Pro-face
Human Machine Interface

Pro-face

**Pro-Server
Communication Tool
PD-Adapter**

Operation Manual

Preface

Thank you for purchasing Pro-face's Pro-Designer software.

To ensure the safe and correct use of Pro-Server Communication Tool, hereafter referred to as "PD-Adapter", be sure to read all related materials carefully, and refer to them often or whenever required.

< Note >

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Table of Contents

Chapter
1 Overview

Pro-Server Communication Tool (hereafter called PD-Adapter) is the middleware that connects Pro-Designer Runtime with Pro-Server. This chapter explains PD-Adaptor's System Design, Features, and Installation procedure.

1.1 PD-Adapter Overview

Use PD-Adapter to view and edit a Pro-Designer user application's variable values from within Pro-Server. As well, use the Pro-Server interface feature to view and edit a Pro-Designer user application's variable values from within an external application. You can also use Pro-Designer variable values to trigger a Pro-Server Action or Provider Data.

1.2 System Setup

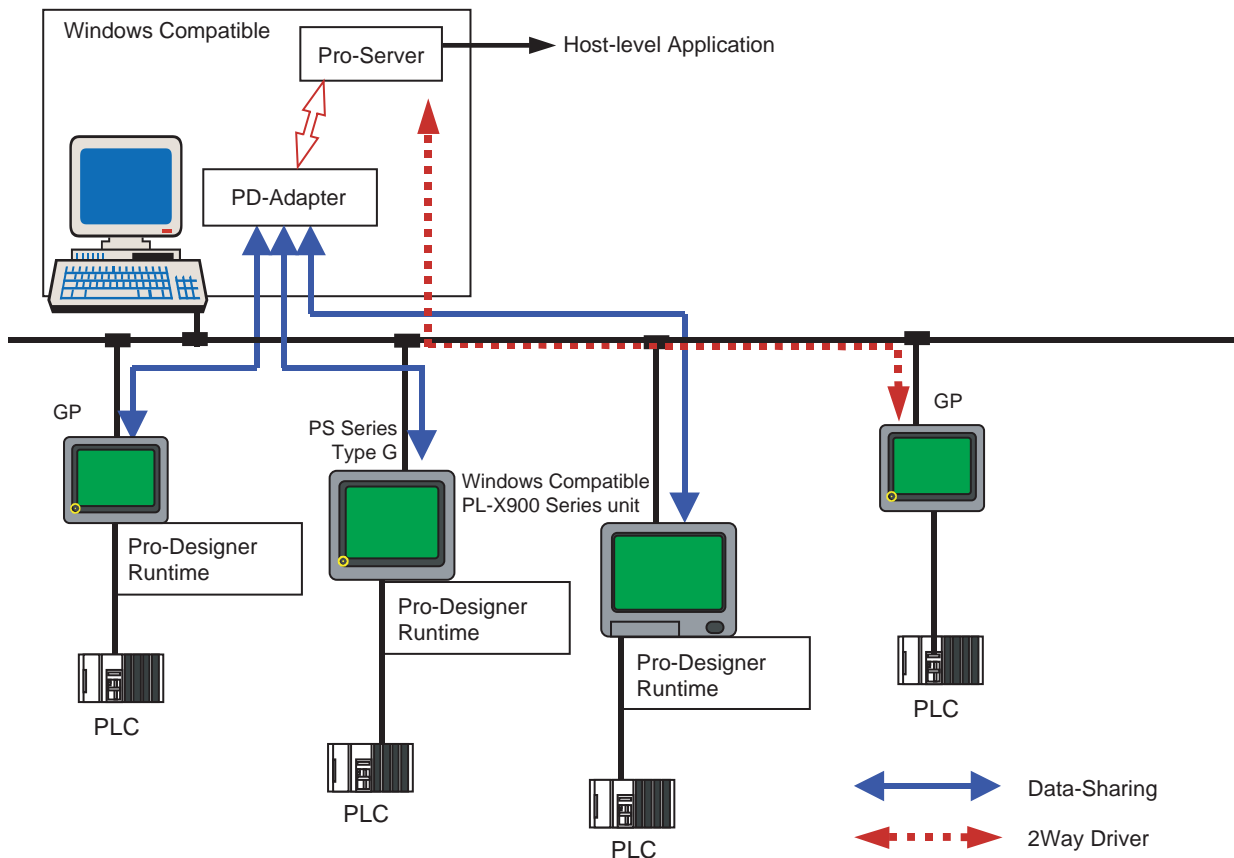The following is an example of a system designed using PD-Adapter.

