom 4 bytes, in hexadecimal text format. Readout of hexadecimal text, whether as upper or lowercase letters, differ depending on the destination unit for the readout.

The MS-DOS time/date format is as follows:

(Example: For 71E54B9F, 4B9F is the date in hexadecimal format, 71E5 is the time in hexadecimal format, resulting in a time stamp of 2017/12/31 14:15:10.)

| Bit | Description |
|---------|---|
| 0 to 4 | Day (1 to 31) |
| 5 to 8 | Month (1 = January, 2 = February , 12 = December) |
| 9 to 15 | Year: Expressed with the number of elapsed years from 1980. The actual year is the sum of 1980 and a value of these bits. |

Specify time in the MS-DOS format. Time is packed in 16 bits in the following format:

| Bit | Description |
|----------|--|
| 0 to 4 | Number of seconds divided by two (0 to 29) |
| 5 to 10 | Minute (0 to 59) |
| 11 to 15 | Hour (0 to 23, on 24-hour basis) |

If the file name is longer than 9 characters or the file extension is longer than 4 characters, it is not included in the read file list.

When reading the file list , file names shorter than 8 characters or file extensions shorter than 3 characters are displayed as bFileName[8+1] or bExt[3+1] respectively, as shown below.

| | |
|----------------|--|
| bFileName[8+1] | When the file name is shorter than 8 characters, null (0x00) is stored at the end of the original file name, and undefined values are stored after null. |
| bExt[3+1] | When the file extension is shorter than 3 characters, null (0x00) is stored at the end of the original file extension, and undefined values are stored after null. |

(Example) When ABC.D is the file name and file extension

| | |
|----------------|--|
| bFileName[8+1] | 0x410x420x430x00***** (**** indicate an undefined value) |
| bExt[3+1] | 0x440x00***** (**** indicate an undefined value) |

| Function | Reading file list from CF card (Type specification) | |
|---|--|--|
| Outputs a list of files from the CF card inserted in a display unit into a file specified with the parameter. Only the file list in the directory specified with "sDirectory" can be output. | | |
| INT WINAPI EasyGetListInCard(LPCSTR sNodeName, LPCSTR sDirectory, INT* oiCount, LPCSTR sSaveFileName); | | |
| Argument sNodeName: Name of node to output file list sDirector: Name of directory to output list (All capitals) This API supports only the following directories: LOG (Logging data) TREND (Trend data) ALARM (Alarm data) CAPTURE (Capture data) FILE (Filing data) oiCount: Number of output files sSaveFileName: Name of file to save output directory information. The specified file stores binary data of the alignment type specified with stEasyDirInfo, in the quantity specified with the return value of oiCount. struct stEasyDirInfo { BYTE bFileName[8+1];// File name (Terminated with "0") BYTE bExt[3+1];// File extension (Terminated with "0") BYTE bDummy[3];// Dummy DWORD dwFileSize;// File size BYTE bFileTimeStamp[8+1];// File timestamp (Terminated with "0") BYTE bDummy2[3];// Dummy 2 } ; | Return value Normal end: 0 Abnormal end: Error code | |

Special Note

If the file name is longer than 9 characters or the file extension is longer than 4 characters, it is not included in the read file list.

When reading the file list, file names shorter than 8 characters or file extensions shorter than 3 characters are displayed as bFileName[8+1] or bExt[3+1] respectively, as shown below.

| Read Source Node | Other than GP series node | GP series node |
|------------------|--|--|
| bFileName[8+1] | When the file name is shorter than 8 characters, null (0x00) is stored at the end of the original file name, and undefined values are stored after null. | When the file name is shorter than 8 characters, single-byte spaces (0x20) are stored after the original file name, with null (0x00) as the final character. |
| bExt[3+1] | When the file extension is shorter than 3 characters, null (0x00) is stored at the end of the original file extension, and undefined values are stored after null. | When the file extension is shorter than 3 characters, single-byte spaces (0x20) are stored after the original file extension, with null (0x00) as the final character. |

(Example) When ABC.D is the file name and file extension

Other than GP series node

| | |
|----------------|--|
| bFileName[8+1] | 0x410x420x430x00***** (**** indicate an undefined value) |
| bExt[3+1] | 0x440x00***** (**** indicate an undefined value) |

GP series node

| | |
|----------------|--------------------------------------|
| bFileName[8+1] | 0x410x420x430x200x200x200x200x200x00 |
| bExt[3+1] | 0x440x200x200x00 |

| Function | Reading file list from CF card (Including sub-folders in Type specification) | | | | | | | | | |
|---|--|---|----------------|--|-----------|--|----------------|--|-----------|--|
| <p>Outputs a list of files from the CF card inserted in a display unit into a file specified with the parameter. Only the file list in the directory specified with "sDirectory" can be output. Get the list of files to read by searching all the folders in the directory specified by "sDirectory".</p> <p>INT WINAPI EasyGetListRecursivelyInCard(LPCSTR sNodeName, LPCSTR sDirectory, INT* oiCount, LPCSTR sSaveFileName);</p> | | | | | | | | | | |
| <p>Argument</p> <p>sNodeName: Name of node to output file list</p> <p>sDirector: Name of directory to output list (All capitals) This API supports only the following directories:</p> <ul style="list-style-type: none">LOG (Logging data)TREND (Trend data)ALARM (Alarm data)CAPTURE (Capture data)FILE (Filing data) <p>oiCount: Number of output files</p> <p>sSaveFileName: Name of file to save output directory information. The specified file stores binary data of the alignment type specified with stEasyRecursiveDirInfo, in the quantity specified with the return value of oiCount.</p> <pre>struct stEasyDirInfo { BYTE bFileName[8+1];// File name (Terminated with "0") BYTE bExt[3+1];// File extension (Terminated with "0") BYTE bDummy[3];// Dummy DWORD dwFileSize;// File size BYTE bFileTimeStamp[8+1];// File timestamp (Terminated with "0") BYTE bFolderName[260+1];// Folder Name (Terminated with "0", "0" is also stored in remaining portions.) BYTE bDummy2[2];// Dummy 2 };</pre> | | <p>Return value</p> <p>Normal end: 0</p> <p>Abnormal end: Error code</p> | | | | | | | | |
| <p>Special Note</p> <p>When you set a GP Series node in this API, it will become an error.</p> <p>If the file name is longer than 9 characters or the file extension is longer than 4 characters, it is not included in the read file list. When reading the file list, file names shorter than 8 characters or file extensions shorter than 3 characters are displayed as bFileName[8+1] or bExt[3+1] respectively, as shown below.</p> <table><tr><td>bFileName[8+1]</td><td>When the file name is shorter than 8 characters, null (0x00) is stored at the end of the original file name, and undefined values are stored after null.</td></tr><tr><td>bExt[3+1]</td><td>When the file extension is shorter than 3 characters, null (0x00) is stored at the end of the original file extension, and undefined values are stored after null.</td></tr></table> <p>(Example) When ABC.D is the file name and file extension</p> <table><tr><td>bFileName[8+1]</td><td>0x410x420x430x00***** (**** indicate an undefined value)</td></tr><tr><td>bExt[3+1]</td><td>0x440x00***** (**** indicate an undefined value)</td></tr></table> | | | bFileName[8+1] | When the file name is shorter than 8 characters, null (0x00) is stored at the end of the original file name, and undefined values are stored after null. | bExt[3+1] | When the file extension is shorter than 3 characters, null (0x00) is stored at the end of the original file extension, and undefined values are stored after null. | bFileName[8+1] | 0x410x420x430x00***** (**** indicate an undefined value) | bExt[3+1] | 0x440x00***** (**** indicate an undefined value) |
| bFileName[8+1] | When the file name is shorter than 8 characters, null (0x00) is stored at the end of the original file name, and undefined values are stored after null. | | | | | | | | | |
| bExt[3+1] | When the file extension is shorter than 3 characters, null (0x00) is stored at the end of the original file extension, and undefined values are stored after null. | | | | | | | | | |
| bFileName[8+1] | 0x410x420x430x00***** (**** indicate an undefined value) | | | | | | | | | |
| bExt[3+1] | 0x440x00***** (**** indicate an undefined value) | | | | | | | | | |

| Function | Reading file from CF card (Optional file name specification) | |
|---|--|--|
| Reads a specified file from the CF card. You can specify an optional file to read. | | |
| CF Card: INT WINAPI EasyFileReadInCfCard(LPCSTR sNodeName, LPCSTR sFolderName, LPCSTR sFileName, LPCSTR pWriteFileName, DWORD* odwFileSize); SD Card: INT WINAPI EasyFileReadInSdCard(LPCSTR sNodeName, LPCSTR sFolderName, LPCSTR sFileName, LPCSTR pWriteFileName, DWORD* odwFileSize); | | |
| Argument sNodeName: Name of node to output file list sFolderName: Name of folder containing source file to be read from CF card (Up to 32 single-byte characters) sFileName: Name of source file to be read from CF card (Up to 8.3 format character string) pWriteFileName : File name of read CF file (Full path) odwFileSize: Size of read CF file | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note If the file name is longer than 9 characters or the file extension is longer than 4 characters, it can not be read. | | |

| Function | Reading file from CF card (Type specification) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|-----------|-----------|---------------|-------------|----|------|----------|----|------|--------------|----|------|------------|----|------|------------------|----|-------|---------------|----|-------|--------------------|----------|------|--------------|----|-----|-----------|----|-------|---------------|----|-------|--------------|----|-------|--------------------|----|-----|-----------------------|----|---------|
| Reads a specified file from the CF card. Only the file type specified with "pReadFileType" can be read. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INT WINAPI EasyFileReadCard(LPCSTR sNodeName, LPCSTR pReadFileType, WORD wReadFileNo, LPCSTR sWriteFileName, DWORD* odwFileSize); | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Argument sNodeName: Name of node to output file list pReadFileType: Type of source file to be read from CF card (See <Special Note>) wReadFileNo: File number of source file to be read from CF card sWriteFileName : File name of read CF file (Full path) odwFileSize: Size of read CF file | | Return value Normal end: 0 Abnormal end: Error code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Special Note If the file name is longer than 9 characters or the file extension is longer than 4 characters, it can not be read. This API supports the following file types. Only the files saved in a specified CF card folder can be read. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ■File types supported for GP Series node | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><th>Data type</th><th>File type</th><th>Target folder</th></tr><tr><td>Filing data</td><td>ZF</td><td>FILE</td></tr><tr><td>CSV data</td><td>ZR</td><td>FILE</td></tr><tr><td>Image screen</td><td>ZI</td><td>DATA</td></tr><tr><td>Sound data</td><td>ZO</td><td>DATA</td></tr><tr><td>Trend graph data</td><td>ZT</td><td>TREND</td></tr><tr><td>Sampling data</td><td>ZS</td><td>TREND</td></tr><tr><td>Alarm block 4 to 8</td><td>Z4 to Z8</td><td>ARAM</td></tr><tr><td>Logging data</td><td>ZL</td><td>LOG</td></tr><tr><td>Alarm Log</td><td>ZG</td><td>ALARM</td></tr><tr><td>Alarm History</td><td>ZH</td><td>ALARM</td></tr><tr><td>Alarm Active</td><td>ZA</td><td>ALARM</td></tr><tr><td>Screen data backup</td><td>ZC</td><td>MRM</td></tr><tr><td>GP Screen data (Jpeg)</td><td>CP</td><td>CAPTURE</td></tr></table> | | | Data type | File type | Target folder | Filing data | ZF | FILE | CSV data | ZR | FILE | Image screen | ZI | DATA | Sound data | ZO | DATA | Trend graph data | ZT | TREND | Sampling data | ZS | TREND | Alarm block 4 to 8 | Z4 to Z8 | ARAM | Logging data | ZL | LOG | Alarm Log | ZG | ALARM | Alarm History | ZH | ALARM | Alarm Active | ZA | ALARM | Screen data backup | ZC | MRM | GP Screen data (Jpeg) | CP | CAPTURE |
| Data type | File type | Target folder | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Filing data | ZF | FILE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSV data | ZR | FILE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Image screen | ZI | DATA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sound data | ZO | DATA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trend graph data | ZT | TREND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sampling data | ZS | TREND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alarm block 4 to 8 | Z4 to Z8 | ARAM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Logging data | ZL | LOG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alarm Log | ZG | ALARM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alarm History | ZH | ALARM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alarm Active | ZA | ALARM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Screen data backup | ZC | MRM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GP Screen data (Jpeg) | CP | CAPTURE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

■File types supported for ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 series and GP3000 Series node

| Data type | File type | Target folder |
|---|-------------|--------------------------------|
| Filing data | ZF or F | FILE |
| CSV data | ZR | FILE |
| Image screen | ZI or I | DATA |
| Sound data | ZO or O | DATA |
| Alarm block 1 | Z1 or ZA | ALARM ^{*1} |
| Alarm block 2 | Z2 or ZH | ALARM ^{*1} |
| Alarm block 3 | Z3 or ZG | ALARM ^{*1} |
| Alarm block 4 to 8 | Z4 to Z8 | ALARM ^{*1} |
| Sampling group 1 to 64 | ZS1 to ZS64 | SAMP01 to SAMP64 ^{*1} |
| GP Screen data (Jpeg) | CP | CAPTURE |
| GP-PRO/PB Trend graph data (compatible) | ZT | TREND |
| GP-PRO/PB Sampling data (compatible) | ZS | TREND |
| GP-PRO/PB Logging data (compatible) | ZL | LOG |

*1) When using GP-Pro EX's [Set number of files in destination folder on external storage] feature, reads the files in sub-folders (for example: "ALARM\00000"). However, if you are using a version of GP-Pro EX before V3.12, or a version of Pro-server EX before V1.32, reads only the files in the [ALARM] or [SAMP**] folder, regardless of this setting.

| Function | Writing file into CF card (Optional file name specification) | |
|---|--|--|
| Writes a specified file into the CF card. You can specify an optional file to write. | | |
| CF Card: INT WINAPI EasyFileWriteInCfCard(LPCSTR sNodeName, LPCSTR pReadFileName, LPCSTR sFolderName, LPCSTR sFileName); SD Card: INT WINAPI EasyFileWriteInSdCard(LPCSTR sNodeName, LPCSTR pReadFileName, LPCSTR sFolderName, LPCSTR sFileName); | | |
| Argument sNodeName: Name of node to write file pReadFileName: Name of source file to be written into CF card (Full path) sFolderName: Name of folder containing target file in CF card (Up to 32 single-byte characters) sFileName: Name of target file in CF card (Up to 8.3 format character string) | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note If the file name is longer than 9 characters or the file extension is longer than 4 characters, the file cannot be written. | | |

| Function | Writing file into CF card (Type specification) | |
|--|--|--|
| Writes a specified file into the CF card. Only the file type specified with "pWriteFileType" can be written. | | |
| INT WINAPI EasyFileWriteCard(LPCSTR sNodeName, LPCSTR pReadFileName, LPCSTR sWriteFileType, WORD wWriteFileNo); | | |
| Argument sNodeName: Name of node to write file pReadFileName: Name of source file to be written into CF card (Full path) sWriteFileType: Type of target file in CF card (See <Special Note> of the function for "Reading file into CF card (Type specification)") wWriteFileNo: File number of target file in CF card | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note When using GP-Pro EX's [Set number of files in destination folder on external storage] feature, writes the files in sub-folders (for example: "ALARM\00000"). However, if you are using a version of GP-Pro EX before V3.12, or a version of Pro-server EX before V1.32, writes only the files in the [ALARM] or [SAMP**] folder, regardless of this setting. | | |

| Function | Deleting file from CF card (Optional file) | |
|--|--|--|
| Deletes a specified file from the CF card. You can specify an optional file to delete. | | |
| CF Card: INT WINAPI EasyFileDeleteInCfCard(LPCSTR sNodeName, LPCSTR sFolderName, LPCSTR sFileName); SD Card: INT WINAPI EasyFileDeleteInSdCard(LPCSTR sNodeName, LPCSTR sFolderName, LPCSTR sFileName); | | |
| Argument sNodeName: Name of node containing file to be deleted sFolderName: Name of folder containing file to be deleted from CF card (Up to 32 single-byte characters) sFileName: Name of file to be deleted from CF card (Up to 8.3 format character string) | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note If the file name is longer than 9 characters or the file extension is longer than 4 characters, the file cannot be deleted. | | |

| Function | Deleting file from CF card (Type specification) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|-----------|-----------|---------------|-------------|----|------|----------|----|------|--------------|----|------|------------|----|------|------------------|----|-------|---------------|----|-------|--------------------|----------|------|--------------|----|-----|-----------|----|-------|---------------|----|-------|--------------|----|-------|--------------------|----|-----|-----------------------|----|---------|
| Deletes a specified file from the CF card. Only the file type specified with "pDeleteFileType" can be deleted. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INT WINAPI EasyFileDeleteCard(LPCSTR sNodeName, LPCSTR pDeleteFileType, WORD wDeleteFileNo); | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Argument sNodeName: Name of node containing file to be deleted pDeleteFileType: Type of file to be deleted from CF card (See <Special Note>) wDeleteFileNo: File number to be deleted from CF card | | Return value Normal end: 0 Abnormal end: Error code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Special Note If the file name is longer than 9 characters or the file extension is longer than 4 characters, the file cannot be deleted. If this function is executed for a file that does not exist in the CF card, it is not judged as an error, and the processing ends normally. This API supports the following file types. Only the files saved in a specified CF card folder can be delete. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ■File types supported for GP Series node | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><th>Data type</th><th>File type</th><th>Target folder</th></tr><tr><td>Filing data</td><td>ZF</td><td>FILE</td></tr><tr><td>CSV data</td><td>ZR</td><td>FILE</td></tr><tr><td>Image screen</td><td>ZI</td><td>DATA</td></tr><tr><td>Sound data</td><td>ZO</td><td>DATA</td></tr><tr><td>Trend graph data</td><td>ZT</td><td>TREND</td></tr><tr><td>Sampling data</td><td>ZS</td><td>TREND</td></tr><tr><td>Alarm block 4 to 8</td><td>Z4 to Z8</td><td>ARAM</td></tr><tr><td>Logging data</td><td>ZL</td><td>LOG</td></tr><tr><td>Alarm Log</td><td>ZG</td><td>ALARM</td></tr><tr><td>Alarm History</td><td>ZH</td><td>ALARM</td></tr><tr><td>Alarm Active</td><td>ZA</td><td>ALARM</td></tr><tr><td>Screen data backup</td><td>ZC</td><td>MRM</td></tr><tr><td>GP screen data (Jpeg)</td><td>CP</td><td>CAPTURE</td></tr></table> | | | Data type | File type | Target folder | Filing data | ZF | FILE | CSV data | ZR | FILE | Image screen | ZI | DATA | Sound data | ZO | DATA | Trend graph data | ZT | TREND | Sampling data | ZS | TREND | Alarm block 4 to 8 | Z4 to Z8 | ARAM | Logging data | ZL | LOG | Alarm Log | ZG | ALARM | Alarm History | ZH | ALARM | Alarm Active | ZA | ALARM | Screen data backup | ZC | MRM | GP screen data (Jpeg) | CP | CAPTURE |
| Data type | File type | Target folder | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Filing data | ZF | FILE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CSV data | ZR | FILE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Image screen | ZI | DATA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sound data | ZO | DATA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trend graph data | ZT | TREND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sampling data | ZS | TREND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alarm block 4 to 8 | Z4 to Z8 | ARAM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Logging data | ZL | LOG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alarm Log | ZG | ALARM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alarm History | ZH | ALARM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alarm Active | ZA | ALARM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Screen data backup | ZC | MRM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GP screen data (Jpeg) | CP | CAPTURE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

■File types supported for ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series and GP3000 Series node

| Data type | File type | Target folder |
|---|-------------|--------------------------------|
| Filing data | ZF or F | FILE |
| CSV data | ZR | FILE |
| Image screen | ZI or I | DATA |
| Sound data | ZO or O | DATA |
| Alarm block 1 | Z1 or ZA | ALARM ^{*1} |
| Alarm block 2 | Z2 or ZH | ALARM ^{*1} |
| Alarm block 3 | Z3 or ZG | ALARM ^{*1} |
| Alarm block 4 to 8 | Z4 to Z8 | ALARM ^{*1} |
| Sampling group 1 to 64 | ZS1 to ZS64 | SAMP01 to SAMP64 ^{*1} |
| GP Screen data (Jpeg) | CP | CAPTURE |
| GP-PRO/PB Trend graph data (compatible) | ZT | TREND |
| GP-PRO/PB Sampling data (compatible) | ZS | TREND |
| GP-PRO/PB Logging data (compatible) | ZL | LOG |

*1) When using GP-Pro EX's [Set number of files in destination folder on external storage] feature, deletes the files in sub-folders (for example: "ALARM\00000"). However, if you are using a version of GP-Pro EX before V3.12, or a version of Pro-server EX before V1.32, deletes only the files in the [ALARM] or [SAMP**] folder, regardless of this setting.

| Function | Renaming file in CF card | |
|--|--------------------------|--|
| Renames a specified file in the CF card. | | |
| CF Card: INT WINAPI EasyFileRenameInCfCard(LPCSTR sNodeName, LPCSTR sFolderName, LPCSTR sFileName,LPCSTR sFileRename); SD Card: INT WINAPI EasyFileRenameInSdCard(LPCSTR sNodeName, LPCSTR sFolderName, LPCSTR sFileName,LPCSTR sFileRename); | | |
| Argument sNodeName: Name of node to write file sFolderName: Name of folder containing file to be renamed in CF card (Up to 32 single-byte characters) sFileName: Name to file to be renamed in CF card (Up to 8.3 format character string) sFileRename: New file name (Up to 8.3 format character string) | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note If the file name is longer than 9 characters or the file extension is longer than 4 characters, the file name cannot be edited. | | |

| Function | Acquiring information on CF card empty space | |
|--|--|--|
| Acquires information on empty space in the CF card connected to a specified entry node. | | |
| CF Card: INT WINAPI EasyGetCfFreeSpace(LPCSTR sNodeName,INT* oiUnallocated); CF Card: INT WINAPI EasyGetCfFreeSpaceEx(LPCTSTR sNodeName,INT* pioUnallocatedL,INT* pioUnallocatedH); SD Card: INT WINAPI EasyGetSdFreeSpace(LPCSTR sNodeName,INT* oiUnallocated); SD Card: INT WINAPI EasyGetSdFreeSpaceEx(LPCTSTR sNodeName,INT* pioUnallocatedL,INT* pioUnallocatedH); | | |
| Argument sNodeName: Name of node to output file list oiUnallocated (*1): Empty space in CF card (number of bytes) pioUnallocatedL: (Out) Empty space in bottom 4 bytes pioUnallocatedH: (Out) Empty space top 4 bytes | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note *1 When the free space exceeds the range for INT, use the CF card (expansion) or SD card (expansion) function. | | |

| Function | FTP passive mode setup | |
|--|------------------------|--|
| <p>'Pro-Server EX' uses a special protocol to access the CF card in a GP Series node. However, to access a ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series and GP3000 Series node FTP protocol is used.</p> <p>For FTP protocol, 'Pro-Server EX' supports two modes: normal mode and passive mode.</p> <p>This API specifies the mode of FTP protocol.</p> <p>INT WINAPI EasyFileSetPassiveMode(INT iPassive);</p> | | |
| <p>Argument</p> <p>iPassive: (In) 0: Normal mode Other than 0: Passive mode</p> <p>At initialization of ProEasy, the FTP protocol is set to "Normal mode".</p> | | <p>Return value</p> <p>Normal end: 0 Abnormal end: Error code</p> |
| <p>Special Note</p> | | |

27.8 Binary Date and Time / Text Display Conversion

■ Convert from binary value to text API

| Function | Binary value text conversion (Time-type) | |
|---|---|--|
| Function to convert binary value to TIME-type string. | | |
| INT WINAPI EasyTIMEToString(DWORD dwData, LPSTR osTime); | | |
| Argument dwData: (In) Binary value prior to conversion osTime: (Out) Converted text string ^{*1} | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note Input Format | | |
| <div><div>31241680</div><div>Elapsed time in milliseconds (Signed)</div></div> | | |
| Output Format %s%02ud%02uh%02um%02us%03ums (sign, day, hours, minutes, seconds, milliseconds) | | |
| Output Example (1) 01d02h03m04s005ms (2) -02d03h04m05s006ms | | |
| Function | Binary value text conversion (TIME_OF_DAY-type) | |
| Function to convert binary value to TIME_OF_DAY-type string. | | |
| INT WINAPI EasyTIME_OF_DAYToString(DWORD dwData, LPSTR osTod); | | |
| Argument dwData: (In) Binary value prior to conversion osTod: (Out) Converted text string ^{*1} | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note Input Format | | |
| <div><div><div>3127211590</div><div><div>Reserved0</div><div>Hours</div><div>Minutes</div><div>Seconds</div><div>Milliseconds</div></div><div>GMT bit 0</div><div>Error bit 0</div></div></div> | | |
| Output Format %02u:%02u:%02u.%03u (hours, minutes, seconds, milliseconds) | | |
| Output Example 23:59:59.999 | | |

| Function | Binary value text conversion (DATE-type) | |
|--|--|--|
| Function to convert binary value to DATE-type string. | | |
| INT WINAPI EasyDATEToString(DWORD dwData, LPSTR osDate); | | |
| Argument dwData: (In) Binary value prior to conversion osDate: (Out) Converted text string ^{*1} | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note Input Format | | |
| <div><div>312421840</div><div><div></div><div>Reserved 0</div><div>Day 0</div><div>Year</div><div>Month</div><div>Date</div></div><div>Error bit 0</div></div> | | |
| Output Format %04u-%02d-%02u (year, month, date) Output Example 2012-01-01 | | |

| Function | Binary value text conversion (DATE_AND_TIME-type) | |
|---|---|--|
| Function to convert binary value to DATE_AND_TIME-type string. | | |
| INT WINAPI EasyDATE_AND_TIMEToString(QWORD qwData, LPSTR osDt); | | |
| Argument dwData: (In) Binary value prior to conversion osDt: (Out) Converted text string ^{*1} | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note Input Format | | |
| <div><div>63310</div><div><div></div><div>Date</div><div></div><div>Time</div></div><div>Error bit 0Error bit 0</div></div> | | |
| Output Format %04u-%02u-%02u-%02u:%02u:%02u.%03u (year, month, date, hours, minutes, seconds, milliseconds) Output Example 2012-01-02-03:04:05.006 | | |

^{*1} Make sure the area is 32 bytes or greater.

^{*2} For information about each device access API, refer to 27.2 Device Access APIs.

■ Convert from text to binary value API

| Function | INT WINAPI EasyStringToTIME() | | | | |
|---|-------------------------------|--------|---------|--|--------------|
| Function to convert TIME-type string to a binary value. | | | | | |
| INT WINAPI EasyStringToTIME(LPCSTR sTime, DWORD *pdwData); | | | | | |
| Argument sTime: (In) Text string prior to conversion pdwData: (Out) Converted binary value | | | | Return value Normal end: 0 Abnormal end: Error code | |
| Special Note Input Format %%s%02ud%02uh%02um%02us%03ums (sign, day, hours, minutes, seconds, milliseconds) | | | | | |
| | Day | Hours | Minutes | Seconds | Milliseconds |
| Setup range | -24...24 | 0...23 | 0...59 | 0...59 | 0...999 |
| Units (separator) | d | h | m | s | ms |
| <ul style="list-style-type: none">Inputs all the items in the setup range as per the input format.Setup each item so that when converted to milliseconds, the total results in a value between -2,147,483,648 and 2,147,483,647. | | | | | |
| Input Example 01d02h03m04s005ms | | | | | |

| Function | INT WINAPI EasyStringToTIME_OF_DAY() | | | |
|--|--------------------------------------|---------|--|--------------|
| Function to convert TIME_OF_DAY-type string to a binary value. | | | | |
| INT WINAPI EasyStringToTIME_OF_DAY(LPCSTR sTod, DWORD *pdwData); | | | | |
| Argument sTod: (In) Text string prior to conversion pdwData: (Out) Converted binary value | | | Return value Normal end: 0 Abnormal end: Error code | |
| Special Note Input Format %02u:%02u:%02u.%03u (hours, minutes, seconds, milliseconds) | | | | |
| | Hours | Minutes | Seconds | Milliseconds |
| Setup range | 0...23 | 0...59 | 0...59 | 0...999 |
| Units (separator) | : | : | . | |
| <ul style="list-style-type: none">Inputs all the items in the setup range as per the input format. | | | | |
| Input Example 23:59:59.999 | | | | |

| Function | INT WINAPI EasyStringToDate() | | | | | | | | | | | | | | |
|--|-------------------------------|--------|--|--|------|-------|------|-------------|-------------|--------|--------|-------------------|---|---|--|
| Function to convert DATE-type string to a binary value. | | | | | | | | | | | | | | | |
| INT WINAPI EasyStringToDate(LPCSTR sDate, DWORD *pdwData); | | | | | | | | | | | | | | | |
| Argument sDate: (In) Text string prior to conversion pdwData: (Out) Converted binary value | | | Return value Normal end: 0 Abnormal end: Error code | | | | | | | | | | | | |
| Special Note Input Format %04u-%02d-%02u (year, month, date) | | | | | | | | | | | | | | | |
| <table><tr><td></td><td>Year</td><td>Month</td><td>Date</td></tr><tr><td>Setup range</td><td>1970...8191</td><td>1...12</td><td>1...31</td></tr><tr><td>Units (separator)</td><td>-</td><td>-</td><td></td></tr></table> | | | | | Year | Month | Date | Setup range | 1970...8191 | 1...12 | 1...31 | Units (separator) | - | - | |
| | Year | Month | Date | | | | | | | | | | | | |
| Setup range | 1970...8191 | 1...12 | 1...31 | | | | | | | | | | | | |
| Units (separator) | - | - | | | | | | | | | | | | | |
| <ul style="list-style-type: none">Inputs all the items in the setup range as per the input format. | | | | | | | | | | | | | | | |
| Input Example 2012-01-01 | | | | | | | | | | | | | | | |

| Function | INT WINAPI EasyStringToDate_AND_TIME() | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--------|----------|--------|---------|---------|--|--|------|-------|------|-------|---------|---------|--------------|-------------|-------------|--------|----------|--------|--------|--------|---------|-------------------|---|---|---|---|---|---|--|
| Function to convert DATE_AND_TIME-type string to a binary value. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INT WINAPI EasyStringToDate_AND_TIME(LPCSTR sDt, QWORD *pqwData); | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Argument sDt: (In) Text string prior to conversion pdwData: (Out) Converted binary value | | | | | | | Return value Normal end: 0 Abnormal end: Error code | | | | | | | | | | | | | | | | | | | | | | | | |
| Special Note Input Format %04u-%02u-%02u-%02u:%02u:%02u.%03u (year, month, date, hours, minutes, seconds, milliseconds) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><td></td><td>Year</td><td>Month</td><td>Date</td><td>Hours</td><td>Minutes</td><td>Seconds</td><td>Milliseconds</td></tr><tr><td>Setup range</td><td>1970...8191</td><td>1...12</td><td>-24...24</td><td>0...23</td><td>0...59</td><td>0...59</td><td>0...999</td></tr><tr><td>Units (separator)</td><td>-</td><td>-</td><td>-</td><td>:</td><td>:</td><td>.</td><td></td></tr></table> | | | | | | | | | Year | Month | Date | Hours | Minutes | Seconds | Milliseconds | Setup range | 1970...8191 | 1...12 | -24...24 | 0...23 | 0...59 | 0...59 | 0...999 | Units (separator) | - | - | - | : | : | . | |
| | Year | Month | Date | Hours | Minutes | Seconds | Milliseconds | | | | | | | | | | | | | | | | | | | | | | | | |
| Setup range | 1970...8191 | 1...12 | -24...24 | 0...23 | 0...59 | 0...59 | 0...999 | | | | | | | | | | | | | | | | | | | | | | | | |
| Units (separator) | - | - | - | : | : | . | | | | | | | | | | | | | | | | | | | | | | | | | |
| <ul style="list-style-type: none">Inputs all the items in the setup range as per the input format. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Input Example 2012-03-21-01:02:03.004 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

^{*1} For information about each device access API, refer to 27.2 Device Access APIs.

27.9 Other APIs

| Function | Read Time as DWORD | |
|--|--------------------|--|
| Acquires a specified display unit's current time as a numeric value (DWORD-type). This function is valid only for the time saved in 6 words from LS2048. | | |
| DWORD WINAPI EasyGetGPTime(LPCSTR sNodeName, DWORD* odwTime); | | |
| Argument sNodeName: Name of target node (A Pro-Server EX node cannot be specified.) odwTime: Acquired time (Time is acquired as a value of DWORD type, (substantially, time_t type defined by ANSI).) | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |

| Function | Read Time as VARIANT | |
|---|----------------------|--|
| Acquires a specified display unit's current time as a numeric value (Variant-type). This function is valid only for the time saved in 6 words from LS2048. | | |
| DWORD WINAPI EasyGetGPTimeVariant(LPCSTR sNodeName, LPVARIANT ovTime); | | |
| Argument sNodeName: Name of target node (A Pro-Server EX node cannot be specified.) ovTime: Acquired time (Time is acquired as a value of VARIANT type. Internal possessing format is "Date".) | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |

| Function | Read Time as STRING | |
|--|---------------------|--|
| Acquires a specified display unit's current time as a character string (LPTSTR-type). This function is valid only for the time saved in 6 words from LS2048. | | |
| DWORD WINAPI EasyGetGPTimeString(LPCSTR sNodeName, LPCSTR sFormat, LPSTR osTime); | | |
| Argument sNodeName: Name of target node (A Pro-Server EX node cannot be specified.) pFormat: String to specify the format of time to be acquired as a string. The format specification codes subsequent to the percentage (%) symbol are changed as shown in <Special Note>. Other characters are expressed without a change. osTime: Time acquired as a string (If a memory area larger than the acquired string length + 1 (NULL) is not secured, unexpected memory destruction occurs. To prevent this, you must secure a memory area larger than the expected string length + 1 (NULL). Otherwise, the operation cannot be guaranteed.) | | Return value Normal end: 0 Abnormal end: Error code |

Special Note

The format specification codes subsequent to the percentage (%) symbol are changed to those listed in the table below. Other characters are expressed without a change. For example, if "%Y_%M %S" is specified, an actual time of "2006/1/2 12:34:56" is expressed as a string of "2006_34 56".

| Format specification code | Folder |
|---------------------------|--|
| %a | Abbreviated name of day of week (*2) |
| %A | Formal name of day of week (*2) |
| %b | Abbreviated name of month (*2) |
| %B | Formal name of month (*2) |
| %c | Expression of date and time depending on locale |
| %#c | Longer expression of date and time depending on locale |
| %d | Decimal expression of day of month (01 to 31) (*1) |
| %H | Time expression on 24-hour basis (00 to 23) (*1) |
| %I | Time expression on 12-hour basis (01 to 12) (*1) |
| %j | Decimal expression of day of year (001 to 366) (*1) |
| %m | Decimal expression of month (01 to 12) (*1) |
| %M | Decimal expression of minute (00 to 59) (*1) |
| %p | AM/PM division for current locale (*2) |
| %S | Decimal expression of second (00 to 59) (*1) |
| %U | Decimal expression of serial week number. Sunday is regarded as the first day of the week. (00 to 53) (*1) |
| %w | Decimal expression of day of week. Sunday is regarded as "0 ". (0 to 6) (*1) |
| %W | Decimal expression of serial week number. Monday is regarded as the first day of the week. (00 to 53) (*1) |
| %x | Expression of date for current locale |
| %#x | Longer expression of date for current locale |
| %X | Expression of time for current local (*2) |
| %y | Decimal expression of low-order 2 digits of the dominical year (00 to 99) (*1) |
| %Y | Decimal expression of 4 digits of the dominical year (*1) |
| %z, %Z | Name or abbreviated name of time zone. If time zone is unknown, leave it blank. (*2) |
| %% | Percentage symbol (*2) |

* 1: If "#" is added before d, H, I, j, m, M, S, U, w, W, y or Y (ex. %#d), leading "0" will be deleted. (ex. "05" is expressed as "5".)

* 2: If "#" is added before a, A, b, B, p, X, z, Z or % (ex. %#a), "#" will be ignored.

| Function | Read Time as STRING VARIANT | |
|--|-----------------------------|--|
| Acquires a specified display unit's current time as a character string (Variant-type). This function is valid only for the time saved in 6 words from LS2048. | | |
| DWORD WINAPI EasyGetGPTimeStringVariant(LPCSTR sNodeName, LPCSTR sFormat, LPVARIANT ovTime); | | |
| Argument sNodeName: Name of target node (A Pro-Server EX node cannot be specified.) pFormat: String to specify the format of time to be acquired as a string. The format specification codes subsequent to the percentage (%) symbol are changed to those listed below. Other characters are expressed without a change. (For details, refer to <Special Note> of "Reading time from GP (STRING-type)".) ovTime: Time acquired as a string (Time is acquired as VARIANT type. Internal possessing format is "BSTR".) | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |

| Function | Reading entry node status | |
|---|---------------------------|--|
| Acquires connected display unit status. Since the response time-out value can be changed, this function can be used to check connection status. | | |
| Single INT WINAPI GetNodeProperty(LPCSTR sNodeName,DWORD dwTimeLimit,LPSTR osGPTType,LPSTR osSystemVersion,LPSTR osComVersion,LPSTR osECOMVersion); Multi INT WINAPI GetNodePropertyM(HANDLE hProServer,LPCSTR sNodeName,DWORD dwTimeLimit,LPSTR osGPTType,LPSTR osSystemVersion,LPSTR osComVersion,LPSTR osECOMVersion); | | |
| Argument hProServer: (In) Pro-Server handle sNodeName: (In) Name of node to read status dwTimeLimit: (In) Response time-out setting value (If "0" is specified, it is set to the default value of 3000 ms.) The setting range is from 1 to 2,147,483,647. (Unit: ms) The API returns status information on the target node to the following area. Secure an area of at least 32 bytes for each item. osGPTType: (Out) Display unit model code osSystemVersion: (Out) Display unit system version osComVersion: (Out) PLC protocol driver version This item is blank except for GP Series nodes. osECOMVersion: (Out) 2way driver version This item is blank except for GP Series nodes. | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note | | |

| Function | Acquiring symbol/group byte size | |
|---|--|--|
| Acquires the total number of bytes required to access a device symbol or group symbol. | | |
| INT WINAPI SizeOfSymbol(LPCSTR sNodeName,LPCSTR sSymbolName,INT* oiByteSize); | | |
| Argument sNodeName: (In) Name of entry node with Device/PLC name sSymbolName: (In) Name of target device or symbol name oiByteSize: (Out) Byte size acquired | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note For "sSymbolName", a device symbol, non-alignment group, whole alignment group, or an element of alignment group can be specified. | | |
| Function | Acquiring number of group members | |
| Acquires the number of members of a group or symbol sheet (total number of symbols and group members). | | |
| INT WINAPI GetCountOfSymbolMember(LPCSTR sNodeName,LPCSTR sSymbolName,INT* oiCountOfMember); | | |
| Argument sNodeName: (In) Name of entry node with Device/PLC name sSymbolName: (In) Name of target group symbol or symbol sheet oiCountOfMember: (Out) Number of members acquired | | Return value Normal end: 0 Abnormal end: Error code |
| Special Note When a group symbol exists in a specified group symbol, the number of members is counted as one, even if multiple device symbols exist in the inner group symbol. | | |
| Function | Acquiring symbol/group/symbol sheet definition information | |
| Acquires definition information (data type, data quantity, etc.) | | |
| INT WINAPI GetSymbolInformation(LPCSTR sNodeName,LPCSTR sSymbolName,INT iMaxCountOfSymbolMember,LPSTR osSymbolSheetName,SymbolInformation* oSymbolInformation,INT* oiGotCountOfSymbolMember); | | |
| Argument sNodeName: (In) Name of entry node with Device/PLC name sSymbolName: (In) Name of symbol/group/symbol sheet iMaxCountOfSymbolMember: (In) Specify a value of the maximum count of desired information + 1. Specify the number of "oSymbolInformation" prepared. osSymbolSheetName: (Out) The API returns the name of symbol sheet that contains the symbol specified with sSymbolName. Prepare 66 bytes or larger work. oSymbolInformation: (Out) The API returns acquired detail information in the alignment structure. Prepare work for the number specified with iMaxCountOfSymbolMember. oiGotCountOfSymbolMember: (Out) The API returns the information quantity that has returned to oSymbolInformation. | | Return value Normal end: 0 Abnormal end: Error code |

Special Note

- Structure of SymbolInformation

```
struct SymbolInformation
{
    WORDm_wAppKind; // Data type, Symbol: 1 to 20, Group: 0x8000
    WORDm_wDataCount; // Data quantity
    DWORDm_dwSizeOf; // Number of bytes in buffer required for access
    char m_sSymbolName[64+1]; // Name of symbol or group
    charm_bDummy1[3]; // Reserve
    charm_sDeviceAddress[256+1]; // Device address (For group, leave it blank.)
    charm_bDummy2[3]; // Reserve
};
```

Acquired information is returned to oSymbolInformation in the alignment structure specified with SymbolInformation. Information on the symbol, group or sheet specified with sSymbolName is set in the first element.

Group member information is set in the second and subsequent elements, when sSymbolName indicates a group.

When sSymbolName indicates a sheet, information on the whole sheet is set in these elements.

When sSymbolName indicates a symbol, there is no information in the second or subsequent elements.

If the target symbol is a bit offset symbol, pay attention to the following points:

(1) When a bit offset symbol is directly specified as an information source symbol (a bit offset symbol is directly specified for sSymbolName), "2" is set to m_dwSizeOf of SymbolInformation, or the first element of oSymbolInformation, as the number of bytes required to access the bit symbol.

In this case, since the information source is one symbol, oSymbolInformation does not have second or subsequent element.

(2) When a group symbol is specified as an information source symbol and the specified group contains a bit offset symbol, "0" is set to m_dwSizeOf, or the second or subsequent element of oSymbolInformation, because it indicates the access size required for a group access member.

- If the number of members is unknown, call GetCountOfSymbolMember() to acquire it. To call this function, prepare SymbolInformation as the number of work of the specified count + 1.

27.10 Precautions for Using APIs

■ About data types available with 'Pro-Server EX'

(1) Principal data types that can be specified with APIs, or received in response to APIs

| Definition name | Decimal value | Hexadecimal value | Meaning of data |
|----------------------------|---------------|-------------------|--------------------------------------|
| EASY_AppKind_Bit | 1 | 0x0001 | Bit Data |
| EASY_AppKind_SignedWord | 2 | 0x0002 | 16-bit (Signed) Data |
| EASY_AppKind_UnsignedWord | 3 | 0x0003 | 16-bit (Unsigned) Data |
| EASY_AppKind_HexWord | 4 | 0x0004 | 16-bit (HEX) Data |
| EASY_AppKind_BCDWord | 5 | 0x0005 | 16-bit (BCD) Data |
| EASY_AppKind_SignedDWord | 6 | 0x0006 | 32-bit (Signed) Data |
| EASY_AppKind_UnsignedDWord | 7 | 0x0007 | 32-bit (Unsigned) Data |
| EASY_AppKind_HexDWord | 8 | 0x0008 | 32-bit (HEX) Data |
| EASY_AppKind_BCDDWord | 9 | 0x0009 | 32-bit (BCD) Data |
| EASY_AppKind_Float | 10 | 0x000A | Single-precision floating point data |
| EASY_AppKind_Real | 11 | 0x000B | Double-precision floating point data |
| EASY_AppKind_Str | 12 | 0x000C | Character string data |
| EASY_AppKind_SignedByte | 13 | 0x000D | 8 Bit (Signed) Data |
| EASY_AppKind_UnsignedByte | 14 | 0x000E | 8 Bit (Unsigned) Data |
| EASY_AppKind_HexByte | 15 | 0x000F | 8 Bit (HEX) Data |
| EASY_AppKind_BCDByte | 16 | 0x0010 | 8 Bit (BCD) Data |
| EASY_AppKind_TIME | 17 | 0x0011 | TIME Data |
| EASY_AppKind_TIME_OF_DAY | 18 | 0x0012 | TIME_OF_DAY Data |
| EASY_AppKind_DATE | 19 | 0x0013 | DATE Data |
| EASY_AppKind_DATE_AND_TIME | 20 | 0x0014 | DATE_AND_TIME Data |

(2) Data types available in special cases

| Definition name | Decimal value | Hexadecimal value | Meaning of data |
|--------------------------|---------------|-------------------|---|
| EASY_AppKind_NULL | 0 | 0x0000 | Indicates that the data type defined for a symbol is used with the API that can use the symbol as the device address. |
| EASY_AppKind_BOOL | 513 | 0x0201 | Handles bit data as Variant BOOL data per bit. |
| EASY_AppKind_Group | -32768 | FF8000 | Group symbol |
| EASY_AppKind_SymbolSheet | -28672 | FF9000 | Symbol sheet |

■ About entry node name with Device/PLC name

(1) Except for GP Series nodes, you can connect display units to multiple device/PLCs. To access these Device/PLCs, you must specify the names of the entry node and Device/PLCs.

(2) For some arguments of the Pro-Server EX APIs, you may specify an entry node name only. For other arguments, you must specify a Device/PLC name as well as the entry node name.

<How to specify a Device/PLC name>

To specify a Device/PLC name, add "." (dot) after the entry node name.

Example)

AGPNode.PLC1

(3) To access the memory link driver of display units (except those set up as GP Series nodes), specify "#INTERNAL" as the Device/PLC name. (It can be omitted.)

(4) To access the memory link driver of display units (except those set up as GP Series nodes), specify "#MEMLINK" as the Device/PLC name. (It cannot be omitted.)

(5) To access a GP Series node or Pro-Server EX node, you need not specify a Device/PLC name. ("." (dot) is not necessary.)

(6) For internal devices of display units (except those set up as GP Series nodes) and device/PLCs mapped to "system area devices", you can omit the device/PLC name by defining the node with the device/PLC name. In this case, however, 'Pro-Server EX' searches the target device for an internal device first, and then searches for a Device/PLC assigned to the "system area device".

■ About symbol searching precedence

For the Device Access APIs of 'Pro-Server EX', you must specify the entry node name with Device/PLC name, and the device address or device symbol as a character string. 'Pro-Server EX' judges according to the following order of precedence whether the specified character string directly specifies the device address or a device symbol.

(1) 'Pro-Server EX' searches the symbol sheet for a matching name. If the specified string exists in the symbol sheet, it is regarded as a sheet.

(2) 'Pro-Server EX' regards the specified string as a group name or symbol, and searches a local symbol sheet. If the specified string exists in the local symbol sheet, it is regarded as a local symbol.

(3) If the specified string does not exist in the local symbol sheet, 'Pro-Server EX' searches a global symbol sheet. (In this case, the target global symbol sheet is that for the Device/PLC that has been specified with "entry node name with Device/PLC name". Global symbol sheets for different Device/PLCs are not searched.)

(4) If the specified string does not exist in the global symbol sheet, it is regarded as a device address.

■ Duplication of name

'Pro-Server EX' provides the following name categories:

- (1) Node Name
- (2) Device/PLC Name
- (3) Trigger Condition Name
- (4) Symbol Sheet Name
- (5) Group/Symbol Name
- (6) ACTION Name

In principle, 'Pro-Server EX' must not have a duplicated name, excepting the following cases:

- (1) Duplication of a Device/PLC name causes no problem, if they belong to different entry nodes.
- (2) Duplication of a group/symbol name causes no problem, if they belong to different entry nodes or different Device/PLCs.

■ Duplication of global symbol name and local symbol name

When a Pro-Server EX API uses a symbol to specify a device address and the same symbol name exists for both local symbol and global symbol, it is regarded as a local symbol.

■ Using Pro-Server EX API for multi-thread application

All functions of Pro-Server EX APIs are synchronous type. (Once a function is called, it will not be returned until processing is completed.)

Therefore, when 'Pro-Server EX' accesses multiple entry nodes by using a single-thread application, processing is executed for individual nodes in sequence.

On the other hand, with a multi-thread application, 'Pro-Server EX' can access another entry node through another thread, even when one thread is used for access to one entry node.

Pro-Server EX APIs can be used for the multi-thread application.

To create a multi-thread application, pay attention to the following points:

- (1) In principle, to execute a multi-thread application, use Multi-Handle functions.
- (2) To use Multi-Handle functions, you must create Pro-Server EX handles. Use separate Pro-Server EX handles for individual threads.
Even if multiple Pro-Server EX handles are created for one thread, there is no problem. However, you must not use a Pro-Server EX handle that has been created for another thread.
To release a Pro-Server EX handle, use the same thread where the handle has been created.

(3) To use a Pro-Server EX API, you must call EasyInit() first.

However, most Pro-Server EX APIs automatically call EasyInit() when each API is called before EasyInit().

Therefore, when using a single-thread application, you need not consider EasyInit() in your program.

(4) The thread where EasyInit() is called must exist until the end of application. If the thread where EasyInit() is called is closed in the middle of application, the operation cannot be guaranteed.

(5) For general applications, the thread used to start an application will exist until the end of application.

(Normally, this applies to applications created by VB or VC.) Therefore, to create a multi-thread application, we recommend you to call EasyInit() at the start of application.

■ Improving cache buffer update efficiency

(1) To use the cache function, you must register a device in the cache buffer. (Register a device on the Pro-Studio EX cache registration screen, or by using the cache buffer control APIs.)

Performance of the whole system varies depending on the registration method.

(2) To select a device to be registered, use the device access log function to identify the device that 'Pro-Server EX' accesses.

(3) In principle, you should cache-register a device that has been frequently read.

(4) When multiple devices are registered, the processing speed becomes higher if these devices can be registered in series.

(Ex.1) When LS100 and LS101 are registered in a cache buffer, the processing speed becomes higher if two devices are registered in series from LS100, rather than separately registered. Also, if the interval between two devices is only several words, the processing speed may be increased if these devices are registered in series.

(Ex.2) When LS100 and LS103 are registered in a cache buffer, the processing speed becomes higher if four devices are registered in series from LS100, rather than separately registered.

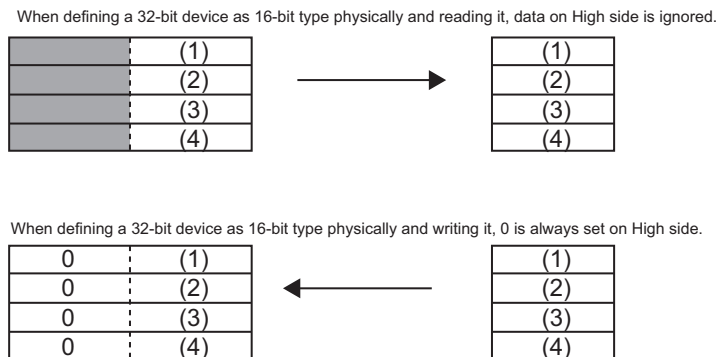
(5) When bit devices are registered in series, the processing speed becomes higher if they can be registered as word devices.

(Ex.) When devices for 20 bits are registered in series from LS123401, the processing speed becomes higher if they are registered in two words from LS1234.

■ 16-bit access operation for device with physically 32-bit width

(1) When a 16-bit symbol is assigned to a device with a physically 32-bit width, and the device is accessed with the 16-bit symbol, or when 16-bit data type is directly specified to access a 32-bit device, 'Pro-Server EX' can handle the 32-bit device as a 16-bit device.

In this case, 'Pro-Server EX' executes the following conversion for READ and WRITE APIs.



(2) The above conversion is executed during access using a data transfer function or API.

(3) When data is transferred between GP Series nodes, an error occurs.

(4) With older versions of 'Pro-Server', if 16-bit access is executed for a device with physically 32-bit width, an error occurs.

■ 16-bit access operation for device with physically 32-bit width

When a 32-bit symbol is assigned to a device with a physically 16-bit width, and the device is accessed with the 32-bit symbol, or when 32-bit data type is directly specified to access a 16-bit device, 'Pro-Server EX' can handle the 16-bit device as a 32-bit device.

In this case, 'Pro-Server EX' handles a series of two devices with a 16-bit width as one device.

■ About Pro-Server auto start, forced closing and restart

(1) If 'Pro-Server EX' has not been started yet, calling a Pro-Server EX API automatically starts 'Pro-Server EX' (excepting some APIs).

If 'Pro-Server EX' cannot start, the API always returns an error code.

(2) After 'Pro-Server EX' normally starts, calling the second or subsequent API will not start 'Pro-Server EX' again, because 'Pro-Server EX' has already been started.

(3) If 'Pro-Server EX' is closed in the middle of application processing, and then an API is called ('Pro-Server EX' has been closed when the second or subsequent API is called), the API will not start 'Pro-Server EX'. It returns an error code.

(4) Do not close 'Pro-Server EX' in the middle of application processing.

Before closing 'Pro-Server EX', be sure to close the application first. (Do not call an API after closing 'Pro-Server EX'.)

However, if 'Pro-Server EX' is manually restarted from the Windows START menu, the API executes Pro-Server EX recovery processing, and tries to continue processing. If 'Pro-Server EX' can be recovered, it continues processing. However, 'Pro-Server EX' may fail in recovery processing, depending on the previous closing method. For example, recovery processing failures may occur in the following cases:

- When 'Pro-Server EX' is forcibly closed from Task Manager
- When 'Pro-Server EX' is closed during a call of an API

■ About specification of symbol index

Specification of symbol index is enabled only by a device name for an API. Specification of symbol index is to specify a value in [] after a symbol name, as shown below. The symbol index indicates the device located ahead from the device specified with the symbol name, by the number of devices specified by the "value" of the symbol data type.

(Symbol name)[Value]

Example) Valve [2]

When valve symbol "D100" is specified as "16-bit signed", Valve [2] indicates D102. When "D100" is specified as "32-bit unsigned", it indicates D104.

■ About queuing cache read and symbol cache read

When queuing cache read (queuing registration using a ReadDevice function (without "D") after BeginQueuingRead) or symbol cache read (ReadSymbol (without "D")) is used, the operation varies depending on which part of target devices has been cache-registered.

- When all target devices have been cache-registered: cache read is executed.
- When all target devices have not been cache-registered: direct read is executed.
- When only some of target devices have been cache-registered: Some of target devices are subjected to cache read, and remaining devices are subjected to direct read. However, cache read is not applied to all of the cache-registered devices. direct read may be applied to some of the cache-registered devices. If you have a trouble in identifying the devices subjected to cache read, you should cache-register all target devices, or use a Direct Read API instead of a Cache Read API.

■ About APIs that cannot be used for .NET

The following APIs cannot be used for .NET. If these APIs are used, operations cannot be guaranteed.

- Symbol access (Byte access)

ReadDevice(), ReadDeviceD(), WriteDevice(), WriteDeviceD()

ReadDeviceM(), ReadDeviceDM(), WriteDeviceM(), WriteDeviceDM()

ReadSymbol(), ReadSymbolD(), WriteSymbol(), WriteSymbolD()

ReadSymbolM(), ReadSymbolDM(), WriteSymbolM(), WriteSymbolDM()

- Symbol size acquisition function

SizeOfSymbol()

■ About APIs that cannot be used in VB functions

You cannot use the following APIs in Visual Basic functions. If these APIs are used, we are unable to verify that the functions will work.

ReadDeviceDATE_AND_TIME(), ReadDeviceDATE_AND_TIMEM(), ReadDeviceDATE_AND_TIMED(),

ReadDeviceDATE_AND_TIMEDM(),

WriteDeviceDATE_AND_TIME(), WriteDeviceDATE_AND_TIMEM(), WriteDeviceDATE_AND_TIMED(),

WriteDeviceDATE_AND_TIMEDM(),

EasyStringToDATE_AND_TIME(), EasyDATE_AND_TIMEToString()

■ When using simple DLL in a multi-thread application

All functions of Pro-Easy APIs are synchronous type. (Once a function is called, it will not be returned until processing is completed.) Therefore, when accessing multiple entry nodes by using a single-thread application, processing is executed for individual nodes in sequence. On the other hand, with a multi-thread application, you can access another entry node through another thread, even when one thread is used for access to one entry node. Pro-Easy APIs can be used for the multi-thread application.

To create a multi-thread application, pay attention to the following points:

1. In principle, to execute a multi-thread application, use Multi-Handle functions.
2. To use Multi-Handle functions, you must create 'Pro-Server EX' handles. Use separate 'Pro-Server EX' handles for individual threads. Even if multiple 'Pro-Server EX' handles are created for one thread, there is no problem. However, you must not use a 'Pro-Server EX' handle that has been created for another thread. To release a 'Pro-Server EX' handle, use the same thread where the handle has been created.
3. To use 'Pro-Server EX API', you must call EasyInit() first. As most Pro-Server EX APIs automatically call EasyInit() when each API is called before EasyInit(), you need not to consider EasyInit() call in your program.
4. In the multi-thread program, the program must call EasyInit() first from the thread (main thread) which was started first. When you call a Pro-Server EX API except from the main thread, call EasyInit() from the main thread in advance.

■ Message Process in Windows

Most of the Windows programs are event-driven, i.e. displaying the dialog box or playing the sounds according to various events including "an icon is clicked", "a mouse is moved", or "a key is pressed".

When an event occurs, Windows will send the message showing the event type to the application. The application confirms that the event occurs by receiving the message and executes each process.

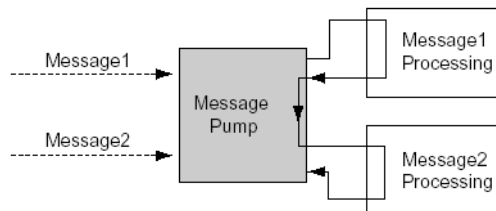
In this manual, the part which receives messages in order and branches into each process (corresponding to `DoEvents` for VB, or the part executing `GetMessage()` and `DispatchMessage()` for VC) is called the message pump. The message pump is not much recognized because it is hidden in the VC or VB framework when programming with VC or VB normally. However, unless this message pump operates properly, Windows applications will cause unintended operation.

For example, when it takes long time for a routine to process a message and recover, the application fails to process the event because it cannot receive an event which occurs in the meantime from Windows.

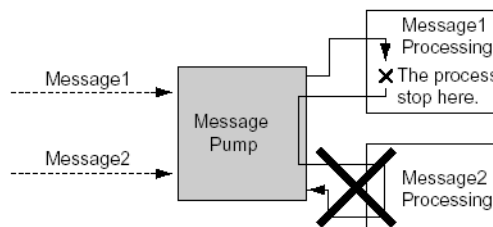
Example) Assume that messages are sent from Windows in the order of message 1 to message 2.

The message pump takes out the message 1 and calls the subroutine for message 1.

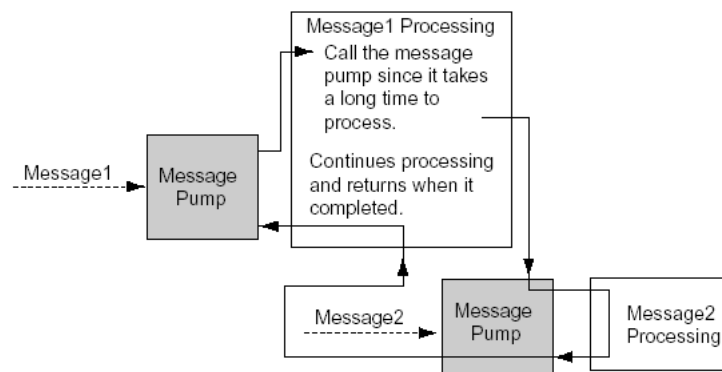
Then, when the message pump recovers from above, it takes out the following message (message 2) and calls the subroutine for message 2.



In this case, assume that it takes long time for processing message 1. Then the message pump cannot process message 2 without recovering.



In such case, force the message pump to run. (calling DoEvents, VC for VB, or GetMessage() and DispatchMessage() for VC)



Windows applications are created assuming an application should run the message pump properly. "Pro-Server EX API" runs the message pump using function for time-consuming process so as to avoid the case shown in (Example).

■ Prohibition of API Double Call

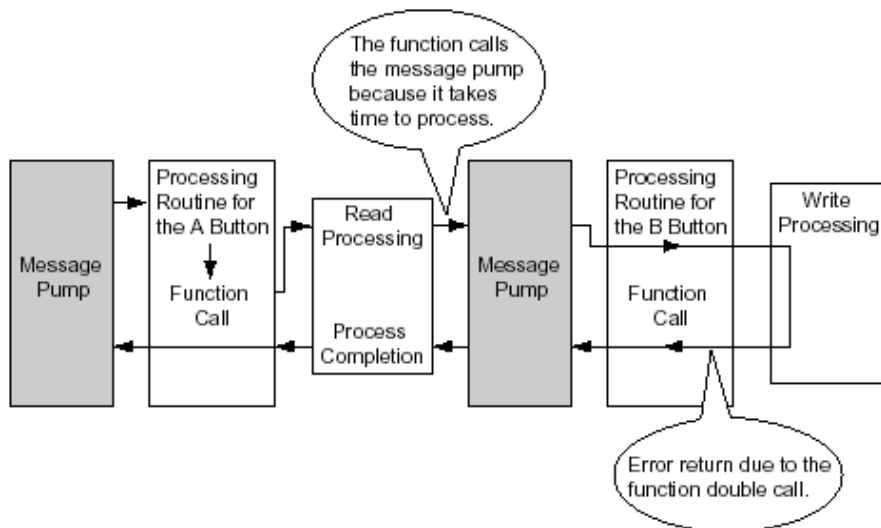
'Pro-Server EX API' prohibits another communication while communicating with a party (while calling a 'Pro-Server EX' function)(double-call). (Double-call is enabled if using the Multi-Handle. For details, refer to the section of Multi-Handle.) However, as 'Pro-Server EX API' runs the message pump inside API, a user program will start to run when an event occurs.

When API is called in the message process routine, double-call may occur.

Examples of double-call are shown below.

1. Double-call by pressing 2 buttons

Assume that there are 2 buttons, A and B. Device read API is called when A is pressed; device write API is called when B is pressed. In this case, press the button B to cause the device write API to be called while calling the device read API when pressing the button A, which leads API double-call and error occurs.



2. Double-call by timer

When periodical process is executed in the Windows program, timer events are often used. However, API double-call may happen in the program using timer events due to careless programming.

- (1) Call the device read API periodically per second, read the device and display it.
- (2) Such programs as call the device write API when a button is pressed and write the value in the device causes an error in the following cases.

When pressing the button (2) while reading a timer event (1), and the process (2) starts to run

When a timer event occurs while writing (2) and read (1)

■ Solutions to avoid API Double-Call

Solutions to avoid API double-call are shown below.

(1) Improve the algorithm not to execute API double-call in a user program. For example,

1. Timer should be always cancelled at the head of timer process routine and button process routine.
2. While a process is running by pressing a button, the button or another button should be ignored even if pressed.

(2) API double-call does not occur if the 'Pro-Server EX' handle using multi-handle is different.

Use API in Multi-Handle type to set the handle of the program in the area which is possible to cause double-call to different handle.

(3) Message should not be processed inside API

Call EasySetWaitType() by argument 2. However, in this case, other problems such as an application causes unintended operation may occur, because other messages except the one which causes double-call will not be processed.

■ How to read character strings in VB

(1) Use ReadDeviceStr to read character strings in VB

In this case, you need to specify (fix) the size of storing destination of character strings read in advance.'

```
'
Public Sub Sample1 ()
    Dim strData As String * 10 ' Correct designation method because it designates the size to read.
    'Dim strData As String      ' Incorrect designation method because it does not designate the character
                                ' string size.

    Dim lErr As Long
    lErr = ReadDeviceStr ("GP1", "LS100", strData, 10)
    If lErr <> 0 Then
        MsgBox "Read Error = " & lErr
    Else
        MsgBox "Read String = " & strData
    End If
End Sub
```

(2) Use Variant type if you use ReadDeviceVariant to read character strings in VB, but not specify the size of storing destination of character strings read in advance.

```
'  
Public Sub Smaple2 ()  
    Dim lErr As Long  
    Dim vrData As Variant      ' Designate the Variant type to the area to save data read.  
    lErr = ReadDeviceVariant ("GP1", "LS100", vrData, 10, EASY_AppKind_Str)  
    If lErr <> 0 Then  
        MsgBox "Read Error = " & lErr  
    Else  
        MsgBox "Read String = " & vrData  
    End If  
End Sub
```

Note that display unit uses NULL for the completion of character strings. For that reason, you need to shorten the character string if the character string obtained in the above method includes NULL as the completion of character strings.

Sample functions to shorten character strings to NULL are shown below.

```
Dim i As Integer  
i = InStr (1, strData, Chr$(0), vbBinaryCompare)  
If 0 < i Then  
    TrimNull = Left (strData, i - 1)  
Else  
    TrimNull = strData  
End If  
End Function
```

27.11 Using APIs (Examples)

By using the read/write functions provided by 'Pro-Server EX', you can read/write data from/into a VB or VC application.

This section describes the procedure for reading/writing a specified symbol with the APIs.

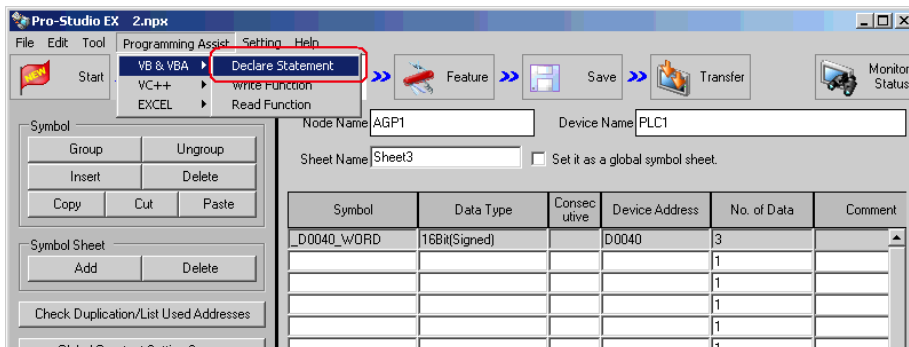
- ☞ "27.11.1 VB Support Function"
- ☞ "27.11.2 VC Support Function"
- ☞ "27.11.3 VB .NET Support Function"
- ☞ "27.11.4 C# Support Function"

27.11.1 VB Support Function

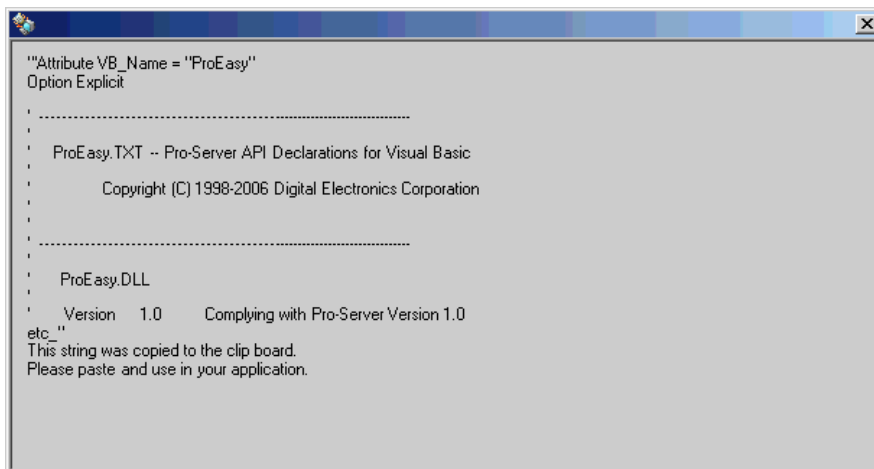
NOTE • You cannot use the DATE_AND_TIME data type or API functions in VB functions.

VB: Declaration statement

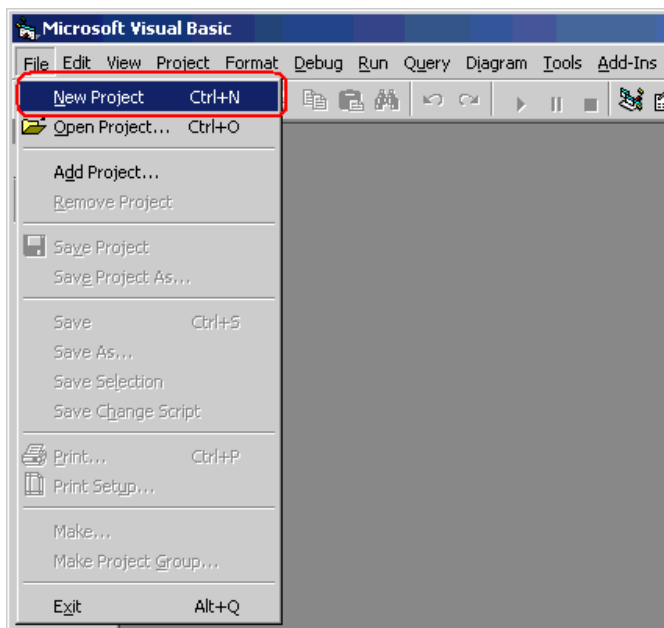
- 1 Select [Programming Assist] - [VB & VBA] - [Declare Statement].



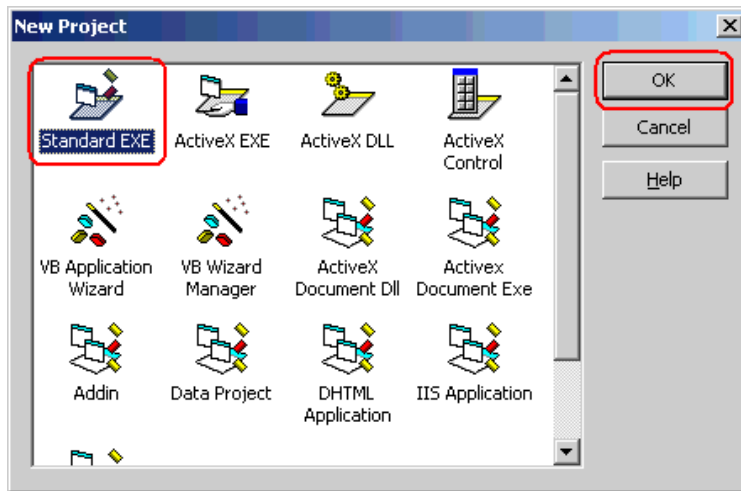
The VB declaration statement is copied to the clipboard.



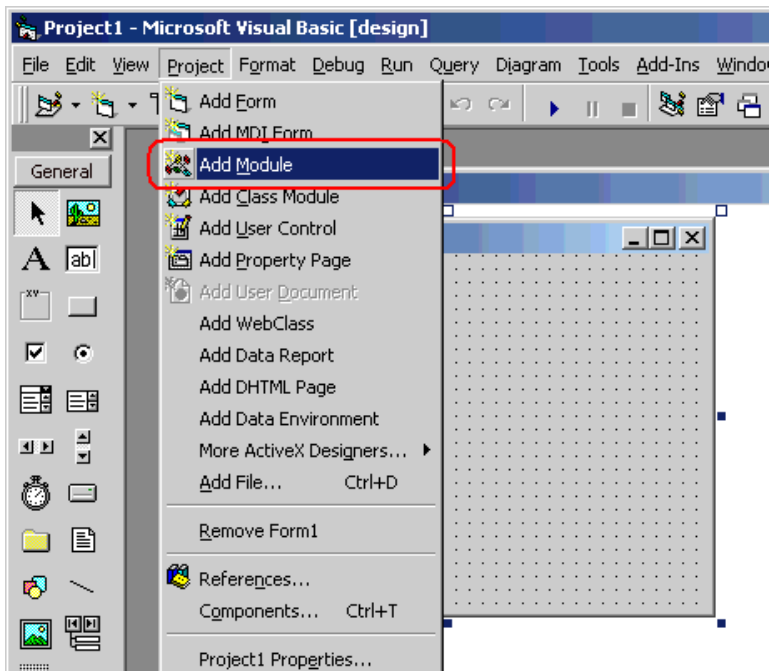
- 2 Start Microsoft Visual Basic, and select [New Project] from [File] on the menu.



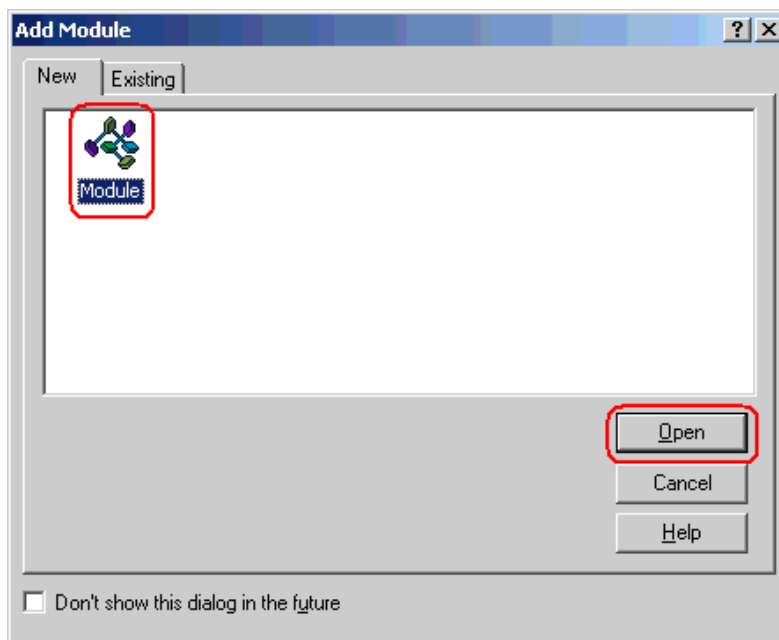
- 3 Select [Standard EXE], and click the [OK] button.



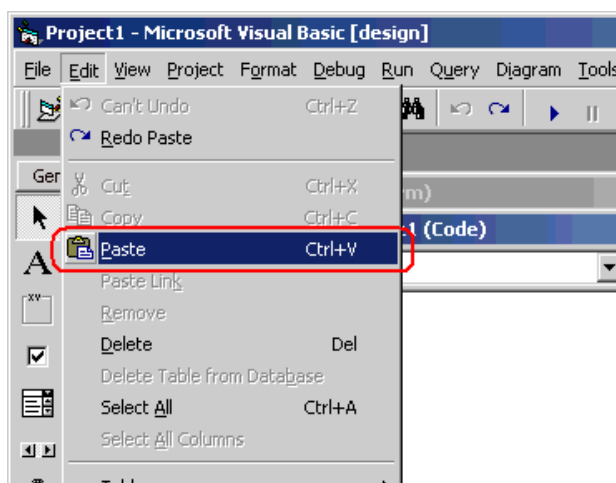
- 4 Select [Add Module] from [Project] on the Microsoft Visual Basic menu.



- 5 Select [Module] in the [New] tab, and click the [Open] button.



- 6 Select [Paste] from [Edit] on the Microsoft Visual Basic menu, and paste the declaration statement (data on the clipboard) to the added standard module.



The deceleration statement is now pasted.

```

Project1 - Module1 (Code)
(General) (Declarations)

Declare Function ReadSymbolD Lib "ProEasy.DLL" (ByVal sNod
Declare Function ReadSymbolVariant Lib "ProEasy.DLL" (ByVa
Declare Function ReadSymbolVariantD Lib "ProEasy.DLL" (ByV

Declare Function ReadSymbolM Lib "ProEasy.DLL" (ByVal hPro
Declare Function ReadSymbolDM Lib "ProEasy.DLL" (ByVal hPr
Declare Function ReadSymbolVariantM Lib "ProEasy.DLL" (ByV
Declare Function ReadSymbolVariantDM Lib "ProEasy.DLL" (By

Declare Function WriteSymbol Lib "ProEasy.DLL" (ByVal sNod
Declare Function WriteSymbolD Lib "ProEasy.DLL" (ByVal sNo
Declare Function WriteSymbolVariant Lib "ProEasy.DLL" (ByV
Declare Function WriteSymbolVariantD Lib "ProEasy.DLL" (By

Declare Function WriteSymbolM Lib "ProEasy.DLL" (ByVal hPr
Declare Function WriteSymbolDM Lib "ProEasy.DLL" (ByVal hP
Declare Function WriteSymbolVariantM Lib "ProEasy.DLL" (By
Declare Function WriteSymbolVariantDM Lib "ProEasy.DLL" (B

' CF-CARD access control API
Declare Function EasyFileSetPassiveMode Lib "ProEasy.DLL"

```

This is the end of the function (read/write function) declaration procedure.

The above 1 to 6 steps apply to both reading and writing applications.

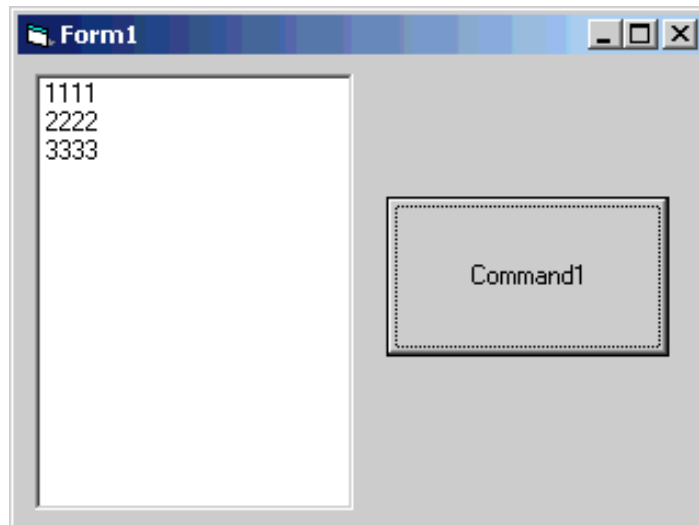
The following procedure varies depending on whether the application is intended for reading or writing, and so is explained individually.

To create a "Reading" application, refer to steps 7 to 16.

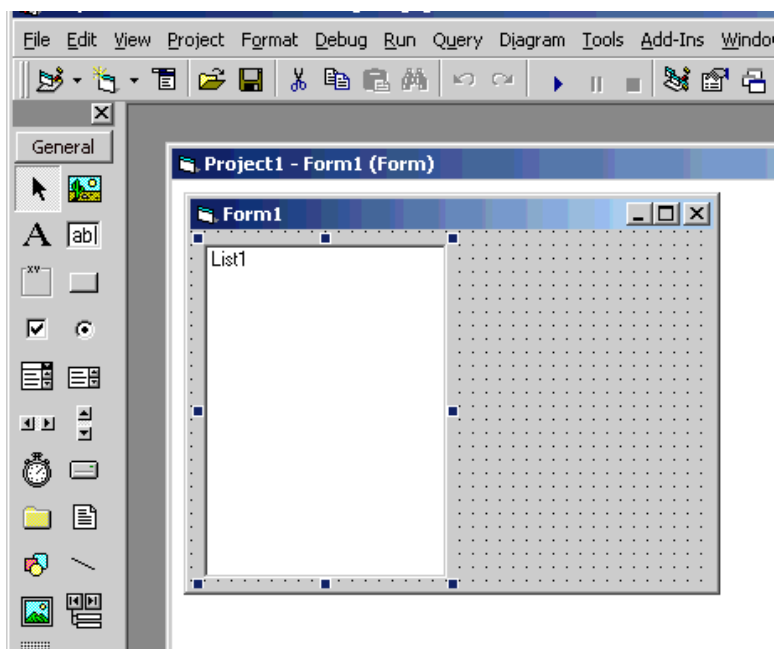
To create a "Writing" application, refer to steps 17 to 26.

Creating "Reading" application

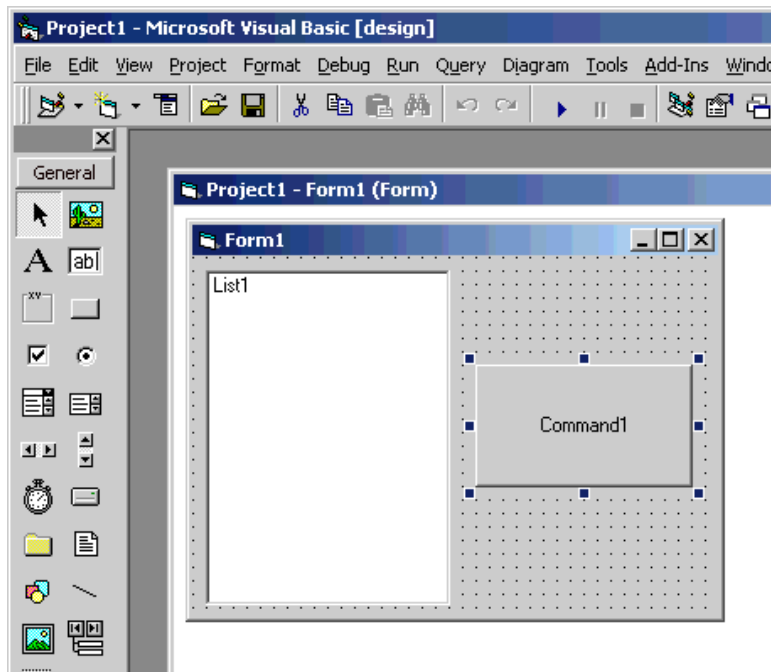
This section describes the procedure for creating an application that reads and displays data (16-bit signed data) for three points with a click on [Command1].



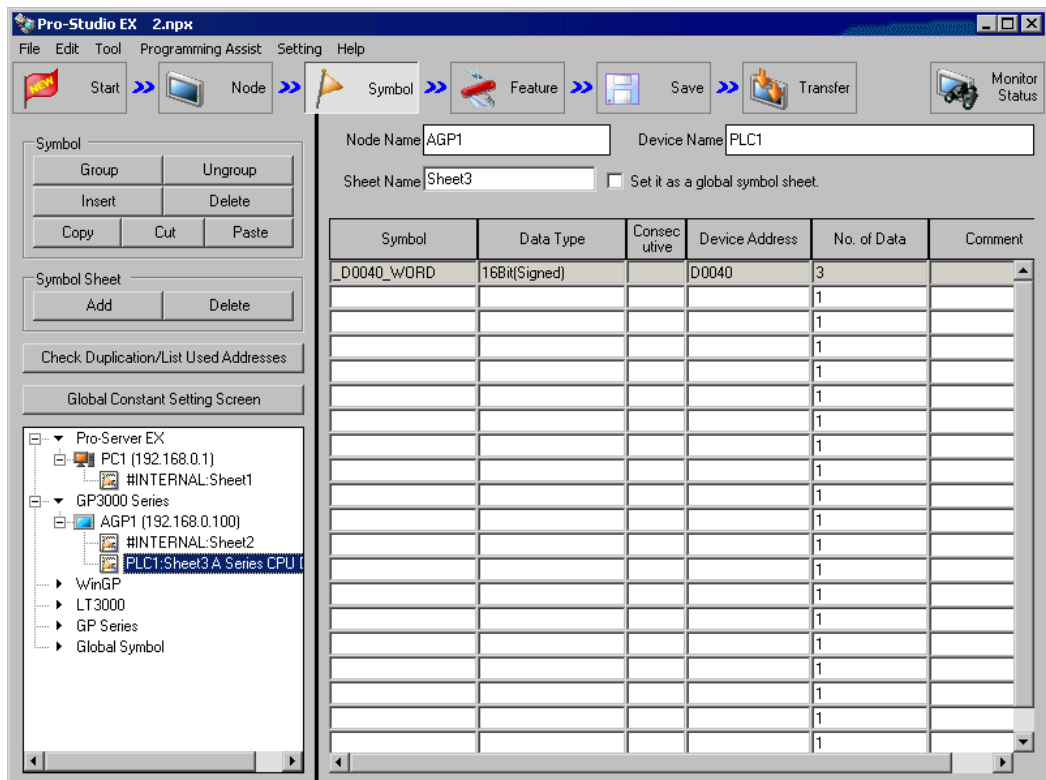
7 Select [ListBox] and paste it to [Form1].



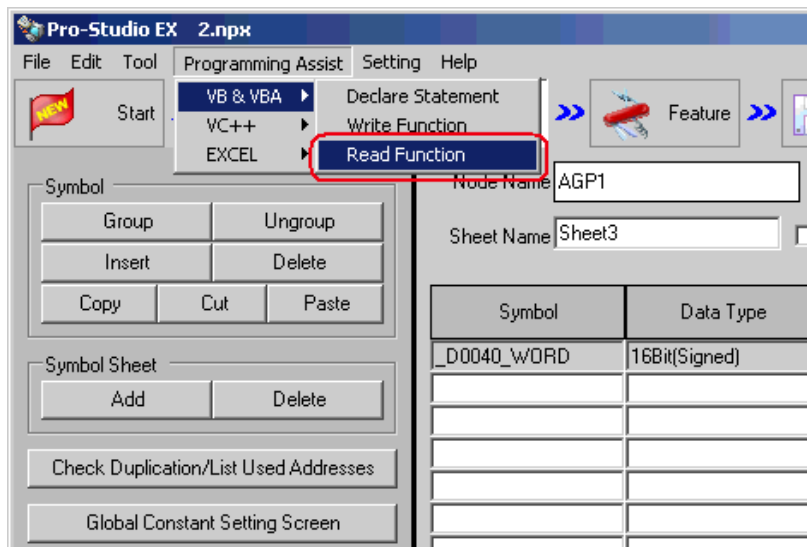
8 Select [CommandButton] and paste it [Form1].



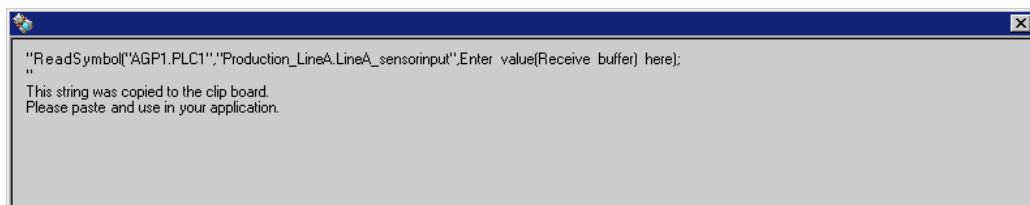
9 Select a target symbol name from those registered in 'Pro-Server EX'. (Select the symbol with first-address for reading.)



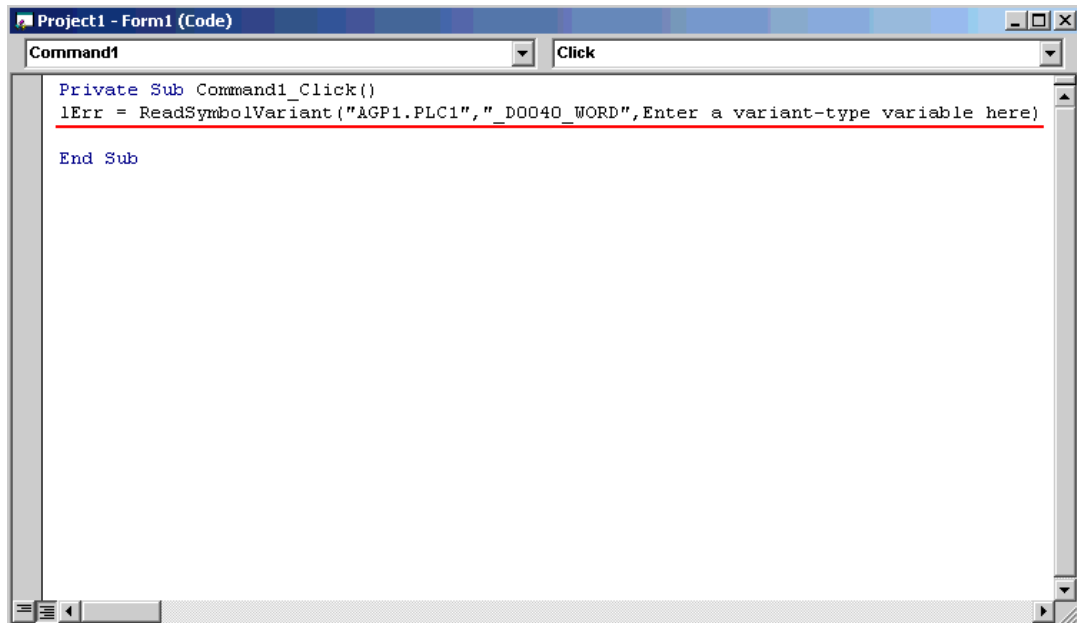
- 10 Select [Programming Assist] - [VB & VBA] - [Read Function] on the menu.



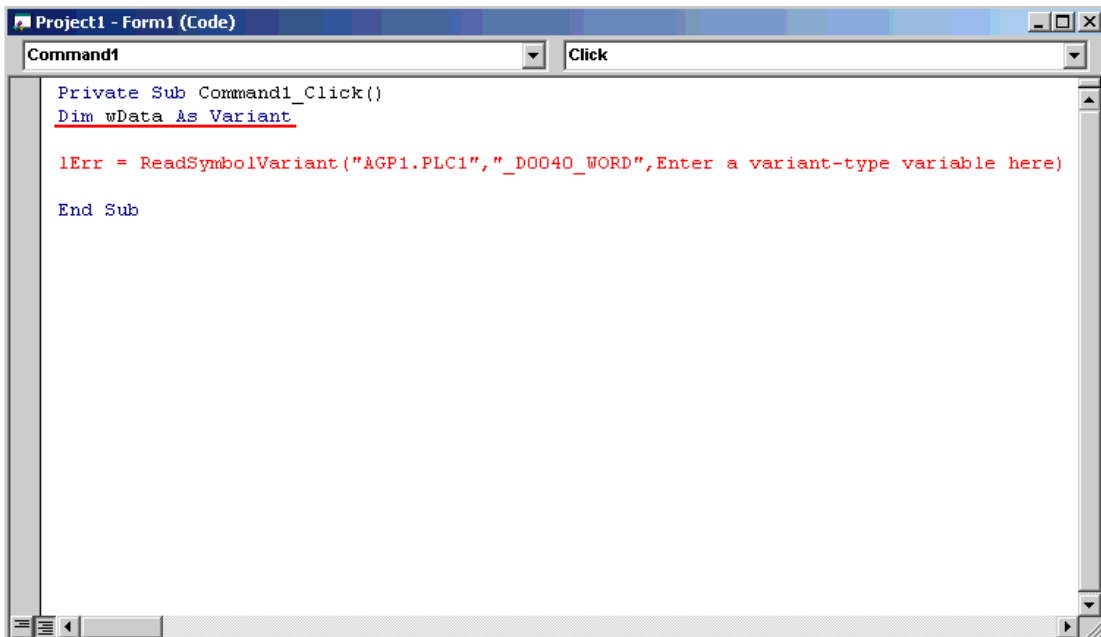
The read function is copied to the clipboard.



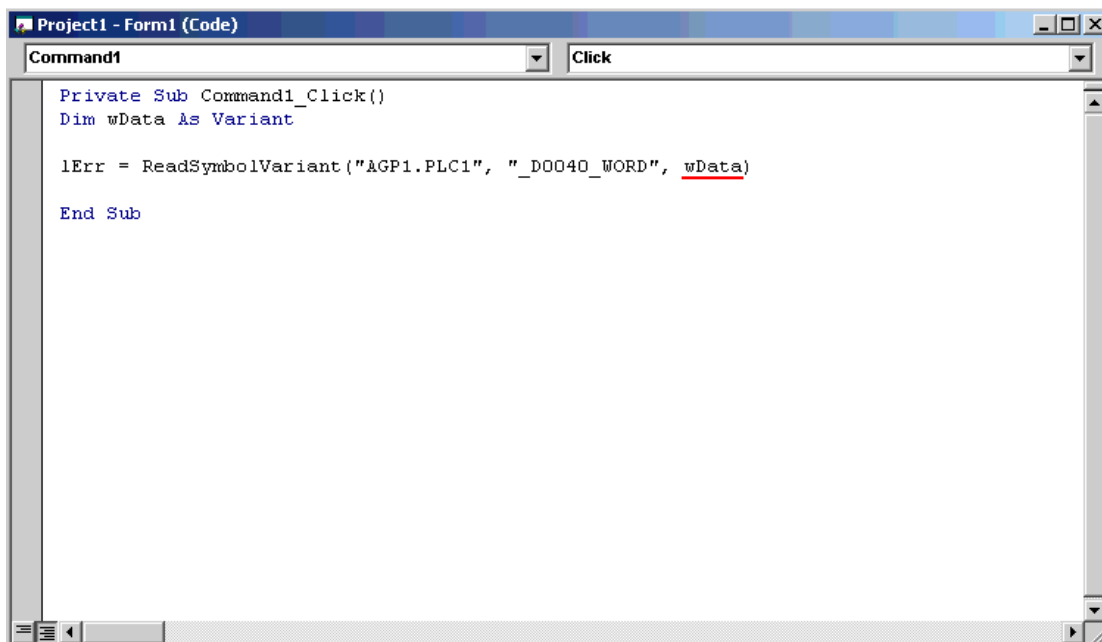
- 11 Double-click [Command1] on [Form1], and paste the data on the clipboard (read function) between 'private sub Command1_Click()' and 'End Sub'.



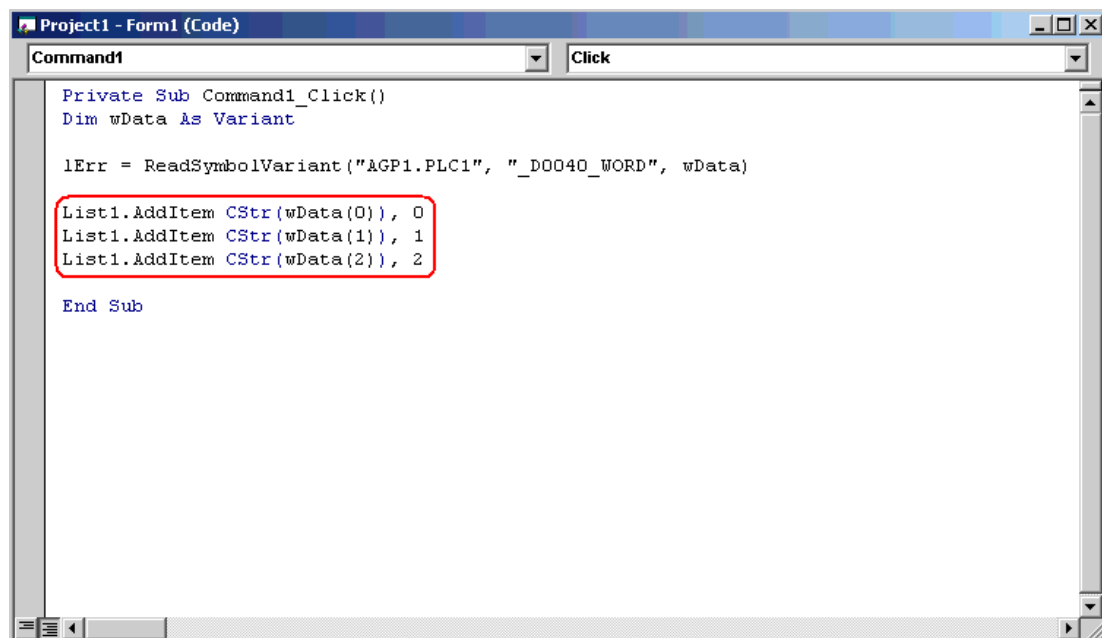
- 12 Declare the area (Array) to store the read data. Ensure that the array type (in this example, Variant-type) is matched with the data type of the symbol being used.



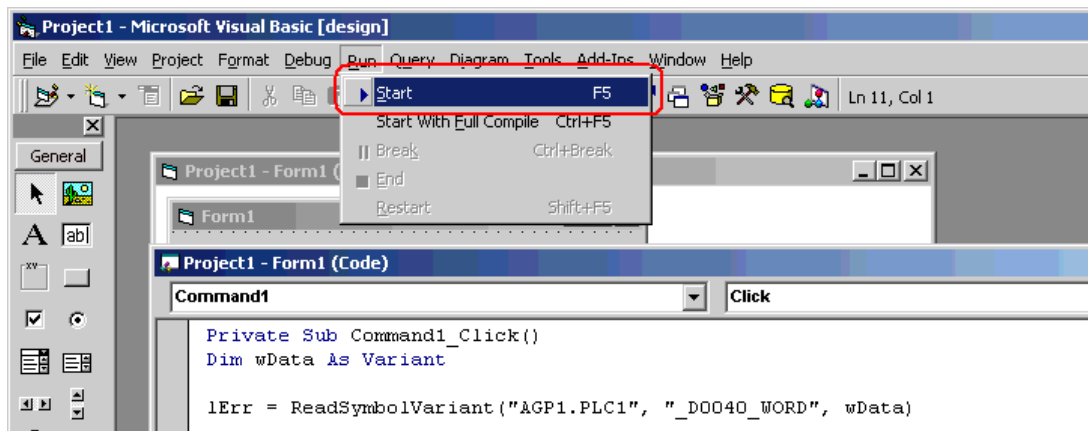
13 Specify the first area (wData) to store the read data.



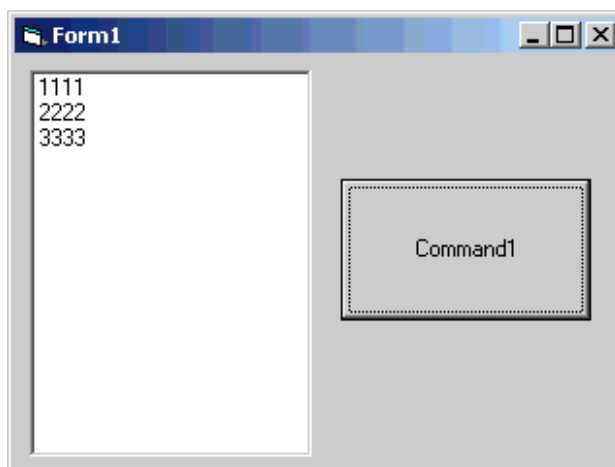
14 The List Box displays the read data for three points (wData(0), wData(1) and wData(2)) in sequence.



- 15 Select [Start] from [Run] on the Microsoft Visual Basic menu.

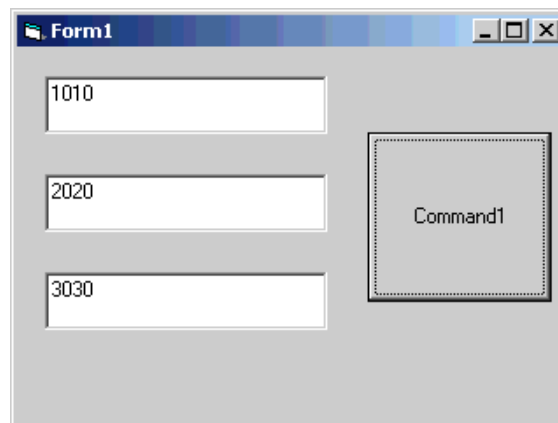


- 16 Click [Command1]. Then, the List Box displays the data for three points from the symbol "_D0040_WORD".

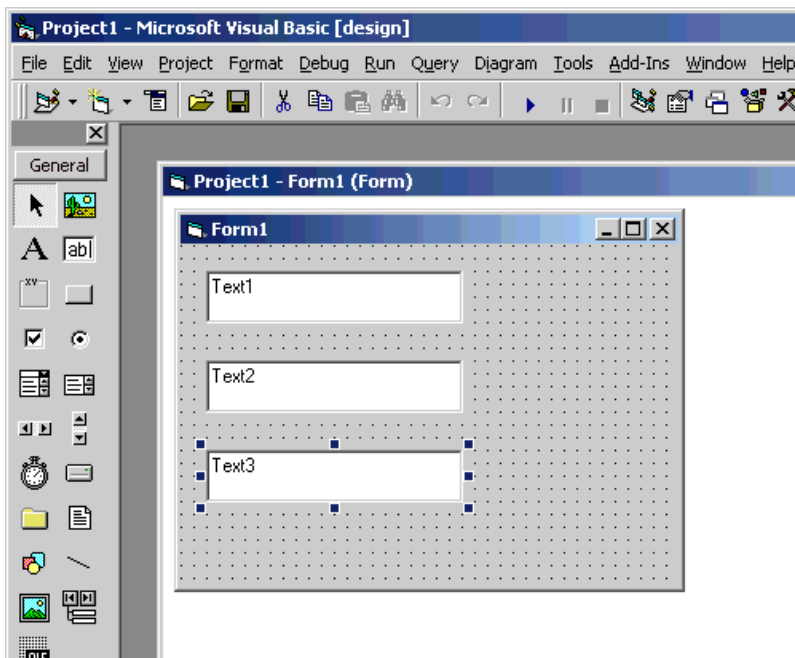


Creating "Writing" application

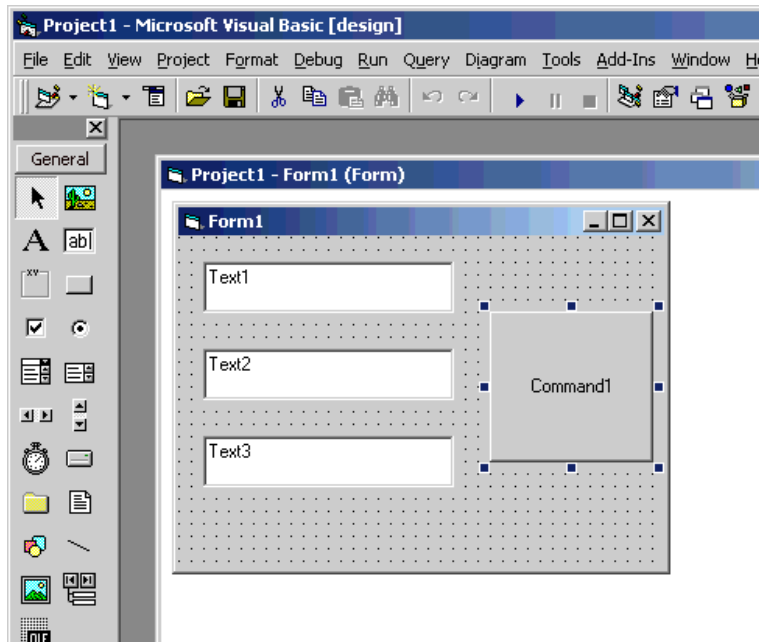
This section describes the procedure for creating an application that writes the data (16-bit signed data) entered for three points with a click on [Command1].



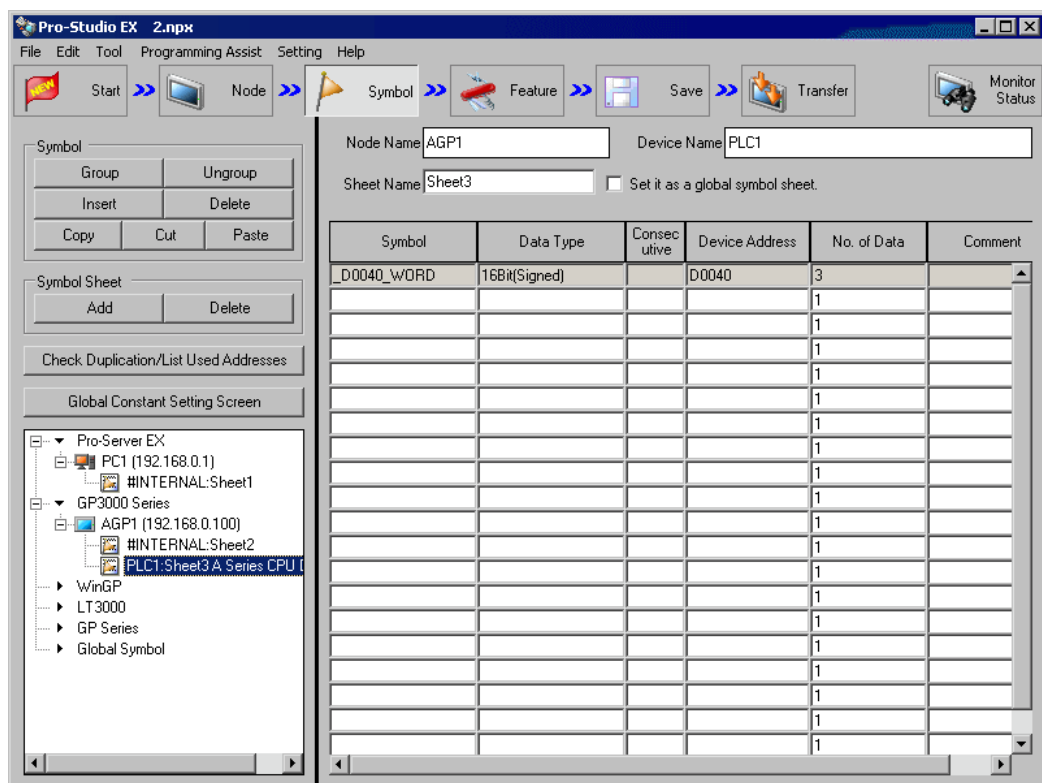
- 17 Select [TextBox] and paste it to [Form1]. Paste [Text Box] for three items.



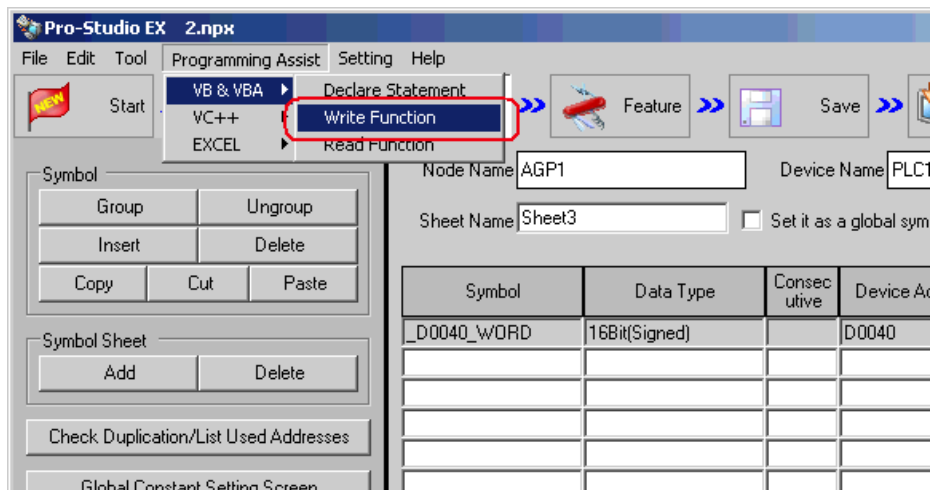
18 Select [CommandButton] and paste it [Form1].



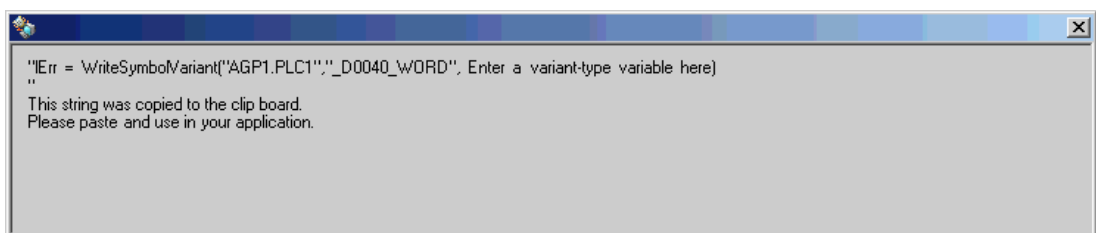
19 Select a target symbol name from those registered in 'Pro-Server EX'. (Select the symbol with first-address for writing.)



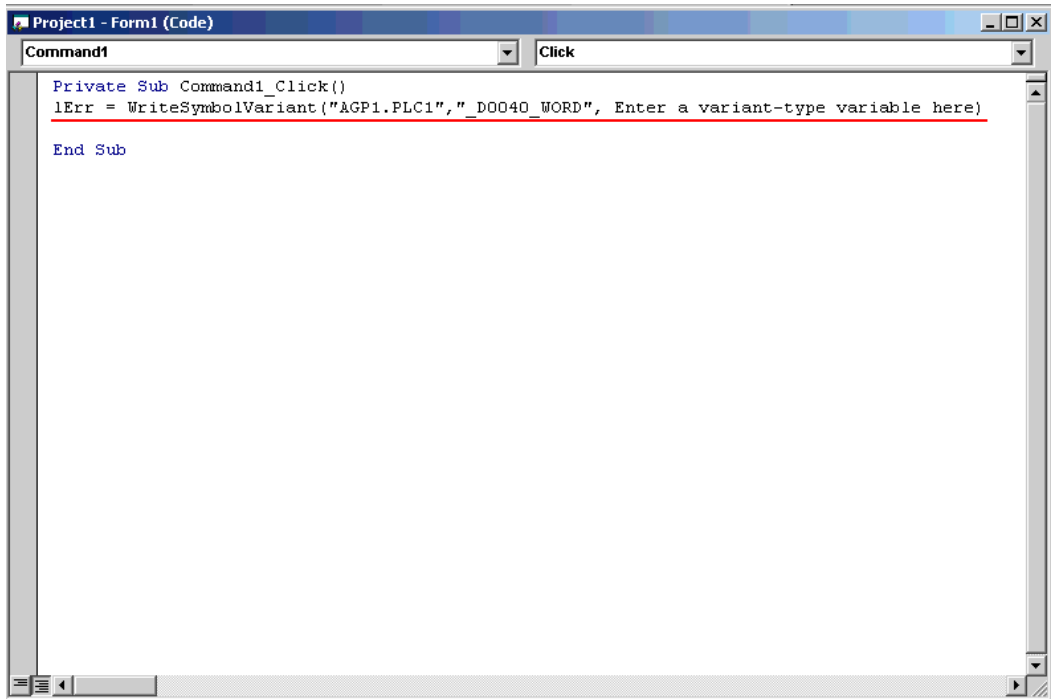
20 Select [Programming Assist] - [VB & VBA] - [Write Function] on the menu.



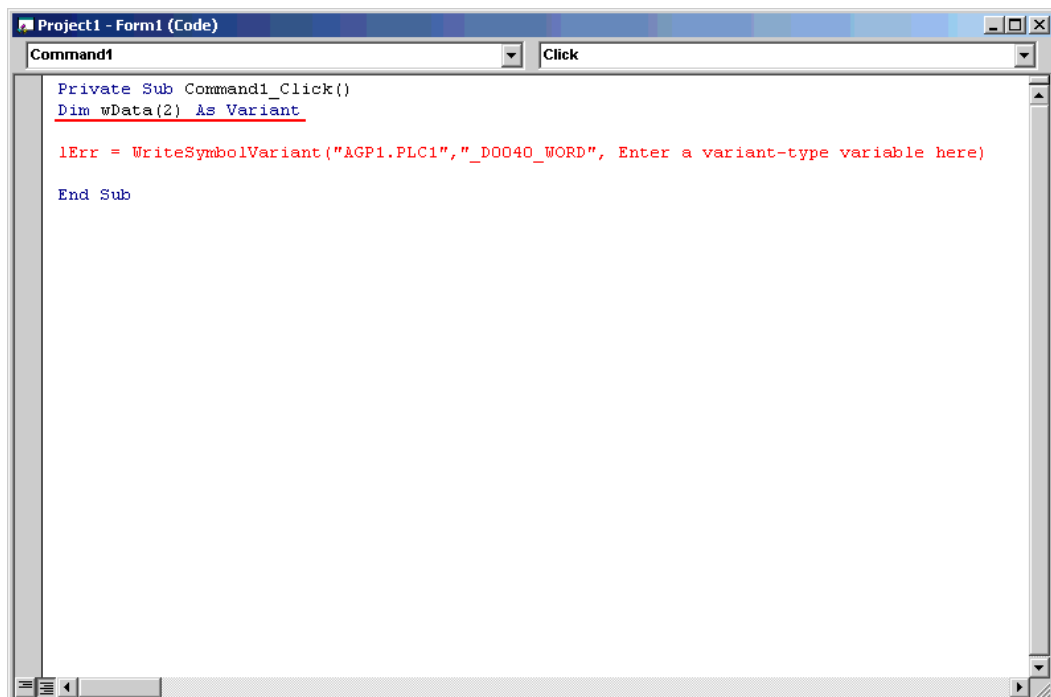
The write function is copied to the clipboard.



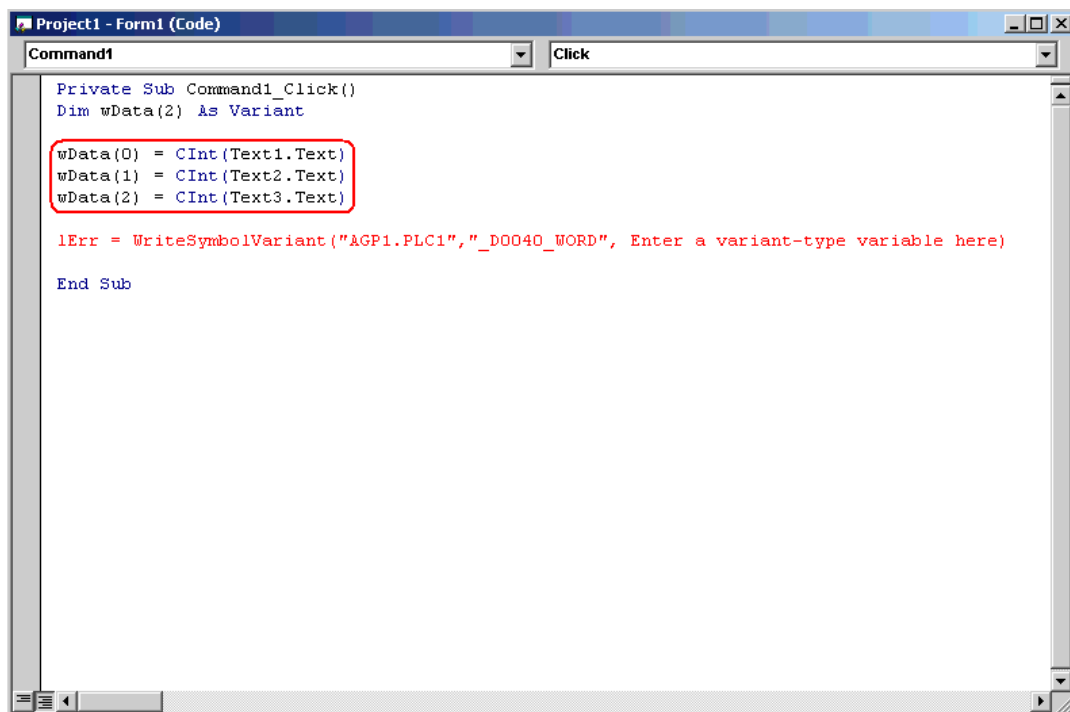
- 21 Double-click [Command1] on [Form1], and paste the data on the clipboard (write function) between the Sub statement and the End Sub statement.



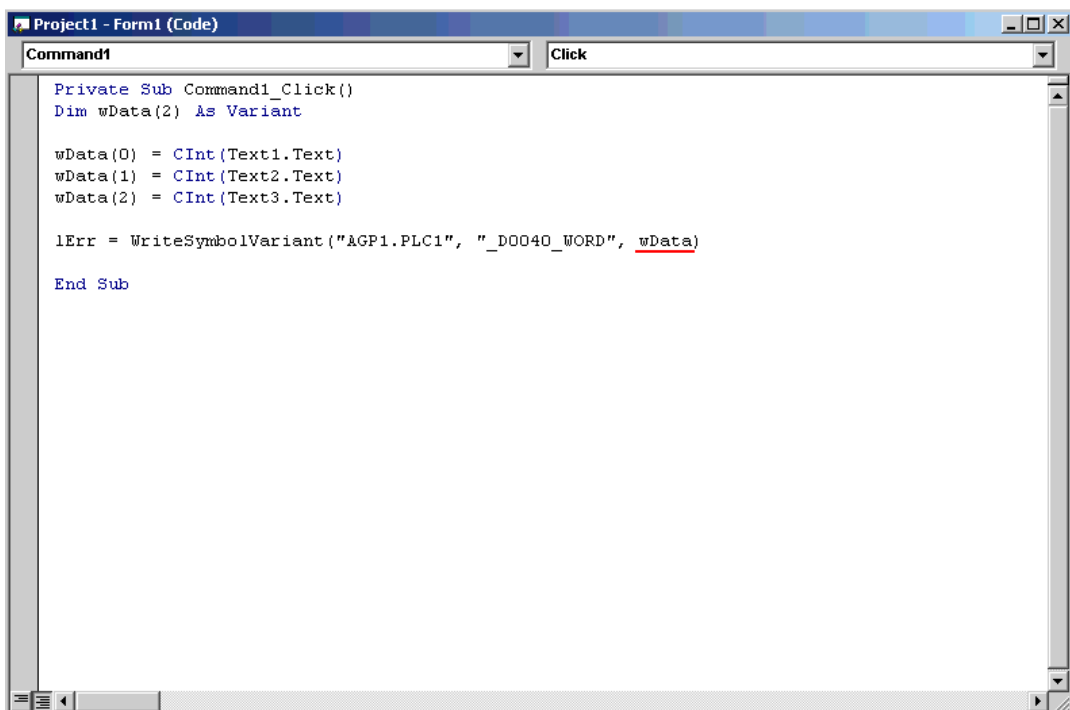
- 22 Declare the area (alignment) to store the written data. Ensure that the alignment type (in this example, Variant-type) is matched with the data type of the symbol being used.



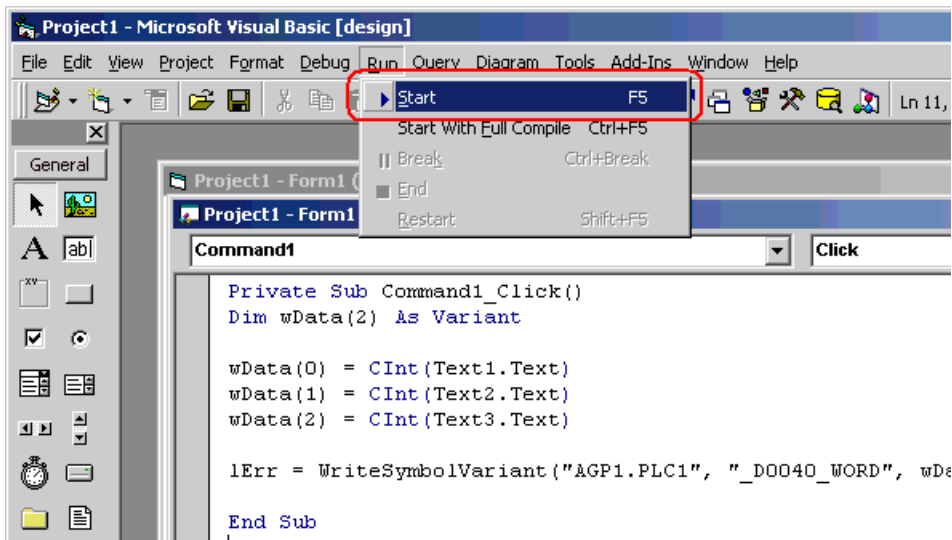
23 Set the data entered in [TextBox] into the alignment.



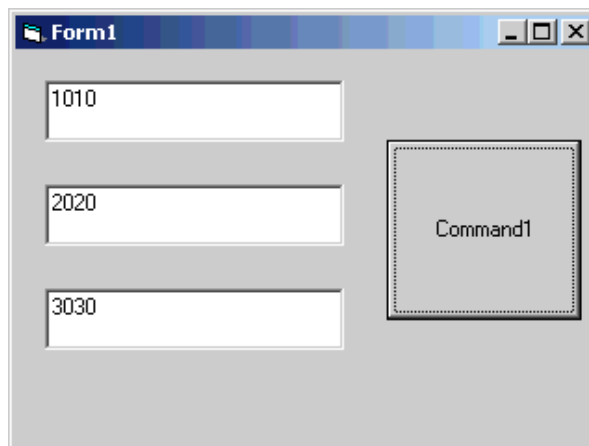
24 Specify the first area (wData) where the written data has been set.



25 Select [Start] from [Run] on the Microsoft Visual Basic menu.



26 After entering values (for three points) in [TextBox], click [Command1]. Then, 'Pro-Server EX' executes the writing of the data for three points from the symbol "_D0040_WORD".

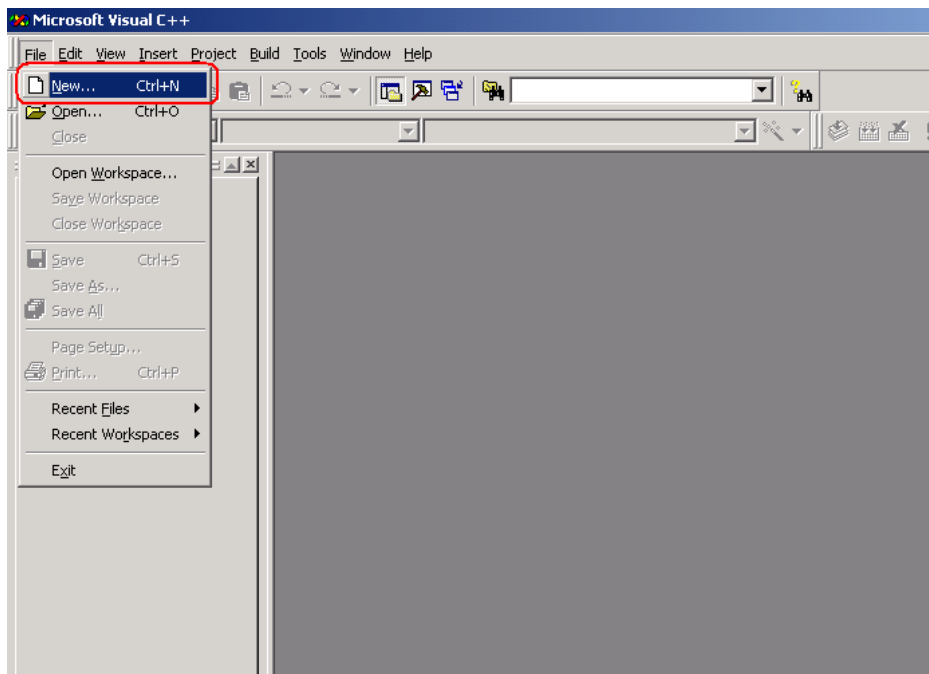


27.11.2 VC Support Function

For example, this section describes the procedure for creating a dialog-based application by using MFC (Microsoft Foundation Class).

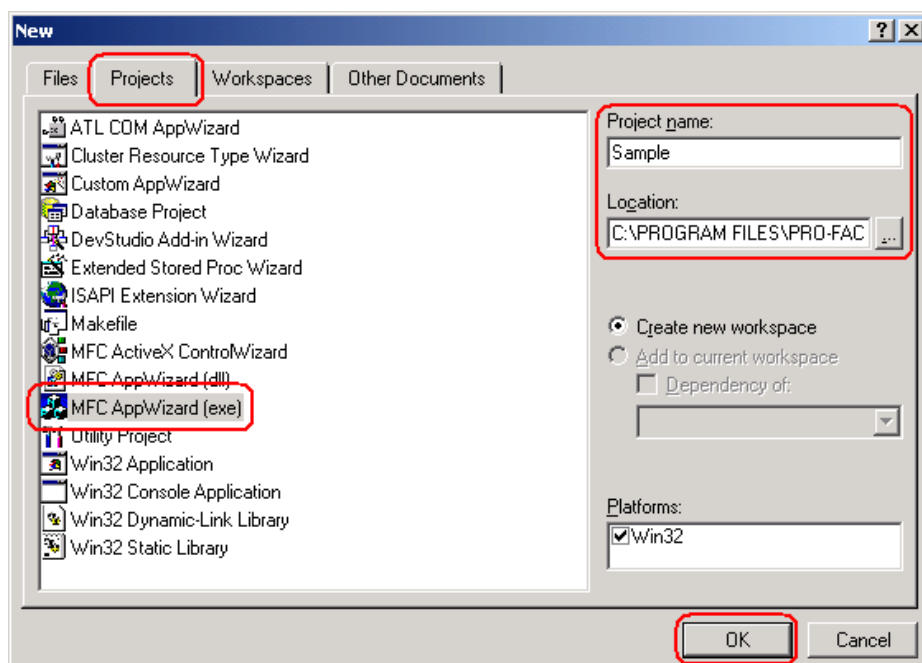
VC: Declaration statement

- 1 Start Microsoft Visual C++, and select [New] from [File].

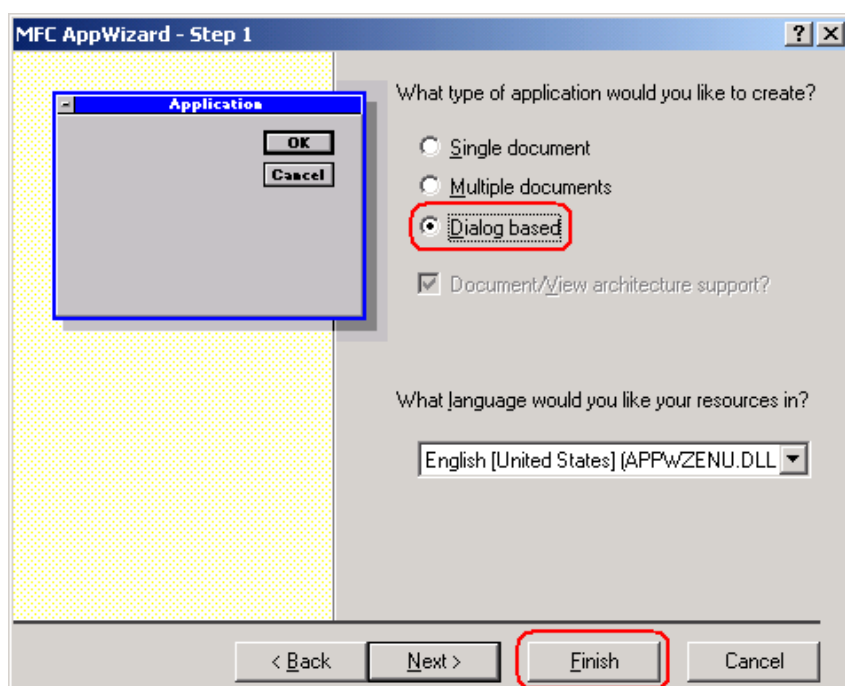


- 2 After selecting [MFC AppWizard(exe)] in the [Projects] tab, enter [Project name] and [Location], and click the [OK] button.

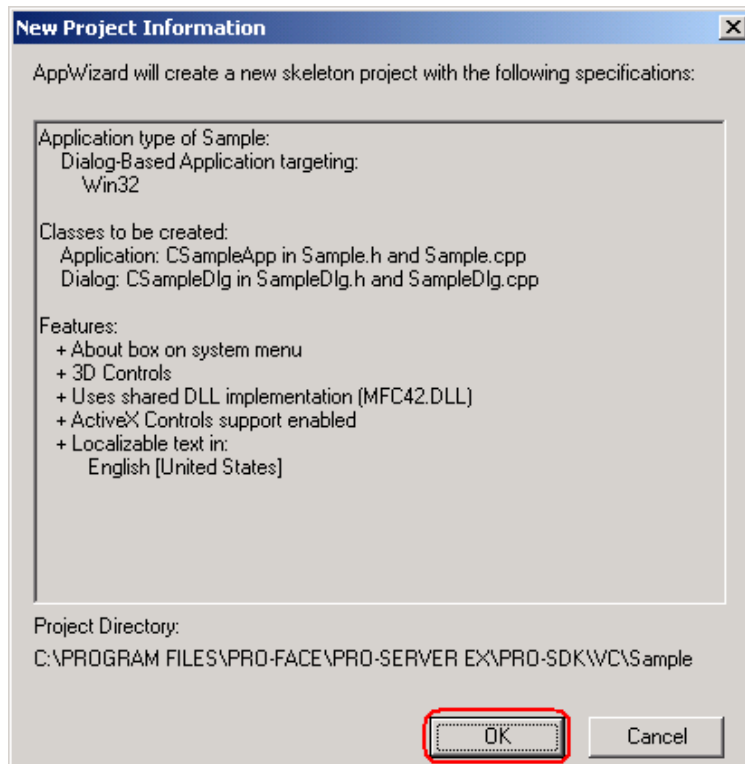
In this example, "Sample" is entered for [Project name], and "C:\Program File(x86)\Pro-face\Pro-Server EX\PRO-SDK\VC" is entered for [Location].



- 3 Select [Dialog Based] for "What type of application would you like to create?", and click the [Finish] button.

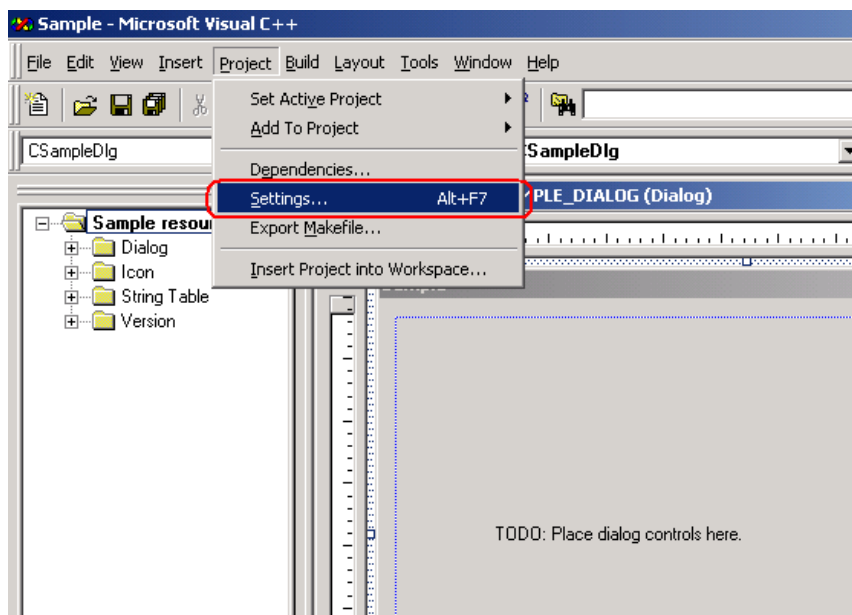


- 4 Click the [OK] button to complete the project.



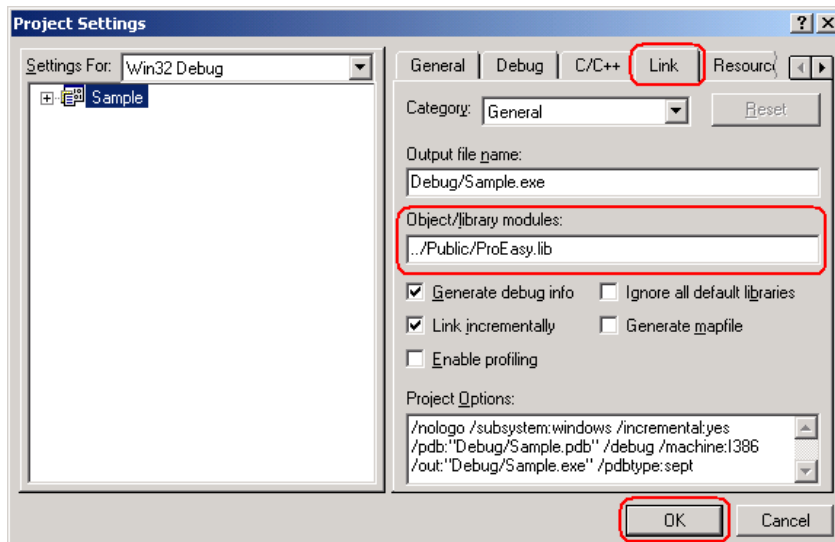
The read/write functions provided by 'Pro-Server EX' are available as DLL. To use DLL, you must specify a LIB file.

- 5 Select [Settings] from [Project] on the Microsoft Visual C++ menu.



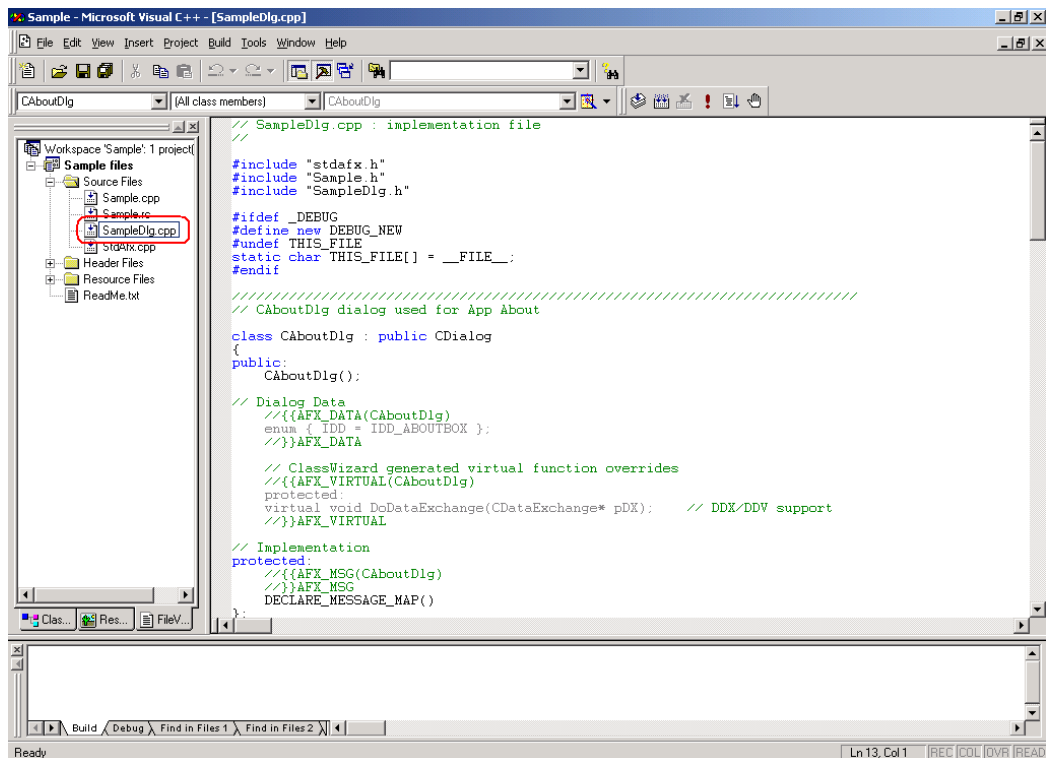
- 6 Specify a LIB file for [Object/library modules] in the [Link] tab. Then, click the [OK] button.

The LIB file (ProEasy.lib) exists in "PRO-SDK\Vc\Public" in the folder where 'Pro-Server EX' has been installed. In this example, "..\Public\ProEasy.lib" is specified.

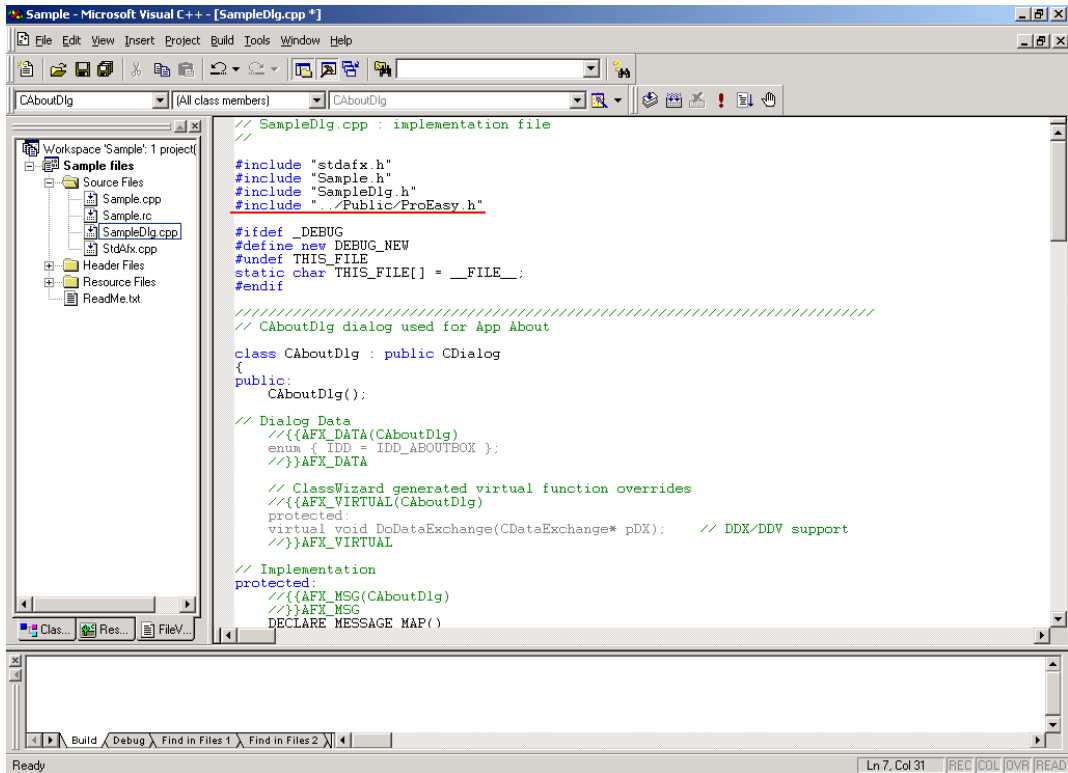


- 7 To use read/write functions provided by 'Pro-Server EX', you must include a header file (ProEasy.h). After clicking the [FileView] tab in the [Work Space] window of Microsoft Visual C++, double-click the "SampleDig.cpp" file.

In this example, the read/write functions are used in the "SampleDig.cpp" file.



- 8 Add `#include "..\Public\ProEasy.h"` to the "SampleDlg.cpp" file. This completes the function (read/write function) declaration procedure.



The above 1 to 8 steps apply to both reading and writing applications.

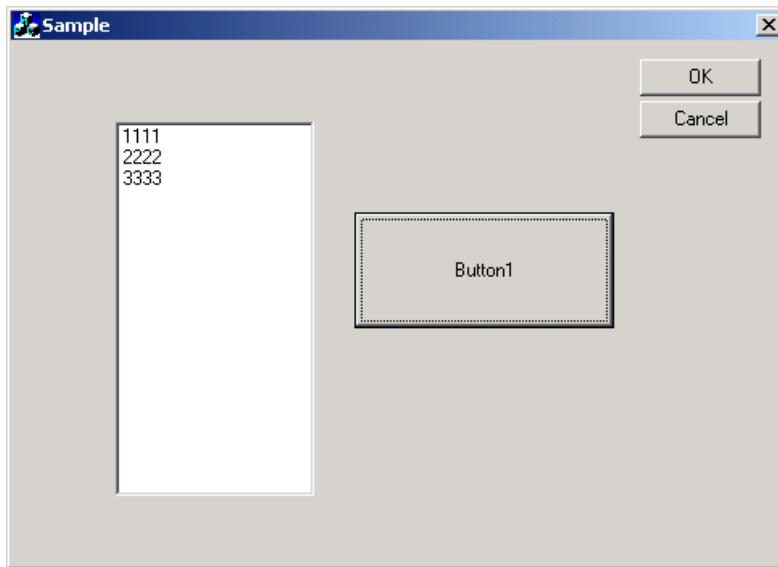
The following procedure varies depending on whether the application is intended for reading or writing, and so is explained individually.

To create a "Reading" application, refer to steps 9 to 30.

To create a "Writing" application, refer to steps 31 to 47.

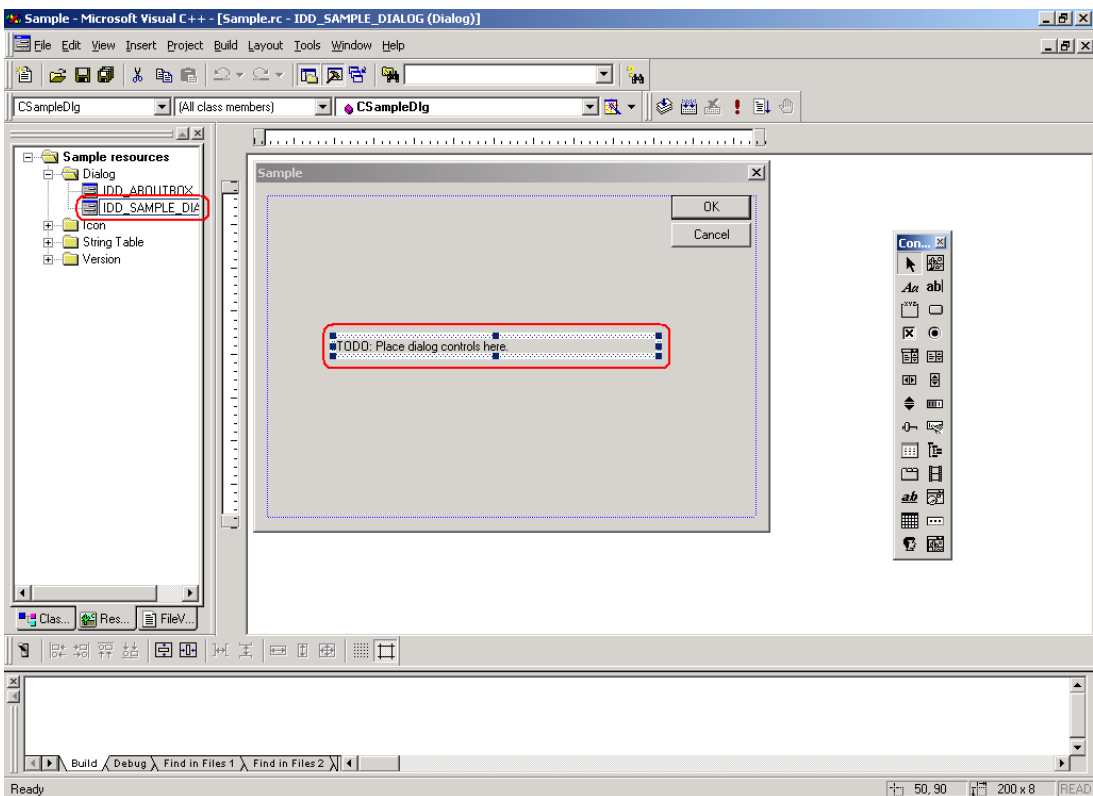
Creating "Reading" application

This section describes the procedure for creating an application that reads and displays data (16-bit signed data) for three points with a click on [Button1].

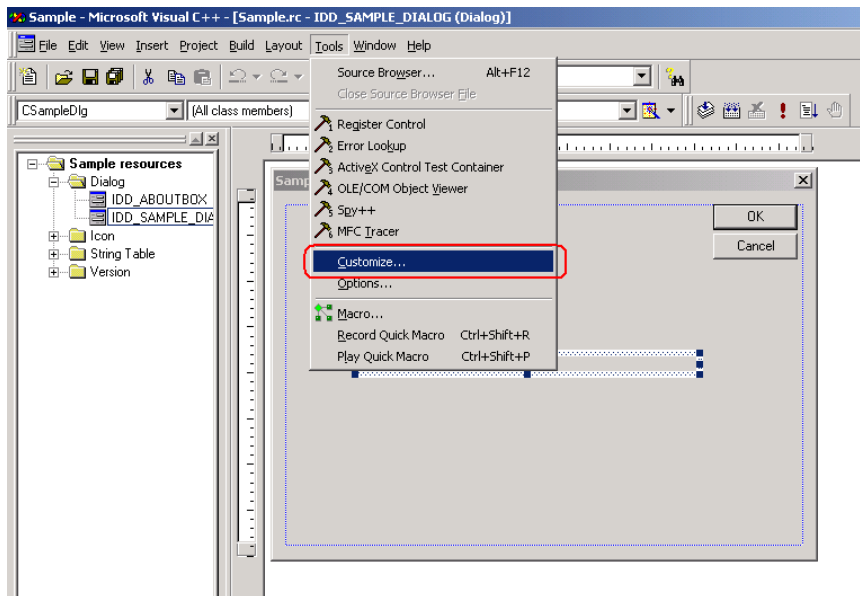


9 After clicking the [ResourceView] tab in the [Work Space] window of Microsoft Visual C++, double-click [IDD_SAMPLE_DIALOG].

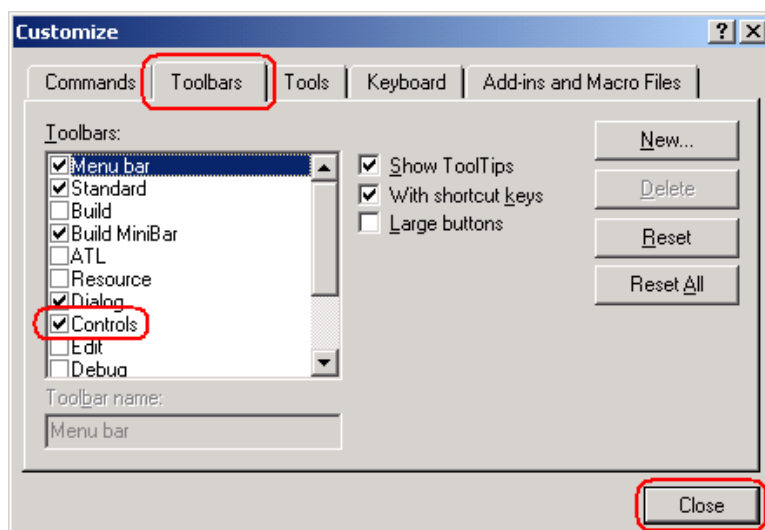
Select [Static Text] at the center of the dialog box, and delete it.



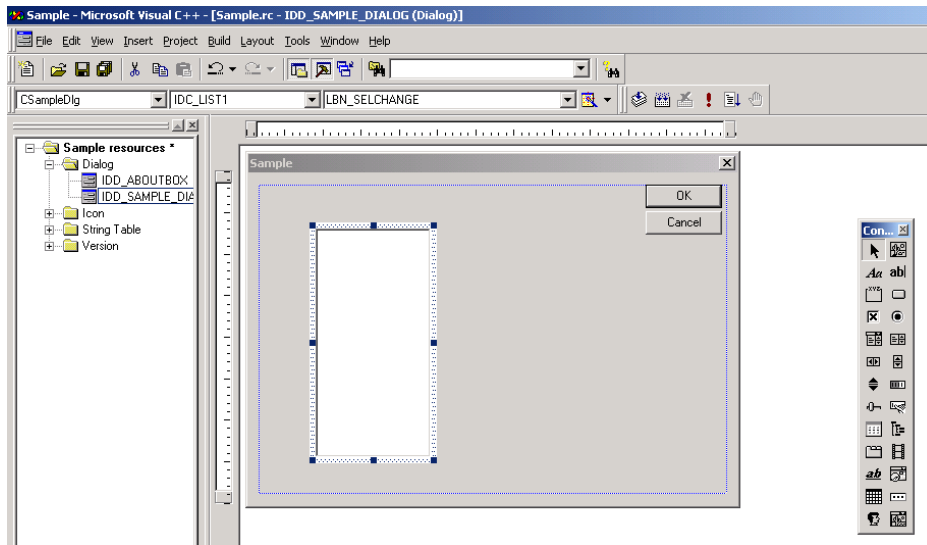
- 10 Select [Customize] from [Tools] on the Microsoft Visual C++ menu.



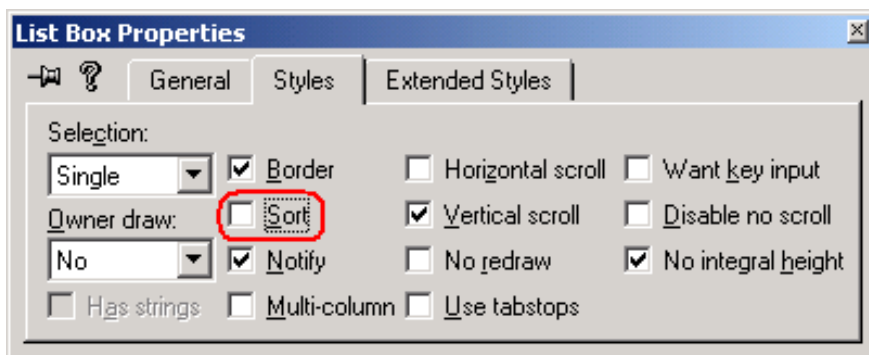
- 11 Check the [Controls] checkbox in the [Toolbars] tab, and click the [Close] button.



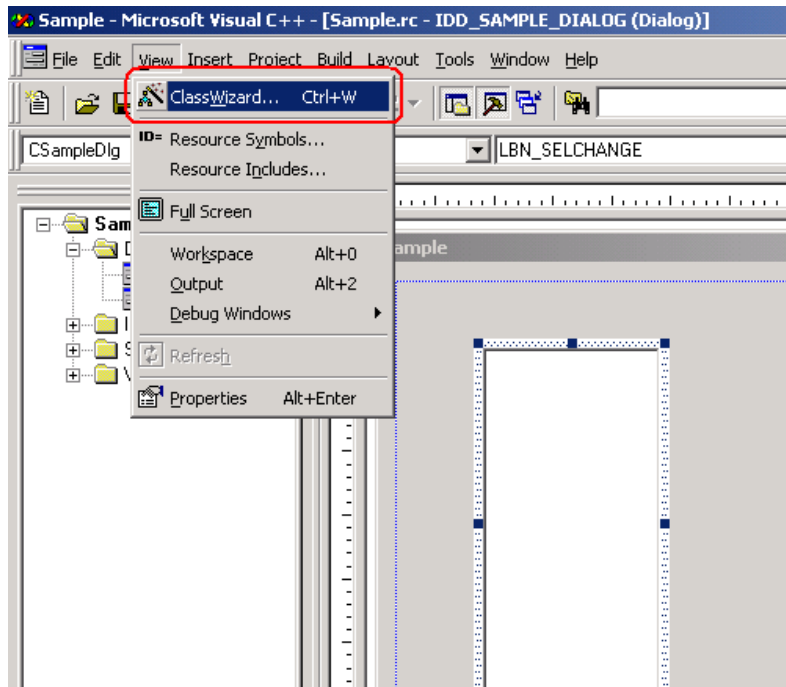
12 Select [ListBox], and paste it to the dialog box.



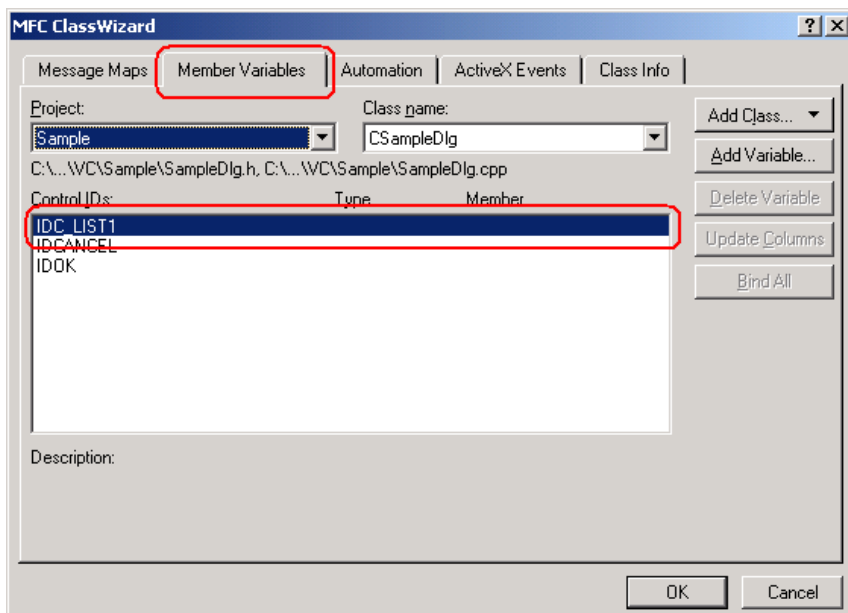
13 Right-click the pasted [ListBox], and select [Property]. The [List Box Properties] dialog box appears. Then, uncheck the [Sort] checkbox.



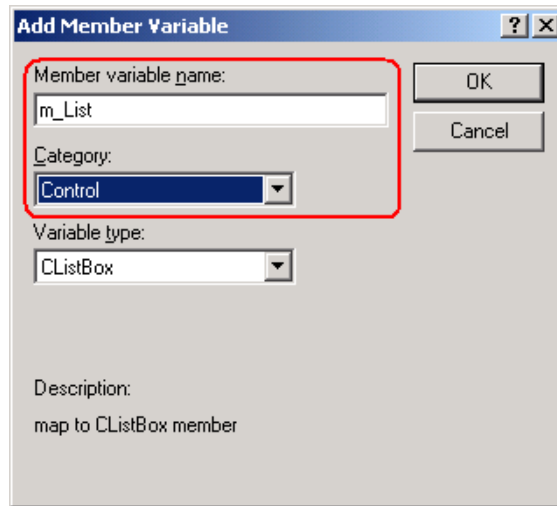
- 14 Select [ClassWizard] from [View] on the Microsoft Visual C++ menu.



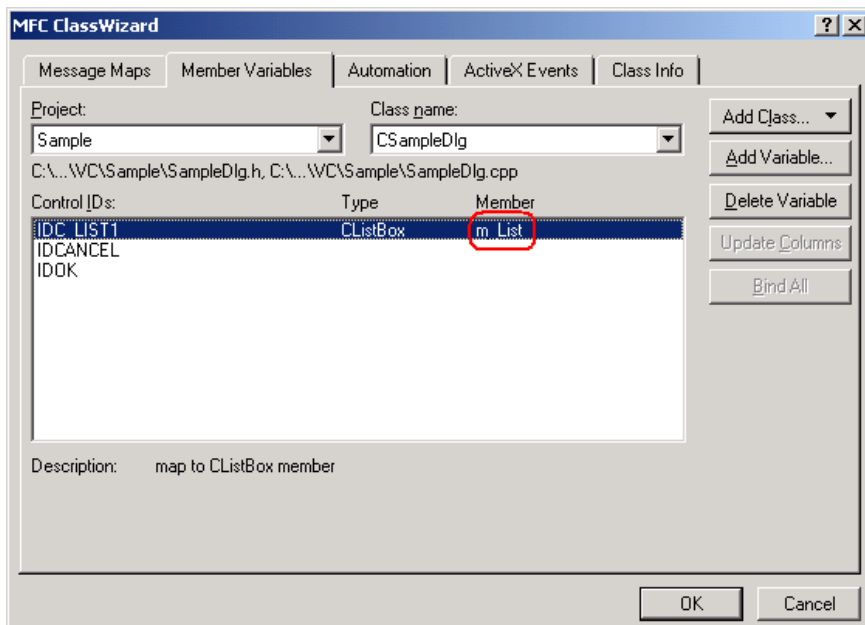
- 15 Select the [Member Variables] tab, and select "IDC_LIST1" for [Control IDs].



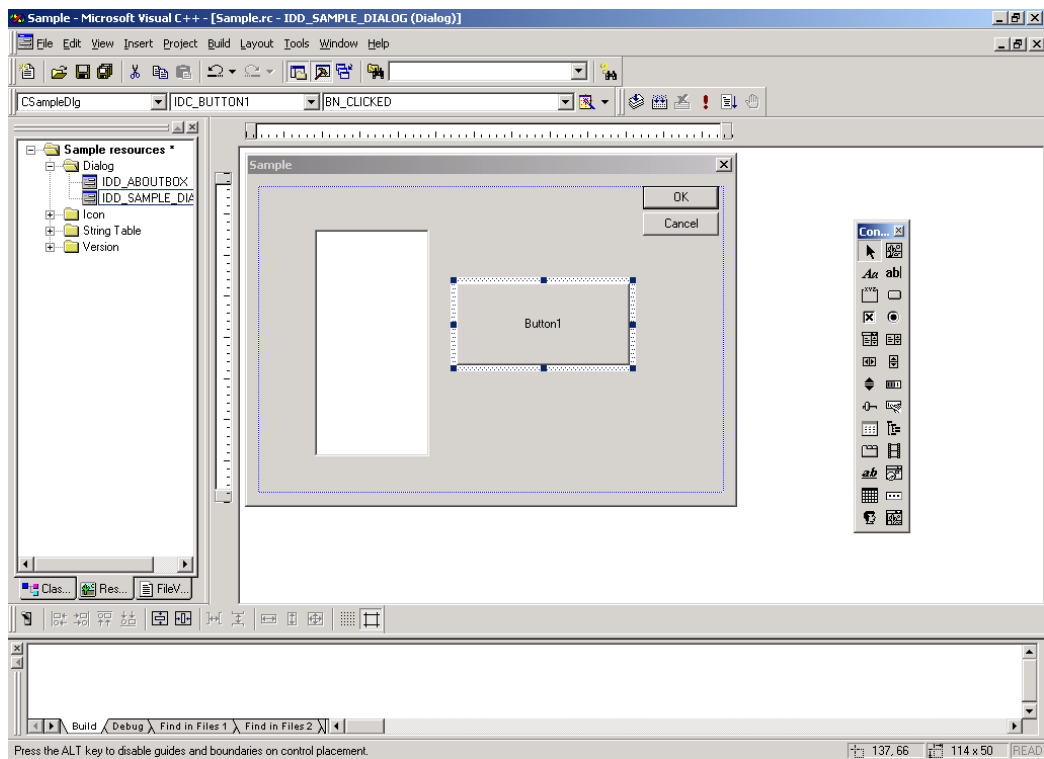
- 16 Click [Add Variable], and enter "m_List" for [Member variable name]. After selecting "Control" for [Category], click the [OK] button.

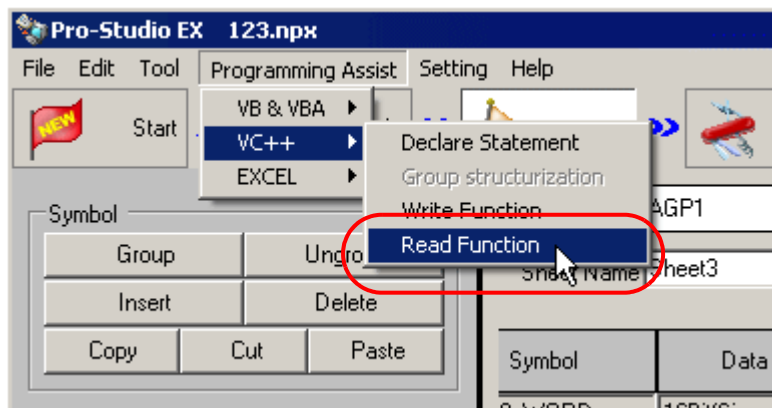
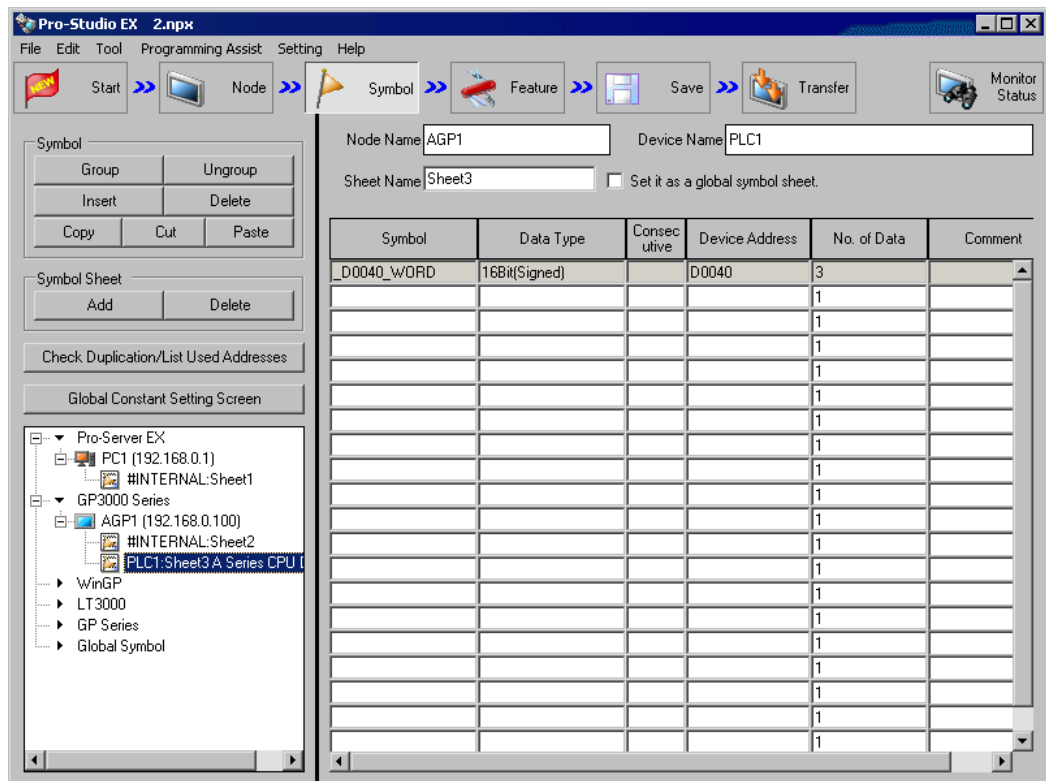


- 17 After confirming that the member variable has been added, click the [OK] button.

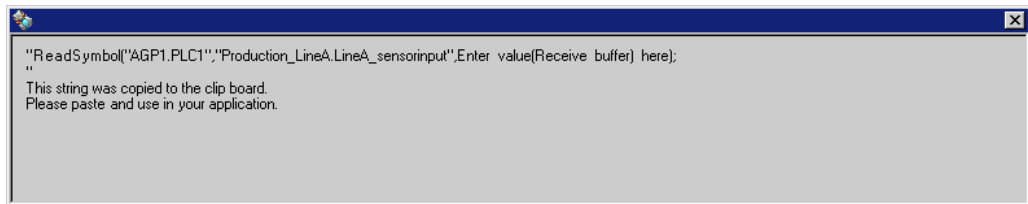


18 Select [Button], and paste it to the dialog box.

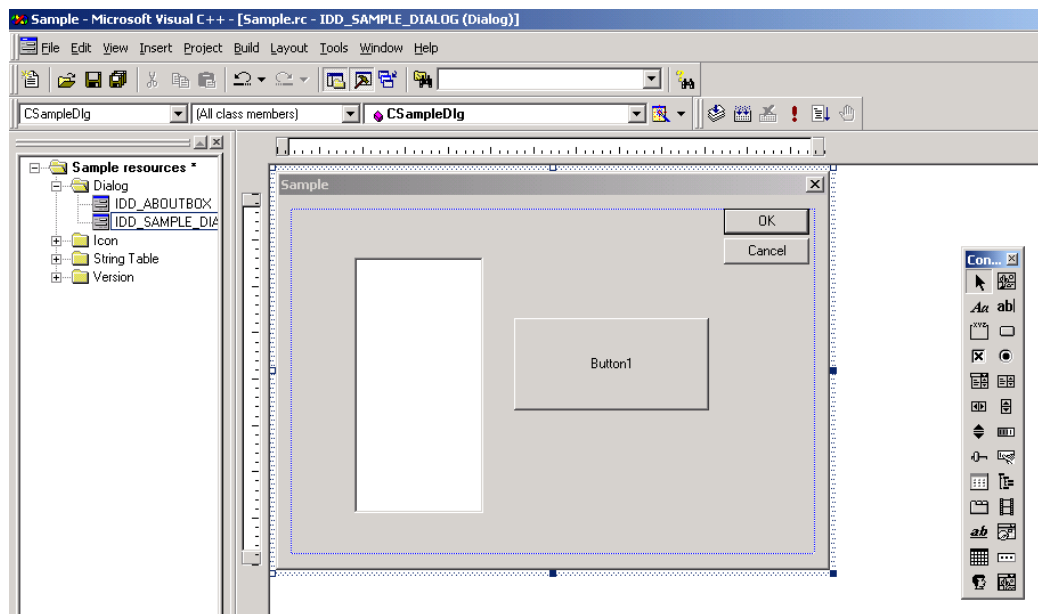




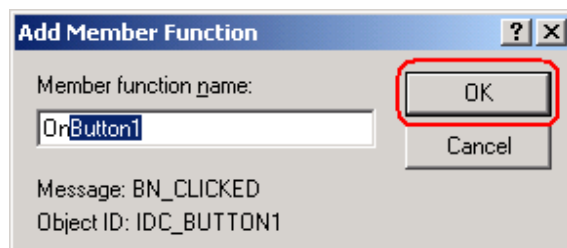
The read function is copied to the clipboard.



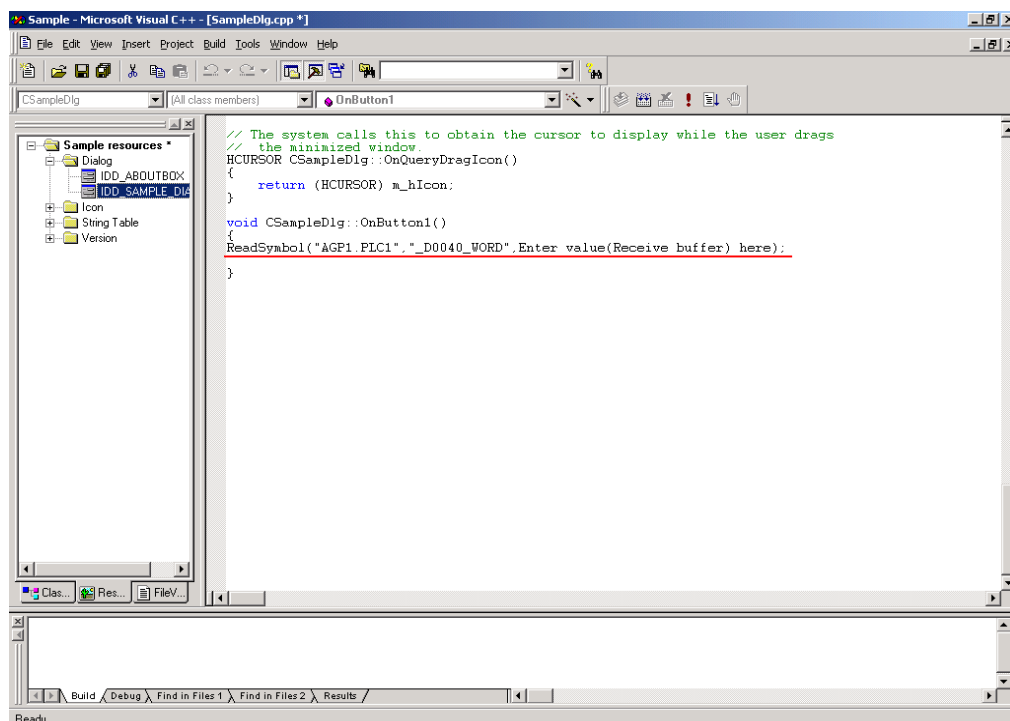
21 Double-click [Button1] that has been pasted to [Dialog] in Microsoft Visual C++.



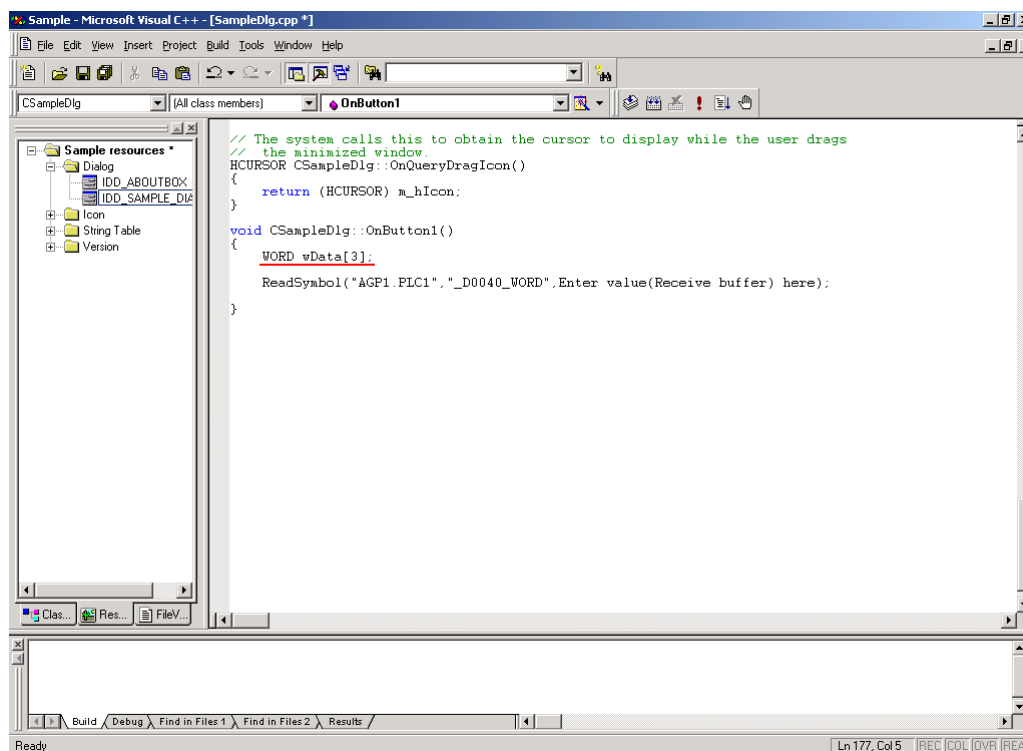
22 Click the [OK] button.



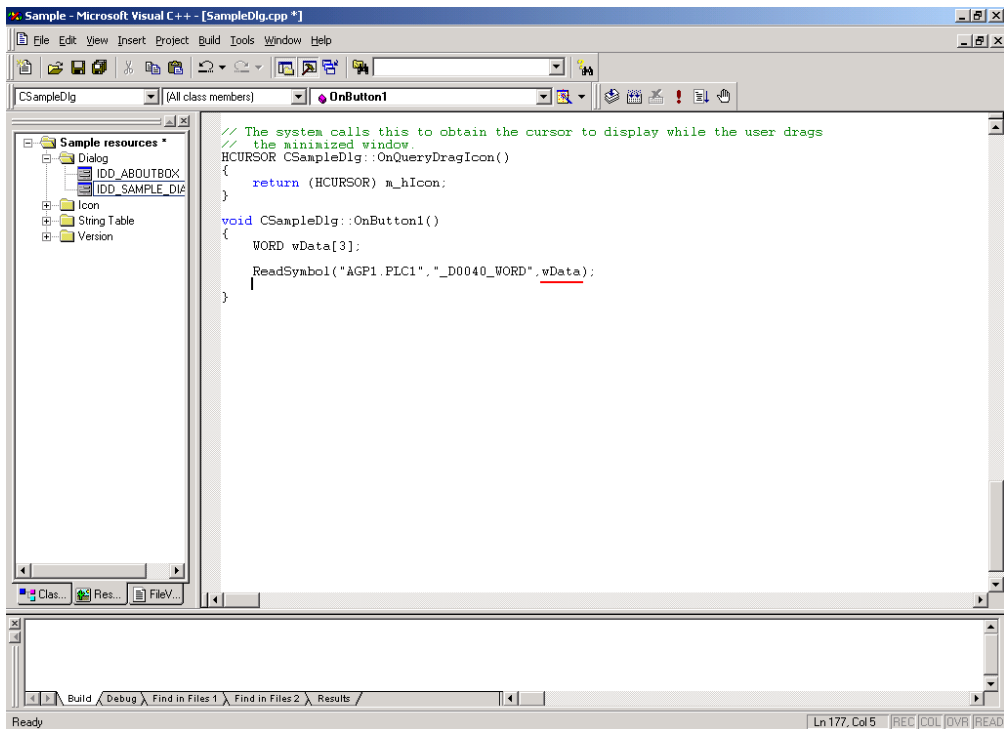
23 Paste the data on the clipboard (read function) into the OnButton1 member function.



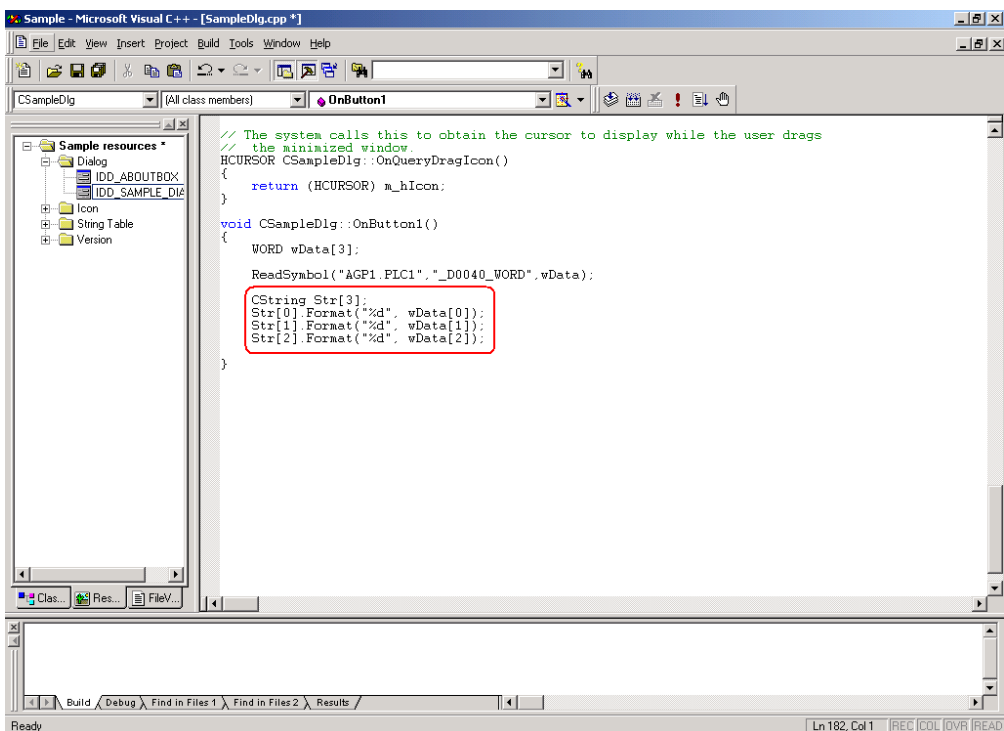
24 Declare the area (Array) to store the read data.



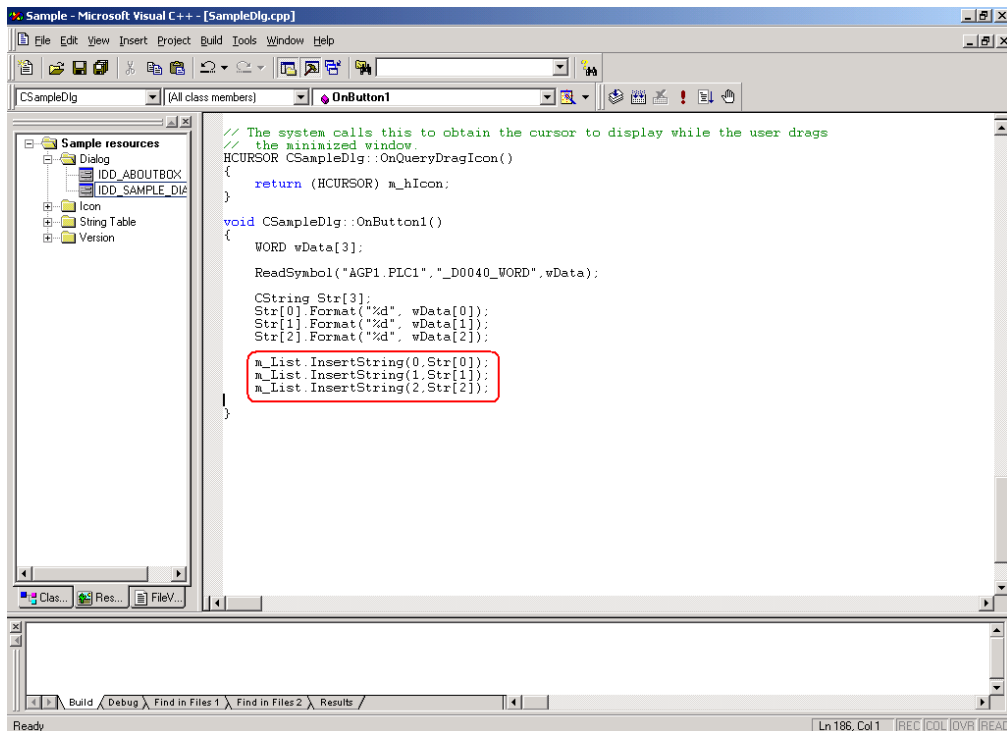
25 Specify the first area (wData) to store the read data.



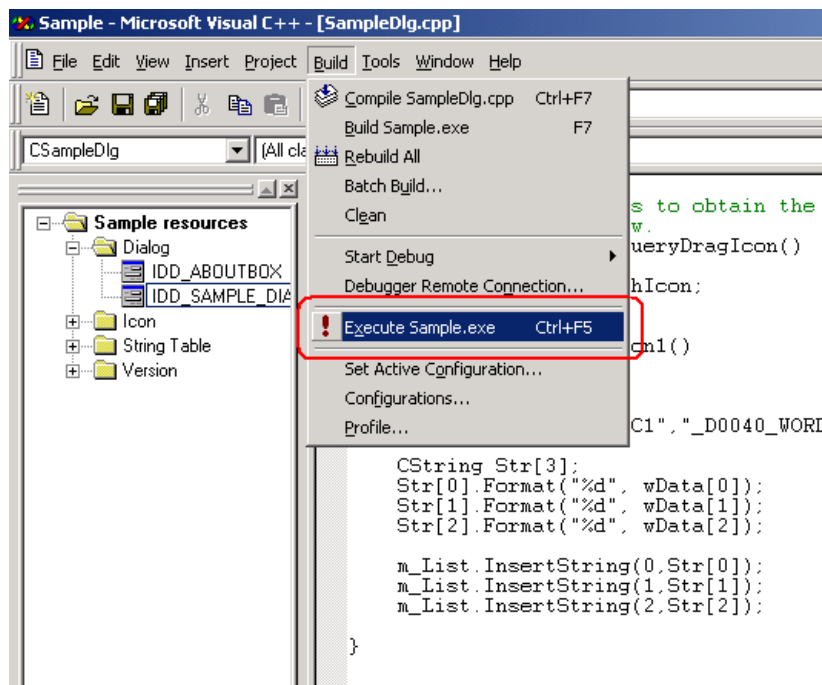
26 To display the read data for three points (wData(0), wData(1) and wData(2)) in the list box, convert the data into CString-type string data.



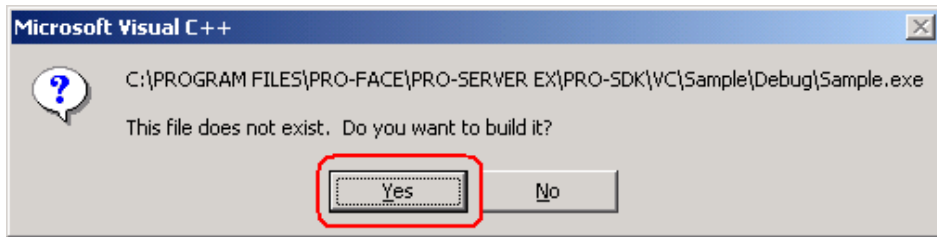
27 The list box (m_List) displays the read data (that has been converted into string data) in sequence.



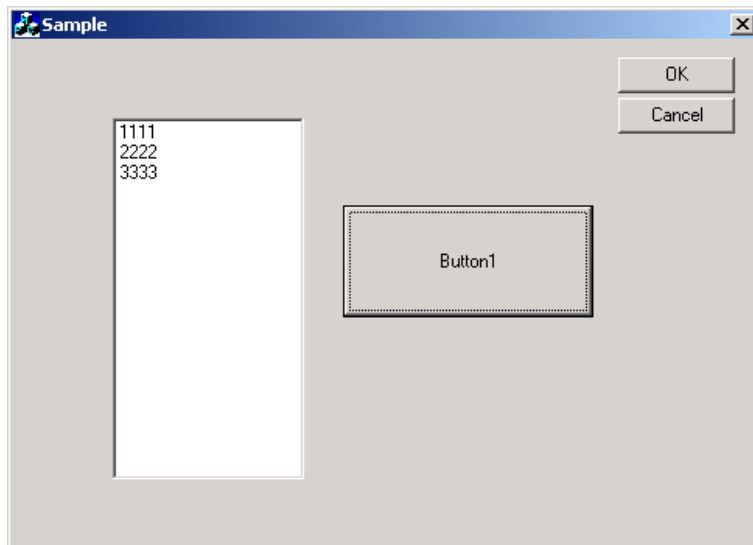
28 Select [Execute Sample.exe] from [Build] on the Microsoft Visual C++ menu.



29 Click the [Yes] button.



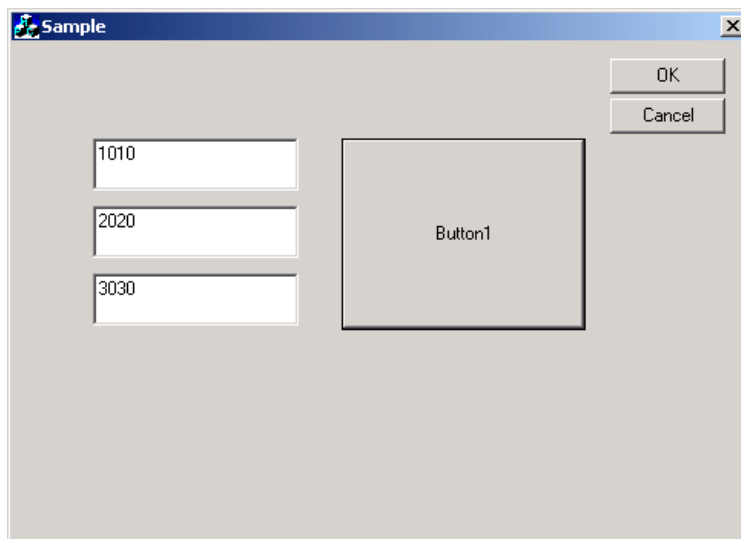
30 Click [Button1]. Then, the list box displays the data for three points from the symbol "_D0040_WORD".



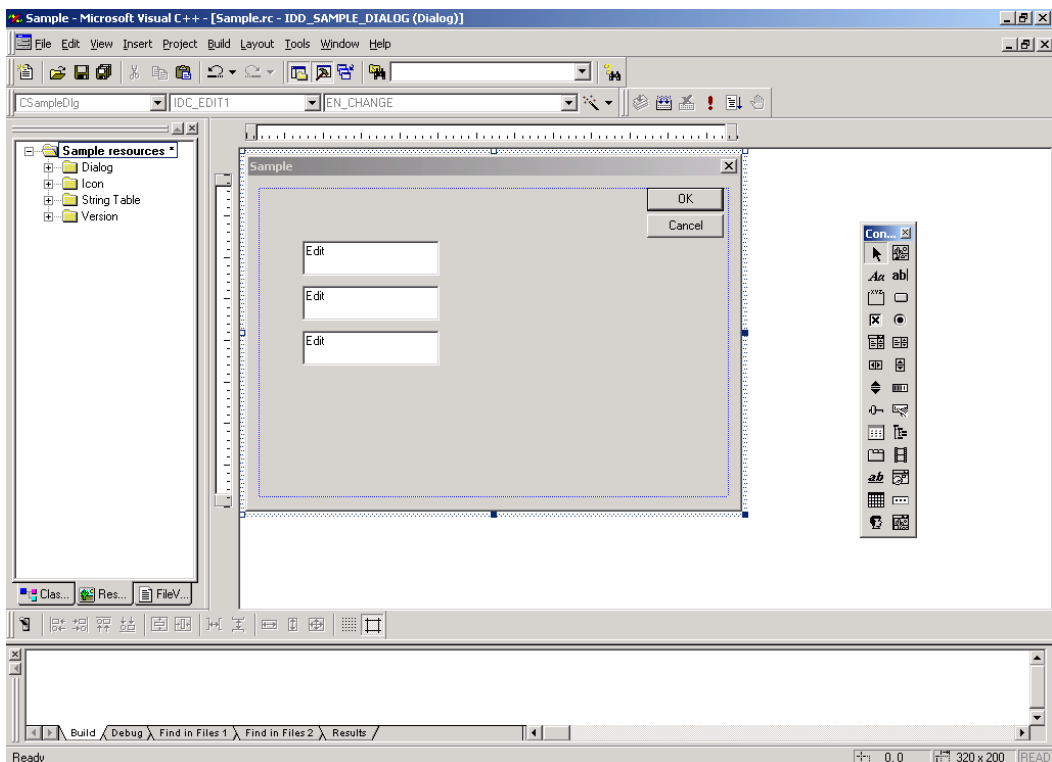
Creating "Writing" application

This section describes the procedure for creating an application that writes the data entered for three points with a click on [Button1].

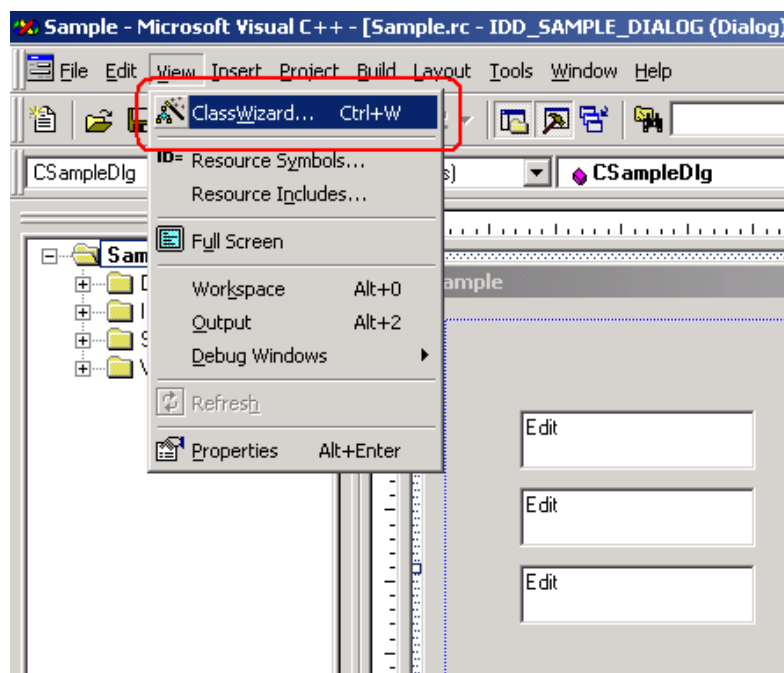
Steps 9 to 11 are the same as those for creating "Reading" application.



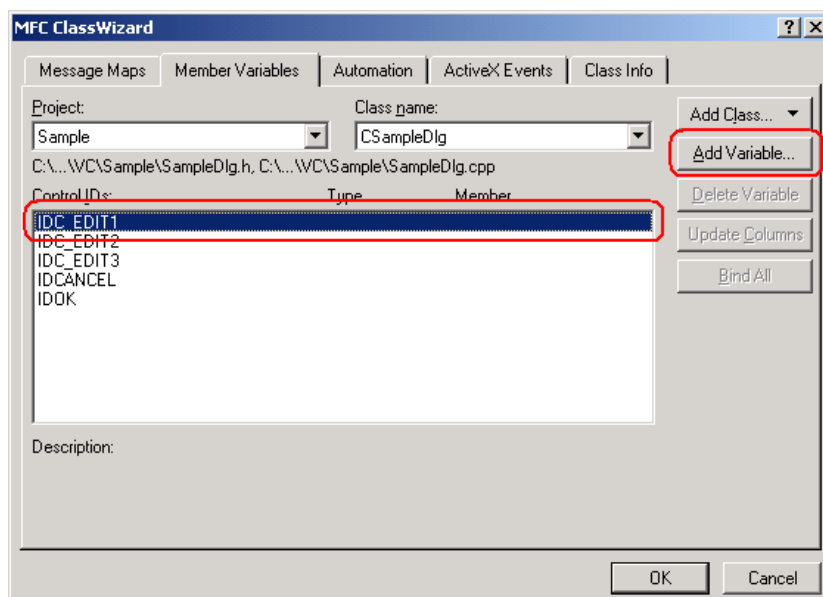
31 Select [EditBox], and paste it to [Dialog]. Paste [Edit Box] for three items.



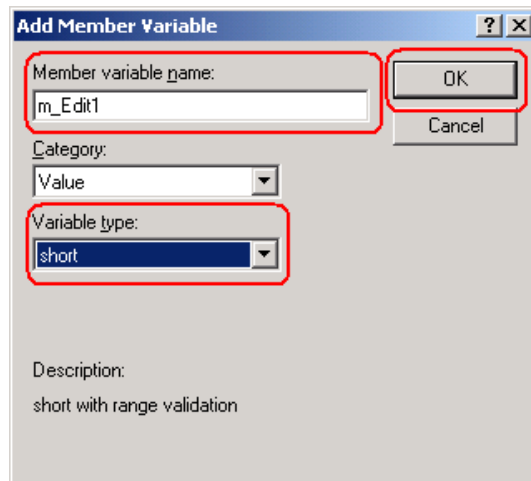
32 Select [ClassWizard] from [View] on the Microsoft Visual C++ menu.



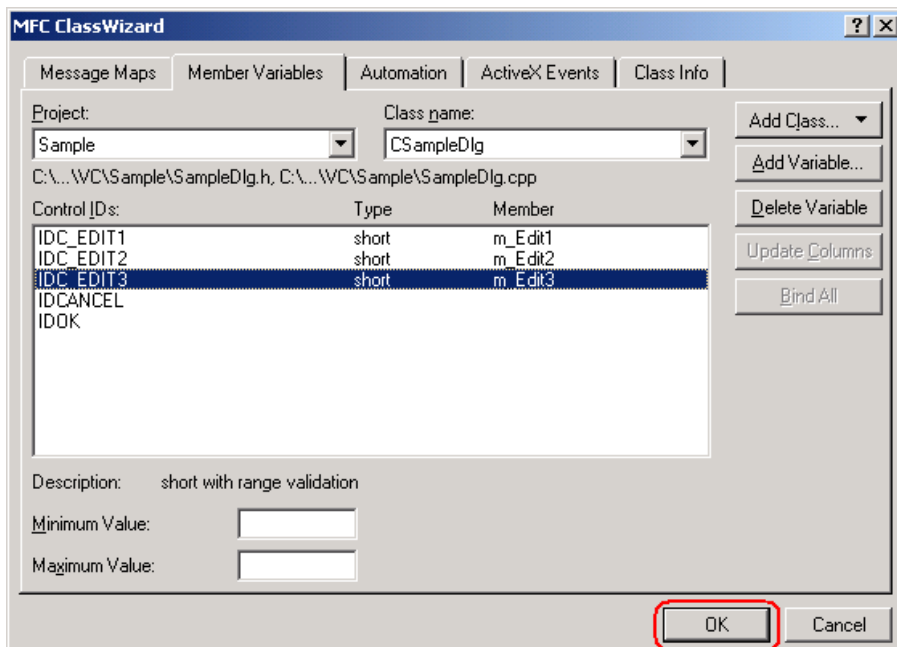
33 Select "IDC_EDIT1" for [Control IDs] in the [Member Variables] tab, and click the [Add Variable] button.



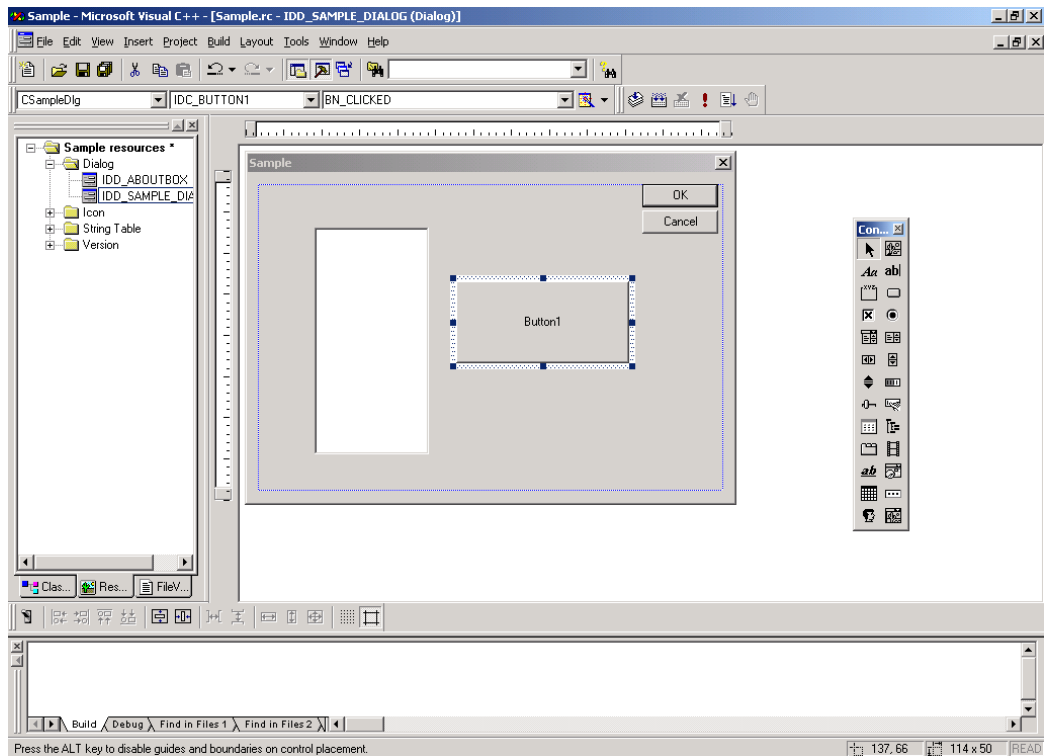
- 34 Enter "m_Edit1" for [Member Variable], and select "short" for [Variable type]. Then, click the [OK] button.
For remaining two [Edit Box], repeat steps 33 and 34. Specify "m_Edit2" and "m_Edit3" for member variables, respectively.



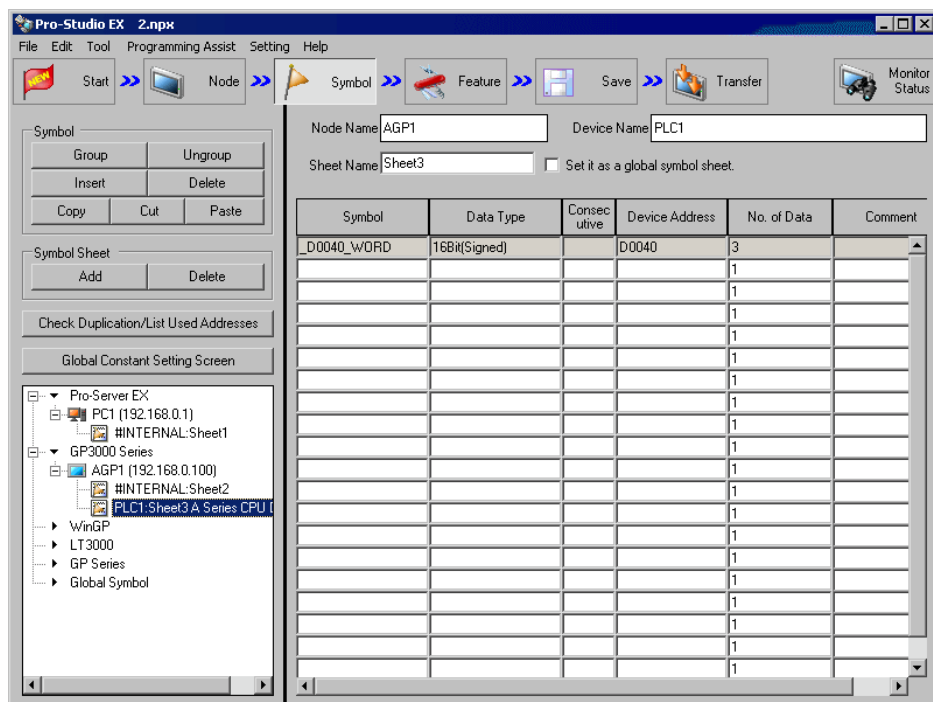
- 35 Click the [OK] button.



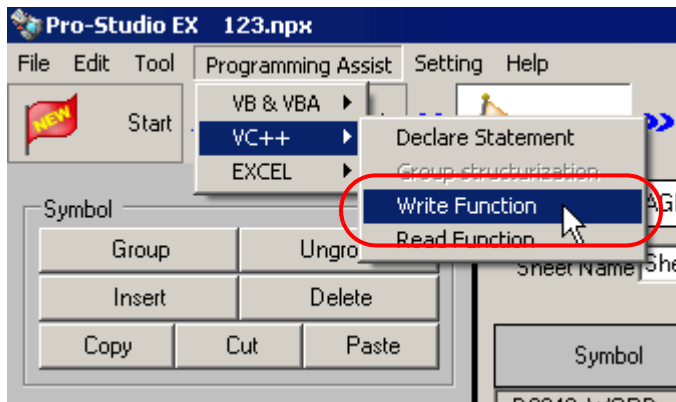
36 Select [Button], and paste it to [Dialog].



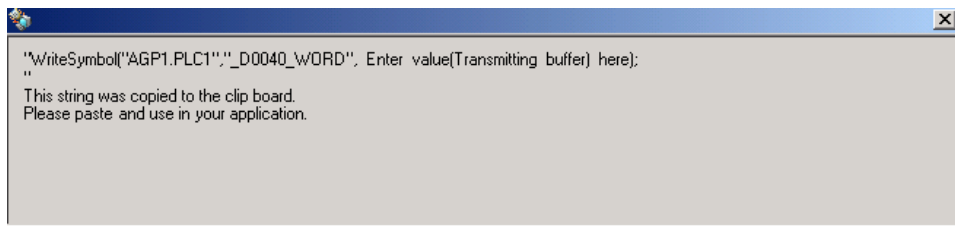
37 Select a target symbol name from those registered in 'Pro-Studio EX'. (Select the symbol with first-address for writing.)



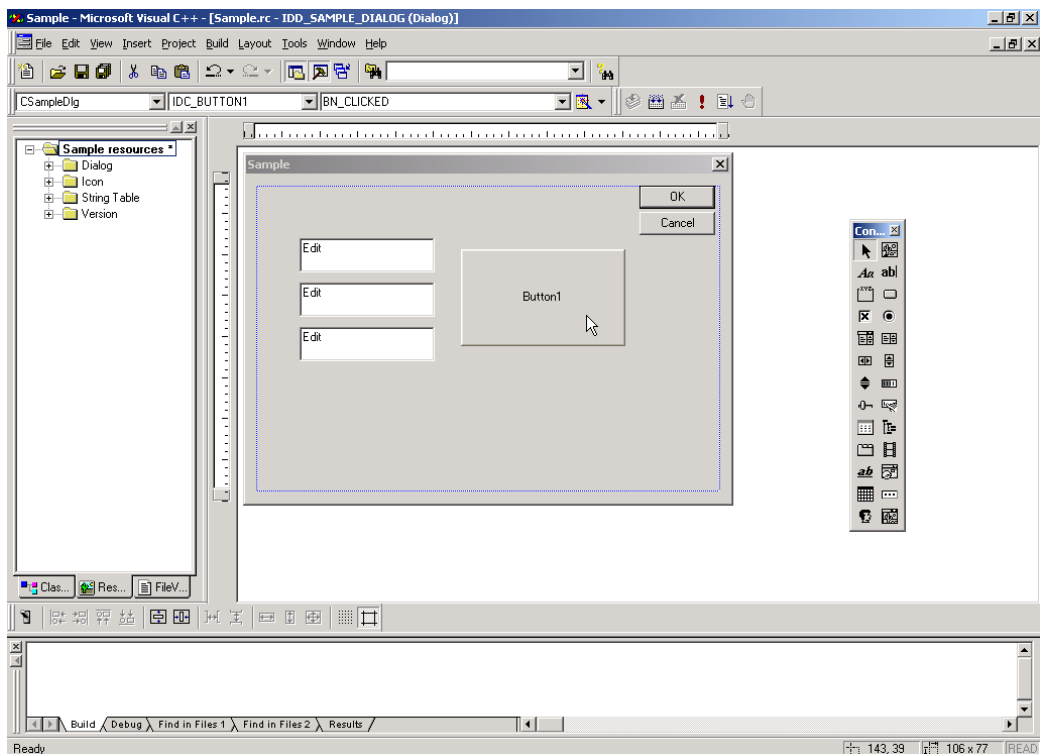
38 Select [Programming Assist] - [VC++] - [Write Function] on the menu.



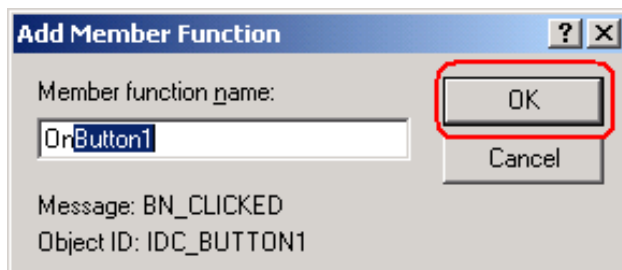
The write function is copied to the clipboard.



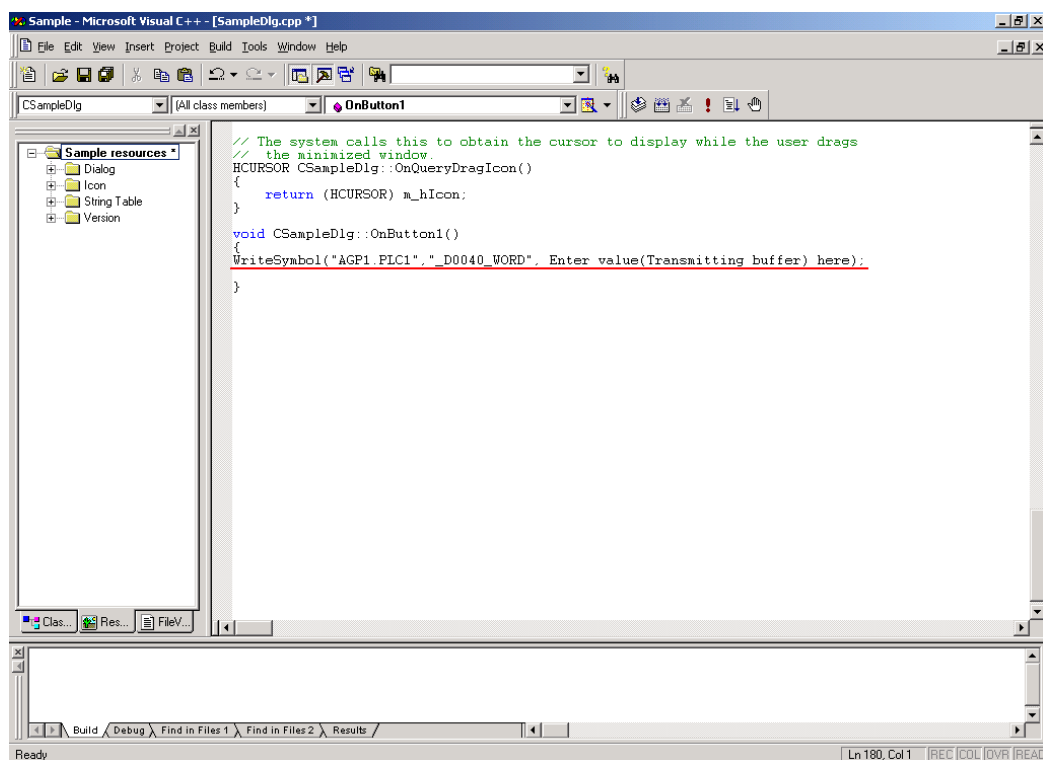
39 Double-click [Button1] that has been pasted to [Dialog] in Microsoft Visual C++.



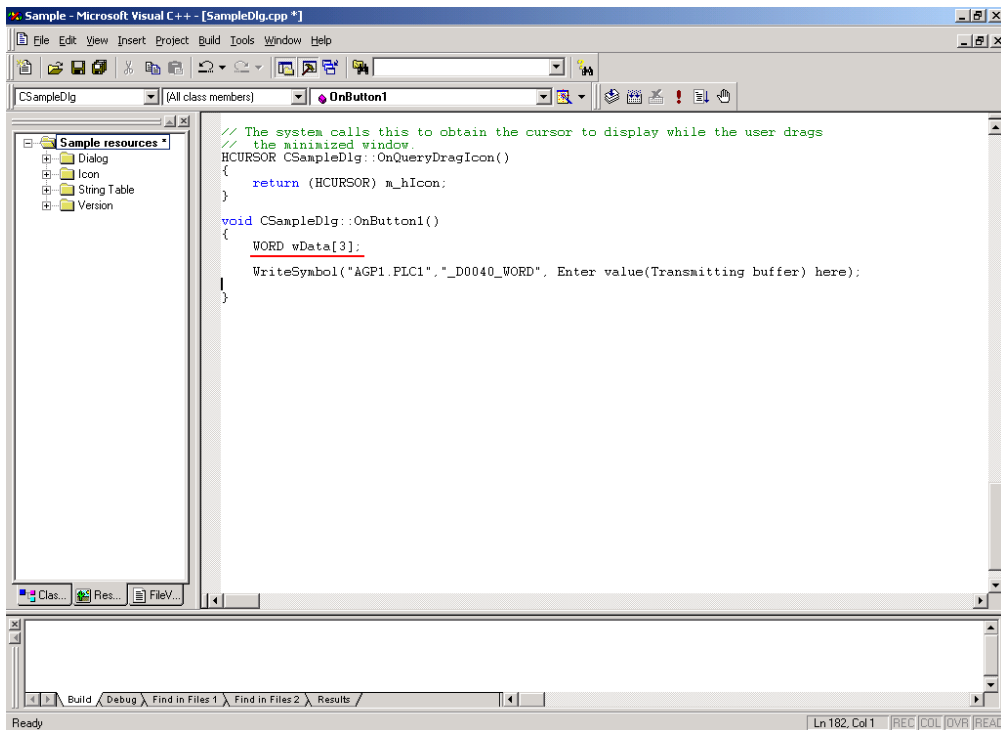
40 Click the [OK] button.



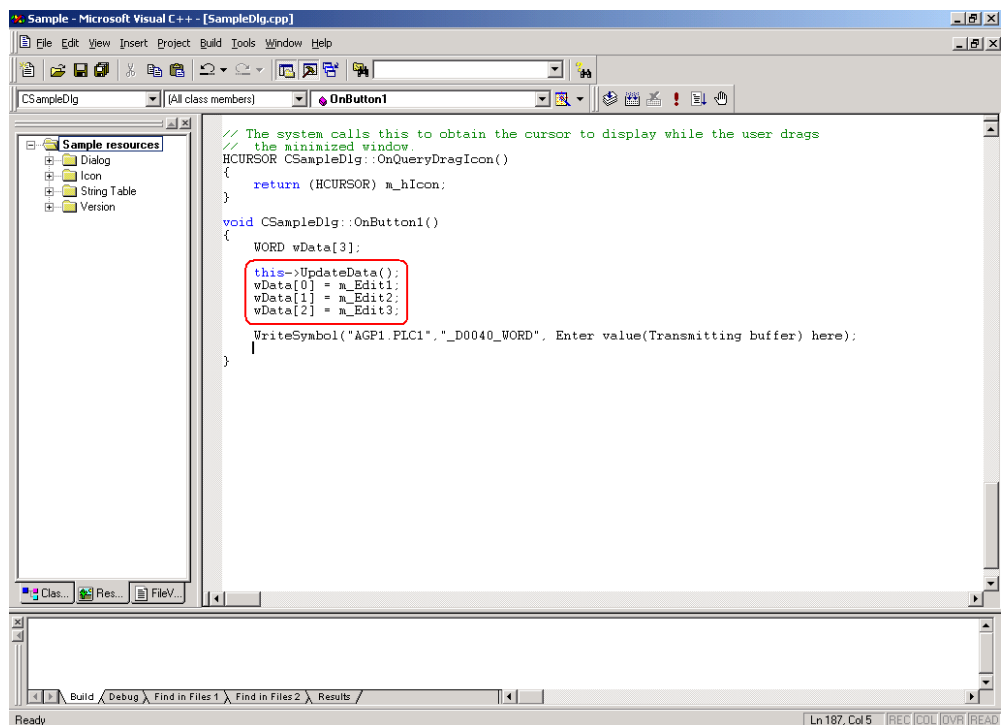
41 Paste the data on the clipboard (write function) into the OnButton1 member function.



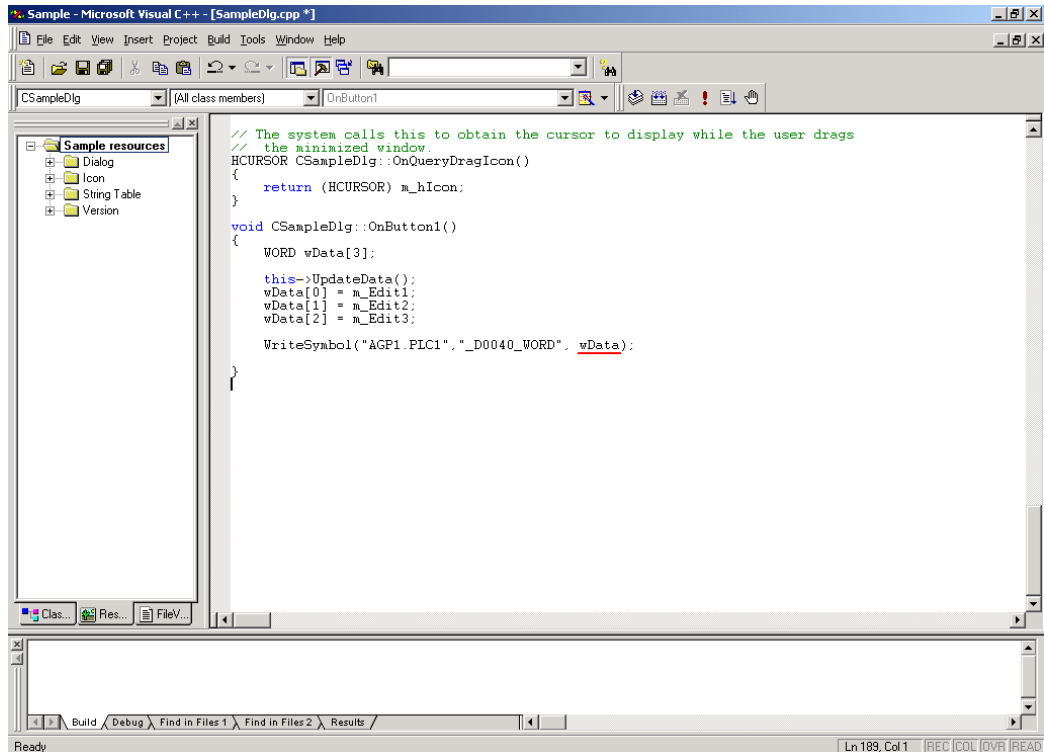
- 42 Declare the area (Array) to store the write data. For three or more writing points, specify three or more array elements.



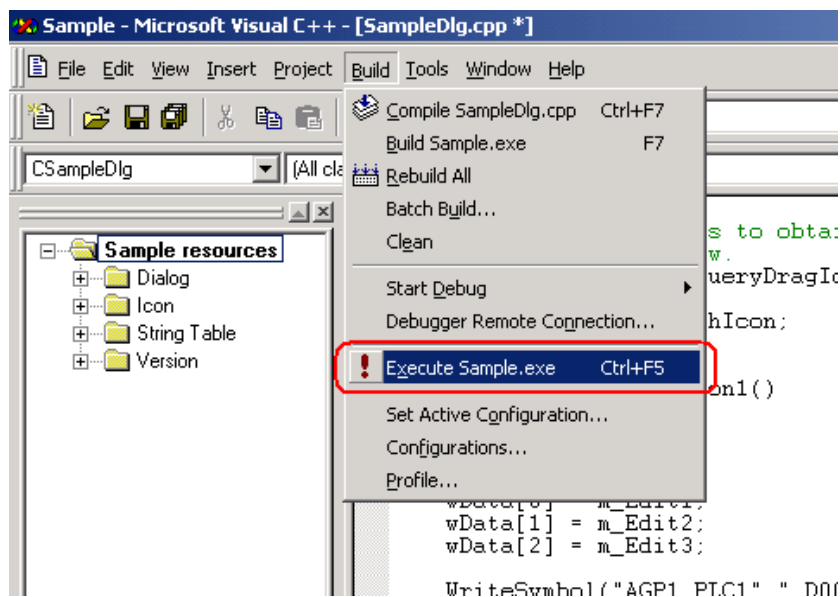
- 43 Set the data entered in [Edit Box] (for three points) into the array.



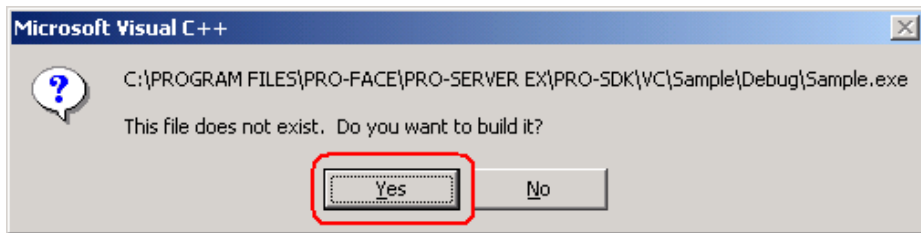
44 Specify the first alignment (wData) where the written data has been set.



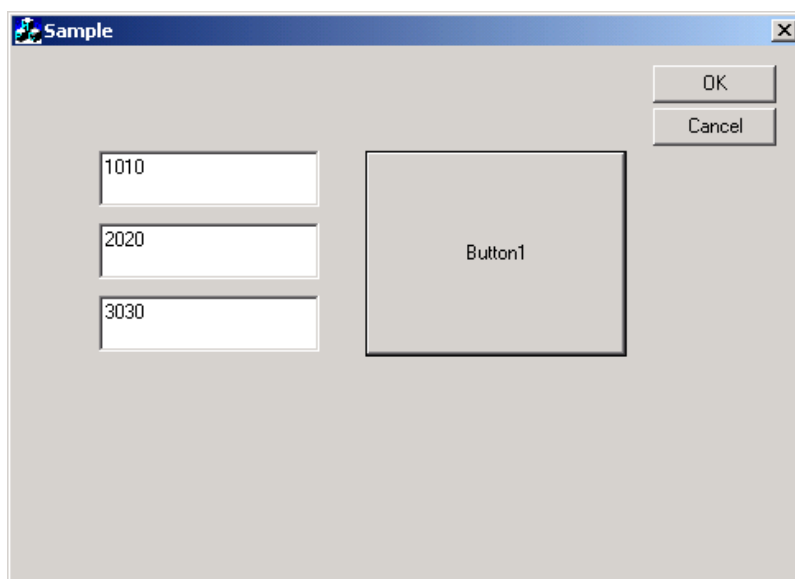
45 Select [Execute Sample.exe] from [Build] on the Microsoft Visual C++ menu.



- 46 Click the [Yes] button.

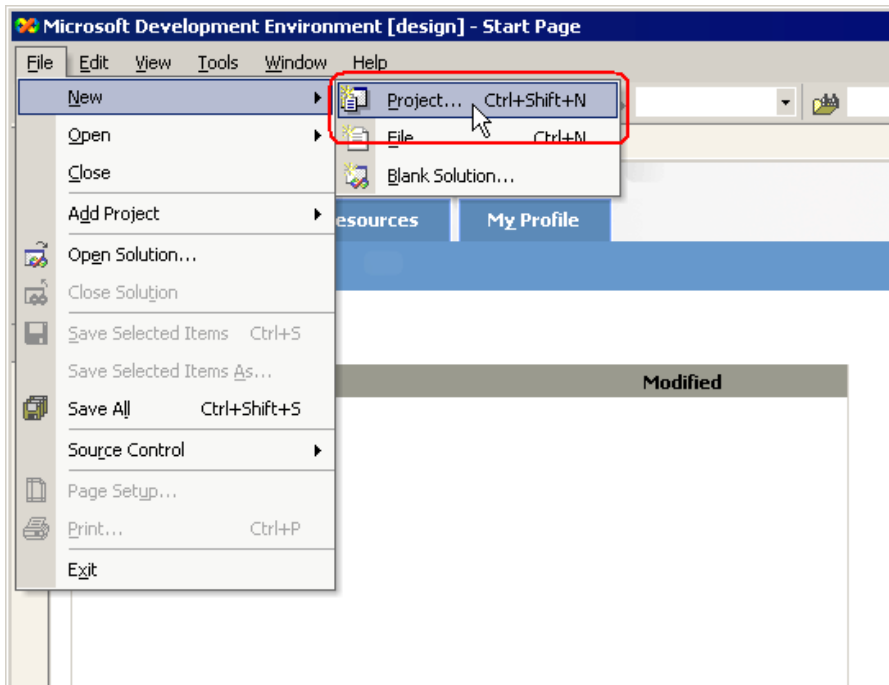


- 47 After entering the values for three points in each [Edit Box], click [Button1]. Then, 'Pro-Server EX' executes the writing of the data for three points from the symbol "_D0040_WORD".

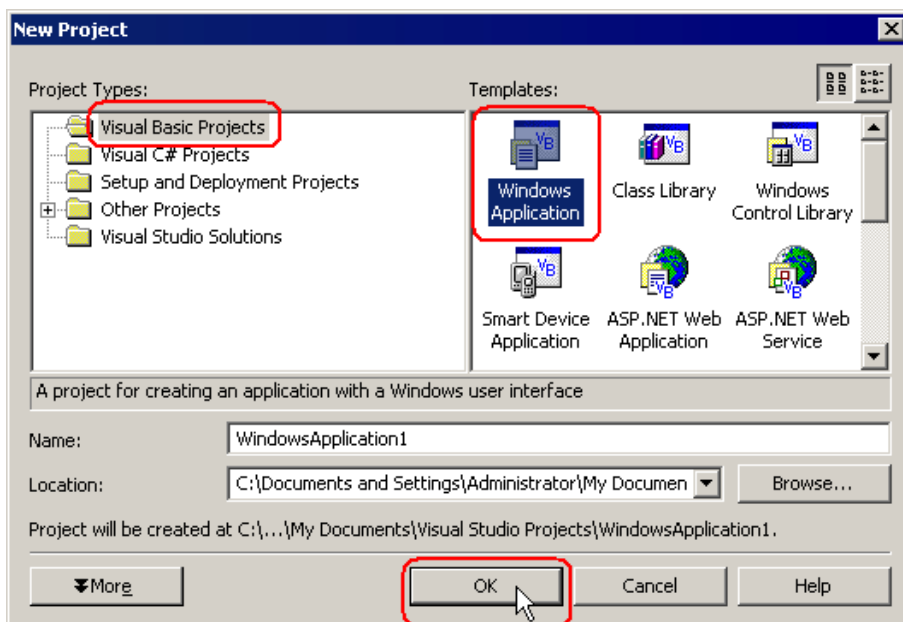


27.11.3 VB .NET Support Function

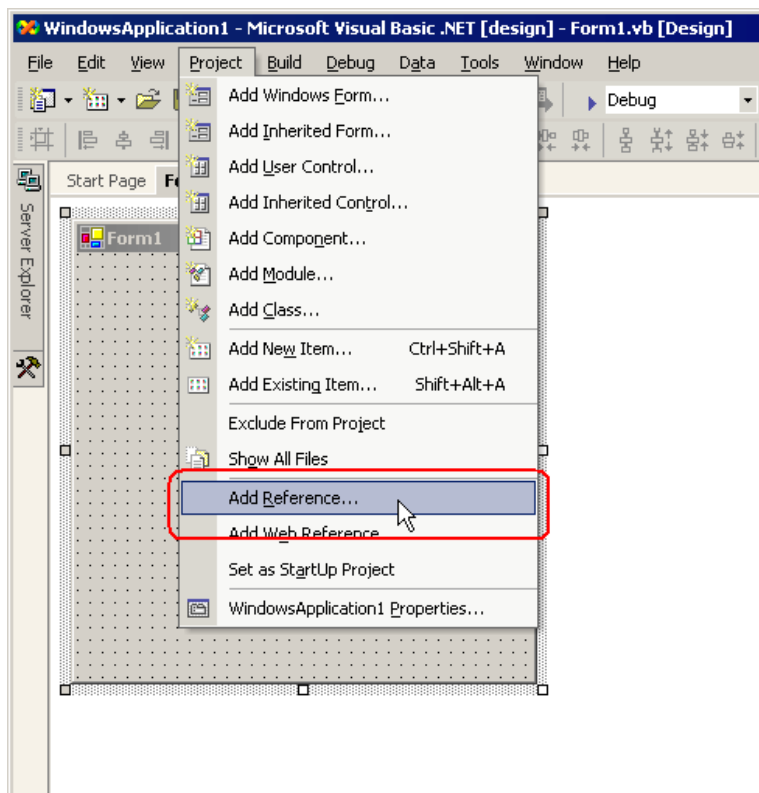
- 1 Start Microsoft Visual Studio .NET 2003 (or later version), and select [New] - [Project] from the [File] menu.



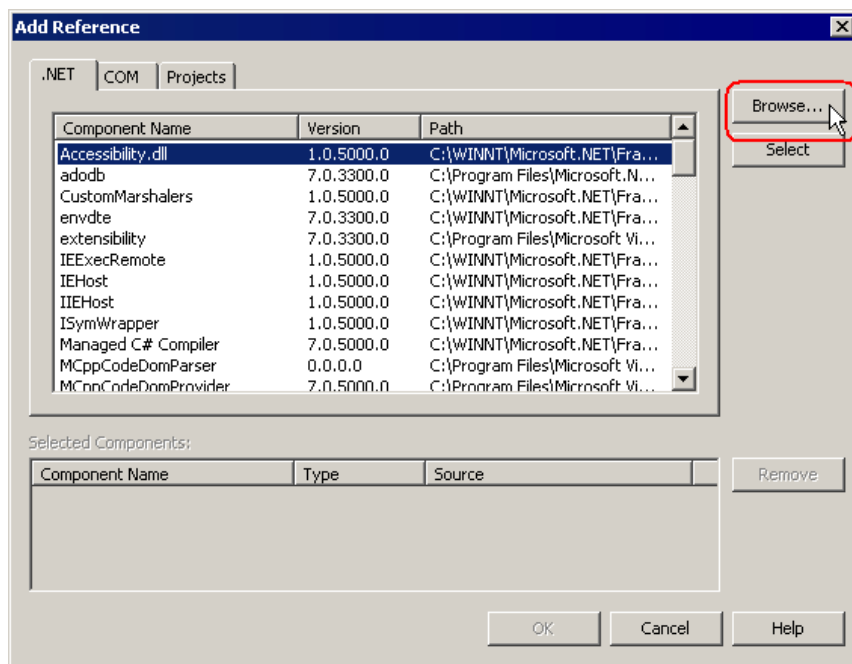
- 2 After selecting [Visual Basic Projects] in [Project Types:], select [Windows Application] in [Templates:], and click the [OK] button.



3 Select [Add Reference] from the [Project] menu.



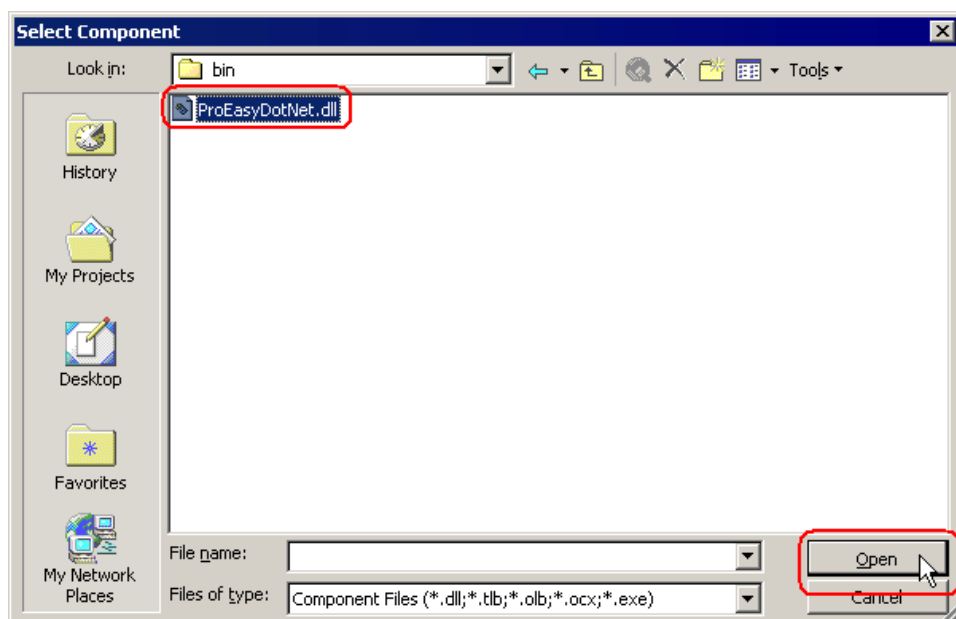
4 Click the [Browse] button.



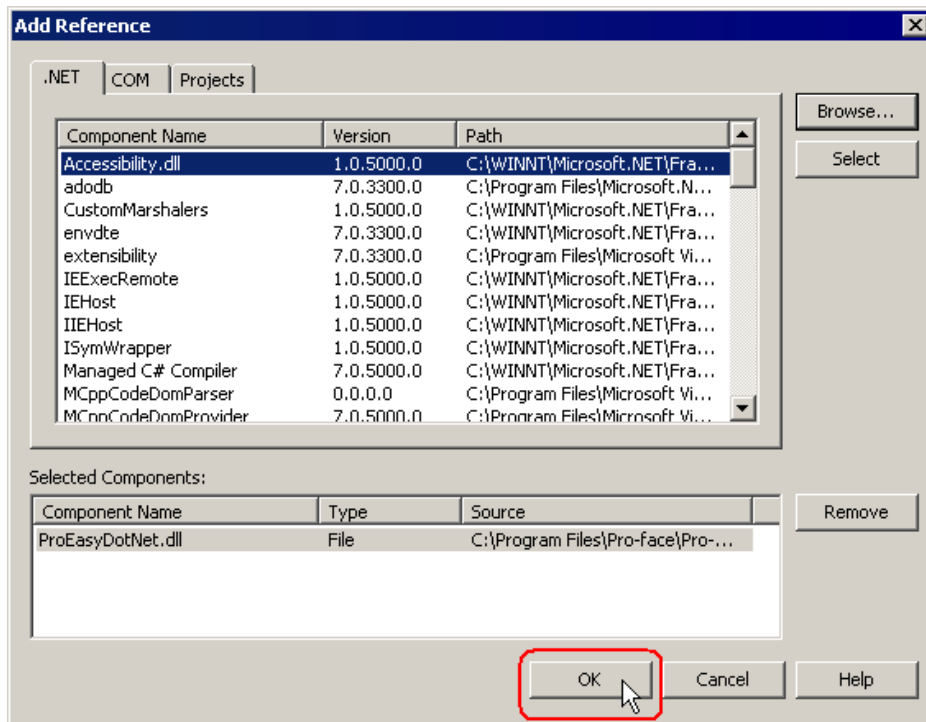
- 5 Specify the directory for ProEasyDotNet.dll to be installed, and click the [Open] button. (When installed as standard, the directory is "C:\Program Files\Pro-face\Pro-Server EX\PRO-SDK\DotNet\bin\ProEasyDotNet.dll".)

NOTE

- Microsoft .NET Framework 1.1 support for ProEasyDotNet
C:\Program File(x86)\Pro-face\Pro-Server EX\PRO-SDK\DotNet\bin\ProEasyDotNet.dll
- Microsoft .NET Framework 2.0 support for ProEasyDotNet
C:\Program File(x86)\Pro-face\Pro-Server EX\PRO-SDK\DotNet20\bin\ProEasyDotNet.dll



6 Click the [OK] button.



"ProEasyDotNet.dll" will be registered.

This completes the VB.NET operating environment setup.

The above 1 to 6 steps apply to both reading and writing applications.

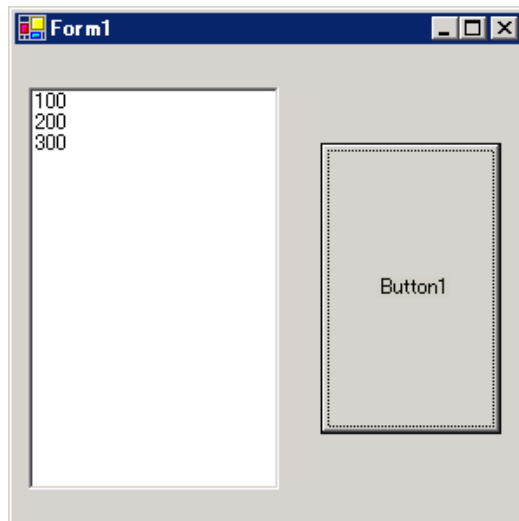
The following procedure varies depending on whether the application is intended for reading or writing, and so is explained individually.

To create a "Reading" application, refer to steps 7 to 19.

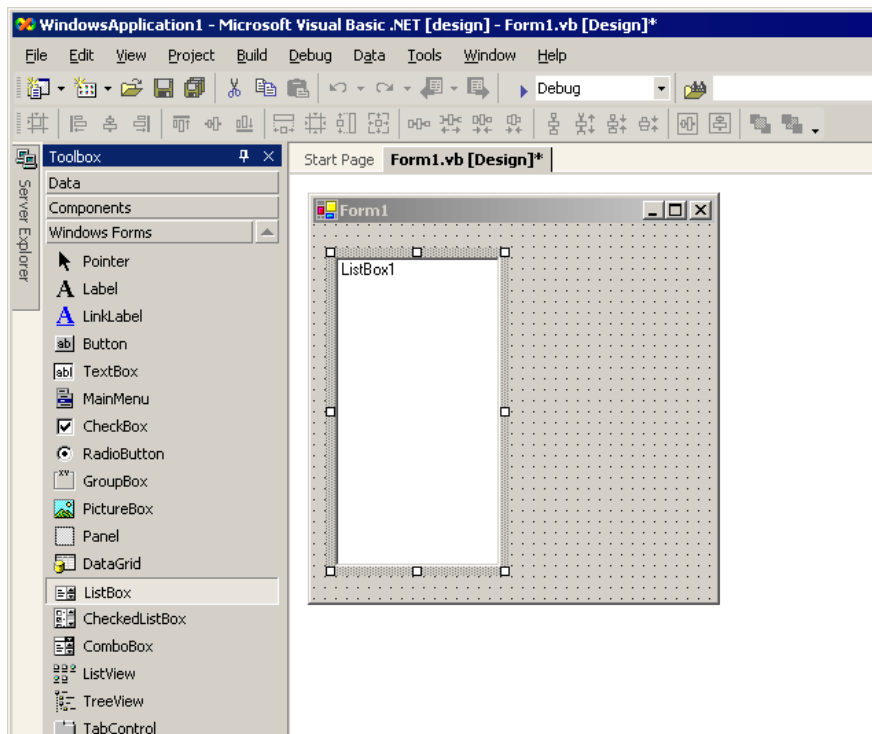
To create a "Writing" application, refer to steps 20 to 32.

Creating "Reading" application

This section describes the application that reads and displays data (signed 16 bits) on three items when you click [Button1].

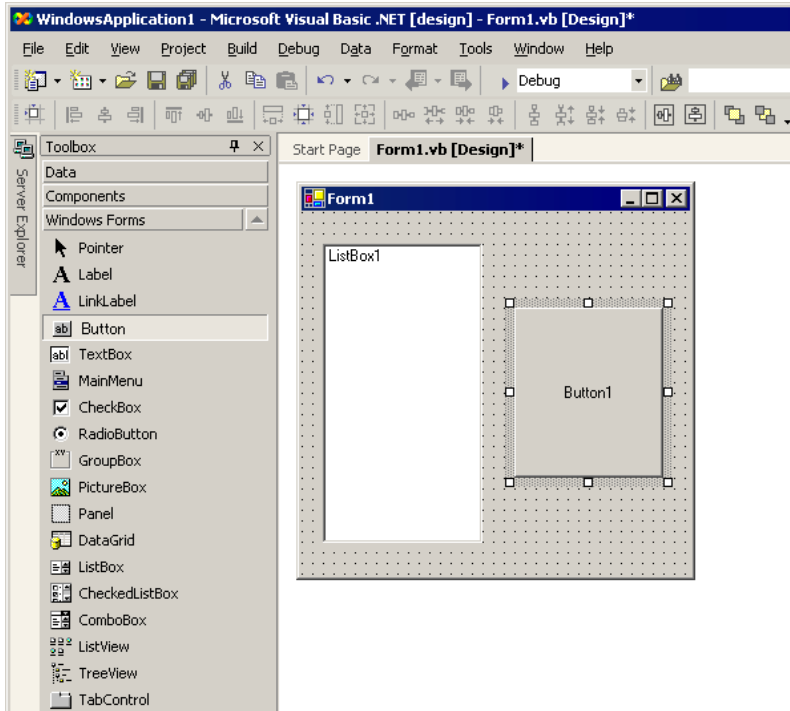


7 After selecting [ListBox] in [Toolbox], clip and paste it onto [Form1].

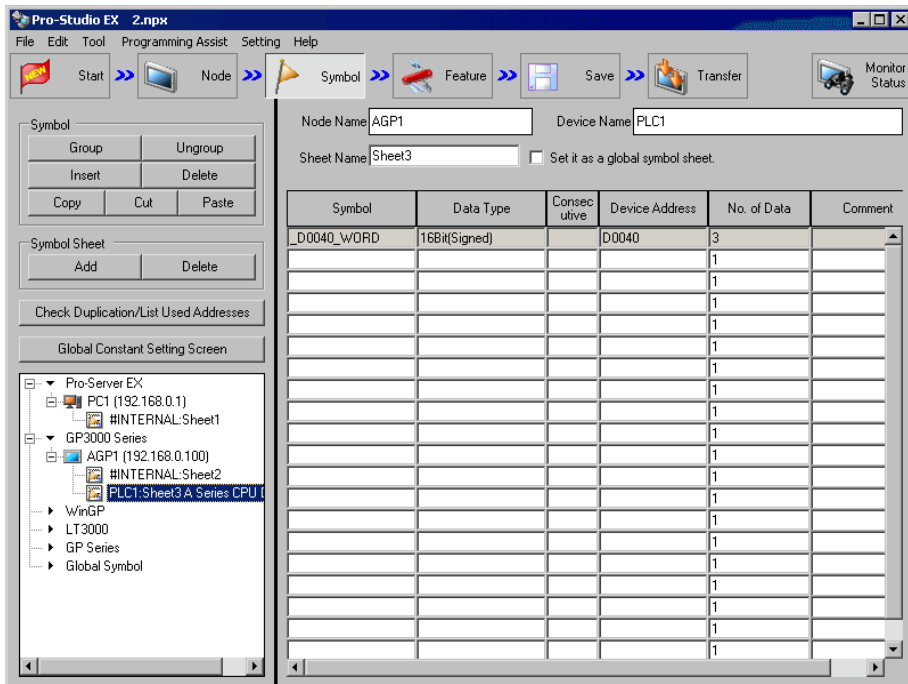


* If [Toolbox] is not displayed, select [Toolbox] from the [View] menu.

8 After selecting [Button] in [Toolbox], clip and paste it onto [Form1].

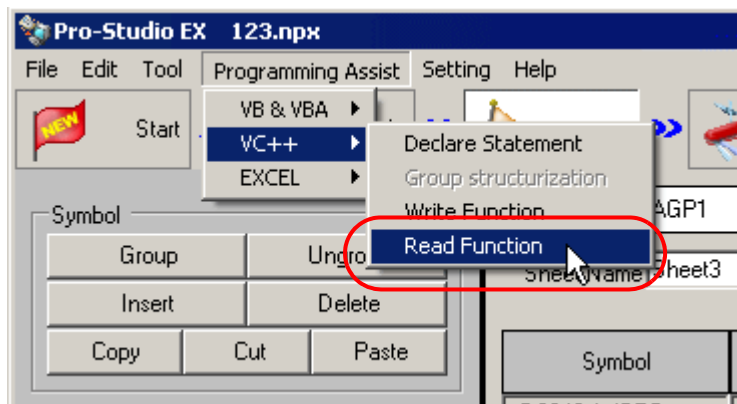


9 Select a desired read symbol name from the symbols that have been registered in 'Pro-Studio EX'.

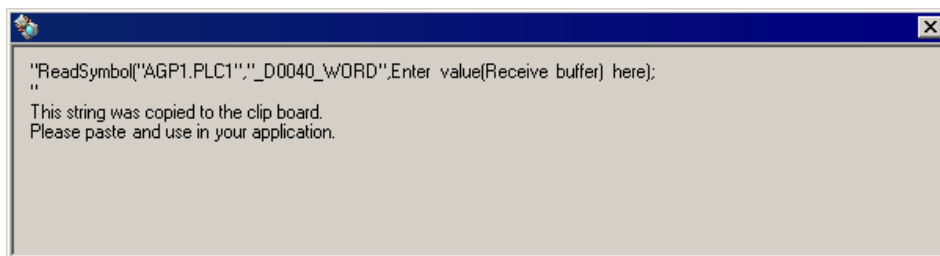


* The above example shows the symbol for the data type of [16Bit (Signed)] and the data quantity of "3".

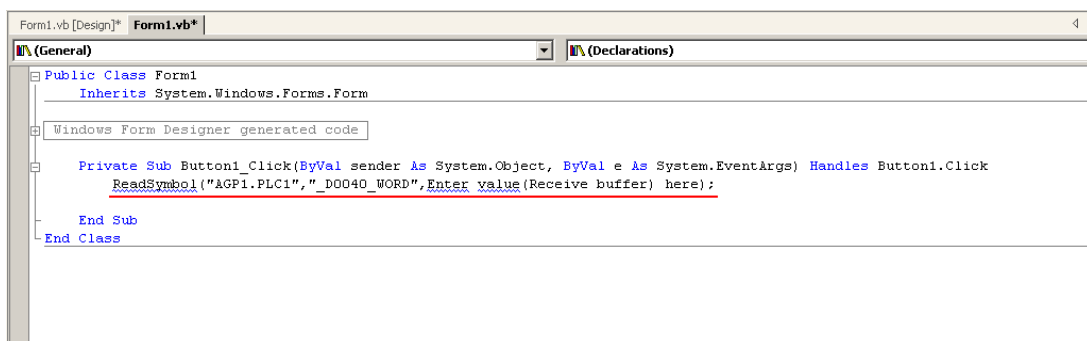
- 10 Select [VC++] - [Read Function] from the [Programming Assist] menu.



The read function is copied to the clipboard.

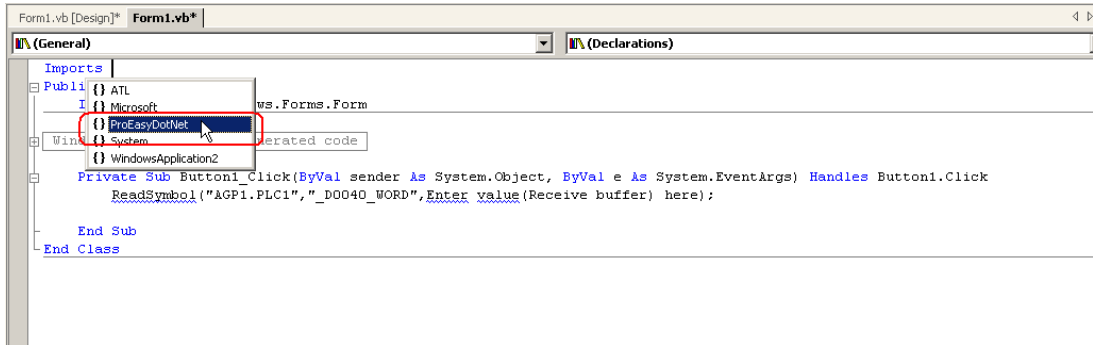


- 11 Double-click [Button1] in [Form1], and paste the clipboard data (read function) between the Sub statement and the End Sub statement.



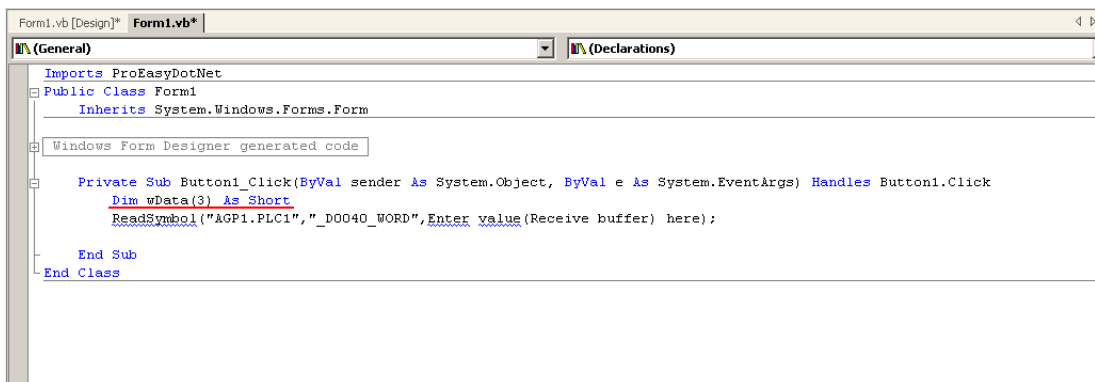
12 Import the ProEasyDotNet library.

Enter "Imports" at the head of the source code, and select [ProEasyDotNet] from the displayed list box.