Diagram 1–1 System Setup

1.3 Operating Environment

■When Entering Settings

Personal Computer	Windows Compatible PC (including PL Series unit)
OS	Windows NT[®] 4.0 ServicePack4 or higher
	Windows[®] 2000
	Windows[®] XP
Required Applications	Pro-Designer Version 3.0 or higher
	Pro-Server with Pro-Studio for Windows Version 3.12 or higher

■When Transferring Data

Personal Computer	Windows Compatible PC (including PL Series unit)
OS	Windows NT[®] 4.0 ServicePack4 or higher
	Windows[®] 2000
	Windows[®] XP
Required Applications	Pro-Server with Pro-Studio for Windows Version 3.12 or higher
Network	Ethernet (TCP/IP)
Connected Target	Pro-Designer Runtime compatible environment

1.4 Installation

Insert To install Pro-Designer, use the following steps.

1) Insert the Pro-Designer CD-ROM in to your unit's CD-ROM drive. If the installation menu appears, close it.

2) Click on the desktop's [Start] menu, then [Run] and enter "X:PSCTInstall\Setup.exe", where "X" is the drive character of your CD-ROM drive.

3) When the installation menus starts, follow the instructions given to install the program.

Important

1. **When setting up communication, install Pro-Server Communication Tool in the same PC as Pro-Designer.**

2. **When running communications, install Pro-Server Communication Tool in the same PC as Pro-Server.**

To start the Pro-Server Communication Tool after installation is complete, click the Windows Start button, then point to Programs, Pro-face, Pro-Series, and Tools, and then click Pro-Server Communication.

1.5 PD-Adapter Features

- PD-Adapter, also known as Pro-Server Communication Tool, is a tool that connects Pro-Designer Runtime and Pro-Server.

- Pro-Designer automatically sets up the information necessary to perform data communication.

- PD-Adapter creates the network project file (*.npj) for the Pro-Server application.

- Data exchange with Pro-Designer Runtime target machines occur over the Ethernet.

- PD-Adapter can access variables from multiple Pro-Designer Runtime target machines.

- PD-Adapter can automatically start data communication at startup.

Chapter

2 Setup and Communication

Create a project in Pro-Designer (Create panels, setup DataSharing) ▼Reference▲ See **3.1.1 – "Pro-Designer — Setup"**

↓

Build and download a Pro-Designer project.

↓

Save the PD-Adapter communication setup file (*.pda) set up in the previous step. ▼Reference▲ See **3.1.4 – "PD-Adapter — Save"**

↓

In PD-Adapter, create a Pro-Server Network Project file (*.npj). ▼Reference▲ See **3.1.9 – "PD-Adapter — Export Pro-Server File"**

↓

Use Pro-Studio to open the network (*.npj) project file created with PD-Adapter, and overwrite the existing data. ▼Reference▲ See **3.1.9 – "Pro-Server — Setup Connection"**

↓

Open the PD-Adapter communication setup file (*.pda). ▼Reference▲ See **3.1.12 – "PD-Adapter — Open"**

↓

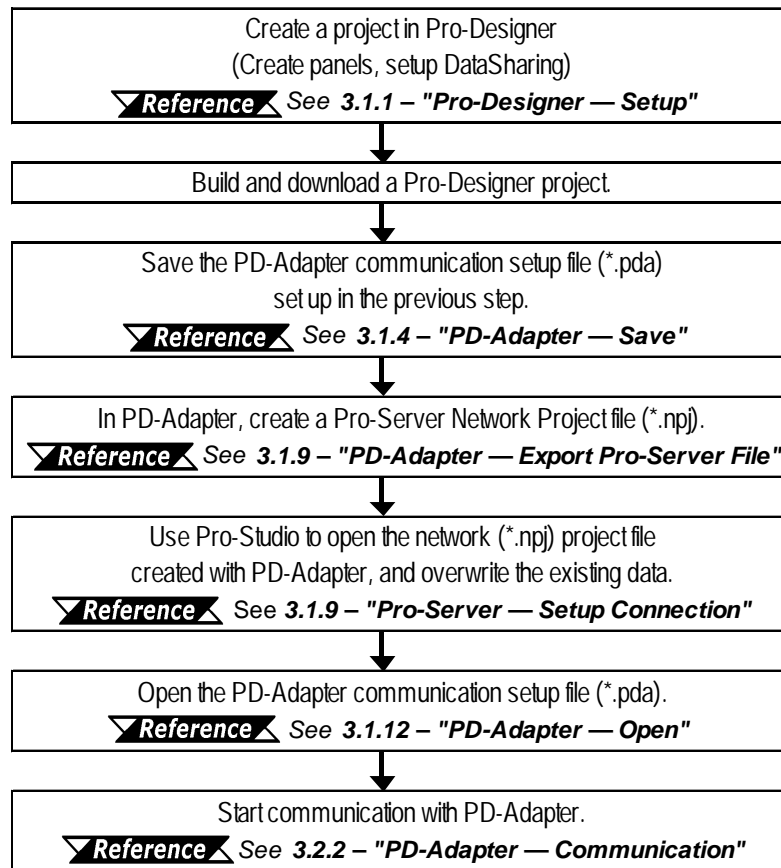| Start communication with PD-Adapter.
▼Reference▲ See **3.2.2 – "PD-Adapter — Communication"** |
| :---: |