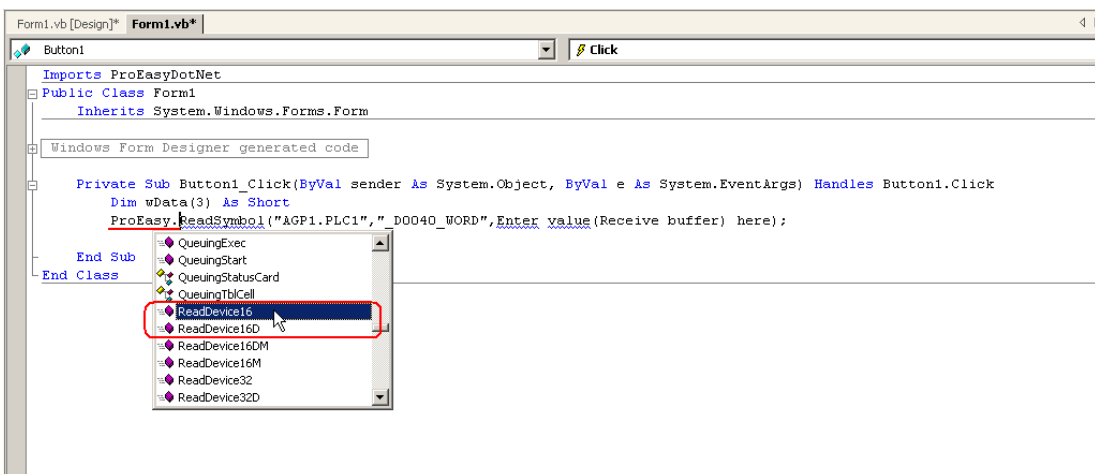


13 For the read data storing area, declare a variable "wData".

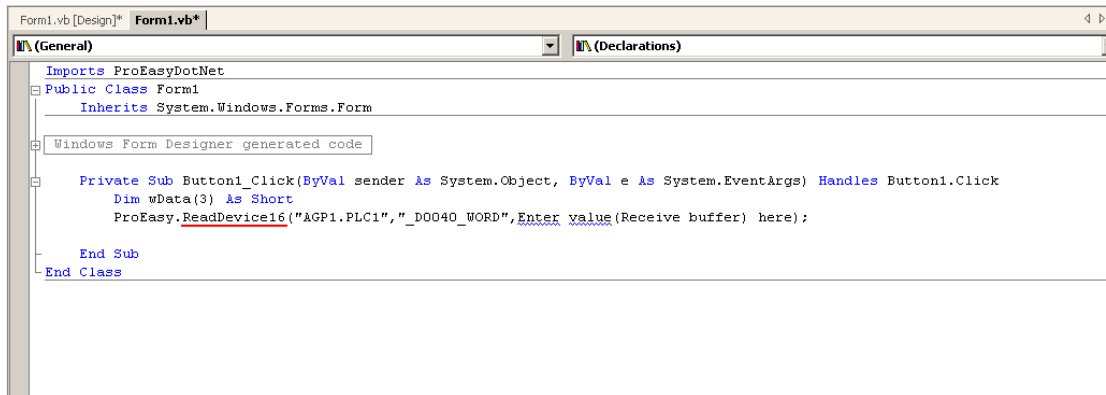
The array type ("Short" in this example) must conform to the data type of the target symbol. Specify the same data length as the target symbol ("3" in this example).



14 Enter "ProEasy." before "ReadSymbol", and select [ReadDevice16] from the displayed list box.



- 15 Delete "ReadSymbol" from the character string (read function) that has been pasted from the clipboard.



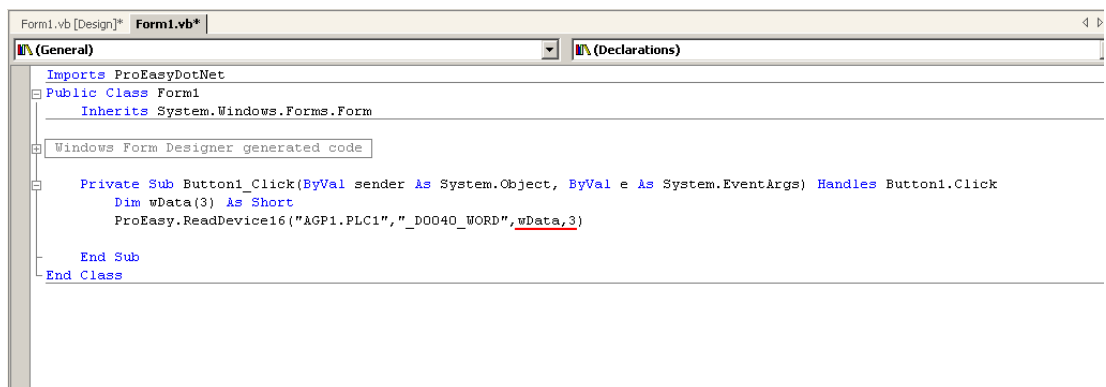
```
Imports ProEasyDotNet

Public Class Form1
    Inherits System.Windows.Forms.Form

    Windows Form Designer generated code

    Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button1.Click
        Dim wData(3) As Short
        ProEasy.ReadDevice16("AGP1.PLC1", "_D0040_WORD", Enter value (Receive buffer) here);
    End Sub
End Class
```

- 16 Specify a data storing area "wData" as the third argument. Enter ", " (comma) at the end of the third argument, and then enter "3" to specify the length of the target symbol as the fourth argument. After that, delete ";" (semicolon) at the end of the line.



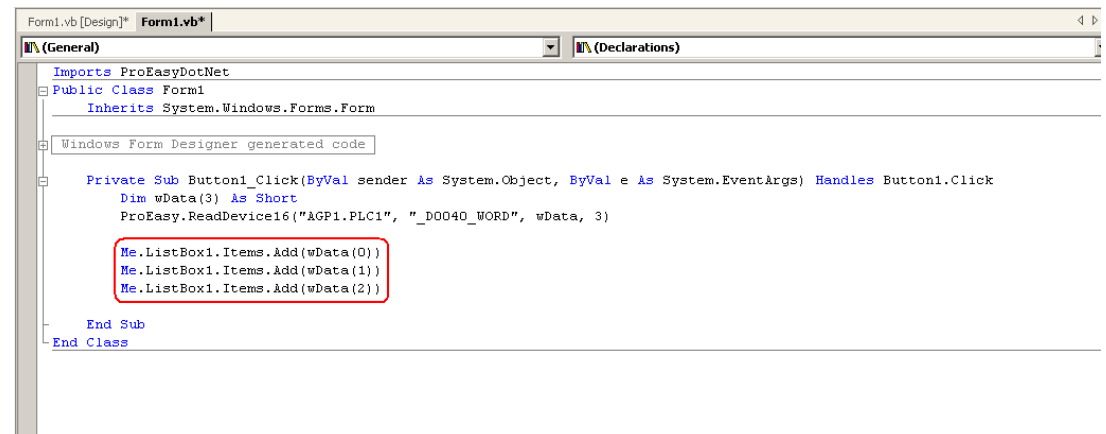
```
Imports ProEasyDotNet

Public Class Form1
    Inherits System.Windows.Forms.Form

    Windows Form Designer generated code

    Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button1.Click
        Dim wData(3) As Short
        ProEasy.ReadDevice16("AGP1.PLC1", "_D0040_WORD", wData, 3)
    End Sub
End Class
```

- 17 Add the read data on three items (wData(0), wData(1), wData(2)) into [ListBox1] in this order.



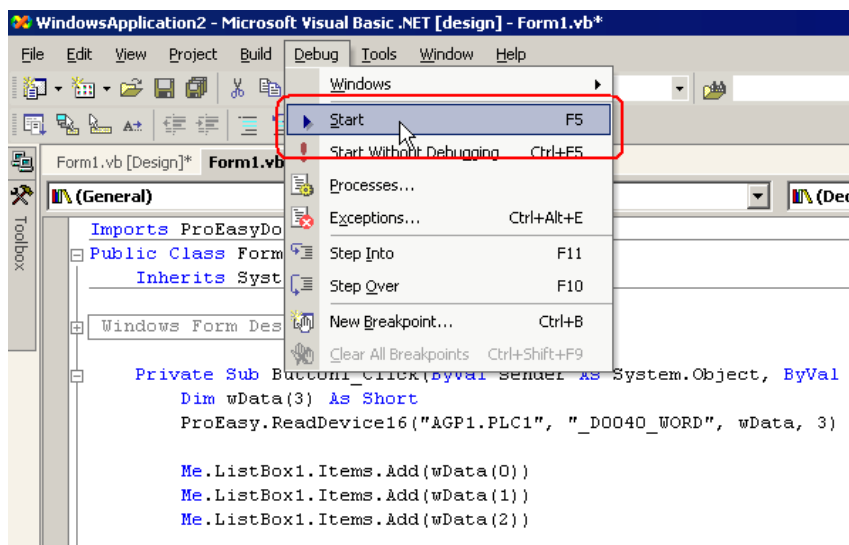
```
Imports ProEasyDotNet

Public Class Form1
    Inherits System.Windows.Forms.Form

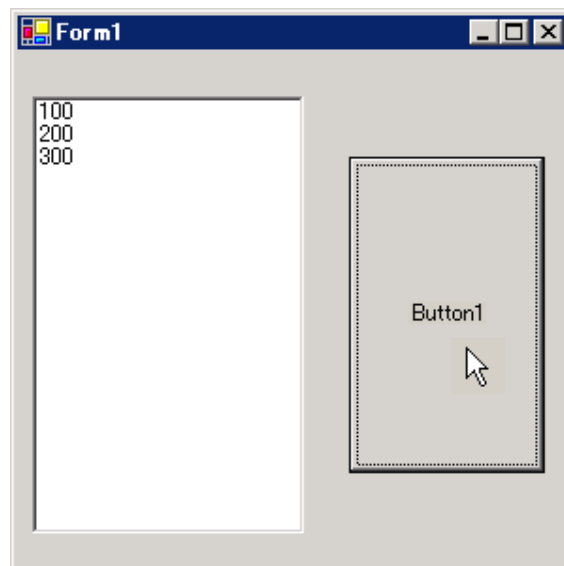
    Windows Form Designer generated code

    Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button1.Click
        Dim wData(3) As Short
        ProEasy.ReadDevice16("AGP1.PLC1", "_D0040_WORD", wData, 3)
        Me.ListBox1.Items.Add(wData(0))
        Me.ListBox1.Items.Add(wData(1))
        Me.ListBox1.Items.Add(wData(2))
    End Sub
End Class
```

18 Select [Start] from the [Debug] menu.

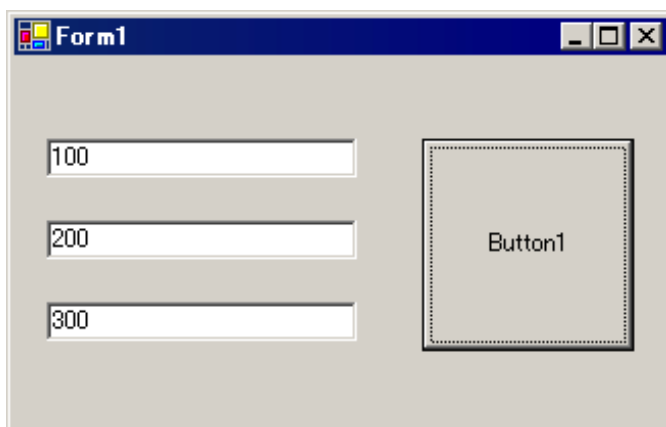


19 If you click [Button1], the target symbol data (three items) are displayed in [ListBox].

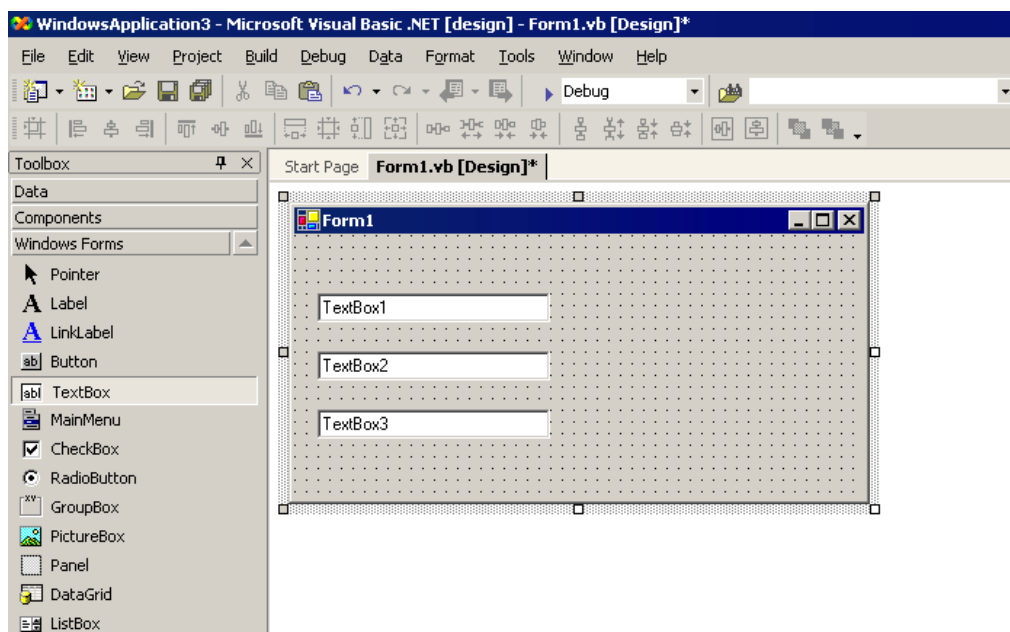


Creating "Writing" application

This section describes the application that writes data (signed 16 bits) on three items when you click [Button1].

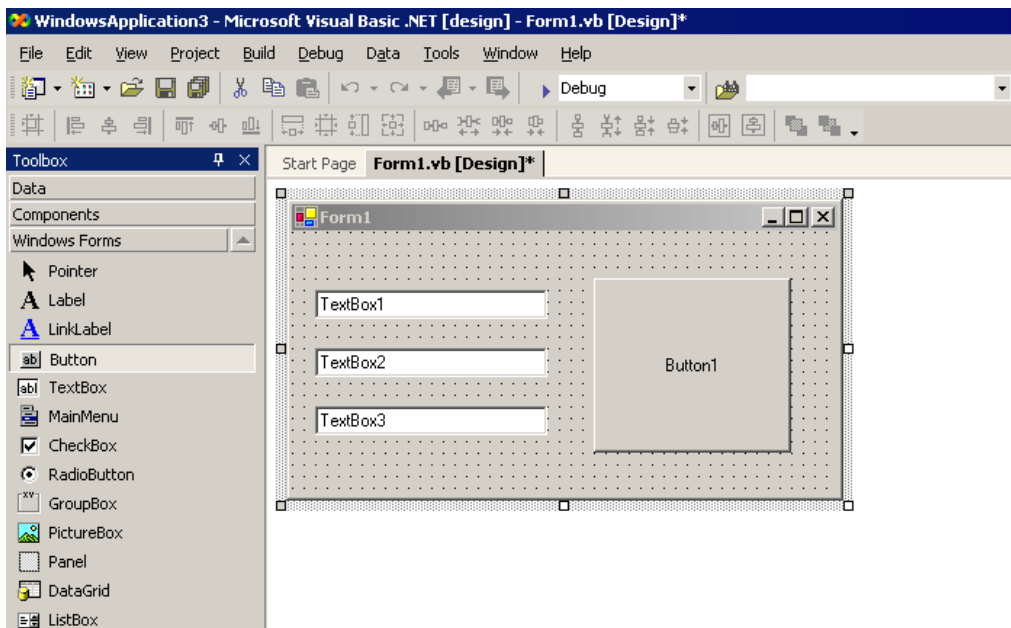


20 After selecting [TextBox] in [Toolbox], clip and paste three text boxes onto [Form1].

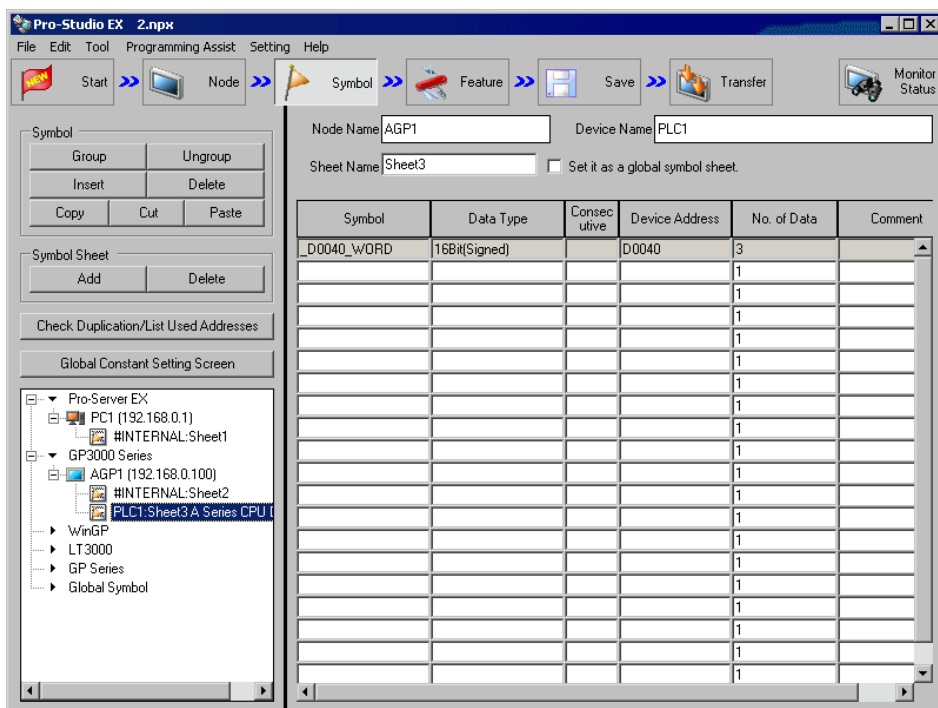


* If [Toolbox] is not displayed, select [Toolbox] from the [View] menu.

21 After selecting [Button] in [Toolbox], clip and paste it onto [Form1].

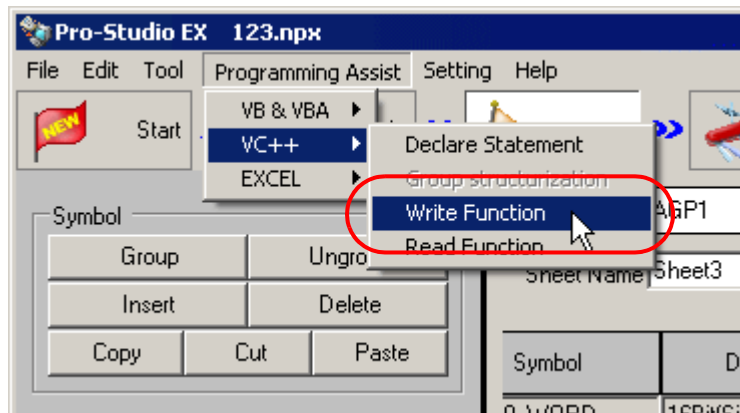


22 Select a desired write symbol name from the symbols that have been registered in 'Pro-Studio EX'. (Select the first writing area.)

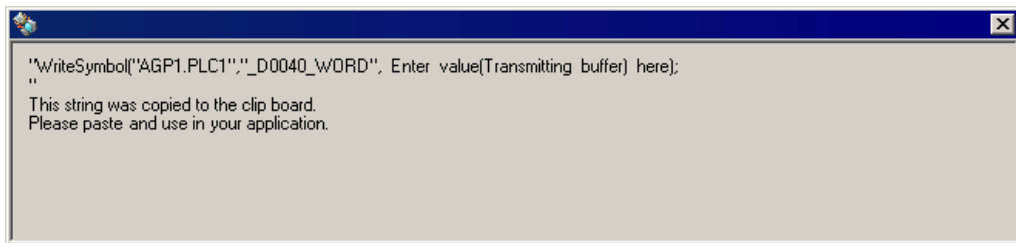


* The above example shows the symbol for the data type of [16Bit (Signed)] and the data quantity of "3".

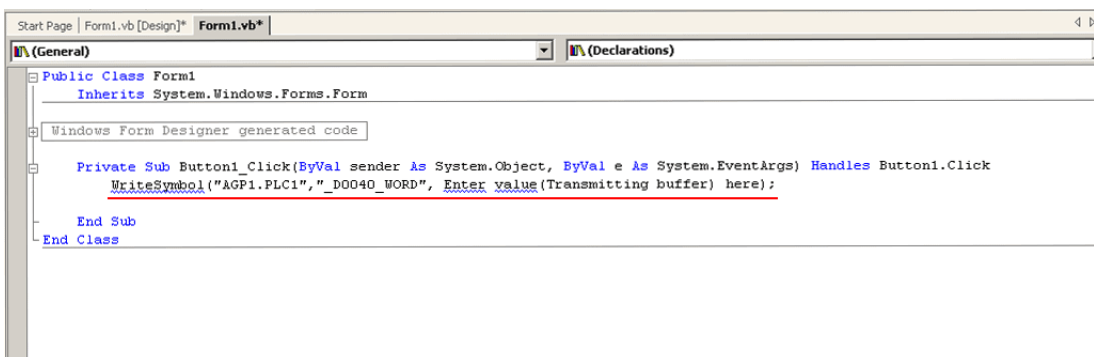
- 23 Select [VC++] - [Write Function] from the [Programming Assist] menu.



The write function is copied to the clipboard.

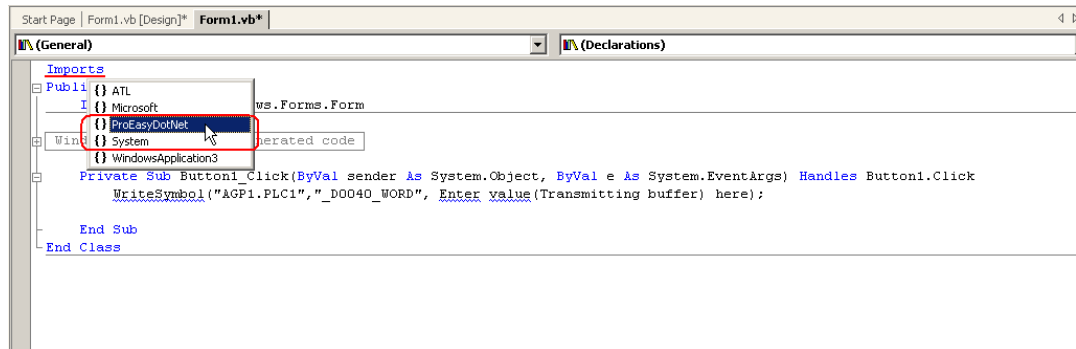


- 24 Double-click [Button1] in [Form1], and paste the clipboard data (write function) below the [Button1_Click] method ("Private Sub Button1_Click..." character string).



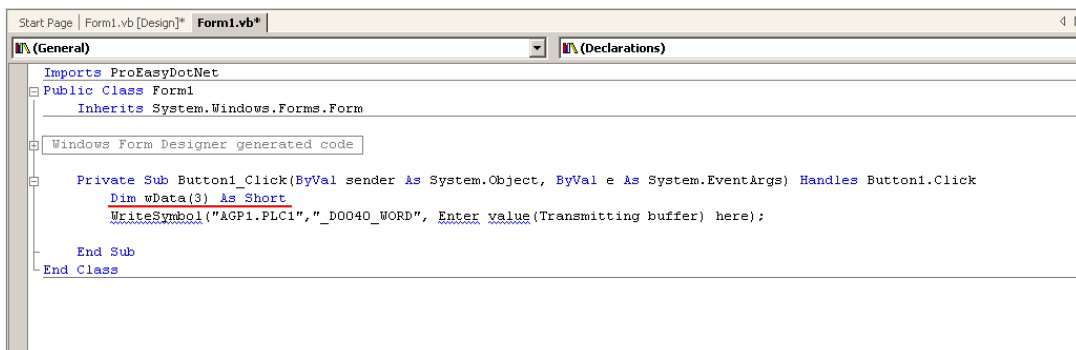
25 Import the ProEasyDotNet library.

Enter "Imports" at the head of the source code, and select [ProEasyDotNet] from the displayed list box.

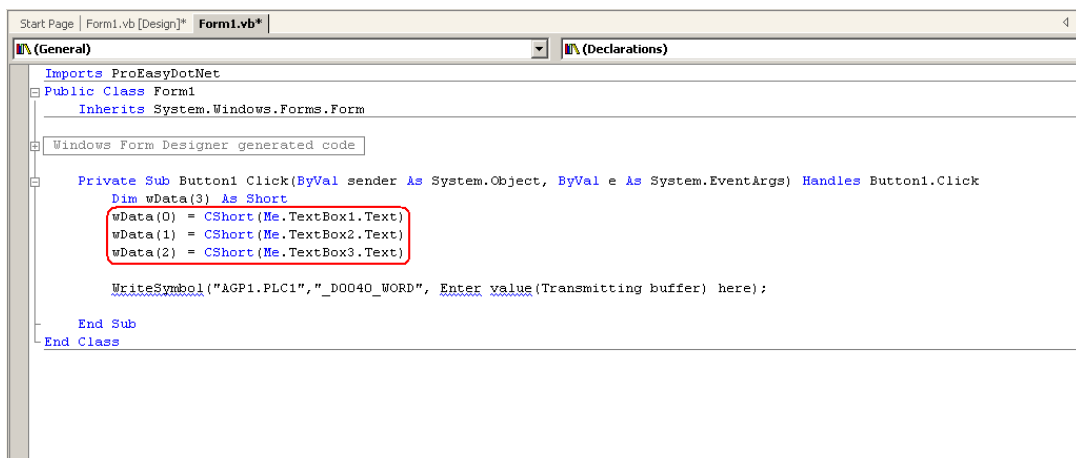


26 For the write data storing area, declare a variable "wData".

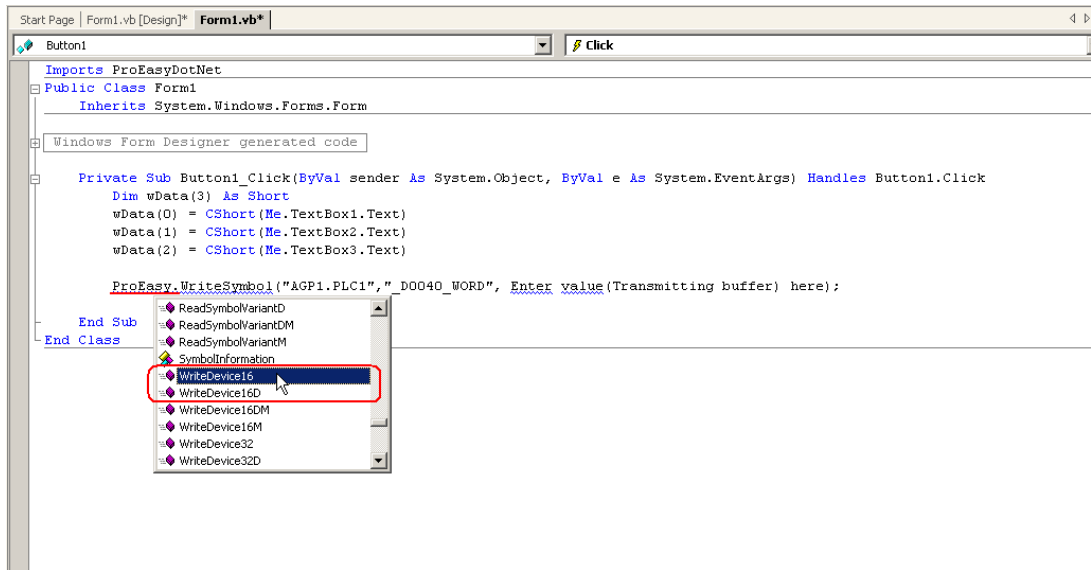
The array type ("Short" in this example) must conform to the data type of the target symbol. Specify the same data length as the target symbol ("3" in this example).



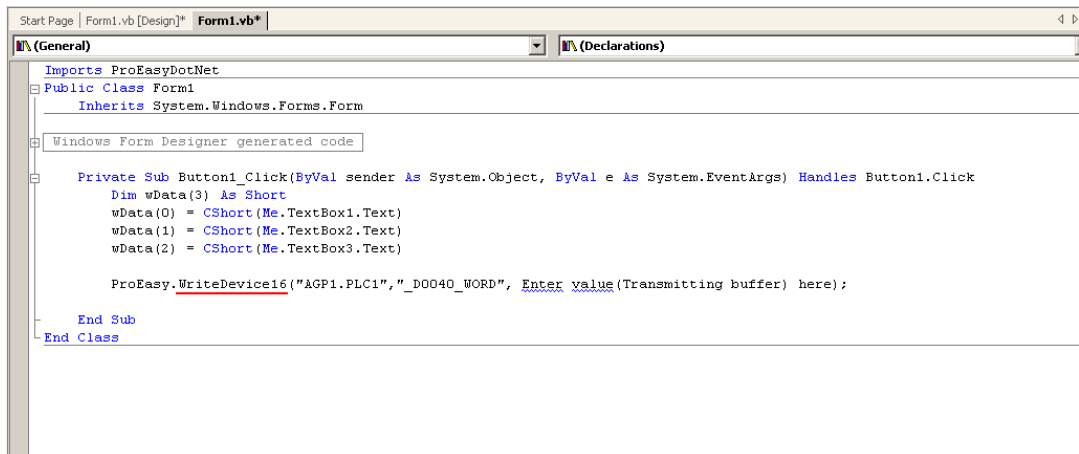
27 Set the data to be entered in [TextBox1] to [TextBox3] in the array.



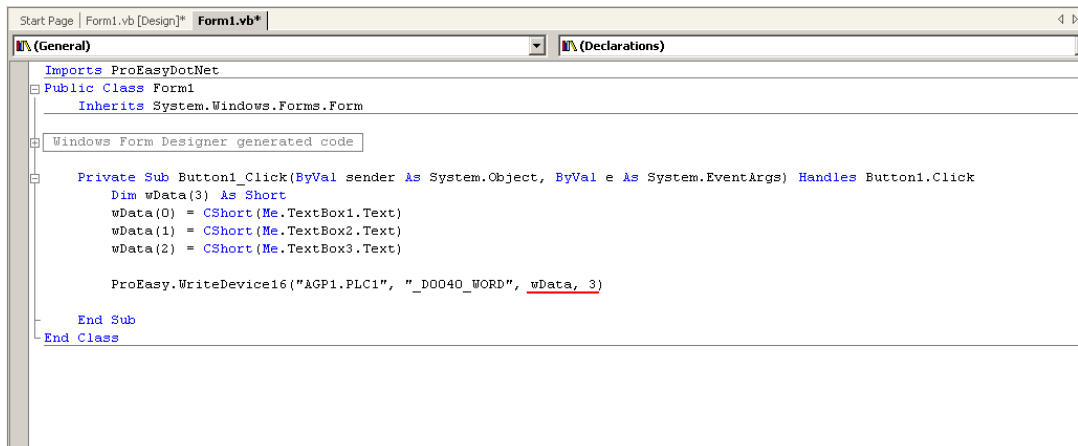
28 Enter "ProEasy." before "WriteSymbol", and select [WriteDevice16] from the displayed list box.



29 Delete "WriteSymbol" from the character string (write function) that has been pasted from the clipboard.



- 30 Specify a data storing area "wData" as the third argument. Enter "," (comma) at the end of the third argument, and then enter "3" to specify the length of the target symbol as the fourth argument. After that, delete ";" (semicolon) at the end of the line.



```
Imports ProEasyDotNet
Public Class Form1
    Inherits System.Windows.Forms.Form

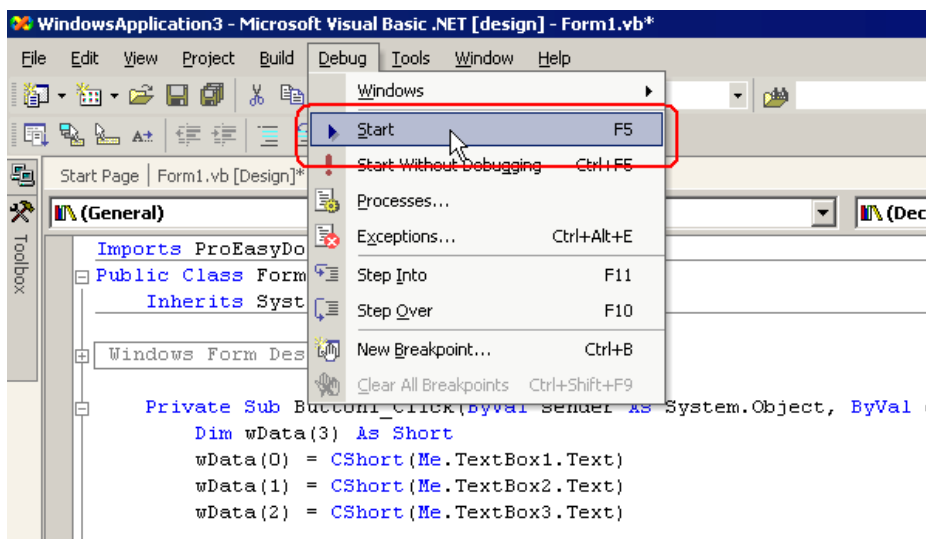
    Windows Form Designer generated code

    Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button1.Click
        Dim wData(3) As Short
        wData(0) = CShort(Me.TextBox1.Text)
        wData(1) = CShort(Me.TextBox2.Text)
        wData(2) = CShort(Me.TextBox3.Text)

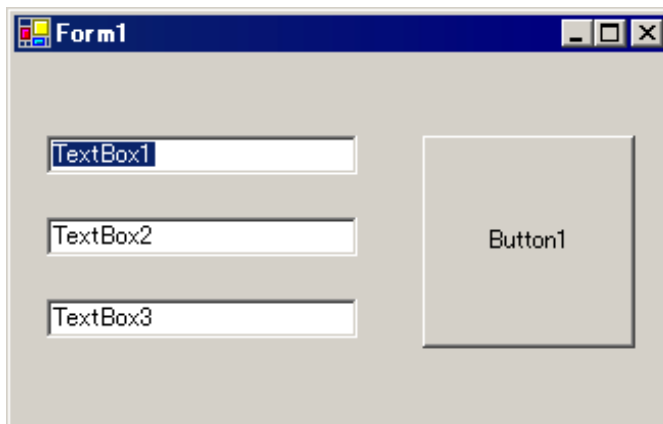
        ProEasy.WriteDevice16("AGP1.PLC1", "_D0040_WORD", wData, 3)

    End Sub
End Class
```

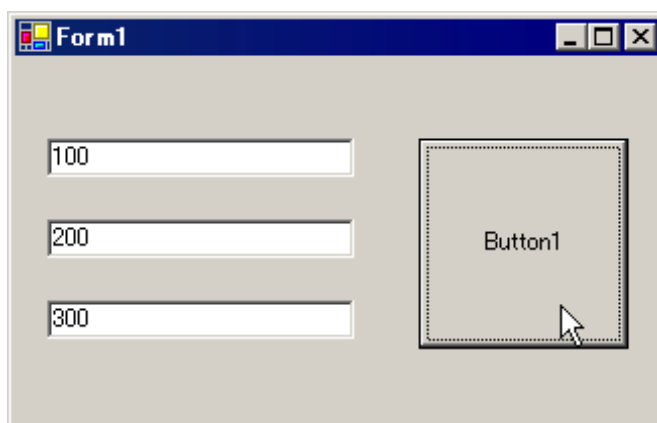
- 31 Select [Start] from the [Debug] menu.



32 Immediately after startup, a character string "TextBox*" is displayed in [TextBox].

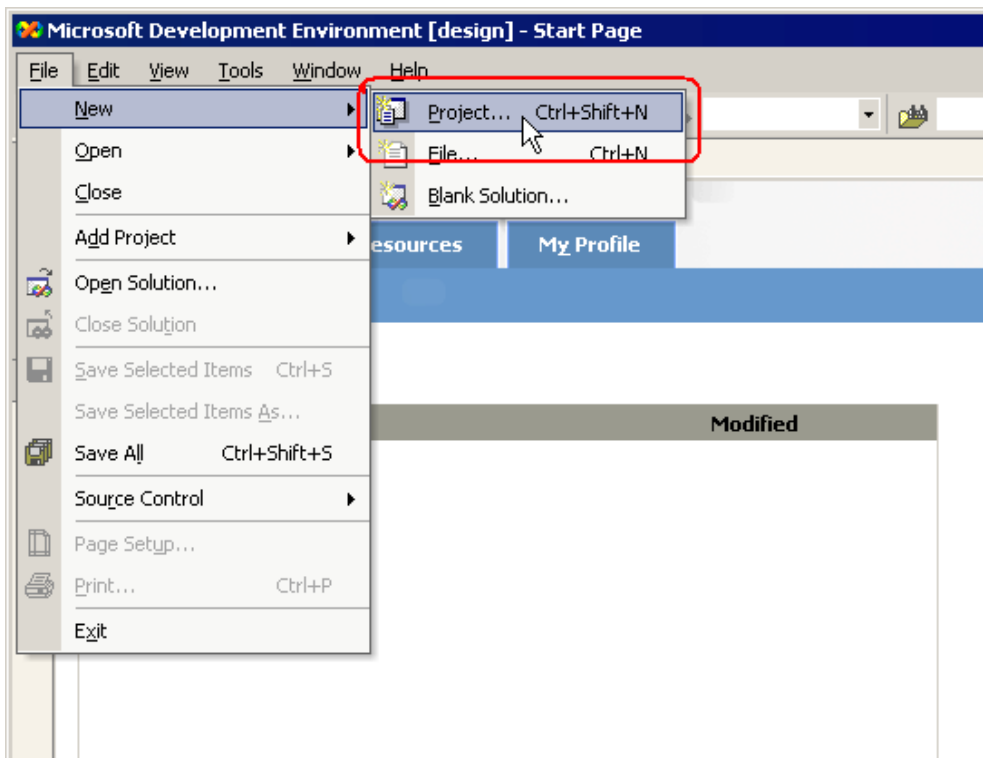


After entering the write data (three items) in [TextBox], click [Button1]. Then, the data will be written into the area specified with the symbol.

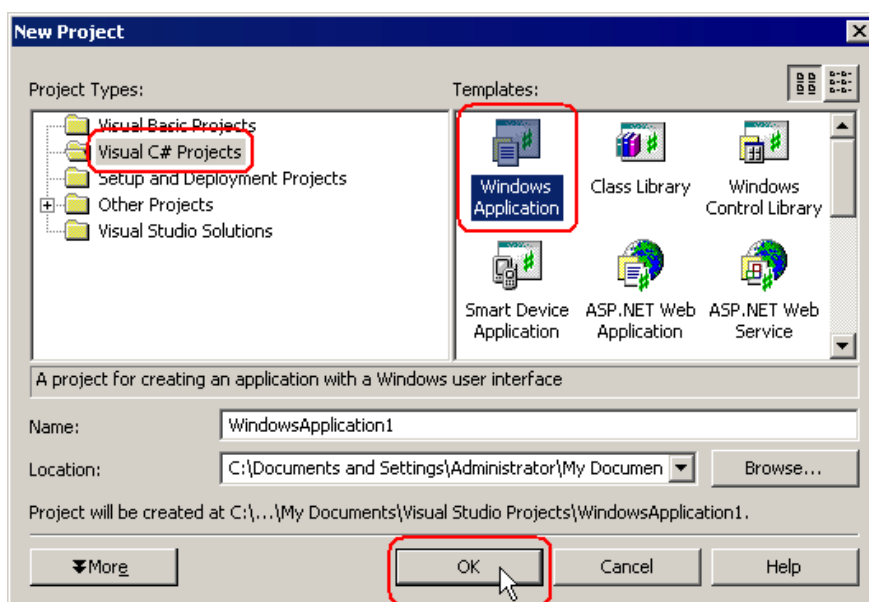


27.11.4 C# Support Function

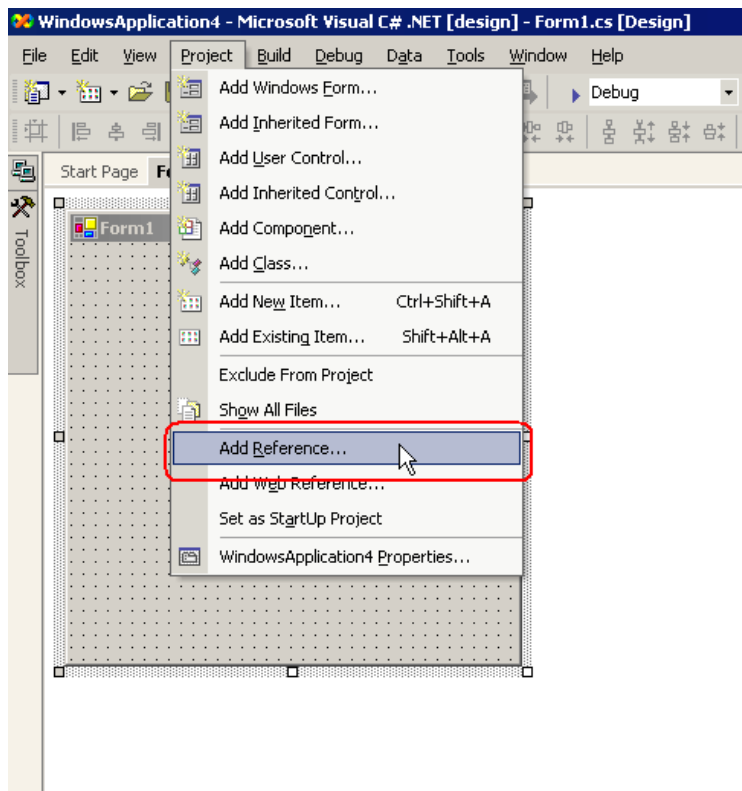
- 1 Start Microsoft Visual Studio .NET 2003 (or later version), and select [New] - [Project] from the [File] menu.



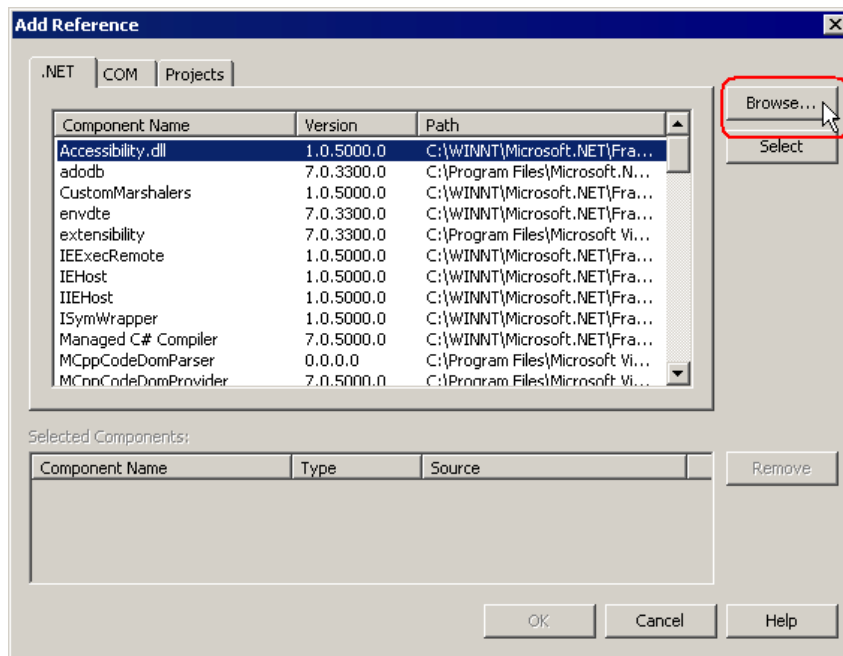
- 2 After selecting [Visual C# Projects] in [Project Types:], select [Windows Application] in [Templates:], and click the [OK] button.



3 Select [Add Reference] from the [Project] menu.



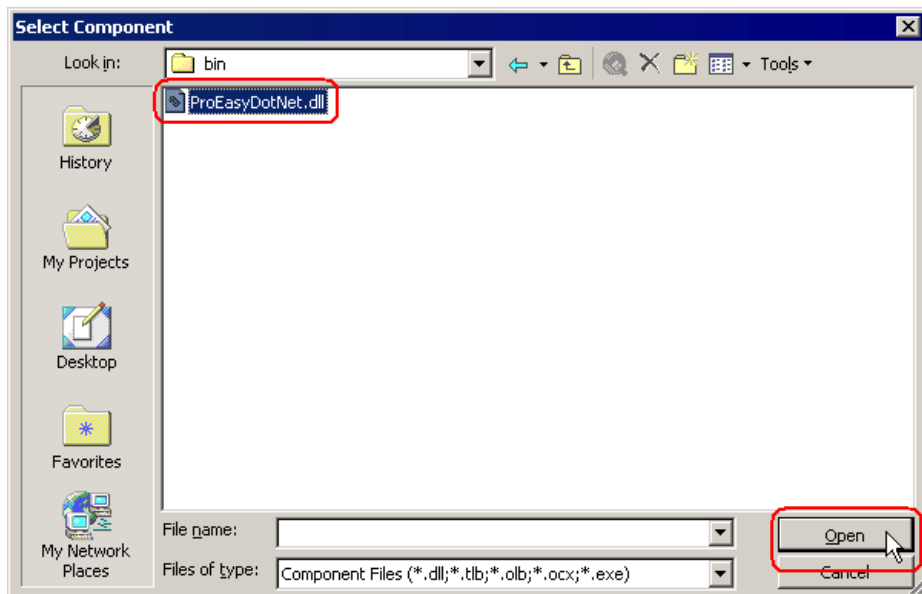
4 Click the [Browse] button.



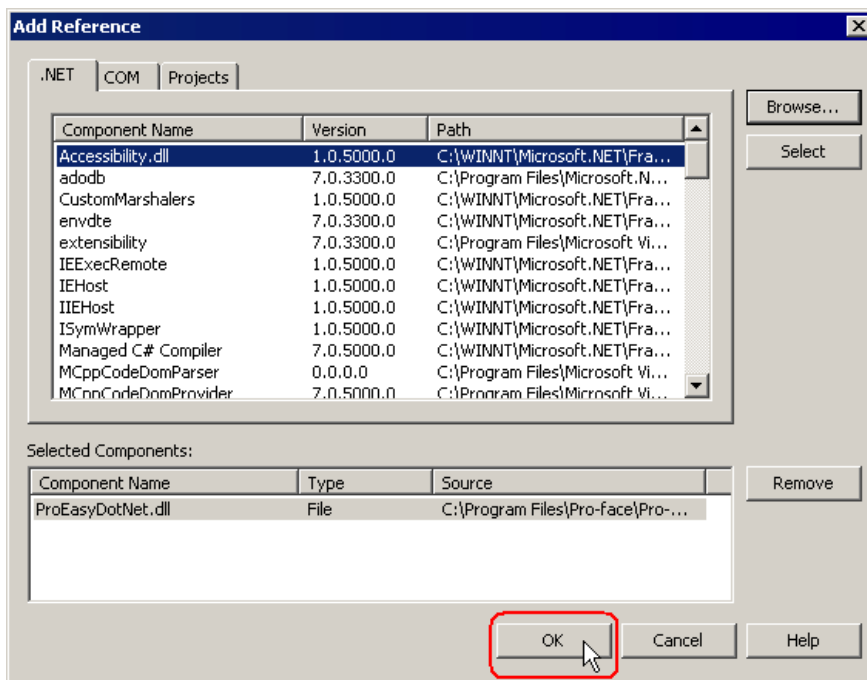
- 5 Specify the directory for ProEasyDotNet.dll to be installed, and click the [Open] button. (When installed as standard, the directory is "C:\Program Files\Pro-face\Pro-Server EX\PRO-SDK\DotNet\bin\ProEasyDotNet.dll".)

NOTE

- Microsoft .NET Framework 1.1 support for ProEasyDotNet
C:/Program File(x86)/Pro-face/Pro-Server EX/PRO-SDK/DotNet/bin/ProEasyDotNet.dll
- Microsoft .NET Framework 2.0 support for ProEasyDotNet
C:/Program File(x86)/Pro-face/Pro-Server EX/PRO-SDK/DotNet20/bin



6 Click the [OK] button.



"ProEasyDotNet.dll" will be registered.

This completes the C# operating environment setup.

The above 1 to 6 steps apply to both reading and writing applications.

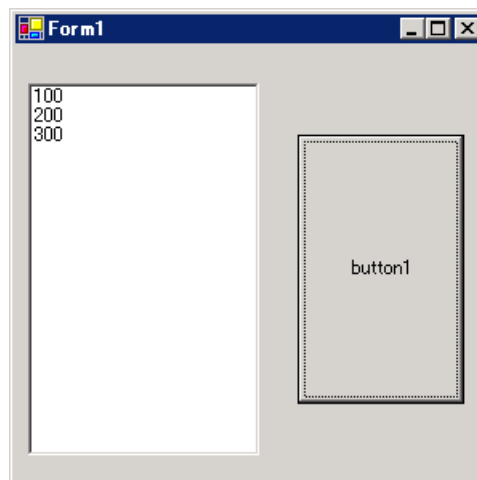
The following procedure varies depending on whether the application is intended for reading or writing, and so is explained individually.

To create a "Reading" application, refer to steps 7 to 19.

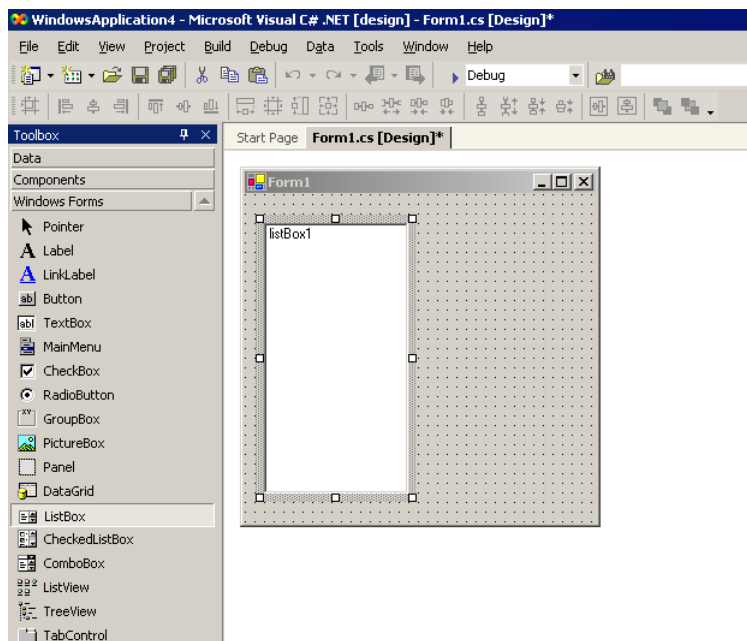
To create a "Writing" application, refer to steps 20 to 32.

Creating "Reading" application

This section describes the application that reads and displays data (signed 16 bits) on three items when you click [button1].

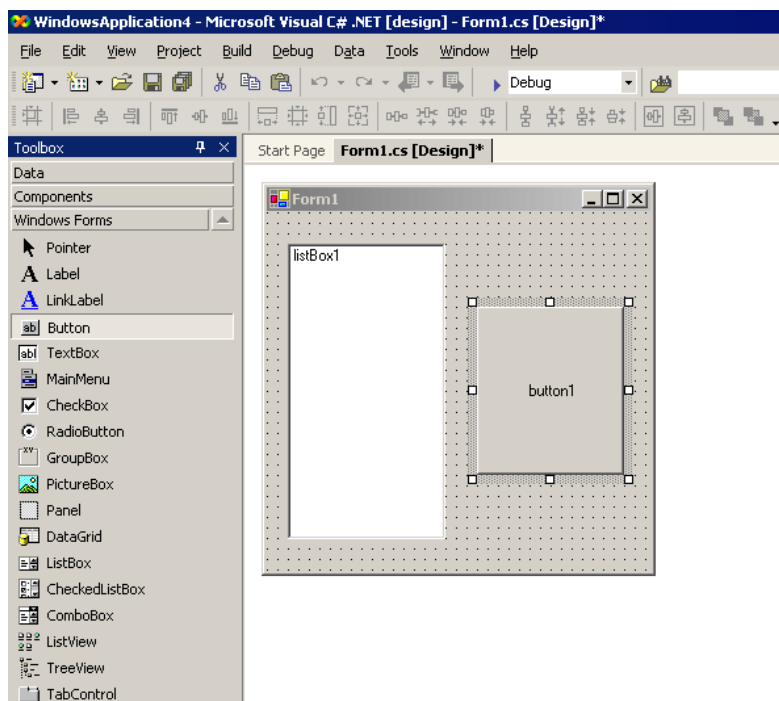


7 After selecting [ListBox] in [Toolbox], clip and paste it onto [Form1].

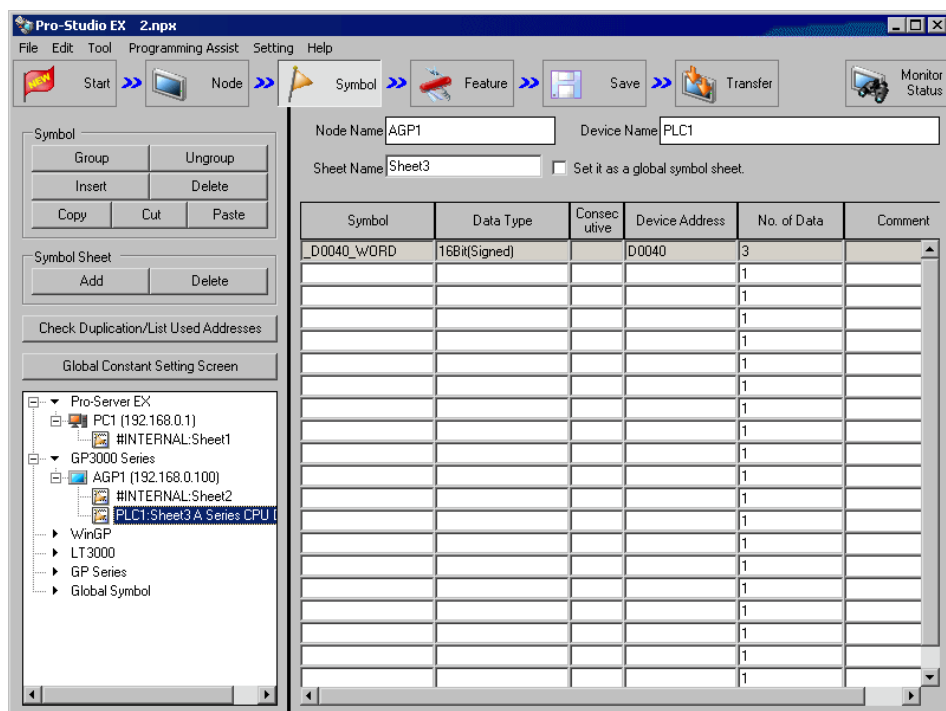


* If [Toolbox] is not displayed, select [Toolbox] from the [View] menu.

8 After selecting [Button] in [Toolbox], clip and paste it onto [Form1].

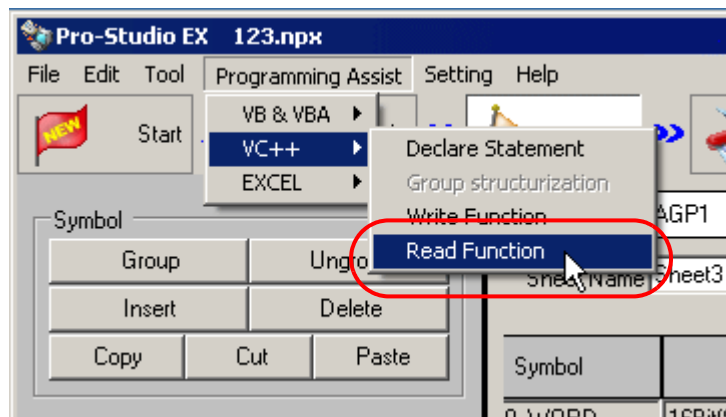


9 Select a desired read symbol name from the symbols that have been registered in 'Pro-Studio EX'.

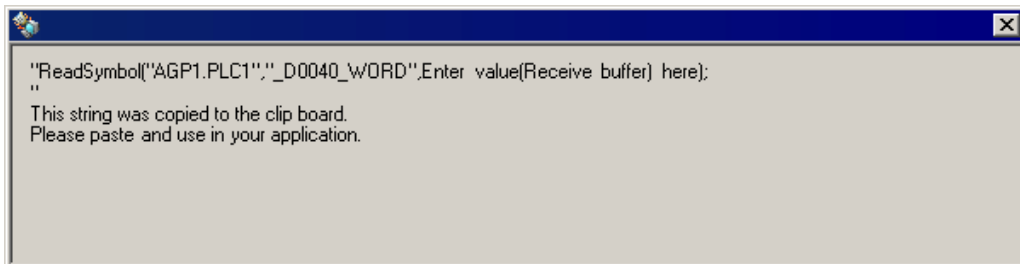


* The above example shows the symbol for the data type of [16Bit (Signed)] and the data quantity of "3".

- 10 Select [VC++] - [Read Function] from the [Programming Assist] menu.



The read function is copied to the clipboard.



- 11 Double-click [button1] in [Form1], and paste the clipboard data (read function) below the [button1_Click] method ("private void button1_Click..." character string).

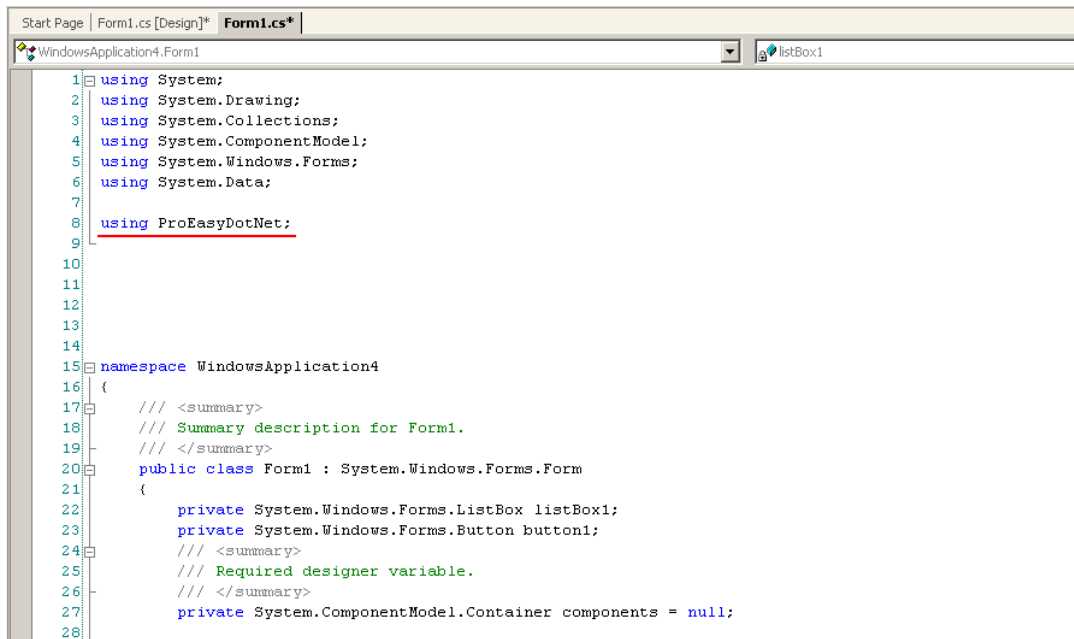
```

13 public class Form1 : System.Windows.Forms.Form
14 {
15     private System.Windows.Forms.ListBox listBox1;
16     private System.Windows.Forms.Button button1;
17     /// <summary>
18     /// Required designer variable.
19     /// </summary>
20     private System.ComponentModel.Container components = null;
21
22     public Form1()...
23     /// <summary>
24     /// Clean up any resources being used.
25     /// </summary>
26     protected override void Dispose( bool disposing )...
27     Windows Form Designer generated code
28
29     /// <summary>
30     /// The main entry point for the application.
31     /// </summary>
32     [STAThread]
33     static void Main()
34     {
35         Application.Run(new Form1());
36     }
37
38     private void button1_Click(object sender, System.EventArgs e)
39     {
40         ReadSymbol("<AGP1.PLC1", " D0040 WORD",Enter value(Receive buffer) here);
41     }
42 }
43
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```

12 Describe the ProEasyDotNet directive.

Enter "using ProEasyDotNet;" at the bottom of the lines that state "using..." at the head of the source code.



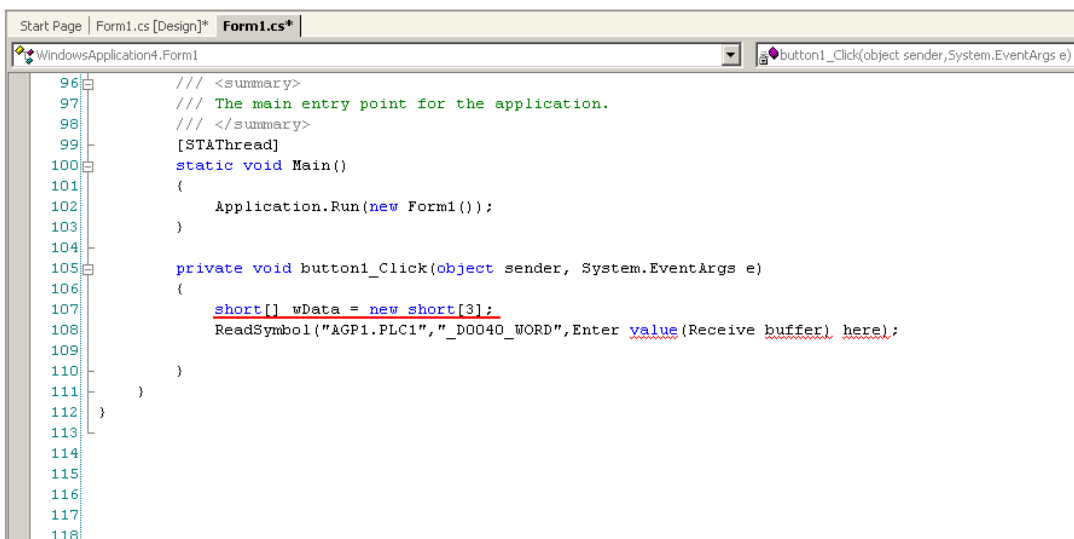
```

1  using System;
2  using System.Drawing;
3  using System.Collections;
4  using System.ComponentModel;
5  using System.Windows.Forms;
6  using System.Data;
7
8  using ProEasyDotNet;
9
10
11
12
13
14
15 namespace WindowsApplication4
16 {
17     /// <summary>
18     /// Summary description for Form1.
19     /// </summary>
20     public class Form1 : System.Windows.Forms.Form
21     {
22         private System.Windows.Forms.ListBox listBox1;
23         private System.Windows.Forms.Button button1;
24         /// <summary>
25         /// Required designer variable.
26         /// </summary>
27         private System.ComponentModel.Container components = null;
28

```

13 For the read data storing area, declare a variable "wData".

The array type ("Short" in this example) must conform to the data type of the target symbol. Specify the same data length as the target symbol ("3" in this example).

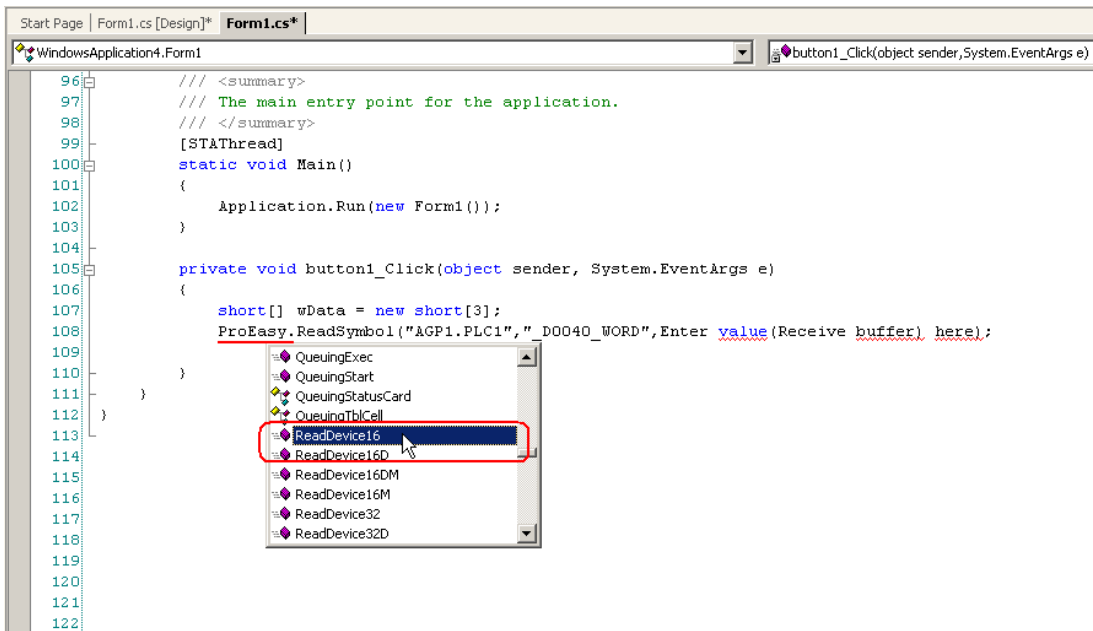


```

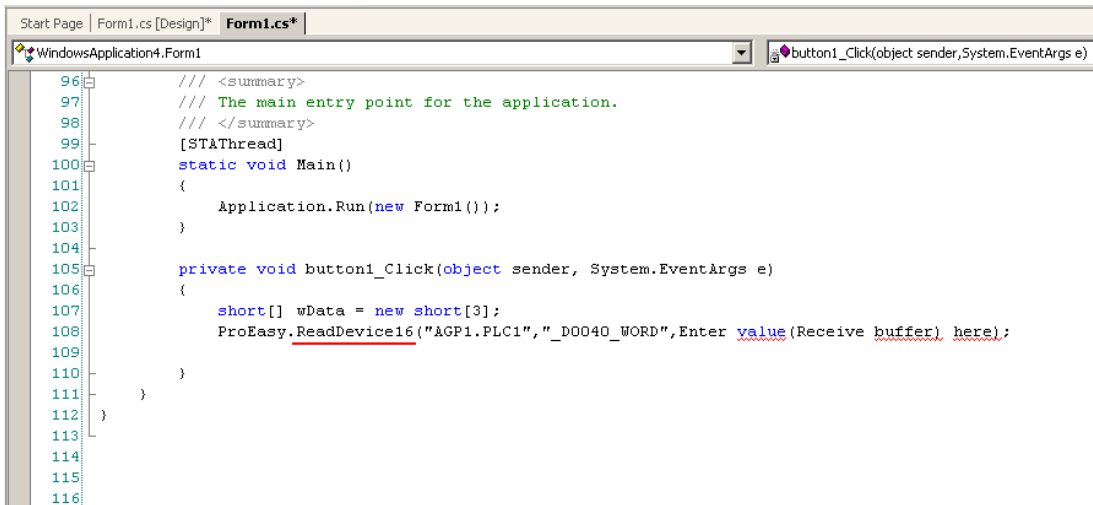
96     /// <summary>
97     /// The main entry point for the application.
98     /// </summary>
99     [STAThread]
100     static void Main()
101     {
102         Application.Run(new Form1());
103     }
104
105     private void button1_Click(object sender, System.EventArgs e)
106     {
107         short[] wData = new short[3];
108         ReadSymbol("AGP1.PLC1", "_D0040_WORD", Enter value(Receive buffer) here);
109     }
110
111 }
112
113
114
115
116
117
118

```

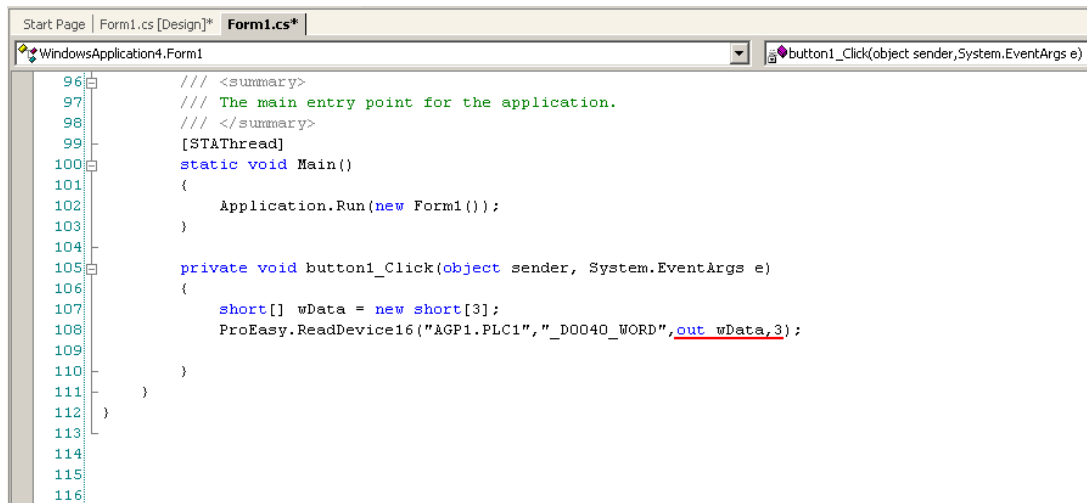

- 14 Enter "ProEasy." before "ReadSymbol", and select [ReadDevice16] from the displayed list box.



- 15 Delete "ReadSymbol" from the character string (read function) that has been pasted from the clipboard.



- 16 Specify a data storing area "wData" with the reference modifier (out), as the third argument. Enter "," (comma) at the end of the third argument, and then enter "3" to specify the length of the target symbol as the fourth argument.

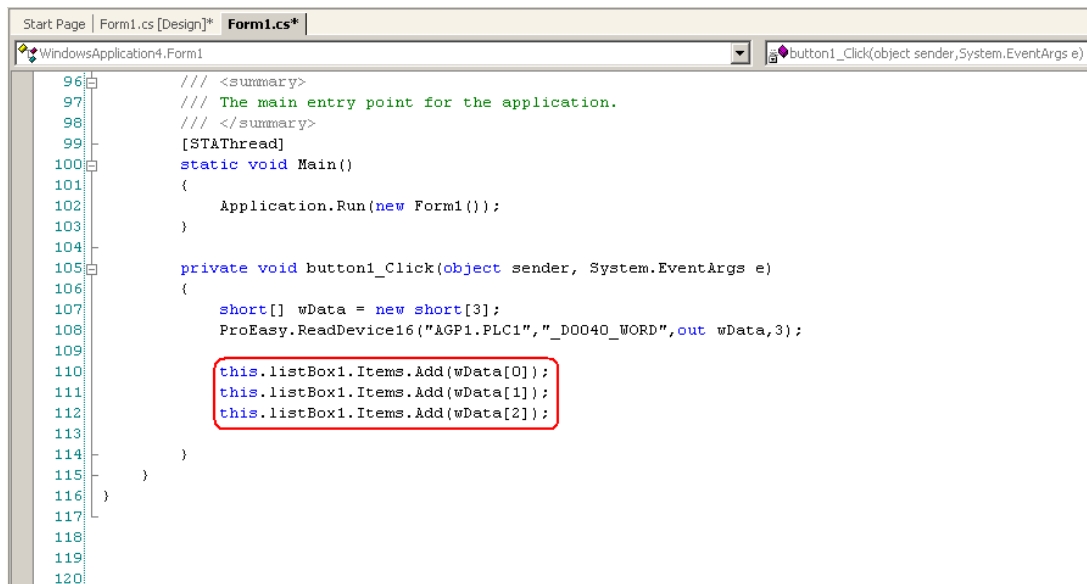


```

96  /// <summary>
97  /// The main entry point for the application.
98  /// </summary>
99  [STAThread]
100 static void Main()
101 {
102     Application.Run(new Form1());
103 }
104
105 private void button1_Click(object sender, System.EventArgs e)
106 {
107     short[] wData = new short[3];
108     ProEasy.ReadDevice16("AGP1.PLC1", "_D0040_WORD", out wData, 3);
109 }
110
111 }
112
113
114
115
116

```

- 17 Add the read data on three items (wData[0], wData[1], wData[2]) into [listBox1] in this order.

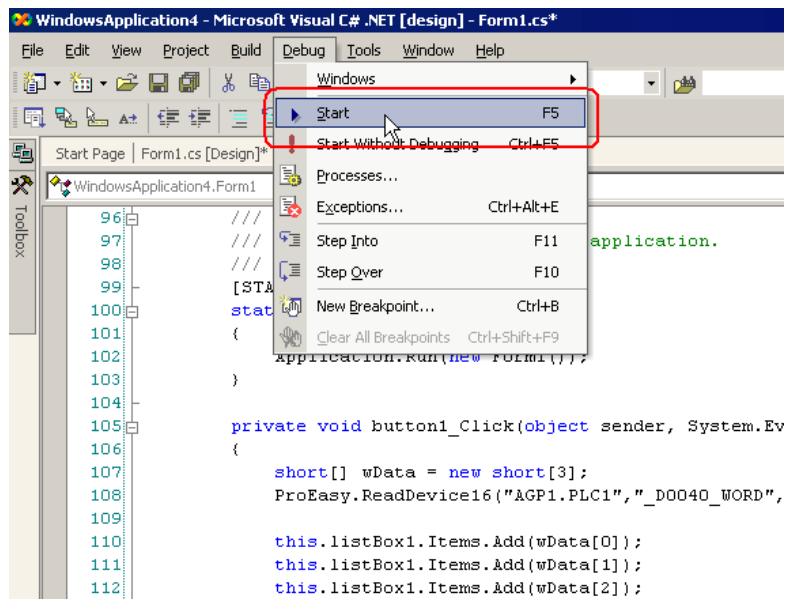


```

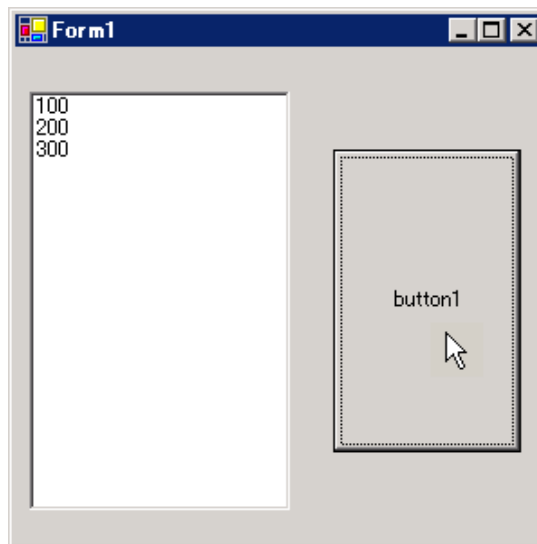
96  /// <summary>
97  /// The main entry point for the application.
98  /// </summary>
99  [STAThread]
100 static void Main()
101 {
102     Application.Run(new Form1());
103 }
104
105 private void button1_Click(object sender, System.EventArgs e)
106 {
107     short[] wData = new short[3];
108     ProEasy.ReadDevice16("AGP1.PLC1", "_D0040_WORD", out wData, 3);
109
110     this.listBox1.Items.Add(wData[0]);
111     this.listBox1.Items.Add(wData[1]);
112     this.listBox1.Items.Add(wData[2]);
113 }
114
115 }
116
117
118
119
120

```

18 Select [Start] from the [Debug] menu.

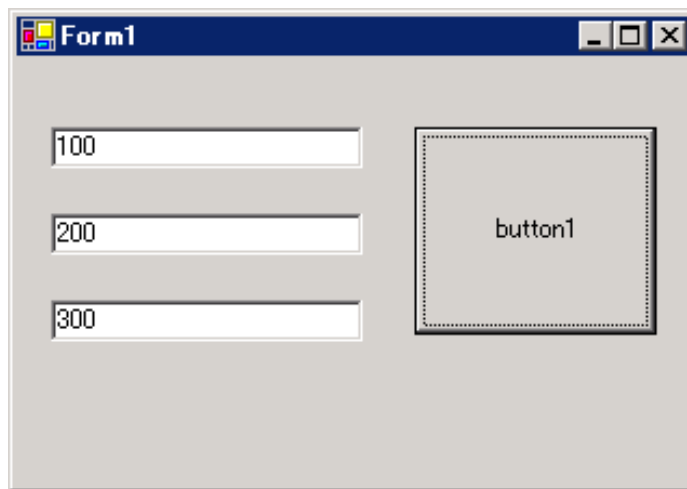


19 If you click [button1], the target symbol data (three items) are displayed in [ListBox].

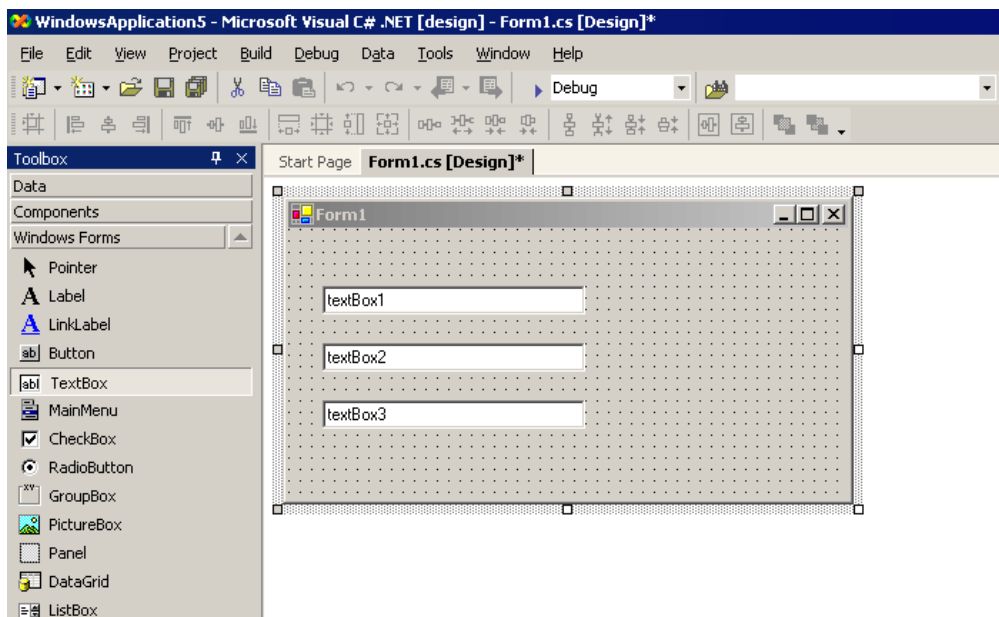


Creating "Writing" application

This section describes the application that writes data (signed 16 bits) on three items when you click [button1].

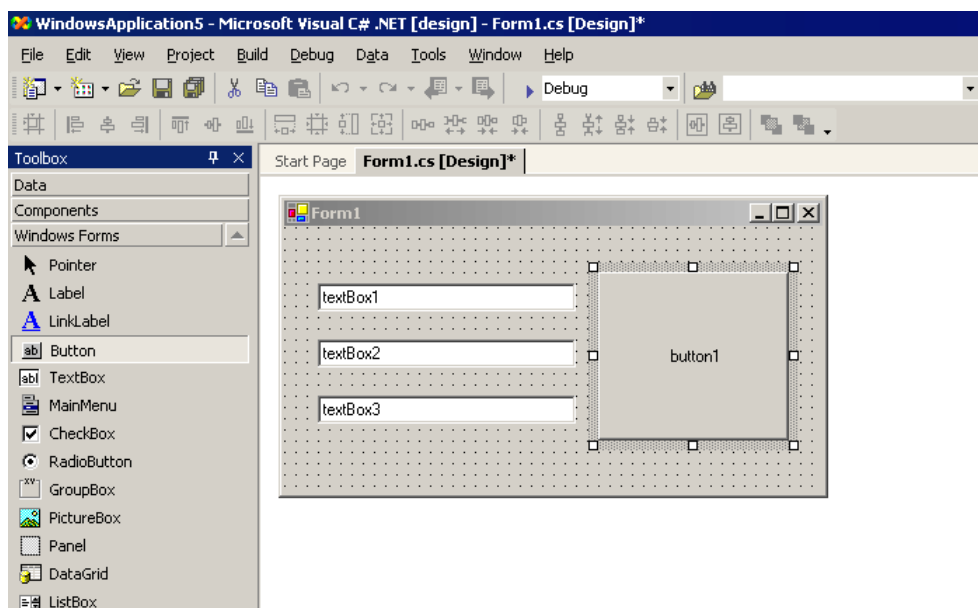


20 After selecting [TextBox] in [Toolbox], clip and paste three text boxes onto [Form1].

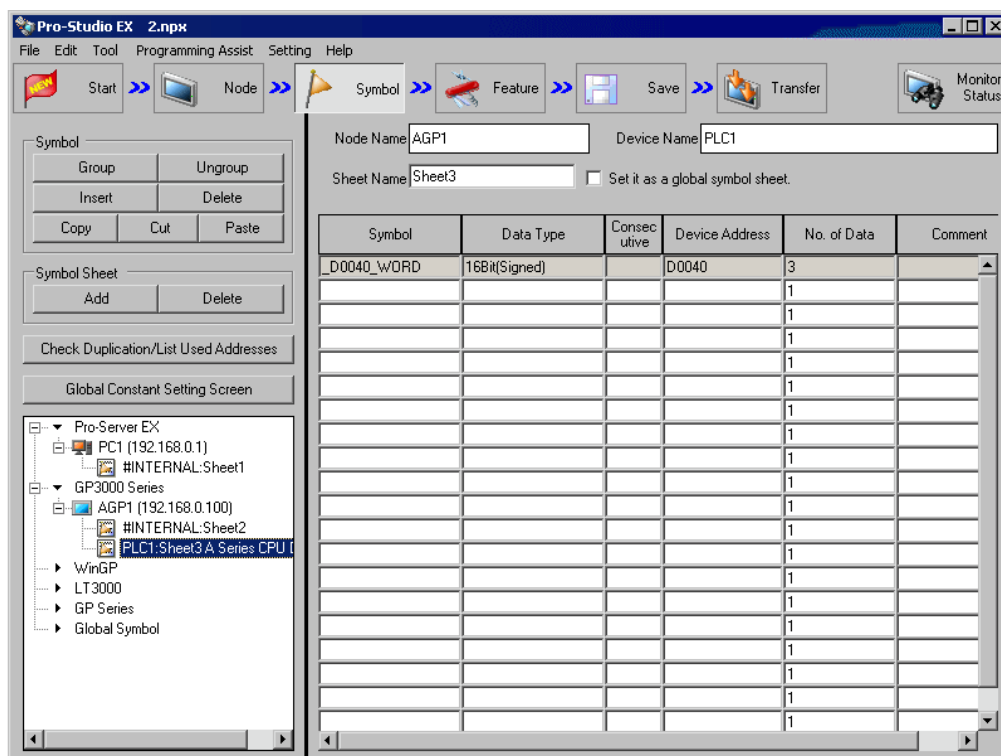


* If [Toolbox] is not displayed, select [Toolbox] from the [View] menu.

- 21 After selecting [Button] in [Toolbox], clip and paste it onto [Form1].

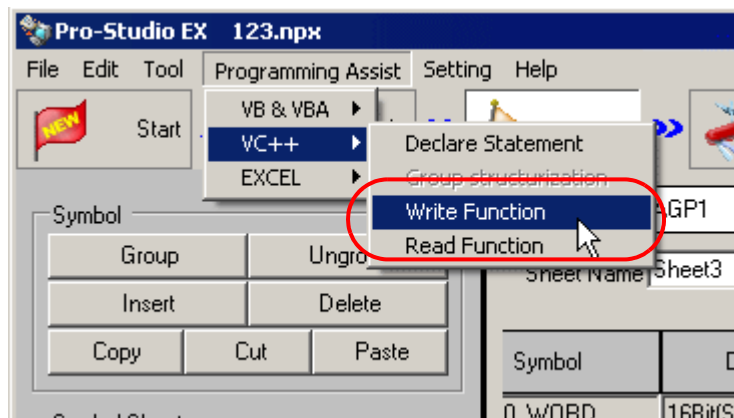


- 22 Select a desired write symbol name from the symbols that have been registered in 'Pro-Studio EX'. (Select the first writing area.)

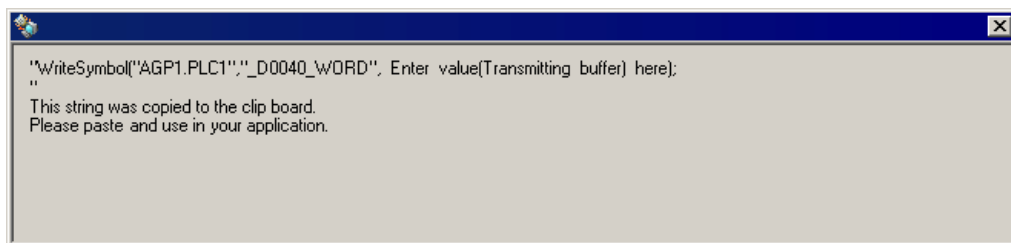


* The above example shows the symbol for the data type of [16Bit (Signed)] and the data quantity of "3".

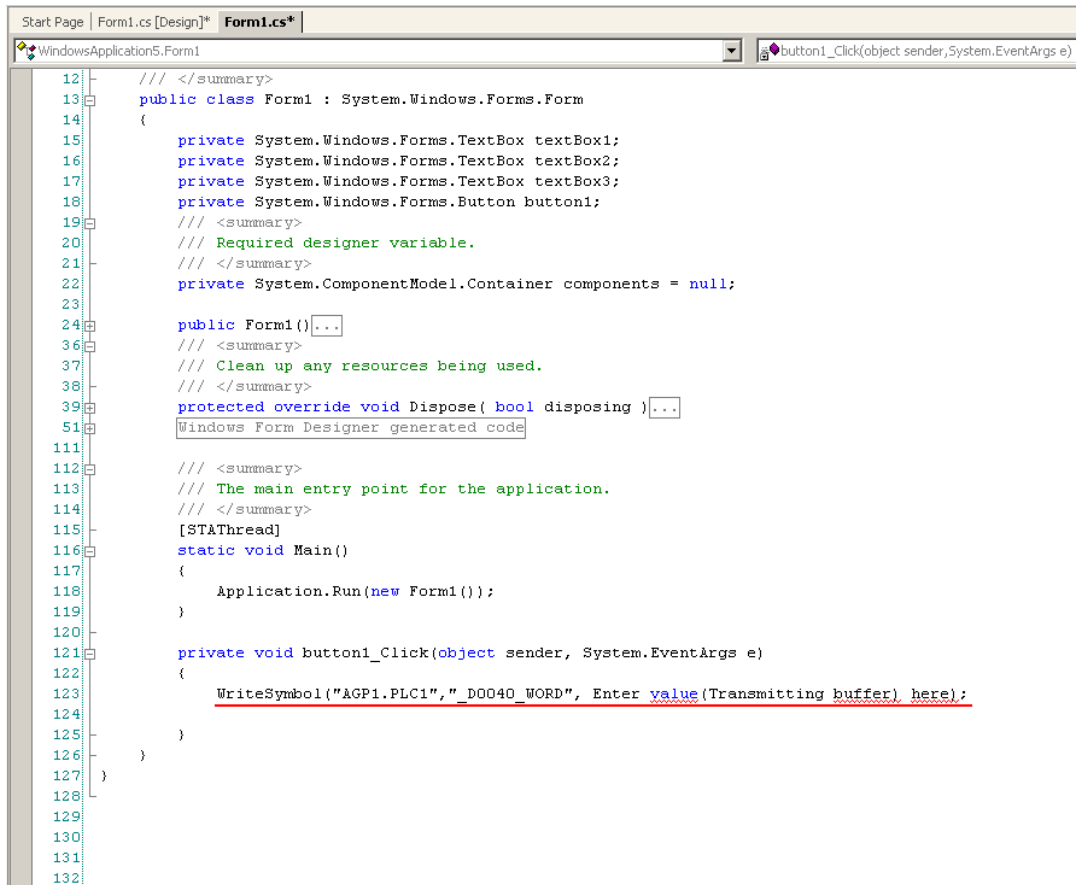
23 Select [VC++] - [Write Function] from the [Programming Assist] menu.



The write function is copied to the clipboard.



- 24 Double-click [button1] in [Form1], and paste the clipboard data (write function) below the [button1_Click] method ("private void button1_Click..." character string).



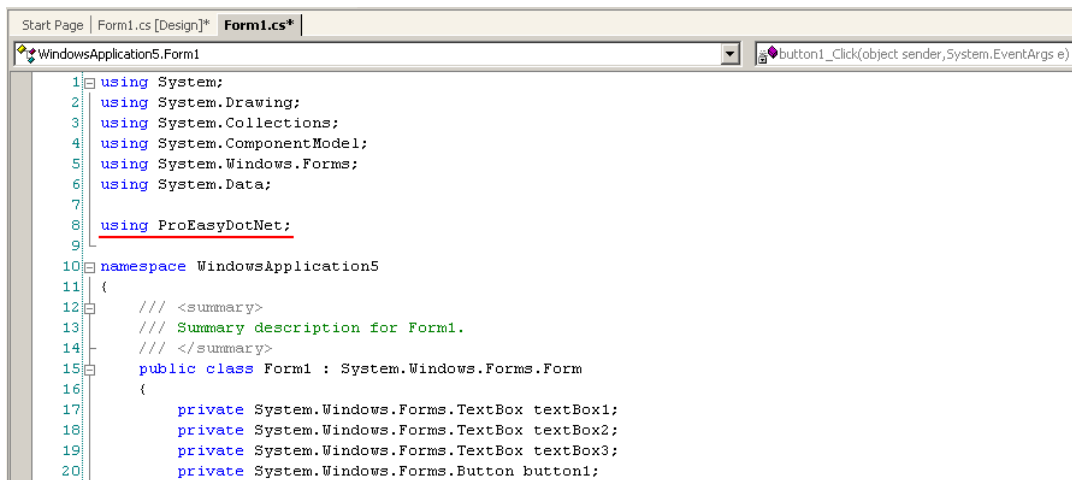
```

12  /// </summary>
13  public class Form1 : System.Windows.Forms.Form
14  {
15      private System.Windows.Forms.TextBox textBox1;
16      private System.Windows.Forms.TextBox textBox2;
17      private System.Windows.Forms.TextBox textBox3;
18      private System.Windows.Forms.Button button1;
19      /// <summary>
20      /// Required designer variable.
21      /// </summary>
22      private System.ComponentModel.Container components = null;
23
24      public Form1() {
25          /// <summary>
26          /// Clean up any resources being used.
27          /// </summary>
28      }
29      protected override void Dispose( bool disposing ) {
30          Windows Form Designer generated code
31
32      }
33      /// <summary>
34      /// The main entry point for the application.
35      /// </summary>
36      [STAThread]
37      static void Main()
38      {
39          Application.Run(new Form1());
40      }
41
42      private void button1_Click(object sender, System.EventArgs e)
43      {
44          WriteSymbol("AGP1.PLC1","_D0040_WORD", Enter value(Transmitting buffer) here);
45      }
46  }

```

25 Describe the ProEasyDotNet directive.

Enter "using ProEasyDotNet;" at the bottom of the lines that state "using..." at the head of the source code.



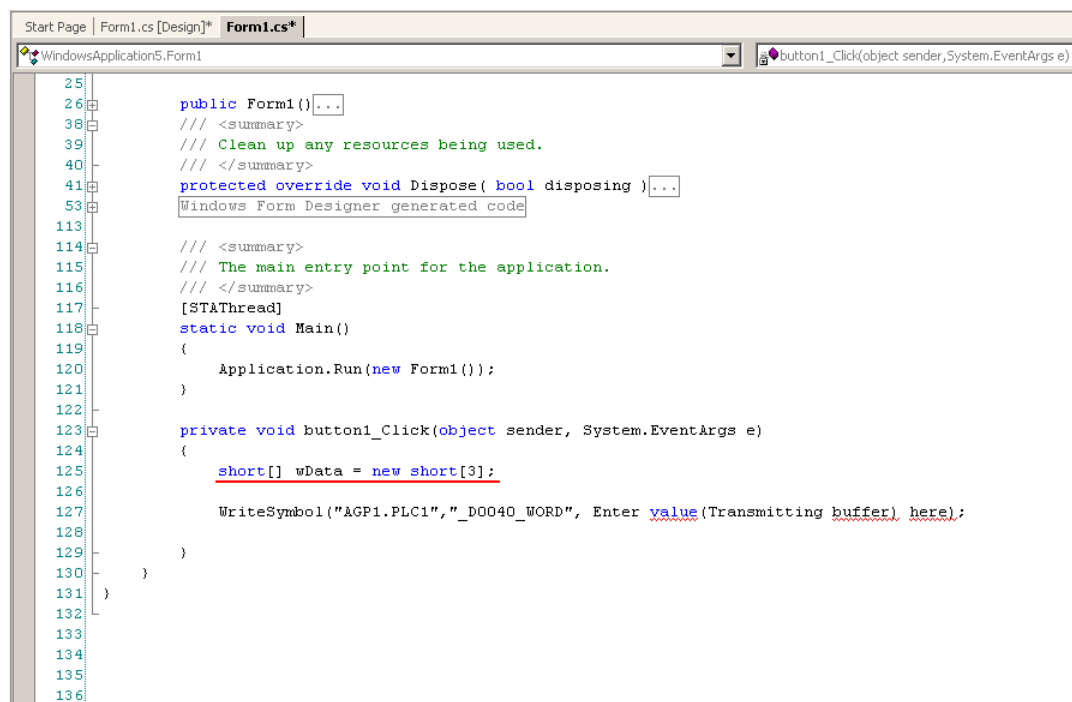
```

1  using System;
2  using System.Drawing;
3  using System.Collections;
4  using System.ComponentModel;
5  using System.Windows.Forms;
6  using System.Data;
7
8  using ProEasyDotNet;
9
10 namespace WindowsApplication5
11 {
12     /// <summary>
13     /// Summary description for Form1.
14     /// </summary>
15     public class Form1 : System.Windows.Forms.Form
16     {
17         private System.Windows.Forms.TextBox textBox1;
18         private System.Windows.Forms.TextBox textBox2;
19         private System.Windows.Forms.TextBox textBox3;
20         private System.Windows.Forms.Button button1;

```

26 For the write data storing area, declare a variable "wData".

The array type ("Short" in this example) must conform to the data type of the target symbol. Specify the same data length as the target symbol ("3" in this example).

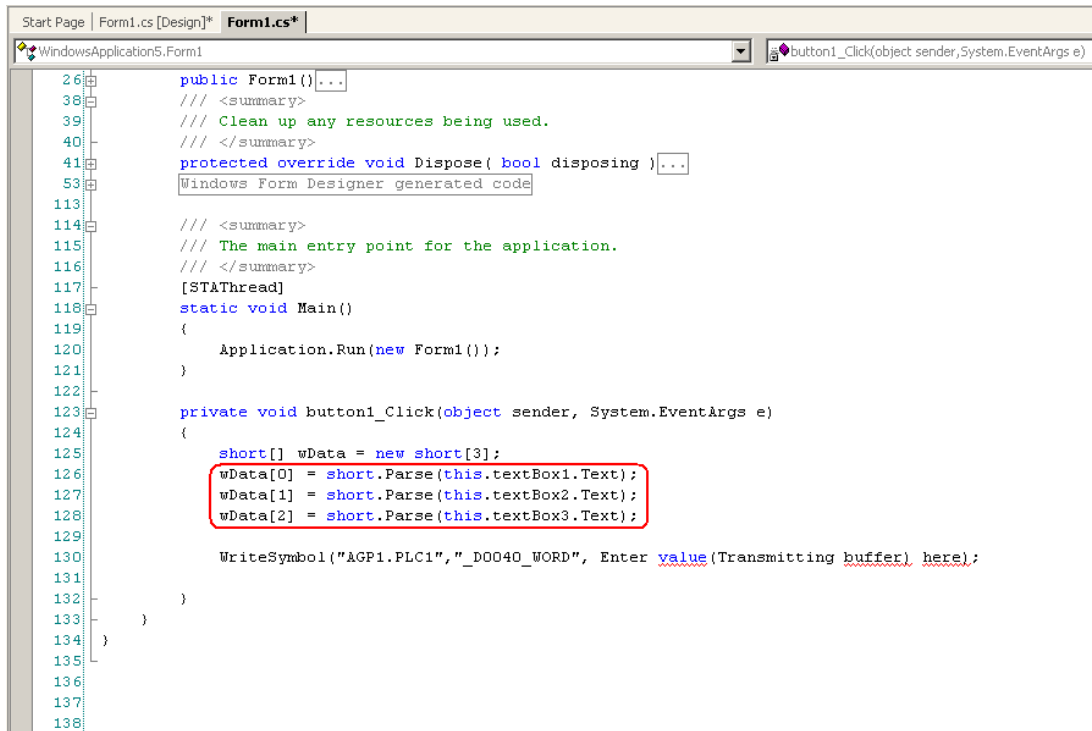


```

25
26     public Form1() { ... }
27
28     /// <summary>
29     /// Clean up any resources being used.
30     /// </summary>
31     protected override void Dispose( bool disposing ) { ... }
32     Windows Form Designer generated code
33
34     /// <summary>
35     /// The main entry point for the application.
36     /// </summary>
37     [STAThread]
38     static void Main()
39     {
40         Application.Run(new Form1());
41     }
42
43     private void button1_Click(object sender, System.EventArgs e)
44     {
45         short[] wData = new short[3];
46
47         WriteSymbol("AGP1.PLC1", "_D0040_WORD", Enter value(Transmitting buffer) here);
48     }
49 }
50
51
52
53
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55
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59
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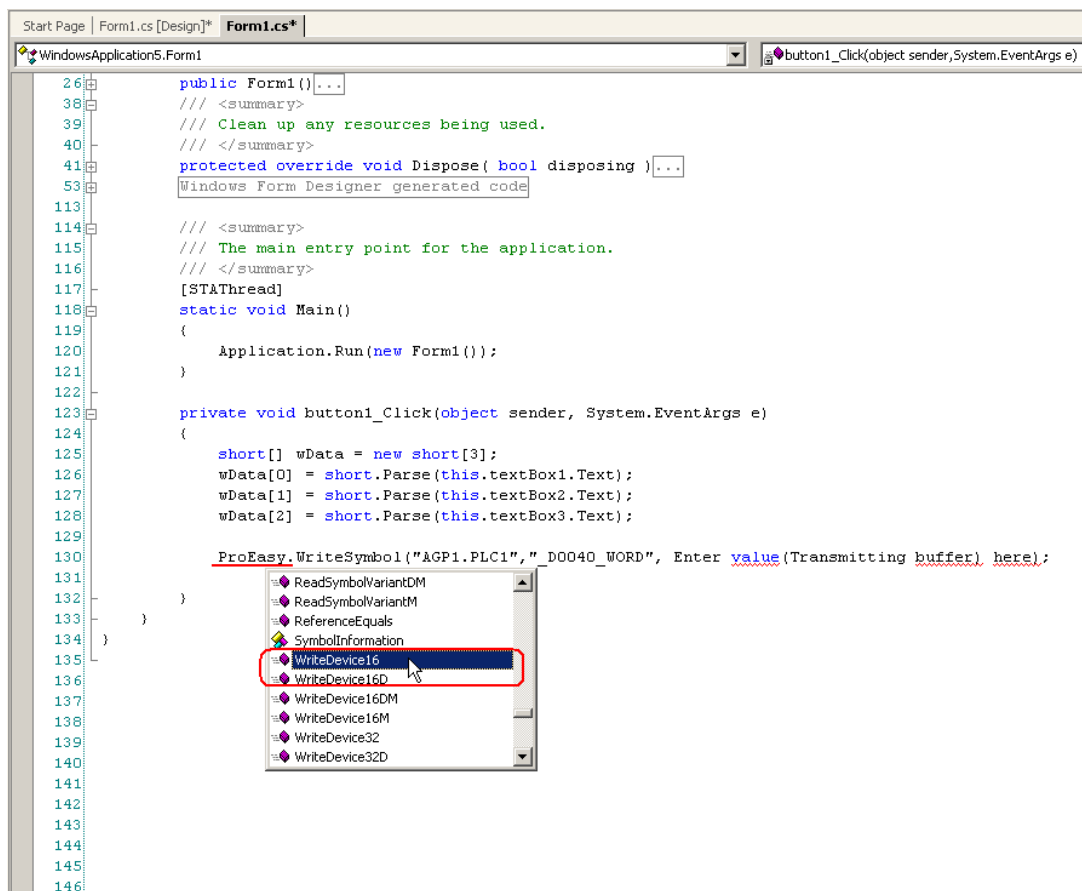
```


27 Set the data to be entered in [textBox1] to [textBox3] in the array.

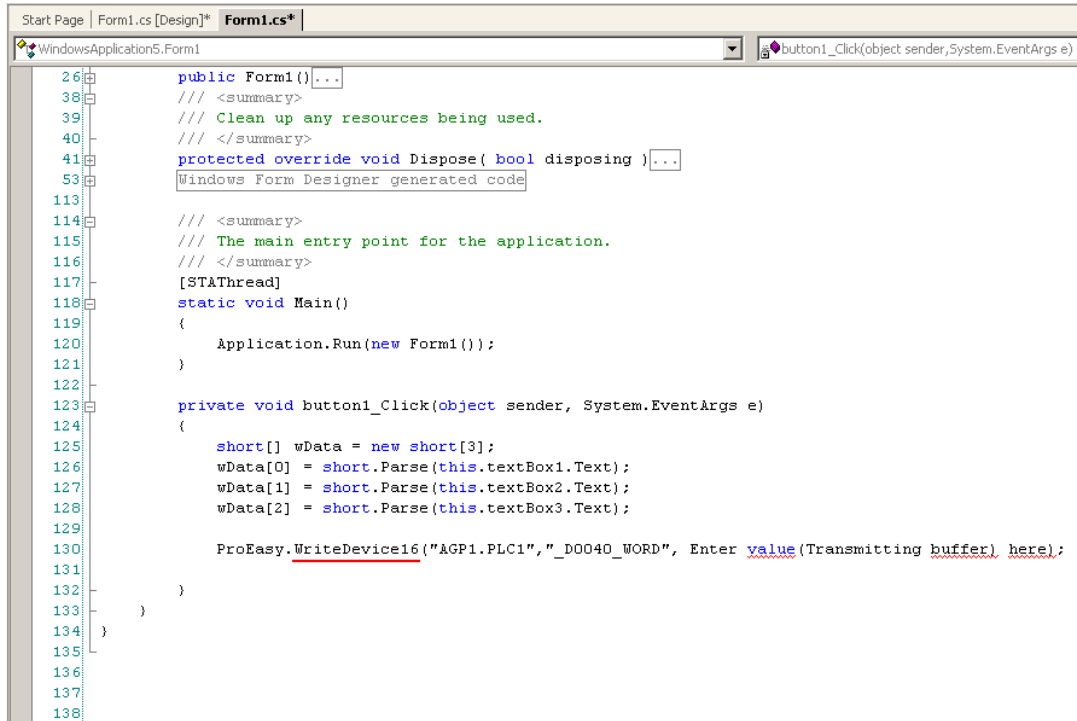


```
126 public Form1()...
138
139 /// <summary>
140 /// Clean up any resources being used.
141 /// </summary>
142 protected override void Dispose( bool disposing )...
143
144 Windows Form Designer generated code
145
146
147 /// <summary>
148 /// The main entry point for the application.
149 /// </summary>
150 [STAThread]
151 static void Main()
152 {
153     Application.Run(new Form1());
154 }
155
156 private void button1_Click(object sender, System.EventArgs e)
157 {
158     short[] wData = new short[3];
159     wData[0] = short.Parse(this.textBox1.Text);
160     wData[1] = short.Parse(this.textBox2.Text);
161     wData[2] = short.Parse(this.textBox3.Text);
162
163     WriteSymbol("AGP1.PLC1", "_D0040_WORD", Enter value(Transmitting buffer) here);
164 }
165 }
```

28 Enter "ProEasy." before "WriteSymbol", and select [WriteDevice16] from the displayed list box.



29 Delete "WriteSymbol" from the character string (write function) that has been pasted from the clipboard.

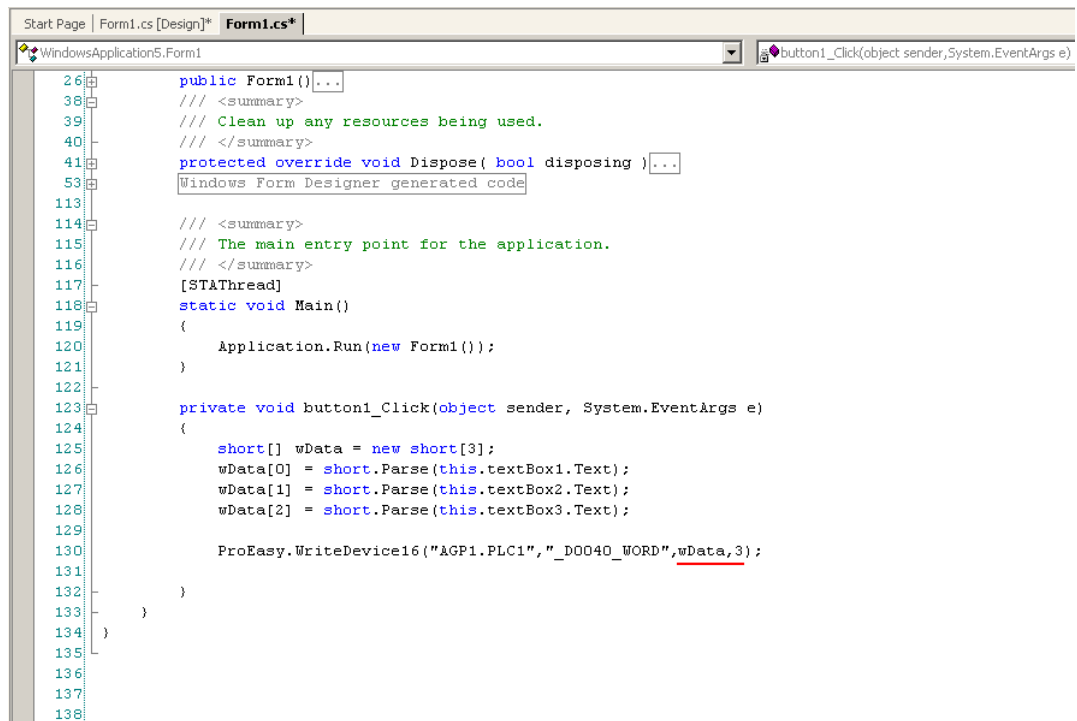


```

26 public Form1() { ...
38     /// <summary>
39     /// Clean up any resources being used.
40     /// </summary>
41     protected override void Dispose( bool disposing ) { ...
53     Windows Form Designer generated code
113
114     /// <summary>
115     /// The main entry point for the application.
116     /// </summary>
117     [STAThread]
118     static void Main()
119     {
120         Application.Run(new Form1());
121     }
122
123     private void button1_Click(object sender, System.EventArgs e)
124     {
125         short[] wData = new short[3];
126         wData[0] = short.Parse(this.textBox1.Text);
127         wData[1] = short.Parse(this.textBox2.Text);
128         wData[2] = short.Parse(this.textBox3.Text);
129
130         ProEasy.WriteDevice16("AGP1.PLC1", "_D0040_WORD", Enter value (Transmitting buffer) here);
131     }
132 }
133
134 }
135
136
137
138

```

30 Specify a data storing area "wData" as the third argument. Enter "," (comma) at the end of the third argument, and then enter "3" to specify the length of the target symbol as the fourth argument.

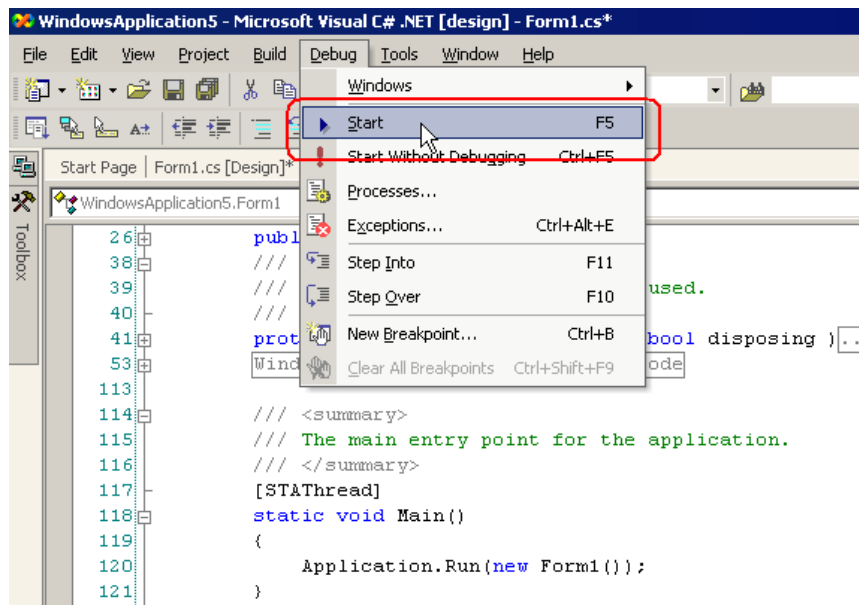


```

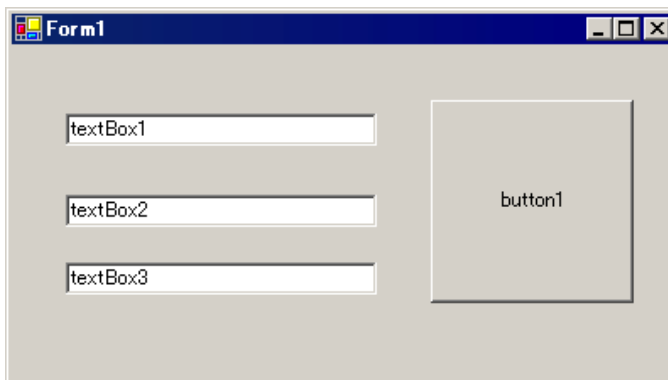
26 public Form1() { ...
38     /// <summary>
39     /// Clean up any resources being used.
40     /// </summary>
41     protected override void Dispose( bool disposing ) { ...
53     Windows Form Designer generated code
113
114     /// <summary>
115     /// The main entry point for the application.
116     /// </summary>
117     [STAThread]
118     static void Main()
119     {
120         Application.Run(new Form1());
121     }
122
123     private void button1_Click(object sender, System.EventArgs e)
124     {
125         short[] wData = new short[3];
126         wData[0] = short.Parse(this.textBox1.Text);
127         wData[1] = short.Parse(this.textBox2.Text);
128         wData[2] = short.Parse(this.textBox3.Text);
129
130         ProEasy.WriteDevice16("AGP1.PLC1", "_D0040_WORD", wData, 3);
131     }
132 }
133
134 }
135
136
137
138

```

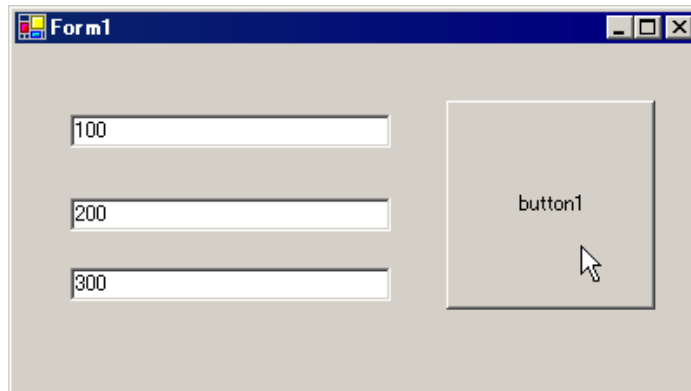
31 Select [Start] from the [Debug] menu.



32 Immediately after startup, a character string "textBox*" is displayed in [TextBox].



After entering the write data (three items) in [TextBox], click [button1]. Then, the data will be written into the area specified with the symbol.



28



Simply Confirming On-site Status

| | | |
|------|---|-------|
| 28.1 | This chapter describes available monitoring tools. | 28-2 |
| 28.2 | Monitoring Operational Status..... | 28-5 |
| 28.3 | Monitoring Device Values..... | 28-12 |
| 28.4 | Monitoring Symbol Values..... | 28-20 |
| 28.5 | Monitoring System Event Logs | 28-28 |
| 28.6 | Monitoring Using Excel Graphs..... | 28-36 |

28.1 This chapter describes available monitoring tools.

■ Monitoring Operational Status

This feature allows you to monitor the current status of any display unit or Device/PLC registered in a network project file under operation.

☞ "28.2 Monitoring Operational Status"

■ Monitoring Device Values

This feature allows you to display the current values of specified devices all at once.

☞ "28.3 Monitoring Device Values"

■ Monitoring Symbol Values

This feature allows you to display the current values of device addresses by each registered symbol.

☞ "28.4 Monitoring Symbol Values"

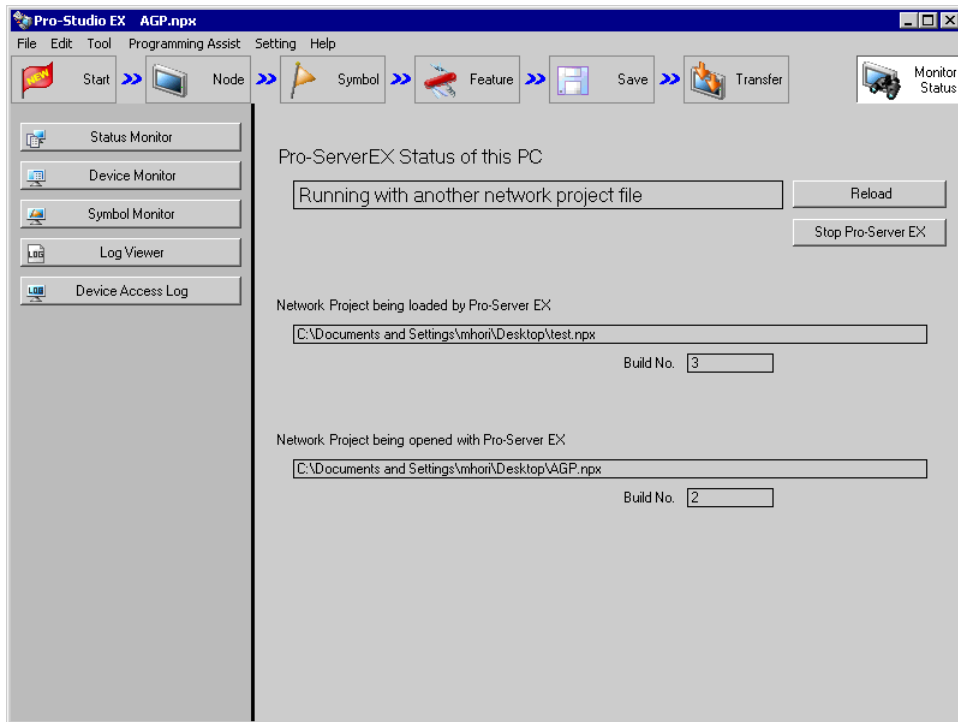
■ Monitoring System Event Logs

This feature allows you to display a list of various information (logs) occurred during operation.

☞ "28.5 Monitoring System Event Logs"

■ Setting Guide

The following explains the displayed contents of the status monitor screen.



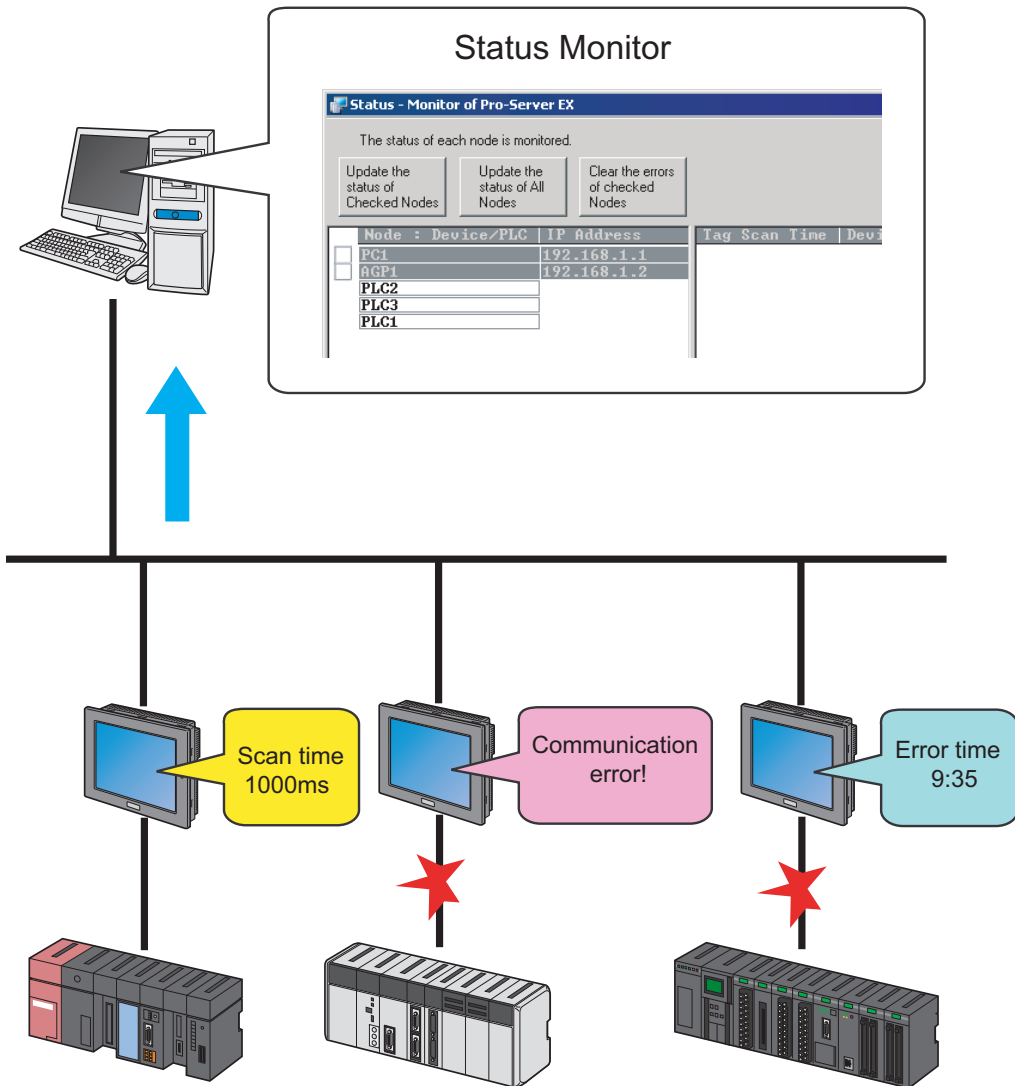
| Setting item | Setting content |
|---------------------------------|--|
| Status Monitor | Perform status monitoring. ☞ "28.2 Monitoring Operational Status" |
| Device Monitor | Perform device monitoring. ☞ "28.3 Monitoring Device Values" |
| Symbol Monitor | Perform symbol monitoring. ☞ "28.4 Monitoring Symbol Values" |
| Log Viewer | Perform log viewing. ☞ "28.5 Monitoring System Event Logs" |
| Device Access Log | Perform device access logs. ☞ "29.6 Device Access Log" |
| Pro-Server EX Status of this PC | The ongoing operational status of 'Pro-Server EX' is displayed. <ul style="list-style-type: none"> • "Under suspension" • 'Pro-Server EX' is out of operation. • "In operation with a blank network project" • The network project is not loaded in 'Pro-Server EX'. • "In operation with a read network project file" • 'Pro-Server EX' is run by a loaded network project. |
| Reload | Reload the network project file under editing in 'Pro-Server EX'. <div style="border: 1px solid black; padding: 2px; display: inline-block;">NOTE</div> <ul style="list-style-type: none"> • Editing is to be invalid if the network project file is not saved. |

| Setting item | Setting content |
|---|--|
| Stop Pro-Server EX | Stop 'Pro-Server EX'. IMPORTANT <ul style="list-style-type: none">• Please exit all applications using 'Pro-Server EX' before exiting 'Pro-Server EX', if any. |
| Network Project being loaded by Pro-Server EX | Displays the name of the network project file loaded by 'Pro-Server EX'. |
| Network Project being opened with Pro-Studio EX | Displays the name of the network project file opened with 'Pro-Studio EX'. |
| Build No. | Displays the build. No of the network project file. |

28.2 Monitoring Operational Status

28.2.1 Monitoring Status

This feature allows you to monitor the current status of any display unit or Device/PLC registered in a network project file under operation.



NOTE

- Refer to "36 Error Information" for details about errors occurring in 'Pro-Server EX'.

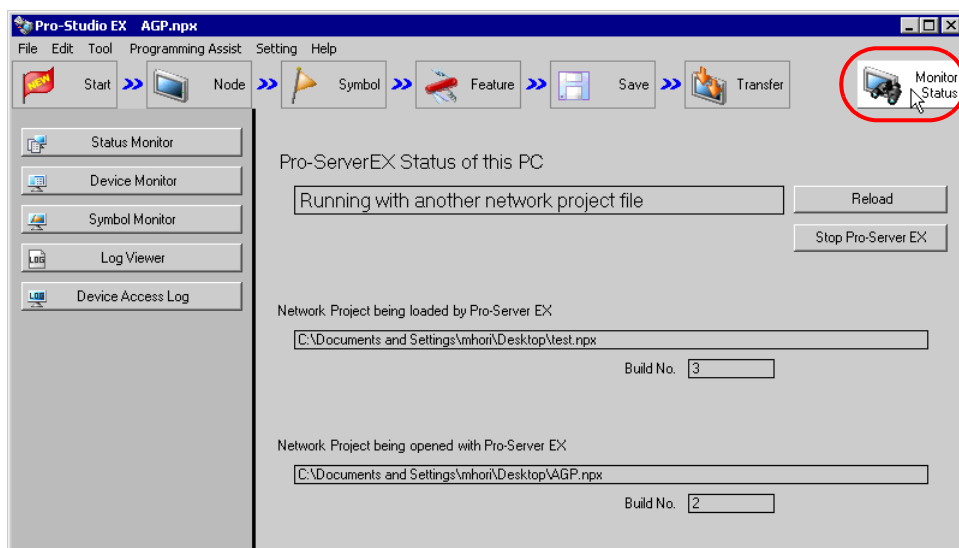
The displayed items and contents on the status monitor are as follows: (The contents differ according to the type of entry node.)

| Display item | Type of entry node | | | |
|---|---|--|--------------|------------------|
| | ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, LT3000 | Device/PLC of ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, LT3000 | GP Series | Pro-Server EX |
| Tag Scan Time | --- | --- | ○ | --- |
| Device/PLC Communication Cycle Time | --- | ○ | ○ | --- |
| Device/PLC Communication Error Count | --- | ○ | --- | --- |
| Device/PLC Communication Error No. | --- | ○ | ○ | --- |
| Device/PLC Communication Error No. (Extended) | --- | --- | ○ | --- |
| Error Time | --- | ○ | --- | --- |
| 2Way Error No. | ○ | --- | ○ | --- |
| System Version | ○ | ○ | ○ | ○ |
| 2Way Version | --- | --- | ○ | --- |
| Protocol Version | --- | ○ | ○ | --- |
| Model | ○ | --- | ○ | ○ |

○: Displayed ---: Not displayed

- 1 Click the [Monitor Status] icon on the status bar.

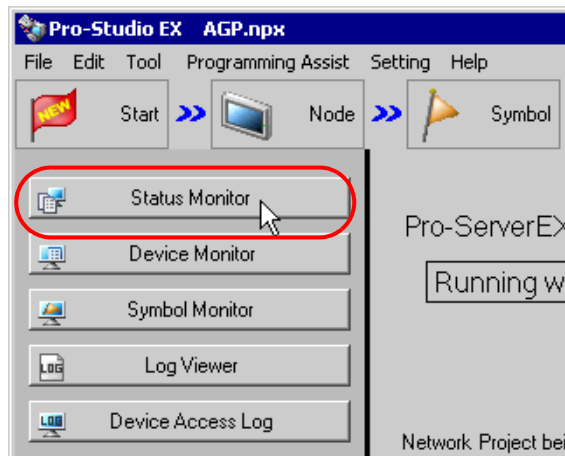
The status monitor screen appears to indicate the ongoing status of 'Pro-Server EX'.



Refer to "28.2.2 Setting Guide" for more details about the screen.

2 Click the [Status Monitor] button.

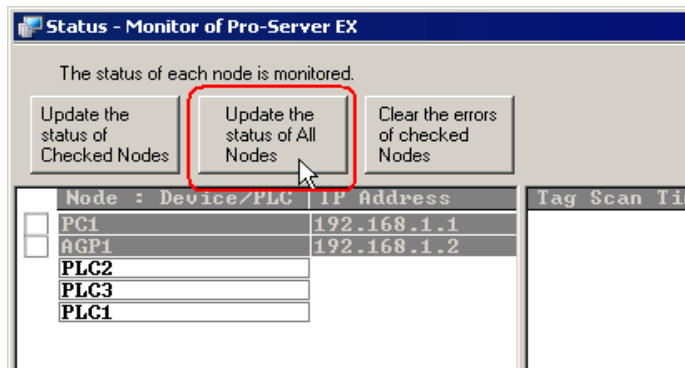
If you click the [Status Monitor] button without 'Pro-Server EX' running, 'Pro-Studio EX' once saves the network project currently opened and starts based on the network project.

**NOTE**

- Refer to "28.2.3 Displayed Messages" for details about the messages displayed when starting the status monitor.

The status monitor screen appears to indicate the entry node(s) registered in the network project file under operation.

- 3 Click the [Update the status of All Nodes] button. Or, click the [Update the status of Checked Nodes] button after checking the entry node(s) to be confirmed.

**NOTE**

- The status is updated in 3-second cycles with each button pressed.
- It takes some time before the status appears.

The status of entry nodes is indicated on the right of the screen. Scroll the screen to check the status of the entry nodes. When the status monitoring is updated, the status is indicated in light blue.

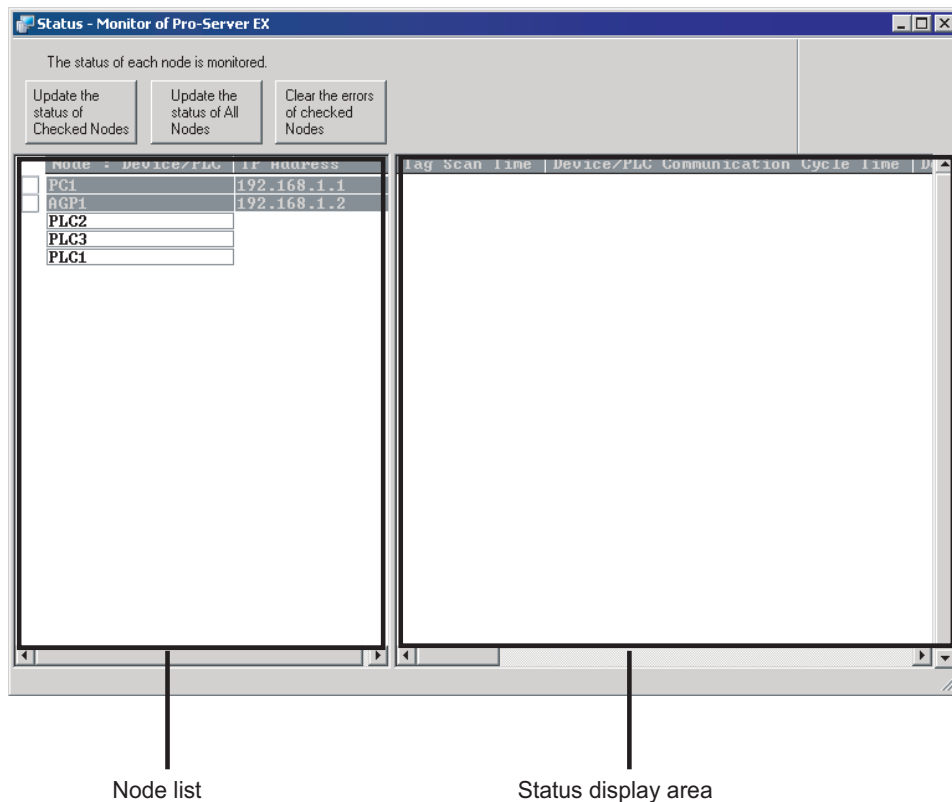
Refer to "28.2.2 Setting Guide" for more details about the screen.

NOTE

- Status monitoring is performed for the checked entry nodes in order. When no communication with the entry nodes is established in such a situation as the display unit is OFF, it takes time for processing. As for the node with which communication is not available, clear the check to monitor the status.

28.2.2 Setting Guide

The following explains the displayed contents of the status monitor screen.



| Setting item | Setting content |
|------------------------------------|--|
| Node List | Displays the entry node(s) and Device/PLC(s) registered in the network project file that is under operation. The node status is displayed by clicking the check box and then the status update button. |
| Status display area | Displays the status of the entry node(s) and Device/PLC(s) checked in the node list. |
| Update the status of Checked Nodes | The entry nodes checked in the node list are updated in 3-second cycles. The status update will finish by clicking this button again. |
| Update the status of All Nodes | All the entry nodes in the node list are automatically checked, and will be updated in 3-second cycles. The status update will finish by clicking this button again. |
| Clear the errors of checked Nodes | Each operation will be performed according to the type of entry nodes. <ul style="list-style-type: none"> In the case of ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, and LT3000 nodes Set the 2way error No. (Value of internal device "LS2075") to zero. In the case of GP Series nodes Set the error No. ("LS2039"), error No. (Extended) ("LS2070") and 2way error No. ("SYS0073") to zero. In the case of Pro-Server EX nodes No operation will be performed. |

28.2.3 Displayed Messages

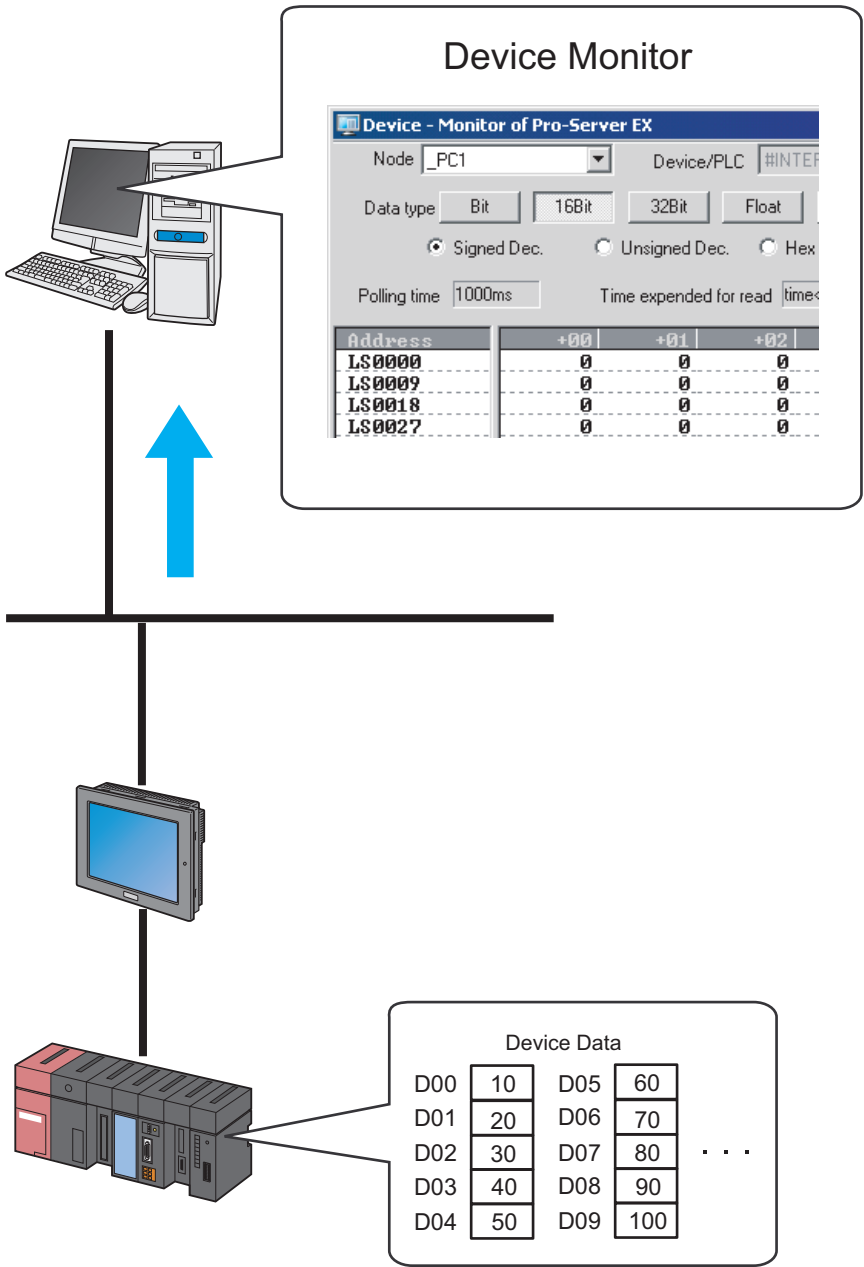
The following explains the contents of the messages.

| Message | Status of 'Pro-Server EX' |
|--|--|
| "Pro-Server EX is to be started to communicate with an entry node. Continue?" | Pro-Server EX is under suspension. To execute various monitors, it is required to start 'Pro-Server EX'. |
| "The network project file is being edited. To communicate with entry nodes, it is required to save the network project file under editing and reload to 'Pro-Server EX'. Continue to save and reload?" | The network project file is not reloaded in 'Pro-Server EX'. Or, the same network project file that is reloaded in 'Pro-Server EX' is opened but is being edited by 'Pro-Studio EX'. It is required to save and reload the file. |
| "Pro-Server EX is running by a different network project file. To communicate with entry nodes, the network project file that is being edited needs to be reloaded to Pro-Server EX. Continue to reload?" | A network project file other than the one reloaded in 'Pro-Server EX' is opened. It is required to save and reload the network project file being opened. |
| "Pro-Server EX is running by a different network project file. To communicate with entry nodes, the network project file that is being edited needs to be saved and reloaded to Pro-Server EX. Continue to save and reload?" | A network project file other than the one reloaded in 'Pro-Server EX' is opened and edited by 'Pro-Studio EX'. It is required to save and reload the file. |

28.3 Monitoring Device Values

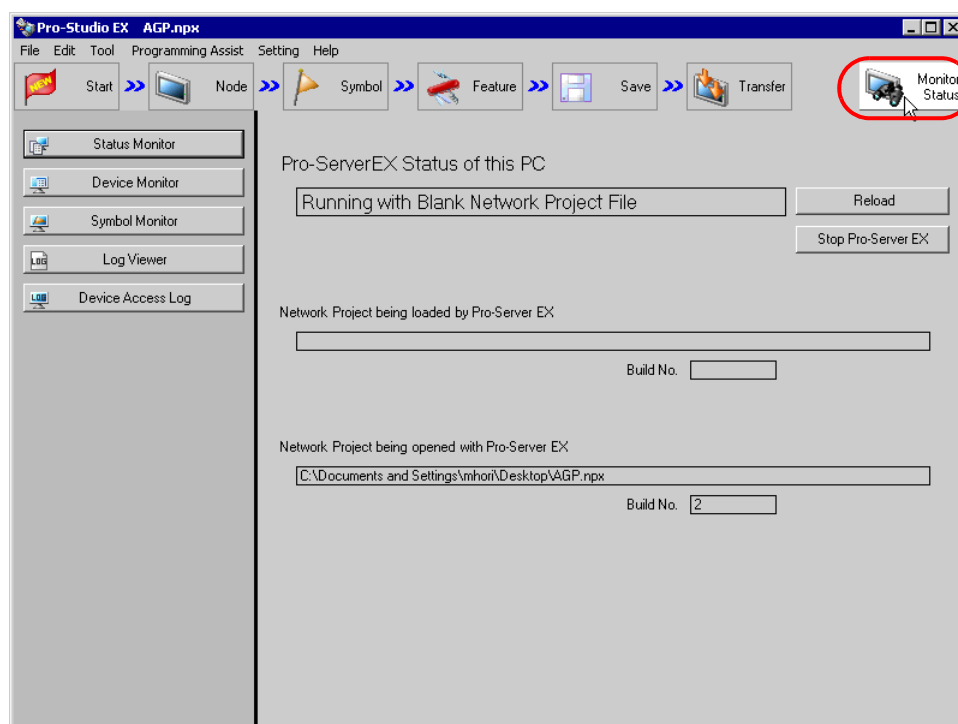
28.3.1 Monitoring Devices

This feature allows you to display the whole current device values sequentially starting with the specified device address.

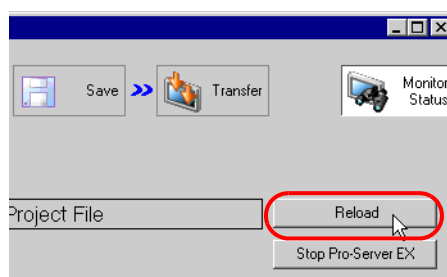


- 1 Click the [Monitor Status] icon on the status bar.

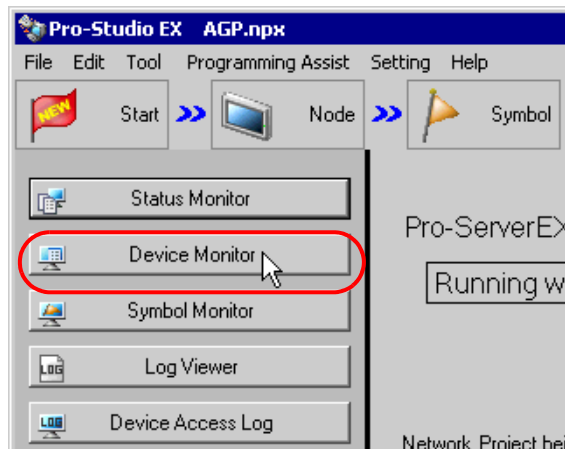
The status monitor screen appears to indicate the ongoing status of 'Pro-Server EX'.


NOTE

- To perform device monitoring, 'Pro-Server EX' should be operating. When 'Pro-Server EX' is under suspension, click the [Reload] button to start the operation.



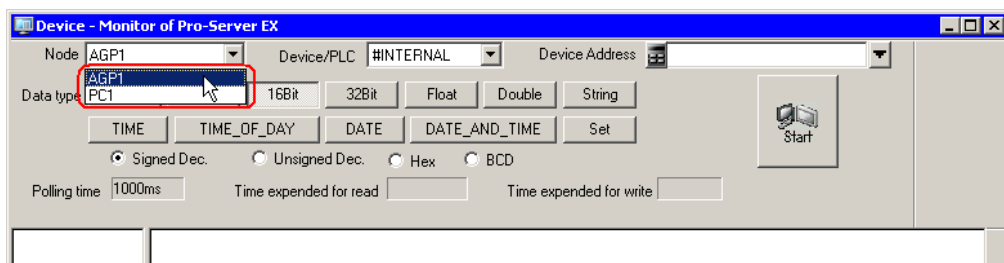
- Click the [Device Monitor] button.



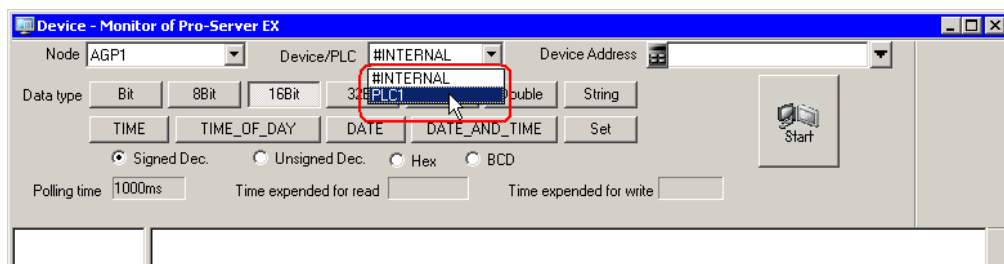
- NOTE** • Refer to "28.2.3 Displayed Messages" for details about the messages displayed when starting the device monitor.

The device monitor screen appears.

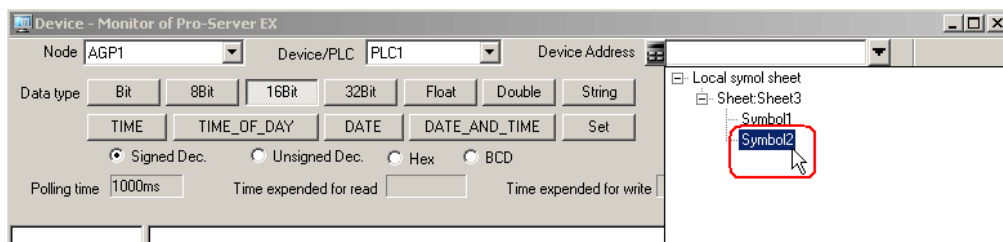
- Click the list button of [Node] and select a node having a monitoring device.



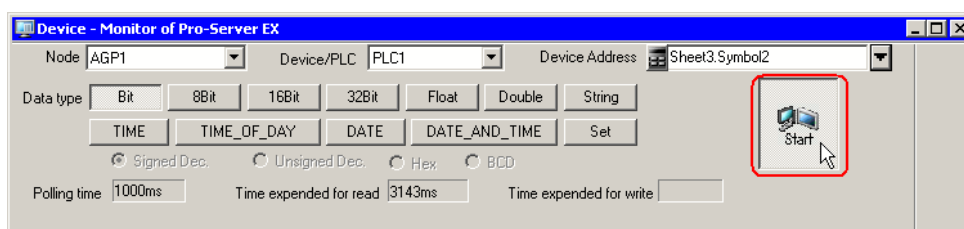
- Click the list button of [Device/PLC] and select a Device/PLC having a monitoring device.



- 5 Input directly the address of the monitoring device in [Device Address], or click the list button to select the symbol.



- 6 Select the data type and format to be displayed and click the [Start] button.



Device values are displayed according to the screen size with the specified device address (symbol) at the top.

| Address | +00 | +01 | +02 | +03 | +04 | +05 | +06 | +07 | +08 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| DM0050 | 60 | 70 | 80 | 90 | 100 | 105 | 1 | 1 | 1 |
| DM0059 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DM0068 | 0 | 0 | 100 | 200 | 300 | 0 | 0 | 0 | 0 |
| DM0077 | 0 | 0 | 0 | 23 | 223 | 521 | 345 | 0 | 0 |
| DM0086 | 0 | 0 | 0 | 0 | 23 | 223 | 521 | 345 | 0 |
| DM0095 | 0 | 0 | 0 | 0 | 0 | 133 | 149 | 0 | 69 |
| DM0104 | 96 | 0 | 0 | 0 | 0 | 0 | 142 | 23 | 23 |
| DM0113 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DM0122 | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 0 |
| DM0131 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DM0140 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DM0149 | 0 | 6 | 6 | 36 | 22 | 45 | 0 | 0 | 0 |
| DM0158 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DM0167 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DM0176 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DM0185 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DM0194 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 13 | 18 |

NOTE • Data type and format can be changed while device values are displayed.

Refer to "28.3.3 Setting Guide" for more details about the screen.

28.3.2 Writing Device Data

This feature allows you to write device data on the device monitor screen.

- 1 On the device monitor screen, double-click the device to write data in.

| Address | +00 | +01 | +02 | +03 | +04 |
|---------|-----|-----|-----|-----|-----|
| DM0050 | 60 | 70 | 80 | 90 | 100 |
| DM0059 | 1 | 0 | 0 | 0 | 0 |
| DM0068 | 0 | 0 | 100 | 200 | 300 |
| DM0077 | 0 | 0 | 0 | 23 | 223 |
| DM0086 | 0 | 0 | 0 | 0 | 23 |

The device data write screen appears.

| DM0060 | | | | | |
|------------------|-----|-----|-----|-----|-----|
| 1 0 Address Hold | | | | | |
| Address | +00 | +01 | +02 | +03 | +04 |
| DM0050 | 60 | | 90 | 100 | |
| DM0059 | 1 | 0 | 0 | 0 | 0 |
| DM0068 | 0 | 0 | 100 | 200 | 300 |
| DM0077 | 0 | 0 | 0 | 23 | 223 |
| DM0086 | 0 | 0 | 0 | 0 | 23 |

- 2 Enter a value in the text box, and press the ENTER key to fix the value.

| DM0060 | | | | | |
|------------------|-----|-----|-----|-----|-----|
| 1 0 Address Hold | | | | | |
| 10 | | | | | |
| Address | +00 | +01 | +02 | +03 | +04 |
| DM0050 | 60 | | 90 | 100 | |
| DM0059 | 1 | 0 | 0 | 0 | 0 |
| DM0068 | 0 | 0 | 100 | 200 | 300 |
| DM0077 | 0 | 0 | 0 | 23 | 223 |
| DM0086 | 0 | 0 | 0 | 0 | 23 |

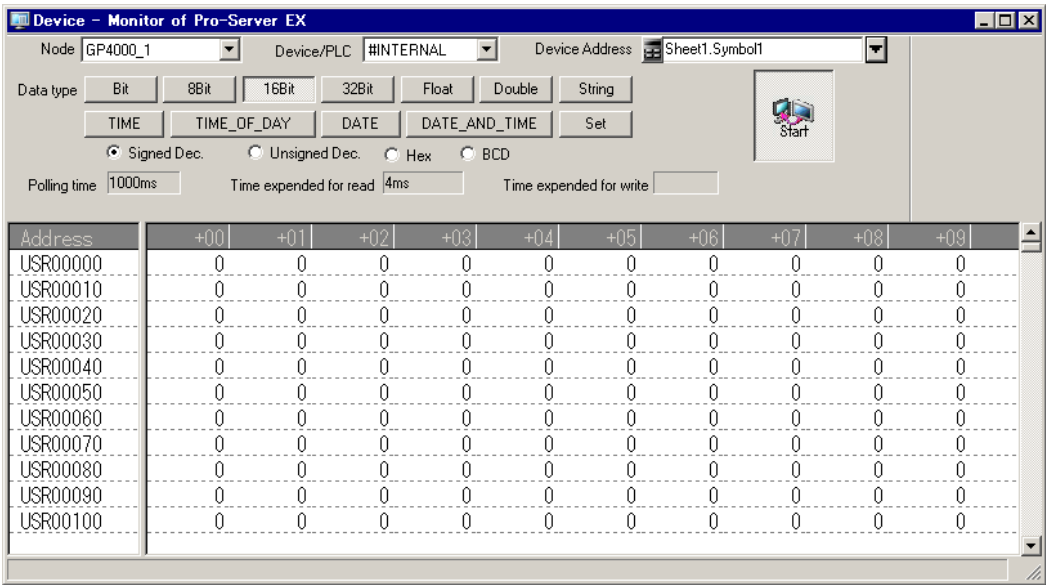
After pressing it, the write screen switches to that of the next device for continuous writing.

NOTE



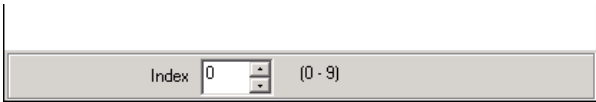
- Click the [Address Hold] button to continue to write data to the same device.
- To write data collectively to sequential devices, separate each value with a space when entering values.
Data of input number will be written into the device.
(Example) If you enter "1 2 3", then "1", "2" and "3" are written to the sequential devices.
- Enclose a character string using the bracket [] to specify the characters with hexadecimal code.
(Example) abc[0D] is handled equally as 0x61,0x62,0x63,0x0D specified in binary code.
Specify [by enclosing it in square brackets [[]].
(Example) To specify the string "[ABC]", type [[]ABC[]]

28.3.3 Setting Guide

The following explains the displayed contents of the device monitor screen.



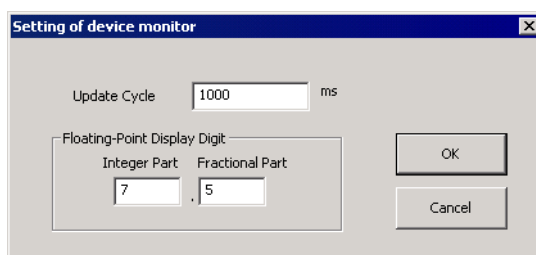
| Name | Description |
|------------|---|
| Node | Select an entry node having a monitoring device. |
| Device/PLC | <div>Select a Device/PLC having a monitoring device.</div> <div><div>NOTE</div><div><ul style="list-style-type: none">It is not necessary to set when the entry node is GP Series or Pro-Server EX.</div></div> |

| Name | Description |
|--|---|
| Device Address | <p>Set up the device address or symbol.</p> <ul style="list-style-type: none"> When specifying a device address: Enter directly from the Calculator icon. <p>Calculator icon</p>  <ul style="list-style-type: none"> When specifying a symbol: Select the symbol by clicking the list button. <p>List button</p>  <p>NOTE</p> <ul style="list-style-type: none"> Enter [Index] when you have selected Group Alignment from the symbol sheet list.  |
| Data type | <p>Change the type of displayed data of device values.</p> <p>NOTE</p> <ul style="list-style-type: none"> If you select "32Bit" for [Data type] and "Hex" for [Data Format], a value exceeding 8 digits entered during device data writing would be rounded off to the last 8 digits. If you select "Float" for [Data type], a value beyond the range of 1.175494351e-38F to 3.402823466e+38 entered during device data writing would cause the error "1.#INFO" to appear. If you select "Double" for [Data type], a value beyond the range of 2.2250738585072014e-308 to 1.7976931348623158e+308 entered during device data writing would cause the error "1.#INFO" to appear. |
| Data Format ([Signed decimal] to [BCD]) | <p>Change the format of displayed data of device values. Set up is possible when [Data type] is 8 bits, 16 bits, or 32 bits.</p> <p>NOTE</p> <ul style="list-style-type: none"> If you select "32Bit" for [Data type] and "Hex" for [Data Format], a value exceeding 8 digits entered during device data writing would be rounded off to the last 8 digits. |
| Set | <p>Clicking this button displays the "Setting of device monitor". Refer to "■ "Setting of device monitor" Screen" for more details.</p> |
| Polling time | <p>Displays the update interval which is set on the "Setting of device monitor" screen.</p> |
| Time expended for read | <p>Displays the time taken to read 1-screen device data of a device monitor.</p> |
| Time expended for write | <p>Displays the time taken to write device data.</p> |

| Name | Description |
|-----------------------------|---|
| Start | Start device data polling. Click again to finish polling. |
| Device Monitor Display Area | Device values are displayed according to the screen size with the specified device address at the top. Click a device value to display the device write screen for data writing. |

■ "Setting of device monitor" Screen

The following items are set on this screen.

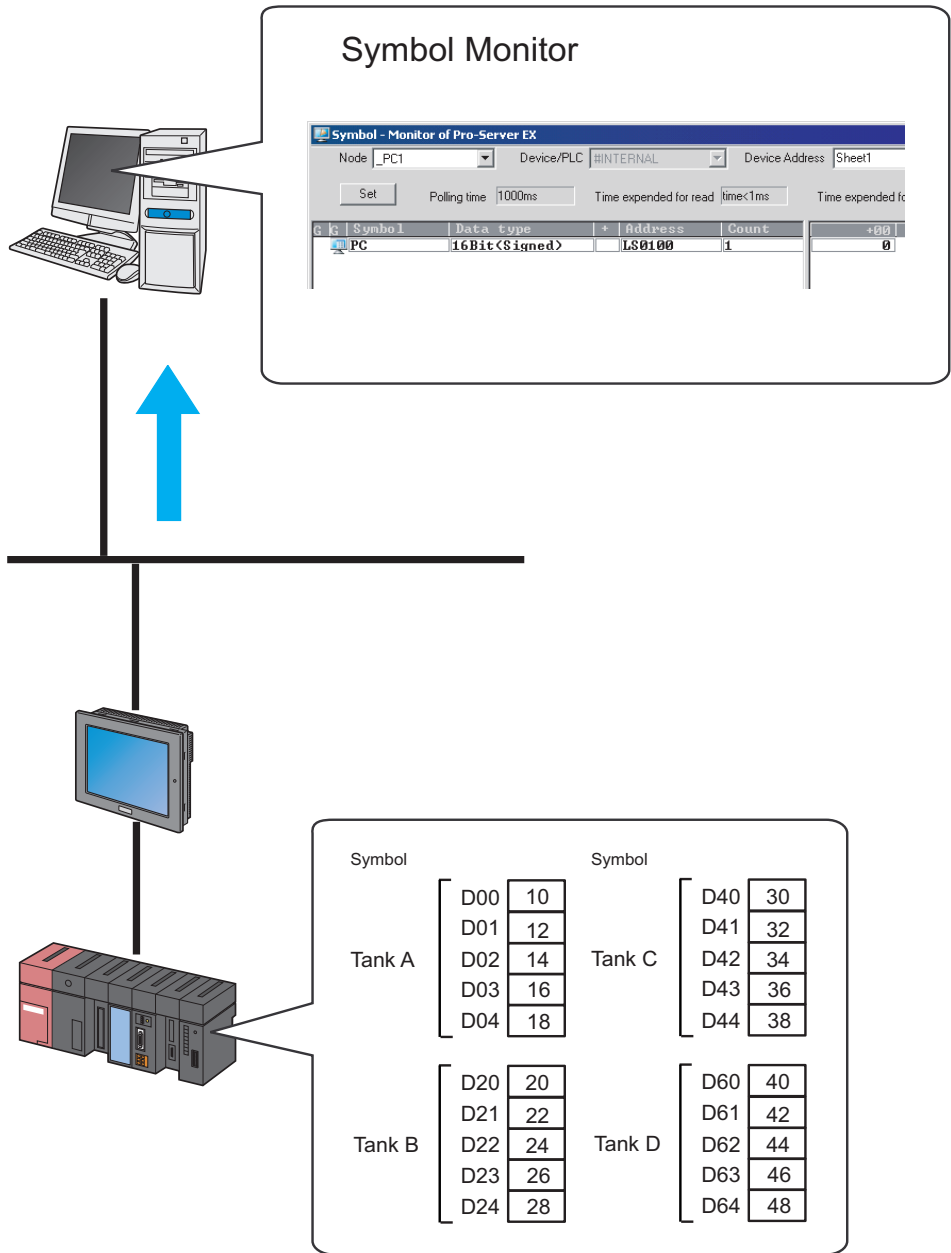


| Setting item | Setting content |
|------------------------------|---|
| Update Cycle | Set a polling interval (ms) of status monitoring. NOTE <ul style="list-style-type: none"> Set the interval in the range of 0 to 1000000 ms. |
| Floating-Point Display Digit | When "Single precision" or "Double precision" is selected as a data type, set each digit number of the integer and fractional portions of a floating point number. NOTE <ul style="list-style-type: none"> Maximum digit number of each integer and exponential portion of a floating point number is 15. |


28.4 Monitoring Symbol Values

28.4.1 Monitoring Symbols

This feature allows you to display the current values of device addresses by each registered symbol. In addition, you can display the current values of non-sequential devices collectively.

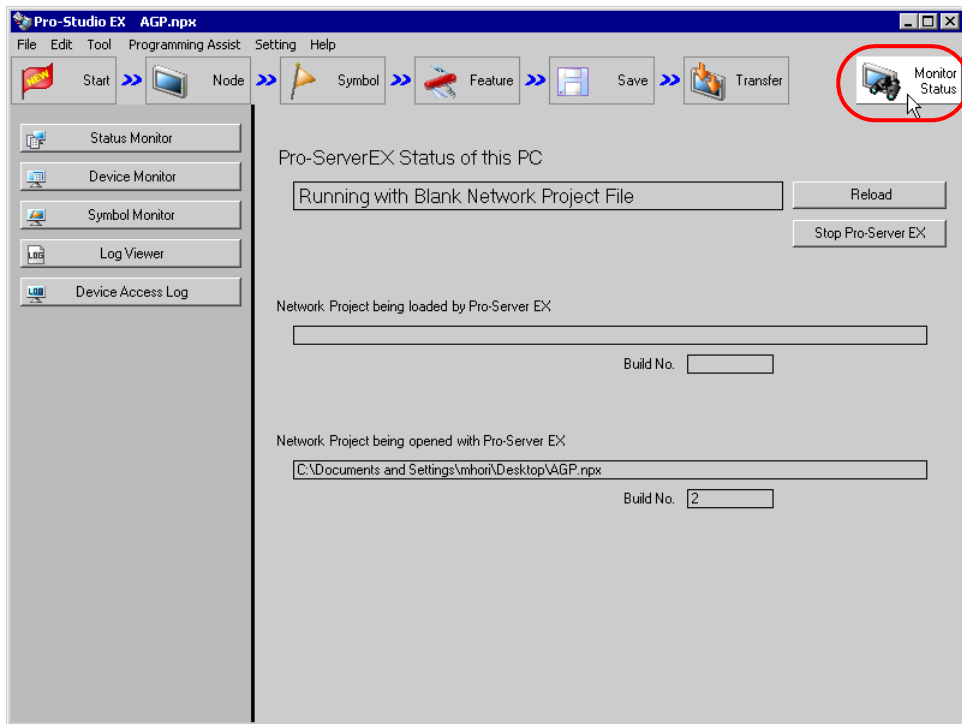


The following explains the items and contents displayed on the symbol monitor.

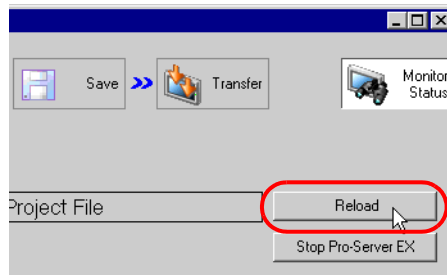
| Name | Description |
|-----------|---|
| G | <p>Click "+" to display the symbols in the lower hierarchy if they are grouped.</p> <p>NOTE</p> <ul style="list-style-type: none"> The symbol monitor displays 1 line per 1 symbol. Click the [Device Monitor] icon if the number of displayed data exceeds the maximum capacity of 256. This shows the "Device Monitor" screen, displaying on it the data with the device address of the symbol as the first address. |
| Symbol | <p>Displays the symbol name(s) in a selected symbol sheet.</p> <p>NOTE</p> <ul style="list-style-type: none"> To change the element No. of group alignment, click the group name and enter an element No. on the element No. entry screen.  |
| Data type | Symbol data type is displayed. |
| + | Displays "+" which indicates sequence if sequential device addresses are specified. |
| Address | Displays the first device address of a symbol. |
| Count | Displays the device number that a symbol holds. |

- 1 Click the [Monitor Status] icon on the status bar.

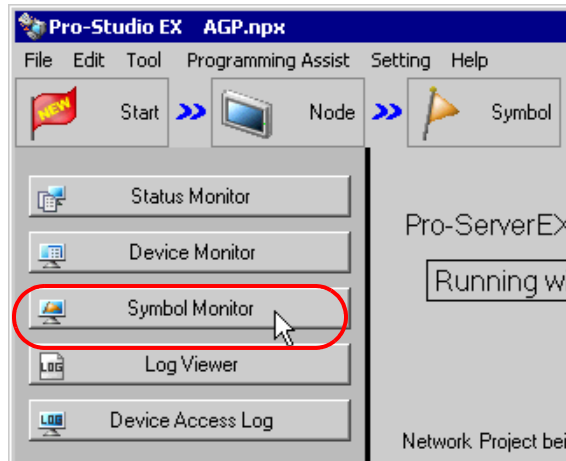
The status monitor screen appears to indicate the ongoing status of 'Pro-Server EX'.



- NOTE**
- To perform symbol monitoring, 'Pro-Server EX' should be operating. When 'Pro-Server EX' is under suspension, click the [Reload] button to start the operation.



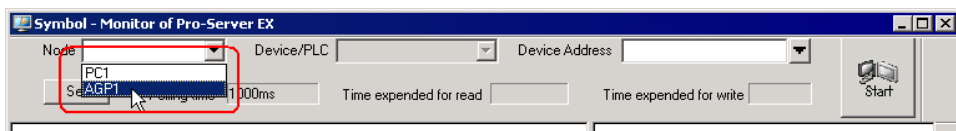
2 Click the [Symbol Monitor] button.



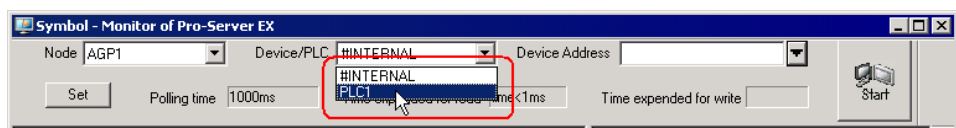
NOTE • Refer to "28.2.3 Displayed Messages" for details about the messages displayed when starting the symbol monitor.

The symbol monitor screen appears.

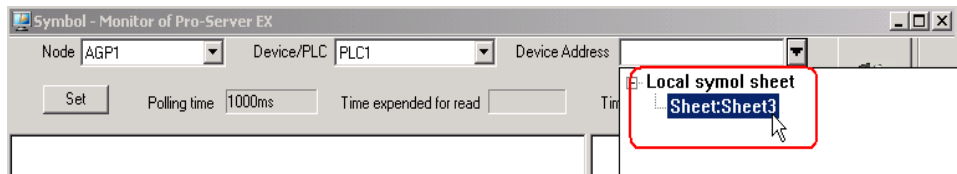
3 Click the list button of [Node] and select a node having a monitoring device.



4 Click the list button of [Device/PLC] and select a Device/PLC having a monitoring device.

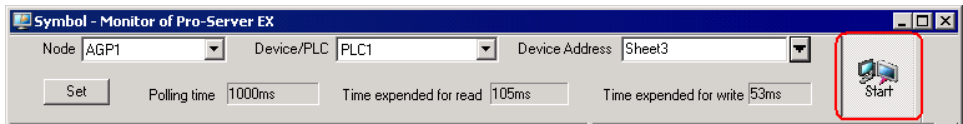


- 5 Input directly the symbol sheet name to be monitored in [Symbol Sheet], or click the list button to select the symbol sheet.



NOTE • Please make sure to specify a symbol sheet. You cannot specify any device address, symbol and group symbol.

- 6 Click the [Start] button in the case that the symbol sheet name is directly entered.



The symbols in the specified symbol sheet are displayed, and the device values are displayed from the first device address according to the screen size.

| G | G | Symbol | Data type | + | Address | Count | +00 | +01 | +02 |
|---|---|---------|---------------|---|---------|-------|-----|-----|-----|
| | | Symbol1 | Bit | | 0000.00 | 1 | 0 | | |
| | | Symbol2 | 16Bit(Signed) | | DM0050 | 1 | 60 | | |

Refer to "28.4.3 Setting Guide" for more details about the screen.

28.4.2 Writing Device Data

This feature allows you to write device data on the symbol monitor screen.

- 1 On the symbol monitor screen, double-click the device to write data in.

| G | Symbol | Data type | + | Address | Count | +00 | +01 | +02 |
|---|---------|----------------|---|---------|-------|-----|-----|-----|
| | Symbol1 | Bit | | 0000.00 | 1 | 0 | | |
| | Symbol2 | 16Bit (Signed) | | DM0050 | 5 | 60 | 70 | 80 |

The device data write screen appears.

- 2 Enter a value in the text box, and press the ENTER key to fix the value.

| G | Symbol | Data type | + | Address | Count | +00 | +01 | +02 |
|---|---------|----------------|---|---------|-------|-----|-----|-----|
| | Symbol1 | Bit | | 0000.00 | 1 | 40 | | |
| | Symbol2 | 16Bit (Signed) | | DM0050 | 5 | 60 | 70 | 80 |

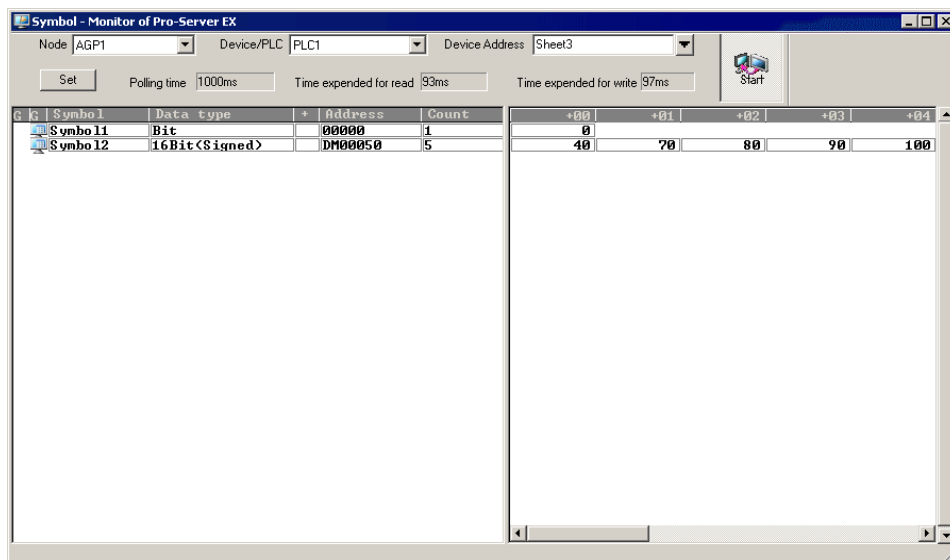
After pressing it, the write screen switches to that of the next device for continuous writing.

NOTE

- Click the [Address Hold] button to continue to write data to the same device.
- Writing a block of data to consecutive device addresses is done in 1 symbol units (data set up on a single row). Separate each value in the block write operation with a space.
(Example) If you enter "1 2 3", then "1", "2" and "3" are written to the sequential devices.
- Enclose a character string using square brackets [] to specify the characters in hexadecimal code.
(Example) abc[0D] is handled equally as 0x61,0x62,0x63,0x0D specified in binary code.
Specify [by enclosing it in square brackets [[]].
(Example) To specify the string "[ABC]", type [[]ABC[]]

28.4.3 Setting Guide

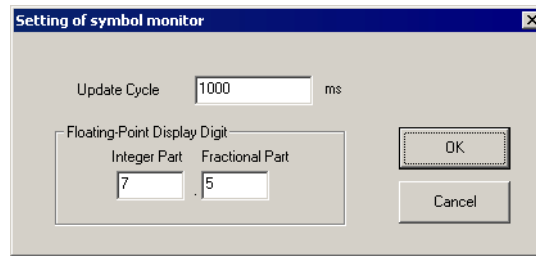
The following explains the displayed items and contents of the symbol monitor screen.



| Setting item | Setting content |
|-----------------------------|---|
| Node | Select an entry node having a symbol sheet that performs monitoring. |
| Device/PLC | Select a Device/PLC having a symbol sheet that performs monitoring. <div style="border: 1px solid black; padding: 2px; display: inline-block;">NOTE</div> <ul style="list-style-type: none"> It is not necessary to set when the entry node is GP Series or Pro-Server EX. |
| Device Address | Select a sheet name having a symbol that performs monitoring from the symbol sheet list. It is not possible to set any device address, symbol and group symbol. |
| Set | The "Setting of symbol monitor" screen appears. Refer to "■ "Setting of symbol monitor" Screen" for more details. |
| Polling time | Displays the update interval which is set on the "Detailed Settings of Symbol Monitor" screen. |
| Time expended for read | Displays the time taken to read 1-screen device data. |
| Time expended for write | Displays the time taken to write device data. |
| Start | Start device data polling. Click again to finish polling. |
| Symbol Monitor Display Area | Device values are displayed according to the screen size by the specified symbol sheet. Click a device value to display the device write screen for data writing. |

■ "Setting of symbol monitor" Screen

The following items are set on this screen.

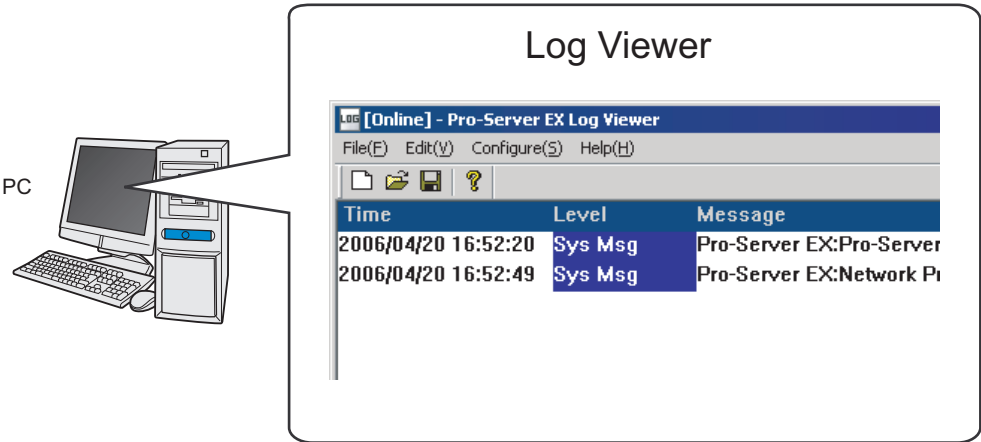


| Setting item | Setting content |
|------------------------------|---|
| Update Cycle | <p>Set a polling interval (ms) of status monitoring.</p> <p>NOTE</p> <ul style="list-style-type: none"> Set the interval in the range of 0 to 1000000 ms. |
| Floating-Point Display Digit | <p>When "Single precision" or "Double precision" is selected as a data type, set each digit number of the integer and fractional portions of a floating point number.</p> <p>NOTE</p> <ul style="list-style-type: none"> Maximum digit number of each integer and exponential portion of a floating point number is 15. |

28.5 Monitoring System Event Logs

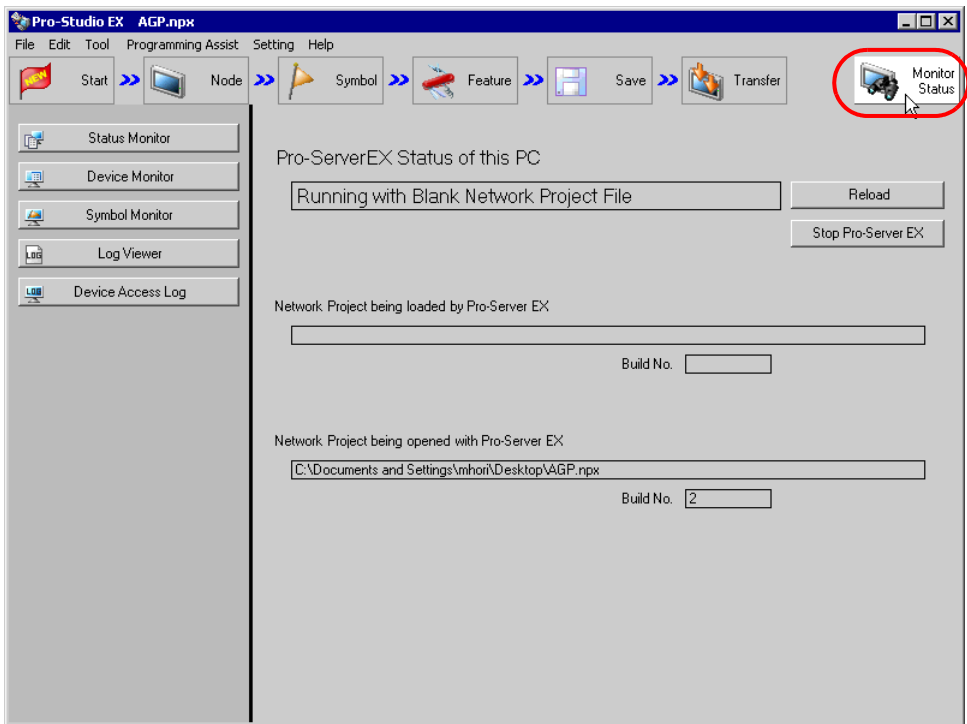
28.5.1 Monitoring Logs

This feature allows you to display a list of various information (logs) occurred during operation.



- 1 Click the [Monitor Status] icon on the status bar.

The status monitor screen appears to indicate the ongoing status of 'Pro-Server EX'.



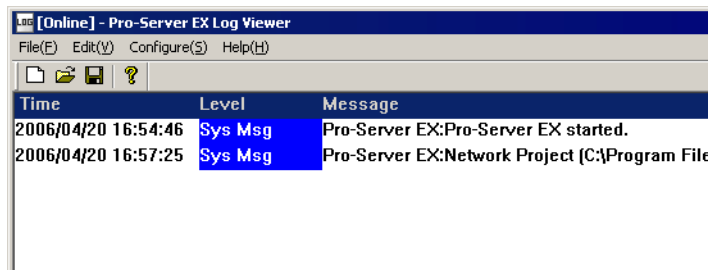
2 Click the [Log Viewer] button.



NOTE

- Refer to "28.2.3 Displayed Messages" for details about the messages displayed when starting the log viewer.

The "Pro-Server EX Log Viewer" screen appears, displaying a list of logs.



NOTE

- The log viewer can hold up to 200 single-byte characters in 1 line. Also, it can hold 500 messages at maximum. When the number of messages exceeds 500, the oldest message will be automatically overwritten in turn.
- To hide the tool bar or status bar on the log viewer screen, clear the check of [Tool Bar] or [Status Bar] from [Display] on the menu bar.
- You can open previously saved log data on the log viewer screen.

☞ "28.5.3 Confirming Previously Saved Logs"

■ Clearing Log Data

Click [Clear online log] from [Setting] on the menu bar.

The "Clear online log?" message appears. Then click the [Yes] button.

■ Saving Log Data

To save log data as a new file, click [Save As] from [File] on the menu bar, and specify a file name and its saving destination on the "Save As" screen, and then save it.

For overwriting, click [Overwrite Save].

Auto saving is available each time new log data occurs. (👉 "28.5.4 Setting Guide")

NOTE

- The log viewer can hold up to 256 single-byte characters for a file path name to be specified. Note that a double-byte character is regarded as 2 single-byte characters.
-

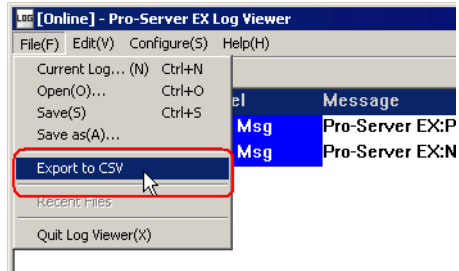
■ Exiting Log Viewer

Click [Exit Application] from [File] on the menu bar.

28.5.2 Outputting Log Data to CSV File

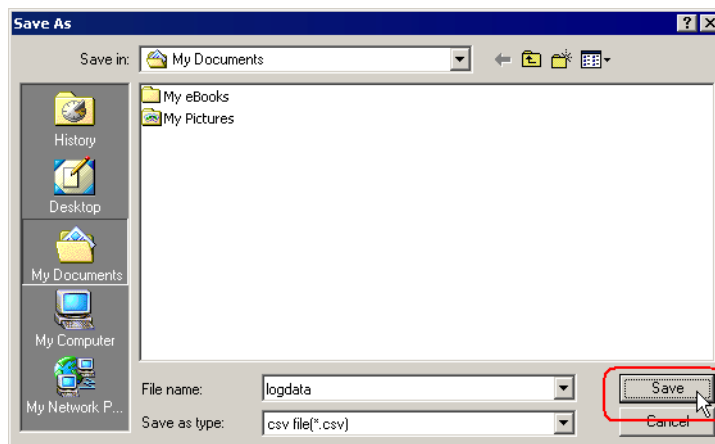
This feature allows you to output displayed log data as a CSV file.

- 1 Click [Export to CSV] on the menu bar.



The "Save As" screen appears.

- 2 Set the folder and file name to which data is output and click the [Save] button.



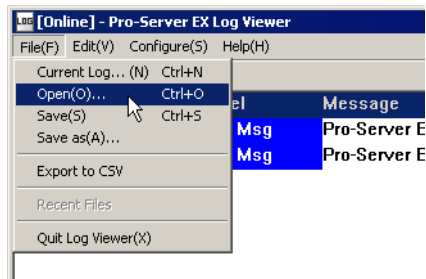
The displayed log data is output as a CSV file.

Data is output in comma-delimited format in order of "Time", "Level" and "Message".

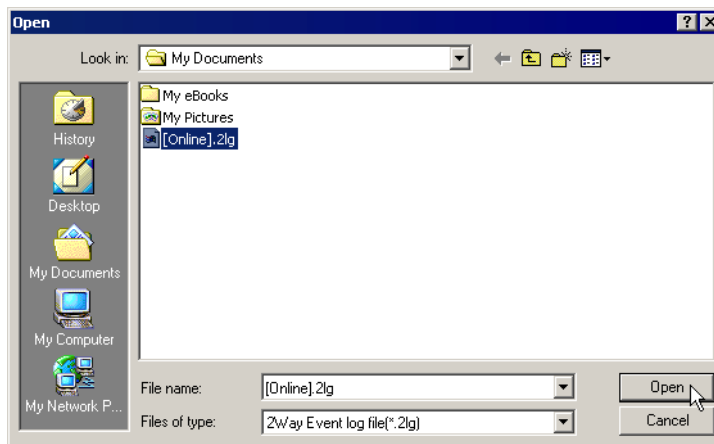
28.5.3 Confirming Previously Saved Logs

The log viewer displays real-time log status (in online mode), and on the other hand, it can also display a previously saved log file (*.2lg) by opening it and changing its screen from online to offline mode.

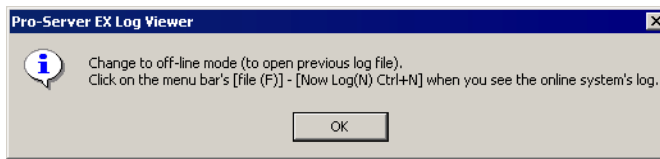
- 1 Click [Open] from [File] on the menu bar.



- 2 Specify a file name and click the [Open] button.

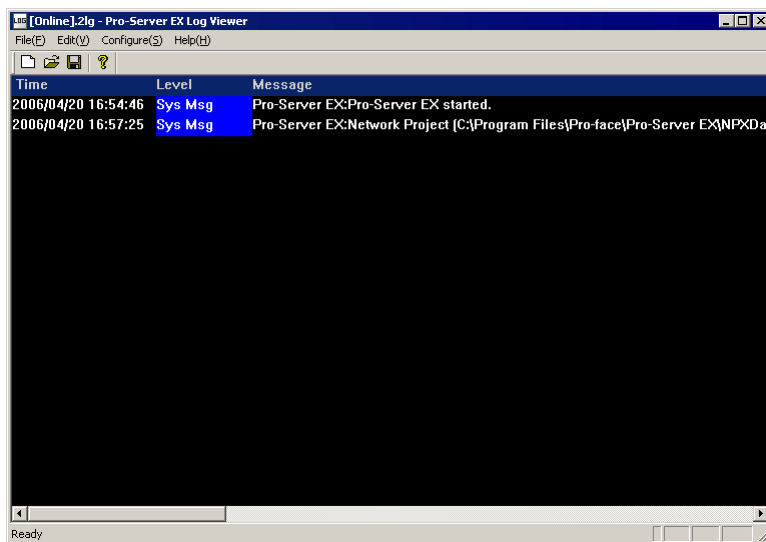


The message appears informing of change to offline mode.



3 Click the [OK] button.

The log viewer screen is changed to offline mode and displays the contents of the selected log file. (In offline mode, the background of the log viewer becomes black.)

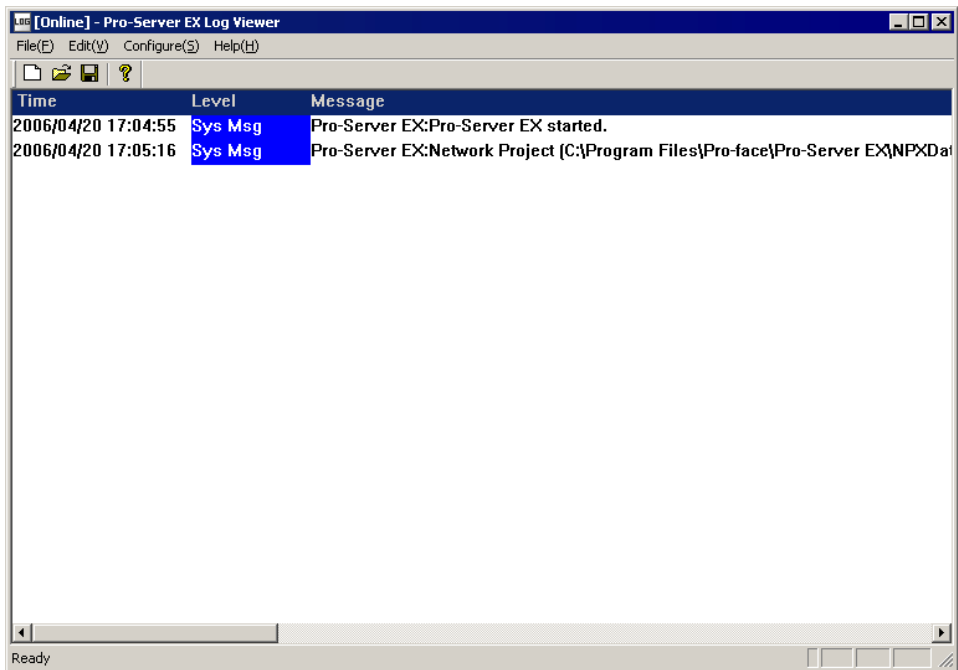


NOTE

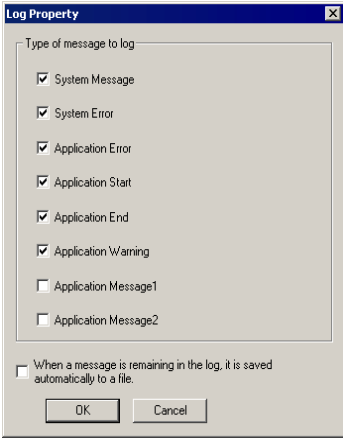
- To return to online mode, select [Current Log] from [File] on the menu bar.

28.5.4 Setting Guide

The following explains the displayed items and contents of the log viewer screen.



| Setting item | Setting content |
|--------------|--|
| Title Bar | Displays the name of an opened log file (*.2lg). |
| Menu Bar | Displays the menus for operating the log viewer. Clicking one of the items displays each pull-down menu. |
| Tool Bar | Displays the icons of frequently used commands. Clicking one of the icons executes each command. |
| Status Bar | Displays messages related to operations. |

| Setting item | | Setting content | | | | | | | | | | | | | | | | | |
|------------------|--|--|-------|---------|---------|----------------|---------|----------------------|-------|---|-------|--|-----|--|---------|---|----------|--|----------|
| Log Display Area | Time | Displays the dates and times when logs occurred. | | | | | | | | | | | | | | | | | |
| | Level | <p>Displays log levels. There are 8 kinds of log levels as shown below.</p> <table><thead><tr><th>Level</th><th>Message</th></tr></thead><tbody><tr><td>Sys Msg</td><td>System message</td></tr><tr><td>Sys Err</td><td>System error message</td></tr><tr><td>Error</td><td>Error messages of user-defined programs</td></tr><tr><td>Start</td><td>Starting messages of user-defined programs</td></tr><tr><td>End</td><td>Ending messages of user-defined programs</td></tr><tr><td>Warning</td><td>Warning messages of user-defined programs</td></tr><tr><td>Message1</td><td>Detailed messages 1 of user-defined programs</td></tr><tr><td>Message2</td><td>Detailed messages 2 of user-defined programs</td></tr></tbody></table> <p>NOTE</p> <ul style="list-style-type: none">You can select which items to be displayed in the log viewer. Click [Log Setting] from [Setting] on the menu, and select the items on the "Log Setting" screen.  <p>When [When a message is remaining in the log, it is saved automatically to a file] is checked, the online log will be overwritten every time a new log message occurs.</p> <ul style="list-style-type: none">When a System Err or Error displays, refer to the following. <p>☞ 36.3 'Pro-Server EX' Error</p> | Level | Message | Sys Msg | System message | Sys Err | System error message | Error | Error messages of user-defined programs | Start | Starting messages of user-defined programs | End | Ending messages of user-defined programs | Warning | Warning messages of user-defined programs | Message1 | Detailed messages 1 of user-defined programs | Message2 |
| Level | Message | | | | | | | | | | | | | | | | | | |
| Sys Msg | System message | | | | | | | | | | | | | | | | | | |
| Sys Err | System error message | | | | | | | | | | | | | | | | | | |
| Error | Error messages of user-defined programs | | | | | | | | | | | | | | | | | | |
| Start | Starting messages of user-defined programs | | | | | | | | | | | | | | | | | | |
| End | Ending messages of user-defined programs | | | | | | | | | | | | | | | | | | |
| Warning | Warning messages of user-defined programs | | | | | | | | | | | | | | | | | | |
| Message1 | Detailed messages 1 of user-defined programs | | | | | | | | | | | | | | | | | | |
| Message2 | Detailed messages 2 of user-defined programs | | | | | | | | | | | | | | | | | | |
| | Message | Displays log messages. In addition, the ACTION names set by 'Pro-Studio EX' are simultaneously displayed. | | | | | | | | | | | | | | | | | |

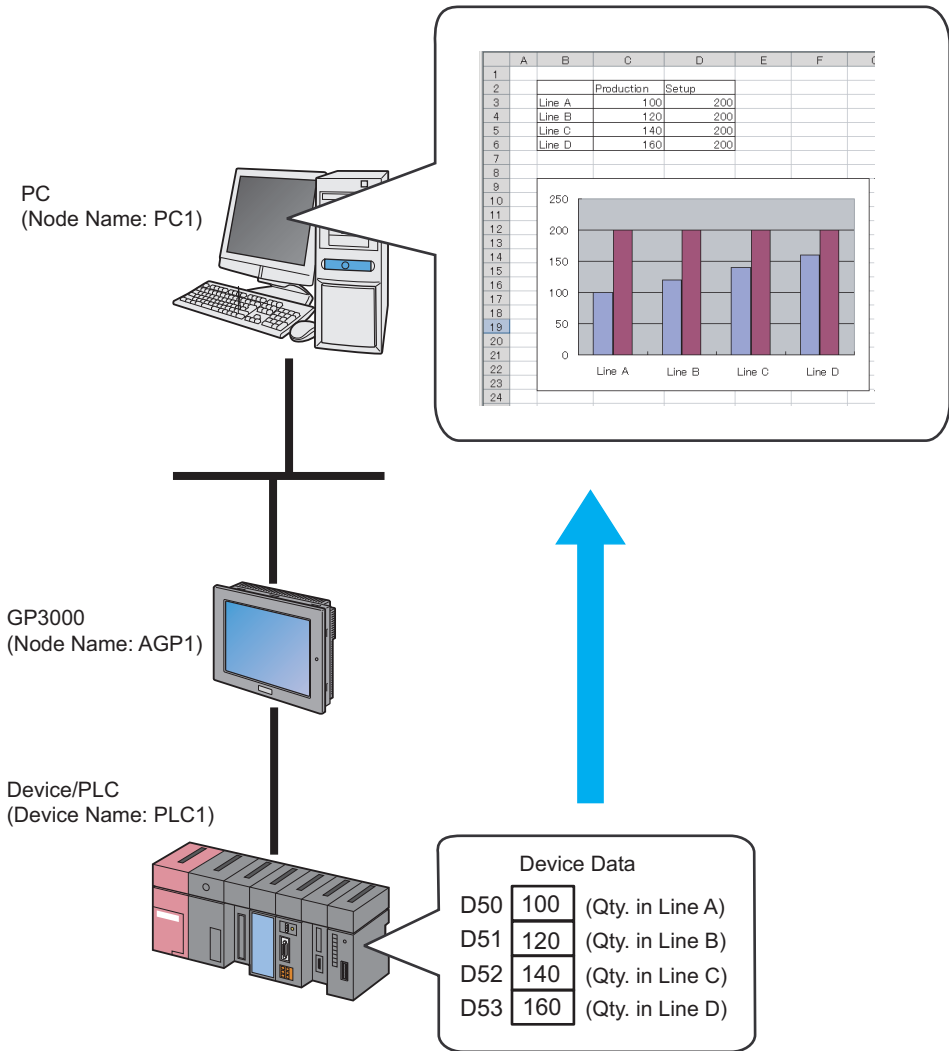
28.6 Monitoring Using Excel Graphs

28.6.1 Try to Display Using Excel Graphs

'Pro-Server EX' incorporates the DDE server function and enables the data transfer with an application including the DDE client function.

This feature allows you to read device data of Device/PLC to a sheet created by Excel with simple operation. You can create a monitor sheet in various formats by using features, such as the Excel graph wizard and functions.

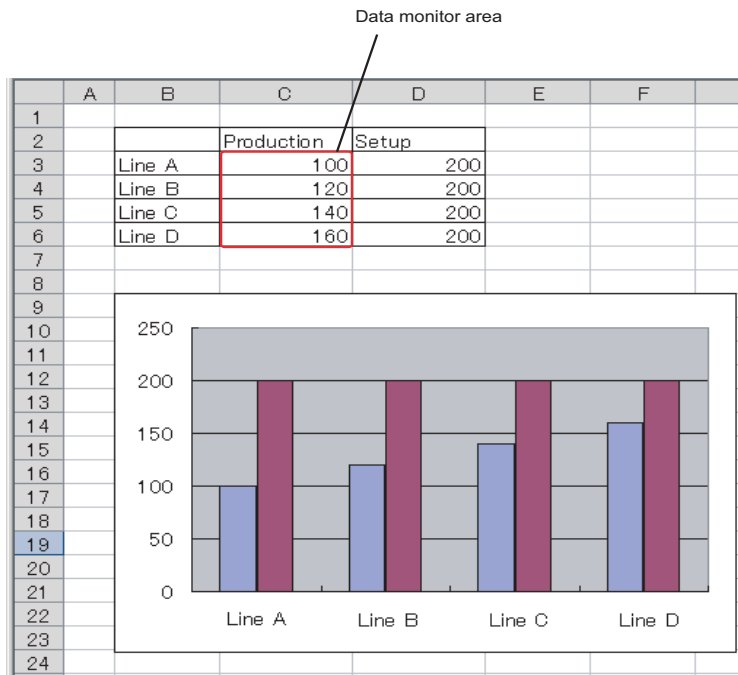
Monitor 4 device values of Device/PLC device addresses (word device: "D50" to "D53") on an Excel sheet and show them in a graph.



(1) Creating an Excel Sheet

This step creates a sheet for monitoring device data.

[Creation Example]



Leave the file open after creating.

NOTE

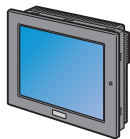
- As for a graph to be shown on the Excel sheet, create it by using Excel features like the graph wizard or functions.

(2) Registering Entry Nodes

This step registers as entry nodes the PC and the display units which serve as trigger conditions (trigger).
Refer to "31 Node Registration" for details about entry nodes.



Node Name :PC1
IP Address :192.168.0.1



Node Name :AGP1
IP Address :192.168.0.100
Device/PLC Information

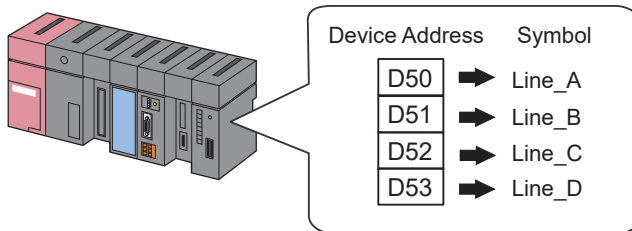
Ex.

| Entry node | Setting item | Setting example |
|--------------|--------------|-----------------|
| PC | Node Name | PC1 |
| | IP Address | 192.168.0.1 |
| Display Unit | Type | GP3000 series |
| | Node Name | AGP1 |
| | IP Address | 192.168.0.100 |

(3) Registering Symbols

This step registers as a symbol the device address from which data is read.

Refer to "32 Symbol Registration" for details about symbols.



| Setting item | Setting content | | | |
|--|----------------------------|----------------------------|----------------------------|----------------------------|
| Symbol Name | Line_A | Line_B | Line_C | Line_D |
| Data Type | 16Bit (Signed) | | | |
| Device address for symbol registration | "D50" of Device/PLC (PLC1) | "D51" of Device/PLC (PLC1) | "D52" of Device/PLC (PLC1) | "D53" of Device/PLC (PLC1) |
| No. of Devices | 1 | 1 | 1 | 1 |

(4) Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "25 Saving" for details about saving a network project file.

IMPORTANT

- 'Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
- Be sure to reload the network project file to 'Pro-Server EX'. If not, ACTION will not work.

(5) Transferring a Network Project File

This step transfers a saved network project file to entry nodes.

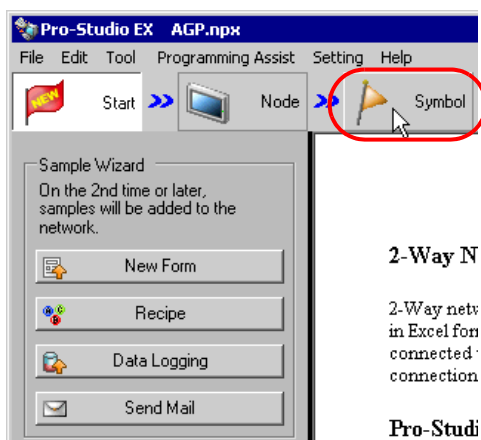
Refer to "26 Transferring" for details about transferring a network project file.

NOTE

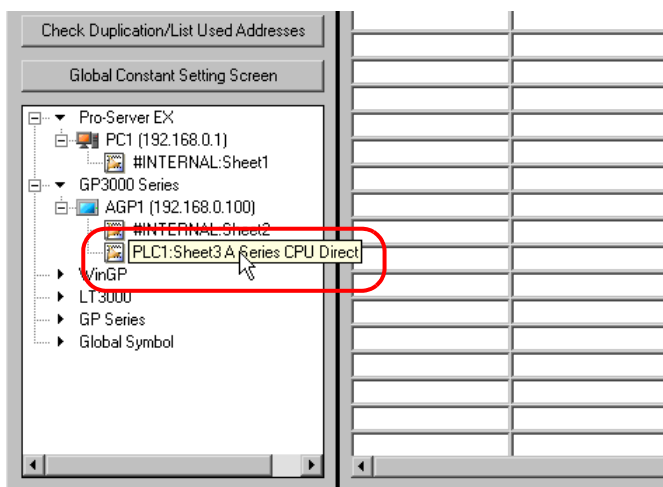
- Be sure to transfer a network project file. If not, ACTION will not work.

(6) Copying Data to an Excel Table

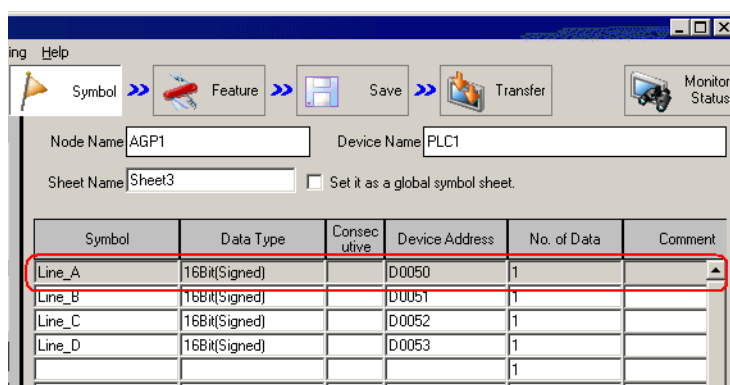
- 1 Click the [Symbol] icon on the status bar.



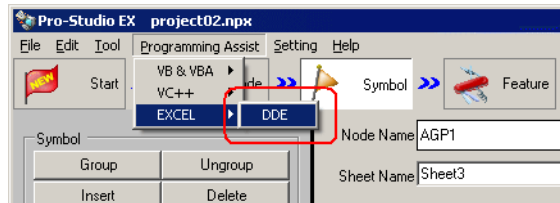
- 2 Click the symbol sheet where the symbol(s) to be monitored are registered.



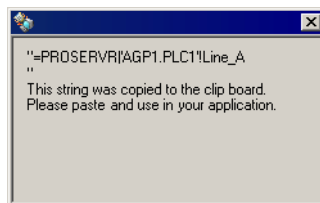
- 3 Select "Line_A".



- 4 From [Programming Assist] on the menu bar, select [Excel] - [DDE].



A pop-up message appears.



The DDE server uses information which consists of 3 parts, including [Application Name], [Topic Name], [Item Name] shown below, to communicate with an application.

[Application Name]

Name of the DDE server. Specify PROSERVR when accessing the 'Pro-Server EX' data. Corresponds to the leading PROSERVR in the above dialog box.

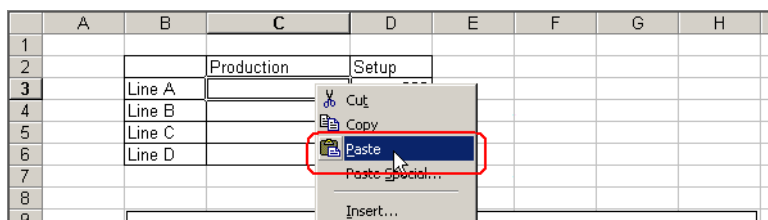
[Topic Name]

Name of the data group on the DDE server. In 'Pro-Server EX', specify the node name of display unit which joins the network, including the Device/PLC name, if necessary. Corresponds to AGP1.PLC1 in the above dialog box.

[Item Name]

Name of the individual data in the data group on the DDE server. In 'Pro-Server EX', specify the device address of PLC which connects to display unit. The symbol name defined with 'Pro-Studio EX' can be used as it is. Corresponds to Qty. in Line A in the above dialog box.

- 5 Display the Excel sheet, right-click the cell of the "Production" column in the "Line A" row, and then select [Paste].



The device data of "Line_A" is pasted into the cell.

| | A | B | C | D | E | F | G | H |
|----|---|--------|------------|-------|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | | Production | Setup | | | | |
| 3 | | Line A | 40 | 200 | | | | |
| 4 | | Line B | | 200 | | | | |
| 5 | | Line C | | 200 | | | | |
| 6 | | Line D | | 200 | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |

- 6 Repeat the procedures above to paste the device data of from "Line B" to "Line D" into the corresponding cells.

| | A | B | C | D | E | F | G | H |
|----|---|--------|------------|-------|---|---|---|---|
| 1 | | | | | | | | |
| 2 | | | Production | Setup | | | | |
| 3 | | Line A | 40 | 200 | | | | |
| 4 | | Line B | 70 | 200 | | | | |
| 5 | | Line C | 80 | 200 | | | | |
| 6 | | Line D | | 200 | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |

The device data will be read out in real time to the cells on the Excel sheet.

NOTE

- You cannot save the device data under monitoring. Use "Excel Report ACTION" etc for data saving.

29



Tips for Faster Communication

| | | |
|------|--|-------|
| 29.1 | Getting to Know the Performance of the Configured System | 29-3 |
| 29.2 | References on System Configuration | 29-7 |
| 29.3 | Grouping Symbols..... | 29-11 |
| 29.4 | Array of Symbols..... | 29-20 |
| 29.5 | Cache Registration of Frequently Used Devices | 29-23 |
| 29.6 | Device Access Log..... | 29-36 |

This chapter describes how to shorten the communication time and achieve efficient communication.

1 First, get to know the present performance!

☞ "29.1 Getting to Know the Performance of the Configured System"

2 Improve communication efficiency by controlling symbols proficiently!

☞ "29.3 Grouping Symbols"

☞ "29.4 Array of Symbols"

3 Improve communication efficiency by stocking the data of Device/PLC to the PC!

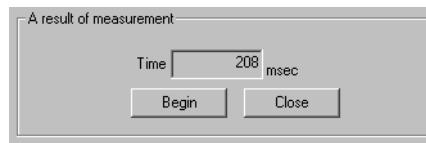
☞ "29.5 Cache Registration of Frequently Used Devices"

4 Which device do you often use?

☞ "29.6 Device Access Log"

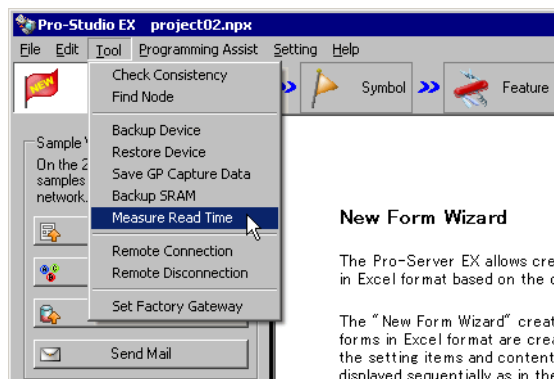
29.1 Getting to Know the Performance of the Configured System

This feature allows you to measure the reading time of device data from the specified node.



29.1.1 Measuring Reading Time

- 1 Click [Measure Read Time] from [Tools] on the menu bar.



- 2 Set each item on the "Data Read Performance Measurement" screen.

Data Read Performance Measurement

Read out the specified device and measure the required time.

Node Name

Device/PLC

Device Address

Number 255

Access Type

☐ Bit

☐ 8Bit

☒ 16Bit

☐ 32Bit

☐ Double

☐ 64Bit

☐ String

Read Type

☒ Direct

☐ Cache

A result of measurement

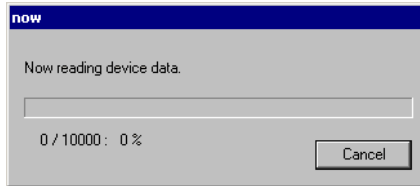
Time msec

Begin Cancel

NOTE

- For details about the setting items, please refer to "29.1.2 Setting Guide".

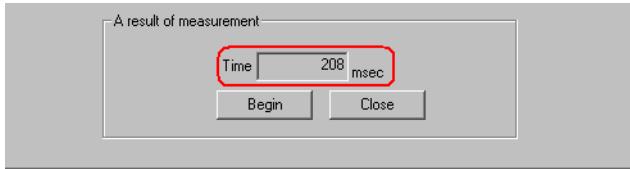
The "now" screen is displayed, indicating the measurement progress of reading performance.



After reading, the following dialog box will appear.



The measurement result (ms) is displayed in [Time] after processing.



NOTE

- Measurement results may vary according to the environmental conditions (number of tags on the screen, PLC connection style, application programs running on Windows at the same time and so on).
- If the set contents are incorrect, the following screen will appear.

| Message | Required action |
|--|--|
| You cannot specify a BIT symbol for measurement other than in BIT format | If you have specified a BIT symbol in the [Device Address] field, you cannot set an access type other than BIT to measure reading time. Reset the access type to [Bit], and then execute measurement. |
| You cannot specify a symbol other than BIT for measurement in BIT format | If you have specified a symbol in formats other than BIT in the [Device Address] field, you cannot set [Bit] as an access type to measure reading time. Reset the access type to other than [Bit], and then execute measurement. |

29.1.2 Setting Guide

Data Read Performance Measurement

Read out the specified device and measure the required time.

Node Name

Device/PLC

Device Address

Number

255

Access Type

☐ Bit
☐ 8Bit
☒ 16Bit
☐ 32Bit
☐ Double
☐ 64Bit
☐ String

Read Type

☒ Direct
☐ Cache

A result of measurement

Time
msec

Begin
Cancel

| Setting item | Setting content |
|----------------|--|
| Node Name | Select the node name that you wish to measure. |
| Device/PLC | Select the Device/PLC having the device you wish to measure. |
| Device Address | Enter the device address directly or select the symbol by clicking the list button. |
| Number | Enter the number of devices. The maximum number is 65535 although it changes depending on the device type and the access type. <div> <div>NOTE</div> <ul style="list-style-type: none"> This is automatically set up when a symbol is selected as the [Access Type]. </div> |

| Setting item | Setting content | | | | | | | | | | |
|---|--|---------|--------------------------------|-----------------------|---------------------|--------------------------------|------|------|-----------------|--------|-------------------|
| Access Type | Select an access type. Accessible tag data formats are as follows: | | | | | | | | | | |
| | | | Device Size or Tag data format | | | | | | | | |
| | | | 1 | 8 | 16 | 32 | | | 64 | STRING | |
| | | | BOOL | BYTE SINT USINT | WORD INT UINT | DWORD DINT UDINT REAL | DATE | TIME | TIME_OF _DAY | | DATE_AND_ TIME |
| | Access Type you can define for data read | Bit | o | x | o*1 | o*1 | x | x | x | x | x |
| | | 8 bits | x | o | x | x | x | x | x | x | x |
| | | 16 bits | x | x | o | o | x | x | x | x | x |
| | | 32 bits | x | x | o | o | o | o | o | x | x |
| | | 64 bits | x | x | x | x | x | x | x | o | x |
| | | Real | x | x | o | o | o | o | o | x | x |
| Text | | x | x | o | o | x | x | x | x | o | |
| *1 Availability depends on the driver in use. | | | | | | | | | | | |
| <div><div>NOTE</div><div><ul style="list-style-type: none">This is automatically set up when a symbol is selected as the [Access Type].</div></div> | | | | | | | | | | | |
| Read Type | Select a read type. | | | | | | | | | | |
| | <ul style="list-style-type: none">[Direct] Read device values directly.[Cache] Read cached device data. | | | | | | | | | | |

29.2 References on System Configuration

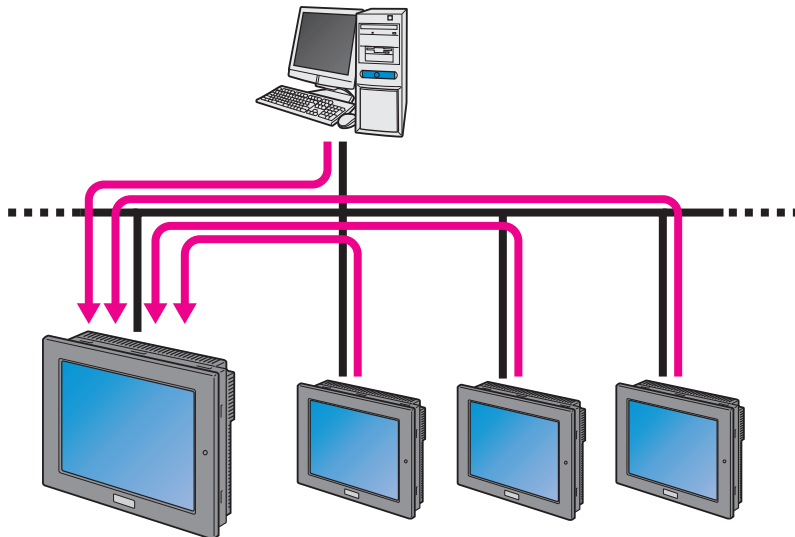
'Pro-Server EX' can access PCs, Displays, and/or Device/PLCs through Displays, via a network. This section describes the following references for dealing with connections.

- Reference when a specified node is accessed many times from multiple nodes
- Reference when a specified node is accessed continuously by other nodes
- Nodes that can be monitored / controlled from 'Pro-Server EX' nodes simultaneously

■ Reference when a Specified Node is Accessed Many Times from Multiple Nodes

When multiple nodes simultaneously access the internal device in a specified node, the number of nodes to access simultaneously should be eight nodes (communications from eight locations) at maximum (access more than once from the same node should be regarded as separate communication).

If nine or more nodes simultaneously access a device, a retry or timeout error may occur.



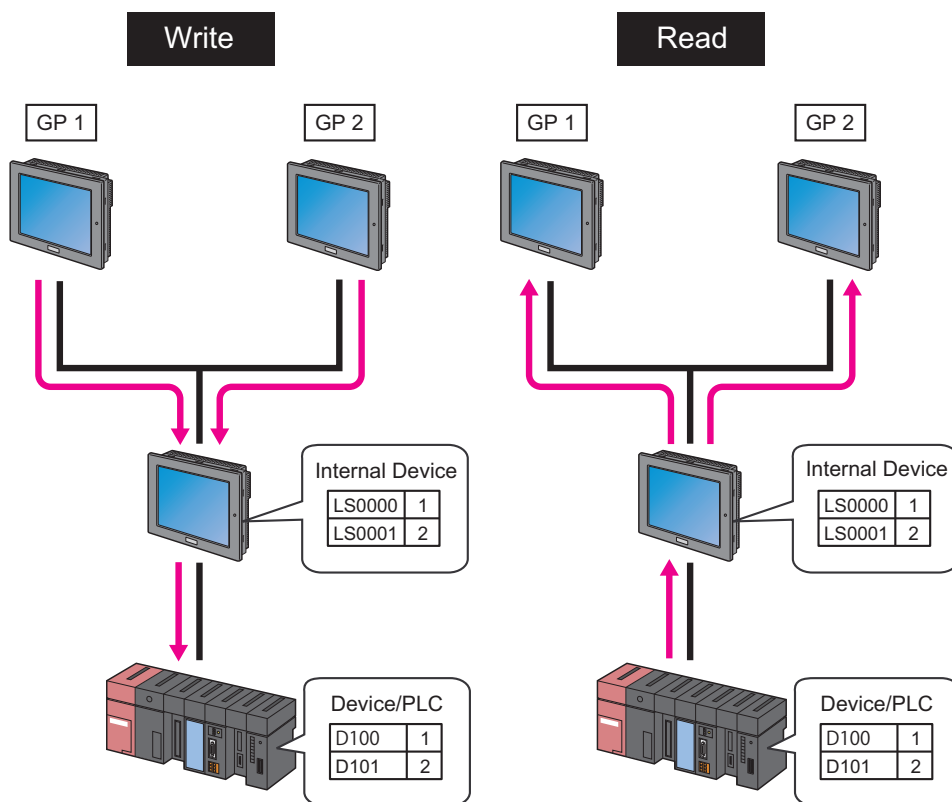
NOTE

- Examples of the internal device in the node are as follows:
 - When a node is 'Pro-Server EX': LS area
 - When a node is a Display: LS area, USR area, Memory link device, System device
- When multiple nodes simultaneously access a Device/PLC, timeout may occur depending on the type or number of devices, even if the number of access source nodes is eight or less. Timeout occurs when communication speed between a device and a node is slower than that between a node and other node.

When timeout occurs, try to access the Device/PLC via the internal device in the node connected to the Device/PLC.

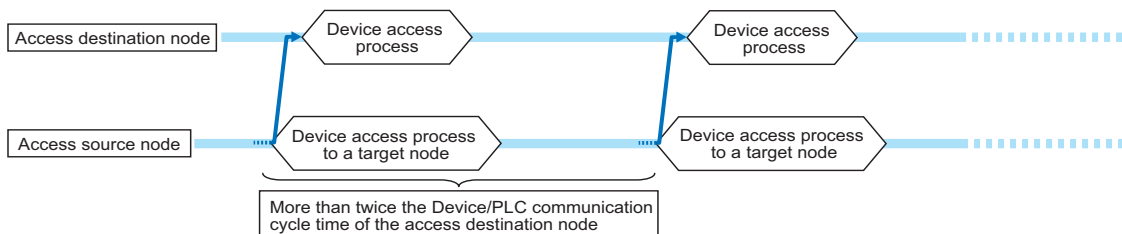
If you execute write access, first execute write from each node to the internal device in the node connected to the Device/PLC. Following this, sum up the written contents and write them from the internal device in the node to the Device/PLC in one shot.

If you execute read access, first read data from the Device/PLC to the internal device in the node connected to the device in one shot, then arrange it so that each node reads the data that has been read in the internal device.



■ Reference when a Specified Node is Accessed Continuously by Other Nodes

When you continuously access a specified node from other nodes at high speed, the screen updating on the Display may slow down. In this case, the access source node should be set to attempt access at intervals. The interval will be approximately more than twice the Device/PLC communication cycle time of the access destination node. If the access destination is an internal device, set the interval to 100 ms or longer.



NOTE

- The Device/PLC communication cycle time varies depending on the configuration of the currently-displayed screens on the Display (e.g. types and numbers of the devices on the screen). Set the continuous access interval to approximately more than twice the slowest cycle time.
- You can check the Device/PLC communication cycle time using the status monitor function.

■ Nodes that can be Monitored / Controlled from 'Pro-Server EX' Nodes Simultaneously

The maximum number of nodes that operate, from which the 'Pro-Server EX' node can read 1000 words in the sequential internal device per second approx., is around 20.

NOTE

- If the number of nodes is over 20, consider the following methods: the Multi-Handle function in a multi-thread application, the device cache function, symbol grouping, and/or symbol alignment.
 - ☞ "29.3 Grouping Symbols"
 - ☞ "29.4 Array of Symbols"
 - ☞ "29.5 Cache Registration of Frequently Used Devices"
- Generally the ARP packet is sent regularly to update the ARP table in the TCP/IP network. On Windows PCs, packets may be lost when transmission is performed via ARP protocol and communication protocol simultaneously. If this is the case, take the following countermeasures.
 - 1 Start the command prompt on a PC in a 'Pro-Server EX' node.
 - 2 Execute the following command.


```
arp -s (IP address of a send destination) (MAC address of a send destination)
```


■ When replacing GP Series node display units with other types of display unit nodes

When a display unit in the GP series node is replaced with that of the ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, or LT3000 node, communication speed for high-speed continuous access may become slower than that before replacement.

If communication speed slows down, do not continuously access at high speed, but consider a method of combining the number of necessary access events into a single one.

The methods for combining a number of times for necessary access into accessing only once include the device cache function, symbol grouping, and symbol alignment.

☞ "29.3 Grouping Symbols"

☞ "29.4 Array of Symbols"

☞ "29.5 Cache Registration of Frequently Used Devices"

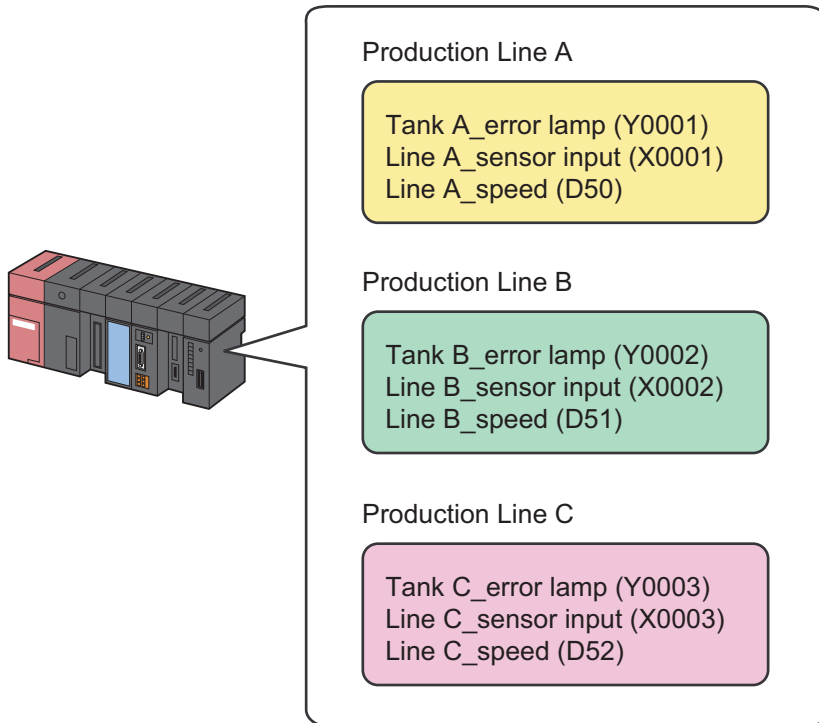
29.3 Grouping Symbols

29.3.1 Grouping Symbols

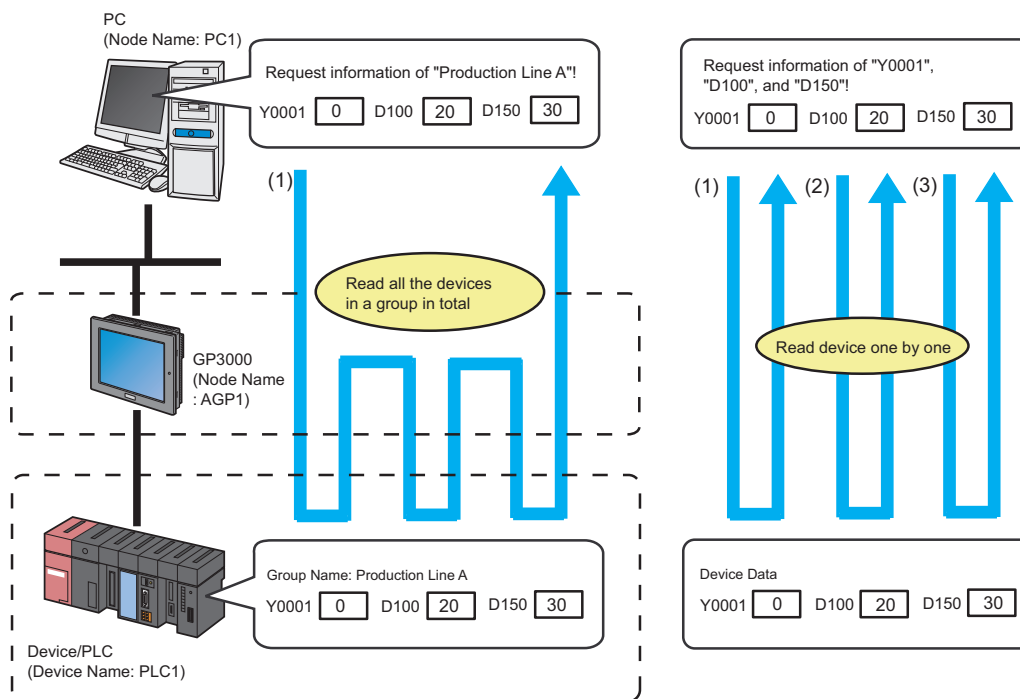
This feature allows you to collect and group multiple symbols.

Within the same Device/PLC, symbol grouping is available regardless of sequential/non-sequential addresses or data type to establish efficient communication at data transfer and access from API.

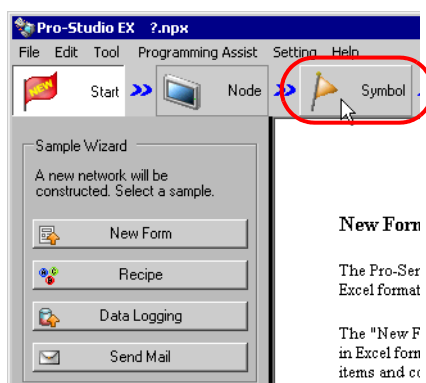
In addition, grouping makes symbol control easier.



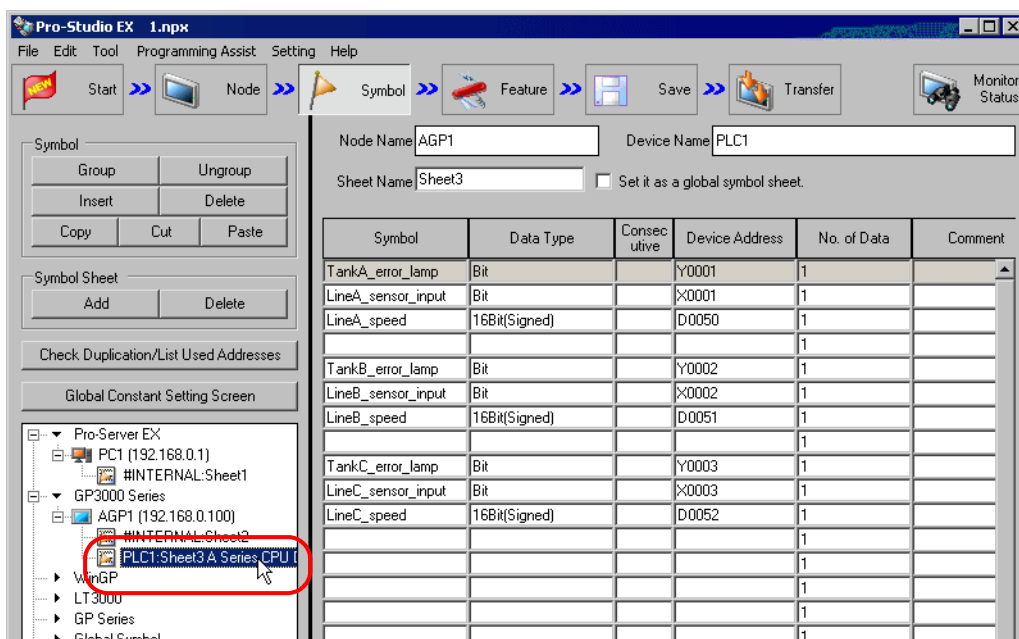
■ Communication Example Using Grouping



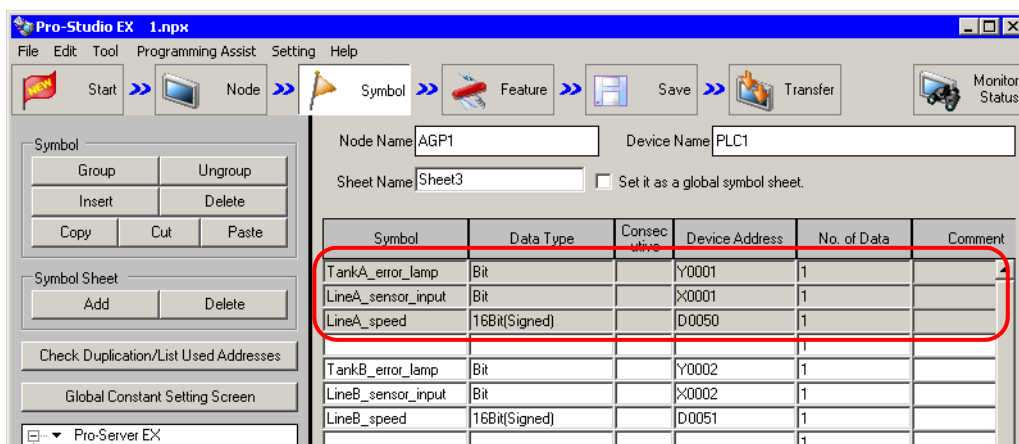
- 1 Click the [Symbol] icon on the status bar.



- 2 Select the symbol sheet where the symbols you wish to group are registered.



- 3 Click the symbols you wish to group on the symbol sheet.

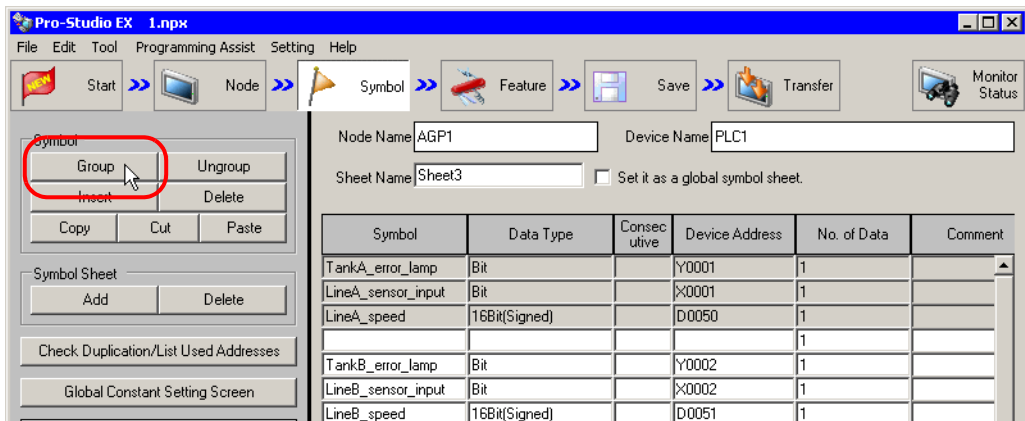


The selected symbol row turns gray.

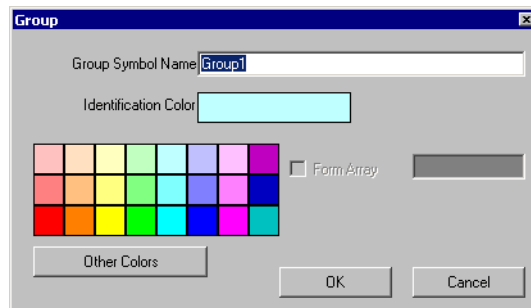
NOTE

- To select sequential multiple symbols at a time, click the first symbol row to be selected and drag the mouse over the last symbol row.

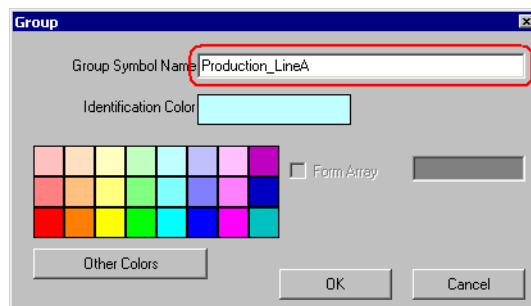
- Click the [Group] button.



The "Group" screen appears.



- Enter a group symbol name in [Group Symbol Name] and click a color that you wish to use from the color palette for distinguishing the group symbol.



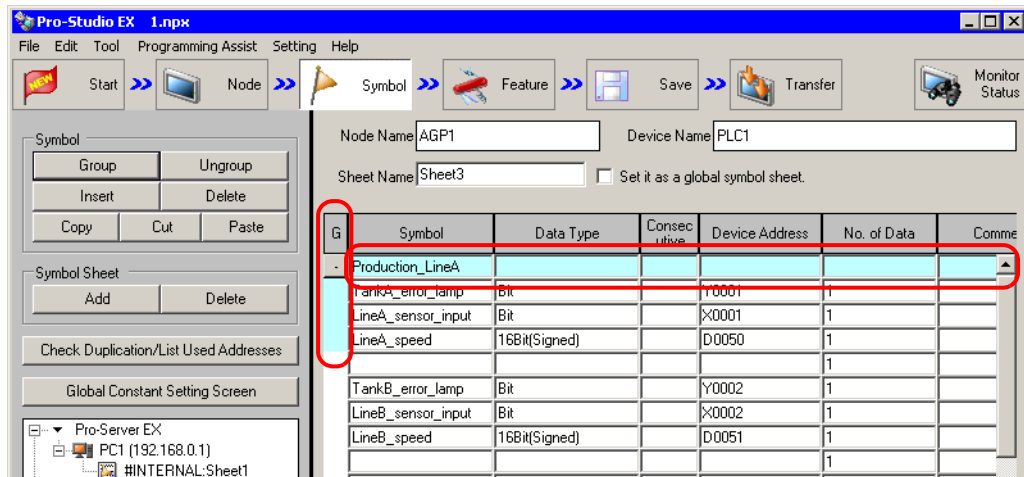
NOTE • If you do not find one you wish to use on the palette, click the [Other Colors] button. This displays the "Color Setup" screen, where you can set the color.

☞ "32.2 Registering Symbols on a Symbol Sheet"

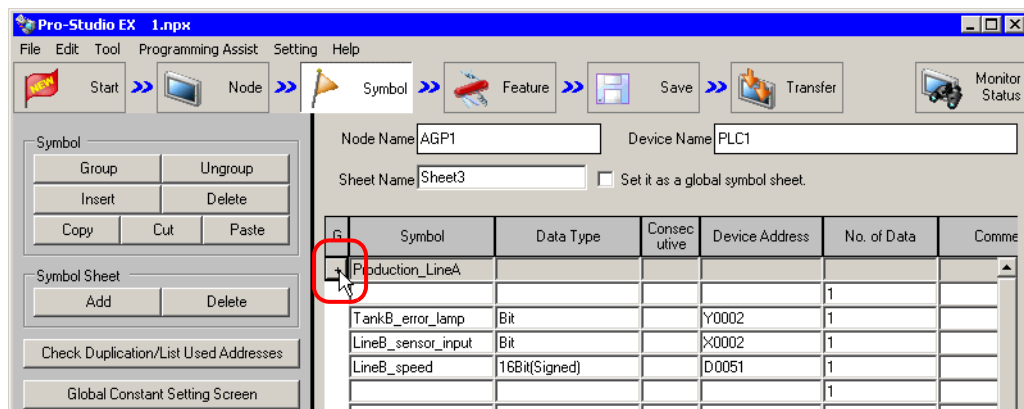
6 Click the [OK] button.

A group display column (indicated as "G") is created on the left of the symbol display window. The set group name is displayed in the top row of the symbols.

Additionally, the group display column of the grouped symbols shows the identifying color set above.



With the group configuration symbols displayed, the [-] button is placed in the column displaying the group name. Clicking the [-] button hides the configuration symbols and displays only the group name. (The [-] button changes to the [+] button.)

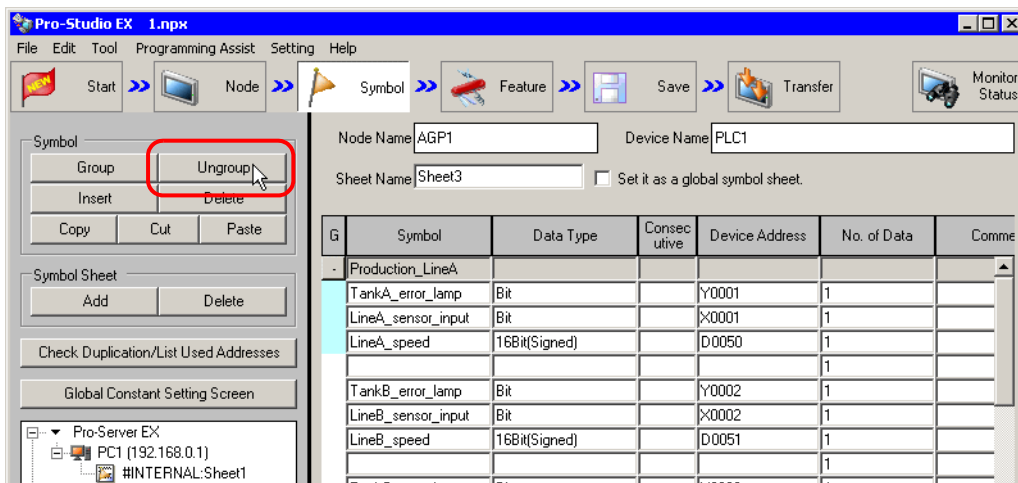


NOTE

- When clicking the [OK] button, the group names are checked whether they are duplicated or not. Reset the same names to be different ones.

Ungrouping

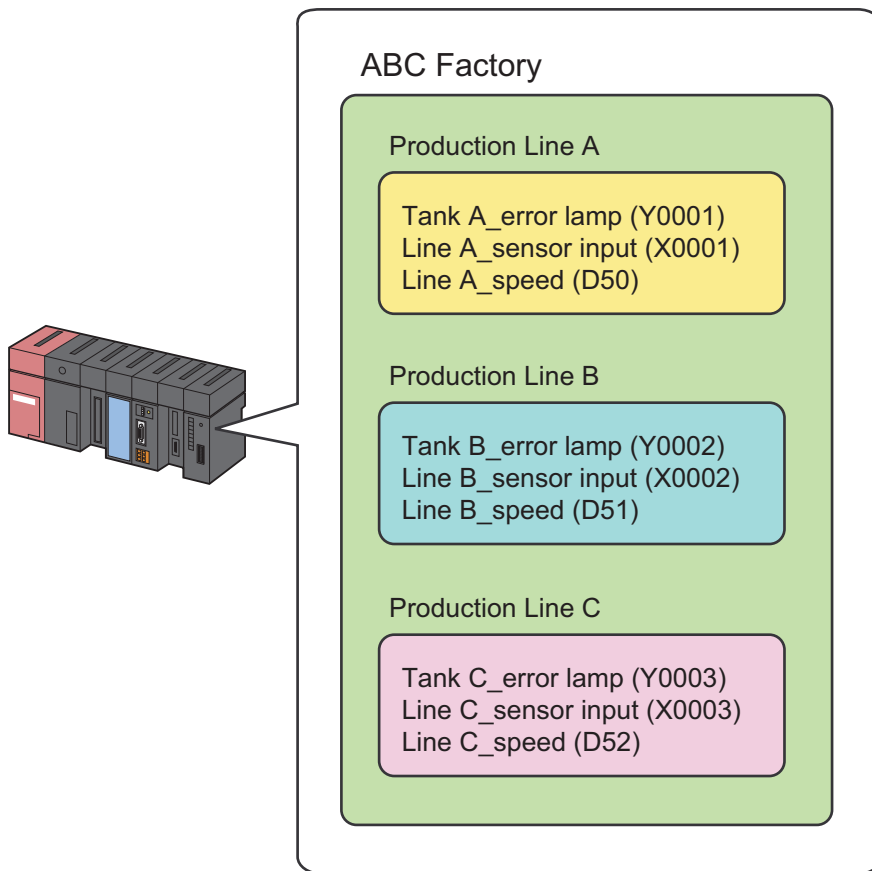
Click the column displaying the group name, and then click the [Ungroup] button.



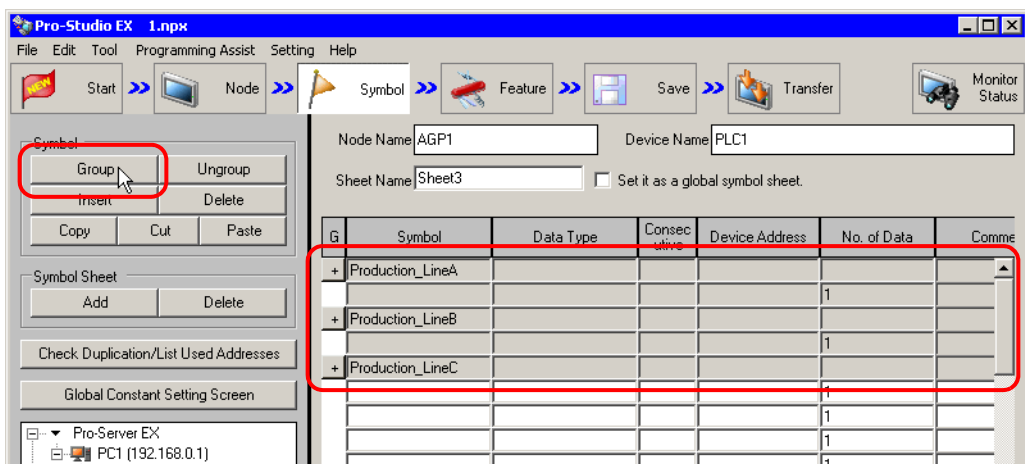
Symbols are ungrouped.

29.3.2 Grouping Groups/Symbols Together

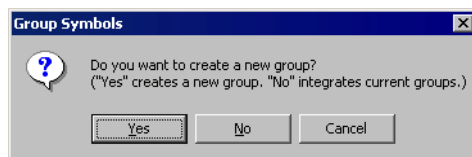
Grouping is available up to 2 hierarchies. You can create a new group by gathering two different groups, or a group and symbols.



- 1 Select the groups or symbols you wish to group from the symbol sheet, and then click the [Group] button.



The "Group Symbols" screen appears.

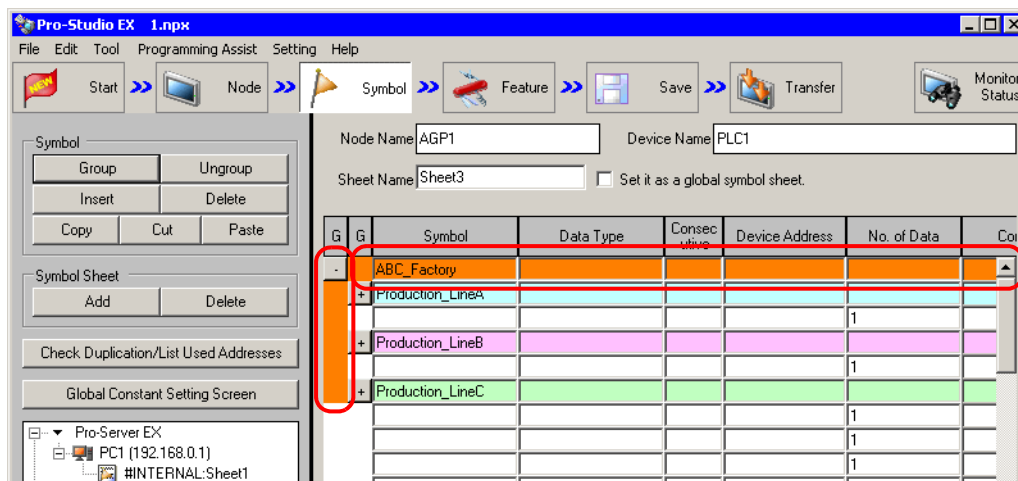


- When you click the [Yes] button:

The "Group" screen appears.

Set [Group Symbol Name] and [Identification Color] for the group in the second hierarchy, and then click the [OK] button.

The second hierarchy group is now created, and the groups or the group and symbols selected above are registered as a new group.



- When you click the [No] button:

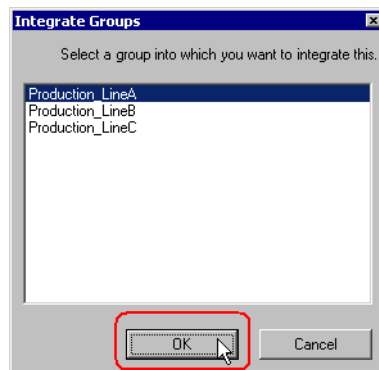
According to the combination of the groups or symbols selected, either (1) or (2) given below will be performed.

(1) Combination of a group and symbols: The selected symbols are integrated (added) into the existing group to be selected.

(2) Combination of two different groups: The selected group is added into the other group.

Select the group name to be integrated on the "Integrate Groups" screen, and then click the [OK] button.

The other group will be added into the group selected here.



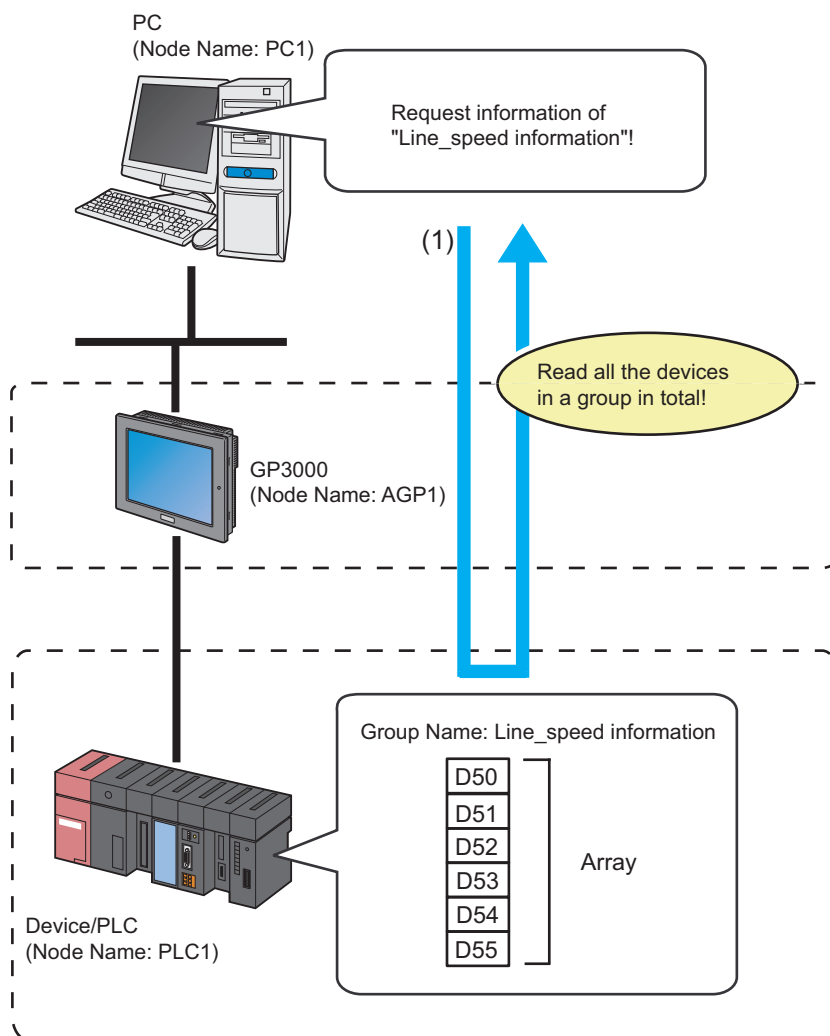
29.4 Array of Symbols

29.4.1 Advantages of Symbol Array

'Pro-Server EX' offers efficient communication by storing data to be read or written in sequential devices.

Moreover, array symbols allows you to save the effort of registering sequential devices as symbols respectively, making symbol control easier.

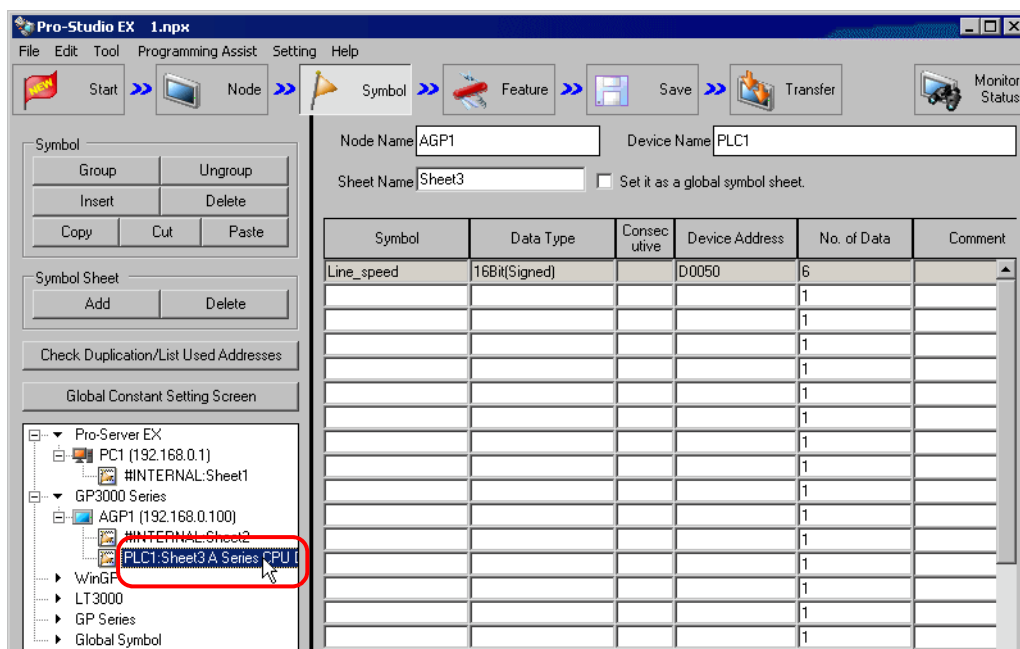
You can register sequential devices on a symbol sheet as "Array".



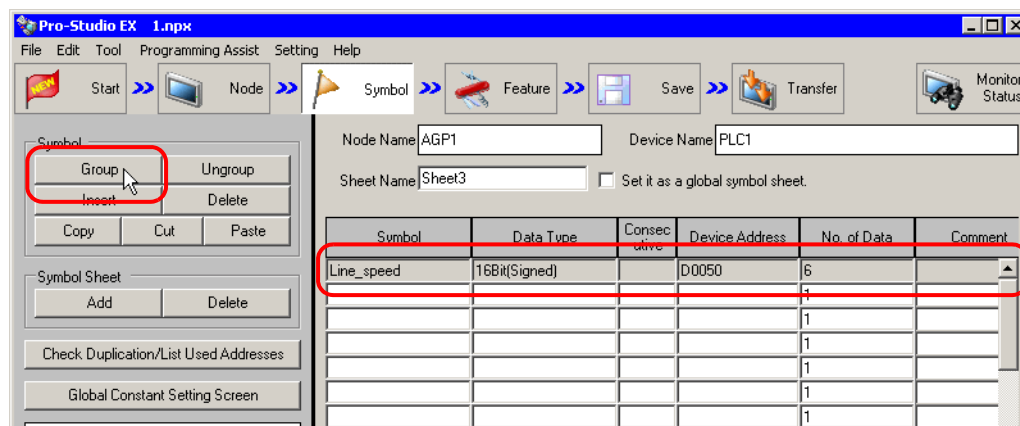
NOTE

- Data types should be integrated into Word or Bit type.
- As for the Word type, you can add Bit offset symbols into an array. However, it is impossible to place these symbols at the first address of the array.

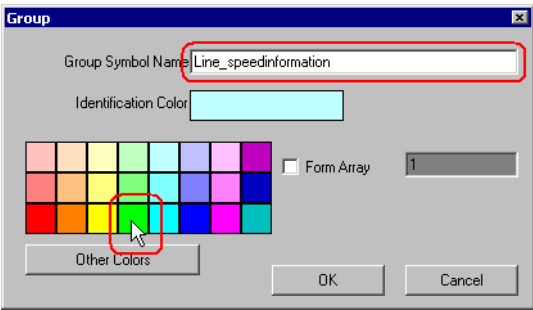
- 1 Click the [Symbol] icon on the status bar, and select the symbol sheet where the symbol you wish to array are registered.



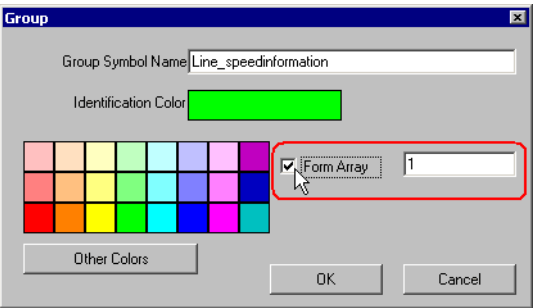
- 2 Click the symbol you wish to align, and click the [Group] button of [Symbol] on the symbol sheet.



3 Set the group symbol name and identification color.



4 Check the [Form Array] check box, and enter the number of array (elements).

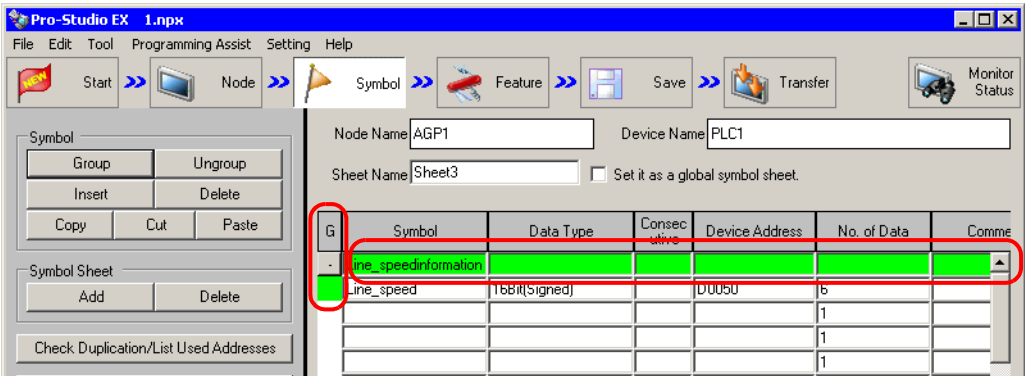


NOTE

- You can select the number of alignments with global constants.
☞ "32.6.3 Global Constant Setting"
- When multiple values are set for the element number, sequential groups from the original device address are created by the number of elements.

5 Click the [OK] button.

A group display column (indicated as "G") is created on the left of the symbol display window. The top row of the symbols shows the group name, array type (Word type or Bit type) and the number of array (elements).



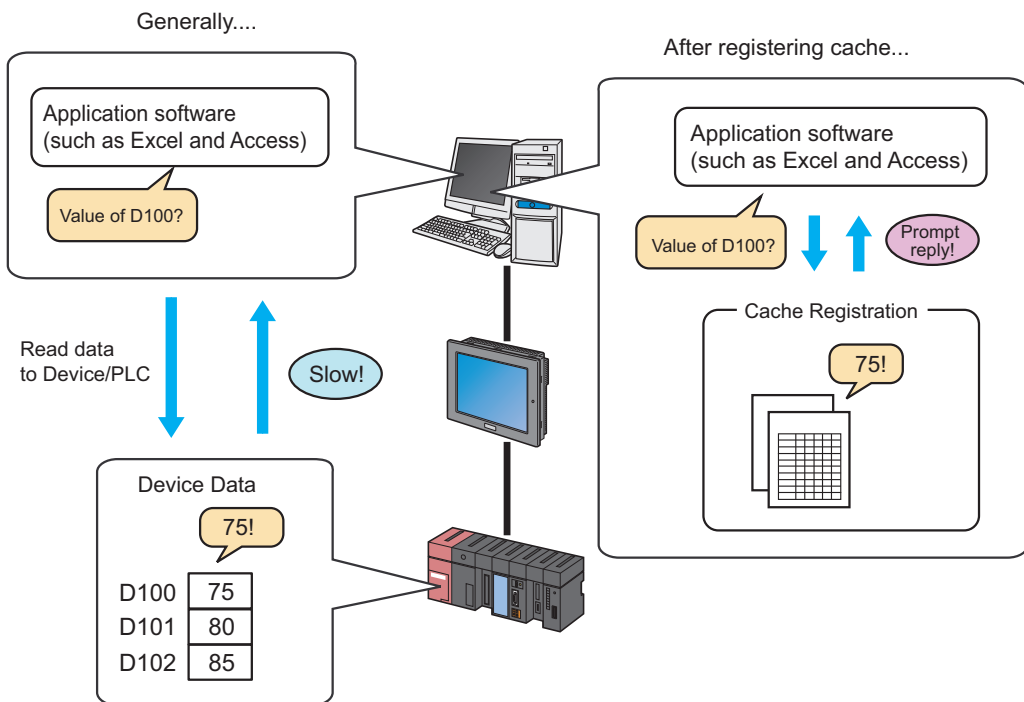
29.5 Cache Registration of Frequently Used Devices

Device cache makes 'Pro-Server EX' automatically access a device and temporarily save the values into the memory in a PC.

When a device receives the access request from the application, 'Pro-Server EX' replies promptly by returning cached data temporarily stored in the memory of a PC if the device has been already cached. If there is no cached data, 'Pro-Server EX' is to read to the Device/PLC via a display unit.

Using device cache minimizes delay of data transfer or disruption on the line due to access concentration.

To utilize the device cache function, the specified device should be registered on the network project in advance.



There are two methods to register device cache as follows:

- Register manually. "29.5.1 Manual Registration"
- Register by importing from device access log. "29.5.2 Import Registration from Device Access Log"

NOTE

- To utilize the device cache function, the specified device should be registered on the network project in advance.

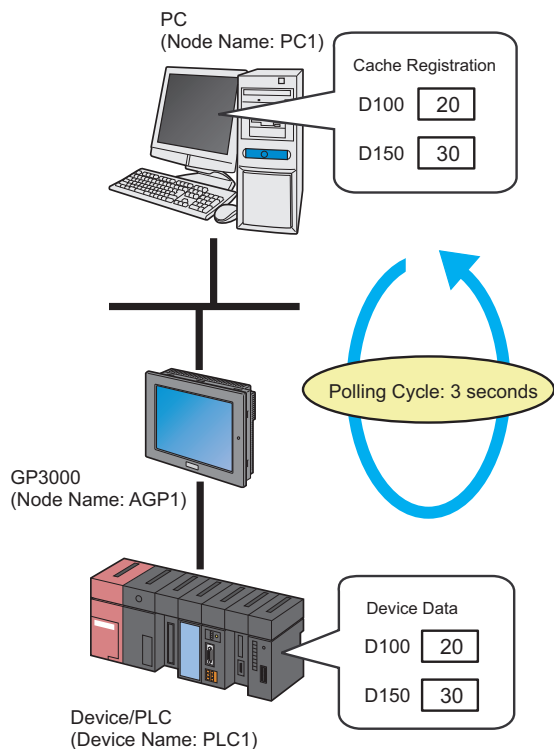
29.5.1 Manual Registration

The following describes how to cache-register the device manually.

NOTE

- You can register devices of multiple nodes in one device cache, but cannot start polling to the other nodes if any of the nodes cannot establish communication. Therefore, it is recommended to register a device for each node as a separate device cache as much as possible.

Manual Cache Registration of Devices



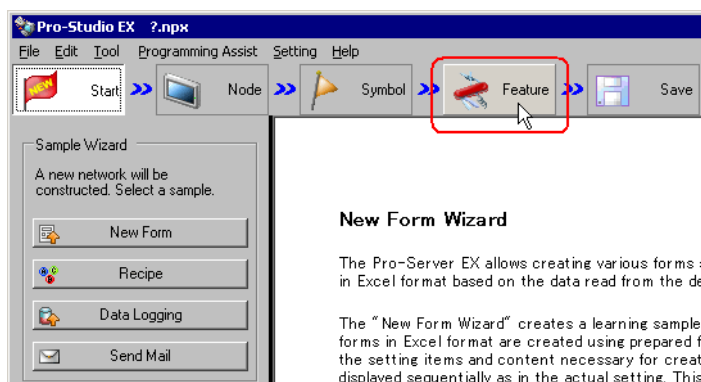
NOTE

- A polling cycle means a time cycle to update the device value that is cache-registered.

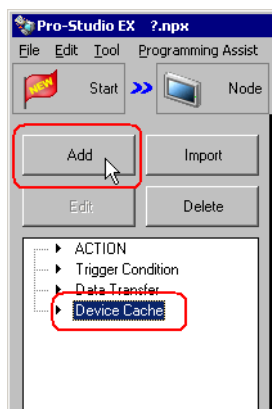
Ex.

| Setting item | Setting content |
|----------------------|---------------------------------------|
| Device Cache Name | Cache Registration |
| Polling Cycle | 3 seconds |
| Polling Start Timing | At Pro-Server EX Startup |
| Cache Subject Device | "D100" to "D150" of Device/PLC (PLC1) |

- 1 Click the [Feature] icon on the status bar.



- 2 Select [Device Cache] from the tree display on the left of the screen, then click the [Add] button.



- 3 Enter "Cache 1" in [Device Cache Name] as a device cache name to be registered.

Device Cache Setting

Device Cache Name:

Polling Cycle

☐ Always

☒ Polling Cycle: sec

Polling Start Timing

☒ At Pro-Server EX Startup

☐ Automatically start when a registered device is read.

☐ sec of lapse from the last access stops Poling.

☐ Disable Auto Start

Cache Subject Device

Add Edit Delete

| Node.DeviceName | Device Address | Data Type | No. of Data |
|-----------------|----------------|-----------|-------------|
|-----------------|----------------|-----------|-------------|

OK Cancel

- 4 Check [Polling Cycle] and set "3.0 seconds".

Device Cache Setting

Device Cache Name:

Polling Cycle

☐ Always

☒ Polling Cycle: sec

Polling Start Timing

☒ At Pro-Server EX Startup

☐ Automatically start when a registered device is read.

☐ sec of lapse from the last access stops Poling.

☐ Disable Auto Start

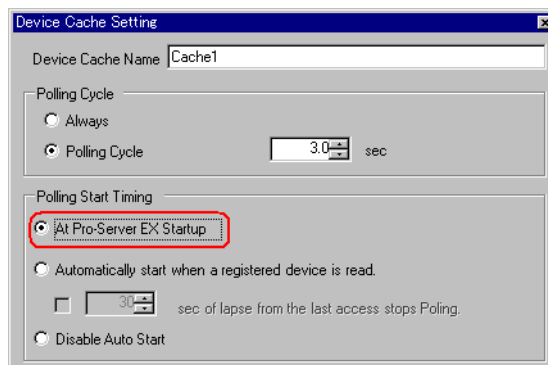
Cache Subject Device

Add Edit Delete

| Node.DeviceName | Device Address | Data Type | No. of Data |
|-----------------|----------------|-----------|-------------|
|-----------------|----------------|-----------|-------------|

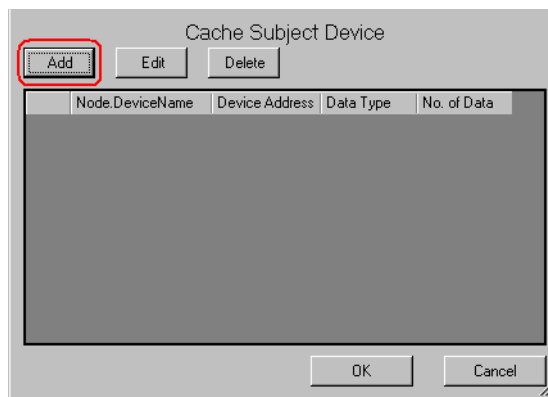
OK Cancel

5 Check [At Pro-Server EX Startup] of [Polling Start Timing].

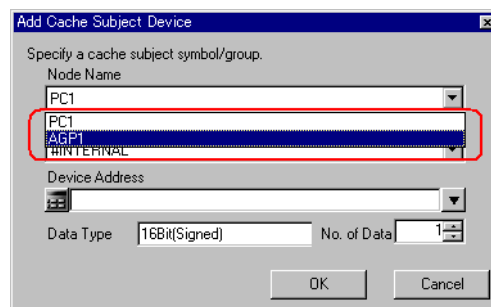


6 Register a device to be cached.

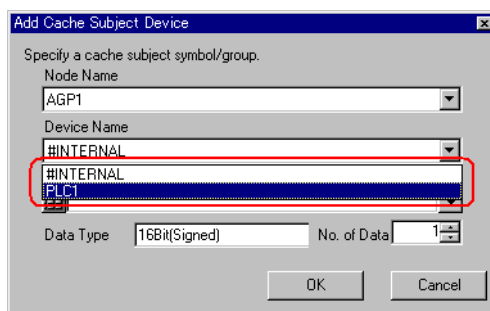
1) Click the [Add] button.



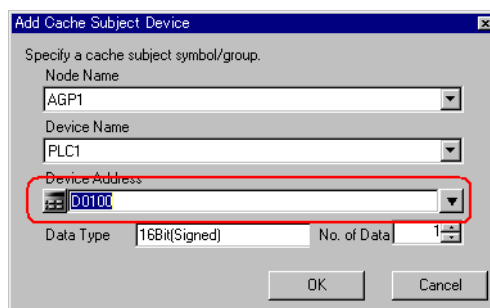
2) Select the node name "AGP1" in [Node Name] which has a device to be cached.



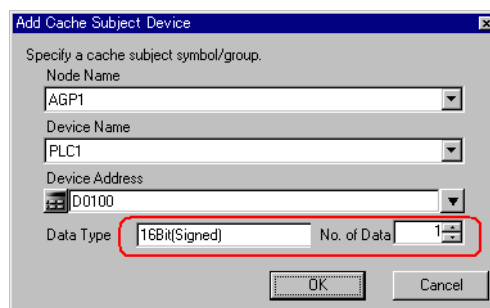
3) Select "PLC1" in [Device Name].



4) Set "D100" in [Device Address] as a device to be cached.



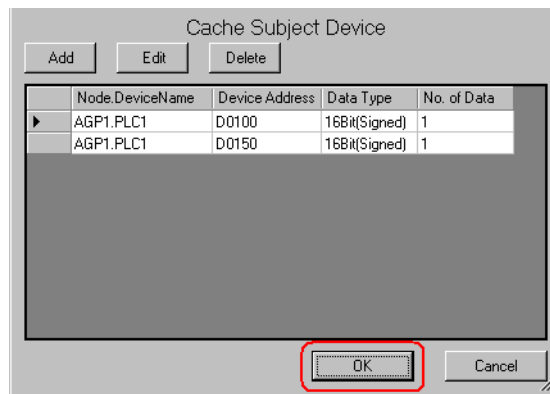
5) Set "16Bit(Signed)" in [Data Type] as a device data type and "1" in [No. of Data] as the number of devices, then click the [OK] button.



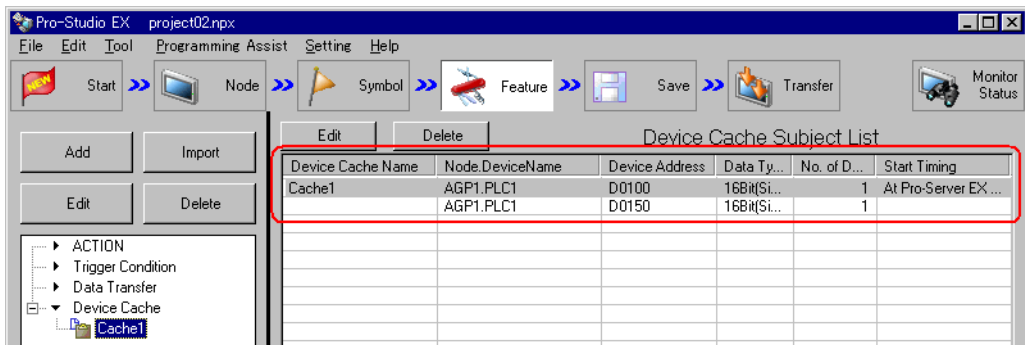
"D100" has now been registered as a device to be cached.

Register the device "D150" in the same manner as "D100".

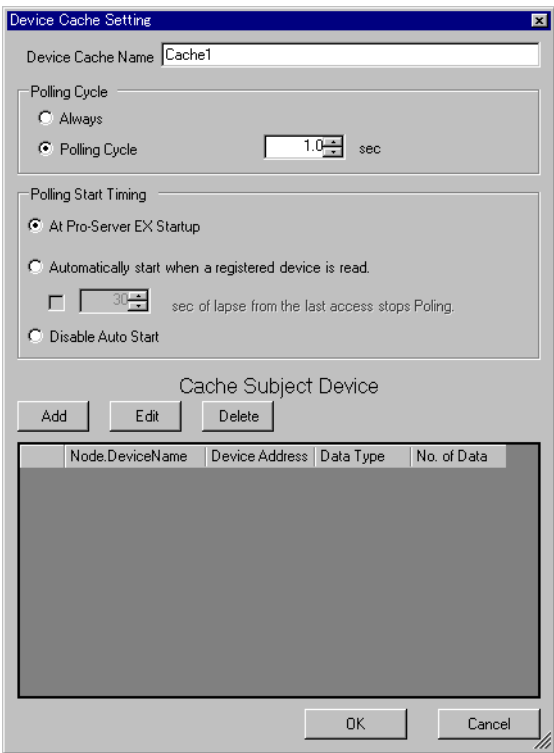
7 Click the [OK] button.





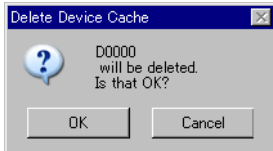
Now you can see the device cache name specified above in the tree display on the left of the screen and "Device Cache Subject List" on the right.



■ Setting Guide



| Setting item | Setting content |
|-------------------|--|
| Device Cache Name | <p>Enter a device cache name.</p> <div>NOTE</div> <ul style="list-style-type: none">Device cache names will be used in the case of control from API. |
| Polling Cycle | <p>Sets the polling time (data update cycle) of the device to be registered.</p> <ul style="list-style-type: none">[Always] Check this when updating device data regularly.[Polling Cycle] Check this when updating device data at a particular interval, which can be set in increments of 100ms (0.1sec). <div>NOTE</div> <ul style="list-style-type: none">If a Pro-Server EX node or a GP Series node is included in a cached record, you cannot specify [Always]. |

| Setting item | Setting content | |
|----------------------|--|--|
| Polling Start Timing | <p>Selects the timing to start polling.</p> <ul style="list-style-type: none"> • [At Pro-Server EX Startup] When 'Pro-Server EX' starts, polling is executed. And when 'Pro-Server EX' exits, polling is stopped. • [Automatically start when a registered device is read.] Polling starts when any registered device is accessed. If checked, the item [* sec of lapse from the last access stops polling] becomes active, and polling stops if no read access is given for the period specified here. If not checked, polling does not stop until 'Pro-Server EX' exits. • [Disable Auto Start] Polling starts according to the request not from 'Pro-Server EX' but from API. | |
| Cache Subject Device | Add | <p>Set [Node Name], [Device Name], [Device Address] (or symbol), [Data Type] and [No. of Data] on the "Add Cache Subject Device" screen. Then, click the [OK] button to register.</p>  |
| | Edit | <p>Specify the device you wish to edit, and edit the contents on the "Edit Cache Subject Device" screen. Then, click the [OK] button.</p>  |
| | Delete | <p>Specify the device you wish to delete, and click the [Yes] button on the "Delete Device Cache" screen.</p>  |

29.5.2 Import Registration from Device Access Log

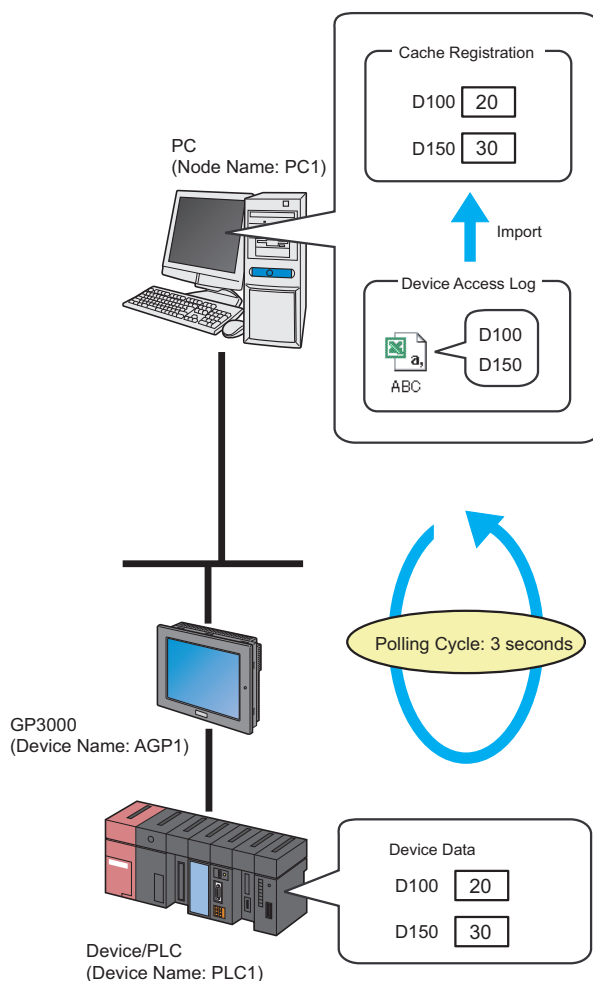
Cache registration is available from the output results of "Device Access Log".

On [Device Access Log], you can output device access logs into a CSV-format file, and then import that file for cache registration.

NOTE

- Refer to "29.6 Device Access Log" about creating device access logs.
- For better performance, it is recommended to open the device access log file before importing it, by means of an application like Excel or Notepad, and to follow the actions below:
 - (1) Delete the devices that do not require device cache.
 - (2) Register the devices that can be arranged in sequence as one sequential device as much as possible.

■ Import Registration

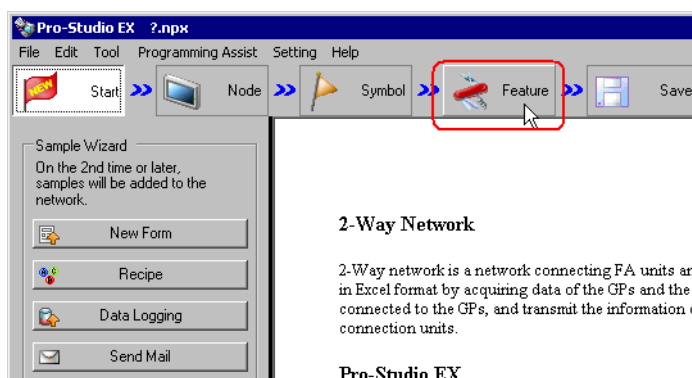

NOTE

- A polling cycle means a time cycle to update the device value that is cache-registered.

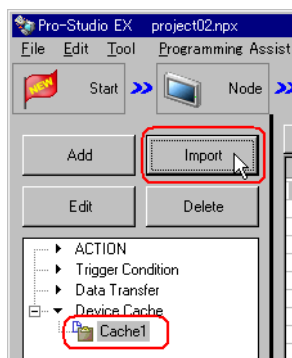
Ex.

| Setting item | Setting content |
|--|--|
| Polling Cycle | 3 seconds |
| Polling Start Timing | At Pro-Server EX Startup |
| Output file of device access logs to be cached | C:\Users\<<User name>>\Desktop\ABC.csv |

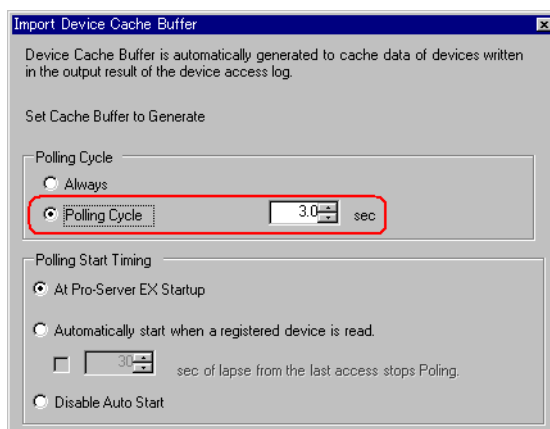
- 1 Click the [Feature] icon on the status bar.



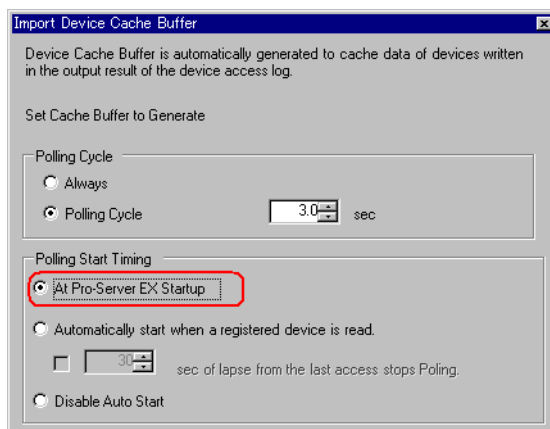
- 2 Select [Cache1] from the tree display on the left of the screen, then click the [Import] button.



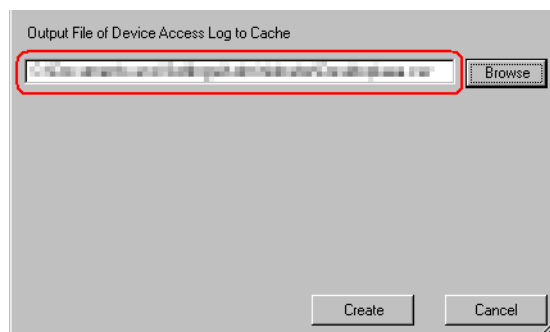
- 3 Check [Polling Cycle] and set "3.0 seconds".



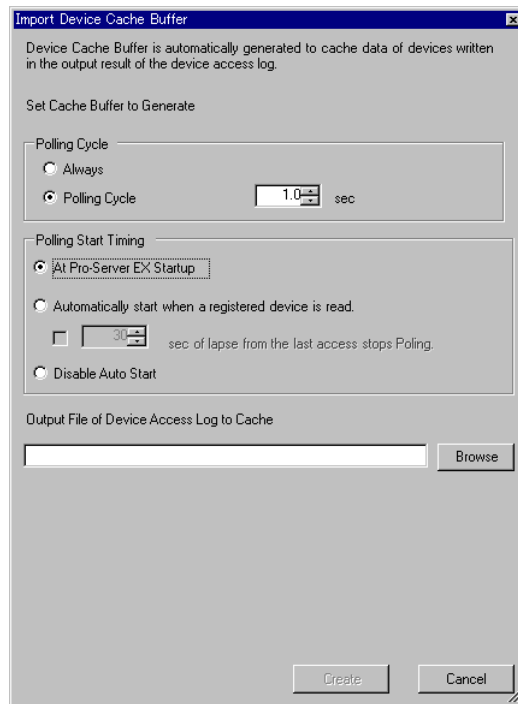
- 4 Check [At Pro-Server EX Startup] of [Polling Start Timing].



- 5 Set the file name "aaa.csv" in [Output File of Device Access Logs to Cache], and then click the [Create] button.



■ Setting Guide



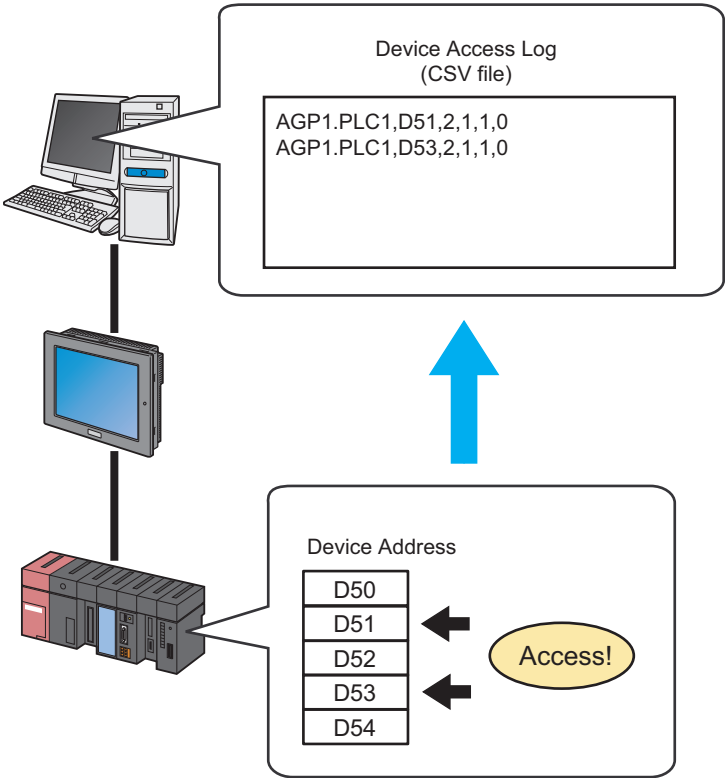
| Setting item | Setting content |
|--|--|
| Polling Cycle | <p>Sets the polling time (data update cycle) of the device to be registered.</p> <ul style="list-style-type: none"> • [Always] Check this when updating device data regularly. • [Polling Cycle] Check this when updating device data at a particular interval, which can be set in increments of 100ms (0.1sec). <p>NOTE</p> <ul style="list-style-type: none"> • When you import the output file including a WindowsPC node or a GP Series node with [Always] selected, the setting will be automatically changed to [Polling Cycle 1.0 second]. After importing, check it again. |
| Polling Start Timing | <p>Selects the timing to start polling.</p> <ul style="list-style-type: none"> • [At Pro-Server EX Startup] When 'Pro-Server EX' starts, polling is executed. And when 'Pro-Server EX' exits, polling is stopped. • [Automatically start when a registered device is read.] Polling starts when any registered device is accessed. If checked, the item [* sec of lapse from the last access stops polling] becomes active, and polling stops if no read access is given for the period specified here. If not checked, polling does not stop until 'Pro-Server EX' exits. • [Disable Auto Start] Polling starts according to the request not from 'Pro-Server EX' but from API. |
| Output File of Device Access Logs to Cache | <p>Click the [Browse] button, and select a device access log file (CSV file) on the "Save As" screen.</p> |

29.6 Device Access Log

'Pro-Server EX' records accessed devices as needed basis, and allows you to output this record (Device access log) to a CSV file.

NOTE

- You can cache-register a device more easily by importing a CSV file.



This section describes a series of actions to collect, save and clear device access logs.

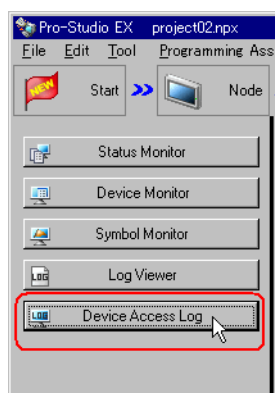
- 1 Click the [Status Monitoring] icon on the status bar.

The status monitor screen appears to indicate the ongoing status of 'Pro-Server EX'.



For details about the screen, see "28 Simply Confirming On-site Status".

- 2 Click the [Device Access Log] button.

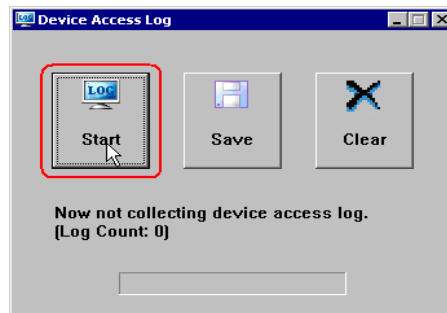


The "Device Access Log" screen appears.



29.6.1 Collecting Device Access Log

- 1 Click the [Start] button.



Collection of device access logs starts with the [Now collecting device access log] message displayed.



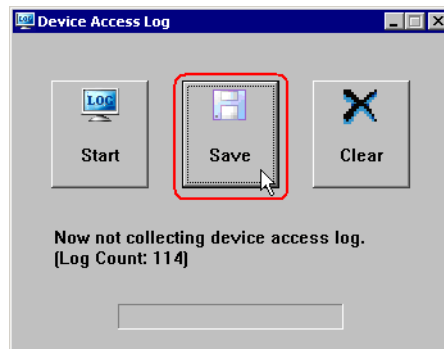
When the collection finishes, csv file appears to indicate the collected log number.

Click the [Stop] button when you want to stop the collection.

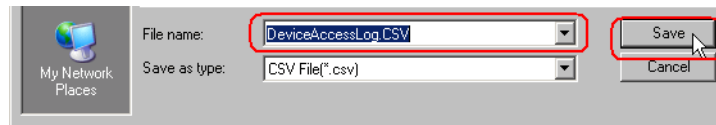


29.6.2 Saving Device Access Log After Collecting

- 1 Click the [Save] button.



- 2 Enter a file name and click the [Save] button.



The Save Completed message now appears, and the collected device access logs are saved.

NOTE

- You can collect at maximum 1000 logs.
- If 'Pro-Server EX' is closed with Device Access Log running, Device Access Log is also closed and the collected logs are to be broken.
- If 'Pro-Server EX' reloads a network project file during the Device Access Log operation, the collected logs are to be broken and the "Now collecting" message will turn to "Under suspension".

■ Formats of Device Access Log to Be Saved

Formats of device access logs (CSV file) to be saved are as follows:

"Node Name. Device Name", "Group Name/Device Address", "Access Mode*", "Access Point", "Access Count" and "0"

(Example)

AGP1.PLC1,D100,2,5,2,0

AGP2,LS200,6,10,1,0

* "Access Mode" is indicated as the numbers in the table below.

| Mode | Value |
|-------------------------------|----------------|
| Bit Access | 1 |
| 16-bit Access (excluding BCD) | 2 |
| 16-bit BCD Access | 5 |
| 32-bit Access (excluding BCD) | 6 |
| 32-bit BCD Access | 9 |
| 64-bit Access Float Access | 10 |
| Double Access | 11 |
| Character String Access | 12 |
| 8-bit Access | 13 |
| 8-bit BCD Access | 16 |
| TIME Access | 17 |
| TIME_OF_DAY Access | 18 |
| DATE Access | 19 |
| DATE_AND_TIME Access | 20 |
| Group | 32768 (0x8000) |

■ Order of Display

Device access logs are output to a CSV file and sorted in the following sequence:

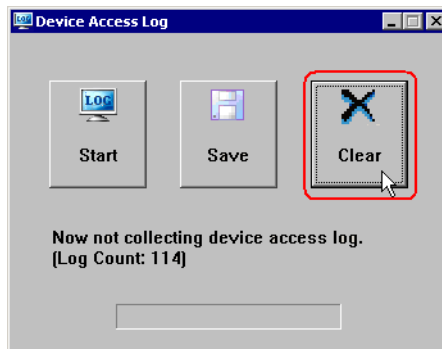
- (1) Node Name. Device Name
- (2) Group Name/Device Address
- (3) Access Mode*
- (4) Access Point

(Example)

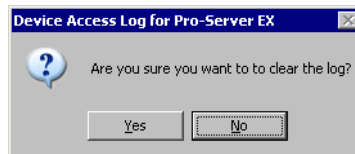
```
AGP1.PLC1,D100,2,5,2,0  
AGP1.PLC2,D100,2,5,2,0  
AGP2.PLC1,D100,2,5,2,0  
AGP2.PLC1,D101,2,5,2,0  
AGP2.PLC1,D101,5,5,2,0  
AGP2.PLC1,D101,5,10,2,0
```


29.6.3 Clearing Device Access Log After Collecting

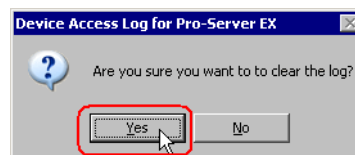
- 1 Click the [Clear] button.



The "Are you sure you want to clear logs?" message appears.



- 2 Select the [Yes] button.



The collected device access logs are cleared.

29.6.4 Restrictions

■ Conditions for collecting device access logs

Whether collecting device access logs or not is determined by the following conditions:

- If a device gives a read-request to the device of another node, device data are collected as logs. When a read-request is received from another node, these data are not collected as logs.
- Access frequency is counted despite whether a request is via a network or not (whether cache read or not).
- Data is collected as logs despite whether actually accessed to devices or not (whether connected on the network or not).
- In the case of data transfer, data is not collected. (excluding a transfer source device when the transfer type is "Collection-type data transfer")

■ Conditions for access to the same device

Whether accessing the same device or not (whether access frequency is counted or not) is determined by the following conditions:

- The first address of the device is the same.
- The access mode is the same.
- The access point is the same.

If any of the above conditions are not satisfied, the access is judged as an access to another device.

(Example) These examples are the cases judged as different:

16-bit access x 1 point to LS100 and 32-bit access x 1 point to LS100

16-bit access x 2 points to LS100 and 32-bit access x 1 point to LS100

Bit access x 16 points to LS100:00 and 16-bit access x 1 point to LS100

When the same device is specified, moreover, the case specifying the device directly and that accessing the group where just one device is registered are judged as different. However, the case accessing by specifying the symbol or device inside of the group (excluding the nest group) is judged as an access by specifying the device directly.

■ Allowance of log collection

You can collect at maximum 1000 logs, and the logs exceeding this limit are not collected. In this case, it is not required to make the [Start] button on the "Device Access Log" screen invalid.

When the access frequency exceeds the maximum number (4294967295), the exceeding access is not counted.

■ Other restrictions

- If 'Pro-Server EX' is closed with Device Access Log running, Device Access Log is also closed (and the collected logs are to be broken).
- If 'Pro-Server EX' reloads a network project file during the Device Access Log operation, the collected logs are to be broken and the [Now collecting] message will turn to [Under suspension].

30



Starting 'Pro-Server EX' in the Service Mode

| | | |
|------|--|------|
| 30.1 | Try to Start 'Pro-Server EX' in the Service Mode | 30-2 |
| 30.2 | Restrictions | 30-9 |

30.1 Try to Start 'Pro-Server EX' in the Service Mode

There are two types of mode to start 'Pro-Server EX' in: "Normal Mode" and "Service Mode". "Normal Mode" is set just after installation. Log on to Windows as well as normal applications to start 'Pro-Server EX' (Refer to "3.1 Starting 'Pro-Studio EX'" for more details on how to start in the normal mode).

When 'Pro-Server EX' is set to start in "Service Mode", 'Pro-Server EX' starts up with Windows. You do not need to log on to Windows to start it. This function is useful when you use 'Pro-Server EX' for system operation.

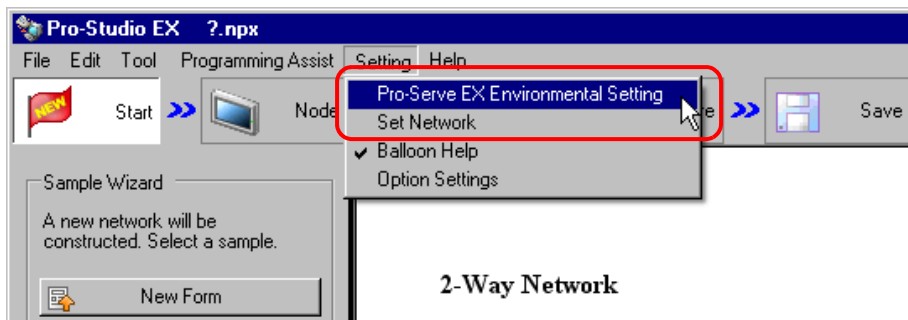
IMPORTANT

- When starting 'Pro-Server EX' in the "Service Mode", you cannot use the "Excel Form" or "Creating a Form Using Excel" Actions.
- "Service Mode" is not available when using WinGP SDK.
- To start 'Pro-Server EX' as a service, the "User Account Control Function" must be disabled. Refer to "30.2 Restrictions" for more details.
- There are further restrictions. Refer to "30.2 Restrictions" for more details.

30.1.1 Settings to Start 'Pro-Server EX' in the Service Mode

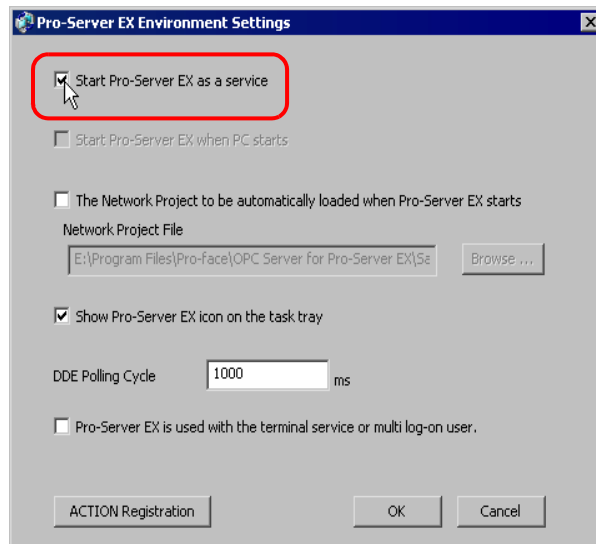
To start 'Pro-Server EX' as Windows service (in the "Service Mode"), start 'Pro-Studio EX' first and set the operation mode of 'Pro-Server EX' to "Service Mode".

- 1 Click [Pro-Server EX Environmental Setting] under [Setting] menu.


NOTE

- You can also select [Pro-Server EX] - [Pro-Server EX Environmental Setting] from the Windows [Start] button to display the [Pro-Server EX Environmental Setting] screen.
- The "User Account Control" dialog box will be displayed before performing "Environmental Setting". When it is displayed, click [Allow].

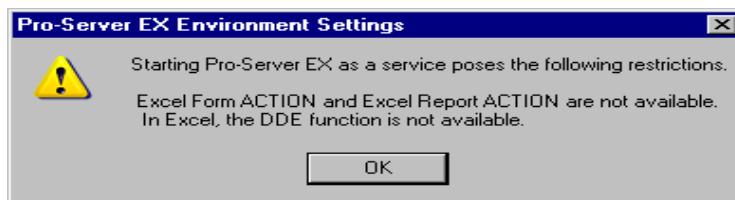
2 Check [Start Pro-Server EX as a service].



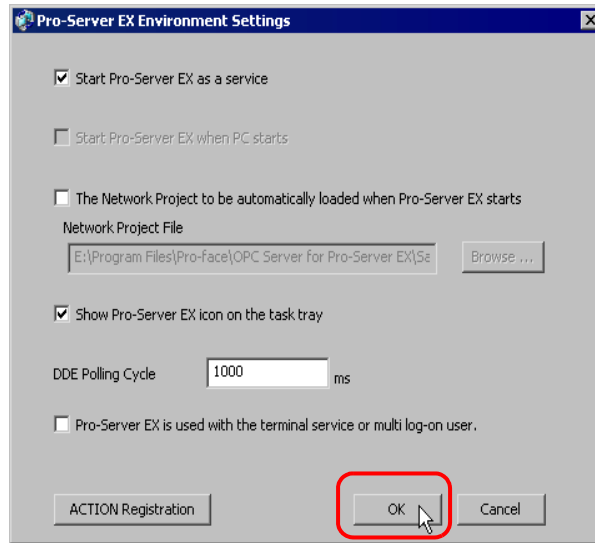
NOTE

- To start 'Pro-Server EX' in "Normal Mode", clear the [Start Pro-Server EX as a service] check box. When you clear the check box and close the [Pro-Server EX Preferences] dialog box, you will be prompted to restart Windows.

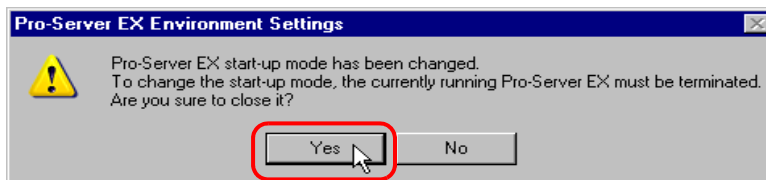
3 When you check [Start Pro-Server EX as a service], the dialog box to notify you of restrictions is displayed. Click the [OK] button.



4 Click the [OK] button.

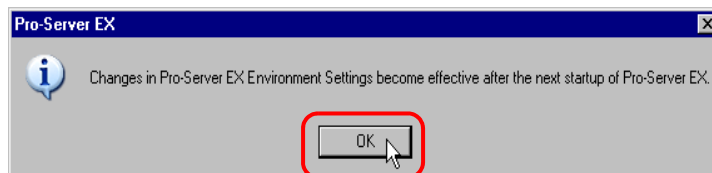


If you change the [Start Pro-Server EX as a service] option while 'Pro-Server EX' is running, the following dialog box is displayed: Click the [Yes] button.



5 The dialog box will be displayed: Click [OK].

6 Click the [OK] button.



NOTE

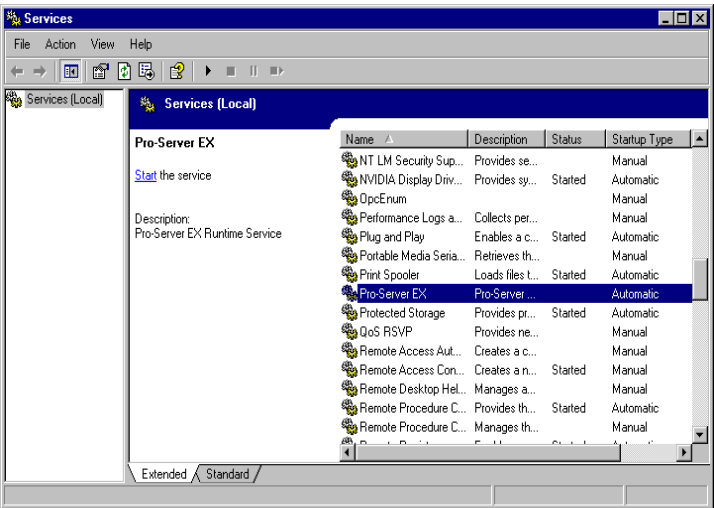
- If you have started 'Pro-Server EX', exit and start it again.

In the Normal Mode: Startup of 'Pro-Server EX'

In the Service Mode: 30.1.2 Starting and Closing 'Pro-Server EX' in the "Service Mode"

- NOTE

- When you check [Start Pro-Server EX as a service] ("Service Mode"), the "Startup Type" of 'Pro-Server EX' is set to "Automatic" on the [Services] screen. When you start or restart your PC next time, 'Pro-Server EX' automatically starts.



- When you uncheck [Start Pro-Server EX as a service] (normal mode), the "Startup Type" of 'Pro-Server EX' is set to "Manual" on the [Services] screen.

30.1.2 Starting and Closing 'Pro-Server EX' in the "Service Mode"

When you set the starting method of 'Pro-Server EX' to "Service Mode", it automatically starts when you start or restart your PC. However, just after you change the starting method or you close it manually, start it as follows:

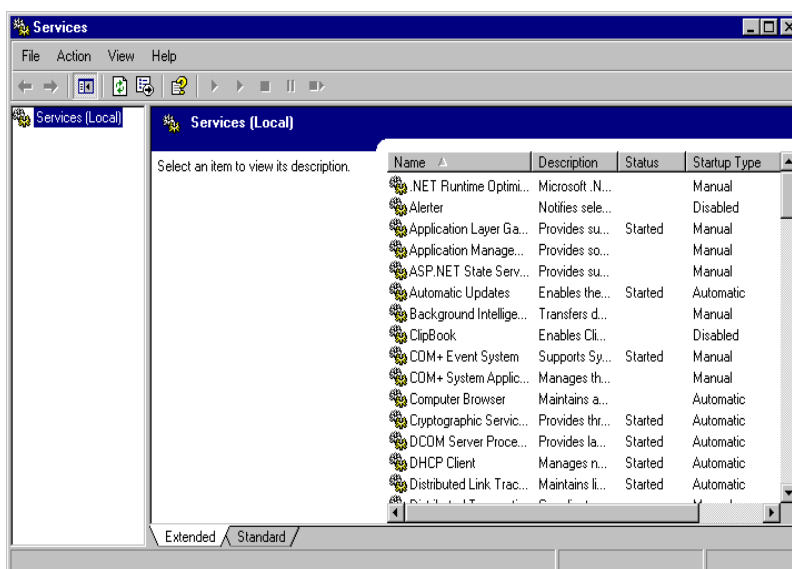
IMPORTANT

- Log on to Windows with the user name of "Administrator" or of the equivalent administrator authority. Refer to the operation manual of the OS for the user authority.
- When you set the starting method of 'Pro-Server EX' to "Normal Mode", you cannot use this method. Refer to "30.1 Try to Start 'Pro-Server EX' in the Service Mode" and change to "Service Mode".

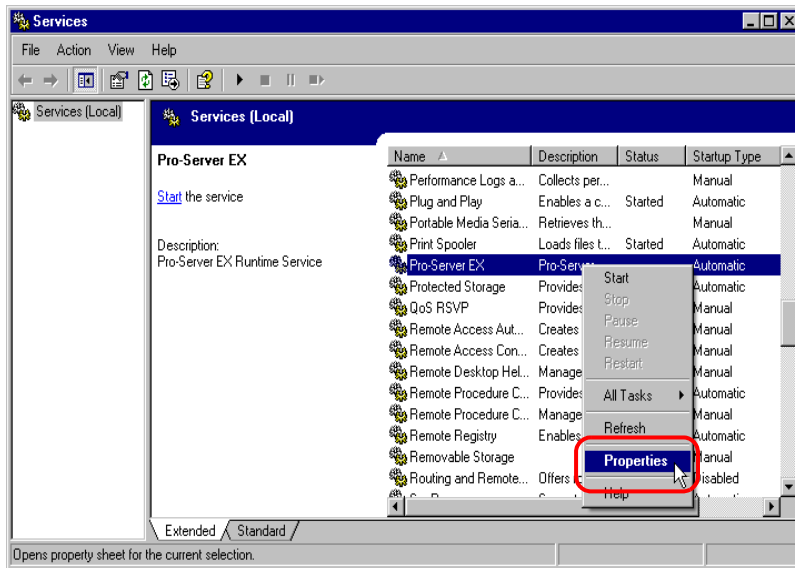
NOTE

- When 'Pro-Server EX' is set to start in "Service Mode", you can also click on the 'Pro-Server EX' icon on the desktop or select 'Pro-Server EX' from the [Start] button on Windows to start it. You can also select 'Close Pro-Server EX' from the [Start] button on the task bar to close it.

- 1 From the [Control Panel], open [Administrative Tools] - [Services].

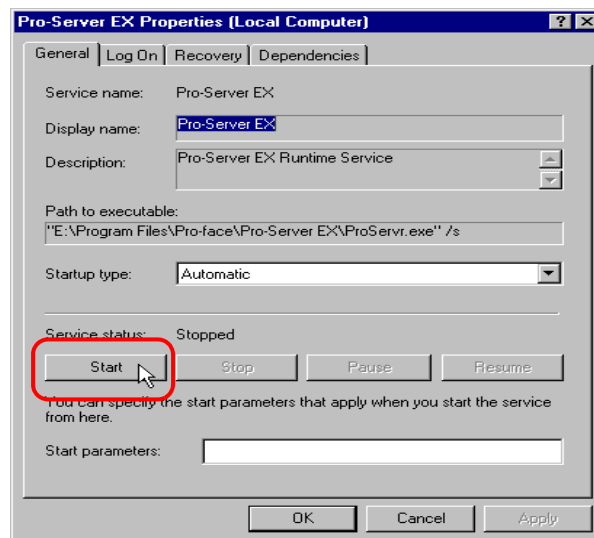


2 Right-click on 'Pro-Server EX' and select [Properties] from the menu.



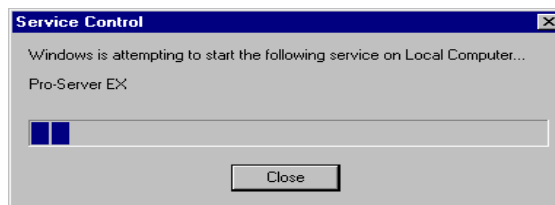
NOTE • You can also select [Start] from the menu to start 'Pro-Server EX'. When you select [Stop] or [Restart], you can close or restart 'Pro-Server EX'.

3 In the [General] tab, check that the [Startup Type] is [Automatic], and then click [Start].

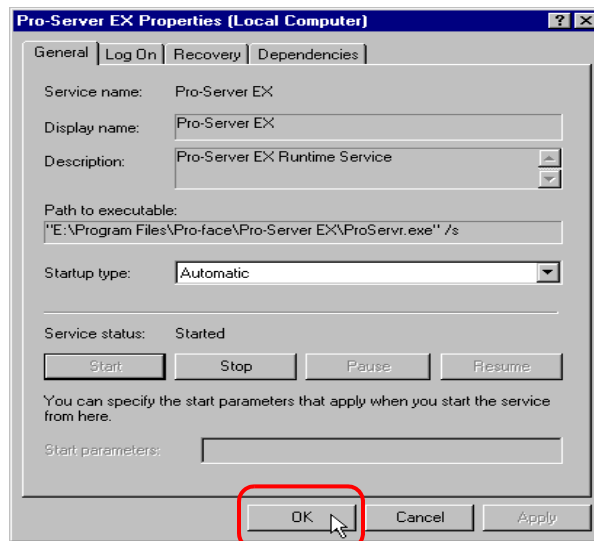


NOTE • You can click the [Stop] button to close 'Pro-Server EX'.
• If the "Startup type" is not set to "Automatic", 'Pro-Server EX' does not start automatically when starting or restarting a PC. To start it automatically, set the "Startup type" to "Automatic".

The "Service Control" screen is displayed.



4 Click the [OK] button.

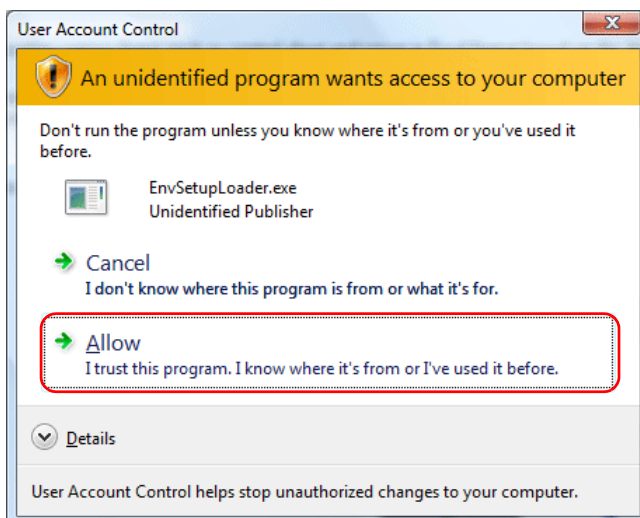


30.2 Restrictions

NOTE

- Depending on the operating system you are using, the display and part names may differ. If so, replace the names with those with similar features used in your system configuration.

- The "User Account Control" dialog box will be displayed before performing "Environmental Setting". When it is displayed, click [Allow].

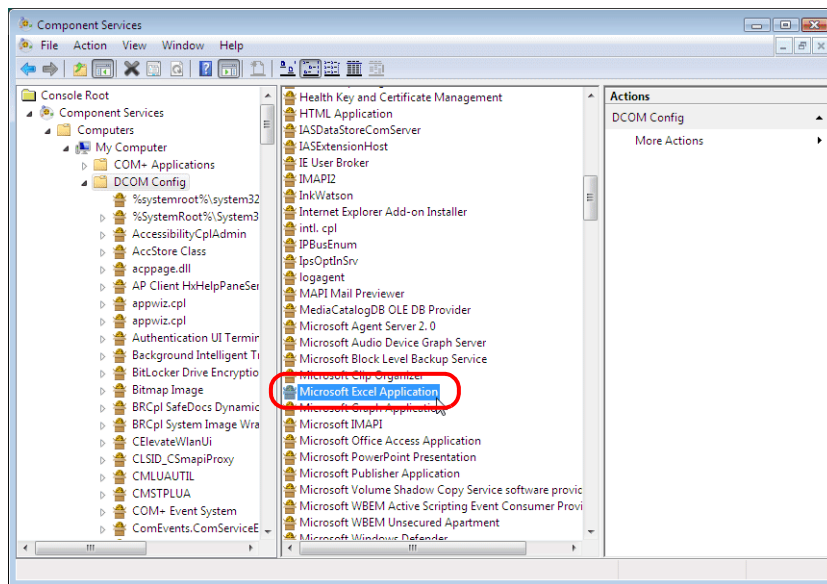


- To start 'Pro-Server EX' as a service, the "User Account Control Function" must be disabled. Refer to the following for the steps to disable the "User Account Control Function".
 - Select "Security and Maintenance" under the "Control Panel".
 - Click [Change User Account Control settings].
 - Set the cursor to [Never notify].)
- To start 'Pro-Server EX' as a service, the following ACTIONS are not supported.
 - Writes Data to Excel Book
 - Upload of GP Log Data
 - Automatic Upload of GP Filing Data
 - Automatic Download of GP Filing Data
 - Download Recipe data for Excel
 - Upload to the database
 - Download from the database

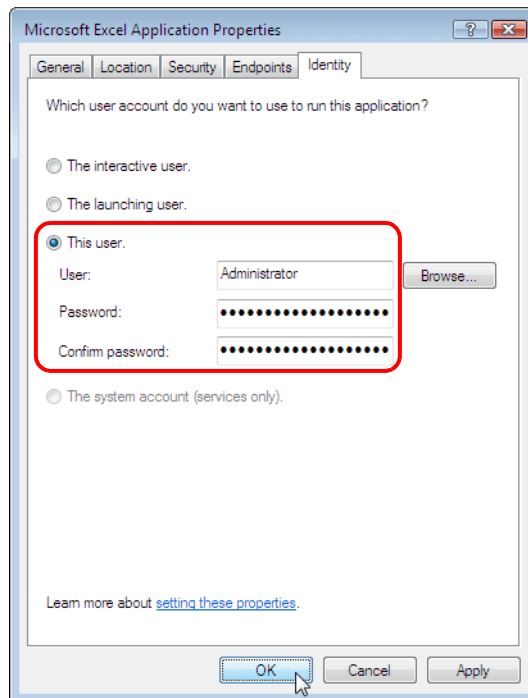
Executing any of these ACTIONS will lead to an error and no processing is performed. However, setting as follows makes the execution possible even when Pro-Server EX runs as a service:

- In the command input field of the [Start] menu, type "dcomcnfg".
[Component Services] is displayed.

- From the left-hand tree, select [Console Root]-[Component Services]- [Computers]- [My Computer]- [DCOM Config]-[Microsoft Excel Application].



- From the right-click menu, select [Properties].
- In the Properties dialogue, display the [Identity] tab.
- Select [This user], enter a user with Administrator rights for the [User], and set the [Password].



- Press [OK] and restart the operating system.

This allows the aforementioned ACTIONS but prevents the user who has logged in from using Excel. (An OLE-related error will occur.) Therefore, the user needs to use another computer to open a Excel file. Please take notice of this restriction on using Excel.

■ Restrictions when Starting 'Pro-Server EX' in the "Service Mode"

- Be sure to check "Allow service to interact with desktop". If you uncheck it, operation cannot be guaranteed.
Confirm the setting as follows:
 1. Select "Administrative Tools" and "Services" under the "Control Panel".
 2. Right-click on 'Pro-Server EX' and select [Properties] from the menu.
 3. Click the [Log On] tab and confirm "Allow service to interact with desktop" is checked.
If unchecked, check it.
 4. Click the [OK] button.
- Do not use the "Excel Form" or "Creating form using Excel" Actions. Operation cannot be guaranteed if you use them.
- Do not use the "DDE function" of 'Excel'. If you use it, Excel freezes.

31



Node Registration

| | | |
|------|--|-------|
| 31.1 | Registration and Deletion of Entry Nodes | 31-2 |
| 31.2 | Searching Nodes..... | 31-7 |
| 31.3 | Getting Data from a Screen Project File | 31-15 |
| 31.4 | Getting Data from the Screen Project File Transferred to the display unit..... | 31-21 |
| 31.5 | Setting Guide | 31-25 |
| 31.6 | Restrictions | 31-34 |

31.1 Registration and Deletion of Entry Nodes

To use 'Pro-Server EX', you must first register the PC and display unit connected on the network as entry nodes. You set the node name, communication information like IP addresses, and Device/PLC type as registration information.

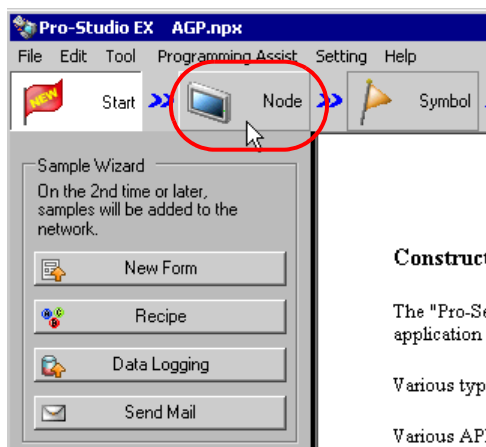
This section describes the procedure to register and delete entry nodes.

NOTE

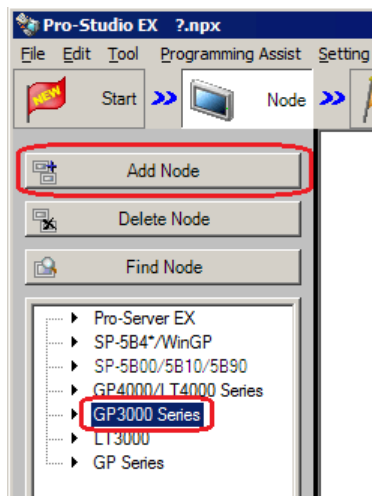
- Even when WinGP and Pro-Server EX are installed on the same computer or display unit, "SP-5B4*/WinGP Node" and "Pro-Server EX Node" must be registered as separate nodes.

31.1.1 Registration of Entry Nodes

- 1 Click the [Node] icon on the status bar.



- 2 Select a node type from the tree display on the left of the screen and click [Add Node].



- 3 Enter [Node Name] and [IP Address]. (Enter [Node Name], [IP Address], and [Subnet Mask] in the "GP Series". Also enter [Gateway], if required.)

- 4 Click the list buttons of [Maker], [Device Type] and [Port Type], and set these items related to Device/PLC. (When you select "GP Series" as the node type, set [Device Type] only.)

NOTE

- The following items are automatically determined according to the selection of Device/PLC type. To change the setting, please follow the steps given below.
- Please correspond the registered information of Device/PLC to that of the actual Device/PLC of the display unit. If the setting is incorrect, proper operation is not expected.
- Depending on the type of device/PLC you selected, you cannot change the setting of each item.

- 5 Click [▲] or [▼] button of [Text Mode] to specify the text mode adopted by Device/PLC.

- NOTE** • Text mode is automatically set when [Device Type] or [Port Type] is selected. This step is necessary only when you wish to change this setting.

- 6 Click [Device Name] field and enter a Device/PLC name.

- NOTE** • Please make sure to totally conform the device name, type and setting to the data specified in 'GP-Pro EX'. Inconsistency may cause access to unauthorized devices.

- 7 Click [Device Configuration] field to set a device.

- 8 Click [System Area Device] drop down list to select the Device/PLC to assign the system address.

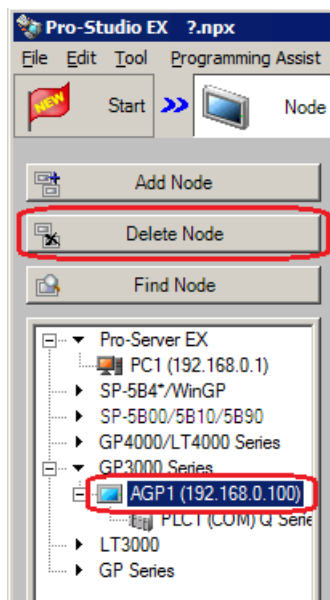
- 9 Enter the first device address of the assigned system area in [System Area Start Device].
Enter the address directly or click the Calculator icon to enter it on the device address input screen.

- 10 Click [Register].

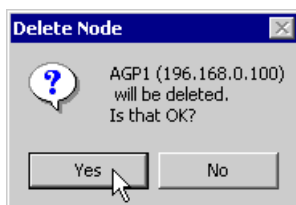
The entry node is now registered with the set contents.

31.1.2 Deletion of Entry Nodes

- 1 Select the entry node you wish to delete from the node list on the left of the screen, and Click [Delete Node].



- 2 The following message appears confirming the deletion. Click [Yes].
The selected node is now deleted.

**NOTE**

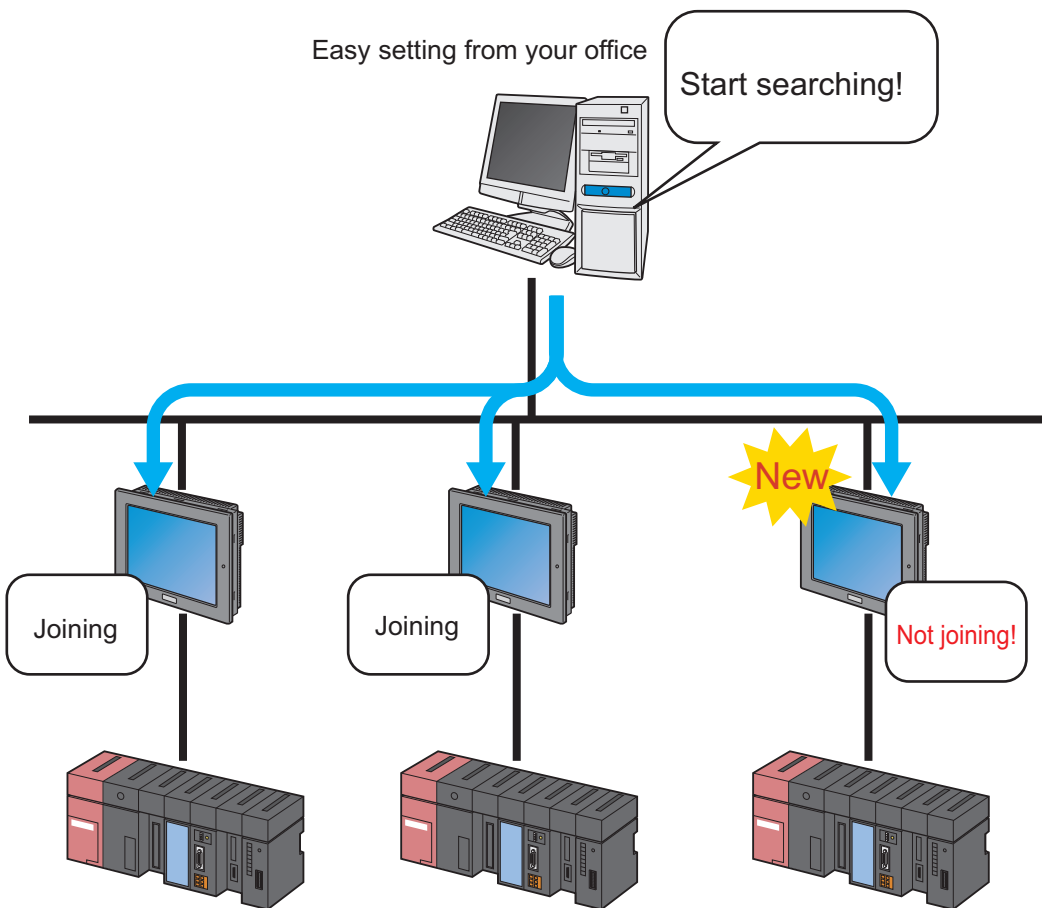
- Node deletion may cause inconsistency in the contents specified on the feature screen. Please check the contents of a network project file to confirm the consistency before reloading and transferring it.

31.2 Searching Nodes

31.2.1 What is "Searching Nodes"?

You can register the PC and display units that are active on the network, individually as a node, and also detect and register any node that is not in the network project file by using the search function.

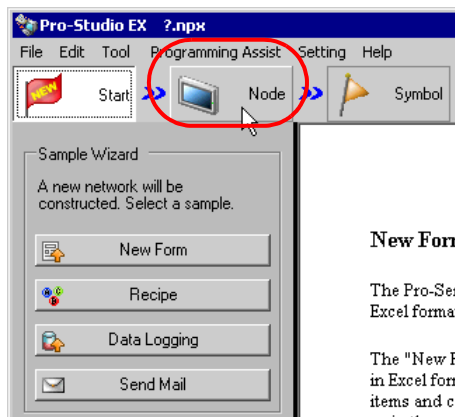
It allows you to register network nodes easily, without confirming on the spot the Ethernet setting of each display unit.


NOTE

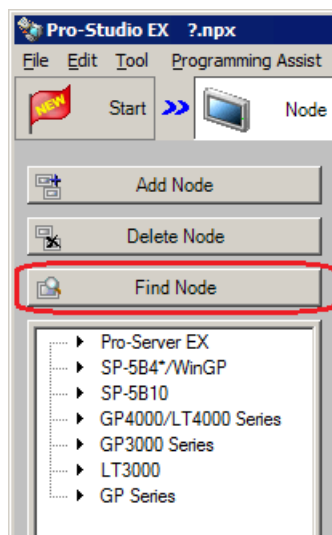
- The search area (where nodes can be found) covers the nodes having the same class ID as that of the IP address of the PC to search. You cannot search the nodes located in the different class or over the router.

This section describes how to use the search function and register entry nodes.

- 1 Click [Node] icon on the status bar.

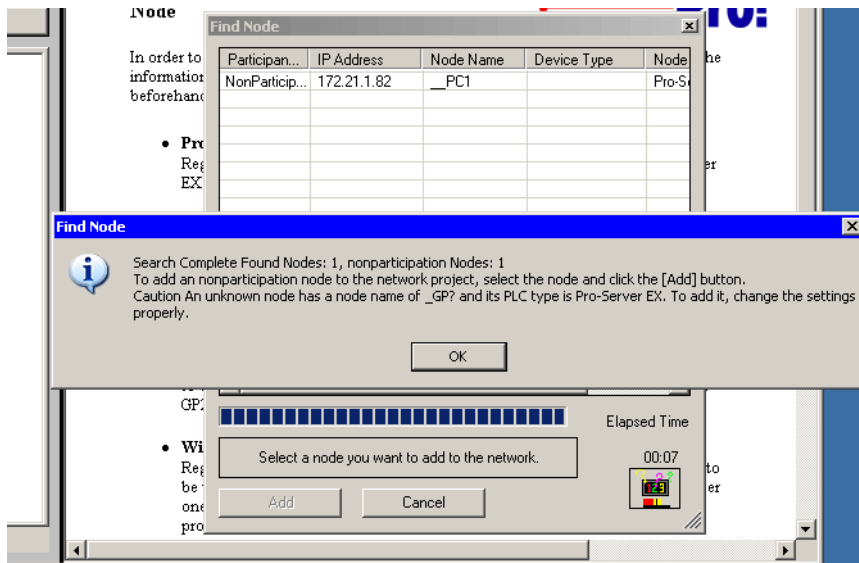


- 2 Click [Find Node].



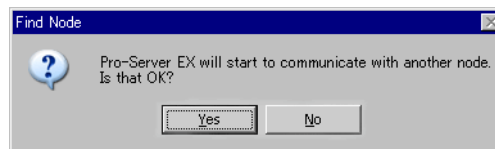
The search of entry nodes now starts and the "Find Node" screen appears.

The "Find Node" screen shows the number of the entry nodes currently connected on the network (detected nodes) and the number of those not registered (Non-Participant nodes).



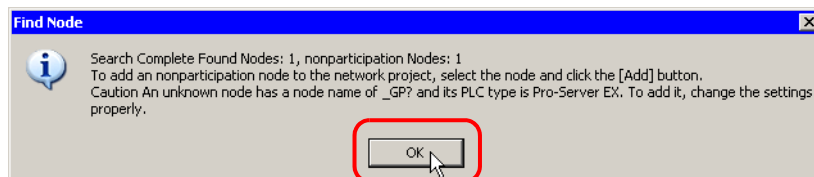
NOTE

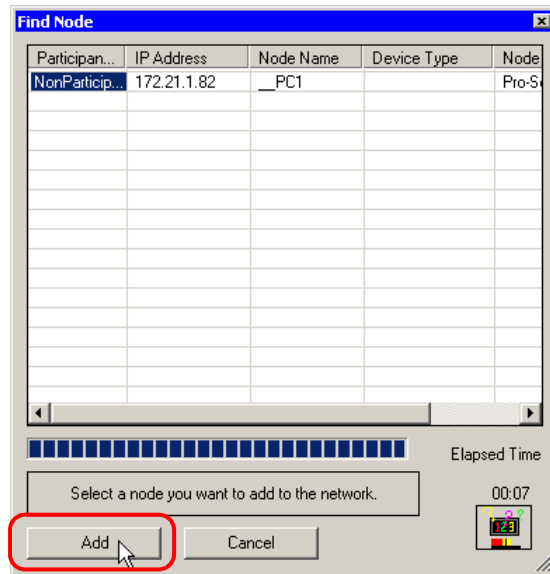
- To perform the node search function, 'Pro-Server EX' should be operated. If 'Pro-Server EX' is not running, the following dialog message appears.



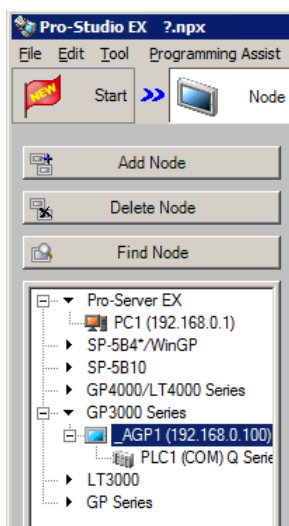
Clicking [Yes] activates 'Pro-Server EX' and starts searching entry nodes. Clicking [No] stops the node search.

3 Click [OK] after checking the message.



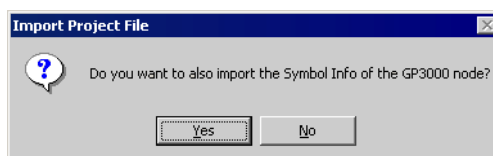


The selected non-participant node is registered as an entry node and indicated in the node list with a temporary name.



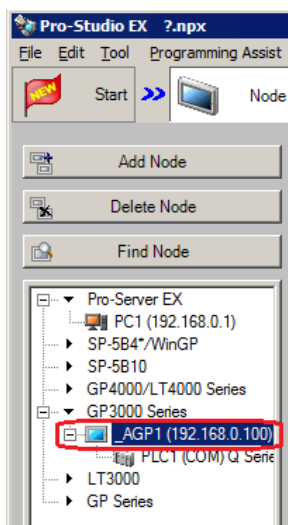
NOTE

- To select more than one node at one time, click the non-entry nodes while pressing the [Shift] key.
- When you attempt to register ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, or LT3000 node (as long as a network project file has already been transferred to that node), the following screen appears.

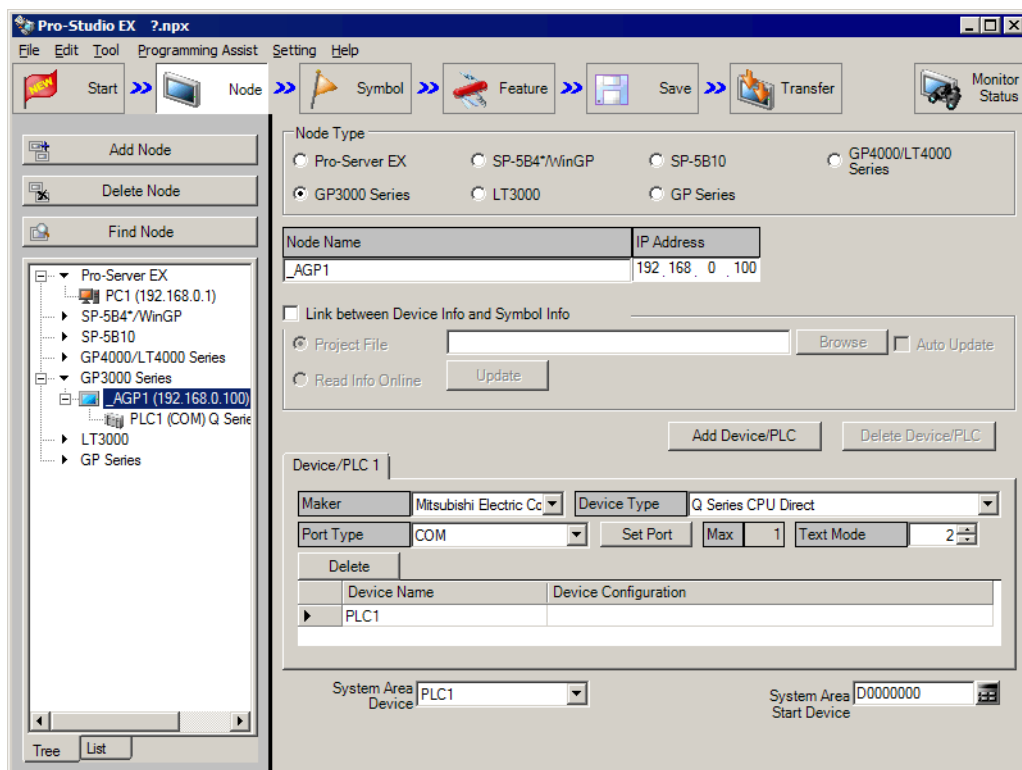


To import the symbol data of the screen project file simultaneously, click [Yes]. If you wish not, click [No].

5 Click a node name in the node list.



The details of the selected entry node are displayed on the right of the screen.



6 Set the items related to Device/PLC.

Refer to "31.1.1 Registration of Entry Nodes" for more details about the setting items.

NOTE

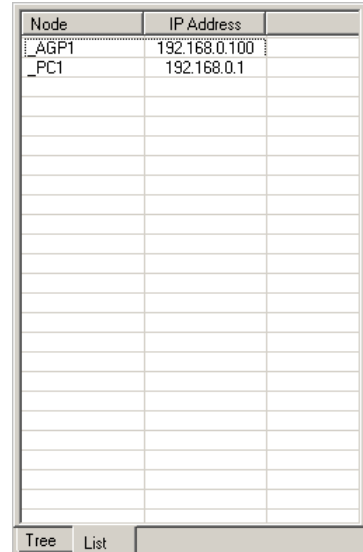
- To change the node name, move the cursor to the text box of [Node Name] and enter a new name.

7 Click [Register].

The entry node is now registered with the set contents.

NOTE

- In a list format, node names and IP addresses are indicated .



List format

- You can change the display format by clicking the tab at the bottom of the node list.

31.2.2 Countermeasure Against Unrecognized Nodes

When no entry node is recognized by the search function, please check the following items.

(1) Cable and LAN hub

Check if the Ethernet cable is not disconnected.

(2) Network setting on the PC and display unit side

Check if the IP address and subnet mask are specified properly.

- Confirmation of display unit setting

☞ "2.4 Set the network of display unit"

- Confirmation of PC setting

☞ "2.3 Setting PC Network"

NOTE

- You can check the setting of the IP address and subnet mask by the following method.

(1) From the [Start] button in Windows, select [Command Prompt].

(2) Enter "ipconfig" on the command prompt screen.

(3) The following screen appears, displaying [IP Address] and [Subnet Mask].

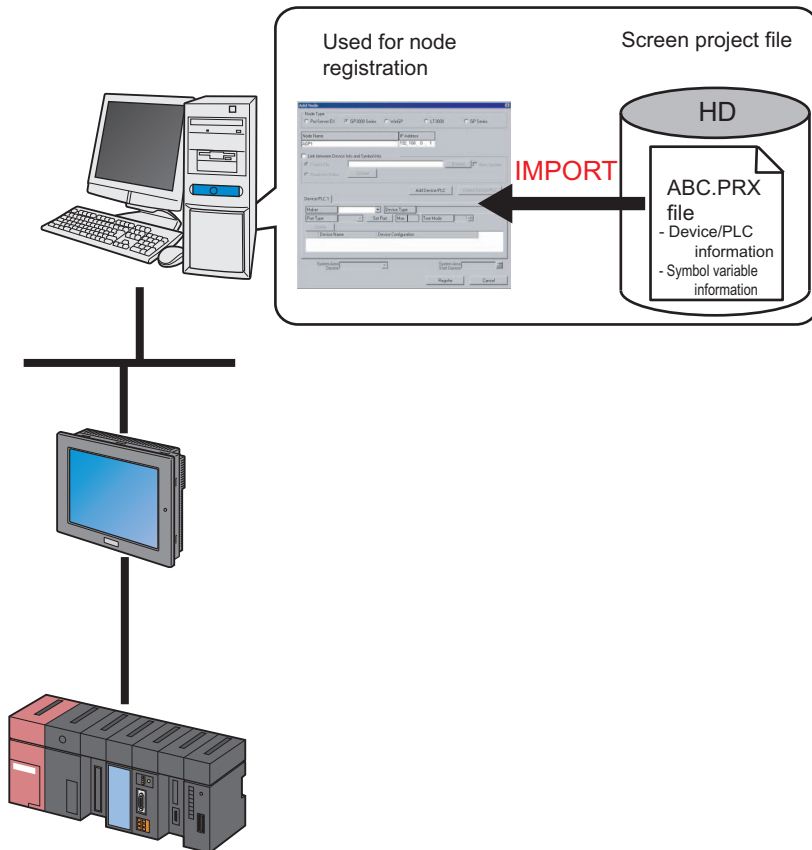


```
Connection-specific DNS Suffix . :  
IP Address. . . . . : 192.168.0.1  
Subnet Mask . . . . . : 255.255.255.0  
Default Gateway . . . . . :
```

31.3 Getting Data from a Screen Project File

This feature allows you to obtain (import) the Device/PLC information and symbol information from a screen project file made by a screen creation application like 'GP-Pro EX'.

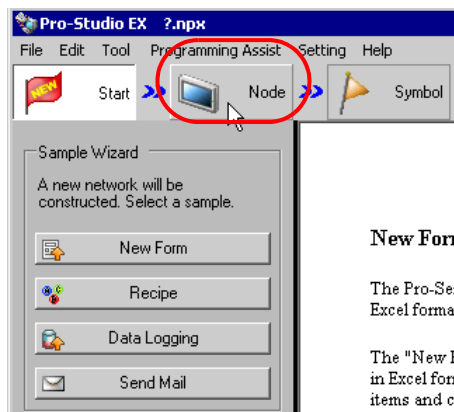
By utilizing a screen project file made by a screen creation application, it is possible to register the accurate data of entry nodes for a short time.



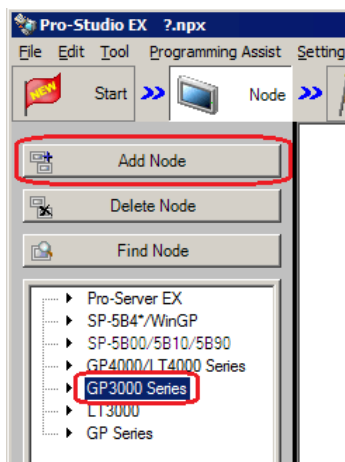
NOTE

- The information that can be imported from a screen project file is that of Device/PLC and of symbols. Import of data saves the effort of inputting the same data to 'Pro-Studio EX'. You can also import data from a screen project file (*.PRW) made by the 'GP-PRO/PBIII for Windows' as well. You can also get information from a "GP-Pro/PB III for Windows" screen project file (*.PRW).

- 1 Click the [Node] icon on the status bar.



- 2 Select a node type from the tree display on the left of the screen and click [Add Node].



- 3 Enter [Node Name] and [IP Address]. (Enter [Node Name], [IP Address], and [Subnet Mask] in the GP Series. Also enter [Gateway], if required.)

Add Node

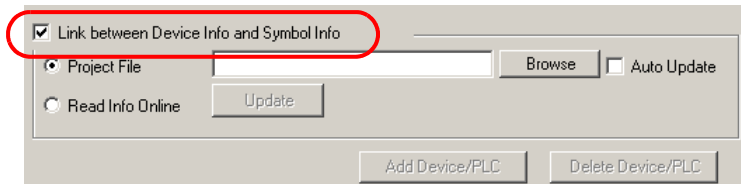
Node Type

☐ Pro-Server EX
 ☐ SP-5B4*/WinGP
 ☐ SP-5B10
 ☐ GP4000/LT4000 Series

☒ GP3000 Series
 ☐ LT3000
 ☐ GP Series

| Node Name | IP Address |
|-----------|---------------|
| AGP1 | 192.168.0.100 |

4 Check [Link between Device Info and Symbol Info].

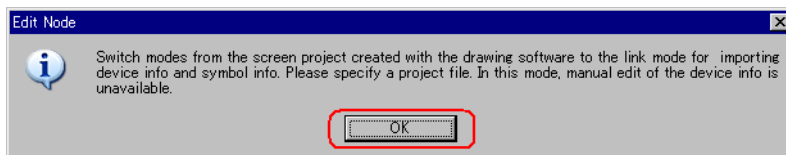


NOTE

- When [Auto Update] is checked, the screen project file that has been imported is automatically updated if there is any change to it.

👉 "31.5 Setting Guide"

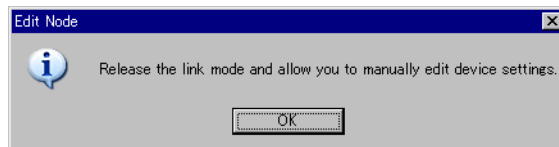
The confirmation screen for data import appears. Click [OK].



The mode is switched to the link mode that allows the data import.

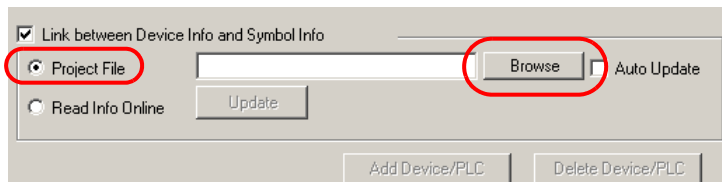
NOTE

- When [Link between Device Info and Symbol Info] is unchecked, the confirmation screen of link-mode cancellation appears.
Click [OK] to cancel the link mode.

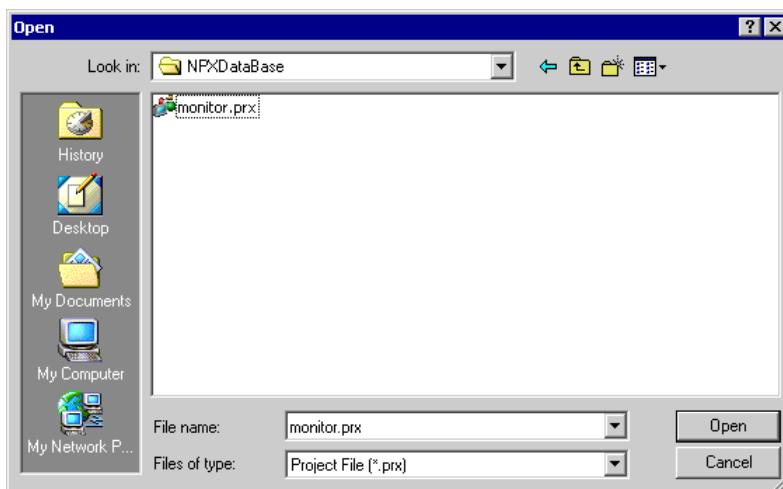


- Depending on the type of device/PLC, you cannot edit the device information manually even if [Link between Device Info and Symbol Info] is cleared.

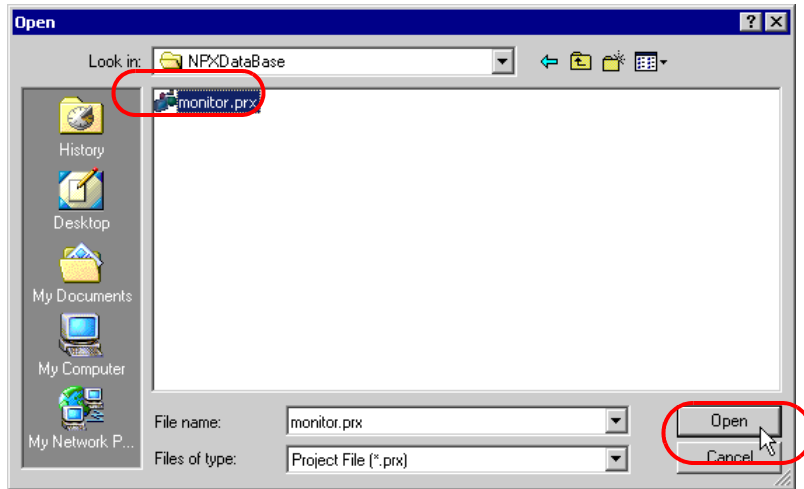
- 5 Select [Project File] and click [Browse].



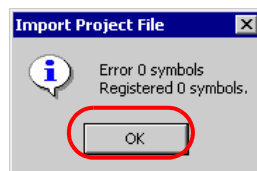
The "Open" dialog box appears.



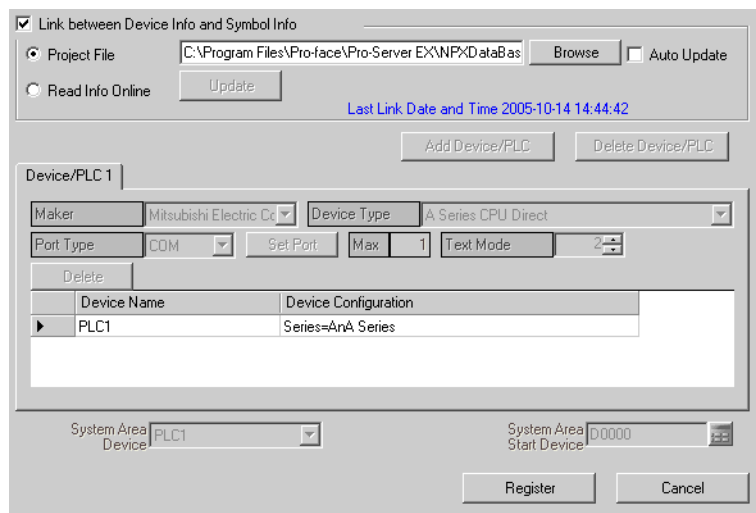
6 Select your target screen project file and click [Open].



The "Import Project File" screen appears. Click [OK].



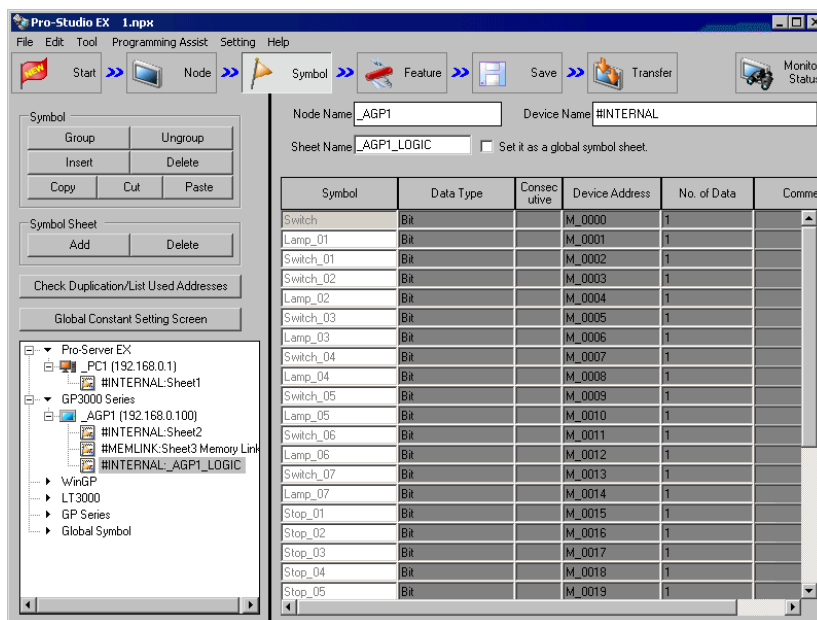
The Device/PLC data set in the screen project file is displayed in each item in the [Device/PLC] tab.



7 Click [Register].

The entry node is now registered with the set contents.

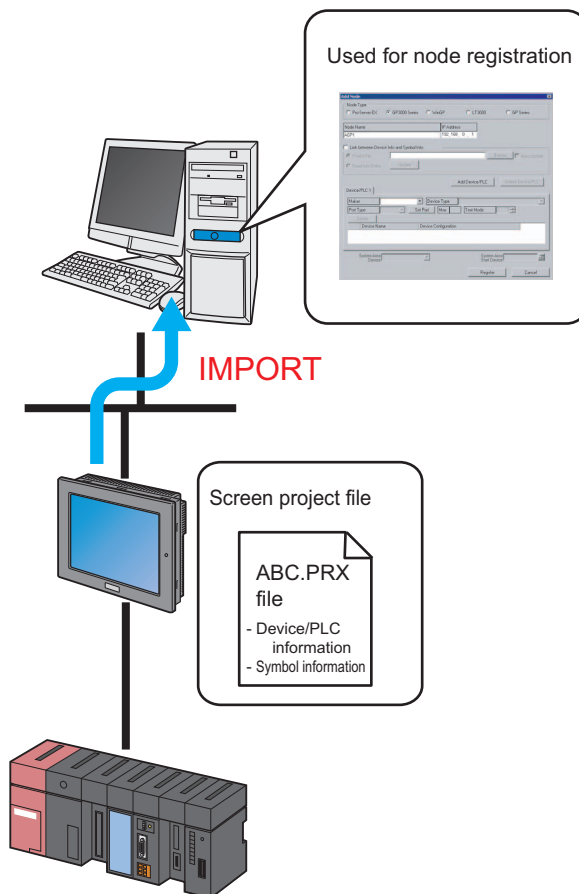
- NOTE** • Imported variables (variable format) of the logic program are registered in a new symbol sheet named "Node name _LOGIC".



31.4 Getting Data from the Screen Project File Transferred to the display unit

You can obtain (import) via the network the Device/PLC data and symbol data from the screen project file transferred to the display unit.

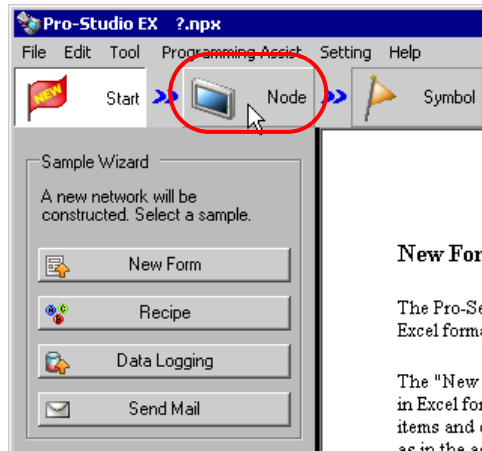
By utilizing a screen project file made by a screen creation application, it is possible to register the accurate data of entry nodes for a short time.



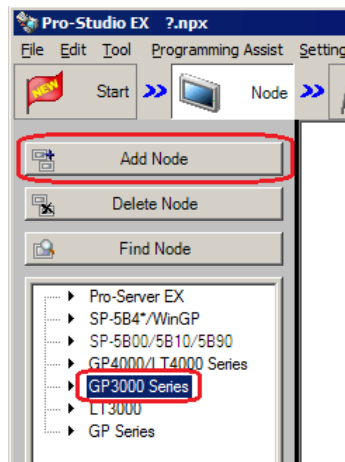
-
- NOTE** • The information that can be imported from a screen project file in the display unit is that of Device/PLC and of symbols. Import of data saves the effort of inputting the same data to 'Pro-Studio EX'. This function is available on display units (except those set up as GP Series nodes).
-

This section describes the setting required for importing the data of a screen project file from each display unit on the network.

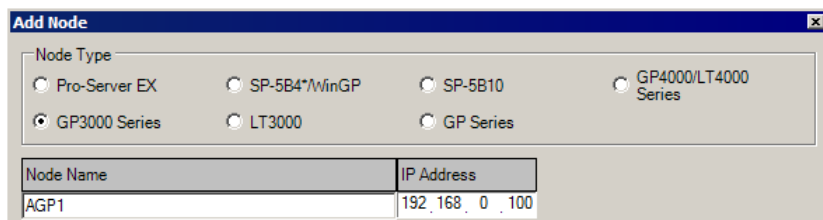
- 1 Click the [Node] icon on the status bar.



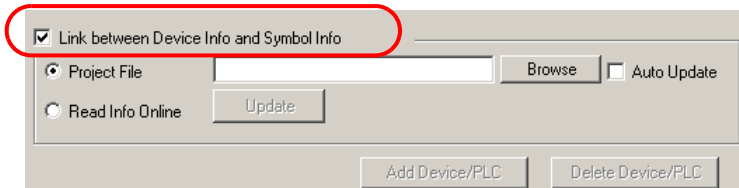
- 2 Select a node from the tree display on the left of the screen and click [Add Node].



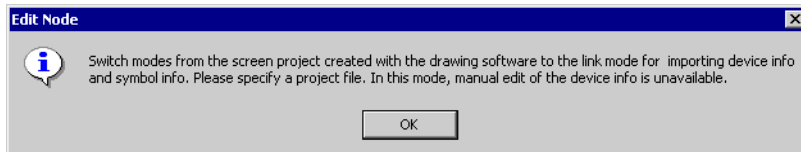
- 3 Enter [Node Name] and [IP Address]. (Enter [Node Name], [IP Address], and [Subnet Mask] in the GP Series. Also enter [Gateway], if required.)



4 Check [Link between Device Info and Symbol Info].



The confirmation screen for data import appears. Click [OK].



The mode is switched to the link mode that allows the data import.

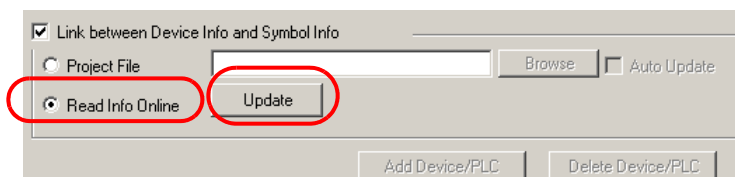
NOTE

- When the [Link between Device Info and Symbol Info] check box is cleared, a confirmation box for link-mode cancellation appears.
Click [OK] to cancel link mode.

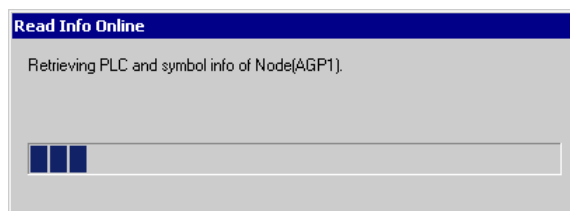


- Depending on the type of device/PLC, you cannot edit the device information manually even if the [Link between Device Info and Symbol Info] check box is cleared.

- 5 Select [Read Info Online] and click [Update].

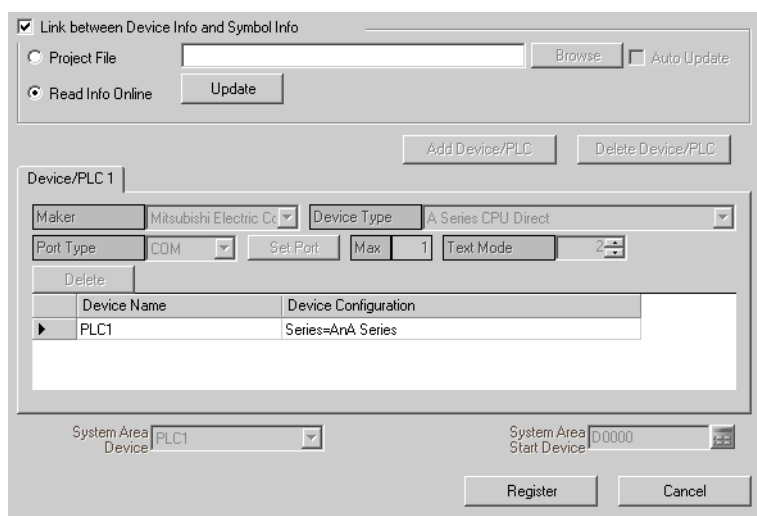


The "Read Info Online" dialog box appears and starts communication with the display unit whose IP address you entered in Step 4. Without going online, the display unit runs an online read.



-
- NOTE** • If "Transfer password" is set for the display unit, the "Transfer password entry" screen appears. Enter the password and click the [OK] button.
-

- 6 When the communication is completed, the Device/PLC data set in the screen project file is displayed in each item in the [Device/PLC] tab.



- 7 Click [Register].

The entry node is now registered with the set contents.

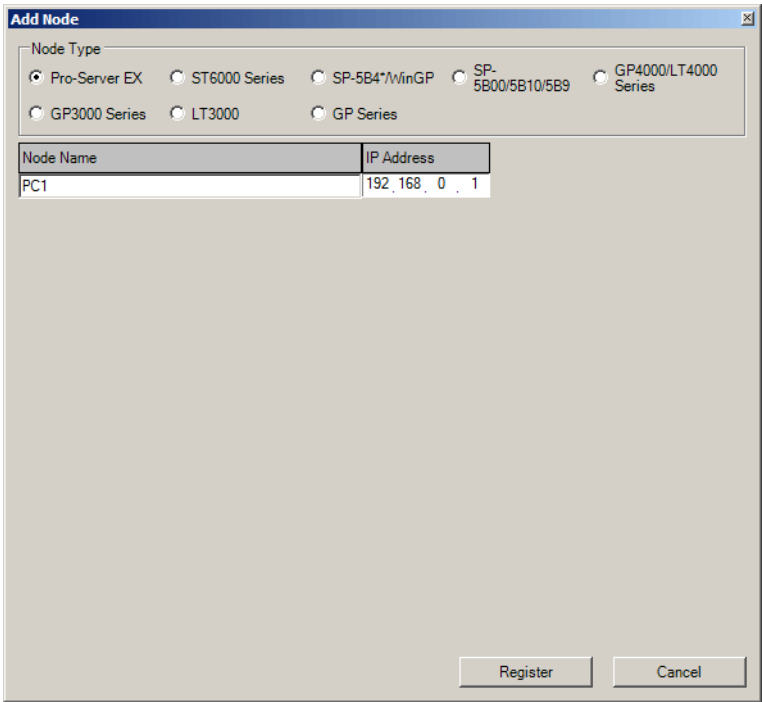
-
- NOTE** • You can click the [Confirm Nodes online] button on the transfer setting screen to confirm if the screen project file transferred to the display unit matches the imported information. Refer to "26 Transferring" for more details.
-

31.5 Setting Guide

31.5.1 Pro-Server EX Node

This section explains the settings on the screen displayed on the conditions below:

- 1) When you select "Pro-Server EX" from the node list and click [Add Node]; or
- 2) When you click a node name from the node list.



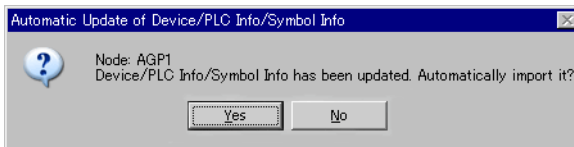
| Setting item | Setting content |
|--------------|---|
| Node Type | <p>"Pro-Server EX" is selected.</p> <div>NOTE</div> <ul style="list-style-type: none">When the node type is changed, the following dialog box appears. <div></div> <p>Clicking the [Yes] button deletes the set data of the Device/PLC and of symbols.</p> |
| Node Name | <p>Enter the node name to be registered. Example) PC_1</p> <div>NOTE</div> <ul style="list-style-type: none">Restrictions on a node name are as follows:<ul style="list-style-type: none">Must be entered at maximum 32 single-byte characters.Cannot begin with a number.Is distinguished between uppercase and lowercase letters, hiragana and katakana. |
| IP Address | Enter the IP address of the entry node. |

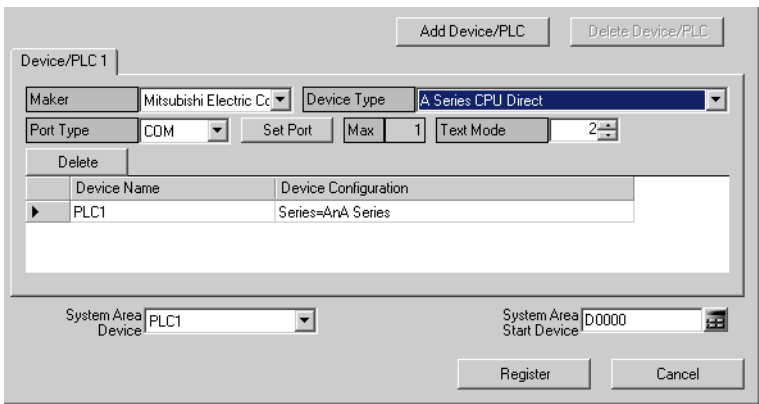
31.5.2 ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, and LT3000 nodes



This section explains the settings on the screen displayed on the conditions below:

- 1) When you select "SP-5B4*/WinGP", "SP-5B00/5B10/5B90", "GP4000/LT4000 Series", "GP3000 Series", or "LT3000" from the node list and click the [Add Node]; or
- 2) When you click a node name from the node list.

| Setting item | Setting content |
|--------------|--|
| Node Type | <p>"SP-5B4*/WinGP", "SP-5B00/5B10/5B90", "GP4000/LT4000 Series", "GP3000 Series", or "LT3000" is selected.</p> <p>NOTE</p> <ul style="list-style-type: none"> When the node type is changed to "Pro-Server EX" or "GP Series", the following dialog box appears. <div data-bbox="655 1464 987 1609" data-label="Image"> </div> <p>Clicking the [Yes] button deletes the set information of the Device/PLC and of symbol variables.</p> |

| Setting item | Setting content |
|--|--|
| Node Name | <p>Enter the node name to be registered. Example) AGP_1</p> <p>NOTE</p> <ul style="list-style-type: none"> Restrictions on a node name are as follows: <ul style="list-style-type: none"> Must be entered at maximum 32 Unicode characters. Cannot begin with a number. Is distinguished between uppercase and lowercase letters. |
| IP Address | Enter the IP address of the entry node. |
| Link between Device Info and Symbol Info | <p>Import the Device/PLC information or symbol variable information from a screen project file.</p> <p>NOTE</p> <ul style="list-style-type: none"> Import of data saves the effort of inputting the same data to 'Pro-Studio EX'. |
| Project File | Select a screen project file in a folder on the PC. |
| Browse | <p>The "Open" screen appears.</p> <p>Select the screen project file you wish to use on this screen.</p> |
| Auto Update | <p>The screen project file that has been imported is automatically updated if there is any change to it.</p> <p>The following dialog box appears to indicate updating occurrence, if any.</p>  <p>Click the [Yes] button when you want to import the updated data.</p> <p>The following messages also appear indicating the link status.</p> <ul style="list-style-type: none"> When Auto Update has been successful: "The link has been updated. The latest link date: yyyy/mm/dd hh:mm:ss" When a link error has occurred: "Failed to update. The latest link date: yyyy/mm/dd hh:mm:ss" When [Cancel] has been selected in the Update dialog box: "Canceled to update. The latest link date: yyyy/mm/dd hh:mm:ss" |
| Read Info Online | Select this to import the Device/PLC information or symbol variable information in the screen project file that has been transferred online from display unit which is registered as a entry node. |
| Update | Read the data of a screen project file online. |

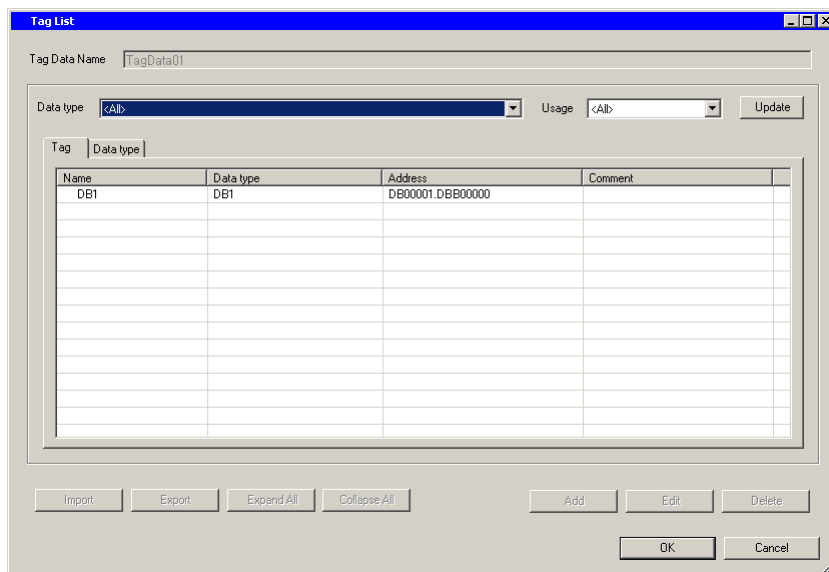
| Setting item | Setting content |
|-------------------|---|
| Add Device/PLC | <p>Add Device/PLCs. You can add Device/PLCs up to 4 drivers. Added Device/PLCs are displayed in each tab.</p>  <p>NOTE</p> <ul style="list-style-type: none"> When LT3000 is selected as the Node Type, you can connect only one device/PLC to the node. |
| Delete Device/PLC | <p>Delete the Device/PLC currently displayed. The message "Delete xxx (Device/PLC name). Continue?" appears. Click the [Yes] button to delete it.</p> |
| Maker | Select the name of the manufacturer of Device/PLC. |
| Device Type | Select the type of Device/PLC. |
| Port Type | Select the type of port that connects display unit and Device/PLC. |
| Set Port | <p>Set the details of communication. For further information, please refer to "Communication Setup" for the corresponding manufacturer in 'GP-Pro EX Device/PLC Connection Manual'.</p> |
| Max. | <p>Displays the maximum number of Device/PLCs that can be connected.</p> <p>NOTE</p> <ul style="list-style-type: none"> No change can be made. |
| Text Mode | <p>Specify the text mode of Device/PLC. Refer to "■ Text Mode" for more details.</p> |
| Device Name | <p>Enter the name of Device/PLC which is connected. Restrictions on its name are as follows:</p> <ul style="list-style-type: none"> Must be entered at maximum 32 Unicode characters. Cannot begin with a number. <p>NOTE</p> <ul style="list-style-type: none"> As for the Device/PLC data, please confirm the contents set on 'GP-Pro EX', and specify the set items to meet such contents. If there is inconsistency in the set contents like the device name, communication is not established. |

| Setting item | Setting content |
|--------------------------|--|
| Device Configuration | <p>Set up the Device/PLC.</p> <p>NOTE</p> <ul style="list-style-type: none"> The set contents may vary according to the Device/PLC. For further information, please refer to "Communication Setup" for the corresponding manufacturer in 'GP-Pro EX Device/PLC Connection Manual'. When the ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, or GP4000/LT4000 Series node is set, in the [Tag Data] you can select [View]. Refer to "■ Tag List" for more details. |
| System Area Device | <p>Select the Device/PLC where the system area is assigned.</p> <p>NOTE</p> <ul style="list-style-type: none"> By default, displays the device name set in [System Area Device] on the "System Area Setting" screen (accessible from [Main Unit Setting] on "System setup window" in 'GP-Pro EX'). <p> 'GP-Pro EX Reference Manual'</p> |
| System Area Start Device | <p>Enter the device address where system area is assigned. Enter the address directly or click the Calculator icon to enter it on the device address input screen.</p> <p>NOTE</p> <ul style="list-style-type: none"> By default, displays the device set in [System Data Area] on the "System Area Setting" screen (accessible from [Main Unit Setting] on "System setup window" in 'GP-Pro EX'). <p> 'GP-Pro EX Reference Manual'</p> |
| Register | An entry node is registered with the set contents. |

■ Tag List

You can check the device/PLC tag information imported into a GP-Pro EX project file. A "Tag" is a name associated with a device address. The "Tag" is also known as a "variable" or "symbol", depending on the device/PLC manufacturer.

For the list of supported drivers, refer to "GP-Pro EX Reference Manual".

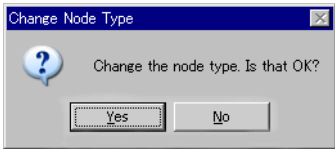


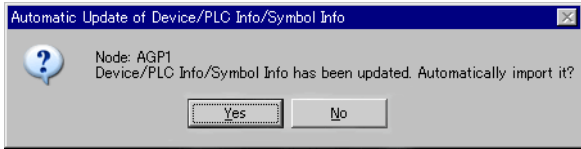
| Setting item | Setting content |
|---------------|--|
| Tag Data Name | Displays the device/PLC tag data name imported to the GP-Pro EX project file. |
| Data Type | Select a data type to display. Displays tags with the selected data type only. |
| Usage | Select the tags to display from [All], [Use], and [Unused]. |
| Update | Update the display list after changing the [Data Type] and [Usage] conditions. |
| List | <p>[Tag] and [Data Type] tabs change the display list content. Displayed information varies depending on the tag.</p> <p>[Tag]: Displays the list of information for each tag.</p> <p>[Data Type]: Displays the list of data types in a project.</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">NOTE</div> <ul style="list-style-type: none"> Click [Expand All] or [Collapse All] in the [Data Type] tab to expand or collapse the lists's display information in one step. |
| Import | <ul style="list-style-type: none"> In Pro-Server EX, you cannot edit or add tags. To edit or add tags, use GP-Pro EX and update the project file. For more details, in the "GP-Pro EX Reference Manual", refer to "7.8 Using Device/PLC Tags". |
| Export | |
| Expand All | |
| Collapse All | |
| Add | |
| Edit | |
| Delete | |

31.5.3 GP Series Node

This section explains the settings on the screen displayed on the conditions below:

- 1) When you select "GP Series" from the node list and click the [Add Node]; or
- 2) When you click a node name from the node list.

| Setting item | Setting content |
|--------------|---|
| Node Type | <p>"GP Series" is selected.</p> <p>NOTE</p> <ul style="list-style-type: none"> When the node type is changed, the following dialog box appears.  <p>Clicking the [Yes] button deletes the set information of the Device/PLC and of symbol variables.</p> |
| Node Name | <p>Enter the node name to be registered. Example) GP_1</p> <p>NOTE</p> <ul style="list-style-type: none"> Restrictions on a node name are as follows: <ul style="list-style-type: none"> Must be entered at maximum 32 Unicode characters. Cannot begin with a number. Is distinguished between uppercase and lowercase letters, hiragana and katakana. |
| IP Address | Enter the IP address of the entry node. |
| Subnet Mask | Enter the subnet mask value of the network on which the node is connected. |

| Setting item | Setting content |
|--|--|
| Gateway | Enter the IP address of the gateway when accessing the node via the gateway. |
| Link between Device Info and Symbol Info | <p>Import the Device/PLC information or symbol variable information from a screen project file.</p> <p>NOTE</p> <ul style="list-style-type: none"> • Import of data saves the effort of inputting the same data to Pro-Studio EX'. • When Auto Update is not checked, a screen project file needs to be updated manually after editing. Specify the edited file and click the [More] button to import the data again. |
| Screen Project File | Select a screen project file in a folder on the PC. |
| Browse | <p>The "Open File" screen appears.</p> <p>Select the screen project file you wish to use on this screen.</p> |
| Auto Update | <p>The screen project file that has been imported is automatically updated if there is any change to it. The following dialog box appears to indicate updating occurrence, if any.</p>  <p>Click the [Yes] button when you want to import the updated data.</p> <p>The following messages also appear indicating the link status.</p> <ul style="list-style-type: none"> • When Auto Update has been successful: "The link has been updated. The latest link date: yyyy/mm/dd hh:mm:ss" • When a link error has occurred: "Failed to update. The latest link date: yyyy/mm/dd hh:mm:ss" • When [Cancel] has been selected in the Update dialog box: "Canceled to update. The latest link date: yyyy/mm/dd hh:mm:ss" |
| Device Type | Select the type of Device/PLC. |
| Text Mode | <p>Specify the text mode of Device/PLC.</p> <p>Refer to "■ Text Mode" for more details.</p> |
| Correction of Inconsecutive Addresses | <p>Specify the data number of protocol communication to be optimized.</p> <p>In the case of "-1", the maximum data number supported by the protocol is adopted and optimization is executed.</p> <p>In the case of "0", optimization is not performed. Address spaces having 1-address space between each other are regarded as non-sequential. Please use it under the circumstance that holds a device which causes trouble when accessed.</p> <p>NOTE</p> <ul style="list-style-type: none"> • Enter the number in the range of -1 to 255. |
| Register | An entry node is registered with the set contents. |

31.5.4 Text Mode

The order of the characters in a string can vary according to the manufacturer of Device/PLC.

Please check the Device/PLC you are using, and select the storage order of the characters in a string from the following table to set the text mode.

- (I) Device storage order of data
- (II) Byte LH/HL storage order in Word
- (III) Word LH/HL storage order in Double-Word

NOTE

- Display unit and 'Pro-Server EX' do not match, the string that is read in will be different, and therefore cannot be processed as text.

Please set the text mode of the display unit in the character string data mode on the "Device/PLC Setting" screen (accessible from [System Setup Window] in 'GP-Pro EX').

List of Text Mode

| (I) Device storage order of data | (II) Byte LH/HL storage order in Word | (III) Word LH/HL storage order in Double-Word | Text mode |
|----------------------------------|---------------------------------------|---|-----------|
| Store from the front data | LH | LH | 4 |
| | | HL | 2 |
| | HL | LH | 5 |
| | | HL | 1 |
| Store from the end data | LH | LH | 6 |
| | | HL | 7 |
| | HL | LH | 8 |
| | | HL | 3 |

Example) When the character string is "ABCDEFGHIJ", the following patterns are available.

Character string A B C D E F G H I J

AB CD EF GH IJ Text mode 4
 BA DC FE HG JI Text mode 2
 CD AB GH EF IJ Text mode 5
 DC BA HG FE JI Text mode 1

IJ GH EF CD AB Text mode 6
 JI HG FE DC BA Text mode 7
 GH IJ CD EF AB Text mode 8
 HG JI DC FE BA Text mode 3

31.6 Restrictions

■ Note on importing the symbol information from a screen project file, or the display unit, to which a screen project file has been transferred

- When you import a screen project file of 'GP-Pro EX' or 'GP-PRO/PBIII for Windows', the data type of word symbol is "Unknown". Please set the data type on 'Pro-Studio EX' again.
- When specifying "Unknown" one more time, you cannot set the bit type.
- The real variable R_xxxx cannot be imported.
- You cannot import if the character string of the device address exceeds 255.

■ Notes on importing a variable created with a logic program

- When you import a variable created with a logic program, you cannot edit the symbol sheet including the imported contents.

To edit them, copy the imported contents on the symbol sheet to another symbol sheet. You can edit the contents on the symbol sheet copied once.

- A timer variable, counter variable, date variable, time variable and PID variable are imported as a group.
- For an alignment variable, the number of alignment elements is replaced with the number of data.
- Maximum number of alignment elements is 4096. If it exceeds the number of symbol data specified by 'Pro-Server EX', symbols are divided and registered on a symbol sheet.

Variable categories and the maximum number of data that can be handled in 'Pro-Server EX' are follows:

| Variable category | Maximum number of data |
|-------------------|------------------------|
| Bit variables | 255 |
| Integer variables | 510 |
| Float variables | 510 |

Example) When importing the integer valuable "Pump" including 2000 elements

| | |
|---------------|----------------|
| First symbol | Pump |
| Second symbol | Pump_510_1019 |
| Third symbol | Pump_1020_1539 |
| Fourth symbol | Pump_1540_1999 |

■ Notes on importing

- All the preset Device/PLC information, symbol variable information and symbol variable information for searching the node are deleted, and replaced with the imported information.
- If you import a file with global constants settings, all the preset global constants are deleted, and replaced with the imported global constants.

■ Notes on "Link between Device Info and Symbol Info"

Under "Link between Device Info and Symbol Info" in the Node Settings, device and symbol information cannot be imported from a screen project file in the following cases:

- If a screen project file is set under the Device/PLC name that starts from the numeral value in 'GP-Pro EX'
- If a screen project file as mentioned above has been transferred to the display unit

Please change the PRX file name using a Device/PLC name that starts from something other than the numeral value in 'GP-Pro EX'.

32



Symbol Registration

| | | |
|------|---|-------|
| 32.1 | Symbol and Symbol Sheet | 32-2 |
| 32.2 | Registering Symbols on a Symbol Sheet..... | 32-5 |
| 32.3 | Sharing Symbols on the Entire Network | 32-26 |
| 32.4 | Copying to a Symbol Sheet in Another Network Project File | 32-28 |
| 32.5 | Checking Registered Symbols | 32-32 |
| 32.6 | Setting Guide | 32-34 |
| 32.7 | Restrictions | 32-41 |

32.1 Symbol and Symbol Sheet

32.1.1 What is a Symbol?

You can collectively register each device data used inside the display unit and Device/PLC, or variable information used in the logic program as "Symbol".

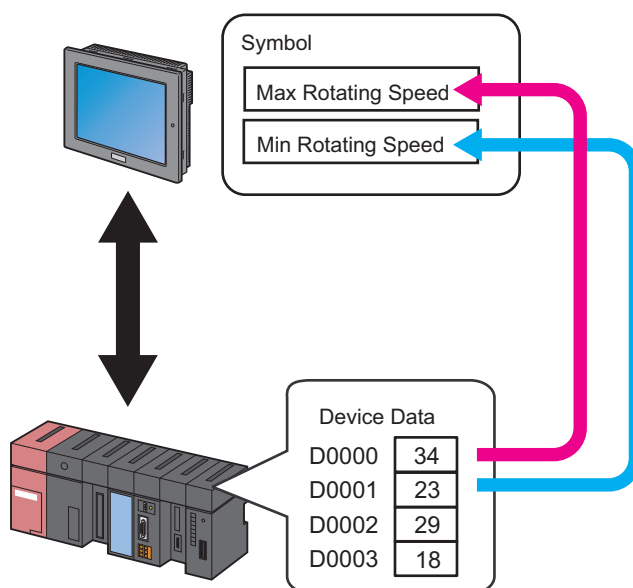
A symbol is a "Variable" to control all data at once such as device address and data type, etc. and 'Pro-Server EX' reads and writes each device data through the registered symbol.

Since you can set the device address directly on 'Pro-Studio EX', symbol registration is not essential. When you wish to change all device data at once, however, it is recommended to use symbols as much as possible for easier maintenance.

The data included in a symbol are: Symbol name, Device address, Data type, Number of data etc.

NOTE

- The contents can be confirmed easily if a symbol has a concrete symbol name ("Maximum number of rotation", "Minimum number of rotation", etc.)



- You can use the system variables (HMI system variables and logic system variables) that is predefined in 'GP-Pro EX'. For details, refer to the GP-Pro EX Reference Manual.

■ 'GP-Pro EX' Variables

◆ Variables created with a logic program

- Variable format

Variables registered by a user with optional names. To use these variables, import a screen project file created with 'GP-Pro EX'.

For details on importing, refer to "31.3 Getting Data from a Screen Project File".

- Address format

Variables automatically assigned to a device in the 'GP-Pro EX'. You do not need to import a screen project file of 'GP-Pro EX', because 'Pro-Server EX' prepares these variables in advance.

NOTE

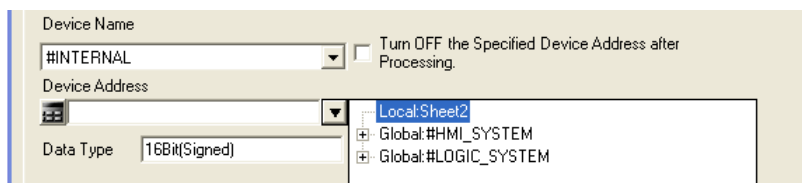
- When defining logic addresses, in 'GP-Pro EX' you would set [Device/PLC] to [#LOGIC], however, in 'Pro-Server EX' you set [Device Name] to [#INTERNAL].

For restrictions of the variables created with the logic program, refer to "32.7 Restrictions".

◆ System variables

Variables having the predefined functions on the 'GP-Pro EX'. You do not need to import a screen project file of 'GP-Pro EX', because 'Pro-Server EX' prepared these variables in advance.

When setting up ACTION or trigger condition, system variables on 'GP-Pro EX' are displayed when you select "#INTERNAL", which is the internal device of a display unit, in [Device Name] and click the list button of [Device Address].



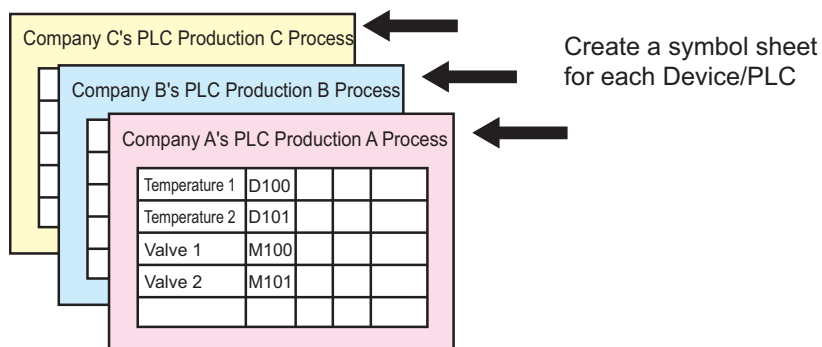
NOTE

- For details about variables on the 'GP-Pro EX', refer to the "GP-Pro EX Reference Manual".
- In Pro-Server EX, you cannot use 'GP-Pro EX' system variables with names that begin with "[PLC*]H#_".

32.1.2 What is a Symbol Sheet?

Symbols are controlled collectively on each Device/PLC. This control unit is called a "Symbol Sheet".

You can create more than one symbol sheet, and symbol control is possible per sheet in accordance with the intended use.

**NOTE**

- You can register 1500 symbols at maximum, in one symbol sheet. When the number of symbols exceed 1500, add a new symbol sheet to register.

☞ "32.2.5 Adding Symbol Sheets"

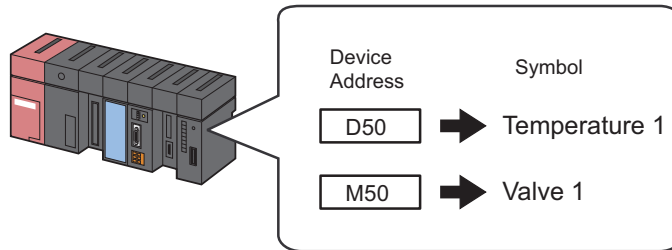
- When editing symbols, you can set up to always check the entered address range.

☞ "34.3 Option Settings"

32.2 Registering Symbols on a Symbol Sheet

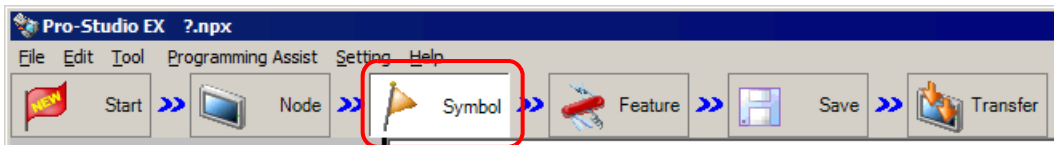
32.2.1 Registering Symbols

Company A's Device/PLC

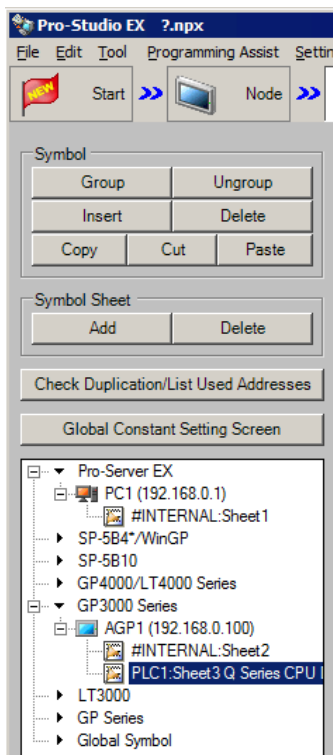


This section describes how to register symbols taking the above case as an example.

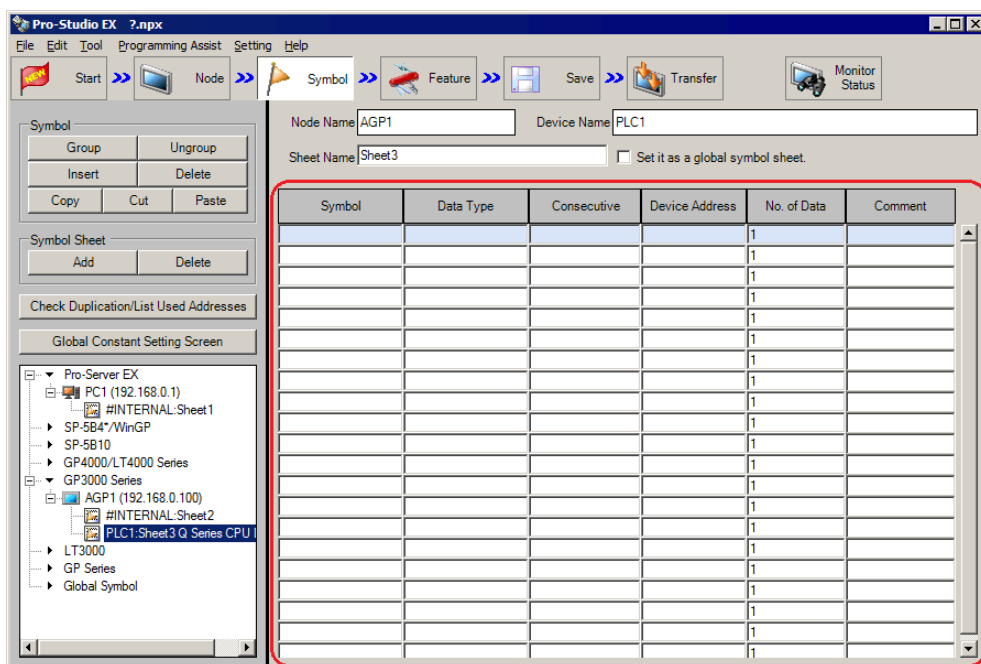
- 1 Click the [Symbol] icon on the status bar.



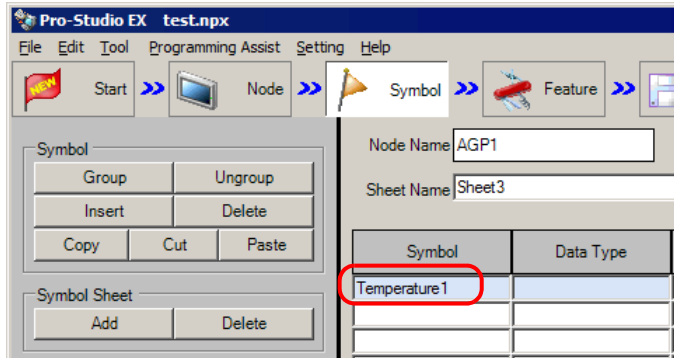
- 2 Select the Device/PLC in which you want to register symbols, from the tree display on the left of the screen.



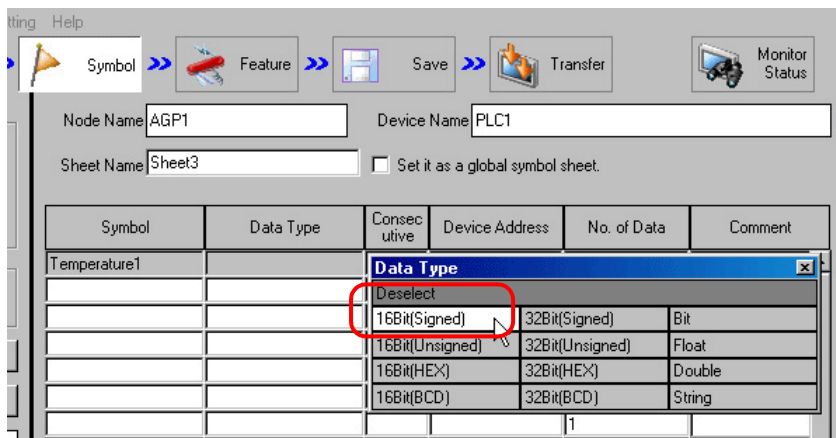
The symbol registration screen of the selected Device/PLC appears on the right of the screen. The area surrounded by red line is a "Symbol sheet" where symbols are registered.



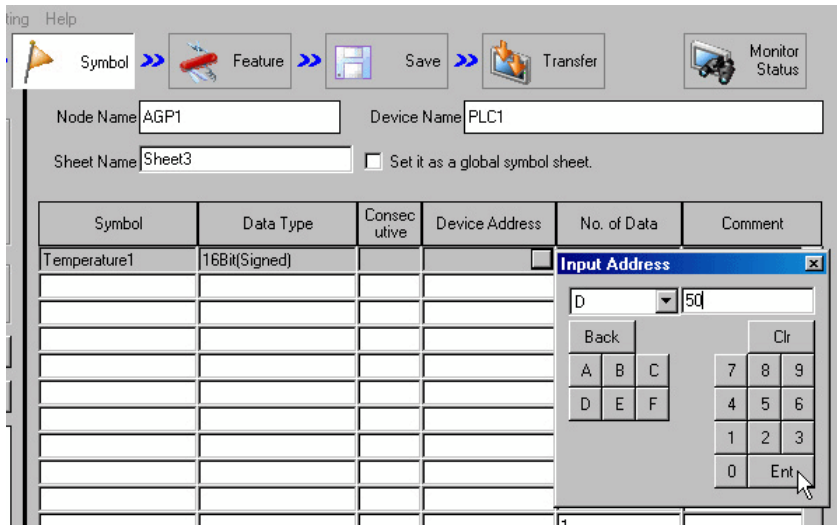
- 3 Enter "Temperature 1" as a symbol name in the [Symbol] field on the symbol sheet.



- 4 Click the [Data Type] field and select the data type from the displayed list.



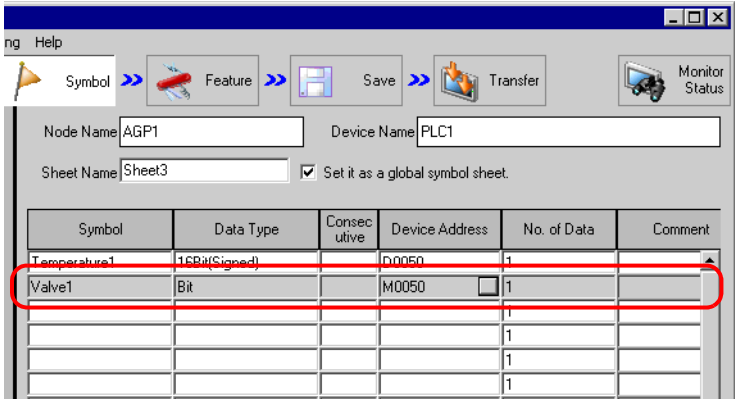
- Click the button that appears by clicking the [Device Address] field, and enter "D50" as a device address to be registered as a symbol. Then click the [Ent] button.



NOTE

- You can also enter the device address directly.
- When the variable created with a logic program (#I_****, #Q_****) it inputs, after selecting "#internal" sheet of Device/PLC which uses variable in tree indication on the right screen input.

- Repeat the above steps (Step 1 to 5) to register the symbol "Valve 1" in the same way.



This is the end of the symbol registration to the symbol sheet.

NOTE

- You can edit the contents of the registered symbols.
Click [Symbol], [Consecutive] or [Device Address] and edit the contents on the "Edit Symbol" screen.

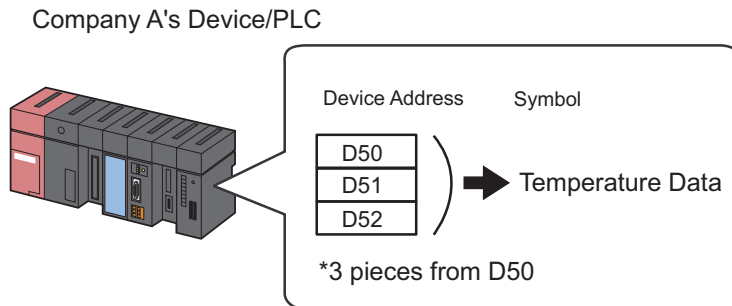


"32.6.2 "Edit Symbol" Screen"

32.2.2 Registering Sequential Devices

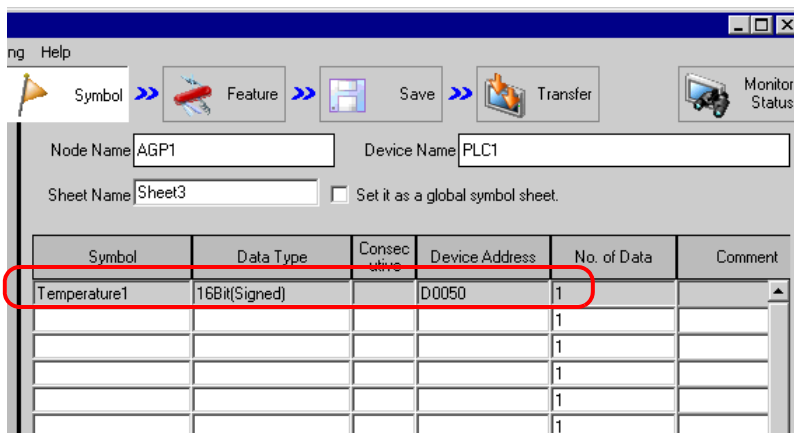
■ Registering sequential addresses individually as symbols

To perform symbol registration continuously for sequential device addresses, you can register these addresses together without specifying each address individually.



This section describes how to register the symbols of sequential addresses taking the above case as an example.

- 1 Register the device address "D50" with the symbol name "Temperature 1".



For the detailed procedure, please refer to Step 1 to 5 in "32.2.1 Registering Symbols".

2 Then, register the device address "D51" as a symbol.

Click the [Symbol] field in the next row of "Temperature 1", and enter "Temperature 2" as a symbol name.

| Symbol | Data Type | Consecutive | Device Address | No. of Data | Comment |
|--------------|---------------|-------------|----------------|-------------|---------|
| Temperature1 | 16Bit(Signed) | | D0050 | 1 | |
| Temperature2 | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |

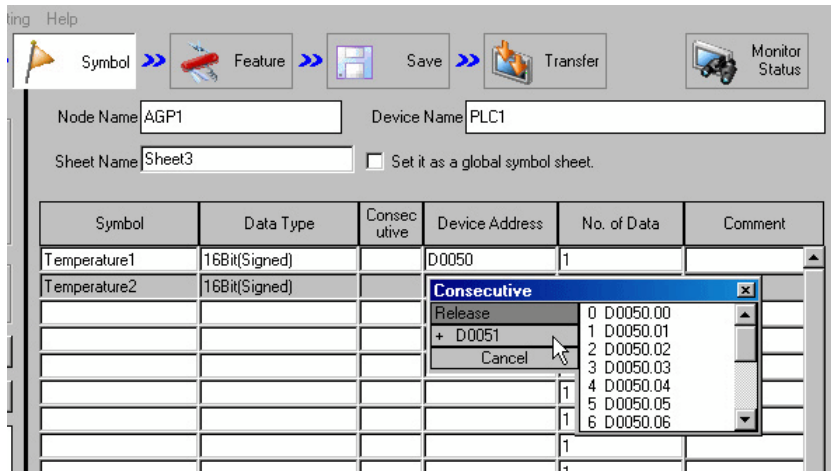
3 Click the [Consecutive] field.

A panel to specify the continuous attribute appears.

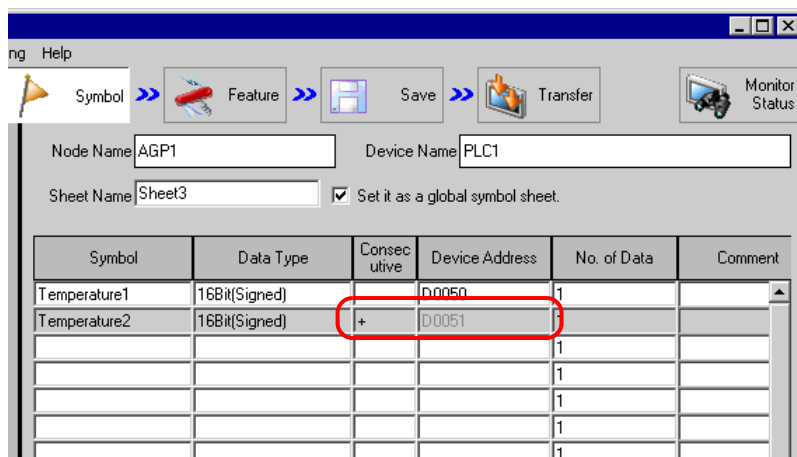
The next device address "D0051" to the symbol "Temperature 1" is indicated on the left of this panel.

| Symbol | Data Type | Consecutive | Device Address | No. of Data | Comment |
|--------------|---------------|-------------|----------------|-------------|---------|
| Temperature1 | 16Bit(Signed) | | D0050 | 1 | |
| Temperature2 | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |

4 Select [+ D0051] as a sequential device address.

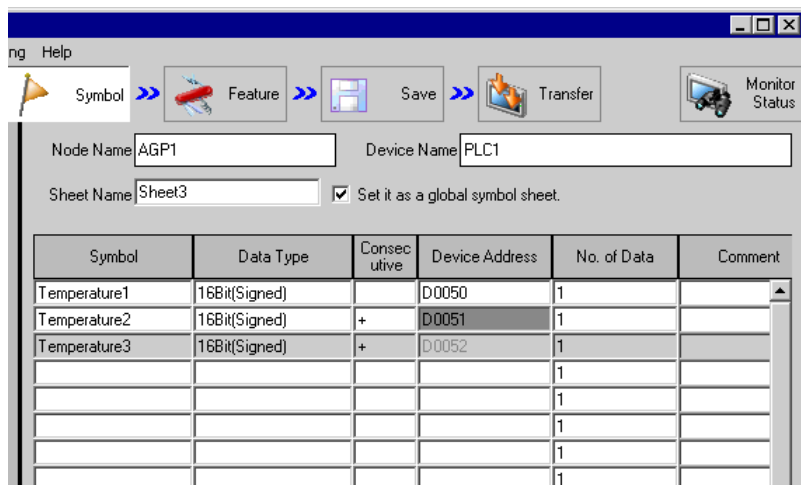


"+", indicating the device continuance, appears in the [Consecutive] field and the device address "D51" is displayed in gray.



NOTE • When symbols are continuously registered, the symbol data type specified at the first setting is automatically input in the [Data Type] field.

5 Repeat Step 2 to 4 to set the next symbol.



ng Help

Symbol Feature Save Transfer Monitor Status

Node Name: AGP1 Device Name: PLC1

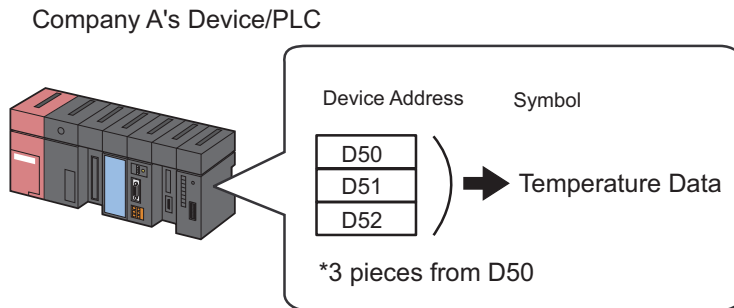
Sheet Name: Sheet3 ☒ Set it as a global symbol sheet.

| Symbol | Data Type | Consecutive | Device Address | No. of Data | Comment |
|--------------|---------------|-------------|----------------|-------------|---------|
| Temperature1 | 16Bit(Signed) | | D0050 | 1 | |
| Temperature2 | 16Bit(Signed) | + | D0051 | 1 | |
| Temperature3 | 16Bit(Signed) | + | D0052 | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |

Now, the sequential devices addressed "D50", "D51" and "D52" have been registered individually as symbols.

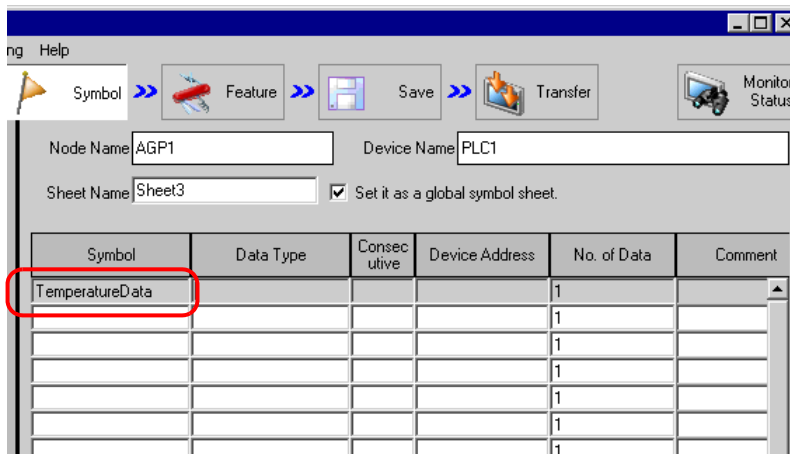
■ Registering sequential addresses collectively as a symbol

You can register sequential device addresses as one symbol by specifying the number of devices.

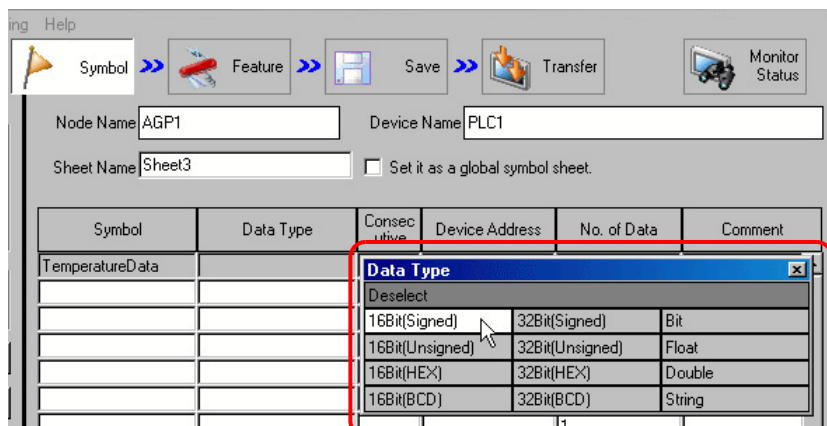


This section describes how to register the symbols of sequential addresses taking the above case as an example.

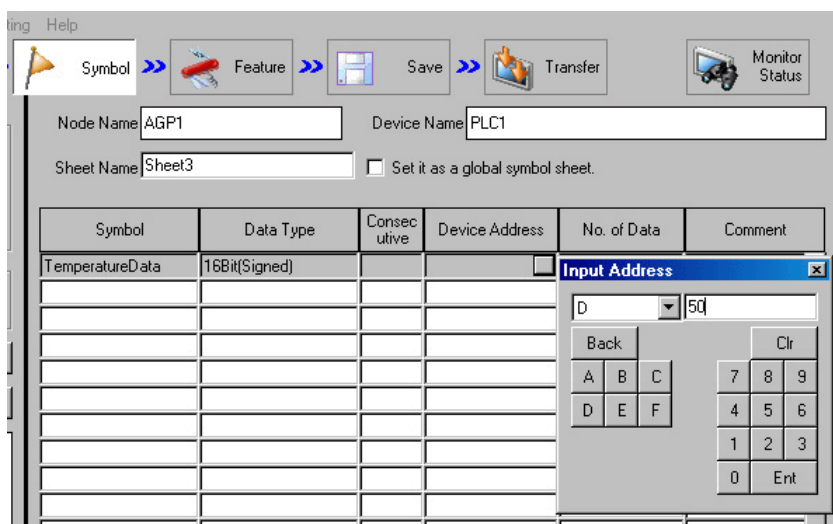
- 1 Enter "Temperature Data" as a symbol name in the [Symbol] field on the symbol sheet.



- Click the [Data Type] field and select the data type from the displayed list.



- Click the button that appears by clicking the [Device Address] field, and enter "D50" as a start device address to be registered as a symbol. Then click the [Ent] button.



4 Enter the number of sequential device addresses "3" in [No. of Data].

Help

Symbol >> Feature >> Save >> Transfer

Node Name: AGP1 Device Name: PLC1

Sheet Name: Sheet3 ☒ Set it as a global symbol sheet.

| Symbol | Data Type | Consecutive | Device Address | No. of Data | Comment |
|-----------------|---------------|-------------|----------------|-------------|---------|
| TemperatureData | 16Bit(Signed) | | D0050 | 3 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |

Now, the sequential devices addressed "D50", "D51" and "D52" have been registered collectively as one symbol.

When you register the next symbol, the address following the last address input in Step 4 (in this case, "+D0053") is displayed on the continuous attribute panel that is displayed by clicking the [Consecutive] field.

Help

Symbol >> Feature >> Save >> Transfer

Node Name: AGP1 Device Name: PLC1

Sheet Name: Sheet3 ☐ Set it as a global symbol sheet.

| Symbol | Data Type | Consecutive | Device Address | No. of Data | Comment |
|-----------------|---------------|-------------|----------------|-------------|---------|
| TemperatureData | 16Bit(Signed) | | D0050 | 1 | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Consecutive

Release

+ D0051

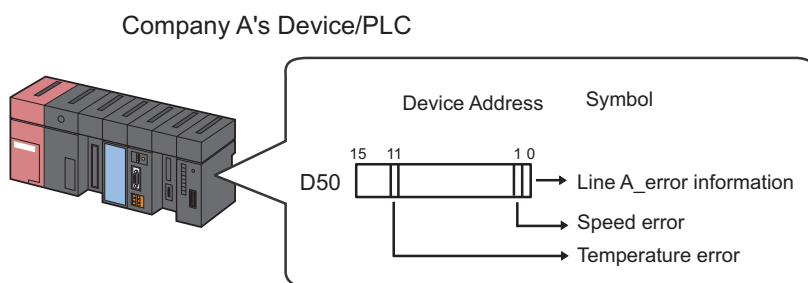
Cancel

- 0 D0050.00
- 1 D0050.01
- 2 D0050.02
- 3 D0050.03
- 4 D0050.04
- 5 D0050.05
- 6 D0050.06

32.2.3 Registering Bit Offset Symbols

When "Word type" is specified as a symbol data type, you may find a symbol of which word device is specified as a word-type symbol first, and the bit of the particular position among such word devices is specified with the offset number beginning with 0. This symbol is called "Bit offset symbol".

For instance, the device address "D50" in the figure below has the error information of Line A. (This device address is the "Parent device".) When the first bit has the "Speed Error" information and the 11th bit has the "Abnormal Temperature" information as further information, you can symbolize particular bits by specifying the bit offset.


NOTE

- When you specify the bit offset, the symbol data type is "Bit" type.
- 32-bit device (Integer_Variables) can be accessed in bit unit.
Add "single space + Xm" following the variable to allow you to access it in bit unit.
Example) When accessing the 7th bit of Integer_Variables
Integer_Variables.X6
- When the data type of the parent device is BCD or String type, bit offset symbols cannot be used.

This section describes how to register bit offset symbols taking the above case as an example.

- 1 Specify "Line A_Error Information" as a device address of "Parent Device".

Help | Symbol | Feature | Save | Transfer | Monitor Status

Node Name: AGP1 Device Name: PLC1

Sheet Name: Sheet3 ☐ Set it as a global symbol sheet.

| Symbol | Data Type | Consecutive | Device Address | No. of Data | Comment |
|-----------------------|---------------|-------------|----------------|-------------|---------|
| LineAErrorInformation | 16Bit(Signed) | | D0050 | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |

For the detailed procedure, please refer to Step 1 to 5 in "32.2.1 Registering Symbols".

- 2 Enter the bit offset symbol name "Speed Error" in the [Symbol] field.

Help | Symbol | Feature | Save | Transfer | Monitor Status

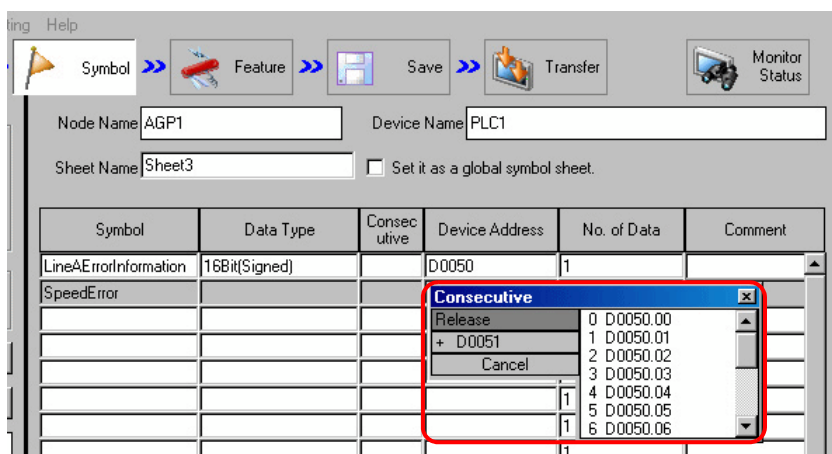
Node Name: AGP1 Device Name: PLC1

Sheet Name: Sheet3 ☐ Set it as a global symbol sheet.

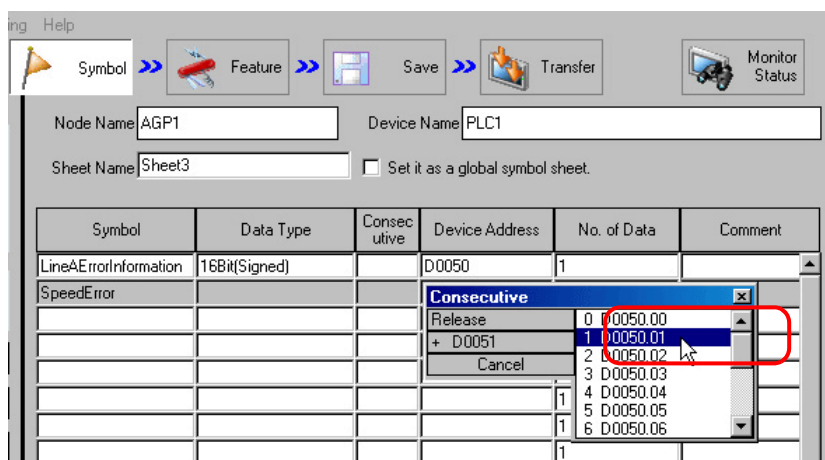
| Symbol | Data Type | Consecutive | Device Address | No. of Data | Comment |
|-----------------------|---------------|-------------|----------------|-------------|---------|
| LineAErrorInformation | 16Bit(Signed) | | D0050 | 1 | |
| SpeedError | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |

3 Click the [Consecutive] field.

A panel to specify the continuous attribute appears.



4 Double-click the target offset (in this case "D0050.01") from the list on the right of the continuous attribute panel.



"01" indicating "Offset" is entered in the [Consecutive] field.

Help

Symbol >> Feature >> Save >> Transfer

Node Name: AGP1 Device Name: PLC1

Sheet Name: Sheet3 ☐ Set it as a global symbol sheet.

| Symbol | Data Type | Consecutive | Device Address | No. of Data | Comment |
|-----------------------|---------------|-------------|----------------|-------------|---------|
| LineAErrorInformation | 16Bit(Signed) | | D0050 | 1 | |
| SpeedError | Bit | 01 | D0050.01 | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |

5 Repeat the above steps (Step 2 to 4) to register the symbol "Abnormal Temperature" in the same way.

Help

Symbol >> Feature >> Save >> Transfer

Node Name: AGP1 Device Name: PLC1

Sheet Name: Sheet3 ☐ Set it as a global symbol sheet.

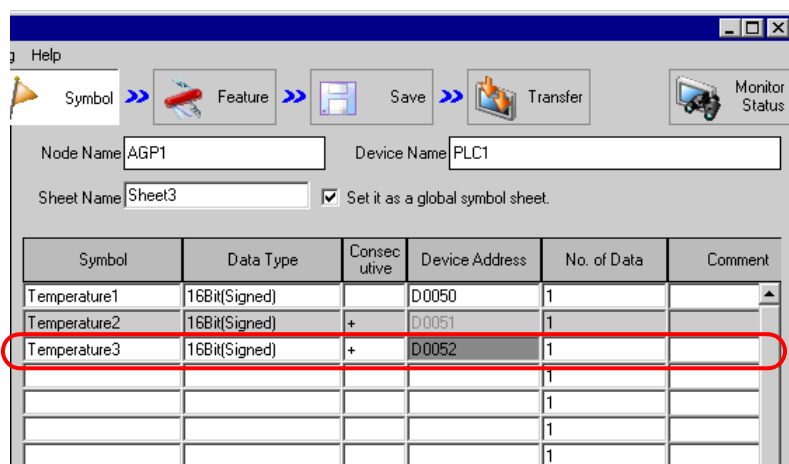
| Symbol | Data Type | Consecutive | Device Address | No. of Data | Comment |
|-----------------------|---------------|-------------|----------------|-------------|---------|
| LineAErrorInformation | 16Bit(Signed) | | D0050 | 1 | |
| SpeedError | Bit | 01 | D0050.01 | 1 | |
| AbnormalTemperature | Bit | 11 | D0050.11 | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |
| | | | | 1 | |

This is the end of the registration of bit offset symbols into the symbol sheet.

32.2.4 Inserting and Deleting Rows on a Symbol Sheet

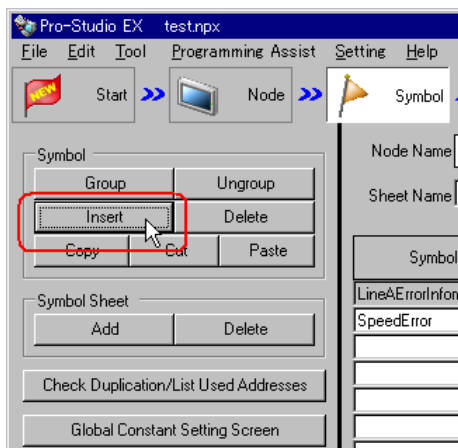
■ Row Insertion

- 1 Select the row just below the place where you want the new one inserted.

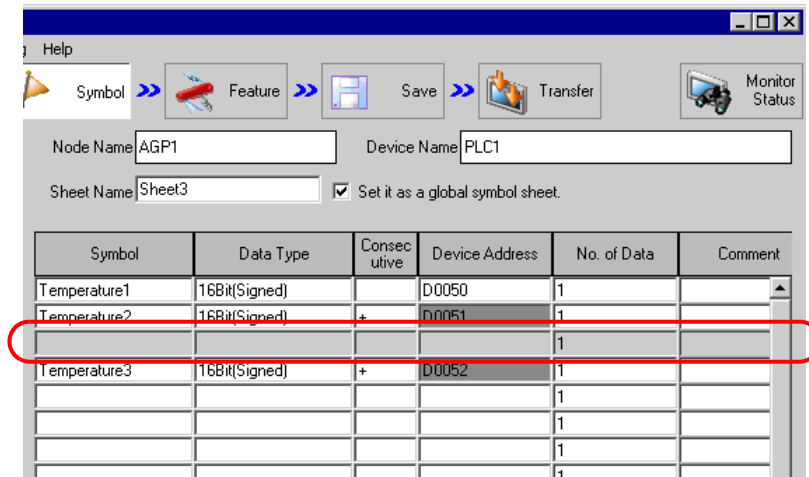


NOTE • To insert more than one row, select the number of rows you want to insert by dragging the mouse.

- 2 Click [Insert] button in [Symbol].

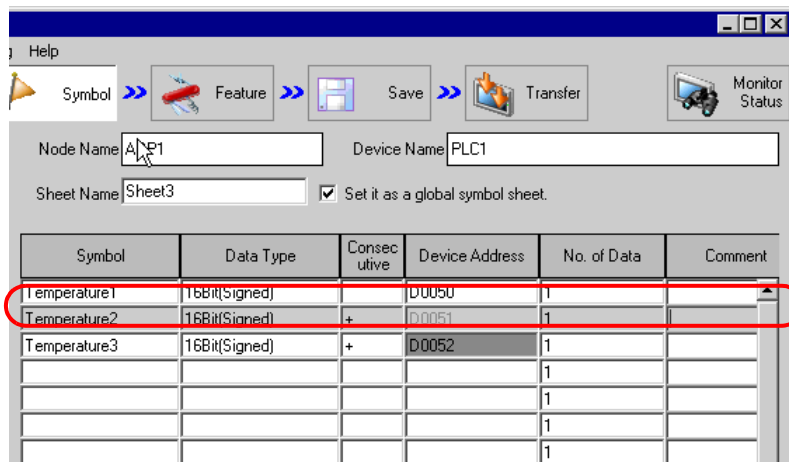


The selected row(s) is displaced by the newly inserted row(s) and shifted down.

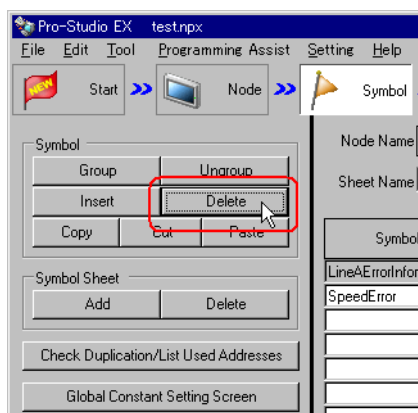


■ Deleting Specified Rows on a Symbol Sheet

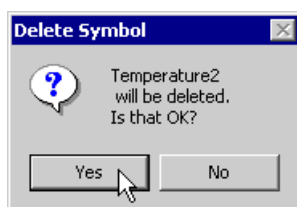
- 1 Select the row you wish to delete.



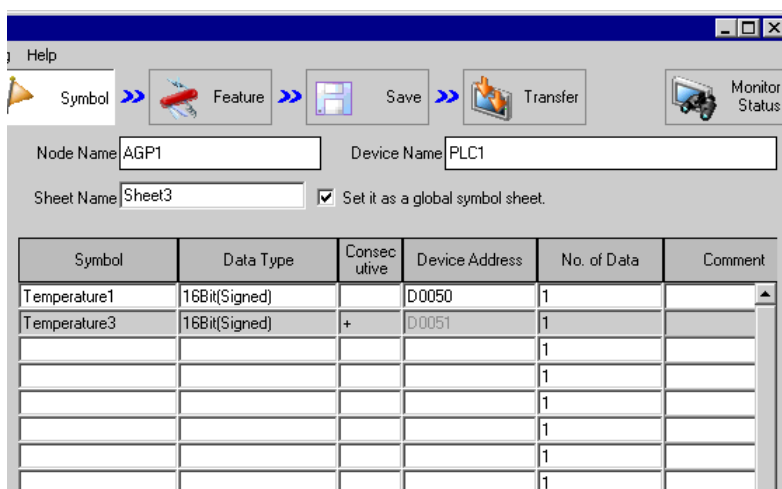
- 2 Click [Delete] button in [Symbol].



- 3 The "Delete Symbol" screen appears. Click [Yes] button.



The specified row is deleted.



32.2.5 Adding Symbol Sheets

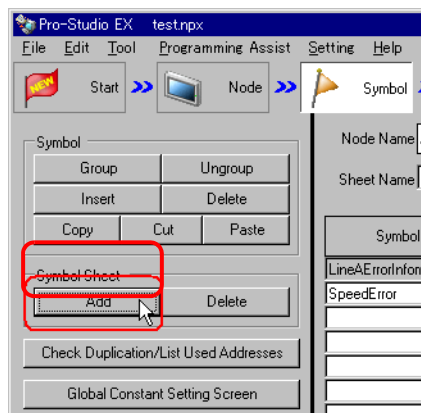
You can create multiple symbol sheets for one entry node.

Registering symbols for purposes allows you to smooth the handling of symbol information.

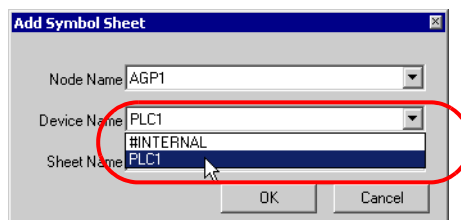
This section describes addition of symbol sheets.

NOTE • You can add 140 sheets at maximum, for one entry node.

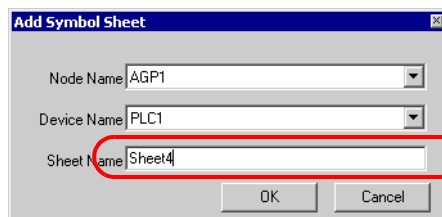
- 1 Click [Add] button in [Symbol Sheet].



- 2 The "Add Symbol Sheet" screen appears. Click the list button of [Node Name] or [Device Name] to select the node or device where you want to add a symbol sheet.

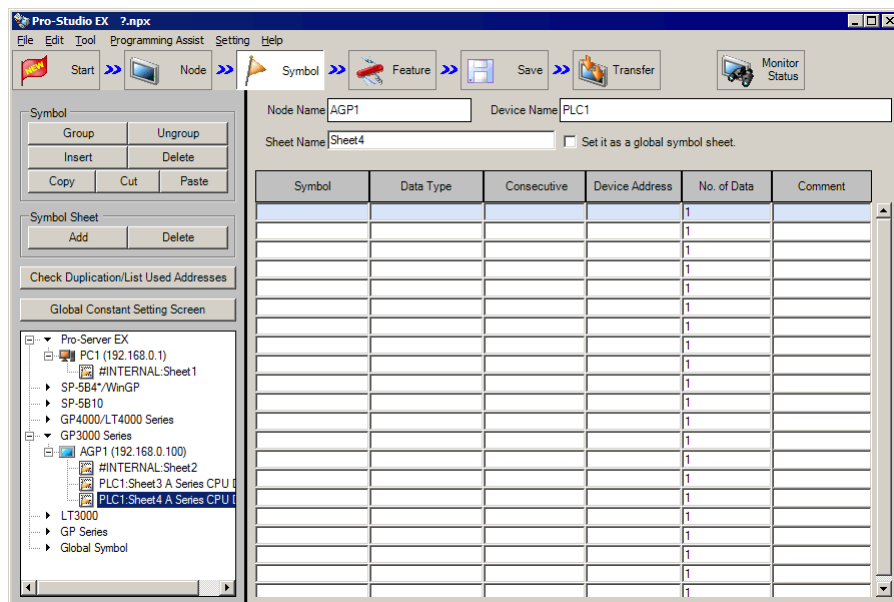


- 3 Enter a symbol sheet name to be added in [Sheet Name]. (By default, the sheet name is "Sheet [No.]").



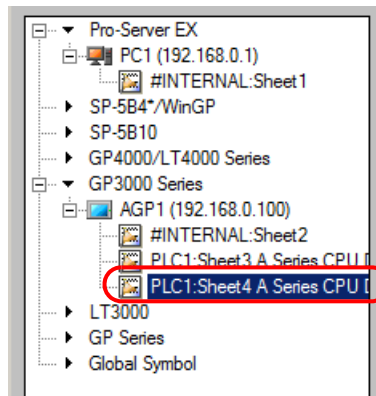
4 Click [OK] button.

A new symbol sheet is now added with its sheet name displayed in the list on the left of the screen.

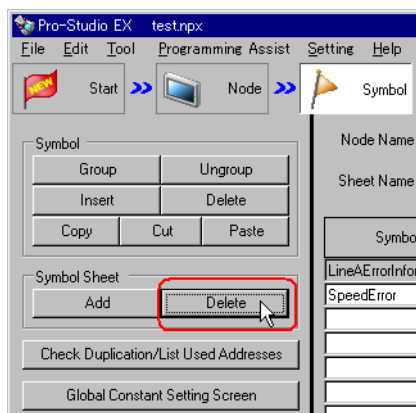


■ Deleting Symbol Sheets

- 1 Select the symbol sheet you wish to delete from the list on the left of the screen.



- 2 Click [Delete] button in [Symbol Sheet].



The selected symbol sheet is now deleted.

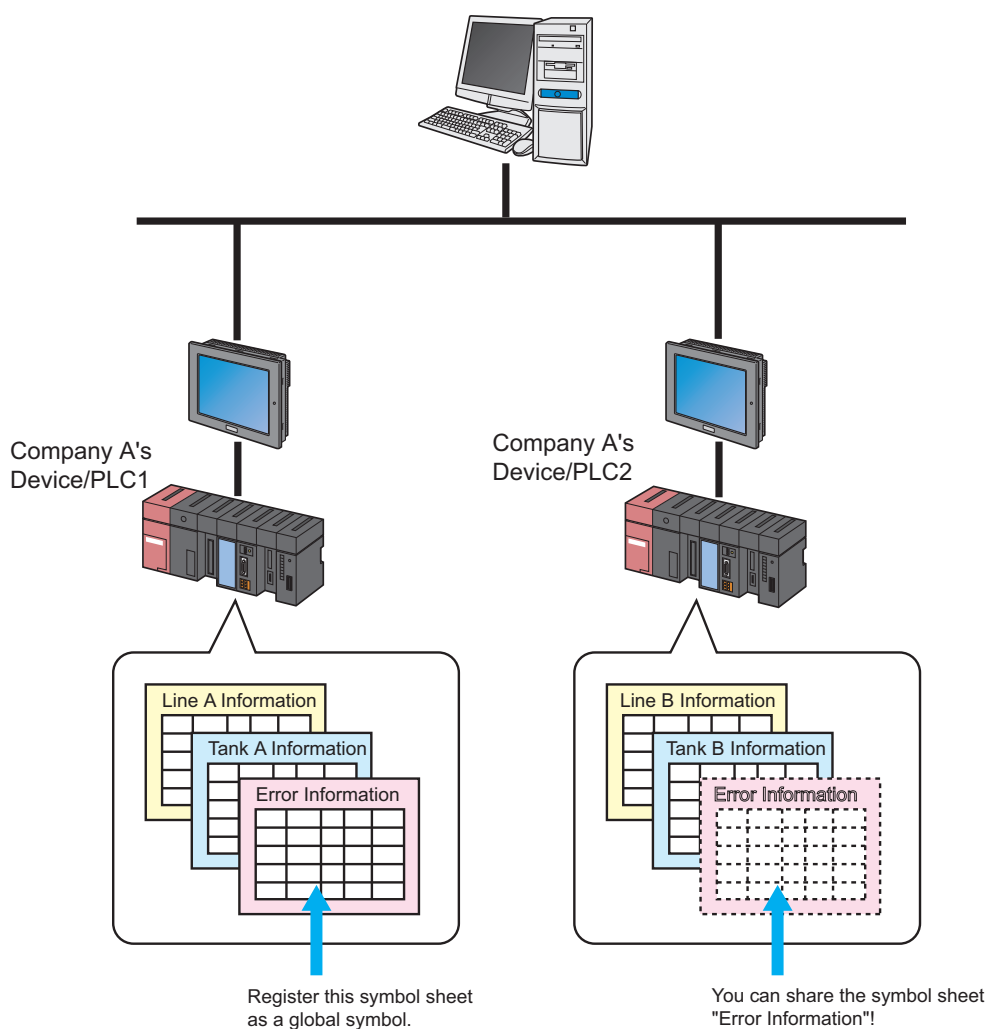
32.3 Sharing Symbols on the Entire Network

32.3.1 What is a Global Symbol?

'Pro-Server EX' allows the same type of Device/PLC to share a symbol. This symbol is called a "Global symbol". Also, a symbol sheet consisting of such global symbols is called a "Global symbol sheet". You can commonly use a same global symbol sheet in all the registered Device/PLCs.

When you register the symbol sheet "Error Information" of "Manufacturer A_Device/PLC 1" as a global symbol sheet, for instance, this "Error Information" symbol is also registered for multiple same Device/PLCs.

Thus, even if many entry nodes are registered on the network, preparing one global symbol sheet saves you creating new symbol sheets as long as the contents are the same.

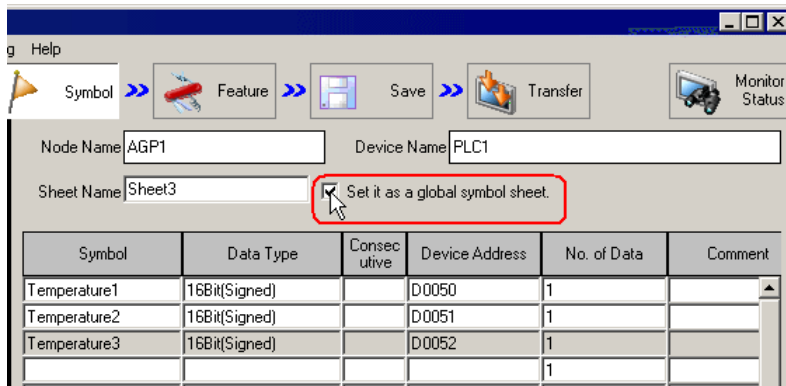

NOTE

- Global symbols should be registered per symbol sheet.
- You can use global symbols commonly between different entry nodes, but the Device/PLCs should be of the same type.

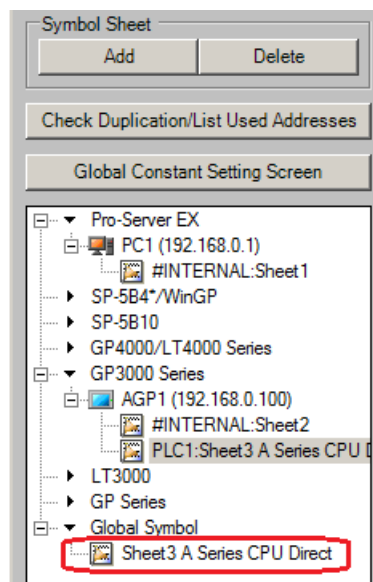
32.3.2 Registering as a Global Symbol

This section describes how to register a global symbol.

- 1 Register a symbol on the symbol sheet.
- 2 Check [Set it as a global symbol sheet] on the right of the screen.

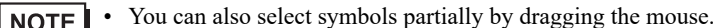


The created symbol sheet is now registered as a global symbol sheet, with the name displayed in "Global symbol" in the tree display on the left of the screen.

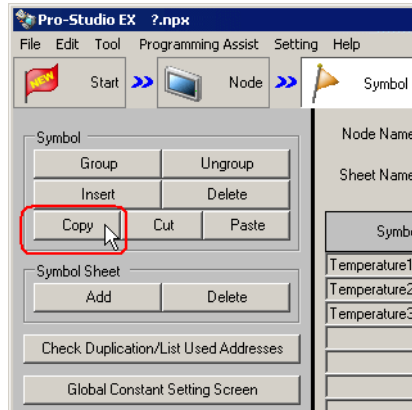


NOTE • To cancel the registration of the global symbol sheet, uncheck [Set it as a global symbol sheet].

- 1 Move the mouse pointer on the symbol sheet, and press the [Ctrl] and [A] keys to select the copy-source symbol sheet.

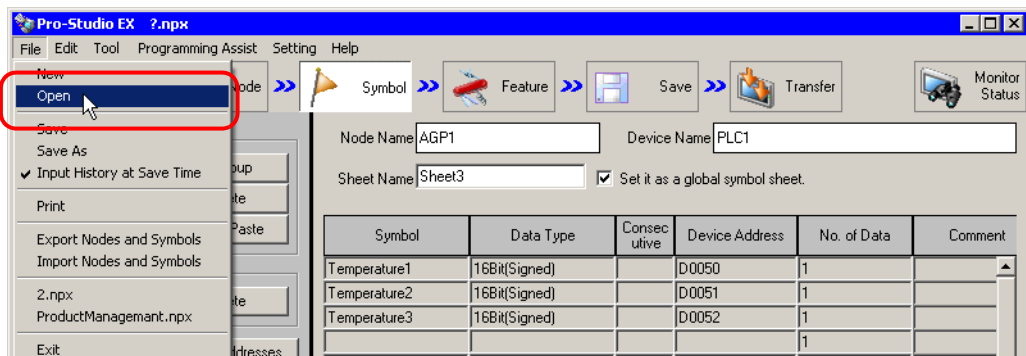


2 Click the [Copy] button in [Symbol].

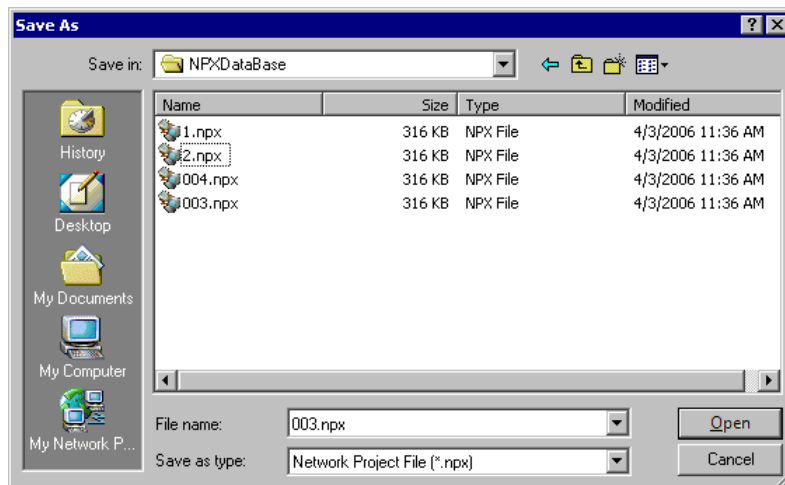


NOTE • You can also select it from the menu list displayed by right-clicking the mouse.

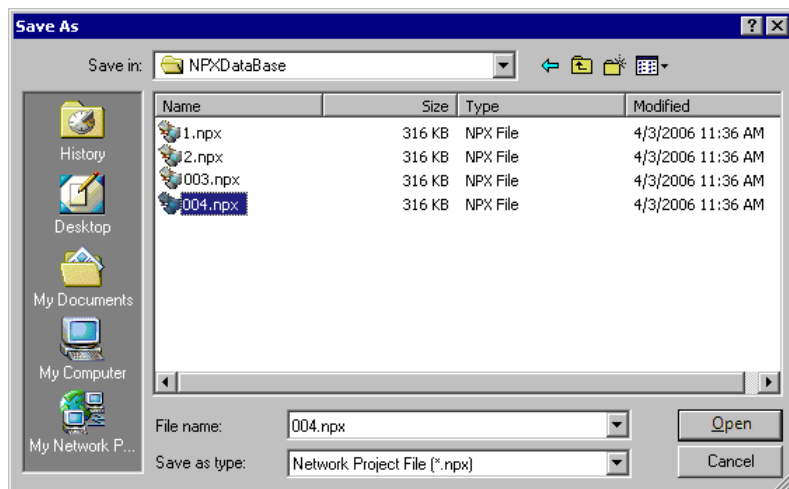
3 Select [Open] from [File] menu.



The "Open File" screen appears.

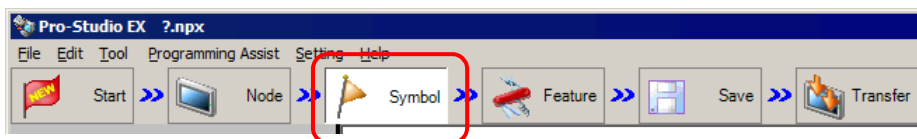


- 4 Select a copy-destination network project file, and click the [Open] button.

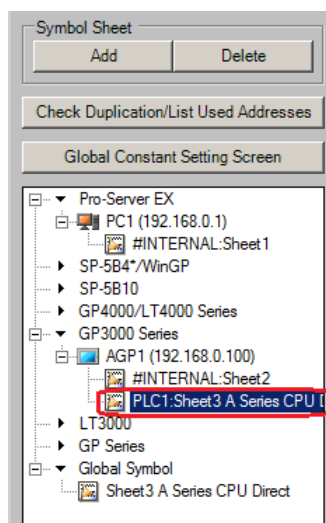


The selected network project file opens.

- 5 Click [Symbol] on the status bar.



- 6 Select the copy-destination symbol sheet.



[illegible]

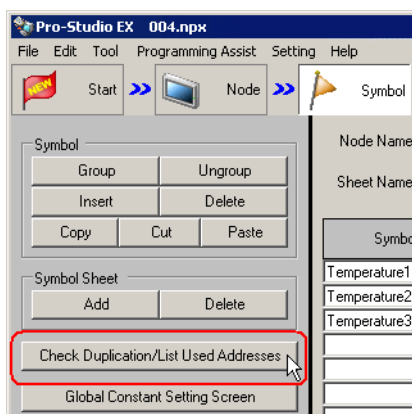
32.5 Checking Registered Symbols

When many symbols are registered in a symbol sheet, you might register the symbol names or device addresses mistakenly in duplication. In this case, 'Pro-Server EX' does not operate properly.

Thus 'Pro-Studio EX' has a function to check the registration duplication in advance. This function also displays/outputs the results of duplication check in a CSV file.

This section describes how to check duplication of symbol names or device addresses.

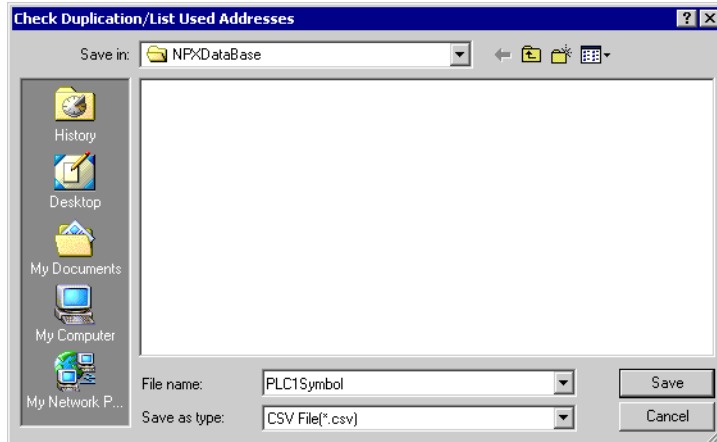
- 1 Display the symbol sheet you wish to check.
- 2 Click [Check Duplication/List Used Addresses] button.



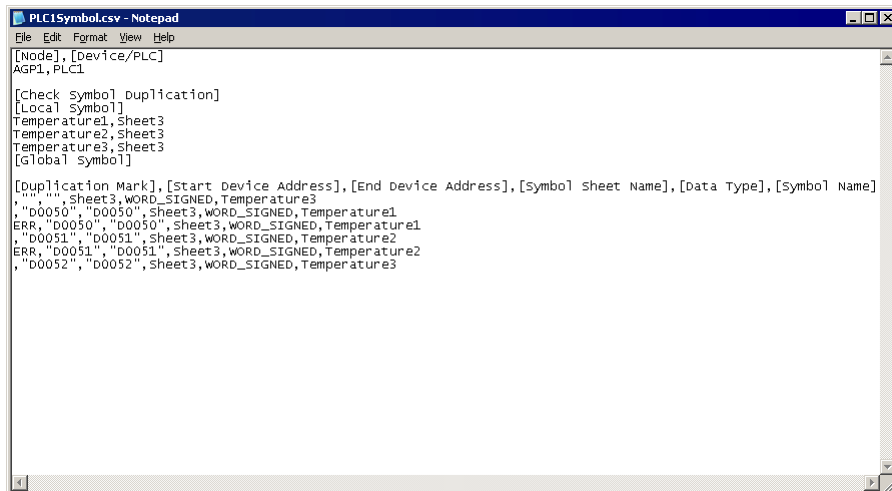
The "Check Duplication/List Used Addresses" screen appears.



3 Specify the storage location and enter the file name to which the results are output. Then click [Save] button.



The check results are now displayed and saved as a CSV file into the specified storage location.



The check results are output in the following format:

[Node Name] and [Device/PLC]

Displays the names of the entry node and Device/PLC having the symbol sheet that has been checked.

[Symbol Duplication Check]

Displays the overlapped symbol names.

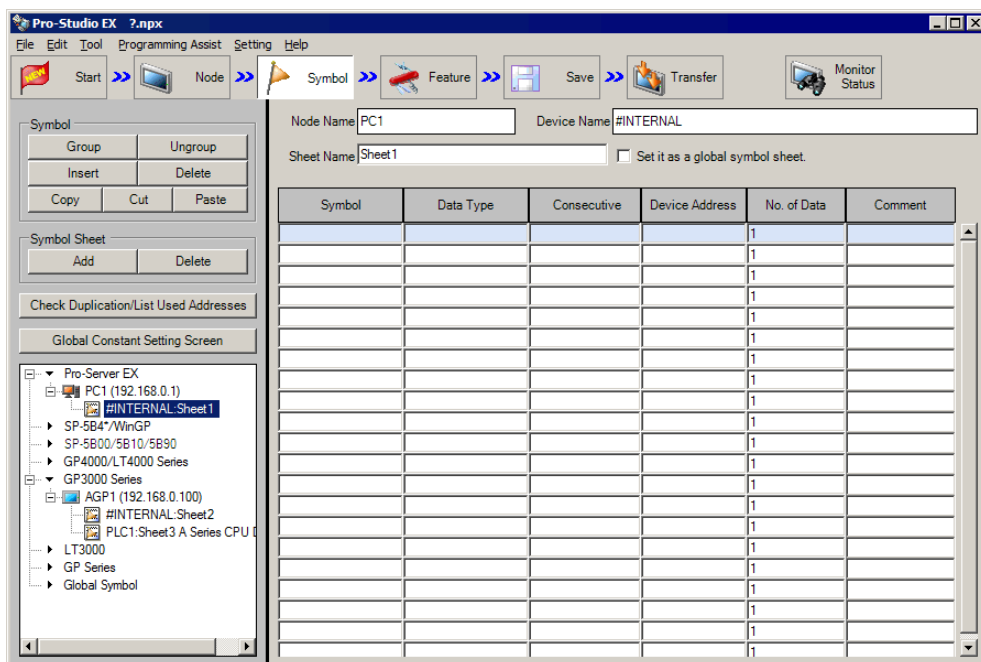
Will be blank if there is no name overlapped.

[Duplication Mark], [Start Address], [End Address], [Symbol Sheet Name], [Data Type] and [Symbol Name]

Symbol check data is displayed in the order above. The symbols are sorted by [Start Address]. The overlapped symbols are indicated in [Duplication Mark] as "ERR".

32.6 Setting Guide

32.6.1 Symbol Registration Screen



| Setting item | | Setting content |
|---------------------------------------|---------|--|
| Symbol | Group | Group registered symbols. Refer to "29.3 Grouping Symbols" for more details. |
| | Ungroup | Ungroup grouped symbols. |
| | Insert | Insert a row directly above a selected row on a symbol sheet. |
| | Delete | Delete selected rows on a symbol sheet. |
| | Copy | Copy selected rows on a symbol sheet. |
| | Cut | Cut selected rows on a symbol sheet. |
| | Paste | Paste to a symbol sheet the contents being copied or cut. When one row is selected, the copied or cut contents are inserted in the row directly above the specified row. When multiple rows are selected, the copied or cut contents are displaced with the selected cells deleted. |
| Symbol Sheet | Add | Add symbol sheets to the registered Device/PLCs. Clicking this button displays the "Add symbol sheet" dialog box. Specify [Node Name], [Device Name] and [Sheet Name]. |
| | Delete | Delete a specified symbol sheet. |
| Check Duplication/List Used Addresses | | Check duplication of symbol names and device addresses. Refer to "32.5 Checking Registered Symbols" for more details. |
| Global Constant Setting Screen | | Displays the "Global Constant Setting" screen. Refer to "32.6.3 Global Constant Setting" for more details. |

| Setting item | Setting content | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|---|-------------|----------------|-------------|----------------|-------------|--------------|---------------|--|-------|---|--------------|---------------|---|-------|---|--|--|--|--|---|--------|-----------|-------------|----------------|-------------|-------------|---------------|--|-------|---|------------|-----|----|----------|---|--|--|--|--|---|
| Node Name | Displays the node name holding the symbol sheet currently displayed. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Device Name | Displays the device name holding the symbol sheet currently displayed. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sheet Name | Displays the name of the symbol sheet currently displayed. You can change the sheet name. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Set it as a global symbol sheet | Regard the symbol sheet currently displayed as a global symbol sheet. Refer to "32.3 Sharing Symbols on the Entire Network" for more details. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Symbol | <p>Enter the symbol you wish to register.</p> <div>NOTE</div> <ul style="list-style-type: none">• Must be entered at maximum 32 Unicode characters.• Cannot begin with a number. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Data Type | <p>Select the type of the symbol to be registered. Clicking the [Data Type] field displays a data type list. The following data types are available.</p> <ul style="list-style-type: none">• Bit• 8 bits (Signed decimal, unsigned decimal, hexadecimal, BCD)• 16 bits (Signed decimal, unsigned decimal, hexadecimal, BCD)• 32 bits (Signed decimal, unsigned decimal, hexadecimal, BCD)• Single-precision floating point• Double-precision floating point• Character string• TIME• TIME_OF_DAY• DATE• DATE_AND_TIME <div>NOTE</div> <ul style="list-style-type: none">• You can set 8 bits, TIME, TIME_OF_DAY, or DATE when using tags.• When using a tag, when you select a [Device Address], the [Data Type] is automatically set.• When using a tag, you cannot specify the data type.• You cannot register text string tags as a symbol. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Consecutive | <p>Displays a continuous attribute panel if symbols have been already set. Select a sequential device address or offset of bit type. When a sequential device address is selected, "+" appears indicating the device continuance; when the offset is selected, offset value appears.</p> <ul style="list-style-type: none">• Sequential specification <table><tr><th>Symbol</th><th>Data Type</th><th>Consecutive</th><th>Device Address</th><th>No. of Data</th></tr><tr><td>Temperature1</td><td>16Bit(Signed)</td><td></td><td>D0050</td><td>1</td></tr><tr><td>Temperature2</td><td>16Bit(Signed)</td><td>+</td><td>D0051</td><td>1</td></tr><tr><td></td><td></td><td></td><td></td><td>1</td></tr></table> <ul style="list-style-type: none">• Offset specification <table><tr><th>Symbol</th><th>Data Type</th><th>Consecutive</th><th>Device Address</th><th>No. of Data</th></tr><tr><td>LineA_Error</td><td>16Bit(Signed)</td><td></td><td>D0050</td><td>1</td></tr><tr><td>SpeedError</td><td>Bit</td><td>01</td><td>D0050.01</td><td>1</td></tr><tr><td></td><td></td><td></td><td></td><td>1</td></tr></table> | Symbol | Data Type | Consecutive | Device Address | No. of Data | Temperature1 | 16Bit(Signed) | | D0050 | 1 | Temperature2 | 16Bit(Signed) | + | D0051 | 1 | | | | | 1 | Symbol | Data Type | Consecutive | Device Address | No. of Data | LineA_Error | 16Bit(Signed) | | D0050 | 1 | SpeedError | Bit | 01 | D0050.01 | 1 | | | | | 1 |
| Symbol | Data Type | Consecutive | Device Address | No. of Data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Temperature1 | 16Bit(Signed) | | D0050 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Temperature2 | 16Bit(Signed) | + | D0051 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Symbol | Data Type | Consecutive | Device Address | No. of Data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LineA_Error | 16Bit(Signed) | | D0050 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SpeedError | Bit | 01 | D0050.01 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Setting item | Setting content |
|----------------|---|
| Device Address | Specify the start address of the device to be specified as a symbol. When [Consecutive] is selected, the address is automatically displayed. |
| No. of Data | <p>Specify the number of devices to be specified as symbols. (The default value is "1".)</p> <p>You can enter the preset global constant by clicking the list button. Refer to "32.6.3 Global Constant Setting" about global constants.</p> <div>NOTE</div> <ul style="list-style-type: none">You can set the number of data up to 2040. |
| Comment | You can enter necessary information like the meanings of symbols as comments, if any. |

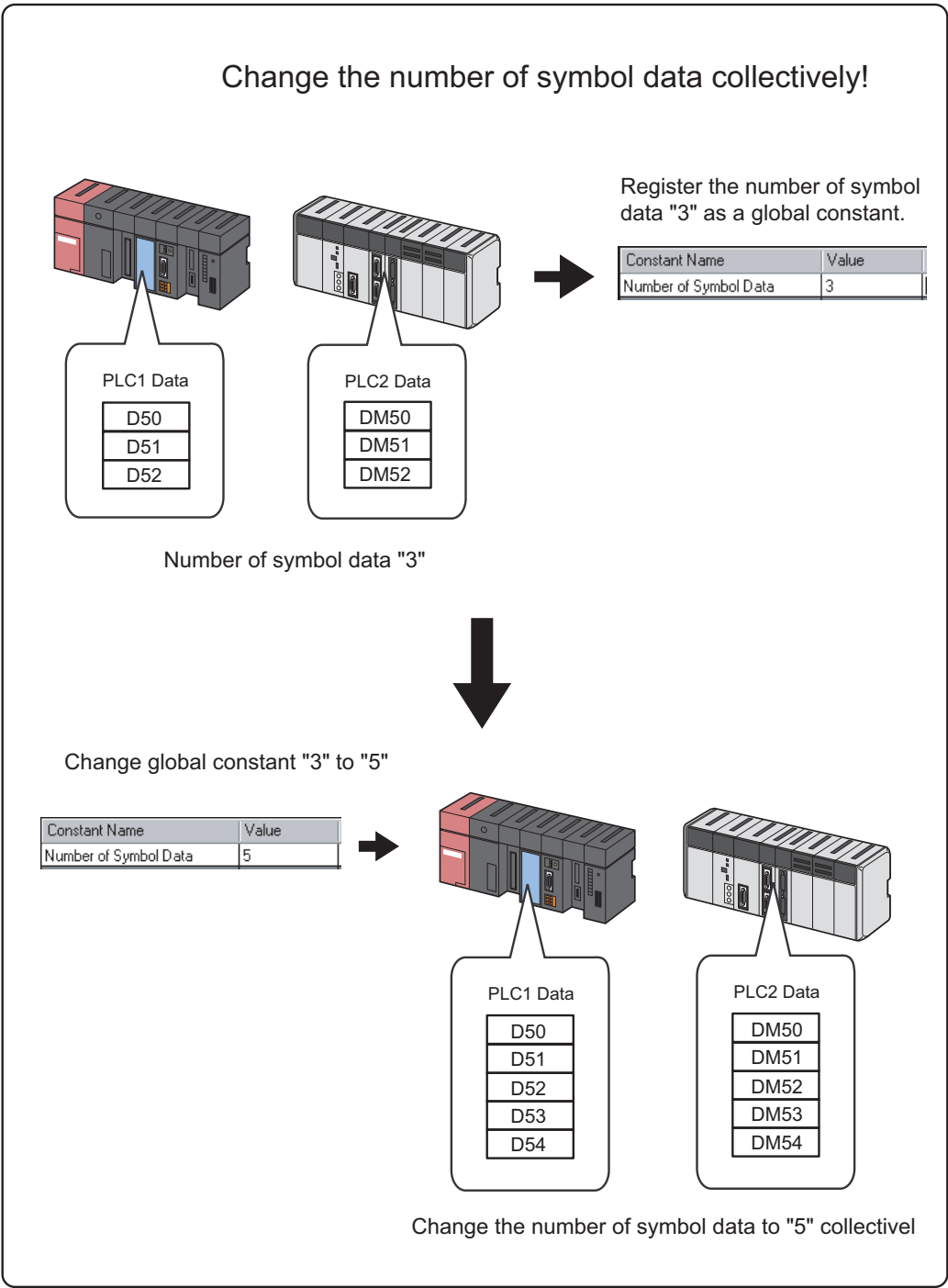
32.6.2 "Edit Symbol" Screen

| Setting item | Setting content |
|-------------------|---|
| Symbol Name | <p>Enter the symbol name you wish to register.</p> <p>NOTE</p> <ul style="list-style-type: none"> • Must be entered at maximum 32 Unicode characters. • Cannot begin with a number. |
| Symbolize Address | <p>Input a symbol name automatically from the device address and data type. A symbol name is to be input as follows: Ex.) In the case of the device address "D50" and the data type "Word": _D50_WORD</p> |
| Address | Enter the (start) device address. |
| Data Type | <p>Select the data type of device: If [8 bits],[16 bits] or [32 bits] is selected, specify the attribute: [Signed Decimal], [Unsigned Decimal], [Hexadecimal], [BCD].</p> <p>NOTE</p> <ul style="list-style-type: none"> • You can set 8 bits, TIME, TIME_OF_DAY, or DATE when using tags. • When using a tag, when you select a [Device Address], the [Data Type] is automatically set. • When using a tag, you cannot specify the data type. • You cannot register text string tags as a symbol. |
| Consecutive | Check this if the device addresses are sequential. |
| Offset | <p>Select an offset value by clicking the list button. 16 bits: from 0 to 15 32 bits: from 0 to 31</p> |
| No. | <p>Specify the number of devices to be specified as symbols. (The default value is "1".) You can enter the preset global constant by clicking the list button. Refer to "32.6.3 Global Constant Setting" about global constants.</p> <p>NOTE</p> <ul style="list-style-type: none"> • You can set the number up to 2040. |

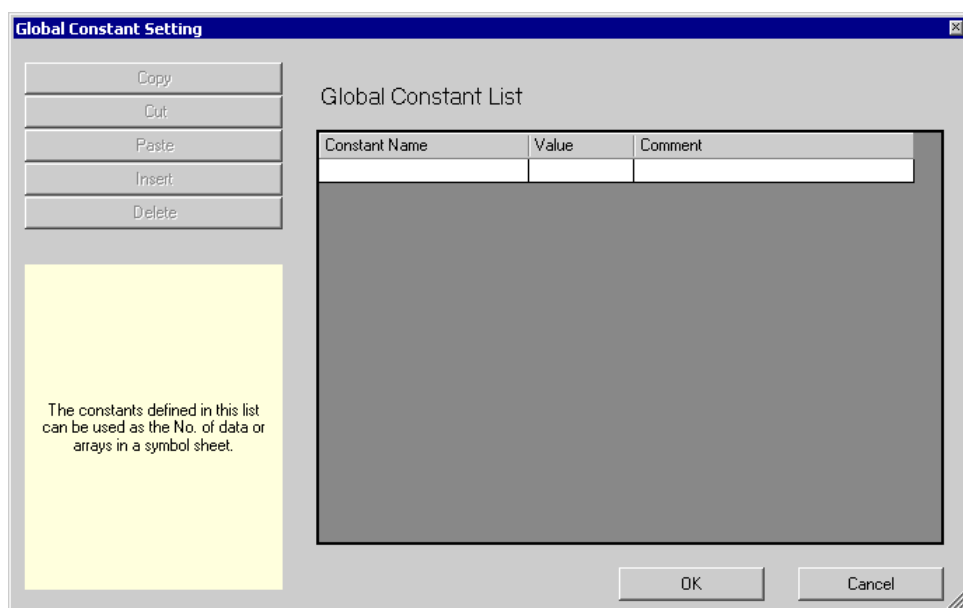
| Setting item | Setting content |
|----------------------|---|
| < | Displays the symbol setting of the upper row. |
| > | Displays the symbol setting of the lower row. |
| Continuous Insertion | <p>Set the sequential device address or offset address-added symbol in the next row of the symbol sheet with the current set contents.</p> <div>NOTE</div> <ul style="list-style-type: none">• When the symbol name is specified in [Symbolization of Address], the values following the device address and data type are automatically changed.• "+" appears in the [Consecutive] field on the symbol sheet. |

32.6.3 Global Constant Setting

By registering the data number of symbols as a "Global constant", you can change all the data numbers at once by changing the constant when such a change has been made to the system as changing a symbol data number.



To set a global constant, click the [Global Constant Setting Screen] button on the symbol registration screen.



| Setting item | Setting content |
|---------------|---|
| Constant Name | Enter the name of the constant to be set. |
| Value | Enter a constant. <div>NOTE</div> <ul style="list-style-type: none"> The valid values range from 1 to 4096. |
| Comment | You can enter necessary information like the meanings of constants as comments, if any. |
| Copy | Copy the global constant in a selected row. |
| Cut | Cut the global constant in a selected row. |
| Paste | Insert a copied or cut global constant to the row directly above a selected one. |
| Insert | Insert a row directly above a selected row on a symbol sheet. |
| Delete | Delete a selected row. |

32.7 Restrictions

■ Symbol whose data type is undefined

When you import a screen project file of 'GP-Pro EX' or 'GP-PRO/PBIII for Windows', the word symbols in the project file are to be imported as an undefined data type of symbol.

- Use with 'Pro-Studio EX'

To use an undefined data type of symbol with 'Pro-Studio EX', you are requested to input the data type. (When you use a defined symbol, data type entry is not available.)

- Use with Pro-Server API

There are 2 types of Pro-Server API: API requiring separate specification of data type and that requiring no specification.

| API type | Description |
|-----------------------------|---|
| With separate specification | This API prioritizes the data type separately specified over the symbol data type. |
| Without specification | When the specified symbol is a 16-bit device, the symbol becomes 16-bit signed; when the specified symbol is a 32-bit device, it becomes 32-bit signed. |

- When MES ACTION is specified

If you select a symbol where the data type is undefined when MES ACTION is specified, the data type and the number of data are fixed to [16Bit(Signed)] and [No.: 1], respectively.

■ Maximum number of data

The following table shows the maximum number of data settable according to the symbol type.

| Symbol type | No. of data |
|--|-------------|
| Bit symbol | 255 |
| Bit offset symbol | 1 |
| 8-bit signed symbol | 1020 |
| 8-bit unsigned symbol | 1020 |
| 8-bit BCD symbol | 1020 |
| 8-bit HEX symbol | 1020 |
| 16-bit signed symbol | 1020 |
| 16-bit unsigned symbol | 1020 |
| 16-bit BCD symbol | 1020 |
| 16-bit HEX symbol | 1020 |
| 32-bit signed symbol | 510 |
| 32-bit unsigned symbol | 510 |
| 32-bit BCD symbol | 510 |
| 32-bit HEX symbol | 510 |
| Single-precision floating point symbol | 510 |
| Double-precision floating point symbol | 255 |
| Character string symbol | 255 |
| TIME | 510 |
| TIME_OF_DAY | 510 |
| DATE | 510 |
| DATE_AND_TIME | 255 |
| (Data type is "Undefined") | 1 |

■ Symbol whose data number is undefined

The data number of the following symbols is regarded as "Undefined".

- Symbols created by importing a screen project file of 'GP-Pro EX' or 'GP-PRO/PBIII for Windows'.
- Symbols created by converting a network project file made by the old version of 'Pro-Server'.
- Symbols whose data number has not been specified in the symbol setting.

- Use with 'Pro-Studio EX'

To use an undefined data type of symbol with 'Pro-Studio EX', you are requested to input the data type. (When you use a defined symbol, data type entry is not available.)

- Use with Pro-Server EX API

Such symbols are regarded as a symbol of which data number is "1".

■ About the system variables of "GP-Pro EX"

The device quantity of one system variable of 'GP-Pro EX' basically as 1 is handled even with 'Pro-Server EX', but "#L_IOInfo" and "#L_IOStatus" is handled as 4.

■ Global Symbol Sheets Settings

If you specify any of the following protocol devices in a global symbol sheet, the project file specified on the entry nodes setting screen for the node must meet the requirements below:

- Manufacture: Rockwell Automation, Inc
- Device Type: EtherNet/IP
- Device Setting: ControlLogix/CompactLogix Series Native

*Requirements

The same IOI file (Data tag definition file) must be set for both the node where the global symbol sheet is specified and the node that references that global symbol sheet. You specify the IOI file in the 'GP-Pro EX' Device/PLC setting.

33



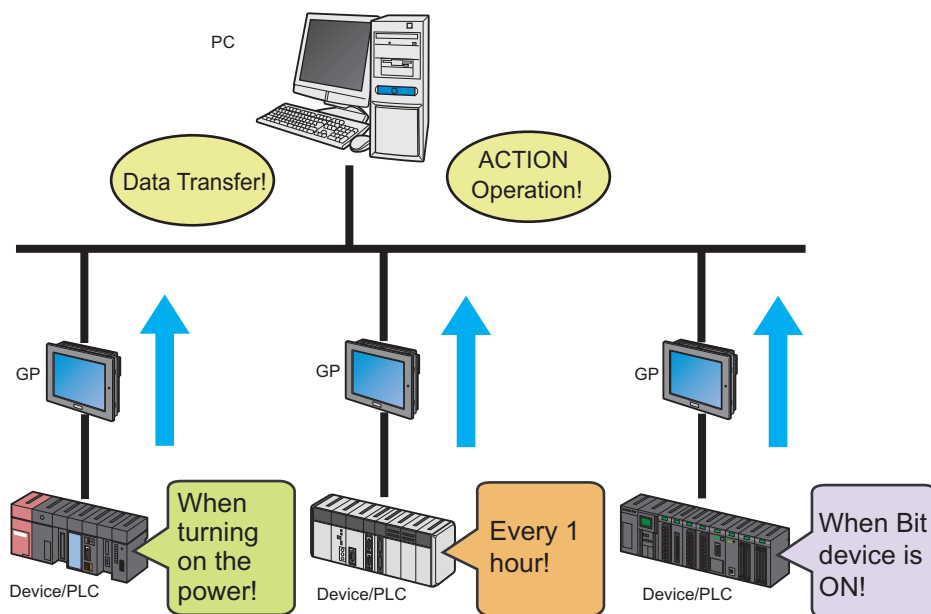
Trigger Conditions

| | | |
|------|--|-------|
| 33.1 | What is a Trigger Condition? | 33-2 |
| 33.2 | Editing Trigger Conditions | 33-38 |
| 33.3 | Deleting Trigger Conditions | 33-40 |
| 33.4 | Sequential Execution of Multiple Data Transfers and ACTIONS with One Trigger Condition | 33-41 |
| 33.5 | Executing ACTION under Multiple Trigger Conditions | 33-51 |

33.1 What is a Trigger Condition?

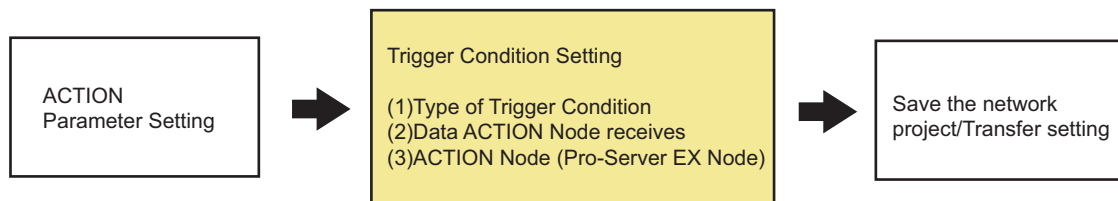
'Pro-Server EX' performs many operations such as data transfer and ACTION at various timings and cycles. This timing or cycle is called as a "Trigger condition".

You can set multiple trigger conditions at one time, set new conditions and use them in combination with the existing ones.

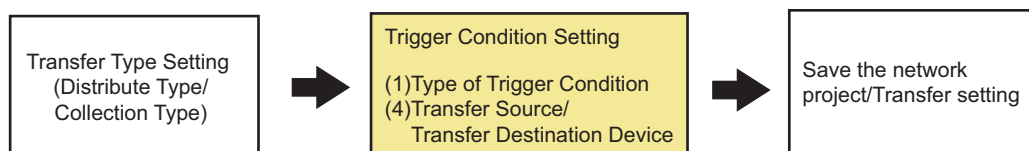


The set contents of "Trigger conditions" to be specified on 'Pro-Server EX' are as follows:

< For data transfer >




< For ACTION >



■ Types of trigger conditions

Specify the timing or cycle for data transfer and ACTION execution.

Trigger conditions are available of 12 types for 'Pro-Server EX' (8 types for GP Series).

 "33.1.1 Types of Trigger Conditions"

■ Data received by ACTION (ACTION)

Specify the device data or fixed number received from the transfer source when the trigger conditions become effective.

 "33.1.2 Data Received by ACTION"


■ Action operating node/Implementation notice (ACTION)

Specify the entry node operating the specified ACTION (normally a personal computer). When the ACTION is implemented, moreover, it is possible to notify the ACTION implementation by setting the notified destination (Bit on).

 "33.1.3 ACTION Nodes"

■ Device of Transfer source/Transfer destination (Data transfer)

Specify the device of the data transfer source and destination when the trigger conditions become effective.

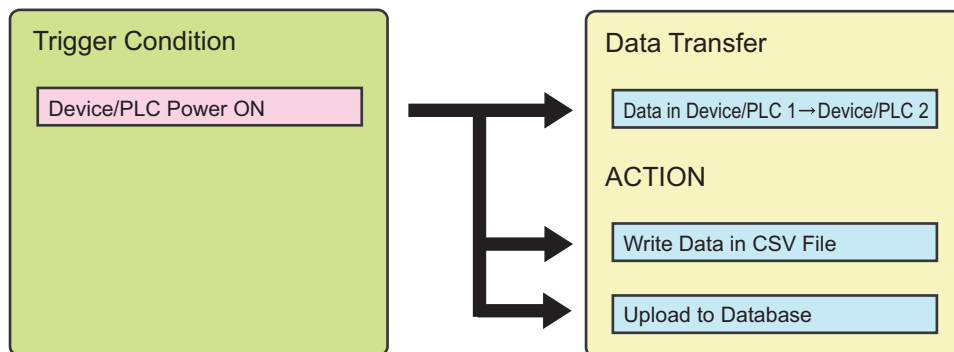
 "19.1.1 Distributing Data"

 "19.1.2 Collecting Data"

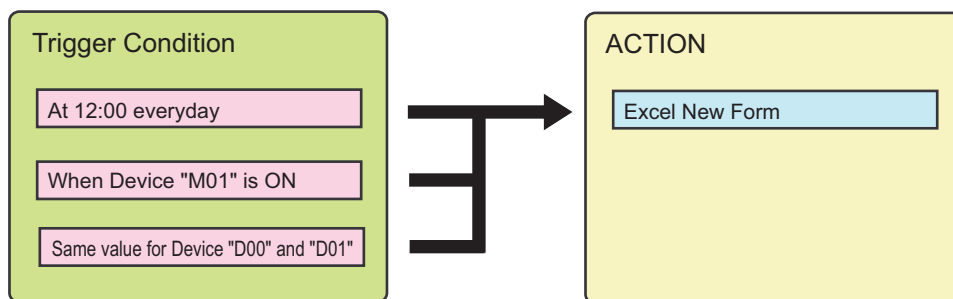
Normally, trigger conditions are to be set in the process of setting data transfer and ACTION, but you can set the trigger conditions separately for the ACTION and data transfer setting. In addition, it is possible to register multiple trigger conditions, change these conditions (See the next step.) and use them in combination with other conditions.

As a result, one trigger condition allows multiple data transfer and multiple ACTION execution, and multiple trigger conditions perform one ACTION execution easily.

Execute Multiple Data Transfer by One Trigger Condition/ACTION



Execute One ACTION by Multiple Trigger Conditions



NOTE • As for the data transfer, specification of multiple trigger conditions is not available.

33.1.1 Types of Trigger Conditions

On 'Pro-Studio EX', you can specify the following trigger conditions:

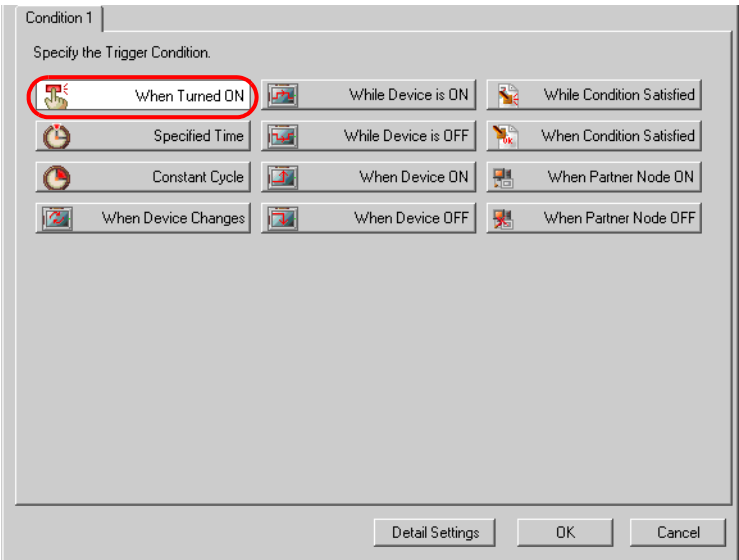
| Trigger condition | Description |
|--|--|
| Power ON | Provides only once when the power of provider node is turned ON. |
| ON Time | Provides only once at the specified time. |
| Constant Cycle | Provides at the specified cycle. |
| At Device Change | Provides when the device data of the specified symbol is changed. |
| While Device On/Off | Provides while the device of the specified symbol is On or Off. You can also specify the execution timing and check cycle. |
| At Device On/Off | Provides when the device of the specified symbol turns On or Off. You can also specify the execution timing and check cycle. |
| While/When conditional expression satisfied (Excluding the case that the node is GP Series) | Provides while the conditional expression that has been specified is satisfied between 2 devices. (Ex.: Device A and B have the same data value.) You can also specify the execution timing and check cycle. |
| When partner node turned On/Off (Excluding the case that the node is GP Series) | Provides only once when the specified partner node is turned On or Off. |

■ Power ON

Provides only once when the power of provider node is turned ON.

NOTE

- Provides also when:
 - 'Pro-Server EX' is executed and loaded;
 - A network project file is reloaded; and
 - The provider is changed to online mode from offline mode.



| Setting item | Setting content |
|---------------------------|--|
| No items to be specified. | |
| Detail Settings | The "Set Trigger Condition Details" screen appears. Specify the methods of completion notification and communication. Refer to "◆ "Set Trigger Condition Details" Screen" for more details. |

■ ON Time

Provides only once at the specified time.

Condition 1

Specify the Trigger Condition.

When Turned ON While Device is ON While Condition Satisfied

Specified Time While Device is OFF When Condition Satisfied

Constant Cycle When Device ON When Partner Node ON

When Device Changes When Device OFF When Partner Node OFF

Specified Time 0 hour 0 min

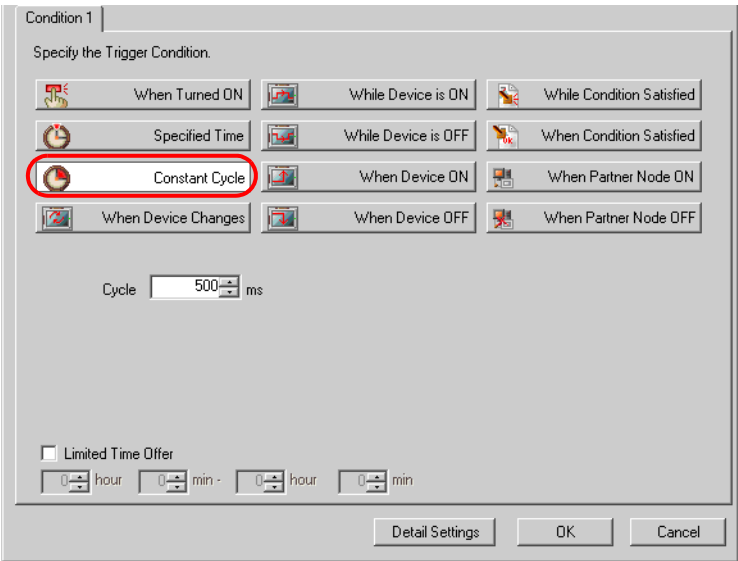
Detail Settings OK Cancel

| Setting item | Setting content |
|-----------------|--|
| Specified Time | Specify the executing timing. |
| Detail Settings | The "Set Trigger Condition Details" screen appears. Specify the methods of completion notification and communication. Refer to "◆ "Set Trigger Condition Details" Screen" for more details. |

■ Constant Cycle

Provides at the specified cycle.

You can also specify the period for execution.





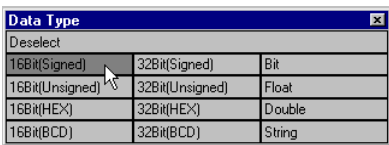
| Setting item | Setting content |
|--------------------|--|
| Cycle | Enter the providing cycle (ms). You can specify the cycle in the range from 0 to 86400000 (24 hours). |
| Limited Time Offer | If you wish to limit the period, check this and specify the period (hr/min). |
| Detail Settings | The "Set Trigger Condition Details" screen appears. Specify the methods of completion notification and communication. Refer to "◆ "Set Trigger Condition Details" Screen" for more details. |

■ At Device Change

Provides when the device data of the specified symbol is changed.

You can also specify the execution timing and check cycle.



| Setting item | Setting content |
|----------------|--|
| Device Name | Select the device name having the subjected device. |
| Device Address | <p>Sets the device address or symbol to be used.</p> <ul style="list-style-type: none"> When specifying a device address: Enter directly from the Calculator icon. <p style="text-align: center;">  </p> <ul style="list-style-type: none"> When specifying a symbol: Select the symbol by clicking the list button. <p style="text-align: center;">  </p> |

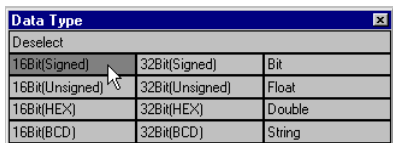
| Setting item | Setting content |
|--------------------|---|
| Data Type | <ul style="list-style-type: none"> When specifying a device address: Specify the data type.  <ul style="list-style-type: none"> When specifying a symbol or tag: Data type automatically appears. <p>NOTE</p> <ul style="list-style-type: none"> You can set up 8 bit, TIME, TIME_OF_DAY, or DATE when using tag. Set up is not possible when the trigger condition is set up with a DATE_AND_TIME device. |
| Limited Time Offer | If you wish to limit the period, check this and specify the period (hr/min). |
| Check Cycle | <p>Specify the cycle to check change of the device data (ms). You can specify the cycle in the range from 0 to 86400000 (24 hours). For constant check, check [Always].</p> <p>NOTE</p> <ul style="list-style-type: none"> When there are many trigger conditions, of which check cycle is specified as [Always], in one node, entire system performance may drop down. |
| Detail Settings | <p>The "Set Trigger Condition Details" screen appears. Specify the methods of completion notification and communication. Refer to "◆ "Set Trigger Condition Details" Screen" for more details.</p> |

■ While Device On

Provides while the device of the specified symbol is On.

You can also specify the execution timing and check cycle.

| Setting item | Setting content |
|----------------|--|
| Device Name | Select the device name having the subjected device. |
| Device Address | <p>Sets the device address or symbol to be used.</p> <ul style="list-style-type: none"> When specifying a device address: Enter directly from the Calculator icon. <p style="text-align: center;">Calculator icon</p>  <ul style="list-style-type: none"> When specifying a symbol: Select the symbol by clicking the list button. <p style="text-align: center;">List button</p>  |

| Setting item | Setting content |
|--------------------|--|
| Data Type | <ul style="list-style-type: none">When specifying a device address: Specify the data type. <div></div> <ul style="list-style-type: none">When specifying a symbol or tag: Data type automatically appears. <div><div>NOTE</div><ul style="list-style-type: none">You can set up 8 bit, TIME, TIME_OF_DAY, or DATE when using tag.Set up is not possible when the trigger condition is set up with a DATE_AND_TIME device.</div> |
| Limited Time Offer | If you wish to limit the period, check this and specify the period (hr/min). |
| Check Cycle | <p>Specify the cycle to check change of the device data (ms). You can specify the cycle in the range from 0 to 86400000 (24 hours). For constant check, check [Always].</p> <div><div>NOTE</div><ul style="list-style-type: none">When there are many trigger conditions, of which check cycle is specified as [Always], in one node, entire system performance may drop down.</div> |
| Detail Settings | <p>The "Set Trigger Condition Details" screen appears. Specify the methods of completion notification and communication. Refer to "◆ "Set Trigger Condition Details" Screen" for more details.</p> |

■ While Device OFF

Provides while the device of the specified symbol is Off.

You can also specify the execution timing and check cycle.

Condition 1

Specify the Trigger Condition.

When Turned ON While Device is ON While Condition Satisfied

Specified Time **While Device is OFF** When Condition Satisfied

Constant Cycle When Device ON When Partner Node ON

When Device Changes When Device OFF When Partner Node OFF

Device Name: #INTERNAL



Device Address: [Calculator icon]

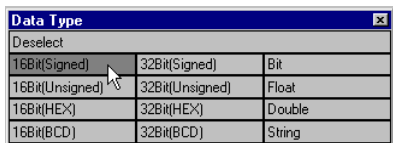
Data Type: 16Bit(Signed)

☐ Limited Time Offer Check Cycle: ☐ Always

0 hour 0 min 0 hour 0 min 500 ms

Detail Settings OK Cancel



| Setting item | Setting content |
|----------------|--|
| Device Name | Select the device name having the subjected device. |
| Device Address | <p>Sets the device address or symbol to be used.</p> <ul style="list-style-type: none"> When specifying a device address: Enter directly from the Calculator icon. <p>Calculator icon</p>  <ul style="list-style-type: none"> When specifying a symbol: Select the symbol by clicking the list button. <p>List button</p>  |

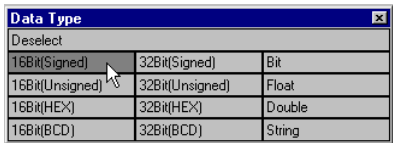
| Setting item | Setting content |
|--------------------|---|
| Data Type | <ul style="list-style-type: none"> When specifying a device address: Specify the data type.  <ul style="list-style-type: none"> When specifying a symbol or tag: Data type automatically appears. <p>NOTE</p> <ul style="list-style-type: none"> You can set up 8 bit, TIME, TIME_OF_DAY, or DATE when using tag. Set up is not possible when the trigger condition is set up with a DATE_AND_TIME device. |
| Limited Time Offer | If you wish to limit the period, check this and specify the period (hr/min). |
| Check Cycle | <p>Specify the cycle to check change of the device data (ms). You can specify the cycle in the range from 0 to 86400000 (24 hours). For constant check, check [Always].</p> <p>NOTE</p> <ul style="list-style-type: none"> When there are many trigger conditions, of which check cycle is specified as [Always], in one node, entire system performance may drop down. |
| Detail Settings | <p>The "Set Trigger Condition Details" screen appears. Specify the methods of completion notification and communication. Refer to "◆ "Set Trigger Condition Details" Screen" for more details.</p> |

■ At Device On

Provides when the device of the specified symbol turns On.

You can also specify the execution timing and check cycle.

| Setting item | Setting content |
|----------------|--|
| Device Name | Select the device name having the subjected device. |
| Device Address | <p>Specify the subjected device address or symbol.</p> <ul style="list-style-type: none"> When specifying a device address: Enter directly from the Calculator icon. <p>Calculator icon</p>  <ul style="list-style-type: none"> When specifying a symbol: Select the symbol by clicking the list button. <p>List button</p>  |

| Setting item | Setting content |
|---|---|
| Data Type | <ul style="list-style-type: none"> When specifying a device address: Specify the data type.  <ul style="list-style-type: none"> When specifying a symbol or tag: Data type automatically appears. <p>NOTE</p> <ul style="list-style-type: none"> You can set up 8 bit, TIME, TIME_OF_DAY, or DATE when using tag. Set up is not possible when the trigger condition is set up with a DATE_AND_TIME device. |
| Turn OFF the Specified Device Address after Processing. | Check this to turn off the subjected device or symbol after processing. |
| Limited Time Offer | Check this and specify the period (hr/min) to limit the period. |
| Check Cycle | <p>Specify the cycle to check change of the device data (ms). You can specify the cycle in the range from 0 to 86400000 (24 hours). For constant check, check [Always].</p> <p>NOTE</p> <ul style="list-style-type: none"> When there are many trigger conditions, of which check cycle is specified as [Always], in one node, entire system performance may drop down. |
| Detail Settings | <p>The "Set Trigger Condition Details" screen appears. Specify the methods of completion notification and communication. Refer to "◆ "Set Trigger Condition Details" Screen" for more details.</p> |

■ At Device OFF

Provides when the device of the specified symbol turns Off.

You can also specify the execution timing and check cycle.

Condition 1

Specify the Trigger Condition.

When Turned ON While Device is ON While Condition Satisfied

Specified Time While Device is OFF When Condition Satisfied

Constant Cycle When Device ON When Partner Node ON

When Device Changes **When Device OFF** When Partner Node OFF

Device Name: #INTERNAL

Device Address: [Calculator icon]



Data Type: 16Bit(Signed)

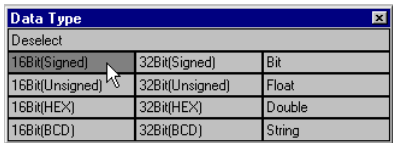
☐ Limited Time Offer

hour min hour min

Check Cycle: ☐ Always 500 ms

Detail Settings OK Cancel



| Setting item | Setting content |
|----------------|--|
| Device Name | Select the device name having the subjected device. |
| Device Address | <p>Specify the subjected device address or symbol.</p> <ul style="list-style-type: none"> When specifying a device address: Enter directly from the Calculator icon. <p>Calculator icon</p>  <ul style="list-style-type: none"> When specifying a symbol: Select the symbol by clicking the list button. <p>List button</p>  |

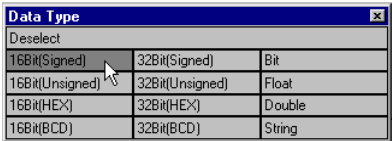
| Setting item | Setting content |
|--|---|
| Data Type | <ul style="list-style-type: none"> When specifying a device address: Specify the data type.  <ul style="list-style-type: none"> When specifying a symbol or tag: Data type automatically appears. <p>NOTE</p> <ul style="list-style-type: none"> You can set up 8 bit, TIME, TIME_OF_DAY, or DATE when using tag. Set up is not possible when the trigger condition is set up with a DATE_AND_TIME device. |
| Turn ON the Specified Device Address after Processing. | Check this to turn on the subjected device or symbol after processing. |
| Limited Time Offer | To limit the period, check this and specify the period (hr/min.). |
| Check Cycle | <p>Specify the cycle to check change of the device data (ms). You can specify the cycle in the range from 0 to 86400000 (24 hours). For constant check, check [Always].</p> <p>NOTE</p> <ul style="list-style-type: none"> When there are many trigger conditions, of which check cycle is specified as [Always], in one node, entire system performance may drop down. |
| Detail Settings | <p>The "Set Trigger Condition Details" screen appears. Specify the methods of completion notification and communication.</p> <p>Refer to "◆ "Set Trigger Condition Details" Screen" for more details.</p> |

■ While conditional expression satisfied (excluding the case that the node is GP Series)

Provides while the conditional expression that has been specified is satisfied between 2 devices. (Ex.: Device A and B have the same data value.)

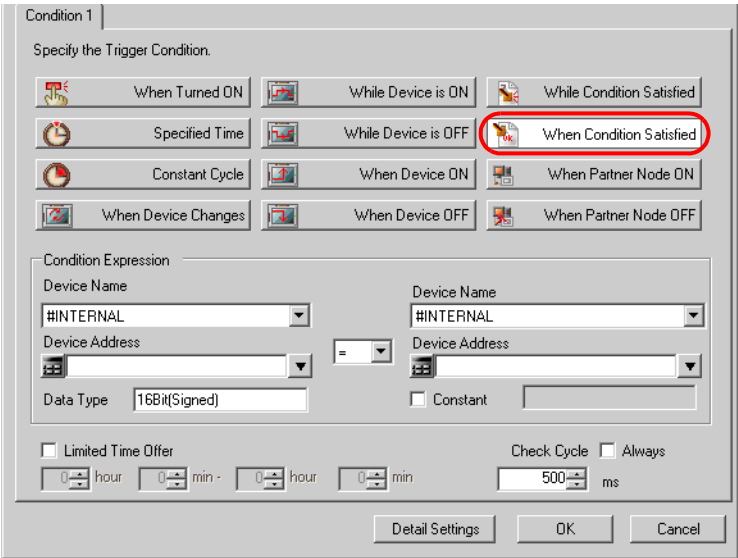
You can also specify the execution timing and check cycle.



| Setting item | | Setting content |
|----------------------|----------------|--|
| Condition Expression | Device Name | Select the device name having the subjected device. |
| | Device Address | <p>Specify the subjected device address or symbol.</p> <ul style="list-style-type: none"> When specifying a device address: Enter directly from the Calculator icon. <div style="text-align: center;">  </div> <ul style="list-style-type: none"> When specifying a symbol: Select the symbol by clicking the list button. <div style="text-align: center;">  </div> |

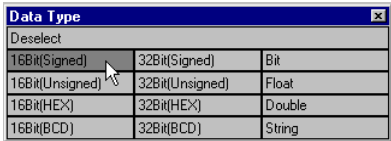
| Setting item | | Setting content |
|----------------------|-------------------|--|
| Condition Expression | Data Type | <ul style="list-style-type: none"> When specifying a device address: Specify the data type.  <ul style="list-style-type: none"> When specifying a symbol or tag: Data type automatically appears. <p>NOTE</p> <ul style="list-style-type: none"> When the data type is "Character String", the character string to be compared is 1 character. You can set up 8 bit, TIME, TIME_OF_DAY, or DATE when using tag. Set up is not possible when the trigger condition is set up with a DATE_AND_TIME device. |
| | Constant | To set a constant in the trigger condition, check this and specify the value. |
| | Expression Symbol | Select the symbols of the specified conditional expression. You can select "=", "<=", ">=", "<", ">" or "<>". |
| Limited Time Offer | | To limit the period, check this and specify the period (hr/min.). |
| Check Cycle | | <p>Specify the cycle to check change of the device data (ms). You can specify the cycle in the range from 0 to 86400000 (24 hours). For constant check, check [Always].</p> <p>NOTE</p> <ul style="list-style-type: none"> When there are many trigger conditions, of which check cycle is specified as [Always], in one node, entire system performance may drop down. |
| Detail Settings | | <p>The "Set Trigger Condition Details" screen appears. Specify the methods of completion notification and communication.</p> <p>Refer to "◆ "Set Trigger Condition Details" Screen" for more details.</p> |

■ When conditional expression satisfied (excluding the case that the node is GP Series)

Provides when the conditional expression that has been specified is satisfied between 2 devices.
You can also specify the execution timing and check cycle.



| Setting item | | Setting content |
|----------------------|----------------|---|
| Condition Expression | Device Name | Select the device name having the subjected device. |
| | Device Address | <div>Specify the subjected device address or symbol.</div> <div><ul style="list-style-type: none">When specifying a device address: Enter directly from the Calculator icon.<div>Calculator icon</div><div></div> <ul style="list-style-type: none">When specifying a symbol: Select the symbol by clicking the list button.<div>List button</div><div></div></div> |

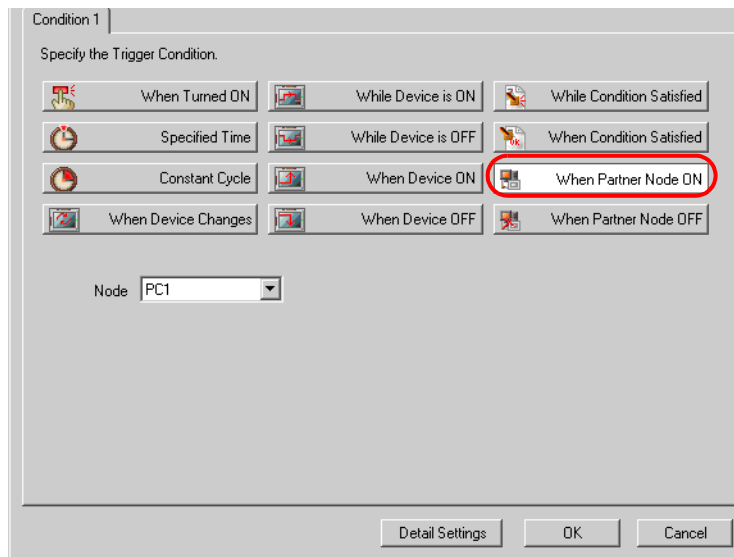
| Setting item | | Setting content |
|----------------------|-------------------|---|
| Condition Expression | Data Type | <ul style="list-style-type: none"> When specifying a device address: Specify the data type.  <ul style="list-style-type: none"> When specifying a symbol or tag: Data type automatically appears. <div style="border: 1px solid black; padding: 2px; margin: 10px 0;">NOTE</div> <ul style="list-style-type: none"> When the data type is "Character String", the character string to be compared is 1 character. You can set up 8 bit, TIME, TIME_OF_DAY, or DATE when using tag. Set up is not possible when the trigger condition is set up with a DATE_AND_TIME device. |
| | Constant | To set a constant in the trigger condition, check this and specify the value. |
| | Expression Symbol | Select the symbols of the specified conditional expression. You can select "=", "<=", ">=", "<", ">" or "<>". |
| Limited Time Offer | | To limit the period, check this and specify the period (hr/min.). |
| Check Cycle | | <p>Specify the cycle to check change of the device data (ms). You can specify the cycle in the range from 0 to 86400000 (24 hours). For constant check, check [Always].</p> <div style="border: 1px solid black; padding: 2px; margin: 10px 0;">NOTE</div> <ul style="list-style-type: none"> When there are many trigger conditions, of which check cycle is specified as [Always], in one node, entire system performance may drop down. |
| Detail Settings | | <p>The "Set Trigger Condition Details" screen appears. Specify the methods of completion notification and communication.</p> <p>Refer to "◆ "Set Trigger Condition Details" Screen" for more details.</p> |

■ When partner node turned On (excluding the case that the node is GP Series)

Runs one time after the specified partner node turns on and communication is established. Also, runs one time after the provider restarts, or when communication is re-established after being disconnected.

NOTE

- When the partner node turns on, a time lag may cause a slight delay in operations.

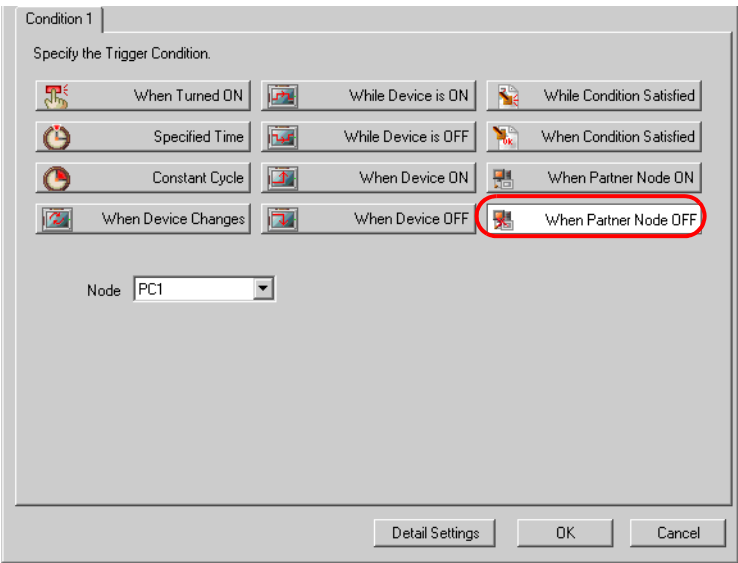


| Setting item | Setting content |
|-----------------|--|
| Node | Select the name of the subjected node. |
| Detail Settings | The "Set Trigger Condition Details" screen appears. Specify the methods of completion notification and communication. Refer to "◆ "Set Trigger Condition Details" Screen" for more details. |

■ When partner node turned Off (excluding the case that the node is GP Series)

Runs one time when the specified partner node turns off, or when communication with the partner node is disconnected.

NOTE • When the partner node turns off, a time lag may cause a slight delay in operations.



| Setting item | Setting content |
|-----------------|--|
| Node | Select the name of the subjected node. |
| Detail Settings | The "Set Trigger Condition Details" screen appears. Specify the methods of completion notification and communication. Refer to "◆ "Set Trigger Condition Details" Screen" for more details. |

◆ "Set Trigger Condition Details" Screen

Specify the method handling the processing results of specific ACTION executed by trigger conditions satisfied and communication method if the ACTION should be made.

You can specify the trigger condition individually.

Set Trigger Condition Details

Completion Notification
 If the processing results of the specified action/data copies are required in the case the trigger condition is satisfied, specify the notification destination.

Bit Showing Completion of the Process Device Name:

☒ Set 1 ☐ Set 0 ☐ Auto Reset after Trigger Condition Reset.

Bit Showing Processing Result (Success/Failure) Device Name:

Error Code Storage Location Device Name:

Abnormal Device IP Address Storage Location Device Name:

Communication Method
☐ General Broadcast ☒ Individual Communication

Retry Timeout Setting
☒ Response Check No. of Retry Times:
 If you give preference to performance over reliability, disable the response check feature.

☒ Enabled to use Data Transfer Timeout Span in the Network Settings.
 Inter-node communication Timeout Span during Data Transfer: ms
 These setting are enabled only when the communication method is "General Broadcast" or the communication partner is a GP NODE. Otherwise, configure the "Node settings other than GP series node settings" in the Network Settings.

Data Transfer Timeout Setting
☐ Enabled to use Data Transfer Timeout Setting
 Data Transfer Timeout Span: ms

OK Cancel

| Setting item | | Setting content |
|-------------------------|---|---|
| Completion Notification | Bit Showing Completion of the Process | <p>Sets "0" or "1" to the specified device when data transfer or ACTION has completed. Select the device name, device and symbol, and check either [Set "1"] or [Set "0"].</p> <pre> graph LR subgraph Display_Unit [Display Unit] A["(1) Trigger condition obtained! (5) Bit Showing Completion of the Process"] end subgraph PC [PC] B["(3) Execute Data Transfer/ACTION (4) Receive Notification"] end A -- "(2)" --> B B -- "(4)" --> A </pre> <p>NOTE</p> <ul style="list-style-type: none"> This setting should be effective under the conditions that: [At Device On] or [AT Device Off] is included in Condition 1 or Condition 2, and [Turn OFF (or ON) the Specified Symbol after Processing] is unchecked. You cannot specify the grouped symbol. Refer to "29.3 Grouping Symbols" for details about group symbols. |
| | Auto Reset after Trigger Condition Reset | <p>Check this to reset the device indicating the process completion when the trigger condition is reset.</p> <p>NOTE</p> <ul style="list-style-type: none"> This setting is available when the [Trigger Condition] is set to either [Device ON] or [Device OFF]. |
| | Bit Showing Processing Result (Success/Failure) | <p>Check this to indicate the processing results on the device. Specify the device name, device and symbol. Sets "0" if processing result is normal, and "1" if not.</p> <p>NOTE</p> <ul style="list-style-type: none"> This setting is available only for device (or symbols) with "Bit" format. You cannot specify the grouped symbol. Processing is made for 1 address (data type) when the symbol is specified. |
| | Error Code Storage Location | <p>Specify the error code storage location when the network related error code is stored in the device in the case that error is found in the processing results.</p> <p>NOTE</p> <ul style="list-style-type: none"> You can set only devices (symbols) with the "16 bits" or the "32 bits" format. You cannot specify the grouped symbol. Processing is made for 1 address (data type) when the symbol is specified. When you use a symbol imported from 'GP-Pro EX', enter the symbol name directly into the text box. |

| Setting item | | Setting content | | | | | | | | | | | | | | |
|----------------------------|---|--|--|--|--|--|--|----------------------------|---------------------|------------------|----------|---|--|---------|---|--|
| Completion Notification | Abnormal Device IP Address Storage Location | <p>Stores the IP address of the provider destination when a provider error occurs.</p> <div>NOTE</div> <ul style="list-style-type: none">• This setting is available only for devices (symbols) with the "32 bits" format. You cannot specify the grouped symbol.• Processing is made for 1 address (data type) when the symbol is specified.• When you use a symbol imported from 'GP-Pro EX', enter the symbol name directly into the text box. | | | | | | | | | | | | | | |
| Communication Method | General Broadcast/ Individual Communication | <p>Select general broadcast or individual communication for data transfer and ACTION data transfer.</p> | | | | | | | | | | | | | | |
| Communication Method | Response Check | <p>Select this check box to confirm the remote station received the transmission.</p> <p>When this check box is selected, in the [No. of Retry Times] field specify the number of retries if the transmission fails.</p> <div>NOTE</div> <ul style="list-style-type: none">• This setting is available for the communication with GP Series nodes, and for broadcast communication. For other types of communication, define the retry times in the [Network Settings] screen's "Node settings other than GP series node settings" field.• The relationship between the [General Broadcast/Individual Communication] and [Response Check] settings with the transmission and acknowledgement of other nodes is as follows: <table><tr><th colspan="2" rowspan="2"></th><th colspan="2">[General Broadcast/Individual Communication]</th></tr><tr><th>[Individual Communication]</th><th>[General Broadcast]</th></tr><tr><td rowspan="2">[Response Check]</td><td>Selected</td><td colspan="2">After sending to the remote station, if there is no response, retry the defined number of times</td></tr><tr><td>Cleared</td><td>Send to the remote station just once (do not retry)</td><td>After the data transfer timeout interval elapses, retry the defined number of times.</td></tr></table> | | | | [General Broadcast/Individual Communication] | | [Individual Communication] | [General Broadcast] | [Response Check] | Selected | After sending to the remote station, if there is no response, retry the defined number of times | | Cleared | Send to the remote station just once (do not retry) | After the data transfer timeout interval elapses, retry the defined number of times. |
| | | | [General Broadcast/Individual Communication] | | | | | | | | | | | | | |
| [Individual Communication] | | | [General Broadcast] | | | | | | | | | | | | | |
| [Response Check] | Selected | After sending to the remote station, if there is no response, retry the defined number of times | | | | | | | | | | | | | | |
| | Cleared | Send to the remote station just once (do not retry) | After the data transfer timeout interval elapses, retry the defined number of times. | | | | | | | | | | | | | |
| | Enable Timeout in the Network Settings | <p>Check this to adopt the timeout span specified on the "Network setup" screen.</p> <p>If not adopted, specify the timeout span (ms) in [Data Transfer Timeout Span] that is to be used.</p> <div>NOTE</div> <ul style="list-style-type: none">• This setting is available for communication with GP Series nodes, and for broadcast communication. For other types of communication, define the retry times in the [Network Settings] screen's "Node settings other than GP series node settings" field. | | | | | | | | | | | | | | |

| Setting item | | Setting content |
|--------------------------------|-------------------------------|--|
| Data Transfer Timeout Settings | Enable Data Transfer Timeout. | <p>Set up the timeout time in the [Data Transfer Timeout] field for one trigger condition used to run multiple data transfers/actions.</p> <div>NOTE</div> <ul style="list-style-type: none">• Even if a timeout occurs, the data transfer/action may still successfully run. If it fails, an error message will appear. For information about error messages, refer to 36.3 'Pro-Server EX' Error. |

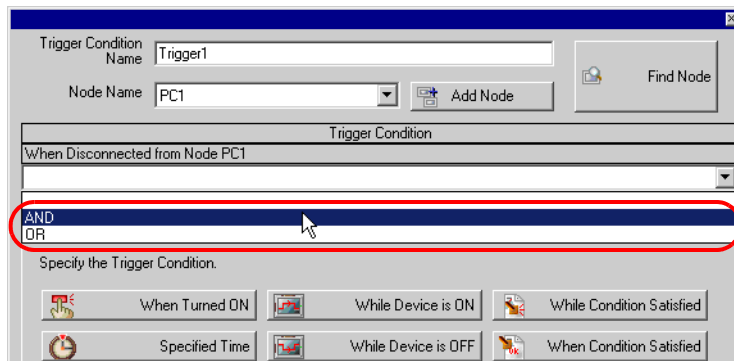
◆ About Communication and Confirmation

The relationship between the [General Broadcast/Individual Communication] and [Response Check] settings, and the transmission to remote stations and confirmation, is as shown below.

| | | [General Broadcast/Individual Communication] | |
|------------------|----------|--|--|
| | | [Individual Communication] | [General Broadcast] |
| [Response Check] | Selected | After sending to the remote station, if there is no response retry the defined number of times | |
| | Cleared | Send to the remote station just once (do not retry) | After the data transfer timeout interval elapses, retry the defined number of times. |

◆ Combining two trigger conditions

You can combine 2 trigger conditions at maximum by using "And" / "Or" when specifying the trigger condition. First, specify a trigger condition. Then click the list button of [Trigger Condition] to select [AND] or [OR], and specify the second trigger condition in the [Condition 2] tab.

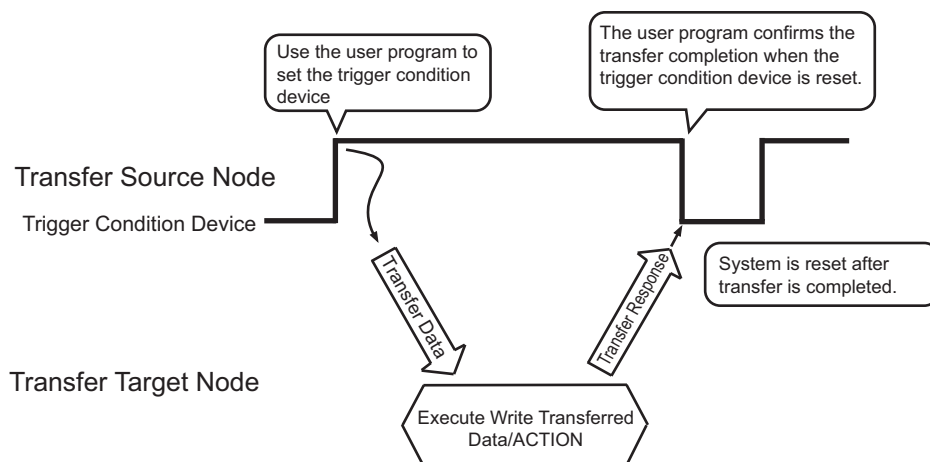


◆ Operation timing with the trigger conditions given below

There are 4 types of trigger conditions that you can specify by using "At Device On" and "At Device Off", and the examples of timing chart with each condition are as follows:

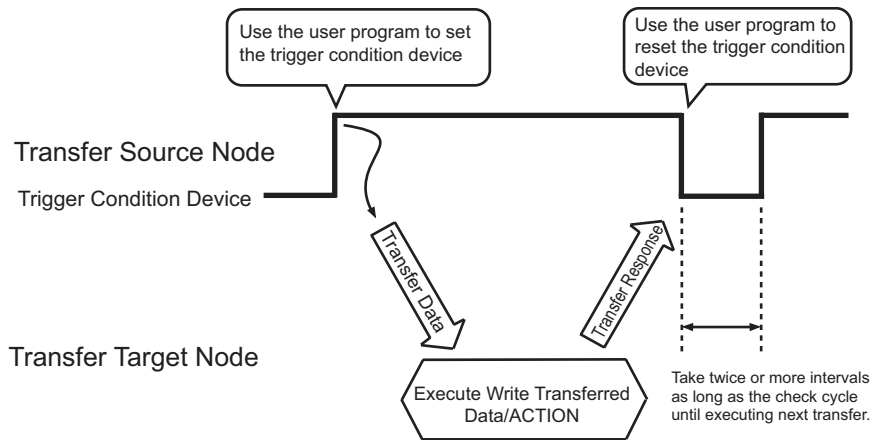
<Example 1: When you set "While Device is ON" or "While Device is OFF" as follows:>

| | | |
|---------------------|---|---------|
| While Device is ON | Turn OFF the specified device address after processing. | Checked |
| While Device is OFF | Turn ON the specified device address after processing. | Checked |



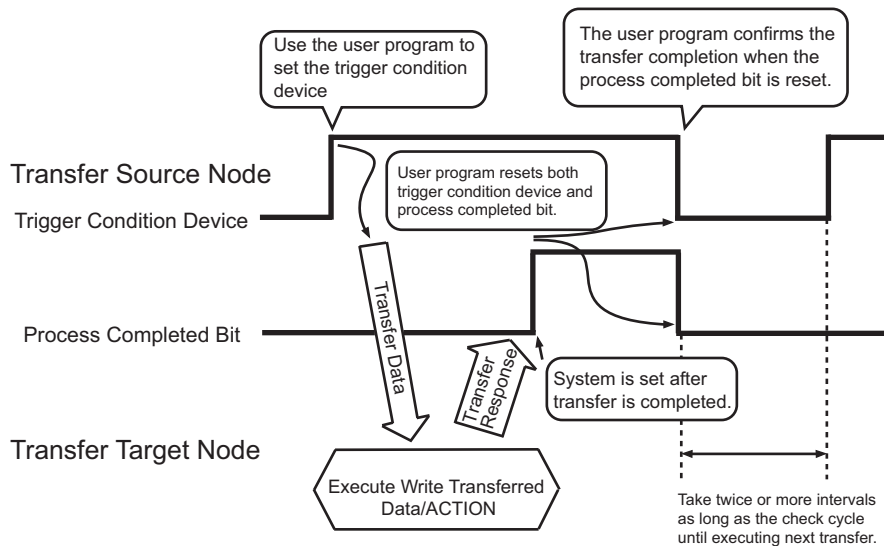
<Example 2: When you set "While Device is ON" or "While Device is OFF" as follows:>

| | | |
|---------------------|---|-----------|
| While Device is ON | Turn OFF the specified device address after processing. | Unchecked |
| While Device is OFF | Turn ON the specified device address after processing. | Unchecked |



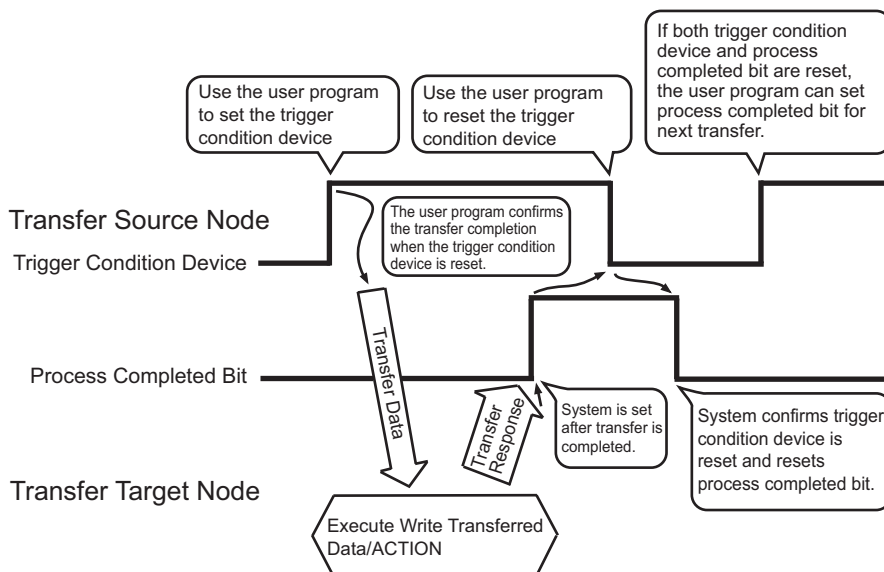
<Example 3: When you set "While Device is ON" or "While Device is OFF" as follows:>

| | | |
|---------------------|--|-----------|
| While Device is ON | Bit Showing Completion of the Process | With |
| | Auto-Reset after Resetting Trigger Condition | Unchecked |
| While Device is OFF | Bit Showing Completion of the Process | With |
| | Auto-Reset after Resetting Trigger Condition | Unchecked |

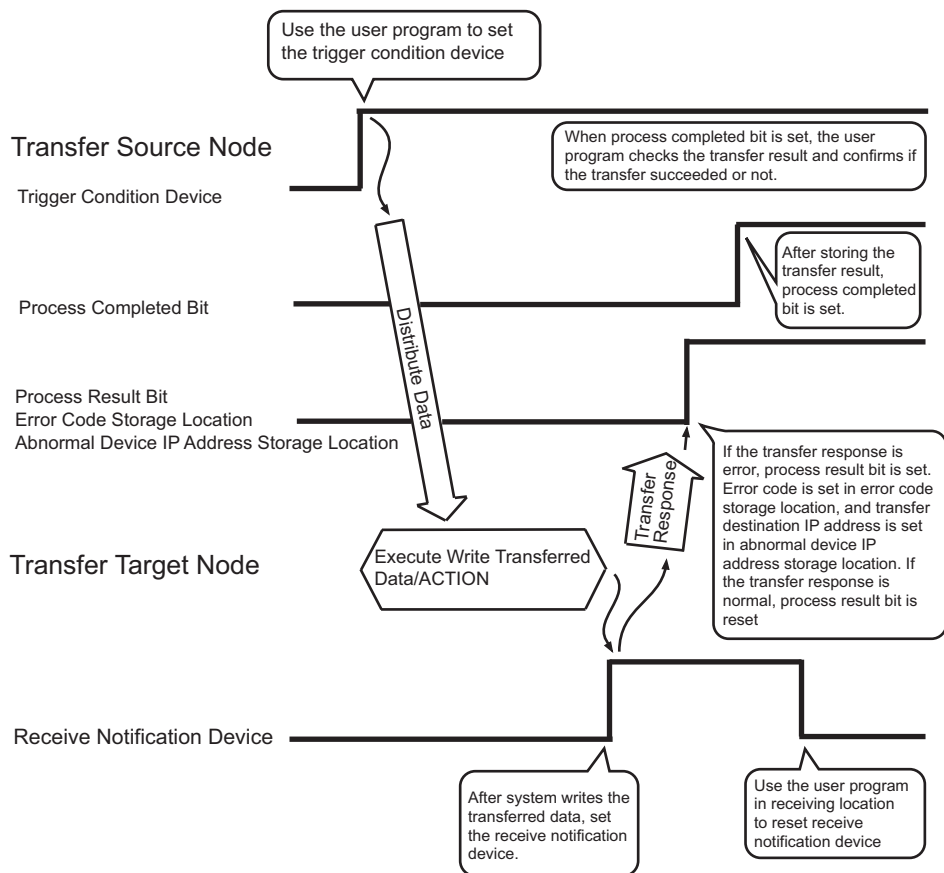


<Example 4: When you set "While Device is ON" or "While Device is OFF" as follows:>

| | | |
|---------------------|--|---------|
| While Device is ON | Bit Showing Completion of the Process | With |
| | Auto-Reset after Resetting Trigger Condition | Checked |
| While Device is OFF | Bit Showing Completion of the Process | With |
| | Auto-Reset after Resetting Trigger Condition | Checked |



The following chart describes the summary of the trigger condition device, [Bit Showing Completion of the Process], [Bit Showing Processing Result (Success/Failure)], [Error Code Storage Location], [Abnormal Device IP Address Storage Location] and the timing to set the receipt notification device described later.



33.1.2 Data Received by ACTION

- NOTE**
- This section describes the setting procedures when the ACTION is performed.
This setting is not effective for the case of data transfer.



When the trigger conditions become effective, the device data and constant number specified here are transferred to ACTION node (Normally PC) from the transfer source node.

ACTION node receives such data, displays them on application software and controls these data.

ACTION data is specified on the "Data settings to be received by ACTION" screen.

- NOTE**
- Some ACTIONs use the data specified in the above screen for start notification, and optional symbol or constant value need to be specified.
You may find that "1" is specified in the setting procedures in the corresponding chapter.

| Setting item | Setting content |
|------------------------------------|---|
| ACTION Type | Displays the ACTION type selected on the "Set ACTION Name/Parameter" screen. |
| ACTION Name | Displays the ACTION name selected on the "Set ACTION Name/Parameter" screen. |
| From the trigger node, this ACTION | Displays the argument name received from the transfer source during the ACTION operation. |

| Setting item | | Setting content |
|-----------------|----------------|--|
| Transfer Source | Node | Displays the node name specified on the "Trigger Condition Settings" screen. |
| | Device Name | Select Device/PLC as a transfer source of ACTION data. |
| | Device Address | <p>Click this to specify the device address (or symbol) when the device is set as a transfer source of ACTION data.</p> <ul style="list-style-type: none"> When specifying a device address: Enter directly from the Calculator icon. <p style="text-align: center;">Calculator icon</p>  <ul style="list-style-type: none"> When specifying a symbol: Select the symbol by clicking the list button. <p style="text-align: center;">List button</p>  <p>NOTE</p> <ul style="list-style-type: none"> When the next item [Constant Value] is specified, this device address setting is not effective. |
| | Constant Value | <p>Click this to enter the number when the constant value is to be set as ACTION data.</p> <p>NOTE</p> <ul style="list-style-type: none"> When the above item [Device Address] is specified, this setting is not effective. |
| | Data Type | Displays automatically the data type of the device specified as a transfer source. |
| | No. | Specifies the number of device when such a device is set as a transfer source. |

33.1.3 ACTION Nodes

NOTE

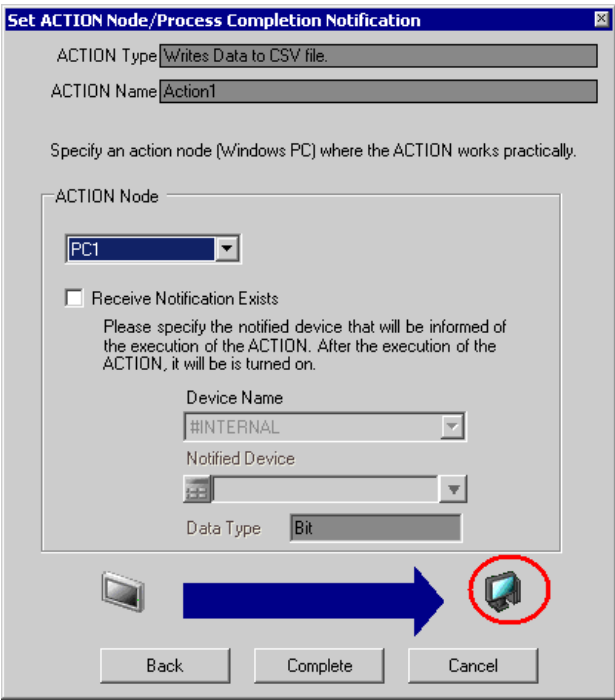
- This section describes the setting procedures when the ACTION is performed.
This setting is not effective for the case of data transfer.

The entry node where the ACTION works practically is called an "ACTION node".



Since ACTION utilizes application software like Excel, a personal computer (Pro-Server EX) is normally set as an ACTION node.

Specify the ACTION node on the "Set ACTION Node/Process Completion Notification" screen when multiple PCs are registered as entry nodes on the network.

You can also set the ACTION completion notification on this screen.



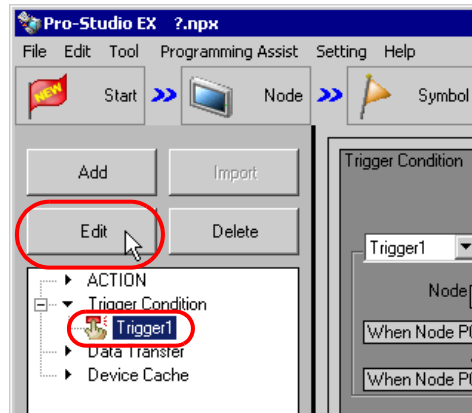
| Setting item | | Setting content |
|--------------|-----------------------------|--|
| ACTION Type | | Displays the ACTION type selected on the [Set ACTION Name/Parameter] screen. |
| ACTION Name | | Displays the ACTION name selected on the [Set ACTION Name/Parameter] screen. |
| ACTION Node | Node | Select the node name to be specified as an ACTION node. |
| | Receive Notification Exists | Check this to receive a notification indicating the ACTION completion. |
| | Device Name | Select the name of device having address to be a notification destination of ACTION execution. |

| Setting item | | Setting content |
|--------------|-----------------|--|
| ACTION Node | Notified Device | <p>Specify the device address (or symbol) that is set to be a notification destination of ACTION execution.</p> <ul style="list-style-type: none">When specifying a device address: Enter directly from the Calculator icon. <p>Calculator icon</p>  <p>When specifying a symbol: Select the symbol by clicking the list button.</p> <p>List button</p>  |
| | Data Type | Displays automatically the data type of the device specified as a notification destination of ACTION execution. |

33.2 Editing Trigger Conditions

Edit the contents of trigger conditions already specified.

- 1 Select the trigger condition to edit, and click the [Edit] button on the "ACTION-Specific Trigger Condition/Process List" screen.



The trigger condition settings screen appears.

2 Edit the contents and click the [OK] button.

NOTE

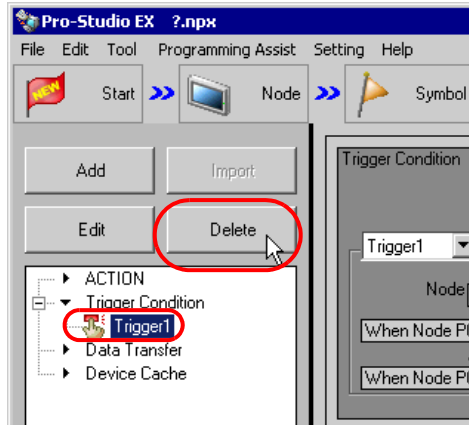
- You can also edit the trigger condition from the [Edit] button on the "Sequence Diagram by Trigger Condition" screen.

👉 "33.4.3 Setting Guide"

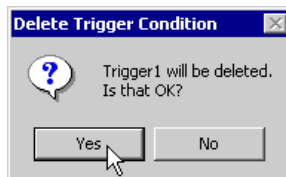
33.3 Deleting Trigger Conditions

Delete the contents of trigger conditions already specified.

- 1 Select the trigger condition you wish to delete, and click the [Delete] button on the "ACTION-Specific Trigger Condition/Process List" screen.



- 2 The "Trigger1 will be deleted. Is that OK?" message appears.
Click the [Yes] button.



The selected trigger condition is deleted.

33.4 Sequential Execution of Multiple Data Transfers and ACTIONS with One Trigger Condition

You can perform multiple data transfers and ACTIONS sequentially by registering them in one trigger condition. Register the first data transfer/ACTION, and add the second data transfer/ACTION with assigning the same trigger conditions.

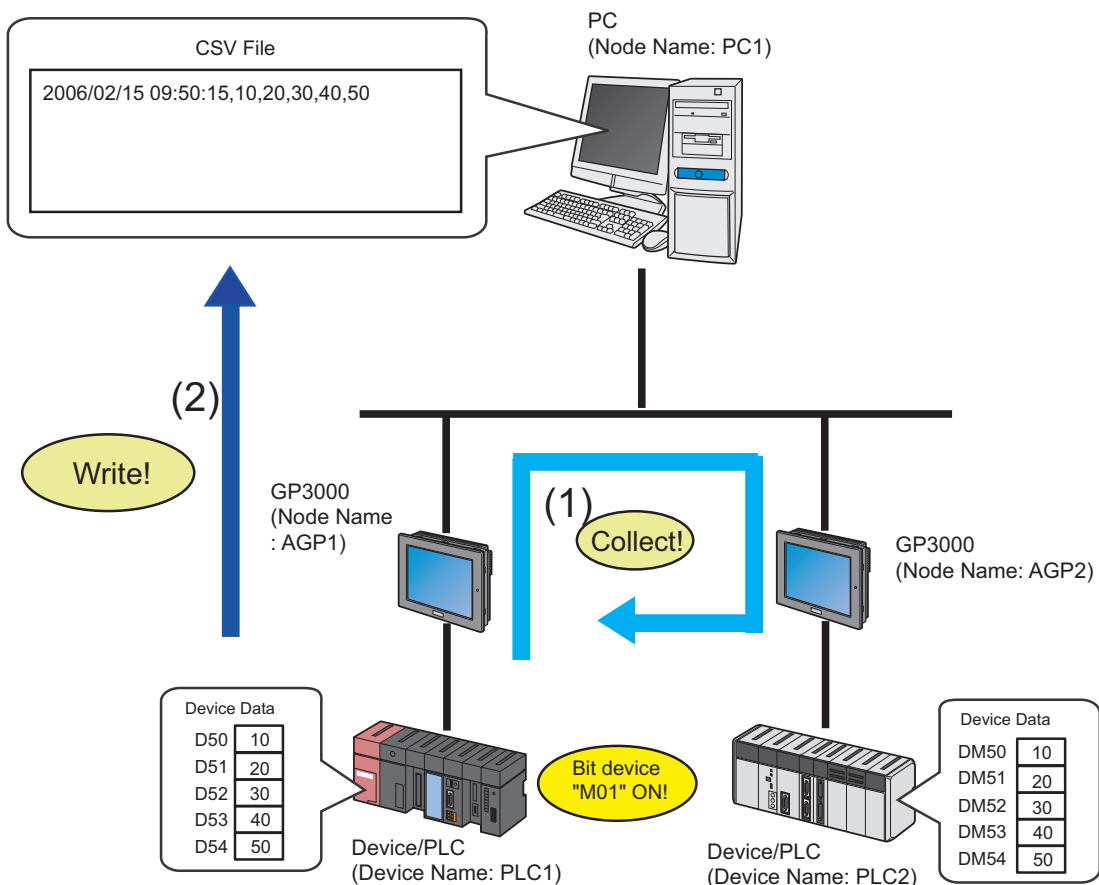
33.4.1 Registering Multiple Data Transfers and ACTIONS in One Trigger Condition

Ex.

Detect the rising of PLC1 device (Bit device: Address "M01");

(1) Collect the data of PLC2 device (Word device: Address "DM50" to "DM54") and then write them to PLC1 device (Word device: Address "D50" to "D54") (Data Transfer);

(2) Write the PLC1 device data that is transferred (Word device: Address "D50" to "D54") to a CSV file (ACTION).



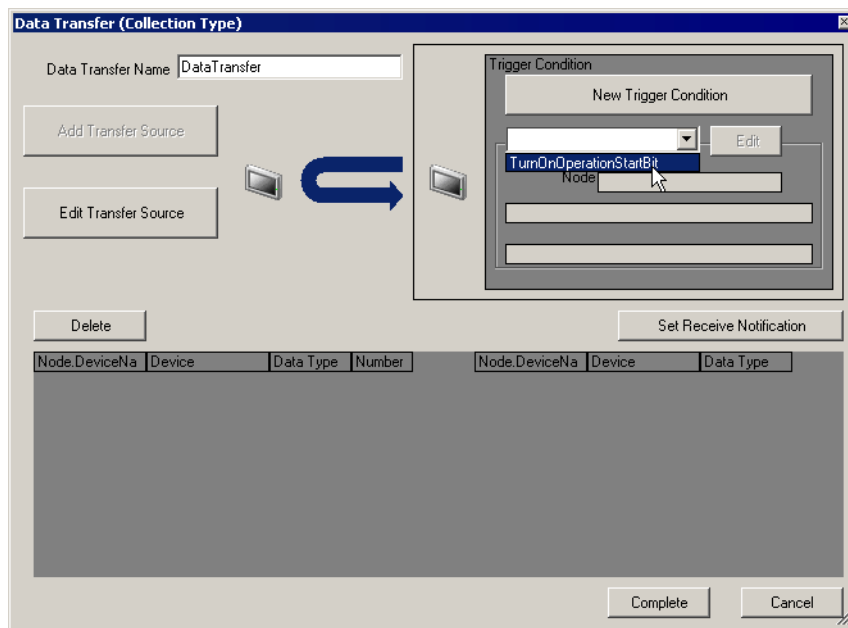
[Set contents of (1) Data Transfer]

| Setting item | | Setting content |
|------------------------|-------------|---|
| Data Transfer Type | | Collection type |
| Data Transfer Name | | Data transfer |
| Trigger Condition Name | | Turn on operation start bit |
| Trigger Condition | | When "Operation start" (M01) is ON |
| Transfer Source | Node | AGP2 |
| | Device Name | PLC2 |
| | Device | PLC2 symbol "Transfer source" (DM50 to DM54) |
| Transfer Destination | Node | AGP1 |
| | Device Name | PLC1 |
| | Device | PLC1 symbol "Transfer destination" (D50 to D54) |

[Set contents of (2) ACTION]

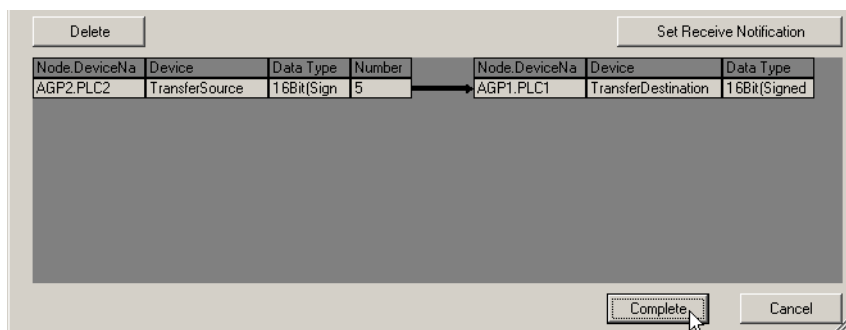
| Setting item | Setting content |
|----------------------------------|--------------------------------------|
| ACTION Name | CSV upload |
| Trigger Condition Name | Turn on operation start bit |
| Trigger Condition | When "Operation start" (M01) is ON |
| Transfer Destination Device Name | PLC1 |
| Transfer Destination Device | PLC1 symbol "PLC1 Data" (D50 to D54) |
| ACTION Node | PC1 |
| Receive Notification | OFF |

- 1 First, register the setting contents of (1) Data Transfer in "TurnOnOperationStartBit" of the trigger condition.

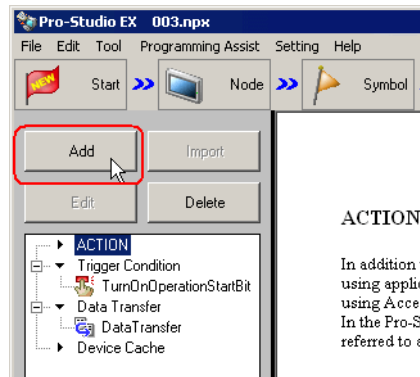


NOTE • For the data transfer setting, please refer to "19 Sending Data between Devices".

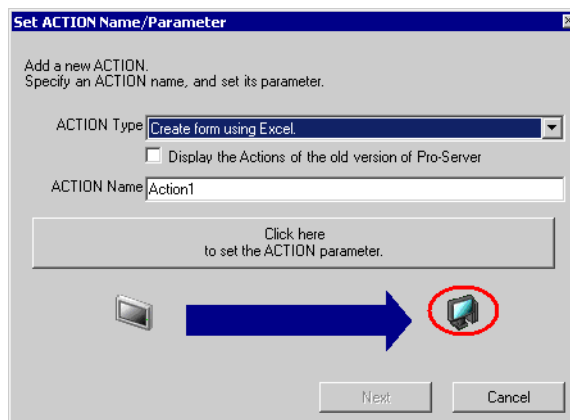
- 2 Click [Complete] button.



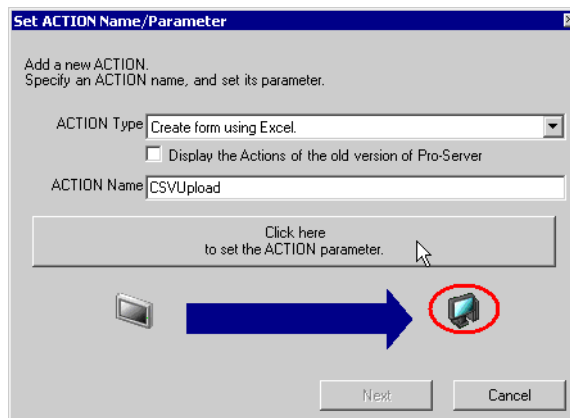
- 3 Select [ACTION] from the tree display on the left of the screen, and click [Add].



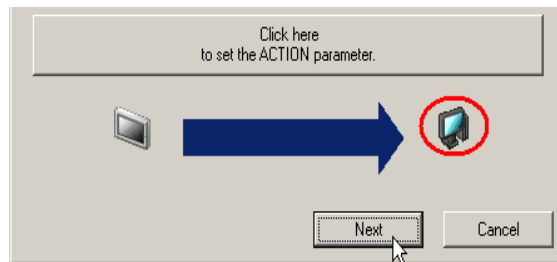
The "Set ACTION Name/Parameter" screen appears.



- 4 Click the list button of [ACTION Type] and select the contents of (2) "Create form using Excel.". Then, enter "CSV Upload" in [ACTION Name] and click the [Click here to set the ACTION parameter] button.

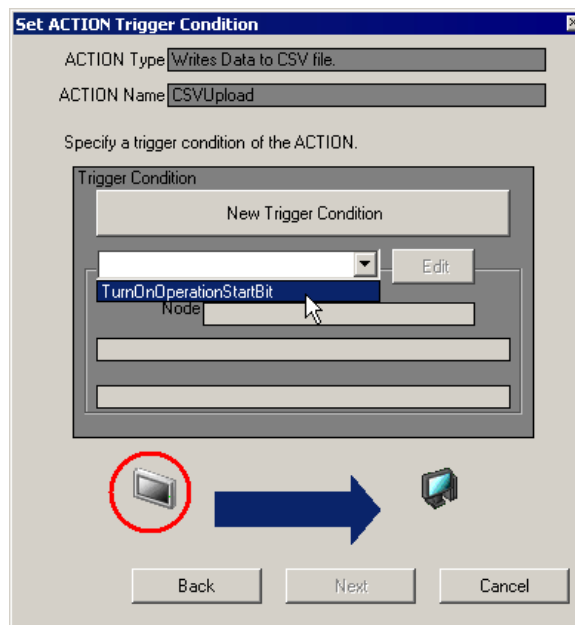


- 5 Set the parameter of the ACTION "CSV Upload" and click the [OK] button. Then click the [Next] button on the "Set ACTION Name/Parameter" screen.



NOTE • For the setting procedures of the ACTION "CSV Upload", please refer to "7 Writing Device/PLC Data in CSV File".

- 6 Click the list button of [Trigger Condition] and select "TurnOnOperationStartBit" that is to be assigned. Then click the [Next] button.



- 7 Specify the ACTION data of "CSV Upload", and click the [Next] button.

Data settings to be received by ACTION

ACTION Type: Writes Data to CSV file.

ACTION Name: CSVUpload

From the trigger node, this ACTION

Device data

is received as a data to do the ACTION. As the data value, the device value of the trigger node or a constant is available. Specify the data.

Transfer Source

Node: AGP1

Device Name: PLC1

☒ Device Address: TransferDestination

☐ Constant Value

Data Type: 16Bit(Signed) No. 5

Back Next Cancel

- 8 Specify ACTION Node and Completion Notification of the additional trigger condition, then click the [Complete] button.

Set ACTION Node/Process Completion Notification

ACTION Type: Writes Data to CSV file.

ACTION Name: CSVUpload

Specify an action node (Windows PC) where the ACTION works practically.

ACTION Node

PC1

☒ Receive Notification Exists

Please specify the notified device that will be informed of the execution of the ACTION. After the execution of the ACTION, it will be turned on.

Device Name: #INTERNAL

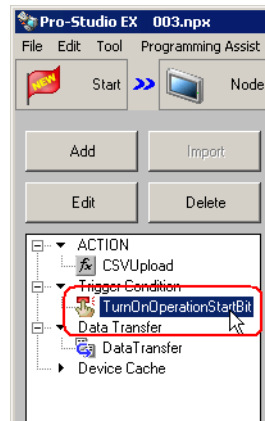
Notified Device:

Data Type: Bit

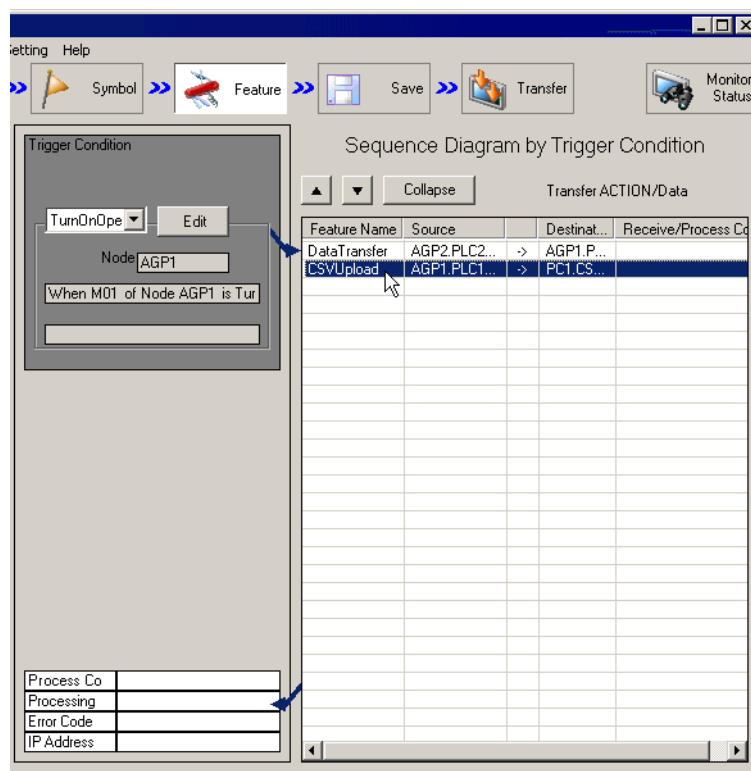
Back Complete Cancel

One data transfer and one ACTION have been now assigned to one trigger condition.

- 9 Click the trigger condition name to which data transfer and ACTION have been assigned from the list on the left of the screen.



Specified data transfer and ACTION are now displayed on the "Sequence Diagram by Trigger Condition" screen.

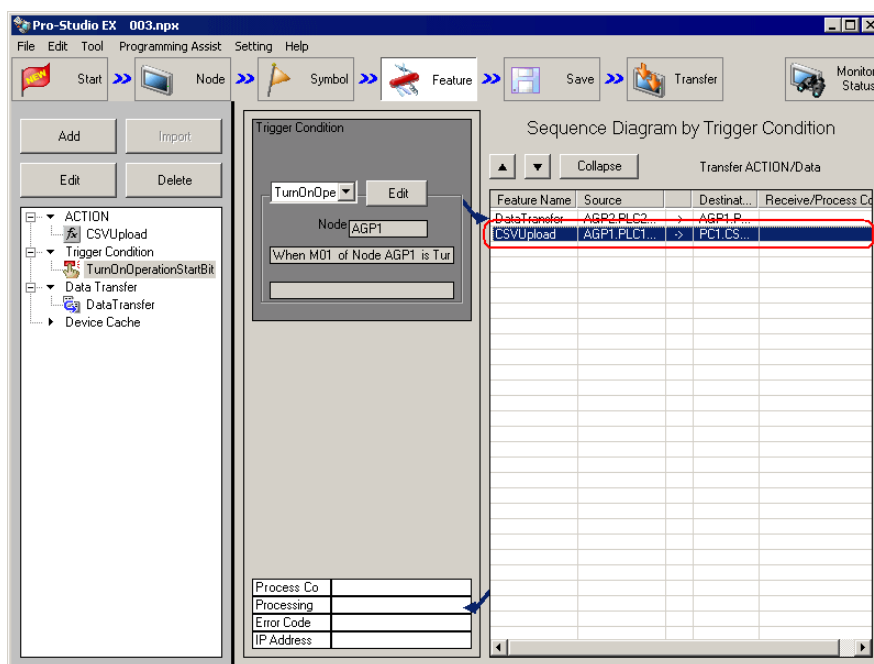


NOTE • To register additional data transfers and ACTIONS, repeat the above steps.

33.4.2 Changing Operation Order of Data Transfer and ACTION

You can change the operation order of data transfer and ACTION specified collectively.

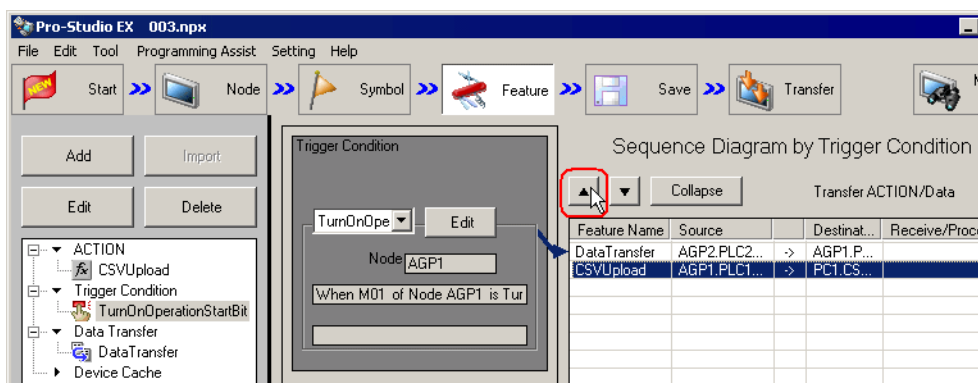
- 1 Click the name of data transfer and ACTION whose operation order you wish to change on the "Sequence Diagram by Trigger Condition" screen.



- 2 Click the [▲] or [▼] button.

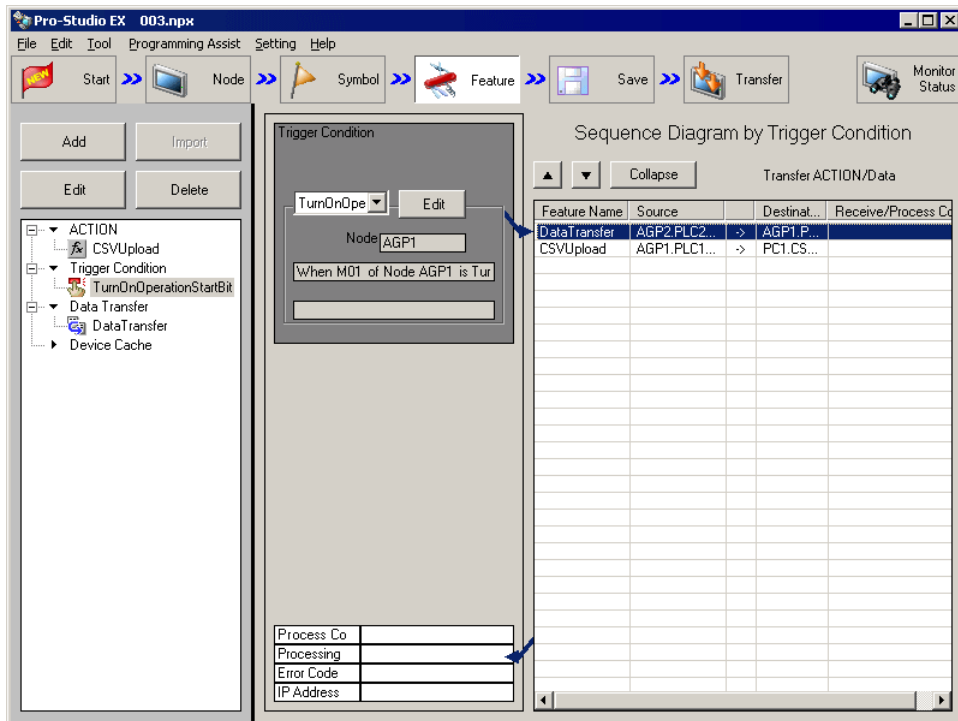
[▲]: Move the operation upward by one row.

[▼]: Move the operation downward by one row.



33.4.3 Setting Guide

This section describes the contents on the "Sequence Diagram by Trigger Condition" screen.



| Setting item | | Setting content |
|---------------------------|------------------------------------|--|
| Trigger Condition Display | Trigger Condition Name | Displays the name of the trigger condition. Select the name by clicking the list button when you wish to change the trigger condition. |
| | Edit | Edits the displayed trigger condition. Edit the set contents on the trigger condition settings screen to be displayed. |
| | Node | Displays the node name having device (or symbol) to be a trigger condition. |
| | Trigger Condition | Displays the contents of the trigger conditions. |
| Sequence Diagram | ▲ / ▼ | Moves the operation order of the specified ACTION upward (or downward) by one row. |
| | Reduced Display / Expanded Display | Change the display format of ACTION. <ul style="list-style-type: none"> • Reduced display Displays only [Feature Name]. • Expanded display Displays all information of ACTION processing in details. |
| | Feature Name | Displays the ACTION name. |
| | Source | Displays the node name, device name and data-transferring device of the data transfer source. |
| | Destination | Displays the node name, device name and data-receiving device of the data transfer destination. |

| Setting item | | Setting content |
|--------------------|---|---|
| Sequence Diagram | Receive/Process Completion Notification | Displays the node name, device name and device notifying the receipt and process completion. |
| Processing Results | Process Completed | Displays the device notifying process completion. |
| | Processing Results | Displays the device notifying the processing results. |
| | Error Code | Displays the device where error code is stored in the case of error occurrence. |
| | IP Address | Displays the device where IP address of processing destination is stored in the case of error occurrence. |

33.5 Executing ACTION under Multiple Trigger Conditions

Specified contents of ACTION are displayed on the "ACTION-Specific Trigger Condition/Process List" screen. Though this screen displays the contents of the existing ACTION, you can add trigger conditions on this screen when you wish to execute one ACTION under multiple trigger conditions.

It is also possible to edit and delete the set contents of trigger condition and ACTION.

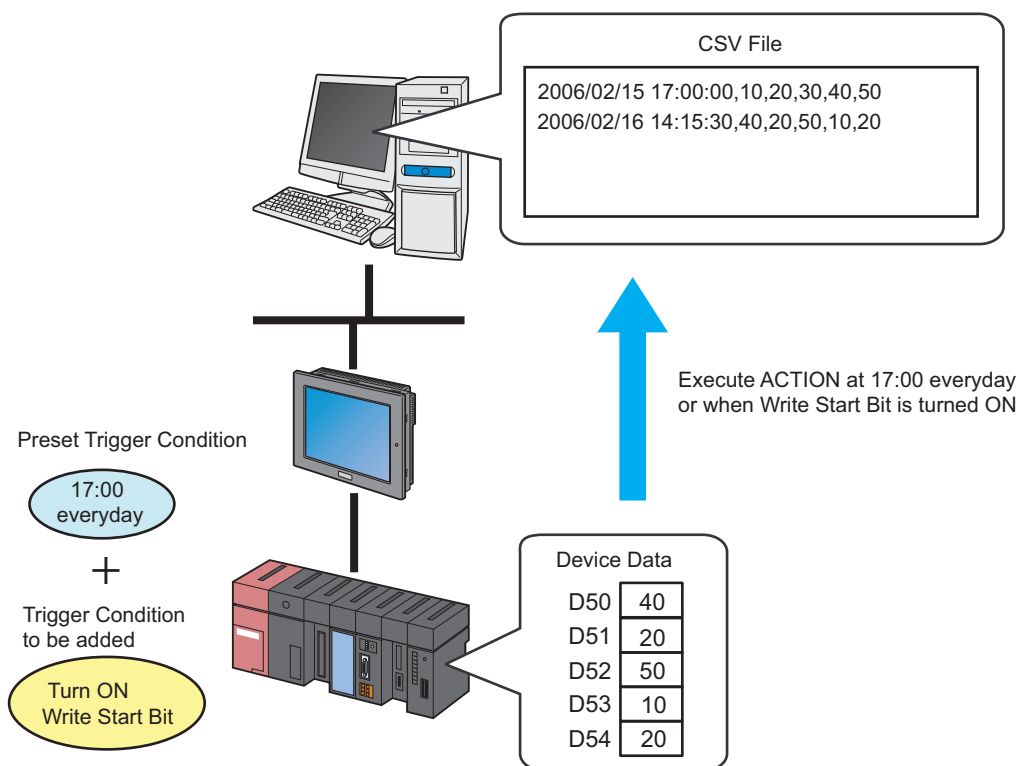
Refer to "33.5.2 Setting Guide" for more details about the screen.

NOTE • As for the data transfer, specification of multiple trigger conditions is not available.

33.5.1 Adding Trigger Conditions

Ex.

Add a new trigger condition "Turn on write start bit" to "At 17:00 Everyday" already registered to the ACTION "Write data in CSV file".



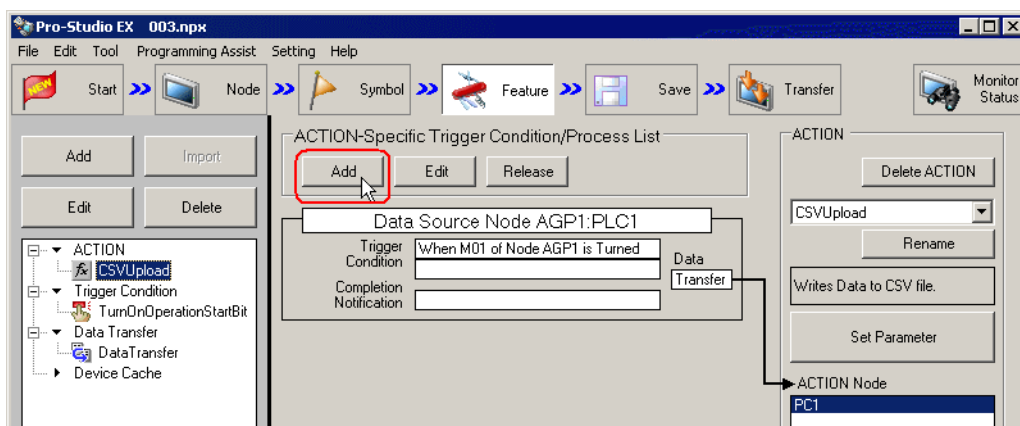
[Set contents already specified]

| Setting item | Setting content |
|----------------------------------|--------------------------------------|
| ACTION Name | CSV upload |
| Trigger Condition Name | 17:00 everyday |
| Trigger Condition | Specified time: 17:00 |
| Transfer Destination Device Name | PLC1 |
| Transfer Destination Device | PLC1 symbol "PLC1 Data" (D50 to D54) |
| ACTION Node | PC1 |
| Receive Notification | OFF |

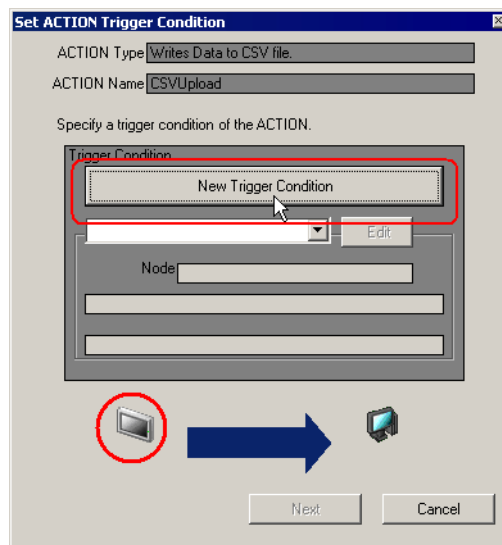
[Set contents to be newly added]

| Setting item | Setting content |
|----------------------------------|--------------------------------------|
| Trigger Condition Name | Turn on write start bit |
| Trigger Condition | When "Start writing" (M01) is ON |
| Transfer Destination Device Name | PLC1 |
| Transfer Destination Device | PLC1 symbol "PLC1 Data" (D50 to D54) |
| ACTION Node | PC1 |
| Receive Notification | OFF |

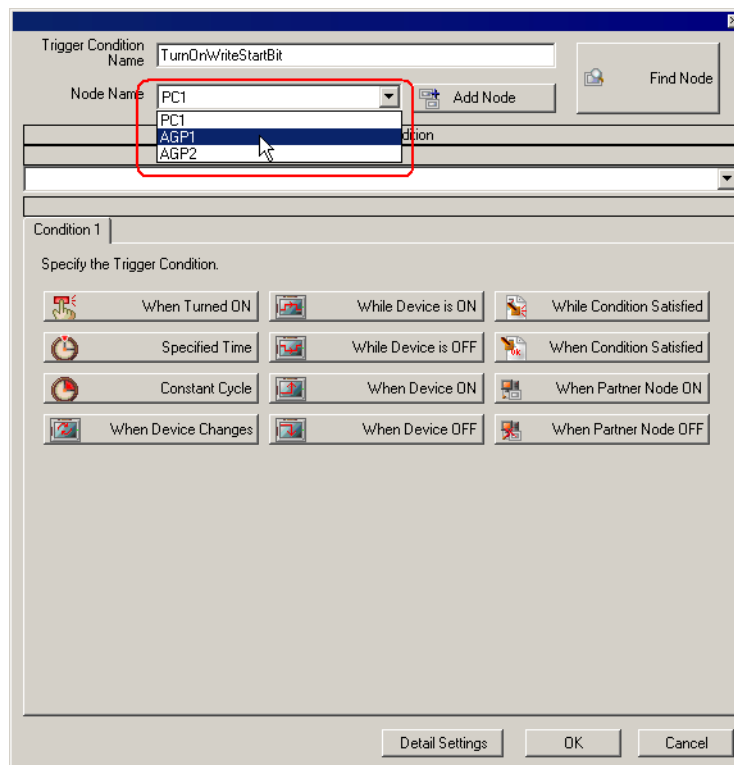
- 1 Click the [Add] button on the "ACTION-Specific Trigger Condition/Process List" screen.



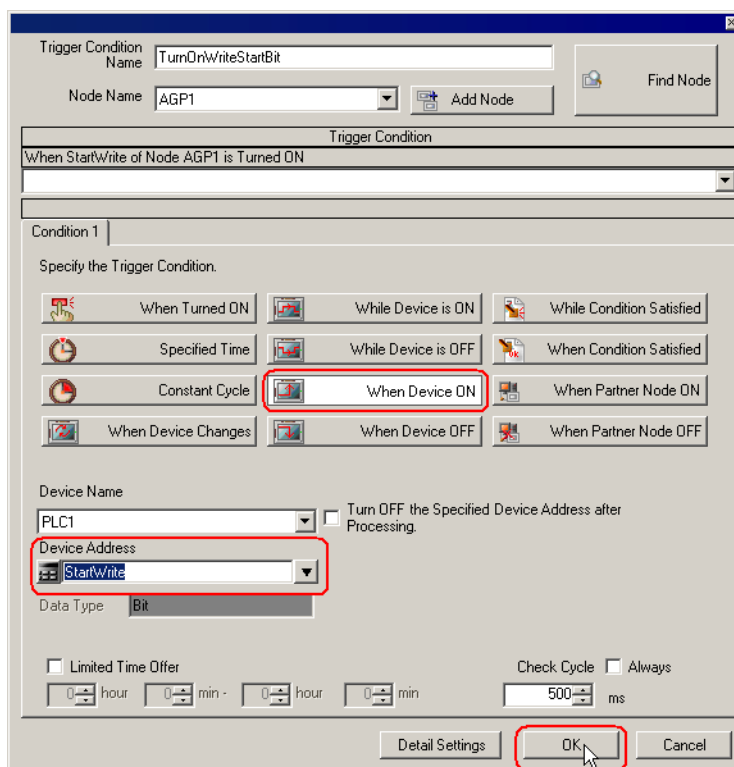
2 Click [New Trigger Condition] button.



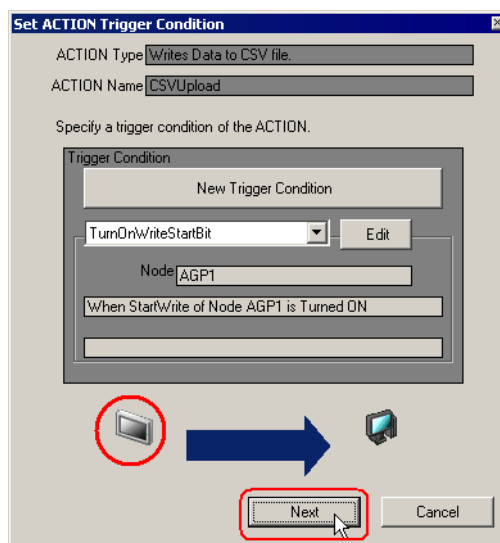
3 Enter "TurnOnWriteStartBit" in [Trigger Condition Name] as the name of newly added trigger condition and select "AGP1" in [Node Name].



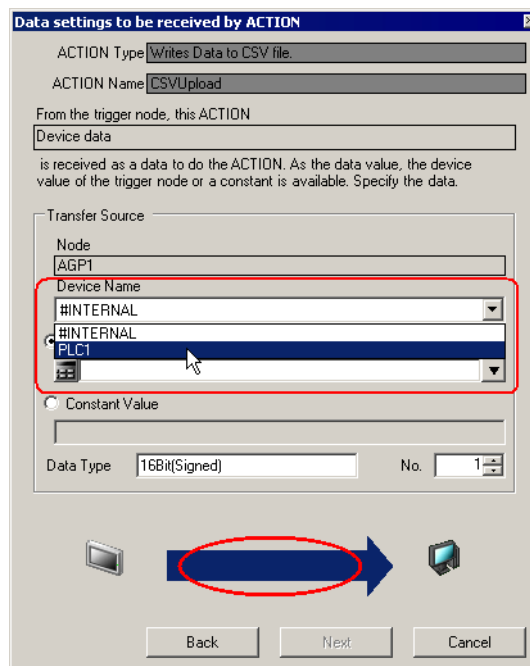
- 4 Click the [When Device On] button in the [Condition 1] tab, and select "PLC1" as a device name and then "Start Write" as a device symbol name to be a trigger. Then click the [OK] button.



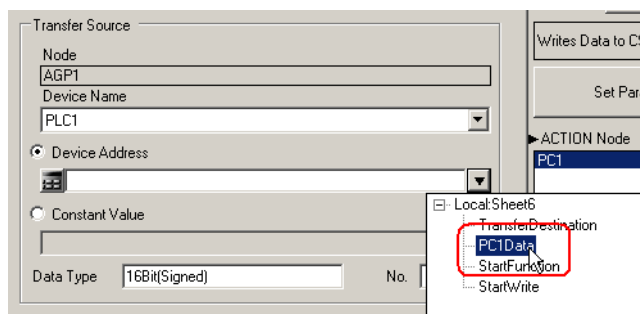
- 5 On the "Set ACTION Trigger Condition" screen, click the [Next] button.



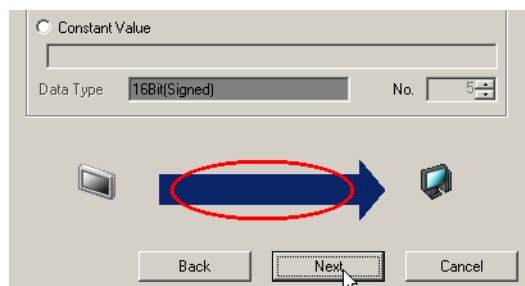
- 6 Click the list button of [Device Name] and select "PLC1" as a Device/PLC to read data from.



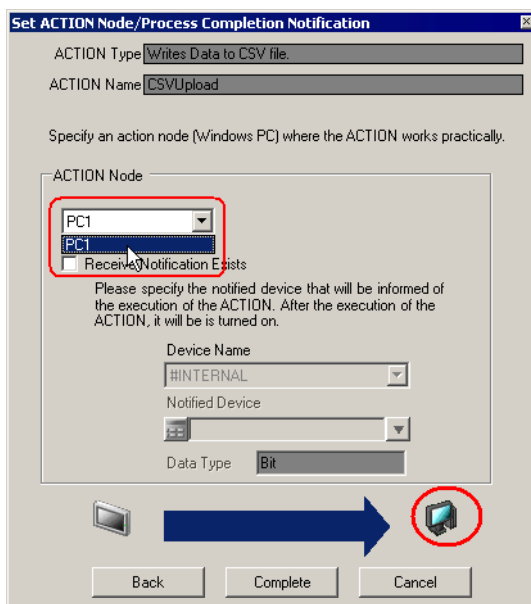
- 7 Click [Device Address] and then the list button to select "PLC1 Data" as a symbol name of the Device/PLC "PLC1" to read data from.



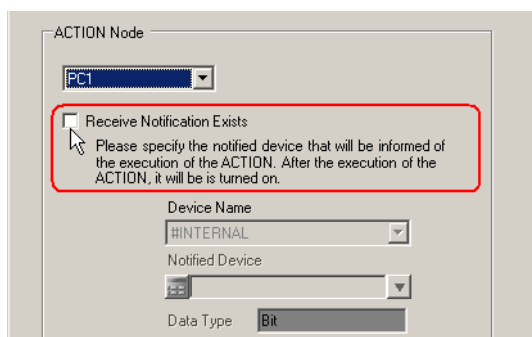
- 8 Click the [Next] button.



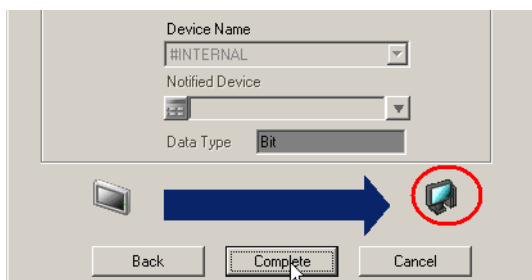
- 9 Click the list button of [ACTION Node] on the "Set ACTION Node/Process Completion Notification" screen, and select "PC1" as a node name where ACTION works.



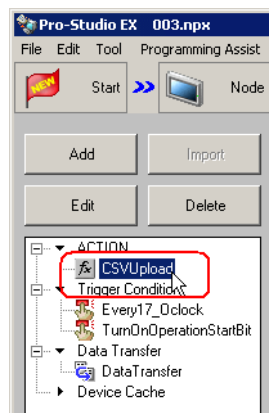
- 10 Turn off the check box of [Receive Notification Exists], if checked.



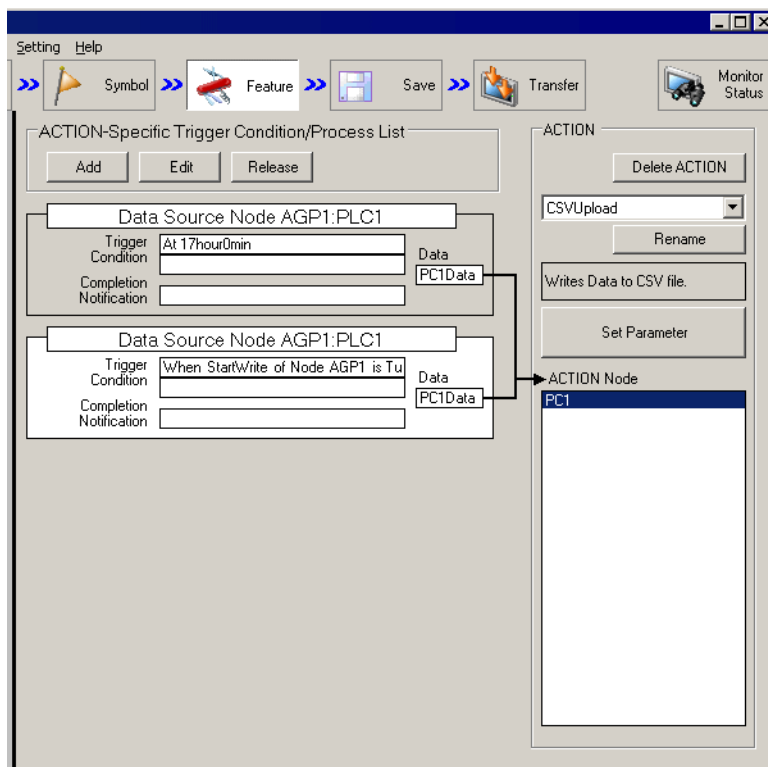
- 11 Click the [Complete] button.



- 12 Click the ACTION name where the trigger conditions are added, from the list on the left of the screen.

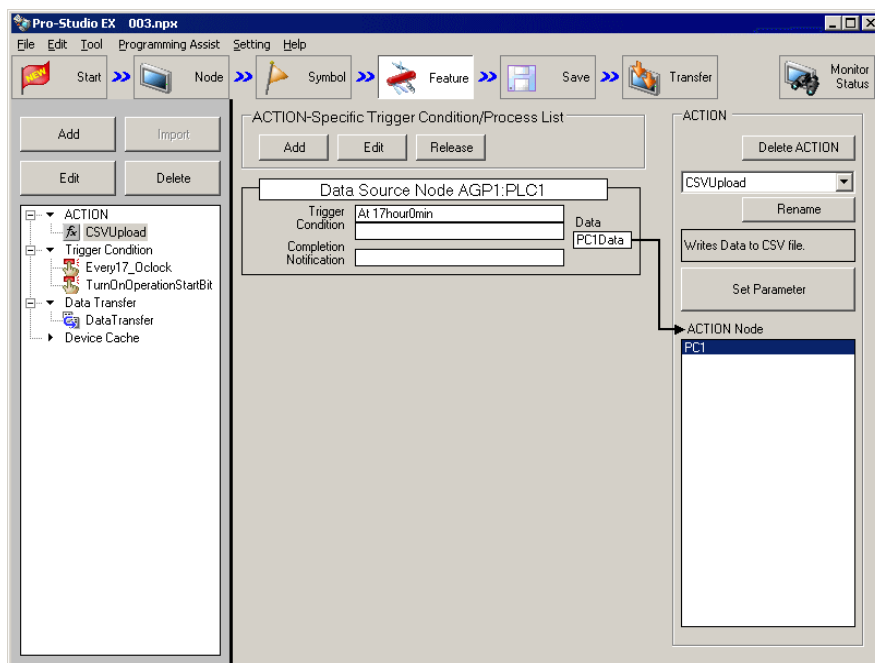


Added trigger conditions are now displayed on the "ACTION-Specific Trigger Condition/Process List" screen.



33.5.2 Setting Guide

This section describes the contents on the "ACTION-Specific Trigger Condition/Process List" screen.



| Setting item | | Setting content |
|--|-------------------------|--|
| ACTION-Specific Trigger Condition/Process List | Add | The "Set ACTION Trigger Condition" screen appears. Specifies trigger conditions to be added on the following screens. |
| | Edit | The "Set ACTION" screen appears. Edits the contents of trigger conditions on this screen. |
| | Delete | Deletes the specified trigger conditions. |
| Trigger Condition Display | Data Source Node | Displays the name of the node and device to be the data source node of ACTION. |
| | Trigger Condition | Displays the contents of the trigger conditions. |
| | Data | Displays the contents of ACTION data. |
| | Completion Notification | Displays the device (or symbol) notifying the processing completion. |
| ACTION Display | Delete ACTION | Deletes the displayed ACTION. |
| | Trigger Condition Name | Selects an ACTION to change the displayed ACTION. |
| | Rename | Changes the displayed ACTION name. Change the name on the "Edit ACTION Name" screen. |
| | Set Parameter | Edits the parameter of ACTION. Displays the parameter setting screen corresponding to each ACTION. Edit the set contents on this screen. |
| | ACTION Node | Displays the ACTION nodes. |

34



Setting Up Environment

| | | |
|------|---|-------|
| 34.1 | Setting Up the Environment of 'Pro-Server EX' | 34-2 |
| 34.2 | Network Setup..... | 34-4 |
| 34.3 | Option Settings..... | 34-10 |
| 34.4 | Restrictions | 34-13 |

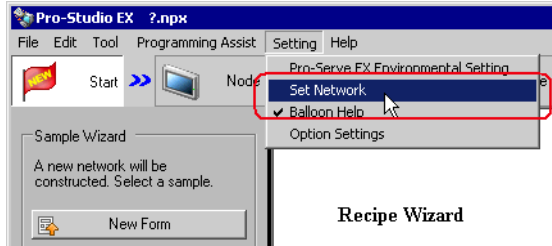
34.1 Setting Up the Environment of 'Pro-Server EX'

This section describes how to set the environment of 'Pro-Server EX'.

NOTE

- Effective range of "Pro-Server EX Environmental Setting" is Whole personal computer".
The environment setting specified in the network project file "X" on the PC "A", for example, is reflected in the network project file "Y" created and edited on the PC "A" later.

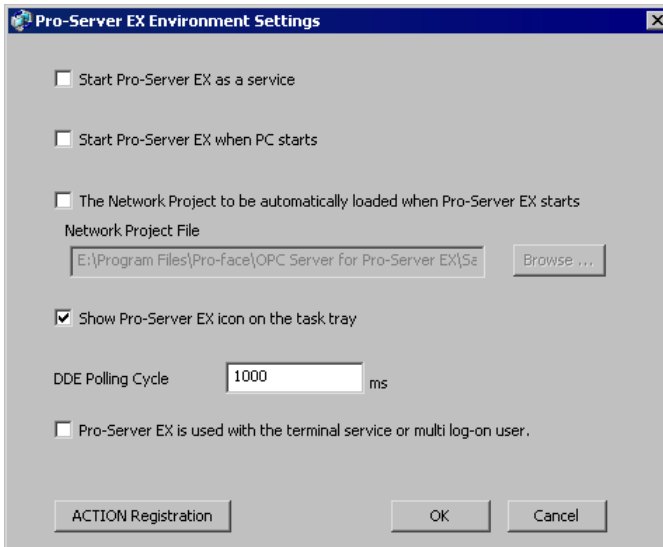
- 1 Click [Set Network] from [Setting] on the start screen.



NOTE

- The "User Account Control" dialog box will be displayed before the "Pro-Server EX Environmental Setting" dialog box is displayed.
When it is displayed, click [Allow].

- 2 Specify each item on the "Pro-Server EX Environmental Settings" screen.



NOTE

- Change of "Pro-Server EX Environmental Setting" becomes valid by restarting 'Pro-Server EX'.

| Setting item | Setting content |
|---|--|
| Start Pro-Server EX as a service | <p>Starts "Pro-Server EX" at the same time as the PC starts.(Service Mode)</p> <p>☞ "30 Starting 'Pro-Server EX' in the Service Mode"</p> <p>IMPORTANT</p> <ul style="list-style-type: none"> To start 'Pro-Server EX' as a service, the "User Account Control Function" must be disabled. Refer to "30.2 Restrictions" for more details. |
| The Network Project to be automatically loaded when Pro-Server EX starts Network Project File | <p>Loads automatically a network project file when 'Pro-Server EX' starts.</p> <p>Click the [Browse] button and select the network project file on the PC on the "Open File" screen.</p> <p>NOTE</p> <ul style="list-style-type: none"> This function is useful for system operation like 'Pro-Server EX' running. Specifying the network project file beforehand makes it unnecessary to start 'Pro-Studio EX' and load the file to 'Pro-Server EX'. |
| Start Pro-Server EX when PC starts | <p>When you log in to your computer, Pro-Server EX starts up.</p> <p>NOTE</p> <ul style="list-style-type: none"> Does not run when you change the SP5000 Series Open Box Shell to a custom shell, even if [Start Pro-Server EX when logging in to Windows] is selected. In the unit's startup window, select "ProServr.exe" located in the Pro-Server EX install destination. For more information about the various settings, refer to the "SP5000 Series Open Box Reference Manual". |
| Show Pro-Server EX icon on the task tray | <p>If unchecked, hides the 'Pro-Server EX' icon in the task tray.</p> <p>NOTE</p> <ul style="list-style-type: none"> Please use this function when you wish to prevent the setting from being changed by third person without permission. To display the Pro-Server EX icon again, select the following buttons in this order: [Start] (on Windows), [Pro-Server EX], and then [Pro-Server EX Environmental Setting]. To close the Pro-Server EX from the non-displayed state, close it from the status monitor screen of Pro-Studio EX, or select [Start] (on Windows), [Pro-Server EX], and then [Close Pro- Server EX]. |
| Pro-Server EX is used with the terminal service or multi log-on user. | <p>If checked, 'Pro-Server EX' can be used by multiple logon users, or with the terminal service.</p> <p>IMPORTANT</p> <ul style="list-style-type: none"> To use 'Pro-Server EX' as the terminal service, or to use it with multiple logon users, the "User Account Control Function" must be disabled. Refer to "30.2 Restrictions" for more details. |
| DDE Polling Cycle | <p>Enter the polling cycle at DDE access. The default value is 1000ms (1sec).</p> <p>☞ "28.6 Monitoring Using Excel Graphs"</p> |
| ACTION Registration | <p>Register ACTION created by a user to 'Pro-Server EX'.</p> <p>The "Open File" screen appears. Specify the file name of ACTION to be newly registered.</p> |

34.2 Network Setup

This section describes the network setup of 'Pro-Server EX'.

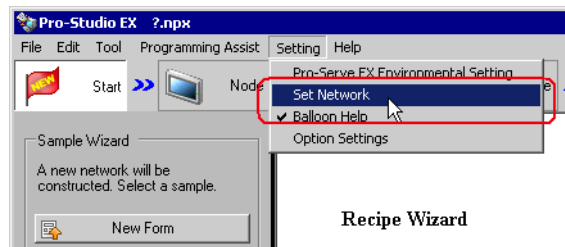
The setting contents vary according to the referenced node.

- NOTE**

- "Set Network" is to be stored in the network project file.

If you wish to switch between multiple network project files on one PC, network setup is required for every file.

1 Click [Set Network] from [Setting] on the start screen.

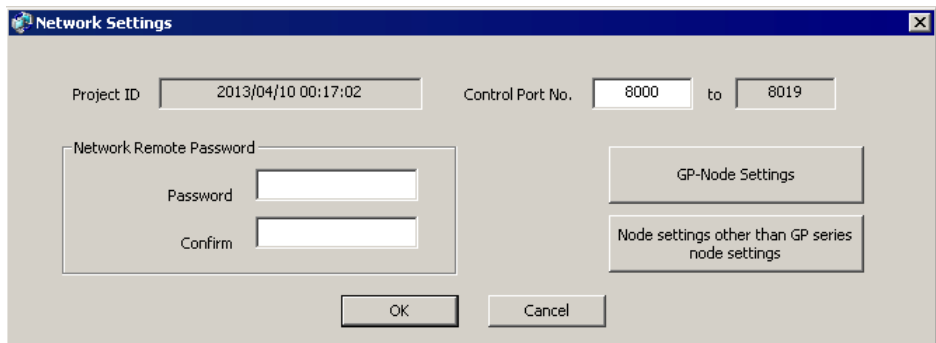



- NOTE**

- When using 'Pro-Server EX', the "User Account Control" dialog box will be displayed before the "Pro-Server EX Environmental Setting" dialog box is displayed.

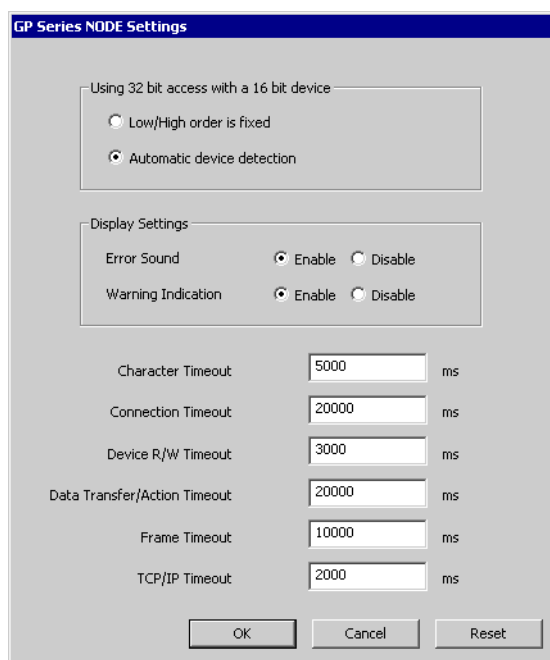
When it is displayed, click [Allow].

2 Specify each item on the "Network Settings" screen.



| Setting item | Setting content |
|--|--|
| Project ID | Displays the date and time when the project was created. |
| Control Port No. | <p>Specify the port numbers for TCP and UDP. 'Pro-Server EX' uses 20 ports beginning with the port number specified here.</p> <p>NOTE</p> <ul style="list-style-type: none"> If you may find the overlapped port number on other application software, please change the setting. You also need to change the display unit port number to be the same when changing the setting. |
| Network Remote Password | <p>Set the password necessary for remote connecting.</p> <p> "23.1.1 Remote Access"</p> |
| GP-Node Settings | <p>The "GP Series NODE Setting" screen appears. Refer to "■ "GP Series NODE Settings" Screen" for more details.</p> |
| Node settings other than GP series node settings | <p>The Pro-Server EX, ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, or LT3000 node settings screen appears. Refer to "■ "Node settings other than GP series node settings" Screen" for more details.</p> <p>NOTE</p> <ul style="list-style-type: none"> Pro-Server EX, ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, and LT3000 are provided with two types of protocols: The 2way protocol mounted on the GP Series and the upgraded 2way protocol offering safer and more prompt communication. Communication is performed by automatically selecting the most efficient protocol according to the communication contents and type of the partner node. |

■ "GP Series NODE Settings" Screen



The image shows a screenshot of the "GP Series NODE Settings" dialog box. It has a title bar with the text "GP Series NODE Settings". Inside, there are two main sections. The first section is titled "Using 32 bit access with a 16 bit device" and contains two radio buttons: "Low/High order is fixed" (unselected) and "Automatic device detection" (selected). The second section is titled "Display Settings" and contains two rows of settings: "Error Sound" with "Enable" (selected) and "Disable" (unselected) radio buttons, and "Warning Indication" with "Enable" (selected) and "Disable" (unselected) radio buttons. Below these sections are seven text input fields, each followed by "ms": "Character Timeout" (5000), "Connection Timeout" (20000), "Device R/W Timeout" (3000), "Data Transfer/Action Timeout" (20000), "Frame Timeout" (10000), and "TCP/IP Timeout" (2000). At the bottom are three buttons: "OK", "Cancel", and "Reset".

| Setting item | | Setting content |
|--|--------------------|--|
| Using 32 bit access with a 16 bit device | | Selects the access order of sequential two 16-bit devices that are regarded as a single 32-bit device. |
| Display Settings | Error Sound | Select whether the buzzer beeps or not when error occurs. |
| | Warning Indication | Select whether displays alarms on the display unit or not. |
| Character Timeout | | Reserved. |
| Connection Timeout | | While currently establishing connection, if there is no communication via the connection for the period of time specified here, the connection will be terminated. (You can establish only one connection for one consumer node, in TCP.) |
| Device R/W Timeout | | <p>If there is no response within the time specified here after 'Pro-Server' raised a read/write request, it will be regarded as timeout. Adjust the timeout period including the time required for the line speed and read/write process.</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;">NOTE</div> <ul style="list-style-type: none"> When the network is quite busy or the delay is observed in the communication between the display unit and Device/PLC, timeout error may possibly occur even under the normal operation. In this case, set a longer time in [Device R/W Timeout]. If the set time is too long, however, it takes much time to detect the communication error (like packet lost) when it occurs. |

| Setting item | Setting content |
|------------------------------|--|
| Data Transfer/ACTION Timeout | <p>If there is no response within the time specified here after data transfer or ACTION is executed, it will be regarded as timeout.</p> <p>In the case of data transfer, however, this is effective only when you checked [Response Check] and [Use Distribution Timeout of Network Settings] in the [Detail Settings] tab.</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">NOTE</div> <ul style="list-style-type: none"> Some of the ACTIONs use application software on the PC, like Excel, and need so much processing time as to cause timeout depending on your PC performance. In this case, please set a longer time in [Data Transfer/ACTION Timeout]. |
| Frame Timeout | <p>When working on mass data, a provider node sends data dividing those into more than one packet, while a self node receives a packet sent in turn. If a self node cannot receive the next packet within the time specified here after receiving one packet, it will be regarded as timeout.</p> |
| TCP/IP Timeout | <p>In TCP communication, "ACK" will be returned to data sent. If "ACK" is not returned, it will be retried, however, if "ACK" is not returned even at retry time, it will be disconnected. Time specified here is maximum waiting time for one action from data sending till ACK return.</p> |

■ "Node settings other than GP series node settings" Screen

By using [Time-out period for slow line between nodes], you can specify the setting of communication between particular nodes in details, when transmission speed of communication with a particular node differs from that with other nodes due to different pathway.

As for the communication with the node not specified in [Time-out period for slow line between nodes], [Default Settings] is adopted.

| Setting item | | Setting content |
|------------------|---------|--|
| Default Settings | TimeOut | <p>Enter a timeout period for communication (ms). You can specify the period in the range from min. 300ms to max. 86400000ms (24 hours). When receiving the requests for writing and reading simultaneously, each request will be processed in order.</p> <p>Adjust the timeout period using the following reference.</p> <p>For ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP-3200/3400/3500/3600/3700 Series, LT3000 or Pro-Server EX Nodes Timeout period = 300ms + Number of receiving requests simultaneously x 60ms or more</p> <p>For GP-3300 Series Timeout period = 300ms + Number of receiving requests simultaneously x 120ms or more</p> |
| | Retry | <p>Specifies the number of retry frequency under communication. You can set the number up to 32. Retrying is not performed by entering "0".</p> |

| Setting item | | Setting content |
|---|-------------------------------|---|
| Time-out period for slow line between nodes | Node | Select the node where the communication timeout period is specified. You can specify the communication timeout period for each pair of nodes. Click the display list and select the nodes to be specified. |
| | 1st time 2nd time or Later | Specifies the first and the later timeout period under communication. Click the display field and enter the timeout period to be specified. <div>NOTE</div> <ul style="list-style-type: none">When initial connection to the network takes some time like a dial-up connection, you can specify the timeout period for the first and later individually. |
| | Retry | Specifies the number of retry frequency under communication. Click the display field and enter the retry frequency to be specified. |

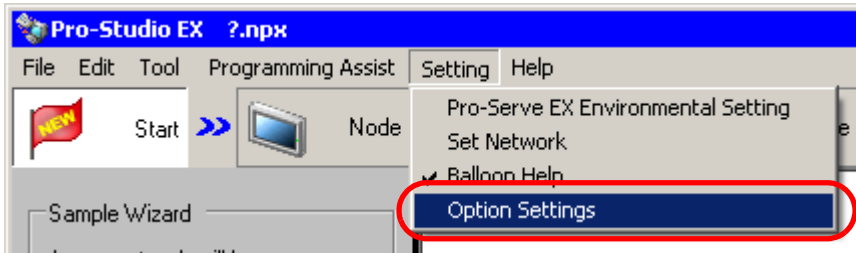
34.3 Option Settings

This section describes the option settings of 'Pro-Server EX'.

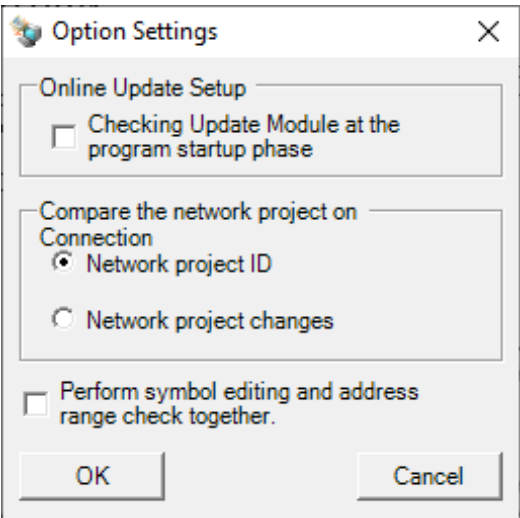
1 Click [Option Settings] from [Setting] on the start screen.

NOTE



- The setting defined in the [Option Settings] dialog box's [Compare the network project on Connection] area is stored in the network project file. If you wish to switch between multiple network project files on one PC, network setup is required for every file.



2 Specify each item on the [Option Settings] screen.



| Setup Item | Setup content |
|---------------------|---|
| Online Update Setup | If you check [Checking Update Module at the program startup phase], you can check and execute software and manual updates via the Internet when starting 'Pro-Studio EX.' |

| Setup Item | Setup content |
|---|---|
| Compare the network project on Connection | <p>Select conditions to allow communication connection between nodes.</p> <ul style="list-style-type: none"> • Network project ID <p>This mode allows communication connection between nodes when the network project IDs match in both nodes. Each time you change the network project, you need to transfer the network project to all nodes, including those that are not affected by the changes.</p> <ul style="list-style-type: none"> • Network Project changes <p>This mode allows communication connection between nodes when target items for comparison included in the network project match in both nodes. Unless the changes of the network project affect target items for comparison, transfer the network project only to nodes that are affected by the changes. Refer to the following section for more details on the description of target items for comparison.</p> <p> " ■ Target items for comparison in the network project changes mode"</p> <p>NOTE</p> <ul style="list-style-type: none"> • When you change selection for [Compare the network project on Connection], execute the transfer to all nodes. • When using group symbols, select [ID Compare Mode]. • The network project changes mode is only valid only for a distribution type of data transfer. The reason is that the network projects cannot be compared in a collection type of data transfer, which operates only with the network project information held by the collection source nodes. • To select [Network Project changes], all the following conditions need to be satisfied. <ul style="list-style-type: none"> • A GP Series node is not included in the nodes. • Individual communication is used for the communication method. <p> " ◆ "Set Trigger Condition Details" Screen"</p> <ul style="list-style-type: none"> • The runtime version in the Pro-Server EX node is 1.24 or later. • The runtime version in the ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, and LT3000 nodes is 2.60 or later. |
| Perform symbol editing and address range check together | <p>Select this check box to always check the address range of each symbol in the Symbol Editing Screen. Values that are out of range display in red.</p> <p>NOTE</p> <ul style="list-style-type: none"> • This feature cannot check grouped symbols. To check grouped symbols, from the [Tool] menu select [Check consistency]. |

■ Target items for comparison in the network project changes mode

The network project changes mode requires consistency of target items for comparison as a communication connection condition between nodes. The changes to affect target items for comparison are described as follows: If the changes of the network project affect target items for comparison, you need to transfer the network project to all nodes.

| | |
|-------------------|--|
| Node | <ul style="list-style-type: none"> • Add/Delete devices in nodes • Change the text mode for devices in nodes |
| ACTION | <ul style="list-style-type: none"> • Add/Delete ACTION • Change the device address, type, or data count at a transfer source • Change the actual address, data type, or data count specified by the symbol when the symbol is specified at a transfer source by ACTION • Change the constant value or count when the constant is specified at a transfer source by ACTION • Change a start condition specified in ACTION • Change the receive notification settings |
| Data Transfer | <ul style="list-style-type: none"> • Add/Delete data transfer • Change the settings at a data transfer source or destination • Change the actual address, data type, or data count specified by the symbol when the symbol is specified at a transfer source or destination • Change the contents of the group (device address, data type, data count, array element count) when the group symbol is specified at a data transfer source or destination • Change the constant value or count when constant distribution is selected for data transfer • Change the receive notification settings |
| Trigger Condition | <ul style="list-style-type: none"> • Change the execution order for ACTION/Data Transfer |

34.4 Restrictions

The following restrictions will be applied when 'Pro-Server EX' is used by multiple logon users, or with the terminal service.

NOTE

- Depending on the operating system you are using, the display and part names may differ. If so, replace the names with those with similar features used in your system configuration.

- You must give the right of "Create global objects" to a user in the local security settings, and on the server side, you must register the 'Pro-Server EX' user on the network.

Make the setting as follows:

- 1 Select "Administrative Tools" and "Local Security Policy" under the "Control Panel".
- 2 Select "Local Policies" from "Security Settings", and double-click "Create global objects" under "User Rights Assignment".
- 3 Register the 'Pro-Server EX' user.

- The log viewer functions only in one location when 'Pro-Server EX' is used by multiple logon users, or with the terminal service.
- The "User Account Control" dialog box will be displayed before performing "Environmental Setting" and "Network Setup".

When it is displayed, click [Allow].

- To start 'Pro-Server EX' as a service or, to use it as the terminal service, or to use it with multiple logon users, the "User Account Control Function" must be disabled.

Refer to the following for the steps to disable the "User Account Control Function".

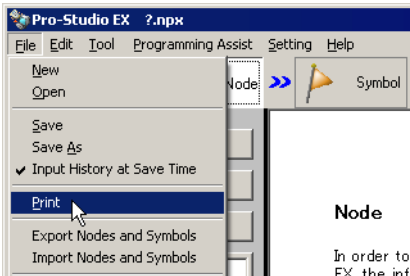
1. Select "User Account" under the "Control Panel".
2. Click [Change User Account Control settings].
3. Set the cursor to [Never notify].

35 | Printing

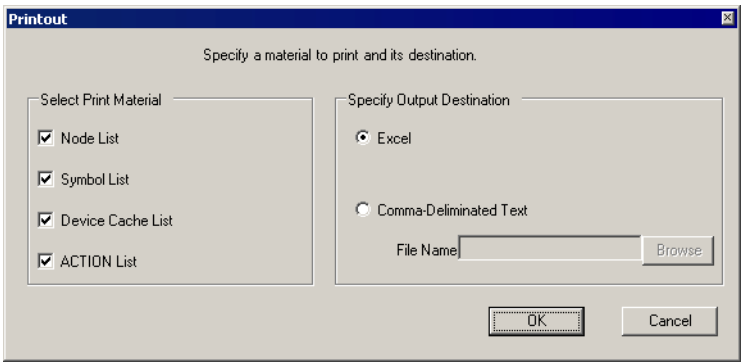
| | | |
|------|-------------------------------|------|
| 35.1 | Printing Network Project..... | 35-2 |
| 35.2 | Restrictions | 35-3 |

35.1 Printing Network Project

You can print information for node, symbol, device cache and action registered in a network project file.
The [File] of a menu bar is clicked and [Print] is chosen from a menu.



■ Printout

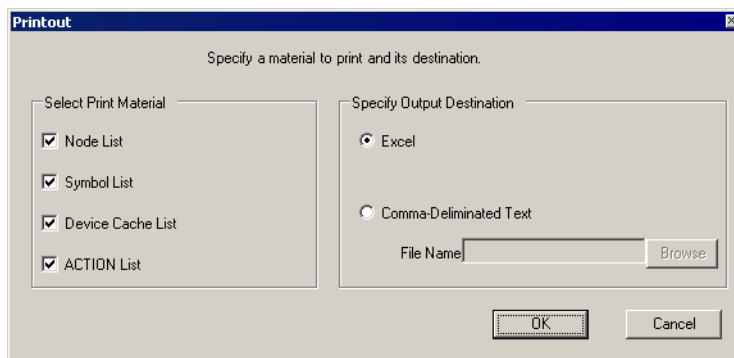


| Setting item | Setting content |
|--|---|
| Node List | Print node information registered in a network project file. |
| Symbol List | Print symbol information registered in a network project file. |
| Device Cache List | Print device cache information registered in a network project file. |
| ACTION List | Print ACTION information registered in a network project file. |
| Specify Output Destination Excel | You can output the destination to the Excel file for printing. If outputted to the Excel file, printing layout can be freely changed. |
| Specify Output Destination Comma-Delimited Text | You can output the destination to the comma-delimited text file for printing. If outputted to the comma-delimited text file, general software can be used and printed. |

35.2 Restrictions

This section describes the restriction when selecting more than one item from [Select Print Material] and specifying Excel in [Specify Output Destination] in the following printout dialog box for printing.

Click [OK] to display only one item among selected more than one item in the print preview screen.



To print all items at a time, close the displayed print preview screen first. Then, select all sheets while pressing the [Shift] key for printing.



36



Error Information

| | | |
|------|---|-------|
| 36.1 | 'Pro-Studio EX' Error | 36-2 |
| 36.2 | 2-Way Driver Error Messages and Syslog Features | 36-9 |
| 36.3 | 'Pro-Server EX' Error..... | 36-16 |
| 36.4 | Error Message..... | 36-60 |

36.1 'Pro-Studio EX' Error

| Error Message | Cause and Troubleshooting | Reference |
|--|---|------------------------------------|
| An undefined error occurred. | Some of the files configuring the program may be lost or damaged. Please check the destination folder of the installation. | - |
| Cannot open the network project. | The project info has contradiction. Please confirm that the project file is not damaged. | - |
| XX was not found. Please check whether the file name and the file storage location are correct. | Please check whether the network project file registered in the history information exists in the specified location. If moved, please specify and open the moved file. | - |
| Failed to save the network project file. | Please find the cause of the error, following the direction of the message. | - |
| Failed to create a backup file. | Please find the cause of the error, following the direction of the message. | - |
| Cannot open XX. | Loading may be failed due to erroneous configuration of project information, or a different version of network project file may be specified. Please confirm the program version. | - |
| Failed to write to the file. | Please specify the different location and re-write. | - |
| Cannot start the application. Application path: XX | The file configuring the program does not exist in the specified location. Please check whether the file exists in the displayed file path. If not existing, please reinstall. | 'Pro-Server EX Installation Guide' |
| The specified folder doesn't exist. Please check the folder name and specify a correct one again. | Please specify a correct folder. | - |
| Cannot open the PRW file. | Some of the files may be damaged. Please check the project file. | - |
| Cannot open the screen project file. | Some of the files may be damaged. Please check the project file. | - |
| PRW file was not found. | Please check whether the PRW file exists in the specified path. | - |
| ProPB may not be installed, or Auto-transfer may be invalid. | Please install the version accepting auto-transfer function of 'GP-PRO/PB III for Windows'. | - |
| Cannot start because ProPB is already running. | Please exit the running 'GP-PRO/PB III for Windows'. | - |
| Cannot start ProPB. | Please check if 'GP-PRO/PB III for Windows' is installed. When installed, 'GP-PRO/PB III for Windows' may be damaged, please install it again. | - |
| Error was found in the transfer preparation flag. | The specified screen project file may have been broken. Please specify an undamaged screen project file. | - |
| Nonexistent PLC code is used. Please check the installation status of driver. | Protocol installed in 'Pro-server EX' is not the latest version. Please update the protocol driver online. | - |

| Error Message | Cause and Troubleshooting | Reference |
|--|--|-----------|
| PLC type does not match. Please check the PLC type settings. | Protocol installed in 'Pro-server EX' is not the latest version. Please update the protocol driver online. | - |
| Cannot access the specified file. | The file may not exist in the specified location, or be controlled by access right. Please confirm the specified file again. | - |
| The specified file in PRW was not found. | Some of the files may be damaged. Please check the project file. | - |
| No PRW file name has been input. | Please input a PRW file name. | - |
| Failed to create a temporary saving file. | The temporary file creation folder may have little free space. Please check the space of the drive, and increase it if insufficient. | - |
| The specified file is not a PRW file. | Please specify a file of which extension is ".prw". | - |
| The specified screen project file is broken. Please specify the proper screen project file. | The specified screen project file may have been broken. Please specify an undamaged screen project file. | - |
| Failed to find symbol table file. | Some of the files may be damaged. Please check the project file. | - |
| Failed to get the device address. | Some of the files may be damaged. Please check the project file. | - |
| Failed to delete the temporary file. | Please execute it again. | - |
| Failed to read the setting file. | The specified screen project file may have been broken. Please specify an undamaged screen project file. | - |
| Failed to open the project file. | Please check if the specified screen project file exists. If yes, the specified screen project file may have been broken. Please specify an undamaged screen project file. | - |
| Failed to read the screen project file. | The specified screen project file may have been broken. Please specify an undamaged screen project file. | - |
| Error was found in the specified screen project file. | Some of the files may be damaged. Please check the project file. | - |
| No necessary data in the screen project file. | Some of the files may be damaged. Please check the project file. | - |
| Failed to create a temporary file. | The temporary file creation folder may have little free space. Please check the space of the drive, and increase it if insufficient. | - |
| The specified file is not a screen project file. Please specify a screen project file created by GP-Pro EX. | Please specify a file of which extension is ".prx" or ".prxe". | - |
| Failed to access the file obtained from display unit. | Some of the files may be damaged. Please check the project file. | - |

| Error Message | Cause and Troubleshooting | Reference |
|--|--|------------------------------------|
| No data in the specified file was found. | Some of the files may be damaged. Please check the project file. | - |
| Network project file have been already opened. | Network project file specified by the other 'Pro-Studio EX' have been opened. Therefore, please make edition in this file. | - |
| Please specify a group. | Please specify the group and execute it. | - |
| You don't have the right of access to the file XX. | Please check the access right to the specified network project. | - |
| No specified XX file was found. | Please check whether the specified file or folder exists. If you specified a network-destination file, please check whether the network is normal. | - |
| The specified file XX is unsupported or broken. | Please check the file format and the application that created the file. | - |
| The specified file XX is the one of an unsupported version. The necessary data table does not exist. | Please check the file format and the application that created the file. | - |
| The specified file XX is currently used by another program. | The specified file or some tables in the file are currently used by another application and locked. Please close the application and do the operation again. | - |
| A system error occurred during the access to the file XX. Operation will be interrupted. | Please check whether the specified file is not broken. Also, please confirm that this product's operating requirements and application software versions are supported. If not solved, install it again. | OPERATING ENVIRONMENT |
| A system error occurred during the internal operation of the network project. | Please reboot your PC. If not solved, install it again. | 'Pro-Server EX Installation Guide' |
| A system error occurred during the internal operation (Redo) of the network project. | Please reboot your PC. If not solved, install it again. | 'Pro-Server EX Installation Guide' |
| A system error occurred during the internal operation (Undo) of the network project. | Please reboot your PC. If not solved, install it again. | 'Pro-Server EX Installation Guide' |
| Insufficient disk space | Please check the space of the drive, and increase it if insufficient. | - |
| The media is write-protected. | Please check whether the file or folder is under control of access right. | - |
| The file does not exist or you do not have the access right. | Please check whether the file or folder is under control of access right. | - |
| The media is not ready. | Please find the cause of the error, following the direction of the message. | - |
| The symbol configuration is invalid. | Please delete the symbol sheet and register the symbols again. | - |

| Error Message | Cause and Troubleshooting | Reference |
|--|--|---|
| The Content folder of the installation-destination directory has no ACTION info. | Please execute Updating Installation to restore the ACTION. | - |
| DLL Load Error: | Please execute Updating Installation to restore the ACTION. | - |
| Failed in the latest update. | Please press Reference button and create the link again. | - |
| The specified node has been already registered in Device/PLC other than memory link. Please select existing node where memory link is registered, or register the node by changing its name. | Please select a node where memory link is set to Device/PLC, or specify a node, which is not registered. | "31.5 Setting Guide" |
| Cannot access the device access log file. | Please check whether the specified file exists. If exists, please confirm the right of access to the file. | "29.6 Device Access Log" |
| The XXth line of the device access log file is invalid. | Please correct or delete the specified line, and import the device cache buffer again. | "29.5.2 Import Registration from Device Access Log" |
| The no. of records in 1 cache buffer exceeded 1000. Import will be aborted. | The no. of device access log specifying the same node exceeds 1000. Please keep 1000 or less. | "29.5.2 Import Registration from Device Access Log" |
| In the device access log file, Node XX exists, which is not registered in the network project file. A line using an unregistered Node cannot be imported. | Please add the node, and import the device cache buffer again. | "29.5.2 Import Registration from Device Access Log" |
| Failed to read the alias file. | Confirm the text substitution table settings in editing the template file. | "5.1.2 Setting Guide" |
| No recipe with the specified record no. exists. | Confirm the No. of recipe record settings in editing the template file. | "12.3 Setting Guide" |
| The cell arrow settings are invalid. Scale or Arrow Start/End Value is wrong. | Confirm the cell arrow settings in editing the template file. | "5.3.2 Setting Guide" |
| Cannot write device values converted to strings. If you want to write them, please cancel the Replace specification. | You cannot write device values converted to strings. Please release the converting specification in writing. | "5.1.2 Setting Guide" |
| Cannot perform Test Read. Please confirm the followings. - The network project file has been correctly loaded into Pro-Server EX. - The target node is participating. - The cable is not broken. | Please confirm the followings. - if the network project file has been correctly loaded into Pro-Server EX. - if the target node is participating. - if the cable is not broken. | - |

| Error Message | Cause and Troubleshooting | Reference |
|---|--|--------------------------------|
| Cannot perform Test Write. Please confirm the followings. - The network project file has been correctly loaded into Pro-Server EX. - The target node is participating. - The cable is not broken. | Please confirm the followings. - if the network project file has been correctly loaded into Pro-Server EX. - The target node is participating. - The cable is not broken. | - |
| The Action Area was too small, so a portion of the data was cut off. | The Action output range is too small. Please expand the Action area in editing the template file. | Chapter of Excel Report Action |
| Could not identify the record no. because the recipe record no. has not been set Please configure the specification method of the record no. in the Recipe Settings dialog. | Please configure the specification method of the record no. in the Recipe Settings dialog. | "12.3 Setting Guide" |
| The Action Area was too small, so cannot write. | The Action output range is too small. Please expand the Action area in editing the template file. | Chapter of Excel Report Action |
| The Action area is too small. | The Action output range is too small. Please expand the Action area in editing the template file. | Chapter of Excel Report Action |
| Cannot execute the Trigger Button because ProEasy.dll was not found. Please confirm that 'Pro-Server EX' has been installed. | Please confirm that 'Pro-Server EX' has been installed. | - |
| During execution of the Trigger Button, a ProEasy.dll not supporting Pro-Server EX was used. Please confirm that 'Pro-Server EX' has been installed. | Please confirm that 'Pro-Server EX' has been installed. | - |
| Cannot execute the Trigger Button because an error occurred while writing device to Pro-Server EX. Pro-Server EX Error Code: | Please open the Action settings and create the Trigger Button again. | "5.6.2 Setting Guide" |

| Error Message | Cause and Troubleshooting | Reference |
|---|------------------------------------|-----------------------|
| It contains a character unavailable as button name or starts with a numeral. Disabled character: + - * / % & ^ < > : @ . , ' ' [] ? = # (except the head) SPACE TAB | Confirm the button name. | "5.6.2 Setting Guide" |
| The Button Name is too long. It must be within 32 characters. | | |
| Cannot confirm that the Button Name is correct because ProEasy.dll was not found. Do you want to continue configuration? | | |
| Cannot check whether the button name is correct because a ProEasy.dll not supporting Pro-Server EX was used during executing the Trigger Button. Do you want to continue configuration? | | |
| The Caption Name is too long. It must be within 256 characters. | Please confirm the Button Caption. | "5.6.2 Setting Guide" |
| Cannot check for Button Name overlapping because Excel Form Action Add-in was not found. The Button Name will be saved as it is. | Confirm the button name. | "5.6.2 Setting Guide" |
| The specified Button Name is already in use. Please specify another Button Name. | | |
| The following characters are invalid in a file name. (\ / : * ? " < > ;) | Confirm the file name. | "5.5.3 Setting Guide" |
| The following characters are invalid in a folder name. (/ * ? " < > ;) | Confirm the folder name. | "5.5.3 Setting Guide" |
| The following characters are invalid in a sheet name. (: \ / ? * []) | Confirm the sheet name. | "5.5.3 Setting Guide" |
| In the File Name Specification, you have not set any file name. Please set one. | Please set the file name. | "5.5.3 Setting Guide" |
| In the Folder Name Specification, you have not set any folder name. Please set one. | Please set the folder name. | "5.5.3 Setting Guide" |
| In the Sheet Name Specification, you have not set any sheet name. Please set one. | Please set the sheet name. | "5.5.3 Setting Guide" |

| Error Message | Cause and Troubleshooting | Reference |
|--|---|-----------------------|
| Macro Execution has not been set. Please set one. | Please set the Macro execution. | "5.5.3 Setting Guide" |
| Please set a folder name. | Please specify the folder of the file to be exported. | "5.5.3 Setting Guide" |
| Cannot set the same Action Areas in a line. | Please set the Action for different areas in a line. | "5.5.3 Setting Guide" |
| Up to 32 Unicode characters can be inputted as a trigger command name. | Confirm the trigger command name. | "5.5.3 Setting Guide" |
| The inputted character is invalid. | | |
| No trigger condition found. Please check that one or more trigger conditions have been registered. | Please register the new trigger condition. | "5.5.3 Setting Guide" |
| No trigger button found. Please check that one or more trigger buttons have been registered | Please register the new trigger button. | "5.5.3 Setting Guide" |

36.2 2-Way Driver Error Messages and Syslog Features

When an error occurs, the 2-Way driver shows the following errors in the left bottom of the display unit screen.

| Screen Display | Meaning |
|----------------|--------------------|
| SYSTEM ERROR | System call error |
| 2Way ERROR | 2-Way Driver error |

System Errors

A system error is a fatal error.

2-Way Errors

A 2-Way error is an error that has occurred due to the 2-Way Driver.

When a 2-Way error occurs, the [2-Way Transfer Error Code] is saved to the display unit's LS2075 address.

Syntax: 2Way ERROR(<Cause No. >:<Error No. 1>:<Error No. 2>:<Error No. 3>)

| Reason Code | Error Type | | | | Cause | Required action | 2-Way Error Code |
|-------------|------------|--------|--------|--------|---|--|------------------|
| | | 1 | 2 | 3 | | | |
| 30 | Fatal | Unused | Unused | Unused | Insufficient GP resources. | Internal problem. Please contact the Pro-face customer care center when it occurred. | FF30 |
| 31 | Fatal | Unused | Unused | Unused | Cannot release GP resources | Internal problem. Please contact the Pro-face customer care center when it occurred. | FF31 |
| 32 | Fatal | Unused | Unused | Unused | Cannot release GP resources | Internal problem. Please contact the Pro-face customer care center when it occurred. | FF32 |
| 40 | Fatal | Unused | Unused | Unused | IP address & Port number are not registered | Either the display unit's IP address or the port number has not been set. Reset it such as on the offline screen. | FF40 |
| 41 | Fatal | Unused | Unused | Unused | The symbol state is different than GLC control. | The symbol state is different than GLC control. The GLC symbol differs from the symbol imported to the network project of Pro-Server. Import the latest symbol to the network project, and then transfer it to GLC | FF41 |

| Reason Code | Error Type | | | | Cause | Required action | 2-Way Error Code |
|-------------|------------|--------|------------------------------|--|---|--|------------------|
| | | 1 | 2 | 3 | | | |
| 51 | Fatal | Unused | Unused | Refer to protocol stack error code | Protocol Stack Call up error. | This means that an error occurred with the display unit's communication program (TCP/IP). Indicates that an error occurred with the display unit communication program (TCP/IP). Check the contents of the Ethernet setting in the offline screen. | FF51 |
| F0 | Warning | 0 | Unused | 2580 | After transmit command was sent, Device Write was ignored due to insufficient Receiver memory | Receiving memories may lack at the node to be provided. Either lengthen the issuing interval of the provider command or decrease the volume of sending data. | 2580 |
| | | 0 | Unused | 25A8 | After transmit command was sent, Receiver unable to find data. | Network project files are different between the node to be provided and the provider source. Transfer the same network project file. | 25A8 |
| | | 0 | Unused | 25A9 | After transmit command (with reply) was sent, no reply was received from Receiver. | Either communication damage has occurred or provider information may differ. Either check communication state or transfer the network project file again. | 25A9 |
| | | 0 | Unused | Code is different from above | Refer to "36.4 Error Message". | | |
| | | C0 | Code is different from above | | For the GP node(s) connected to 'Pro-Server EX', error codes start with C0. Refer to "36.3 'Pro-Server EX' Error" for more details. | | |
| | | 1 | Except display unit | Refer to the manual of each PLC maker. | After issuing a provider command, device write failed at the node to be provided. Refer to the manual of each PLC maker. | Write failed due to a communication error occurred with PLC. Refer to the operation manual of the PLC maker and check workaround corresponding to the error code. | FFF0 |

Protocol Stack Error Codes

The following protocol stack error codes are displayed on the display unit screen.

| Error Code | Meaning | Required action |
|------------|--|--|
| 1000 | Current node IP Address entry failed during initialization | The IP address setup of the self node is incorrect. Reset it such as on the offline screen. |
| 1005 | Initialization failed | Check if the Ethernet unit is normally set. |
| 1006 | Transmit Halt processing failed | Internal problem. Please contact the Pro-face customer care center when it occurred. |
| 1007 | Initialization is performed again, without previous initialization being completely terminated | Internal problem. Please contact the Pro-face customer care center when it occurred. |
| 1008 | Provider Node Port number error | The port number of the self node is out the designated range. Reset it such as on the offline screen. |
| 1009 | Receiver Node port number error. | The port number of the partner node is out the designated range. Reset it such as on the offline screen. |
| 100A | Receiver Node IP Address error. | The IP address setup of the partner node is incorrect. Reset it such as on the offline screen. |
| 100B | UDP was used to register this port number | The port number of PLC communication overlaps with that for 2Way. Check the setup of the self node port. |
| 100C | TCP was used to connect an adjacent port with a port having the same number. | The TCP port is used for the same partner node using the same port number. Check if the port number of the partner node is duplicated. |
| 100D | Protocol Stack establishment refused | Internal problem. Please contact the Pro-face customer care center when it occurred. |
| 100E | Protocol Stack Open Failure(value)was returned | Internal problem. Please contact the Pro-face customer care center when it occurred. |
| 100F | The(communication)connection has been cut. | The TCP connection is closed by the partner node. Check if there are any problems with the communication setup. |
| 1010 | All connections are currently in use. | The communication connection with the display unit is at maximum. Exit one application, and then reconnect it. |
| 1013 | Receiver has aborted(communication). | The TCP connection is aborted by the partner node. Check if there are any problems with the communication setup. |
| 101D | No Ethernet controller | Expansion Ethernet unit is required when using GP-2401/GP-2501/GP-2601 Series units |
| 1030 | No response from the protocol stack. | Internal problem. Please contact the Pro-face customer care center when it occurred. |
| 1032 | No response from the Receiver. | A problem occurred on communication with the partner node. Check the connection state including cables. |

NOTE

- When the error type is fatal, the 2-Way Driver cannot be restored.
 - When the error type is Warning, the 2-Way Driver continues to operate. Once the cause of the error is removed, the error display will disappear when the display unit's screen changes.
 - When the Reason Code is "F0", the "<Alarm Issued Time>" and "<Receiver IP Address>" will also be displayed.
-

SYSLOG

If the SYSLOG file(SYSLOG.EXE), located inside the Pro-Server's system folder, is started, the following data can be checked.

The 2-Way Driver downloaded to the display unit can perform a variety of tasks, among them being the output of SYSLOG data.

You can select the type of SYSLOG data output via the display unit OFFLINE mode's [SYSLOG Information Settings].

The correspondence of the Output Level and the output producing SYSLOG Priority level is shown below.

| Output Level | SYSLOG Output Priority Level |
|--------------|------------------------------|
| 0 | No correspondence |
| 1 | INFO, |
| 2 | INFO,NOTICE |
| 3 | INFO,NOTICE,WARNING |
| 4 | INFO,NOTICE,WARNING,DEBUG |

SYSLOG Output Information

| SYSLOG Level | ECOM Response | SYSLOG Text |
|--------------|-------------------|--|
| INFO | Starts ONLINE | gp[17]:start online |
| INFO | Starts OFFLINE | gp[17]:start offline |
| WARNING | Processing Failed | gp[17]:bel:fail,<Processing Failed Text><Argument1> |
| DEBUG | Device Read | gp[17]:rdev:<Argument2> |
| DEBUG | Device Write | gp[17]:wdev:<Argument2> |
| DEBUG | Command Received | gp[17]:bel:<Command Text1>,recv from <IP address>(<port>)<Argument3> |
| DEBUG | Command Sent | gp[17]:bel:<Command Text2>,send to <IP address>(<port>)<Argument3> |
| DEBUG | s201 File Read | gp[17]:s201:<Command Text3>< Argument4> send to<IP address> |

| Failed Processing String | Meaning |
|-----------------------------------|--|
| read device | Failed in reading from the device |
| write device | Failed in writing to the device. |
| sync provide, response timeout | No return data received from the receiver node after providing data. |
| sync provide, fail to read device | Failed in reading from the device when providing data. |
| lack memory | Command ignored due to insufficient 2-Way driver memory. |
| first trigger on | The command to enable the first trigger failed. |
| second trigger on | The command to enable the second trigger failed. |
| backup data read | Failed in reading the backup data. |

| Command String 1 | Contents |
|-------------------|-----------------------------|
| response | Receives the response. |
| sync provide | Provides the data. |
| read device | Reads from the device. |
| write device | Writes to the device. |
| get node property | Reads the node property. |
| first trigger on | Enables the first trigger. |
| second trigger on | Enables the second trigger. |
| backup data read | Reads the backup data. |

| Command String 2 | Contents |
|---|---|
| sync provide, broadcast | Provides the data(Broadcast, no response). |
| sync provide, send each | Provides the data(Peer to Peer, no response). |
| sync provide, broadcast and wait for response | Provides the data(Broadcast, with response). |
| sync provide, send each and wait for response | Provides the data(Peer to Peer, with response). |
| sync provide, response | Provide data response. |
| read device, response | Device read response. |
| write device, response | Device write response. |
| write device, response(retry) | Write to device(Retry)response. |
| get node property, response | Read node property response. |
| first trigger on, response | First trigger enable response. |
| second trigger on, response | Second trigger enable response. |
| backup data read, response | Read backup data response. |

| Command String 3 | Contents |
|----------------------|---|
| register as sender | Registers provide data command as sender(provider). |
| register as receiver | Registers provide data command as receiver. |

Argument1(<String>=<Value>)

| String | Value | Value display format |
|--------|-----------|----------------------|
| err | Error No. | Hex. |
| pr | ProjectID | Hex. |
| ow | OwnerApp | Hex. |
| ma | MajorNo | Hex. |
| mi | MinorNo | Hex. |

Argument2(<String>=<Value>)

| Character string | Value | Value display format |
|------------------|--------------------|----------------------|
| code | Device Code | Hex. |
| addr | Device Address | Hex. |
| pack | DataPack | Hex. |
| kind | DataKind | Hex. |
| count | Data count by Word | Hex. |
| d0 | First data (1WORD) | Hex. |

Argument3(<String>=<Value>)

| Character string | Value | Value display format |
|------------------|-----------|----------------------|
| pr | ProjectID | Hex. |
| ow | OwnerApp | Hex. |
| ma | MajorNo | Hex. |
| mi | MinorNo | Hex. |
| dl | DataLen | Hex. |
| va | Validity | Hex. |

Argument4(<String>=<Value>)

| Character string | Value | Value display format |
|------------------|----------------|----------------------|
| rn | ResourceNo | Hex. |
| pack | DataPack | Hex. |
| kind | DataKind | Hex. |
| count | ProvidCount | Hex. |
| howto | HowTo | Hex. |
| ext | ExtDevType | Hex. |
| code | Device Code | Hex. |
| addr | Device Address | Hex. |
| retry | RetryCount | Hex. |
| wait | RetryWaitTime | Hex. |

36.3 'Pro-Server EX' Error

36.3.1 "REAA****" Error Info

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|---|--|
| 0xC0A10001 REAA001 -1063190527 3231776769 | Failed to read the device set in the "Transfer Source" of the "Action/Data Transfer (XX)". (XX: Action/Data Transfer Name) | Failed to read the device specified as "Transfer from". Please confirm the device set in "Action/Data Transfer" of Pro-Studio EX. | Chapter of corresponding Action |
| 0xC0A10002 REAA002 -1063190526 3231776770 | Failed to write the device set in the "Transfer Source" of the "Action/Data Transfer (XX)". (XX: Action/Data Transfer Name) | Failed to write the device specified as "Transfer to". Please confirm the device set in "Action/Data Transfer" of Pro-Studio EX. | Chapter of corresponding Action |
| 0xC0A10003 REAA003 -1063190525 3231776771 | Could not store the IP address of the node where the error occurred. (Trigger Condition: XX) (XX: Trigger condition name) | Could not store the IP address of the abnormal node. Please confirm "Save Abnormal IP Address in" set in the screen of "Set Trigger Condition Details" of 'Pro-Studio EX'. | "◆ "Set Trigger Condition Details" Screen" of "33.1.1 Types of Trigger Conditions" |
| 0xC0A10004 REAA004 -1063190524 3231776772 | Could not store the error code (Trigger Condition: XX) (XX: Trigger condition name) | Could not store the error code. Please confirm "Save Error Code in" set in the screen of "Set Trigger Condition Details" of 'Pro-Studio EX'. | "◆ "Set Trigger Condition Details" Screen" of "33.1.1 Types of Trigger Conditions" |
| 0xC0A10005 REAA005 -1063190523 3231776773 | Could not write the "Processing Result Success-or-Failure Bit" (Trigger Condition: XX) (XX: Trigger condition name) | Failed to write the "Processing Result Success-or-Failure Bit". Please confirm "Bit Showing Processing Result (Success/Failure)" set in the screen of "Set Trigger Condition Details" of 'Pro-Studio EX'. | "◆ "Set Trigger Condition Details" Screen" of "33.1.1 Types of Trigger Conditions" |
| 0xC0A10006 REAA006 -1063190522 3231776774 | Could not write the "Processing Completion Bit" (Trigger Condition: XX) (XX: Trigger condition name) | Failed to write the "Processing Completion Bit". Please confirm "Processing Completion Bit" set in the screen of "Set Trigger Condition Details" of 'Pro-Studio EX'. | "◆ "Set Trigger Condition Details" Screen" of "33.1.1 Types of Trigger Conditions" |
| 0xC0A10007 REAA007 -1063190521 3231776775 | Could not clear the "Trigger Condition device" (Trigger Condition: XX) (XX: Trigger condition name) | Failed to clear the "Trigger Condition Device". Please confirm the device set in the screen of "Set Trigger Condition Details" of 'Pro-Studio EX'. | "33.1.1 Types of Trigger Conditions" |
| 0xC0A10008 REAA008 -1063190520 3231776776 | Could not read the "Trigger Condition device" (Trigger Condition: XX) (XX: Trigger condition name) | Failed to read the "Trigger Condition Device". Please confirm the device set in the screen of "Set Trigger Condition Details" of 'Pro-Studio EX'. | "33.1.1 Types of Trigger Conditions" |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|--|---------------------------------|
| 0xC0A10009 REAA009 -1063190519 3231776777 | Could not write the "Receive Notification Device" (Action/Data Transfer: XX) (XX: Action/Data Transfer name) | Failed to write to the "Receive Notification Device". Please confirm "Receive Notification Device" set in the screen of "ACTION Node/Process Completion Notification Settings" of 'Pro-Studio EX'. | Chapter of corresponding Action |
| 0xC0A1000A REAA010 -1063190518 3231776778 | Transfer network project changes: Unable to run Action/Data Transfer (XX). Reason: XX | Transfer network project to all participating nodes related to [Action/Data Transfer]. | 34.3 Option Settings |
| 0xC0A1000B REAA011 -1063190517 3231776779 | Compare NPX Project on Connection do not match. As a result, unable to run Action/Data Transfer. | | |
| 0xC0A1000C REAA012 -1063190516 3231776780 | Data transfer information in the source and destination nodes do not match. | | |
| 0xC0A1000D REAA013 -1063190515 3231776781 | Data transfer information in the source and destination nodes do not match. (Location XX-XX) | | |
| 0xC0A1000E REAA014 -1063190514 3231776782 | Data transfer destination node and runtime versions are not compatible. | Update to a new version of the run time on all participating nodes related to [Action/Data Transfer]. | |
| 0xC0A10010 REAA016 -1063190512 3231776784 | Could not use the XX port (No: XX). (XX: Part name/No.) | The system port number may be in use. | - |
| 0xC0A10011 REAA017 -1063190511 3231776785 | Attempted to access a write-protect area (XX) (XX: Device name) | Cannot write to Write Inhibit Area (LS0000-LS0019, LS2032-LS2095, LS9000-LS9999) via D-Script or Network. | - |
| 0xC0A10012 REAA018 -1063190510 3231776786 | Attempted to access a device outside the address range (XX) (XX: Device name) | Attempted to access an out-of-range device. | - |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|---|------------------------------|
| 0xC0A10015 REAA021 -1063190507 3231776789 | An invalid ID (Node, Device, Address) has been specified. | An invalid ID was specified. Attempted to access a nonexistent device. | - |
| 0xC0A10016 REAA022 -1063190506 3231776790 | An invalid ID (Node, Device, Address) has been specified. | An invalid ID was specified. Attempted to access a nonexistent device. | |
| 0xC0A1001A REAA026 -1063190502 3231776794 | Illegal/Undefined Device Address | An invalid device was specified. Attempted to access a nonexistent device. | - |
| 0xC0A1001B REAA027 -1063190501 3231776795 | Illegal/Undefined Device Address | | |
| 0xC0A1001C REAA028 -1063190500 3231776796 | Illegal/Undefined Device Address | | |
| 0xC0A1002A REAA042 -1063190486 3231776810 | Could not complete 'Action/Data Transfer (XX)' within the time of Data Transfer Timeout. | An error may have occurred during communication with a network node or a connected device/PLC. Check the devices configured in Pro-Studio's [Action/Data Transfer]. | - |
| 0xC0A1002B REAA043 -1063190485 3231776811 | Could not start 'Action/Data Transfer (XX)' because the previous 'Action/Data Transfer (XX)' had been executed. | Wait awhile, then run [Action/Data Transfer] again. | - |
| 0xC0A1001D REAA029 -1063190499 3231776797 | Unable to use device's Device ID (XX) | Define the equipment ID that matches the series associated with the indirect devic/PLC. | "GP-Pro EX Reference Manual" |
| 0xC0A10030 REAA048 -1063190480 3231776816 | Warning: You cannot use some of Pro-Server features because the network-project file is in an old format. | Please transfer the network-project file again using the latest 'Pro-Studio EX'. | - |
| 0xC0A10031 REAA049 -1063190479 3231776817 | Warning: You cannot use some of Pro-Server features because the network-project file is in a new format. | Please execute forced transfer using the latest 'GP-Pro EX'. Then transfer the network-project file again using 'Pro-Studio EX'. | - |
| 0xC0A10032 REAA050 -1063190478 3231776818 | You cannot use Pro-Server features because the network-project file is in an unusable old format. | Please transfer the network-project file again using the latest 'Pro-Studio EX'. | - |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|--|-----------|
| 0xC0A10033 REAA051 -1063190477 3231776819 | You cannot use Pro-Server features because the network-project file is in an unusable new format. | Please execute forced transfer using the latest 'GP-Pro EX'. Then transfer the network-project file again using 'Pro-Studio EX'. | - |
| 0xC0A10034 REAA052 -1063190476 3231776820 | You cannot use Pro-Server features because the network-project file is in an unknown format or damaged. | Please transfer the network-project file again using 'Pro-Studio EX'. | - |
| 0xC0A10040 REAA064 -1063190464 3231776832 | A communication error occurred during communication with the destination node. Please confirm that the network connection to the node has been properly established. | Please forcibly transfer the system using 'GP-Pro EX'. | - |
| 0xC0A10041 REAA065 -1063190463 3231776833 | The destination node did not responded within the specified time. Please confirm that the network connection to the node has been properly established. | Please check whether the network cable between the local node and the destination node etc. is correctly connected. | - |
| 0xC0A10042 REAA066 -1063190462 3231776834 | The destination node did not responded within the specified time. Please confirm that the network connection to the node has been properly established. | Please check whether the network cable between the local node and the destination node etc. is correctly connected. | - |
| 0xC0A10043 REAA067 -1063190461 3231776835 | Communication with the destination Node stopped because the destination or local Node closed. | Please check whether the network cable between the local node and the destination node etc. is correctly connected. | - |
| 0xC0A10044 REAA068 -1063190460 3231776836 | Unable to connect to server. Server authentication failed. | Please enter the correct authentication information on the viewer. | - |
| 0xC0A10045 REAA069 -1063190459 3231776837 | You do not have permission to run the operation in the viewer. | Increase the security level on the viewer. | - |
| 0xC0A10046 REAA070 -1063190458 3231776838 | [Writing from GP-Viewer] of the server setup is disable. The process can not be executed. | Tried to write into the Device/PLC by pressing the switch from the viewer while [Writing from GP-Viewer] is disabled in the server settings. Change the setting if writing is necessary. This error also occurs when the screen is switched from 'GP-Viewer EX' in the synchronous mode. | - |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|---|------------------------------|
| 0xC0A1004A REAA074 -1063190454 3231776842 | Failed to write to SRAM. | Failed to update SRAM. Update SRAM again. | - |
| 0xC0A1004B REAA075 -1063190453 3231776843 | Failed to read from SRAM. | Failed to update SRAM. Update SRAM again. | - |
| 0xC0A10050 REAA080 -1063190448 3231776848 | Can not load Web Server. | Please forcibly transfer the system using 'GP-Pro EX'. | - |
| 0xC0A10051 REAA081 -1063190447 3231776849 | Web Server is not trasferred | Please forcibly transfer the system using 'GP-Pro EX'. | - |
| 0xC0A10052 REAA082 -1063190446 3231776850 | Can not start Web Server | Please forcibly transfer the system using 'GP-Pro EX'. | - |
| 0xC0A10060 REAA096 -1063190432 3231776864 | Master IP address in Ethernet Multilink is invalid or uses IP address of the display unit (XX). | Change the master node's IP address (node that is displaying the message) and transfer the screen project again. Or, change the IP address of the current node. | "GP-Pro EX Reference Manual" |
| 0xC0A10070 REAA112 -1063190416 3231776880 | Failed to read data. Too many addresses to read from server. Or, too many GP-Viewer EX may be connected. | Edit the screen project to reduce the number of used device points, then transfer again. Or, reduce the number of simultaneous GP-Viewer connections to a single server. | |
| 0xC0A10071 REAA113 -1063190415 3231776881 | Too many devices to register in the device cache. Direct read will be used instead.(XX) | Reduce the number of device points that are registered as the Always type in the device cache. | |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

36.3.2 "RYAA****" Error Info

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|--|----------------------|
| 0xC0AF0001 RYAA001 -1062273023 3232694273 | The specified shared memory already exists. | A fatal error occurred. Please perform forced transfer of 'GP-Pro EX', and then execute transfer again. | "26.1 Setting Guide" |
| 0xC0AF0002 RYAA002 -1062273022 3232694274 | The specified shared memory does not exist. | | |
| 0xC0AF0003 RYAA003 -1062273021 3232694275 | A shared memory already exists, but its memory size is less than specified. | Please close another application or restart the PC. | - |
| 0xC0AF0004 RYAA004 -1062273020 3232694276 | Cannot create a shared memory due to insufficiency of memory or resource. | | |
| 0xC0AF0005 RYAA005 -1062273019 3232694277 | Could not start TdasEngine because it is already in execution or termination. | A fatal error occurred. Please perform forced transfer of 'GP-Pro EX', and then execute transfer again. | "26.1 Setting Guide" |
| 0xC0AF0006 RYAA006 -1062273018 3232694278 | Could not stop TdasEngine because it is already in suspension or termination. | | |
| 0xC0AF0007 RYAA007 -1062273017 3232694279 | Could not register the operation in TdasEngine. | | |
| 0xC0AF0008 RYAA008 -1062273016 3232694280 | Cannot execute State Transition of TdaInfo because a small service is now in transition. | A fatal error occurred. Please perform forced transfer of 'GP-Pro EX', and then execute transfer again. | "26.1 Setting Guide" |
| 0xC0AF0009 RYAA009 -1062273015 3232694281 | The device name (XX) specified as the destination NODE does not exist. (XX: Device/PLC name) | Device name specified by the node for 'Pro-Server Ex' and that for the display unit does not match. Please match these names. In the case that these name match, the network project may not be transferred to the remote node. Please transfer the network project to the remote node again. | "25.1 Setting Guide" |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|---|----------------------|
| 0xC0AF000A RYAA010 -1062273014 3232694282 | Cannot execute the operation due to the invalid state of the small service. | A fatal error occurred. Please perform forced transfer of 'GP-Pro EX', and then execute transfer again. | "26.1 Setting Guide" |
| 0xC0AF000B RYAA011 -1062273013 3232694283 | Cannot execute the operation because the small service is not in operation. | | |
| 0xC0AF000C RYAA012 -1062273012 3232694284 | Cannot execute the operation because the small service is in suspension. | A fatal error occurred. Please perform forced transfer of 'GP-Pro EX', and then execute transfer again. | "26.1 Setting Guide" |
| 0xC0AF000D RYAA013 -1062273011 3232694285 | The I/F of an unsupported small service was called. | | |
| 0xC0AF0010 RYAA016 -1062273008 3232694288 | Could not register the item because of insufficient memory. | Please close another application or restart the PC. | - |
| 0xC0AF0011 RYAA017 -1062273007 3232694289 | Accessed a device in which no item is registered. | A fatal error occurred. Please perform forced transfer of 'GP-Pro EX', and then execute transfer again. | "26.1 Setting Guide" |
| 0xC0AF0012 RYAA018 -1062273006 3232694290 | Accessed an out-of-range device. | Attempted to access an out-of-range device. | - |
| 0xC0AF0013 RYAA019 -1062273005 3232694291 | Failed to register the specified cluster because an invalid item is specified in it. | A fatal error occurred. Please perform forced transfer of 'GP-Pro EX', and then execute transfer again. | "26.1 Setting Guide" |
| 0xC0AF0014 RYAA020 -1062273004 3232694292 | The specified data type is invalid. | | |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|---|---------------------------------|
| 0xC0AF0015 RYAA021 -1062273003 3232694293 | The specified access type is illegal. | A fatal error occurred. Please perform forced transfer of 'GP-Pro EX', and then execute transfer again. | "26.1 Setting Guide" |
| 0xC0AF0016 RYAA022 -1062273002 3232694294 | The specified data type is illegal. | | |
| 0xC0AF0017 RYAA023 -1062273001 3232694295 | The no. of data you specified is too many to write (Please reduce it to XX or fewer) (XX: Data number) | | |
| 0xC0AF0018 RYAA024 -1062273000 3232694296 | The operation result to write is below the lower limit value. | Attempted to write an out of range value. Please change the setting to write an in-range value. | "27 Designing Your Own Program" |
| 0xC0AF0019 RYAA025 -1062272999 3232694297 | The operation result to write is beyond the upper limit value. | | |
| 0xC0AF001A RYAA026 -1062272998 3232694298 | Could not send processing request to the network destination due to insufficient memory. | Please close another application or restart the PC. | - |
| 0xC0AF001B RYAA027 -1062272997 3232694299 | The specified group was not found. | A fatal error occurred. Please perform forced transfer of 'GP-Pro EX', and then execute transfer again. | "26.1 Setting Guide" |
| 0xC0AF001C RYAA028 -1062272996 3232694300 | The two compared access tickets differ in their nodes, equipment, or devices. | A fatal error occurred. Please perform forced transfer of 'GP-Pro EX', and then execute transfer again. | "26.1 Setting Guide" |
| 0xC0AF001D RYAA029 -1062272995 3232694301 | The specified access ticket is not for this node. | | |
| 0xC0AF001E RYAA030 -1062272994 3232694302 | Could not register the cache because of insufficient memory. | Please close another application or restart the PC. | - |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|--|---------------------------------------|
| 0xC0AF0020 RYAA032 -1062272992 3232694304 | The access ticket you tried to use in block access is not of the block type. | A fatal error occurred. Please perform forced transfer of 'GP-Pro EX', and then execute transfer again. | "25.1 Setting Guide" |
| 0xC0AF0021 RYAA033 -1062272991 3232694305 | The small service to process was not found. | | |
| 0xC0AF0022 RYAA034 -1062272990 3232694306 | The size of block access to the device exceeded the limit. | The max buffer size for Device Block Write/Read is 10KB. Please set a size less than that. | - |
| 0xC0AF0025 RYAA037 -1062272987 3232694309 | The no. of requests to Read/Write via network at a time exceeded the limit (XX). (XX: Device no.) | Please recheck the settings of requests from 'Pro-Server EX' and 'GP-Pro EX' to the network destination, and redesign the system to limit the no. of requests to the max value. | - |
| 0xC0AF0030 RYAA048 -1062272976 3232694320 | Communication error occurred during communication with the destination node. Please confirm that the network connection to the node has been properly established. | <ul style="list-style-type: none"> • Please check whether the network cable between the local node and the destination node etc. is correctly connected. • In the destination node's [Port Control], confirm the Pro-Server EX port is open. Set [Port Control] from the [Security Settings] screen in offline mode. | "2.2 Connecting PC with display unit" |
| 0xC0AF0031 RYAA049 -1062272975 3232694321 | The destination node did not responded within the specified time. Please confirm that the network connection to the node has been properly established. | - | - |
| 0xC0AF0032 RYAA050 -1062272974 3232694322 | The destination node did not responded within the specified time. Please confirm that the network connection to the node has been properly established. | - | - |
| 0xC0AF0033 RYAA051 -1062272973 3232694323 | Communication with the destination Node stopped because the destination or local Node closed. | Please place remote node online. Or restart Pro-Server EX. | - |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|---|------------------------------|
| 0xC0AF0040 RYAA064 -1062272960 3232694336 | Failed to read the device. | The data may have been read into an illegal or undefined device address. Please specify a proper device address. | - |
| 0xC0AF0041 RYAA065 -1062272959 3232694337 | Failed to write the device. | The data may have been written into an illegal or undefined device address. Please specify a proper device address. | |
| 0xC0AF0045 RYAA069 -1062272955 3232694341 | The specified request is not supported. | Please upgrade 'GP-Pro EX' to a supported version by transferring the system with 'GP-Pro EX'. Or the Node Type set in the 'Pro-Studio EX' Node Settings may be different from the actual model. Please confirm that the Node Type is properly set. | "31.5 Setting Guide" |
| 0xC0AF0046 RYAA070 -1062272954 3232694342 | The specified request is not supported. | Please upgrade 'GP-Pro EX' to a supported version by transferring the system with 'GP-Pro EX'. | 'GP-Pro EX Reference Manual' |
| 0xC0AF0050 RYAA080 -1062272944 3232694352 | The project ID of the network project file is different (A different NPJ is being used). | Please transfer the network project file with 'Pro-Studio EX' again. | "25.1 Setting Guide" |
| 0xC0AF0051 RYAA081 -1062272943 3232694353 | The network project file does not have necessary data. | | |
| 0xC0AF0052 RYAA082 -1062272942 3232694354 | The network project file is damaged. | Please transfer the network project file with 'Pro-Studio EX' again. If it's not solved, after performing forced transfer of 'GP-Pro EX', please transfer the network project file with 'Pro-Studio EX' again. | "25.1 Setting Guide" |
| 0xC0AF0053 RYAA083 -1062272941 3232694355 | The network project file does not exist. | | |
| 0xC0AF0060 RYAA096 -1062272928 3232694368 | Failed to transfer data to GP. | Please confirm that the Device/ PLC connected to the display unit works properly. Or, please transfer the network project file with 'Pro-Studio EX' again. | "25.1 Setting Guide" |
| 0xC0AF0061 RYAA097 -1062272927 3232694369 | Failed to read the device from GP. | Accessed a read-protect area. Please change the settings to avoid this. | - |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|--|---|
| 0xC0AF0062 RYAA098 -1062272926 3232694370 | Failed to write the device to GP. | Accessed a write-protect area. Please change the settings to avoid this. | - |
| 0xC0AF0063 RYAA099 -1062272925 3232694371 | In device access to GP, the device no. was out of range. | An invalid device was specified. Attempted to access a nonexistent device. | - |
| 0xC0AF0064 RYAA100 -1062272924 3232694372 | Failed to transfer data to GP. (The destination NODE does not respond.) | The Destination Node does not respond. Please check and run the following: <ul style="list-style-type: none"> • The network cable is properly connected • The destination node is ON, and • The IP address in the Node Setting of 'Pro-Studio EX' is correct. • Transfer the network project file again using 'Pro-Studio EX'. When communicating with a GP series node, the error may arise when there is congestion in the network environment or when communication is slow between the GP series node and external device. When you think these are the reasons for the error, please enter a longer time in the [GP Series Node Settings] screen's [Device R/W Timeout] setting. | "2.2 Connecting PC with display unit" "31.5 Setting Guide" "34.2 Network Setup" |
| 0xC0AF0065 RYAA101 -1062272923 3232694373 | Failed to read the device from GP. (The destination NODE does not respond.) | The Destination Node does not respond. Please check the followings: <ul style="list-style-type: none"> • The network cable is properly connected • The destination node is ON, and • The IP address in the Node Setting of 'Pro-Studio EX' is correct. | "2.2 Connecting PC with display unit" "31.5 Setting Guide" "34.2 Network Setup" |
| 0xC0AF0066 RYAA102 -1062272922 3232694374 | Failed to write the device to GP. (The destination NODE does not respond.) | When communicating with a GP series node, the error may arise when there is congestion in the network environment or when communication is slow between the GP series node and external device. When you think these are the reasons for the error, please enter a longer time in the [GP Series Node Setting] screen's [Device R/W Timeout] setting. | |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

36.3.3 "SAAA****" Error Info

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|--|------------------------------------|
| 0xC0B00001 SAAA001 -1062207487 3232759809 | System Error | Please reboot your PC. If not solved, install it again. | - |
| 0xC0B00002 SAAA002 -1062207486 3232759810 | Cannot process due to a shortage of OS resource or memory. | | 'Pro-Server EX Installation Guide' |
| 0xC0B00003 SAAA003 -1062207485 3232759811 | Cannot execute any new process until the Pro-Server EX returns a processing result. | | |
| 0xC0B00005 SAAA005 -1062207483 3232759813 | The process was interrupted because 'Pro-Server EX' was terminated. | Please exit all the applications before you close 'Pro-Server EX'. | - |
| 0xC0B00006 SAAA006 -1062207482 3232759814 | The process was interrupted because 'Pro-Server EX' was terminated during the process. | | |
| 0xC0B00007 SAAA007 -1062207481 3232759815 | The specified connector has already been registered. The application is already in execution. | Please reboot your PC. If not solved, install it again. | 'Pro-Server EX Installation Guide' |
| 0xC0B00008 SAAA008 -1062207480 3232759816 | An error occurred in an OLE function. Cannot convert the data. | | |
| 0xC0B0000A SAAA010 -1062207478 3232759818 | Cannot refer to the resource because Pro-Server EX has not been started. | | |
| 0xC0B0000B SAAA011 -1062207477 3232759819 | Cannot request the system to execute processing because Pro-Server EX has not been started. | | |
| 0xC0B0000C SAAA012 -1062207476 3232759820 | The system is broken. Cannot process. | | |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|--|------------------------------------|
| 0xC0B00010 SAAA016 -1062207472 3232759824 | The action is not in progress. Cannot process. Cannot process. | (1) From the task tray, select [Action], and confirm that the box of [Disable Actions] is unchecked. If checked, please clear it. (2) Please review the timing of the action. | - |
| 0xC0B00011 SAAA017 -1062207471 3232759825 | An error occurred when accessing the XX file. The file is locked (shared) or broken. (XX: File name) | Please reboot your PC. If not solved, install it again. | 'Pro-Server EX Installation Guide' |
| 0xC0B00012 SAAA018 -1062207470 3232759826 | Too many connectors to register. | Please confirm that the Pro-Server EX handle is correctly generated and destructed. | "27.5 System APIs" |
| 0xC0B00020 SAAA032 -1062207456 3232759840 | Cannot open the PRW file. | Please check whether the specified file name is correct. If correct, the file may be broken. | - |
| 0xC0B00021 SAAA033 -1062207455 3232759841 | To import a PRW file, a GP-ProPB III supporting auto transfer is required. Not having that kind of GP-ProPB III installed, this PC cannot import a PRW file. | Please install the version accepting auto-transfer function of 'GP-PRO/PB III for Windows'. | - |
| 0xC0B00022 SAAA034 -1062207454 3232759842 | Cannot import a PRW file while GP-Pro PB III is running. Please close the GP-Pro PBIII for installation. | Please exit the running 'GP-PRO/PB III for Windows'. | - |
| 0xC0B00023 SAAA035 -1062207453 3232759843 | Cannot import a PRW file because GP-ProPB III could not start. | Please check if 'GP-PRO/PB III for Windows' is installed. When installed, 'GP-PRO/PB III for Windows' may be damaged, please install it again. | - |
| 0xC0B00024 SAAA036 -1062207452 3232759844 | Cannot prepare for transfer correctly. The file may be damaged. | The specified screen project file may have been broken. Please specify an undamaged screen project file. | "31.5 Setting Guide" |
| 0xC0B00026 SAAA038 -1062207450 3232759846 | Cannot access the specified file. | Please confirm that the screen project file is not in current use. If in use, please close the file. | - |
| 0xC0B00027 SAAA039 -1062207449 3232759846 | No PRW file name has been entered. | Please input the file name of the screen project file. | - |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|--|-------------------------|
| 0xC0B00028 SAAA040 -1062207448 3232759848 | The specified file is not a PRW file. | Please specify a file of which extension is ".prw". | "31.5.3 GP Series Node" |
| 0xC0B00029 SAAA041 -1062207447 3232759849 | Failed to get device info from the project file. | The specified screen project file may have been broken. Please specify an undamaged screen project file. | |
| 0xC0B0002A SAAA042 -1062207446 3232759850 | Failed to get symbol info from the project file. | The specified screen project file may have been broken. Please specify an undamaged screen project file. | "31.5 Setting Guide" |
| 0xC0B0002B SAAA043 -1062207445 3232759851 | Failed to get the device address from the project file. | | |
| 0xC0B0002C SAAA044 -1062207444 3232759852 | Failed to get setting info from the project file. | | |
| 0xC0B0002D SAAA045 -1062207443 3232759853 | Failed to create a temporary file. | The temporary file creation folder may have little free space. Please check the space of the drive, and increase it if insufficient. | - |
| 0xC0B0002E SAAA046 -1062207442 3232759854 | Cannot open the project file. | Please check whether the specified file name is correct. If correct, the file may be broken. | "31.5 Setting Guide" |
| 0xC0B0002F SAAA047 -1062207441 3232759855 | Failed to delete the temporary file. | Please execute it again. | - |
| 0xC0B00030 SAAA048 -1062207440 3232759856 | The specified project file has an error. | The specified screen project file may have been broken. Please specify an undamaged screen project file | "31.5 Setting Guide" |
| 0xC0B00031 SAAA049 -1062207439 3232759857 | The project file does not have necessary data. | | |
| 0xC0B00032 SAAA050 -1062207438 3232759858 | The specified file is not a project file. | Please specify a file of which extension is ".prx" or ".prxe". | "31.5 Setting Guide" |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|---|--|
| 0xC0B00033 SAAA051 -1062207437 3232759859 | Cannot access the file acquired from display unit. | Some of the obtained files may be damaged. Please execute the operation again. | - |
| 0xC0B00034 SAAA052 -1062207436 3232759860 | The setting contents of the network project is abnormal. | Please execute Consistency Check with 'Pro-Studio EX'. After correcting detected errors, please transfer the network project again. | "26.1 Setting Guide" |
| 0xC0B00035 SAAA053 -1062207435 3232759861 | The file is broken. | The project file is broken. Please use the file additionally saved in 'GP-Pro EX'. | 'GP-Pro EX Reference Manual' |
| 0xC0B00036 SAAA054 -1062207434 3232759862 | Cannot handle this file version. | The project file was saved in a new format. Please use the latest 'Pro-Studio EX'. | - |
| 0xC0B00037 SAAA055 -1062207433 3232759863 | Cannot handle this file type. | The project file was saved in an unsupported format. Please use the latest 'Pro-Studio EX'. | - |
| 0xC0B00060 SAAA096 -1062207392 3232759904 | Cannot open the network project file. The file does not exist or you don't have the access right. | Please check the specified file and the specification method of the network project file. | "24.1 Try to connect with Factory Gateway" |
| 0xC0B00061 SAAA097 -1062207391 3232759905 | Cannot open the network project file. | Please check the specified file and the specification method of the network project file. If they are correct, and the phenomenon still reoccurs even if you restart the PC, please install 'Pro-Sever EX' again. | "24.1 Try to connect with Factory Gateway" |
| 0xC0B00062 SAAA098 -1062207390 3232759906 | The network project file is broken. Cannot read. Please confirm whether the file you specified is a real network project file. | Please check whether the specified file is not broken. | - |
| 0xC0B00063 SAAA099 -1062207389 3232759907 | Cannot write to the network project file. | Please confirm that the disk space is sufficient, and that you have the access right to the file/folder. | - |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|---|--|
| 0xC0B00064 SAAA100 -1062207388 3232759908 | The file is not a network project file, or its version is old. Cannot read the data. | Please specify a network project file. If you have already specified one, it may have been broken. Please specify an undamaged network project file. | "24.1 Try to connect with Factory Gateway" |
| 0xC0B00065 SAAA101 -1062207387 3232759909 | The specified device was not found in (XX). It may have been deleted or renamed. Please check it again. (XX: NODE name) | Please confirm the Device/PLC, following the direction of the message. | - |
| 0xC0B00066 SAAA102 -1062207386 3232759910 | The specified NODE (XX) has not been registered. There is a conflict. Please check it again. (XX: NODE name) | When you delete a Node, please review all the things using the Node. (1) Data Transfer feature (2) Cache feature (3) ACTION feature (4) Trigger Condition etc. Once a Node is deleted, even if you add the same Node, the settings remain disabled (They are not restored). Please check the settings again. | "24.1 Try to connect with Factory Gateway" |
| 0xC0B00067 SAAA103 -1062207385 3232759911 | The specified NODE info is incorrect. No NODE info exists. | | |
| 0xC0B00068 SAAA104 -1062207384 3232759912 | The device setting in the system area of the specified node has an error. Please check the device you set. | If it has one or more device other than memory link, you must specify a system area device/PLC and a system area device address. Please confirm the specifications. | "31.5 Setting Guide" |
| 0xC0B00069 SAAA105 -1062207383 3232759913 | (XX: XX) is invalid as a device/symbol. Cannot analyze. (XX: Device/Symbol name) | Please confirm the symbol, following the direction of the message. | "32.6 Setting Guide" |
| 0xC0B0006A SAAA106 -1062207382 3232759914 | The trigger condition of (XX) is invalid. The node involved in this trigger condition may have been deleted. Please check it again. (XX: Trigger condition name) | Please confirm the trigger condition, following the direction of the message. | "33.1.1 Types of Trigger Conditions" |
| 0xC0B0006B SAAA107 -1062207381 3232759915 | There is a conflict with communication functions because the action data was deleted. Please check it again. | Please confirm the action settings, following the direction of the message. | Chapter of corresponding Action |
| 0xC0B0006C SAAA108 -1062207380 3232759916 | The network setting is broken. | Please review the network settings. | "34.2 Network Setup" |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|--|--------------------------------------|
| 0xC0B0006D SAAA109 -1062207379 3232759917 | There is a conflict with symbol info because the device was deleted. Please check it again. | Deleting a Device/PLC disables all the related information. Please review all the information related to the Device/PLC. Once a Device/PLC is deleted, even if you add the same Device/PLC, the settings remain disabled (They are not restored). Please check the settings again. | "31.5 Setting Guide" |
| 0xC0B0006E SAAA110 -1062207378 3232759918 | There is a conflict with symbol info because the node was deleted. Please check it again. | Please confirm the symbol, following the direction of the message. | "32.6 Setting Guide" |
| 0xC0B0006F SAAA111 -1062207377 3232759919 | Too many trigger conditions. The number must be within XX. (XX: Number) | Please reduce the no. of trigger conditions, following the direction of the message. | "33.2 Editing Trigger Conditions" |
| 0xC0B00070 SAAA112 -1062207376 3232759920 | (Symbol Sheet: XX Group: XX) has too large total size of device data. Please divide the group. (XX Bytes or less) | Please reduce the no. of group symbol data (array element count, member count, or data count of each member), following the direction of the message. | "29.3 Grouping Symbols" |
| 0xC0B00071 SAAA113 -1062207375 3232759921 | Too many actions to register. | Please reduce the no. of registered actions. | Chapter of corresponding Action |
| 0xC0B00072 SAAA114 -1062207374 3232759922 | Unsupported trigger condition is set for the node (XX) (A GP Series node has trigger-condition restrictions. For more details, please refer to the manual). (XX: NODE name) | Please confirm the trigger condition, following the direction of the message. Please confirm the trigger condition, following the direction of the message. | "33.1.1 Types of Trigger Conditions" |
| 0xC0B00073 SAAA115 -1062207373 3232759923 | The trigger condition (XX) is for a GP Series node. Logic operation is not supported in this type of trigger condition. (XX: Trigger condition name) | | |
| 0xC0B00074 SAAA116 -1062207372 3232759924 | The structure of a sheet/group in the symbol sheet of (XX) is collapsed. Please create it again. | Please re-create the group symbol, following the direction of the message. | "32.6 Setting Guide" |
| 0xC0B00075 SAAA117 -1062207371 3232759925 | No trigger condition exists in (XX). The trigger condition may have been deleted. Please check it again. | Please confirm those using the trigger condition (data transfer feature, action feature, etc.), following the direction of the message. | "32.1 Symbol and Symbol Sheet" |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|--|---------------------------------|
| 0xC0B00076 SAAA118 -1062207370 3232759926 | The node specified in the trigger condition used in (XX) does not exist. The node may have been deleted. Please check it again. | Please confirm the trigger condition, following the direction of the message. | "32.1 Symbol and Symbol Sheet" |
| 0xC0B00077 SAAA119 -1062207369 3232759927 | The transfer-source constant value specified in data transfer (XX) has an error. (XX: Data transfer name) | Please confirm that the constant value is proper for the data type. | Chapter of corresponding Action |
| 0xC0B00078 SAAA120 -1062207368 3232759928 | (Symbol Sheet: XX, Symbol: XX Address: XX and Address: XX) is invalid as a device address. | Please confirm the settings of the symbol sheet, following the direction of the message. | "32.6 Setting Guide" |
| 0xC0B00079 SAAA121 -1062207367 3232759929 | Because of the non-bit type symbol in the previous line, consecutive bit type is unavailable for (Symbol Sheet: XX, Symbol: XX, and Address: XX). Please check it again. | | |
| 0xC0B0007A SAAA122 -1062207366 3232759930 | Because of the bit type symbol in the previous line, consecutive non-bit type is unavailable for (Symbol Sheet: XX, Symbol: XX, and Address: XX). Please check it again. | Please confirm the settings of the symbol sheet, following the direction of the message. | "32.6 Setting Guide" |
| 0xC0B0007B SAAA123 -1062207365 3232759931 | Cannot specify consecutive from the previous line for (Symbol Sheet: XX Symbol: XX Address: XX). Please check whether it is within the device range. | | |
| 0xC0B0007C SAAA124 -1062207364 3232759932 | (Symbol Sheet: XX Symbol: XX Address: XX) is beyond the valid device range. | | |
| 0xC0B0007D SAAA125 -1062207363 3232759933 | (Symbol Sheet: XX Symbol: XX) does not have any valid symbols before. Cannot judge for which device the bit specification is. | | |
| 0xC0B0007E SAAA126 -1062207362 3232759934 | (Symbol Sheet: XX Group: XX) does not have any valid symbols. A group must have at least 1 symbol. | Please confirm the settings of the symbol sheet, following the direction of the message. | "32.6 Setting Guide" |
| 0xC0B0007F SAAA127 -1062207361 3232759935 | (Symbol Sheet: XX) has nonconsecutive symbols. Cannot set them in array. | | |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|---|------------------------------------|
| 0xC0B00080 SAAA128 -1062207360 3232759936 | (Symbol Sheet: XX Array Group: XX) has too many devices to support. | Please confirm the settings of the symbol sheet, following the direction of the message. | "32.6 Setting Guide" |
| 0xC0B00081 SAAA129 -1062207359 3232759937 | (Symbol Sheet: XX Array Group: XX) is beyond the valid device range. | | |
| 0xC0B00082 SAAA130 -1062207358 3232759938 | The specified NODE (XX) has not been registered in the network project. (XX: NODE name) | Please reboot your PC. If not solved, install it again. | 'Pro-Server EX Installation Guide' |
| 0xC0B00083 SAAA131 -1062207357 3232759939 | The specified NODE (XX) is not a GP Series NODE. (XX: NODE name) | | |
| 0xC0B00084 SAAA132 -1062207356 3232759940 | The device of the specified NODE (XX) is not supported. (XX: NODE name) | | |
| 0xC0B00085 SAAA133 -1062207355 3232759941 | In (Data Transfer: XX Transfer Source: XX Transfer Destination: XX), the data types are different. In data transfer to/from a GP Series NODE, the source and the destination must have the same data type. | Please confirm the settings of the data transfer feature, following the direction of the message. | Chapter of corresponding Action |
| 0xC0B00086 SAAA134 -1062207354 3232759942 | Cannot transfer the data. In (Data Transfer: XX Transfer Source: XX Transfer Destination: XX), the source and the destination have different group structures. | Please confirm the settings of the data transfer feature, following the direction of the message. | Chapter of corresponding Action |
| 0xC0B00087 SAAA135 -1062207353 3232759943 | Cannot transfer the data. In (Data Transfer: XX Transfer Source: XX Transfer Destination: XX), the data type of the transfer destination is unsupported. | | |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|---|---------------------------------|
| 0xC0B00088 SAAA136 -1062207352 3232759944 | Cannot transfer the data. In (Data Transfer: XX Transfer Source: XX Transfer Destination: XX), the data type of the transfer source is unsupported. | Please confirm the settings of the data transfer feature, following the direction of the message. | Chapter of corresponding Action |
| 0xC0B00089 SAAA137 -1062207351 3232759945 | In (Data Transfer: XX Transfer Source: XX Transfer Destination: XX), the data types are different. Please set the same data type. | | |
| 0xC0B0008A SAAA138 -1062207350 3232759946 | In (Data Transfer: XX Transfer Source: XX Transfer Destination: XX), the data count is 0 or out of range. | | |
| 0xC0B0008B SAAA139 -1062207349 3232759947 | In (Data Transfer: XX Transfer Source: XX Transfer Destination: XX), word access to a 32-bit device of a GP Series Node is specified. This access method is not supported. | | |
| 0xC0B0008C SAAA140 -1062207348 3232759948 | In (Data Transfer: XX Transfer Source: XX Transfer Destination: XX), the transfer source is out of the valid device range. | Please confirm the settings of the data transfer feature, following the direction of the message. | Chapter of corresponding Action |
| 0xC0B0008D SAAA141 -1062207347 3232759949 | In (Data Transfer: XX Transfer Source: XX Transfer Destination: XX), the transfer destination is out of the valid device range. | | |
| 0xC0B0008E SAAA142 -1062207346 3232759950 | The specified action was not found in (XX). Please check it again. | Please confirm the action settings, following the direction of the message. | Chapter of corresponding Action |
| 0xC0B0008F SAAA143 -1062207345 3232759951 | (Data Transfer: XX Transfer Source Group: XX) has too large total buffer size of device data. Please divide the group. (XX Bytes or less) | Please reduce the no. of group symbol data (array element count, member count, or data count of each member), following the direction of the message. | "29.3 Grouping Symbols" |
| 0xC0B00090 SAAA144 -1062207344 3232759952 | (Data Transfer: XX Transfer Source Group: XX) has too large total device size. Please divide the group. (XX Bytes or less) | | |
| 0xC0B00091 SAAA145 -1062207343 3232759953 | (Device Cache: XX) has too large total device size. Please divide the device cache. (XX Bytes or less) | In the 'Pro-Studio EX' Feature screen, please reduce the no. of devices in the device cache. | "29.3 Grouping Symbols" |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|---|---------------------------------|
| 0xC0B00092 SAAA146 -1062207342 3232759954 | Too many device caches are registered. Please reduce them. (X or less) | In the 'Pro-Studio EX' Feature screen, please reduce the no. of registered device caches. | "29.3 Grouping Symbols" |
| 0xC0B00093 SAAA147 -1062207341 3232759955 | (Device Cache: XX) has too many records. Please reduce them. (XX or less) | In the 'Pro-Studio EX' Feature screen, please reduce the no. of records in the device cache. | "29.3 Grouping Symbols" |
| 0xC0B00094 SAAA148 -1062207340 3232759956 | Too many NODEs are registered. Please reduce them. (XX NODEs or less) | In the 'Pro-Studio EX' Node setting screen, please reduce the no. of registered nodes. | "31.5 Setting Guide" |
| 0xC0B00095 SAAA149 -1062207339 3232759957 | (Symbol Sheet: XX Symbol: XX No. of Devices: XX) is beyond the range of the no. of devices. (Valid Range: XX-XX) | In the 'Pro-Studio EX' Symbol screen, please reduce the no. of the devices in the symbol. | "32.6 Setting Guide" |
| 0xC0B00096 SAAA150 -1062207338 3232759958 | (Symbol Sheet: XX Group: XX) has the no. of rows beyond the limit. Please reduce it. (XX rows or less) | In the 'Pro-Studio EX' Symbol screen, please reduce the no. of the devices registered in the group. | "29.3 Grouping Symbols" |
| 0xC0B00097 SAAA151 -1062207337 3232759959 | The NODE (XX) is set to the IP address of the local PC. Please change the NODE Type to Pro-Server EX NODE or WinGP NODE, or change the IP address. (XX: NODE name) | In the 'Pro-Server EX' Node screen, please confirm that the "Node Type" and the "IP Address" are correct. | "31.5 Setting Guide" |
| 0xC0B00098 SAAA152 -1062207336 3232759960 | The network project size exceeded the limit. | In the 'Pro-Studio EX' Feature screen, please reduce the no. of action or data transfer settings. | Chapter of corresponding Action |
| 0xC0B0009A SAAA154 -1062207334 3232759962 | In (Symbol Sheet: XX Symbol: XX), the type or the no. of symbols is undefined. Cannot create Symbol/Group Configuration Info. | In the 'Pro-Studio EX' Symbol screen, please specify symbol no. and type. | "32.6 Setting Guide" |
| 0xC0B0009C SAAA156 -1062207332 3232759964 | In a symbol sheet, 2 symbol/group names are the same. (Symbol Sheet: XX Name1: XX Name2: XX) | In the 'Pro-Studio EX' Symbol screen, please specify symbol type. | "32.6 Setting Guide" |
| 0xC0B0009D SAAA157 -1062207331 3232759965 | The device driver of (Node: XX) is not supported (Necessary driver has not been installed). | Please install device differences. | - |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|--|--|
| 0xC0B000A8 SAAA168 -1062207320 3232759976 | (Trigger Condition: xx:xx) In Distribution and Action, Broadcast Service to WinGP NODEs is not available. To communicate with a WinGP NODE, change the communication-method setting in the trigger condition to Individual Communication. | Change the communication setting in the trigger condition from Broadcast communication to Individual Communication. | ◆ "Set Trigger Condition Details" Screen |
| 0xC0B000A9 SAAA169 -1062207319 3232759977 | (xx:xx)The specified Device/ Symbol is beyond the valid device range. | Following the message, check the settings on the feature screen. | - |
| 0xC0B000AC SAAA172 -1062207316 3232759980 | When On Connection is Transfer network project changes, you cannot include GP series nodes. When using GP series, open Pro-Studio and from the [Setting] menu select [Option Settings]. In the dialog box, set On Connection to Compare ID. (GP series node: xx). | Select [Network project ID] under [Compare the network project on Connection] on the [Option Settings] screen. | "34.3 Option Settings" |
| 0xC0B000AD SAAA173 -1062207315 3232759981 | When On Connection is Transfer network project changes, the data transfer communication method cannot be set to General Broadcast. Either change the communication method to Individual Communication, or On Connection to Compare ID. (Trigger Condition set up with General Broadcast : xx) | Execute one of the following steps. <ul style="list-style-type: none"> • Select [Individual Communication] under [Communication Method] on the "Set Trigger Condition Details" screen • Select [Network project ID] under [Compare the network project on Connection] on the [Option Settings] screen | ◆ "Set Trigger Condition Details" Screen "34.3 Option Settings" |
| 0xC0B000AE SAAA174 -1062207314 3232759982 | (XX: XX) Cannot use the specified data type to the specified device. | Display the setup screen for the feature that shows up as an error in Pro-Studio EX. For the defined device, set up the appropriate data type again. | - |
| 0xC0B000AF SAAA175 -1062207313 3232759983 | (Symbol Sheet: XX Symbol: XX Address : XX) Cannot register the specified device as the symbol. | Display the symbol sheet that shows up as an error in Pro-Studio EX, and delete the symbol. In the location where the symbol is used, reference the device directly. | - |
| 0xC0B000B0 SAAA176 -1062207312 3232759984 | (Symbol Sheet: XX Symbol: XX) Unable to use bit offset symbols. | From Pro-Studio EX's Symbol setting screen, either set the symbol's data type to word, or set the number of devices to 1. | "32.6 Setting Guide" |
| 0xC0B000B1 SAAA177 -1062207311 3232759985 | (XX: XX) When using the specified device address and [Data Type] is Bit, [No.] must be 1. | Either set the symbol's data type to word, or set the number of devices to 1. | - |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|--|--|
| 0xC0B000E0 SAAA224 -1062207264 3232760032 | Warning: In different symbol sheets, 2 symbol/group names are the same. To use the same name, please specify both sheet names. (Symbol Sheet1: XX Symbol Sheet2: XX The Same Name: XX) | In the 'Pro-Studio EX' Symbol setting screen, please change the name to avoid name overlapping. | "32.6 Setting Guide" |
| 0xC0B000E1 SAAA225 -1062207263 3232760033 | Warning: In different symbol sheets, 2 symbol/group names are the same. To use the same name, please specify both sheet names. (Symbol Sheet: XX The Same Symbol: (Sheet: XX Name: XX)) | In the 'Pro-Studio EX' Symbol setting screen, please change the name to avoid name overlapping. | "32.6 Setting Guide" |
| 0xC0B000E2 SAAA226 -1062207262 3232760034 | Warning: (Data Transfer: XX Transfer Source: XX Transfer Destination: XX) has different data sizes. The transfer data size is conformed to the size of the transfer source (XX). | When using the data transfer feature, the data size settings of the transfer destination and the source must be the same. | "19.2 Setting Guide" |
| 0xC0B000E3 SAAA227 -1062207261 3232760035 | Warning: The no. of registered ACTIONs exceeded XX. Performance can be affected because ACTIONs use a lot of resources. Please consider reducing the no. (XX: Number) | ACTIONs use a lot of PC resources. Therefore, although up to 3000 ACTIONs can be registered, recommended no. is 100 or less in view of performance. | Chapter of corresponding Action |
| 0xC0B000E4 SAAA228 -1062207260 3232760036 | Warning: The array variable(xx) has too many elements for API Communication for WinGP to access the whole array. In API Communication for WinGP, only xx elements from the head are accessible. | (1) Try to divide the array elements into several parts before registration in 'GP-Pro EX'. (2) If you cannot divide them, try to use 'Pro-Server EX' instead of WinGP SDK. Because 'Pro-Server EX' has the function to automatically divide the array variables, the number of which elements exceeds the accessible limit for one time, and register them as multiple symbols, when you import a 'GP-Pro EX' project file into a network project. | - |
| 0xC0B000E5 SAAA229 -1062207259 3232760037 | (Data transfer:xx Transfer Source:xx Transfer Destination:xx) Cannot use Tag in Communication Method using General Broadcast. | Change the communication method of the trigger condition from broadcast communication to individual communication. | ◆ "Set Trigger Condition Details" Screen |
| 0xC0B000E6 SAAA230 -1062207258 3232760038 | (Data transfer:xx Transfer Source:xx Transfer Destination:xx) Cannot set Data Trancefer to Node which does not support the Tag. | Change the device address in the transfer destination to a node that supports tags. | "19.2 Setting Guide" |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|--|--|
| 0xC0B000E7 SAAA231 -1062207257 3232760039 | (Trigger Condition:xx Address:xx) Cannot use the specified device address or data type. | Change the device address specified as the trigger condition. | "33.1.1 Types of Trigger Conditions" |
| 0xC0B000E8 SAAA232 -1062207256 3232760040 | (Data transfer:xx Transfer Source:Constant Value Transfer Destination:xx) Cannot use Tag in Communication Method using General Broadcast. | Change the communication method of the trigger condition from broadcast communication to individual communication. | ◆ "Set Trigger Condition Details" Screen |
| 0xC0B000E9 SAAA233 -1062207255 3232760041 | Data type is different in (Data Transfer:xx Transfer Source:Constant Value Transfer Destination:xx). Set the same data type. | Match the data types of the transfer destination and transfer source. | "19.2 Setting Guide" |
| 0xC0B000EA SAAA234 -1062207254 3232760042 | Cannot execute data transfer because 8-bit of Day/Time data type is included in the group of (Data Transfer:xx Transfer Source:xx Transfer Destination:xx). | When running data transfer of a group that contains 8 Bit and Date/ Time data types, group it all together. | "19.2 Setting Guide" |
| 0xC0B000EB SAAA235 -1062207253 3232760043 | (Trigger Condition:xx Address:xx) Cannot specify the same address as the one specified in [Bit Showing Completion of the Process]. ([Trigger Condition]-[Detail Settings]-[Completion Notification]-[Bit Showing Completion of the Process]) | When the trigger condition is [When Device ON (OFF)] and [Turn OFF the Specified Device Address after Processing], the specified device address is the same as the [Detail Settings] screen's [Bit Showing Completion of the Process] field. Set to a different address. | ◆ "Set Trigger Condition Details" Screen |
| 0xC0B000F0 SAAA240 -1062207248 3232760048 | Value read is incorrect or out of range, it cannot be displayed in the form of type TIME. | Please select the appropriate data type for the device. If the selected data type is correct, you may have to format the associated value on the device. | - |
| 0xC0B000F1 SAAA241 -1062207247 3232760049 | Value read is incorrect or out of range, it cannot be displayed in the form of type TIME_OF_DAY. | | - |
| 0xC0B000F2 SAAA242 -1062207246 3232760050 | Value read is incorrect or out of range, it cannot be displayed in the form of type DATE. | | - |
| 0xC0B000F3 SAAA243 -1062207245 3232760051 | Value read is incorrect or out of range, it cannot be displayed in the form of type DATE_AND_TIME. | | - |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

36.3.4 "SAAF****" Error Info

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|---|------------------------------------|
| 0xC0B00201 SAAF001 -1062206975 3232760321 | Cannot initialize TCP/IP. | From [Control Panel]-[Network Connection], please confirm that connection setting is enabled and that the TCP/IP protocol has been installed, which can be confirmed in the property of the connection setting. 'Pro-Server EX' does not work without the TCP/IP. | - |
| 0xC0B00203 SAAF003 -1062206973 3232760323 | This PC does not have a valid IP address allocated. Please check the TCP/IP environment of this PC. | Please confirm that the LAN card works properly. Please check the LAN cable, too. | "2.1.2 Necessary Equipment |
| 0xC0B00204 SAAF004 -1062206972 3232760324 | Cannot load the PLCInfo.xml file. | Please update the protocol driver. If it does not solve the problem, please install 'Pro-Server EX' again. | 'Pro-Server EX Installation Guide' |
| 0xC0B00205 SAAF005 -1062206971 3232760325 | Cannot load the Editor Driver. | | |
| 0xC0B00206 SAAF006 -1062206970 3232760326 | An error occurred in Active X I/F. | Please confirm that the OS version is appropriate. If the phenomenon still reoccurs despite the restart, please install 'Pro-Server EX' again. | 'Pro-Server EX Installation Guide' |
| 0xC0B00207 SAAF007 -1062206969 3232760327 | Cannot execute because of the version inconsistency of DLL and EXE for 'Pro-Server EX'. The program XX will be shut down. (XX: Program name) | Please confirm that there are not two or more different versions or DLLs of 'Pro-Server EX' in a PC. Only 1 version of 'Pro-Server EX' can be installed in a PC. | - |
| 0xC0B00208 SAAF008 -1062206968 3232760328 | Cannot open the INI file ('XX') of the ACTION Contents. (XX: File name) | Please reboot your PC. If it does not solve the problem, please install 'Pro-Server EX' again. | 'Pro-Server EX Installation Guide' |
| 0xC0B00209 SAAF009 -1062206967 3232760329 | The file Core. ID was not found. | | |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|--|------------------------------------|
| 0xC0B0020A SAAF010 -1062206966 3232760330 | Cannot start the ACTION Content used by the ACTION 'XX'. The ACTION Content does not exist or is broken. Please install it again. (XX: Action name) | Necessary ACTION content may not exist in the PC. Please confirm that it has been successfully installed. If it has been installed and this error still occurs, the registry registration may be insufficient. Please perform registry registration with 'Pro-Studio EX'. | - |
| 0xC0B0020B SAAF011 -1062206965 3232760331 | ProNet.dll has not been correctly installed. | Please reboot your PC. If it does not solve the problem, please install 'Pro-Server EX' again. | 'Pro-Server EX Installation Guide' |
| 0xC0B0020C SAAF012 -1062206964 3232760332 | Cannot start 'Pro-Server EX'. Please close all the applications that use 'Pro-Studio EX' or 'Pro-Server EX', and try again. | Cannot start 'Pro-Server EX' because 'Pro-Server EX' or an application using 'Pro-Server EX' did not possibly stop normally. Please close 'Pro-Server EX' and all the applications running on it, and then try again. | - |
| 0xC0B0020D SAAF013 -1062206963 3232760333 | Present log-on user is not permitted to create the resource of the OS. This function is not available. | Please give the right to create global objects to a logon user. Or, execute as Administrator. | - |
| 0xC0B00211 SAAF017 -1062206959 3232760337 | This API is not supported. | The API you tried to use is unavailable. Please consider another method. | "27 Designing Your Own Program" |
| 0xC0B00212 SAAF018 -1062206958 3232760338 | The specified string is invalid as a device address. | Please reconfirm the address specification method. Please confirm that no change has been made to devices and nodes. Please confirm that the necessary device driver has been installed. | - |
| 0xC0B00213 SAAF019 -1062206957 3232760339 | The specified device supports bit access only. | Please confirm the device to access and access method. | "32.6 Setting Guide" |
| 0xC0B00214 SAAF020 -1062206956 3232760340 | The specified device driver is not supported (The necessary device driver has not been installed). | Please install device differences. | 'Pro-Server EX Installation Guide' |

- * - 1st line: Error code
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4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|--|------------------------------------|
| 0xC0B00215 SAAF021 -1062206955 3232760341 | The parameter value is invalid. | In the case it occurred while you were using the API, please check the API parameters. In the case it occurred while you were using some feature, please check the settings of the feature. | "27 Designing Your Own Program" |
| 0xC0B00216 SAAF022 -1062206954 3232760342 | The device no. is out of range. | Please check the device no. | - |
| 0xC0B00217 SAAF023 -1062206953 3232760343 | The specified device does not exist. | Please check the group symbol specification. | "31.5 Setting Guide" |
| 0xC0B00218 SAAF024 -1062206952 3232760344 | The specified group symbol does not exist. | Please check the group symbol specification. | "29.3 Grouping Symbols" |
| 0xC0B00219 SAAF025 -1062206951 3232760345 | When using the specified device address and [Data Type] is Bit, [No.] must be 1. | Either set the symbol's data type to word, or set the number of devices to 1. | - |
| 0xC0B0021A SAAF026 -1062206950 3232760346 | In Queuing Access, read-access and write-access, or cache access and direct access, cannot be mixed. | Please confirm that no different access method exists between the start of queuing and the actual access. If there is the necessity of using a different access method, please use another queuing access. | "27.4 Queuing Access Control APIs" |
| 0xC0B0021D SAAF029 -1062206947 3232760349 | The specified node has not been registered in the network project. | Please check the node specification. | "31.5 Setting Guide" |
| 0xC0B0021F SAAF031 -1062206945 3232760351 | The API was redundantly called. The specified access handle for Pro-Server EX is already running. | If there is the necessity of calling the API at the same time, please use another Pro-server handle. Or, please consider using EasySetWaitType() or EasySetWaitTypeM() to avoid calling the API at the same time. | "27.5 System APIs" |
| 0xC0B00220 SAAF032 -1062206944 3232760352 | In data-type conversion, the data type of the conversion source/destination is unsupported. | Please check the contents of the Variant type. | - |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|---|---------------------------------|
| 0xC0B00221 SAAF033 -1062206943 3232760353 | The specified backup-data type is unsupported. | Please check the data type specification. | - |
| 0xC0B00222 SAAF034 -1062206942 3232760354 | Failed to open the SRAM backup data file or to create its copy in the PC. | Please check the specifications of the destination file/folder in the PC, disk space, and the access right to the file etc. | "20.2 Setting Guide" |
| 0xC0B00223 SAAF035 -1062206941 3232760355 | In Read/Write Backup Data, failed to access the file. | In reading or writing SRAM Backup Data, an error occurred accessing the specified file. Please check the free space of the PC and the file access right, and then execute it again. | "20.2 Setting Guide" |
| 0xC0B00224 SAAF036 -1062206940 3232760356 | In Write SRAM Backup Data, the specified file size is too large. It must be 96KB or less. | Please confirm that the file specified in Write SRAM Backup Data is correct. Also, please specify a file of the size of 96Kbytes or less. | "20.2 Setting Guide" |
| 0xC0B00225 SAAF037 -1062206939 3232760357 | Numeric value error. Please set a correct value. | Please confirm that the string is valid as a numeric value. | - |
| 0xC0B00226 SAAF038 -1062206938 3232760358 | The specified data count is 0 or out of range. | Please check the data count. | Chapter of corresponding Action |
| 0xC0B00227 SAAF039 -1062206937 3232760359 | The max number of access destinations is too high (It must be 1500 or less). | Please consider dividing it for successful access. | - |
| 0xC0B00228 SAAF040 -1062206936 3232760360 | The total buffer size of the data to access is too high. (It must be 1MB or less.) | | |

- * - 1st line: Error code
 2nd line: Integrated error code
 3rd line: Error code with decimal code
 4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|--|---|
| 0xC0B00230 SAAF048 -1062206928 3232760368 | Cannot start Pro-Server EX. | Please reboot your PC. If it does not solve the problem, please install 'Pro-Server EX' again. When you set the starting method of 'Pro-Server EX' to "Service Mode", start 'Pro-Server EX' from Windows Services. | 'Pro-Server EX Installation Guide' "30.1.2 Starting and Closing 'Pro-Server EX' in the "Service Mode"" |
| 0xC0B00231 SAAF049 -1062206927 3232760369 | Cannot start Pro-Studio EX. | Please reboot your PC. If it does not solve the problem, please install 'Pro-Server EX' again. | 'Pro-Server EX Installation Guide' |
| 0xC0B00232 SAAF050 -1062206926 3232760370 | Cannot start the device monitor. | | |
| 0xC0B00233 SAAF051 -1062206925 3232760371 | Cannot start the symbol monitor. | Please reboot your PC. If it does not solve the problem, please install 'Pro-Server EX' again. | 'Pro-Server EX Installation Guide' |
| 0xC0B00234 SAAF052 -1062206924 3232760372 | Cannot start the status monitor. | | |
| 0xC0B00235 SAAF053 -1062206923 3232760373 | Cannot start the log viewer. | | |
| 0xC0B00236 SAAF054 -1062206922 3232760374 | Cannot start the device access log. | | |
| 0xC0B00237 SAAF055 -1062206921 3232760375 | Cannot read backup data from the specified NODE. | A Pro-Server EX node is specified. Reading backup data is possible on remote nodes other than a Pro-Server EX node. Specify a remote node other than a Pro-Server EX node. | "21.2 Setting Guide" |
| 0xC0B00238 SAAF056 -1062206920 3232760376 | Reading out logging data is not allowed. | Please change the setting not to execute Read Logging Data. | "18.2 Setting Guide" |
| 0xC0B00239 SAAF057 -1062206919 3232760377 | Reading out trend data is not allowed. | Please change the setting not to execute Read Trend Data. | "18.2 Setting Guide" |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|---|---|--|--|
| 0xC0B00240 SAAF064 -1062206912 3232760384 | The specified access handle for Pro-Server EX is invalid. | Please check the handle value. It must be other than 0, correctly created, and not discarded. | "27.5 System APIs" |
| 0xC0B00241 SAAF065 -1062206911 3232760385 | Cannot continue because this command is unsupported. | Please reboot your PC. If it does not solve the problem, please install 'Pro-Server EX' again. | 'Pro-Server EX Installation Guide' |
| 0xC0B00242 SAAF066 -1062206910 3232760386 | Cannot process because Pro-Server EX stopped. | Please exit all the applications before you close 'Pro-Server EX'. | - |
| 0xC0B00243 SAAF067 -1062206909 3232760387 | While waiting for a processing result from the server, the API received the application quitting message. | If you do not want to receive WM_QUIT, please use a multihandle system API in EasySetWaitTypeM(2). | "27.5 System APIs" |
| 0xC0B00244 SAAF068 -1062206908 -1062206908 | The file name consists of more than 256 characters. Supposed to be within 256 characters. | Please check the file name specification. | "24.1 Try to connect with Factory Gateway" |
| 0xC0B00245 SAAF069 -1062206907 3232760389 | Queuing access registration has not started. | Please check the program sequence. | "27.4 Queuing Access Control APIs" |
| 0xC0B00246 SAAF070 -1062206906 3232760390 | Actual queuing access has not been made. | | |
| 0xC0B00247 SAAF071 -1062206905 3232760391 | The device access to the specified no. failed. | Please check the cable/device requirements. | "2.2 Connecting PC with display unit" |
| 0xC0B00248 SAAF072 -1062206904 3232760392 | The device access with the specified no. has not been registered. Please check the preregistered access count and no. | Please check the program sequence. | "27 Designing Your Own Program" |
| 0xC0B00249 SAAF073 -1062206903 3232760393 | Cache access to an action is not supported. | Please confirm the device name in cache registration is not the same as the action name. | "29.5 Cache Registration of Frequently Used Devices" |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|--|---|
| 0xC0B0024A SAAF074 -1062206902 3232760394 | Queuing access/group access to an action is not supported. | (1) Please confirm you are not trying to have queuing access to the action. (Please confirm the device name is different from the action name) (2) Please confirm there exists no device symbol nor device address that is the same as the action name. | "27.4 Queuing Access Control APIs" "29.3 Grouping Symbols" |
| 0xC0B0024B SAAF075 -1062206901 3232760395 | Cannot execute an unregistered ACTION. | Please confirm that no device/symbol of the same name as this ACTION has been registered in Data Transfer etc. | - |
| 0xC0B0024C SAAF076 -1062206900 3232760396 | The specified group no. is not within the range of sampling data group no. | Please review the API parameters. | "27 Designing Your Own Program" |
| 0xC0B0024D SAAF077 -1062206899 3232760397 | In Queuing Access, Read and Write cannot be mixed. | Please check the sequence of the program. | "27 Designing Your Own Program" |
| 0xC0B0024E SAAF078 -1062206898 3232760398 | The specified data type can not be used for the specified device. | Check if you can use the specified data type. | - |
| 0xC0B0024F SAAF079 -1062206897 3232760399 | The input value is invalid or out of range. | Check if the format of the entered text string or the format of the binary value is correct. | - |
| 0xC0B00250 SAAF080 -1062206896 3232760400 | No word exists. | Please review the API parameters. | "27 Designing Your Own Program" |
| 0xC0B00251 SAAF081 -1062206895 3232760401 | Invalid name/word. Illegal characters are included. | | |
| 0xC0B00252 SAAF082 -1062206894 3232760402 | The specified node has not been registered in the network project. | Please review the API parameters. Please confirm that the loaded network project is the one you need. | "27 Designing Your Own Program" |
| 0xC0B00253 SAAF083 -1062206893 3232760403 | The specified device has not been registered. | | |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|--|-------------------------|
| 0xC0B00254 SAAF084 -1062206892 3232760404 | Array Index Specification Error | Please check the array specification method. | "29.4 Array of Symbols" |
| 0xC0B00255 SAAF085 -1062206891 3232760405 | The specified device is an undefined symbol or an invalid address. | Please check the device address specification method. | "32.6 Setting Guide" |
| 0xC0B00256 SAAF086 -1062206890 3232760406 | The symbol name is invalid, or the group specification is too deeply nested. | | |
| 0xC0B00257 SAAF087 -1062206889 3232760407 | Index specification is unavailable for a string-type symbol. | | |
| 0xC0B00258 SAAF088 -1062206888 3232760408 | The specified index value is too high. | | |
| 0xC0B00259 SAAF089 -1062206887 3232760409 | Group symbol specification is unavailable for this device specification. | Please check the device address specification method. | "32.6 Setting Guide" |
| 0xC0B0025A SAAF090 -1062206886 3232760410 | Please specify a group symbol to specify a device. | | |
| 0xC0B0025B SAAF091 -1062206885 3232760411 | The symbol sheet name is invalid, or it is unavailable for the specified device. | | |
| 0xC0B0025C SAAF092 -1062206884 3232760412 | Device names are redundantly specified. | Please check the specification method of the node and the device address. | "31.5 Setting Guide" |
| 0xC0B0025E SAAF094 -1062206882 3232760414 | Failed to analyze the option-specifying string. | In the case it occurred while you were using the API, please check the API parameters. In the case it occurred while you were using some feature, please check the settings of the feature. | - |
| 0xC0B0025F SAAF095 -1062206881 3232760415 | The specified data type can not be used for the specified device. | Check if you can use the specified data type. | - |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|---|-----------------------------|
| 0xC0B00260 SAAF096 -1062206880 3232760416 | An error occurred when connecting to the Display Unit. | The PC LAN card may not be available. If it is disabled, please enable it. | "2.1.2 Necessary Equipment" |
| 0xC0B00261 SAAF097 -1062206879 3232760417 | An error occurred when connecting to the Display Unit. | | |
| 0xC0B00262 SAAF098 -1062206878 3232760418 | Failed to read the file. | Please confirm that the specified file exists in the CF-card folder. If exists, please confirm the right of access to the file. | - |
| 0xC0B00263 SAAF099 -1062206877 3232760419 | Failed to write to the file. | Please check the access right to the write destination. If there is no problem with the access right, please check whether the CF-card has enough free space. | - |
| 0xC0B00264 SAAF100 -1062206876 3232760420 | The specified file was not found. | Please confirm that the specified file exists. | - |
| 0xC0B00265 SAAF101 -1062206875 3232760421 | Failed to delete the file. | Please confirm that the specified file exists in the CF-card folder. If exists, please confirm the right of access to the file. | - |
| 0xC0B00266 SAAF102 -1062206874 3232760422 | Failed to rename the file. | Please confirm that the specified file exists in the CF-card folder. If it does, please check the access right to the file and whether the new file name does not contain any forbidden characters. | - |
| 0xC0B00267 SAAF103 -1062206873 3232760423 | Cannot open the file list retention file. | Please check the access right to the destination folder. If there is no problem with the access right, please check whether the drive has enough free space. | - |
| 0xC0B00269 SAAF105 -1062206871 3232760425 | No file name has been inputted. | Please input a file name. | - |
| 0xC0B0026A SAAF106 -1062206870 3232760426 | Too long file path. | Please shorten the file path. | - |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|--|--|
| 0xC0B0026C SAAF108 -1062206868 3232760428 | Connection to the Display unit was reset. | After confirming the remote node is still on and the cable is properly connected, please execute it again | "2.2 Connecting PC with display unit" |
| 0xC0B0026D SAAF109 -1062206867 3232760429 | The destination NODE does not respond. | | |
| 0xC0B0026E SAAF110 -1062206866 3232760430 | Could not complete the operation because connection was broken during the process. | | |
| 0xC0B0026F SAAF111 -1062206865 3232760431 | Cannot connect to the specified node because it does not exist. | Please load the network project file in which the specified Node name is registered into 'Pro-Server EX'. | "24.1 Try to connect with Factory Gateway" |
| 0xC0B00272 SAAF114 -1062206862 3232760434 | The parameter value is invalid. | Please review the inputted parameter, and set a correct value. | "27 Designing Your Own Program" |
| 0xC0B00273 SAAF115 -1062206861 3232760435 | Failed to get the file list in the CF-card. | Please confirm that the specified file type is correct. Also, please check the access right to the destination folder. If there is no problem with the access right, please check whether the drive has enough free space. | - |
| 0xC0B00274 SAAF116 1062206860 3232760436 | Could not connect to the Display Unit. | The remote node may be busy. Please execute it again after a brief interval. Or, if the connection with the remote node is established using the transfer tool, please exit the tool and then execute it again. | - |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|---|--|
| 0xC0B00280 SAAF128 -1062206848 3232760448 | The destination NODE does not respond. | Network connection between your port and the destination port has not been properly established. Please check the followings, and then execute Transfer or Delete again. <ul style="list-style-type: none"> The network cable is properly connected The destination node is ON, and The IP address in the Node Setting of 'Pro-Studio EX' is correct. In the destination node's [Port Control], confirm the Pro-Server EX port is open. Set [Port Control] from the [Security Settings] screen in offline mode. | "31.5 Setting Guide" |
| 0xC0B00281 SAAF129 -1062206847 3232760449 | Cannot judge the specified node model. Not supported Display Unit. | Please disconnect the unsupported display unit node. Or, make sure the node setting is correct. If it does not solve the problem, please install 'Pro-Server EX' again. | "Supported Models" |
| 0xC0B00282 SAAF130 -1062206846 3232760450 | Cannot execute because the 2WayDriver version is earlier than 4.50. | Cannot execute the specified feature because the 2 WayDriver version of the GP Series Node is old. Please upgrade the 2 WayDriver, and then execute it again. | - |
| 0xC0B00283 SAAF131 -1062206845 3232760451 | Screen Capture is not supported. | | |
| 0xC0B00284 SAAF132 -1062206844 3232760452 | New Filing Data is not supported. | | |
| 0xC0B00285 SAAF133 -1062206843 3232760453 | The device cache was not found | Please confirm that a cache buffer has been generated under the device cache name you specified. Also, please confirm that the device cache name is correct. | "29.5 Cache Registration of Frequently Used Devices" |
| 0xC0B00286 SAAF134 -1062206842 3232760454 | The device cache already has been already registered. | Please confirm that no cache buffer with the same device cache name has been generated. Also, please confirm that the device cache name is correct. | "29.5 Cache Registration of Frequently Used Devices" |
| 0xC0B00287 SAAF135 -1062206841 3232760455 | The provided device-cache handle is invalid. | Please confirm that the handle is correct. | "29.5 Cache Registration of Frequently Used Devices" |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|---|--|
| 0xC0B00288 SAAF136 -1062206840 3232760456 | The no. of device caches exceeds the limit. | The max number of cache buffers is 1000. No more can be registered. If you want to register another cache buffer, please reduce the number of already registered ones. | "29.5 Cache Registration of Frequently Used Devices" |
| 0xC0B00289 SAAF137 -1062206839 3232760457 | The no. of device cache records exceeds the limit. | Please register the record in another cache buffer. Or please reduce the number of records. | "29.5 Cache Registration of Frequently Used Devices" |
| 0xC0B0028A SAAF138 -1062206838 3232760458 | The device cache size exceeds the limit. | Please register the record in another cache buffer. Or please reduce the total number of bytes. | "29.5 Cache Registration of Frequently Used Devices" |
| 0xC0B0028B SAAF139 -1062206837 3232760459 | Could not execute because the device cache was in processing. | Before you register a record in a cache buffer, please be sure that cache action is not in execution. | "29.5 Cache Registration of Frequently Used Devices" |
| 0xC0B0028E SAAF142 -1062206834 3232760462 | Invalid Transfer Password | The transfer password you entered is not the same as the one set up on the remote node. Please enter the correct password, and try Transfer again. If you forgot your transfer password, please either configure it again in 'GP-Pro EX' or delete the transfer password. | "23.1.1 Remote Access" |
| 0xC0B0028F SAAF143 -1062206833 3232760463 | Transfer failed. | Please try Transfer again. If you still cannot transfer, please forcibly transfer the project file to the remote node using 'GP-Pro EX', and then transfer the network project file using 'Pro-Studio EX'. | "26.1 Setting Guide" |
| 0xC0B00290 SAAF144 -1062206832 3232760464 | Cannot connect to the destination NODE. | <ul style="list-style-type: none"> The remote node is now in transfer mode. Please try Transfer again after a while, or after powering the remote node off and then on. Please confirm whether the destination is supported by 'Pro-Studio EX'. | "26.1 Setting Guide" "Supported Models" |
| 0xC0B00294 SAAF148 -1062206828 3232760468 | Failed to recognize the destination main unit. Please confirm whether the model is supported by Pro-Studio EX. | Please confirm whether the destination is supported by 'Pro-Studio EX'. | "Supported Models" |

- * - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|--|--|
| 0xC0B00298 SAAF152 -1062206824 3232760472 | File access went wrong with the destination main unit. | Please forcibly transfer the project file to the remote node using 'GP-Pro EX', and then transfer the network project file using 'Pro-Studio EX'. | "26.1 Setting Guide" |
| 0xC0B00299 SAAF153 -1062206823 3232760473 | CF-Card is not inserted or not supported. | Please check whether the CF-card is properly inserted. | - |
| 0xC0B0029B SAAF155 -1062206821 3232760475 | System Error | Please install 'Pro-Studio EX' again. | 'Pro-Server EX Installation Guide' |
| 0xC0B0029C SAAF156 -1062206820 3232760476 | Transfer stopped. | If operation is continued without any interruption by the user, this message is not displayed. | "26.1 Setting Guide" |
| 0xC0B0029D SAAF157 -1062206819 3232760477 | Cannot transfer the network project because the version of destination GP Runtime(2WayDriver) is earlier than V4.55. Please transfer it again after upgrading GP Runtime(2Way Driver). | Please transfer the new 2Way Driver from GP-Pro/PB to the GP Series Node. | - |
| 0xC0B002A1 SAAF161 -1062206815 3232760481 | The model in Node Setting is different from the actual model. | The model in Node Setting of 'Pro-Studio EX' is different from the actual model. Please check the followings, and then execute Transfer or Delete again. <ul style="list-style-type: none"> • The Node type is the same as that of the actual model. • The IP address setting is correct. • The connected Display unit model is correct. | "31.5 Setting Guide" |
| 0xC0B002A2 SAAF162 -1062206814 3232760482 | Cannot read the project file from the Display Unit because the file does not exist or is broken. | Please transfer the project file from 'GP-Pro EX' to the remote node. | 'GP-Pro EX Reference Manual' |
| 0xC0B002A3 SAAF163 -1062206813 3232760483 | Cannot transfer the network project because the Runtime version of the Display Unit is old. | Please transfer the new runtime from 'GP-Pro EX' to the remote node. | 'GP-Pro EX Reference Manual' |
| 0xC0B002A4 SAAF164 -1062206812 3232760484 | Cannot register the device in the device cache. | When the sampling cycle of the device cache is 0, the device of the PC or the GP Series Node cannot be registered. Please change the sampling cycle to a value other than 0 before registration. | "29.5 Cache Registration of Frequently Used Devices" |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|--|------------------------------|
| 0xC0B002A5 SAAF165 -1062206811 3232760485 | Failed to save the project file. | If the hard-disk capacity of the PC is insufficient, please increase it and execute the operation again. Or please restart the PC and execute again. | - |
| 0xC0B002A6 SAAF166 -1062206810 3232760486 | Failed to process because Read SRAM Backup Data is now being used. | Please execute Read SRAM Backup Data again. | "20.2 Setting Guide" |
| 0xC0B002A7 SAAF167 -1062206809 3232760487 | Parameter Error in Read SRAM Backup Data | Please execute Read SRAM Backup Data using a correct parameter. | "27.6 SRAM Data Access APIs" |
| 0xC0B002A8 SAAF168 -1062206808 3232760488 | Failed to write to a saved file. | If the hard-disk capacity of the PC is insufficient, please increase it and execute the operation again. Or please restart the PC and execute again. | - |
| 0xC0B002A9 SAAF169 -1062206807 3232760489 | Cannot continue the operation because Pro-Server EX is not running. | Start 'Pro-Server EX'. | - |
| 0xC0B002AA SAAF170 -1062206806 3232760490 | NODE Information with the specified index does not exist. | In the case it occurred while you were using the API, please check the API parameters. In the case it occurred while you were using some feature, please check the settings of the feature. | - |
| 0xC0B002AB SAAF171 -1062206805 3232760491 | Device Information with the specified index does not exist. | In the case it occurred while you were using the API, please check the API parameters. | - |
| 0xC0B002AC SAAF172 -1062206804 3232760492 | Symbol-Sheet Information with the specified index does not exist. | In the case it occurred while you were using some feature, please check the settings of the feature. | - |
| 0xC0B002AD SAAF173 -1062206803 3232760493 | Global-Constant Information with the specified index does not exist. | In the case it occurred while you were using the API, please check the API parameters. | - |
| 0xC0B002AE SAAF174 -1062206802 3232760494 | Device-Cache Information with the specified index does not exist. | In the case it occurred while you were using some feature, please check the settings of the feature. | - |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|---|-----------|
| 0xC0B002AF SAAF175 -1062206801 3232760495 | Attempted to access a device outside the address range. | Attempted to access an out-of-range device. | - |
| 0xC0B002B0 SAAF176 -1062206800 3232760496 | R_Device is not supported. | 'Pro-Server EX' does not support R_Device. Use other devices. | |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

36.3.5 "SAAJ****" Error Info

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|--|------------------------------------|
| 0xC0B00501 SAAJ001 -1062206207 3232761089 | Failed to get the Pro-Server EX handle. | Please confirm that the handle is correct. | "27.5 System APIs" |
| 0xC0B00502 SAAJ002 -1062206206 3232761090 | Cannot open the template of the ACTION report sheet, or cannot add the sheet. | Please reboot your PC. If not solved, install it again. | 'Pro-Server EX Installation Guide' |
| 0xC0B00503 SAAJ003 -1062206205 3232761091 | Failed to start EXCEL. | Please check that Excel is installed and restart the PC. | - |
| 0xC0B00504 SAAJ004 -1062206204 3232761092 | Cannot open the template book. | Please save the file from the command of template file edit, to reload. If you start Excel with this error generated, Excel exits at the timing of closing 'Pro-Server EX'. During the error, first close 'Pro-Server EX' and then start Excel. | Chapter of corresponding Action |
| 0xC0B00505 SAAJ005 -1062206203 3232761093 | ACTION System Error | Please reboot your PC. If not solved, install it again. | 'Pro-Server EX Installation Guide' |
| 0xC0B00506 SAAJ006 -1062206202 3232761094 | Cannot save the output book. | Please exit Pro-Server EX. Please check that the attribution of output file is not "Read-only", and reload. | - |
| 0xC0B00507 SAAJ007 -1062206201 3232761095 | The specified template sheet (XX) was not found in the template book. (XX: Template sheet name) | Please check that the specified sheet exists in the template file. | - |
| 0xC0B00508 SAAJ008 -1062206200 3232761096 | Failed to add the sheet. | Please reboot your PC. If not solved, install it again. | 'Pro-Server EX Installation Guide' |
| 0xC0B00509 SAAJ009 -1062206199 3232761097 | Cannot execute due to the command (XX) impossible to interpret. (XX: Command name) | Please save the file from the template file edit. Or, create new template file. | Chapter of corresponding Action |
| 0xC0B0050A SAAJ010 -1062206198 3232761098 | Failed to print. | Please check the printer status normally used. | - |

- * - 1st line: Error code
 2nd line: Integrated error code
 3rd line: Error code with decimal code
 4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|--|--|------------------------------------|
| 0xC0B0050B SAAJ011 -1062206197 3232761099 | The specified data type is not supported. | Settings for the specified action are not supported. | - |
| 0xC0B0050C SAAJ012 -1062206196 3232761100 | Cannot execute. The Pro-Server EX version is old. | Please reinstall. | 'Pro-Server EX Installation Guide' |
| 0xC0B0050D SAAJ013 -1062206195 3232761101 | The ACTION report sheet is damaged. | | |
| 0xC0B0050E SAAJ014 -1062206194 3232761102 | Cannot paste image. | Possible cause is that the image file does not exist. Please create an image data again with the Display Unit. | 'GP-Pro EX Reference Manual' |
| 0xC0B0050F SAAJ015 -1062206193 3232761103 | Cannot read the file. The header of the CSV file acquired is damaged. | The CSV file may be damaged. Create a new CSV file for the log data on the Display Unit. | - |
| 0xC0B00510 SAAJ016 -1062206192 3232761104 | Cannot open the specified CSV file (XX). (XX: File name) | CSV file is possibly broken. Please make CSV file of log data again with an Display Unit. | 'GP-Pro EX Reference Manual' |
| 0xC0B00511 SAAJ017 -1062206191 3232761105 | The ACTION area size is too small. | The Action output range is too small. Please expand the Action area in editing the template file. | Chapter of corresponding Action |
| 0xC0B00512 SAAJ018 -1062206190 3232761106 | The specified data type is not supported. | Please save the file from the template file edit. | Chapter of corresponding Action |
| 0xC0B00513 SAAJ019 -1062206189 3232761107 | The file name is too long to create an output book. | Please shorten the file name. | Chapter of corresponding Action |
| 0xC0B00514 SAAJ020 -1062206188 3232761108 | An error occurred executing the macro. Please refer to the log viewer for details. | Please check the macro to be executed. | - |
| 0xC0B00515 SAAJ021 -1062206187 3232761109 | Failed in scrolling. | Please reboot your PC. If not solved, install it again. | 'Pro-Server EX Installation Guide' |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|--|--|
| 0xC0B00516 SAAJ022 -1062206186 3232761110 | The setting to save in a file is invalid. | Please check again the specification of export to be implemented. | - |
| 0xC0B00520 SAAJ032 -1062206176 3232761120 | Could not identify the record no. because the recipe record no. has not been set. Please configure the specification method of the record no. in the Recipe Settings dialog.. | Please configure the specification method of the record no. in the Recipe Settings dialog. | Chapter of corresponding Action |
| 0xC0B00521 SAAJ033 -1062206175 3232761121 | A runtime error occurred. The target output sheet is unknown or the cell range is invalid. | Please check the output folder and file. In addition, please check the cell range of action area is correct. | Chapter of corresponding Action |
| 0xC0B00522 SAAJ034 -1062206174 3232761122 | Failed to read the alias file. | Confirm the text substitution table settings in editing the template file. | "12.3 Setting Guide" |
| 0xC0B00523 SAAJ035 -1062206173 3232761123 | No recipe with the specified record no. exists. | Confirm the No. of recipe record settings in editing the template file. | "12.3 Setting Guide" |
| 0xC0B00524 SAAJ036 -1062206172 3232761124 | Cannot export the output file. | Please check the specification of export to be implemented. | - |
| 0xC0B00525 SAAJ037 -1062206171 3232761125 | The specified ACTION area does not exist. | Please open the template file and save again. | Chapter of corresponding Action |
| 0xC0B00526 SAAJ038 -1062206170 3232761126 | The cell arrow settings are invalid. Scale or Arrow Start/End Value is wrong. | Confirm the cell arrow settings in editing the template file. | "5.3.2 Setting Guide" |
| 0xC0B00527 SAAJ039 -1062206169 3232761127 | Cannot write device values converted to strings. If you want to write them, please cancel the Replace specification. | Cannot write device values converted to strings. If you want to write them, please cancel the Replace specification. | "12.3 Setting Guide" |
| 0xC0B00528 SAAJ040 -1062206168 3232761128 | When the cell is in the edit mode, no ACTION can be executed. Please close Edit Cell before execute the ACTION again. | Finish editing the cell, and execute the Action again. | Setting guide in the corresponding chapter |
| 0xC0B00529 SAAJ041 -1062206167 3232761129 | The Action Area was too small, so cannot write in. | The Action output range is too small. Please expand the Action area in editing the template file. | Setting guide in the corresponding chapter |

* - 1st line: Error code
 2nd line: Integrated error code
 3rd line: Error code with decimal code
 4th line: Error code without decimal code

| Error Code* | Error Message | Cause and Troubleshooting | Reference |
|--|---|--|--|
| 0xC0B0052A SAAJ042 -1062206166 3232761130 | Cannot execute Replace. The alias file is the same as the template file. Please specify an alias file that is different from the template file. | Specify the alias file so as to be different from the template file. | Setting guide in the corresponding chapter |
| 0xC0B0052B SAAJ043 -1062206165 3232761131 | Cannot open the output book. | Specify the output book so as to be different from the template file, or text substitution file. | Setting guide in the corresponding chapter |

* - 1st line: Error code
2nd line: Integrated error code
3rd line: Error code with decimal code
4th line: Error code without decimal code

36.4 Error Message

| Error Code | | Message |
|-------------------|---------------------|---|
| Decimal | Hexadecimal | |
| 9300 | 2454h | Cannot find network project file. |
| 9301 : 9329 | 2455h : 2471h | Reserved. |
| 9330 | 2472h | Cannot execute the command because resources are insufficient. Terminated program. |
| 9331 | 2473h | The system resource was dead-locked. Terminated program. |
| 9332 | 2474h | System Error |
| 9333 | 2475h | Cannot execute the command because program versions do not match. Terminated program. |
| 9334 : 9339 | 2476h : 247Bh | Reserved. |
| 9340 | 247Ch | An error occurred when accessing the <%s> file. |
| 9341 | 247Dh | Pro-Server is being used by too many applications. |
| 9342 | 247Eh | OS resources are insufficient (insufficient memory). |
| 9343 | 247Fh | The set connector is used by another application. |
| 9344 | 2480h | Pro-Server has not been started. Could not reference data. |
| 9345 | 2481h | Pro-Server has been terminated. Could not reference data. |
| 9346 | 2482h | Cannot continue - Pro-Server has been terminated. |
| 9347 | 2483h | Cannot continue - Pro-Server has been terminated. |
| 9348 | 2484h | Could not start Pro-Server. |
| 9349 | 2485h | Could not start Pro-Studio. |
| 9350 | 2486h | Unsupported command. Cannot continue. |
| 9351 | 2487h | Failed in loading the network project file. |
| 9352 | 2488h | The entered node name has already been registered. |
| 9353 | 2489h | The entered node name has not been registered. |
| 9354 | 248Ah | Backup data type specified is not supported. |
| 9355 | 248Bh | Failed to writing to the file. |
| 9356 | 248Ch | Could not create a file to store the SRAM backup data. |
| 9357 | 248Dh | The node name entered has not been registered. |
| 9358 | 248Eh | Pro-Server is already operating. Cannot start two copies. |
| 9359 | 248Fh | Reserved. |
| 9360 | 2490h | '%s' has not been entered. |
| 9361 | 2491h | 0 cannot be entered in '%s'. |
| 9362 | 2492h | '%s' should be: "xxx.xxx.xxx. xxx" format; where xxx is a value between 0 and 255. |

| Error Code | | Message |
|-------------------|---------------------|--|
| Decimal | Hexadecimal | |
| 9363 | 2493h | An invalid value has been entered in '%s'. |
| 9364 | 2494h | A character unavailable for '%s' is involved. |
| 9365 | 2495h | '%s' has not been entered yet. |
| 9366 | 2496h | Cannot start a new process until the process result is returned from the server. |
| 9367 | 2497h | Cannot terminate the application while waiting for the process result. |
| 9368 | 2498h | Read permission required to execute this command. Log on to the network again. |
| 9369 | 2499h | Write permission required to execute this command. Log on to the network again. |
| 9370 | 249Ah | Administrator permission required to execute this command. Log on to the network again. |
| 9371 | 249Bh | The specified number is not registered. |
| 9372 : 9375 | 249Ch : 249Fh | Reserved. |
| 9376 | 24A0h | Cannot read the file (Core.ID) |
| 9377 : 9389 | 24A1h : 24ADh | Reserved. |
| 9390 | 24AEh | Mode of Appointed handle is EASY_TB_STATUS_NOW or EASY_TB_STATUS_LAST_READ. Please execute after changing its mode to EASY_TB_STATUS_PAST or EASY_TB_STATUS_INDEX. |
| 9391 | 24AFh | Unable to open the designated LS Area |
| 9392 | 24B0h | Designated LS Area is not open |
| 9393 | 24B1h | Failed to acquire CF Card's File List |
| 9394 | 24B2h | Failed to read CF Card's file(s) |
| 9395 | 24B3h | Failed to write CF Card's file(s) |
| 9396 | 24B4h | CF Card is not inserted |
| 9397 | 24B5h | CF Card is not initialized |
| 9398 | 24B6h | CF Card is damaged |
| 9399 | 24B7h | Unable to access the designated file |
| 9400 | 24B8h | The function of Pro-Easy.DLL was doubly called up. The function of PfnApiEasy.DLL is already running. |
| 9401 | 24B9h | The specified access handle for Pro-Server EX is not effective. |
| 9402 | 24BAh | Pro-Server has stopped and can not perform processing. |
| 9403 | 24BBh | The error occurred in the function of OLE. Data cannot be converted. |
| 9404 | 24BCh | The effective data for the specified data-type variant does not exist in the original data, or is not enough. |
| 9405 | 24BDh | Original data and destination data types cannot be converted by data-type variant. |
| 9406 | 24BEh | The specified argument is not enabled. |

| Error Code | | Message |
|-------------------|---------------------|---|
| Decimal | Hexadecimal | |
| 9407 | 24BFh | Can not create the time bar. |
| 9408 | 24C0h | The symbol name is not registered. |
| 9409 | 24C1h | Cannot open the distribution sheet. |
| 9410 | 24C2h | The specified time bar has already been locked. |
| 9411 | 24C3h | The specified time bar has already been linked. |
| 9412 | 24C4h | The specified handle is not linked. |
| 9413 | 24C5h | The specified handle is not linked to the database. |
| 9414 | 24C6h | Specified handle is locked or played, Please execute after clearing to its status. |
| 9415 | 24C7h | The argument is wrong. |
| 9416 | 24C8h | Designate the internal format of the argument's Variant as either "Date" type, or compatible with "Date". |
| 9417 | 24C9h | The specified time is out of the valid range. |
| 9418 | 24CAh | The invalid argument has been set. |
| 9419 | 24CBh | Database of appointed handle is closed. |
| 9420 | 24CCh | Database access error. |
| 9421 | 24CDh | INI file ('%s') in the action contents cannot be opened. |
| 9422 | 24CEh | '%s' of INI file ('%s') in the action contents cannot be analyzed. |
| 9423 | 24CFh | Action '%s' uses action contents not yet installed in the network project. |
| 9424 | 24D0h | There are too many actions to register. |
| 9425 | 24D1h | The specified action has already been registered. |
| 9426 | 24D2h | The action contents which action '%s' uses cannot be started. The designated action is not registered. |
| 9427 | 24D3h | An error occurred on the Active-X IF. |
| 9428 | 24D4h | The designated action has been registered in the registry. |
| 9429 : 9449 | 24D5h : 24E9h | Reserved. |
| 9450 | 24EAh | The node name or symbol name is not specified. |
| 9451 | 24EBh | The node name is not specified. |
| 9452 | 24ECh | The data type setting is not valid. |
| 9453 | 24EDh | The node name and symbol is not delimited with '!'. The symbol name has not been registered or it is not a valid device address. |
| 9454 | 24EEh | The symbol name has not been registered or it is not a valid device address. |
| 9455 | 24EFh | Cannot continue the process - no valid device is specified. |
| 9456 | 24F0h | Cannot make word-access to 32-bit devices. |
| 9457 | 24F1h | The address is out of the valid range. |

| Error Code | | Message |
|-------------------|---------------------|--|
| Decimal | Hexadecimal | |
| 9458 | 24F2h | The No. of points setting is invalid. |
| 9459 | 24F3h | The No. of points setting is 0 or exceeds the setting range. |
| 9460 | 24F4h | Cannot convert the set symbol into a device address. |
| 9461 | 24F5h | A value input error occurred. Enter a correct value. |
| 9462 | 24F6h | The specified lifetime is invalid. |
| 9463 | 24F7h | The designated bit location is incorrect. |
| 9464 : 9469 | 24F8h : 24FDh | Reserved. |
| 9470 | 24FEh | Unable to connect to designated Node |
| 9471 | 24FFh | Node is a Windows PC. Unable to perform processing. |
| 9472 | 2500h | Failed to save captured screen data as JPEG file |
| 9473 | 2501h | Screen Capture is not supported. |
| 9474 | 2502h | Capture Approval Flag is not ON |
| 9475 | 2503h | Failed to acquire CF Card free space data |
| 9476 | 2504h | Data Transfer is not supported |
| 9477 | 2505h | ProNet.dll has not been installed properly |
| 9478 | 2506h | Unable to perform due to the 2-Way Driver's version not being 4.50 or higher |
| 9479 | 2507h | Reserved. |
| 9480 | 2508h | Failed to delete CF Card's file |
| 9481 | 2509h | Failed to change CF Card's internal file |
| 9482 | 250Ah | File exceeds 256 characters - reduce number of characters |
| 9483 : 9499 | 250Bh : 251Bh | Reserved. |
| 9500 | 251Ch | Pro-Server schedule management thread initialization error |
| 9501 | 251Dh | Pro-Server LAN management thread initialization error |
| 9502 | 251Eh | Pro-Server timer management thread initialization error |
| 9503 | 251Fh | Pro-Server DDE control thread initialization error |
| 9504 | 2520h | Pro-Server API control thread initialization error |
| 9505 | 2521h | Pro-Server API parameter error |
| 9506 | 2522h | Response time out |
| 9507 | 2523h | Pro-Server failed in initializing the LAN. |
| 9508 | 2524h | No data |
| 9509 | 2525h | Invalid device |
| 9510 | 2526h | Invalid address |

| Error Code | | Message |
|-------------------|---------------------|--|
| Decimal | Hexadecimal | |
| 9511 | 2527h | The address is out of the valid range. |
| 9512 | 2528h | Data type error |
| 9513 | 2529h | Transmission message error |
| 9514 | 252Ah | Cannot initialize Pro-Server cache function. |
| 9515 | 252Bh | Cannot load the network project because the database is used. |
| 9516 : 9559 | 252Ch : 2557h | Reserved. |
| 9560 | 2558h | System Error (DLL load error) |
| 9561 | 2559h | System Error (DLL version may be old.) |
| 9562 | 255Ah | System Error |
| 9563 | 255Bh | The designated property ID is not defined. (version may be old) |
| 9564 | 255Ch | Value conversion error. Incorrect characters as numbers are designated. |
| 9565 | 255Dh | Too many characters. |
| 9566 | 255Eh | The number is too large. |
| 9567 | 255Fh | System Error (Cannot start COMM.) |
| 9568 | 2560h | System Error (Cannot start GP-Viewer runtime.) |
| 9569 | 2561h | Cannot open the %s file. |
| 9570 | 2562h | File read error. |
| 9571 | 2563h | File write error. |
| 9572 | 2564h | No tags exist. (No parameter class declarations exist.) |
| 9573 | 2565h | No end tags exist. (No parameter class declarations exist.) |
| 9574 | 2566h | Found the unexpected end tag (No parameter class declarations exist.) |
| 9575 | 2567h | Signatures do not match. |
| 9576 | 2568h | Unsupported parameter. |
| 9577 | 2569h | Reached the file end. |
| 9578 | 256Ah | The incorrect structure. |
| 9579 | 256Bh | Cannot continue the process due to a memory lack. |
| 9580 | 256Ch | Cannot analyze the device name. |
| 9581 | 256Dh | DB name is not designated. |
| 9582 | 256Eh | Cannot access to DB. |
| 9583 | 256Fh | Cannot edit DB because it is locked (edited) by another program (e.g. Data View). |
| 9584 | 2570h | Either the node name or the device name is not designated. |
| 9585 | 2571h | Cannot use DB because it has been closed. (DB in use is automatically closed once when NPJ is saved/loaded.) |
| 9586 | 2572h | The database may be broken. |

| Error Code | | Message |
|-------------------|---------------------|---|
| Decimal | Hexadecimal | |
| 9587 | 2573h | Data not saved. |
| 9588 | 2574h | Cannot find data at the designated time. |
| 9589 | 2575h | No polling setups exist. |
| 9590 | 2576h | The database has not been opened. (Or it has already been closed.) |
| 9591 | 2577h | Already polling start. |
| 9592 | 2578h | Old data will be overwritten, instead of newest data. |
| 9593 | 2579h | Delete record |
| 9594 | 257Ah | Exceeds designated file size. |
| 9595 | 257Bh | Designated file number does not exist |
| 9596 : 9599 | 257Ch : 257Fh | Reserved. |
| 9600 | 2580h | Cannot continue the process due to a resource lack in GP. |
| 9601 : 9619 | 2581h : 2593h | Reserved. |
| 9620 | 2594h | The network project item has been registered redundantly. (The network project file has been broken.) |
| 9621 : 9639 | 2595h : 25A7h | Reserved. |
| 9640 | 25A8h | The Provider information data that is not registered in the network project file were sent from other node. (Network projects differ between theProvider and the Receiver nodes.) |
| 9641 | 25A9h | Either that the device write failed at the Receiver node or that no partner nodes exist while providing data. |
| 9642 : 9659 | 25AAh : 25BBh | Reserved. |
| 9660 | 25BCh | Data Read failed. |
| 9661 | 25BDh | Invalid access range of the read device. |
| 9662 : 9669 | 25BEh : 25C5h | Reserved. |
| 9670 | 25C6h | It is an access range wrong point by the write of device. |
| 9671 : 9699 | 25C7h : 25E3h | Reserved. |
| 9700 | 25E4h | Received the first trigger establish command for non-existing provider information. |
| 9701 : 9709 | 25E5h : 25EDh | Reserved. |

| Error Code | | Message |
|-------------------|---------------------|--|
| Decimal | Hexadecimal | |
| 9710 | 25EEh | Received the second trigger establish command for non-existing provider information. |
| 9711 : 9729 | 25EFh : 2601h | Reserved. |
| 9730 | 2602h | The GP is busy sending screen data or saving SRAM backup data to another PC. |
| 9731 | 2603h | An error occurred in reading the SRAM backup data. (The item ID differs from the previous ID.) |
| 9732 | 2604h | An error occurred in reading the SRAM backup data. (The data type differs from the previous type.) |
| 9733 | 2605h | An error occurred in reading the SRAM backup data. (The block No. differs from the previous No.) |
| 9734 | 2606h | SRAM backup data read error. (The requested data amount is 0 or differs from the previous amount.) |
| 9735 : 9739 | 2607h : 260Bh | Reserved. |
| 9740 | 260Ch | The GP is busy sending screen data or saving SRAM backup data to another PC. |
| 9741 | 260Dh | An error occurred in reading the SRAM backup data. (The item ID differs from the previous ID.) |
| 9742 | 260Eh | An error occurred in reading the SRAM backup data. (The data type differs from the previous type.) |
| 9743 | 260Fh | An error occurred in reading the SRAM backup data. (The block No. differs from the previous No.) |
| 9744 | 2610h | SRAM backup data read error. (The requested data amount is 0 or differs from the previous amount.) |
| 9745 : 9749 | 2611h : 2615h | Reserved. |
| 9750 | 2616h | CF command error. |
| 9751 | 2617h | CF Access error |
| 9752 | 2618h | No CF card unit. |
| 9753 : 9779 | 2619h : 2633h | Reserved. |
| 9780 | 2634h | Transmission error occurred with PLC during data write. (Code:%02x:%04x) |
| 9781 | 2635h | The designated SRAM backup data is not in the GP. |
| 9782 | 2636h | The GP's SRAM backup data is incorrect. (Code:%04x) |
| 9783 | 2637h | New alarm block is not supported. |
| 9784 : 9789 | 2638h : 263Dh | Reserved. |

| Error Code | | Message |
|-------------------|---------------------|---|
| Decimal | Hexadecimal | |
| 9790 | 263Eh | No remote access right (not connected remotely) |
| 9800 | 2648h | Parameter error. |
| 9801 | 2649h | Data count is over. |
| 9802 | 264Ah | File create error. |
| 9803 | 264Bh | EXCEL sheet create error. |
| 9804 | 264Ch | Write file error. |
| 9805 | 264Dh | File open error. |
| 9806 | 264Eh | Read only file. |
| 9807 | 264Fh | Print out error. |
| 9808 | 2650h | Save folder access error. |
| 9809 | 2651h | Reserved. |
| 9810 | 2652h | Unable to find message table file. |
| 9811 | 2653h | Unable to open message table file. |
| 9812 | 2654h | Unable to find designated sheet in message table file. |
| 9813 | 2655h | Message table is incorrect. |
| 9814 | 2656h | No equivalent enabled code. |
| 9815 | 2657h | Error occurred during POP confirmation. For details see the Log Viewer. |
| 9816 | 2658h | Unable to send mail. For details see the Log Viewer. |
| 9817 | 2659h | Unable to send portion of mail. For details see the Log Viewer. |
| 9818 9819 | 265Ah 265Bh | Reserved. |
| 9820 | 265Ch | Unable to find designated database |
| 9821 | 265Dh | Unable to find designated Table. Or, there are no records in the designated Table |
| 9822 | 265Eh | Unable to find the designated field name |
| 9823 | 265Fh | Unable to find the designated data |
| 9824 | 2660h | Field data is incorrect |
| 9825 | 2661h | Validation failed |
| 9826 | 2662h | Error occurred while accessing the database |
| 9827 | 2663h | Unable to create the Pro-Server handle |
| 9828 | 2664h | There are no character data |
| 9829 : 9839 | 2665h : 266Fh | Reserved. |
| 9840 | 2670h | Unable to open Action Report Sheet Template, or unable to append sheet |
| 9841 | 2671h | Failed to start EXCEL |

| Error Code | | Message |
|------------|-------------|---|
| Decimal | Hexadecimal | |
| 9842 | 2672h | Unable to open Template Book |
| 9843 | 2673h | Action System Error |
| 9844 | 2674h | Unable to save Output Book |
| 9845 | 2675h | Designated Template Sheet(%)s does not exist in Template Book |
| 9846 | 2676h | Failed to append sheet |
| 9847 | 2677h | Unable to interpret command (%)s and cannot execute |
| 9848 | 2678h | Failed to print |
| 9849 | 2679h | Designated data type is not supported |
| 9850 | 267Ah | Pro-Server version is old and cannot be started |
| 9851 | 267Bh | Action Report sheet is corrupted |
| 9852 | 267Ch | Designated group does not exist |
| 9853 | 267Dh | Unable to paste image |
| 9854 | 267Eh | File header is corrupted - unable to read |
| 9855 | 267Fh | Unable to open designated CSV file (%)s |
| 9856 | 2680h | Action Area Size is too small |
| 9857 | 2681h | Unable to create or read temporary file |
| 9858 | 2682h | No usable files exist in GP/GLC |
| 9859 | 2683h | Designated data type is not supported |
| 9860 | 2684h | A file name is too long, and Output Book cannot be make |
| 9861 | 2685h | An error occurred while macro run. Refer to Log Viewer for the details |
| 9862 | 2686h | Unable to save GP Screen Capture data. |
| 9863 | 2687h | Check if the Permission Flag has turned ON. |
| 9864 | 2688h | The file name is error. |
| 9865 | 2689h | The specified file does not exist in the CF card. |
| 9866 | 268Ah | Not the browser application's designated folder. Browser cannot be displayed. |
| 9870 | 268Eh | Error downloading Binary file |
| 9871 | 268Fh | Binary file Read failed |
| 9872 | 2690h | Binary file Open error |
| 9873 | 2691h | Binary file Analysis failed |
| 9874 | 2692h | Error writing to Excel file |
| 9875 | 2693h | Error writing to CSV file |
| 9876 | 2694h | Error creating Binary file |
| 9877 | 2695h | Designated file does not exist |
| 9878 | 2696h | Conversion from Excel file to Binary file failed |
| 9879 | 2697h | Conversion from CSV file to Binary file failed |

| Error Code | | Message |
|------------|-------------|--|
| Decimal | Hexadecimal | |
| 9880 | 2698h | Provided data is outside range |
| 9881 | 2699h | Failed in GP log data upload. |
| 9882 | 269Ah | There is no data to support. |
| 9883 | 269Bh | This data requires more than one sheet. |
| 9884 | 269Ch | Microsoft Excel is not installed on this machine. |
| 9885 | 269Dh | Wrong parameter is designated. |
| 9886 | 269Eh | Failed to write data. |
| 9887 | 269Fh | Failed to read CSV file. |
| 9888 | 26A0h | An error occurred in deleting an unnecessary file. |
| 9889 | 26A1h | Action Failed. |
| 9891 | 26A3h | No corresponding data in ACCESS file. |
| 9892 | 26A4h | Command error. |
| 9893 | 26A5h | Failed in automatic upload of ACCESS data. |
| 9894 | 26A6h | Cannot open the specified table. |

For information about 2580h, 25A8h, 25A9h, refer to "36.2 2-Way Driver Error Messages and Syslog Features".

37 | Restrictions

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37.1 Restrictions on Names

■ Specifying a Macro to Use the Same Save File Name for each ACTION

You can change file names to [Node Name] or [Saved Data in Device Name (Symbol Name) of Provider Node] by specifying one of the macro codes shown below in [Saved File Name] in the parameter settings for each ACTION.

- Provider node name (Macro code: %NODE)

(Ex.) If the entry node "AGP1" is specified using "Data_%NODE", the file name will become "Data_AG1".

- Saved data in the device name of provider node (Macro code: %DEV(Device Name or Symbol Name))

(Ex.) When storing "2043" to D100, if "Data_%DEV[D100]" is used, the file name will change to "Data_2043".

NOTE

- When using a macro for a save file name, be sure to enter the macro code correctly. Entering incorrectly, you could not save the file.

However, you cannot use the file name macro for the following data types:

- 8 bit
- TIME
- TIME_OF_DAY
- DATE
- DATE_AND_TIME

When you convert the data saved in the provider's device name (symbol name) to a file name, please pay attention to the following notes:

- Data types when specifying the device name (Default: Decimal, signed 16 bits)

The data type can be changed if after the device name a single-byte space and one of the data type specifications shown in the table below are attached.

(Ex.) When using decimal, unsigned 16 bits, and storing "40505" to D100, specifying "Lot_No%DEV[D100.WORD]" will change the file name to "Lot_No40505"

| Data type | Data type specifying characters | Data type | Data type specifying characters |
|------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Bit | .BIT | 32 bits without decimal code | .DWORD |
| 16 bits with decimal code | .+WORD | Hexadecimal 32 bits | .HEXDWORD |
| 16 bits without decimal code | .WORD | BCD 32 bits | .BCDDWORD |
| Hexadecimal 16 bits | .HEXWORD | Single-precision floating point | .FLOAT |
| BCD 16 bits | .BCDWORD | Double-precision floating point | .DOUBLE |
| 32 bits with decimal code | .+DWORD | Character string | .STR |

- Precautions when using non-character strings for symbol names

The file name is created using the data type registered on the "Symbol Registration" screen.

(Ex.) If the value "0x999" is stored to the BCD-type symbol "Product_3", when "Data_%DEV[Product_3]" is specified, the file name changes to "Data_9999".

- Precautions when using character strings for symbol names

Attaching an asterisk (*) plus a number after a symbol name allows you to specify the number of characters. The default value is 32 characters, and the maximum is 255 characters.

(Ex.) "%DEV[MOJI .STR .*10]" means that 10 characters after the symbol name "MOJI" are read out, and file names are created until the string NULL is reached.

37.2 Restrictions on Pro-Server EX

■ In case that the "Excel Report" ACTION is forcibly terminated

If the "Excel Report" ACTION is forcibly terminated for some reasons, chances are that you cannot open Excel files by double-click. (Excel starts with no book.)

In this case, follow the steps below to open Excel files:

- (1) On the Excel menu bar, select [Tools] - [Option] - [General].
- (2) Uncheck "Ignore other applications" shown below.

■ When the trigger button in Excel Report does not function normally

After the security patch of Microsoft Office is applied, the trigger button may not function normally. If such a case happens, update the output book following the steps as shown below.

- (1) Open the template file again with Pro-Studio EX.
- (2) Overwrite the template file without making any changes.
- (3) Delete the output book or update the output book using the NEW Book command.

■ Text substitution with Excel Report actions does not replace correctly

If you use multiple Excel report actions to replace text, depending on the timing of when they start, the text substitution process may not work.

When that happens, use one of the following to make the text substitution work correctly.

- Combine multiple text substitution tables into a single Excel workbook
- Run all Excel report actions for text substitution with the same trigger condition
- Set up the trigger conditions so the Excel report actions for text substitution do not start at the same time

■ Saving the network projectfile

For the saving destination and file name of the network project file, a semicolon (;) cannot be used.

■ The maximum registration number of each setting item

The maximum registration number for each item is shown in the table below.

| Item | Limit value | Remarks |
|---|---|---|
| Maximum registration No. of nodes | 1022 nodes | |
| Maximum symbol sheet No. | 140 sheets for each entry node | |
| Maximum row No. for one symbol sheet | 1500 rows | |
| Row No. for one group | 1499 rows | |
| Byte size of a group | When using data transfer function or device cache function: 10 Kbytes or less When using APIs: 1 Mbyte or less | |
| Maximum registration No. of communications between devices | 3000 records | The total number of records of a distribution type of data transfer, a collection type of data transfer, and data transfer for ACTION in the whole network project. |
| Maximum registration No. of device caches | 1000 or less | Note that alarm appears when over 100. |
| Maximum record No. in one device cache | 1000 records | Note that alarm appears when over 100. |
| Total byte No. in one device cache | Always: 1 Kbyte Polling: 10 Kbytes | |
| Maximum registration No. of ACTIONS | 500 | |
| No. of data transfers or ACTIONS available with one trigger condition | 300 | |
| Accessible data No. using API queuing access | 1500 or less, and also the number of data bytes is 1 Mbyte or less | |
| File name specification | 250 characters or less by full path | |

■ Guide to memory in use

The maximum size of a network project file is as follows.

Pro-Server EX Node: There is no restriction.

ST6000 Series Node: 262144 bytes

SP-5B4*/WinGP Node: There is no restriction.

SP-5B00/5B10/5B90 Node: 262144 bytes

GP4000/LT4000 Series Node: 262144 bytes

GP3000 Series Node: 262144 bytes

LT3000 Node: 262144 bytes

GP Series Node: 59526 bytes

The following is the lowest amount of used memory with 'Pro-Server EX' loading a network project file.

Pro-Server EX Node: 1700 bytes approx.

ST6000 Series Node: 1000 bytes approx.

SP-5B4*/WinGP Node: 1000 bytes approx.

SP-5B00/5B10/5B90 Node: 1000 bytes approx.

GP4000/LT4000 Series Node: 1000 bytes approx.

GP3000 Series Node: 1000 bytes approx.

LT3000 Node: 1000 bytes approx.

GP Series Node: 400 bytes approx.

The table below shows used memory capacity for each item.

| | | Incremental memory for Pro-Server EX nodes | Incremental memory for GP Series nodes | Incremental memory for Pro-Server EX / nodes other than GP Series nodes | Supplement |
|---------------------|--|--|--|---|--|
| Additional Function | Add one Pro-Server EX node | 320 bytes approx. | 100 bytes approx. | 20 bytes approx. | |
| | Add one GP Series node | 320 bytes approx. | 100 bytes approx. | 20 bytes approx. | |
| | Add one ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, or LT3000 node | 600 bytes approx. | 100 bytes approx. | 20 bytes approx. | |
| | Add one Device/PLC to a ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, or LT3000 node | 180 bytes approx. | 0 | 50 bytes approx. | Depends on the type of Device/PLC or parameters. |
| | Add one trigger condition | 200 bytes approx. | 160 bytes approx. | 200 bytes approx. | |
| | Add one record of a distribution type of data transfer | 120 bytes approx. | 1. Except for groups: 50 bytes approx. 2. The groups other than alignment groups: No. of group members x 50 bytes approx. 3. Alignment groups: No. of members x No. of elements x 50 bytes approx. | 120 bytes approx. | For constant distribution, increases by the byte size of the constant. |
| | Add one record of a collection type of data transfer | 120 bytes approx. | 1. Except for groups: 50 bytes approx. 2. The groups other than alignment groups: No. of group members x 50 bytes approx. 3. Alignment groups: No. of members x No. of elements x 50 bytes approx. | 120 bytes approx. | |
| | Add one device cache | 50 bytes approx. | 0 | 0 | |
| | Add one record to a device cache | 30 bytes approx. | 0 | 0 | |
| | Add one ACTION | 250 bytes approx. | 50 bytes approx. | 120 bytes approx. | Depends on the type of ACTION or parameters. |

| | | Incremental memory for Pro-Server EX nodes | Incremental memory for GP Series nodes | Incremental memory for Pro-Server EX / nodes other than GP Series nodes | Supplement |
|-------------------|--|--|--|---|------------|
| Additional Symbol | Add one SymbolSheet | 120 bytes approx. | 0 | 0 | |
| | Add one symbol which does not belong to Group Symbol | 60 bytes approx. | 0 | 0 | |
| | Add one Group Symbol | 180 bytes approx. | 80 bytes approx. | 0 | |
| | Add one symbol is increased in Group Symbol | 60 bytes approx. | 120 bytes approx. | 0 | |

■ Rules for Specifying Names

'Pro-Server EX' frequently requests you to specify names such as node names, symbol names. Please take the following rules into consideration when naming:

- (1) A name must consist of 32 double-byte characters (64 single-byte characters) or less.
- (2) The following characters are not available for names: + - * / % & ^ | < > \ : @ . , " [] # ? (Space) (TAB)
Some are used, however, in certain reserved words or concatenators.
- (3) You can use "#" at the beginning of a name when specifying a new node or symbol name, but 'Pro-Server EX' recognizes these words starting with "#" as reserved words. Therefore, don't use "#" at the beginning of a name.
- (4) You cannot use single-byte numeric characters at the beginning of a name.
- (5) You may connect names, for example, for grouped symbols, but don't exceed the maximum number of characters (255 double-byte characters) including extensions like "." (dot) and "[" (brackets), elemental numbers, and global constant numbers.
Ex.) Group1[1].Symbol1
Group2[LOTNO].OpeName[MACHINE1].Temp
- (6) Names are not case-sensitive.

<Recommended Rules>

Sometimes 'Pro-Server EX' exchanges data with other applications.

Names are then used as keywords, and thus 'Pro-Server EX' can fail to exchange data according to specifications of other applications. To prevent such possible trouble, the following rules are recommended:

- (1) Don't start a name with "__" (2 underscores).
- (2) 'Pro-Server EX' internally uses UNICODE character strings for name data, but on the other hand, many applications uses multi-byte character strings. Thus, character strings are frequently converted between UNICODE and Multi-byte. Depending on the OS language you are using, characters may be garbled. In this case, 'Pro-Server EX' does not work properly, so it is recommended to avoid using machine-dependent characters as much as possible.
In addition, use only alphanumeric characters when using DDE function of Excel. Katakana or double-byte characters exit the Excel DDE function (due to Excel specifications).

■ Accessing the backup SRAM

While 'Pro-Server' is accessing the backup SRAM, the status data of "0500h" is stored in the mode of the control address when the display unit has received a request for transfer from the backup SRAM to the CF card.

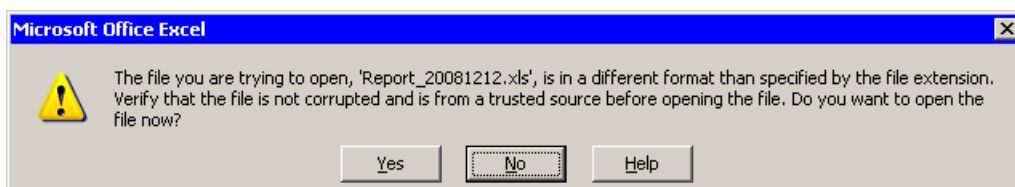
In this case, perform the transfer again to the CF card.

■ BCD Conversion

| | |
|---------------------|--|
| BCD16→BIT | Convert to 0 and 1 per 16 bits |
| BCD16→BCD16, BCD32 | No conversion |
| BCD16→16BIT | Convert from BCD to Binary at read |
| BCD16→String | Convert from BCD to Binary at read and write to character strings under text mode at write |
| BCD16→ACTION | Convert from BCD to Binary at read |
| | |
| BCD32→BIT | Convert to 0 and 1 per 32 bits |
| BCD32→BCD16, BCD32 | No conversion |
| BCD32→16BIT | Convert from BCD to Binary at read |
| BCD32→String | Convert from BCD to Binary at read and write to character strings under text mode at write |
| BCD32→ACTION | Convert from BCD to Binary at read |
| | |
| BIT→BCD16 | Extend bit to 16-bit unit |
| BIT→BCD32 | Extend bit to 32-bit unit |
| 16BIT→BCD16, BCD32 | Convert from Binary to BCD at write |
| 32BIT→BCD16, BCD32 | Convert from Binary to BCD at write |
| String→BCD16, BCD32 | Read character strings at read and convert from Binary to BCD at write |

■ Note when using 'Microsoft Excel 2007 or later

Under the following conditions, opening a file created in “Microsoft Excel 2007’ or later produces a warning message. Click [Yes] to open the file.



- Upload of GP log data
- Excel Recipe Download
- Writing Data in Excel Book
- Automatic upload of GP filing data

■ When renewal of a screen data, reading processing, etc. are delayed

In a ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, and LT3000 nodes, write-to-device processes take precedence over read processes such as screen update and sampling.

Therefore, when a large quantity of data is written to a Node, or when multiple Nodes try to write data (even if in small quantity) to a Node at a time, read processes may be delayed because they have a lower priority.

This problem occurs via a network as well.

Display unit's screen data is not updated if the read process is delayed.

Referring to the communication cycle time^{*1}, tune the amount of data to write via the network.

- ^{*1} Communication cycle time is the time between data request from the display unit to the device and acquisition.

NOTE

- If writing a large quantity of data is required, Pro-Server EX provides a "Writing in progress" indicator lamp or message by turning ON a certain device bit before start of writing, and by turning it OFF after completion of writing, to inform the operator of a delay caused by writing.
- When writing data from multiple Nodes at a time is required, the method that writes the data from each Node into the internal device first and then writes the integrated data into the device of the device/PLC may improve the performance.

■ If you want both 'Pro-Server EX' and 'WinGP' to reside on the same machine

When 'WinGP' is installed on PS Series, PL Series, or PC/AT compatible machine and you install 'Pro-Server EX' (version 1.10 or later), the WinGP SDK is removed. When you install 'WinGP' after installing 'Pro-Server EX', the WinGP SDK is not installed. However, you can use applications that use the WinGP SDK by setting up the network nodes on 'Pro-Server EX'.

■ About WinGP versions

When you cannot use the following Pro-Server EX features on the WinGP node, upgrade the WinGP node's run-time version to GP-Pro EX Ver.3.01.200 or later.

- In Pro-Studio EX, from the [Tools] menu [Save GP Screen]
- Action [Upload of GP JPEG Data] action
- Excel forms action [Log Data in GP Area]-[Data Type]-[GP Screen Data (JPEG)]

■ Real variables on 'GP-Pro EX'

In 'Pro-Server EX', you cannot use real variables on 'GP-Pro EX'. Therefore, you cannot use "R_" when specifying the device address in address format.

■ OPC Server for Pro-Server EX

- In the OPC configuration tool, LT4000 Series are treated as GP4000 Series nodes, and LT3000 Series are treated as GP3000 Series nodes.
- While connected to 'OPC Server for Pro-Server EX', do not perform a reload using 'Pro-Server EX'. To change the network project, shut down all connections to the 'OPC Server for Pro-Server EX' before performing a reload.
- While reloading a network project file on a network PC to Pro-Server EX, you cannot use 'OPC Server for Pro-Server EX'. Save the network project file you want to reload to the same PC where 'OPC Server for Pro-Server EX' is installed.

■ MES ACTION

- To use MES ACTION, you need to attach the MES Action database. For details, please refer to 'Before using MES ACTION' in the "MES Action Reference Manual".
- When upgrading the MES ACTION version, backup the MES ACTION database before installation.
- After upgrading the MES ACTION version, before using MES ACTION, from the Pro-Server EX installation folder run "DbInstall_No2.sql" in the "MESActionDB" folder.
- For models without a CF/SD Card slot, if you use MES Action to work with CF features, an error is generated.
- MES ACTION cannot be copied or pasted on the 'Pro-Studio EX' feature setting screen.
- For "MES Action: GP CF-card Alarm-History-File Collection", once the table to which data is output is deleted, the output table may not be recreated even if the ACTION is activated. In this case, navigate through the 'Pro-Server EX' installation folder → the Content folder → the ProCfAlarm folder to find the appropriate Action GUID file and delete it.
- Symbols imported from 'GP-Pro EX' have fixed [Data Type] and [No.], which cannot be edited.

■ Device Addresses When Omitting Bit Position

If a device address is specified as Bit type without specifying its bit position, the first bit represents the bit position.

37.3 Restriction on Protocol

■ Protocol

'Pro-Server EX' does not support the following protocols when connecting to ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, or LT3000 node.

- YE DIGITAL CORPORATION, MMcloud TCP Client

■ Special Protocol

'Pro-Server EX' does not support the following 12 types of special protocols when connecting to GP Series.

- MITSUBISHI MELSECNET/10
- OMRON SYSMAC-CS1 (ETHER)
- HITACHI HIDIC H (ETHER)
- Siemens S7-200 via MPI
- Siemens S7-300/400 via MPI
- SIEMENS S7-300/400 (ETHER)
- AB Slc500 DH485
- Allen Bradley SLC5/05 (ETHER)
- Schneider TSX via UNI-TELWAY
- Schneider Modbus TCP (ETHER)
- Schneider Modbus RTU 1:n comm.
- AB ControlLogix (EtherNet/IP)

■ Indirect Devices

Pro-Server EX cannot use indirect devices set up in 'GP-Pro EX'.

■ Restrictions when GP-Pro EX uses the tag import feature

- When reading from or writing to multiple devices that are non-consecutive, and device addresses use tags, communication takes longer compared to not using tags.
- You cannot cut or copy multiple selections of nodes for tags imported in Pro-Studio EX. Select one at a time to cut or copy.

■ Using Byte-type Variables

Byte-type variables created for use with the protocols below are handled in word units on Pro-Server EX.

For example, for a 11 byte variable, the variable size on Pro-Server EX is 12 bytes (6 words), whereas the variable size on the device/PLC is 11 bytes.

As a result, if you map a 11 character string from Pro-Server EX an error occurs as the variable size on the device/PLC is exceeded.

When using byte-type variables, set them up with an even number of bytes.

- Beckhoff Automation GmbH, TwinCAT ADS/AMS
- CoDeSys Automation Alliance, CoDeSys Ethernet
- CoDeSys Automation Alliance, CoDeSys SIO
- Fuji Electric Co., Ltd., MICREX-SX Series Ethernet
- Fuji Electric Co., Ltd., MICREX-SX Series SIO

- Omron Corporation, CS/CJ/NJ Series EtherNet/IP
- Rockwell Automation, Inc., EtherNet/IP
- Siemens Building Technologies, SAPHIR SIO

■ Reading from and writing to bit devices

You cannot read from or write to bit devices with the following protocols.

- Rockwell Automation Inc, DH-485
- IEC Standard, IEC 60870-5-101

■ Reading and Writing Bits to Word Addresses

When using the following device/PLCs with either word devices that support bit access, or word-type tags that support bit access, you cannot read or write multiple points of bits..

| Manufacturer | Driver Name | Target Device |
|------------------------|---------------------------|------------------------|
| Siemens AG | SIMATIC S7 MPI Direct | Data Block (DB) |
| | | Input (I/E) |
| | | Output (Q/A) |
| | | Marker (M) |
| | | Variable (V) |
| | SIMATIC S7 3964 (R)/RK512 | Data Block (DB) |
| | | Input (I/E) |
| | | Output (Q/A) |
| | | Marker (M) |
| | SIMATIC S7 Ethernet | Data Block (DB) |
| | | Input (I/E) |
| | | Output (Q/A) |
| | | Marker (M) |
| | SIMATIC S5 CPU Direct | Input Relay (I) |
| | | Output Relay (Q) |
| | | Internal Relay (F) |
| PROFIBUS International | PROFIBUS DP Slave | Data Block (DB) |
| | | Input (I/E) |
| | | Output (Q/A) |
| | | Marker (M) |
| | | Direct I/O Input (PI) |
| | | Direct I/O Output (PQ) |
| Fuji Electric Co.,Ltd. | MICREX-F Series SIO | Input Relay(B) |
| | | Supplementary Relay(M) |
| | | Special Relay(F) |
| | | Differential Relay(D) |
| | | Keep Relay(K) |
| | | Announce Relay(A) |
| | | Link Relay(L) |

■ Restrictions When Accessing 64-bit Device

In 'Pro-Server EX', when accessing a 32-bit device using double-precision floating point, the access target is 2 sequential 32-bit devices.

Refer to the following access order regarding Low/High placement of the data when accessing 32-bit device of Device/PLCs.

- Via GP Series Node
Access in the order of Low to High.
- Via ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, or LT3000 node
Access in the order of High to Low.

| Protocol name in GP Series Node | Protocol name in ST6000 Series, SP-5B4*/WinGP, SP-5B00/5B10/5B90, GP4000/LT4000 Series, GP3000 Series, or LT3000 node | Target Device Name |
|--|---|--------------------|
| Fuji Electric Co., Ltd. MICREX-F Series | Fuji Electric FA Components and Systems Co., Ltd. MICREX-F Series SIO | BD |
| | | DI |
| | | TR |
| | | TS |
| | | W9. |
| | | CR |
| | | CS |
| | | W33. |
| | | W34. |
| Allen Bradley ControlLogix DF1 | Rockwell Automation, Inc. DF1 | REAL |

■ Sequential Address Specification

'Pro-Server EX' has restrictions when specifying sequential addresses in the following protocols required for connecting to GP Series.

Yokogawa Electric Corp. FACTORY ACE 1:1 communication

Yokogawa Electric Corp. FACTORY ACE 1:n communication

Yokogawa Electric Corp. FA-M3(ETHER)

Sequential specification is not available in X and Y devices.

Sequential specification in the same link number is available in L and W devices.

Hitachi Industrial Equipment Systems Co., Ltd. HIDIC H Series

Hitachi Industrial Equipment Systems Co., Ltd. HIDIC H2 Series

Sequential specification is not available in X, Y, WX and WY devices.

SIEMENS S5 90-115 Series

SIEMENS S5 135-155 Series

Sequential specification in the same Data Block is available in SIEMENS S5 3964(R) D, X devices.

Sequential bit specification is not available in I, Q and F devices.

Sequential bit specification is not available in DB*W(* shows 1 to 60) device.

Sequential bit specification is not available in I, Q, M, SM, V, T and C devices.

Sequential bit specification is not available in I, O, M and DB*W(* shows 2 to 60) devices.

Sequential bit specification is not available in I, O, M and DB*W(* shows 2 to 60) devices.

Allen Bradley SLC500 Series

Allen Bradley PLC-5 Series

Sequential specification in the same file number is available in PLC devices of Allen Bradley.

■ Access Using Device Monitor or Device Access API

The following protocol ST devices have 41-word unit areas. When other area than the 41-word unit areas is accessed using the device monitor or device access API, therefore, the ST device does not work normally.

- Rockwell Automation Inc., DH-485

- Rockwell Automation Inc., Ethernet/IP

- Rockwell Automation Inc., DF1

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