Diagram 2–1 Setup and Communication Flowchart

1. In Pro-Designer Editor, select the Target node, set its DataSharing property to True, and then build and download the user application to the target machine.

2. Start PD-Adapter.

3. In the PD-Adapter setup screen, set the destination.

   a. Select the name of the Pro-Designer project.

   b. Select the name of the target, and set up the IP address of the target machine.

4. Select variables from the target's variable list.

5. Save the PD-Adapter communication setup file (*.pda).

6. After selecting the variables, export a Pro-Server network Project file (*.npj).

7. In Pro-Server, open the NPJ file generated in Step 6.

8. In the target machine, start the Pro-Designer Runtime application, and in PD-Adapter, open the PD-Adapter communication setup file (*.pda) generated in Step 5.

9. Start communication.

Chapter

3 Operation

The following sections describe the items that need to be set up to use PD-Adapter.
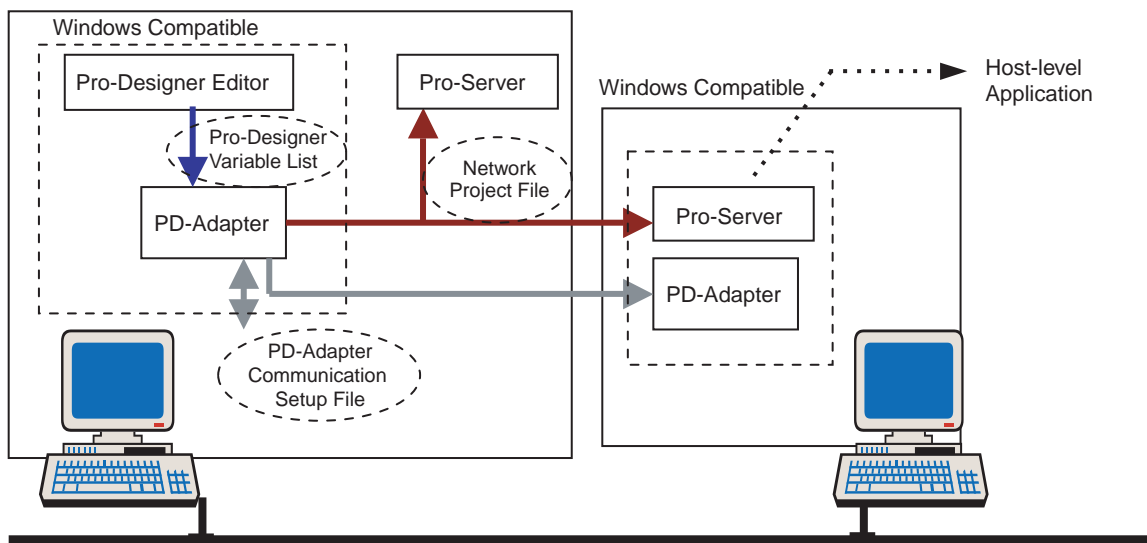
3.1 Connection Settings

Diagram 3–1 System Setup

3.1.1 Pro-Designer – Setup

Open the project in Pro-Designer, select the Target node, and set up the following properties:

- IP Address

  Enter the IP address of the target machine on which the user application will run. When Download is Local, the IP address is automatically set.

- DataSharing

  Set DataSharing to True and assign a port number.

  ▽ *Reference* △ *See 4.1 – "Setup Restrictions."*

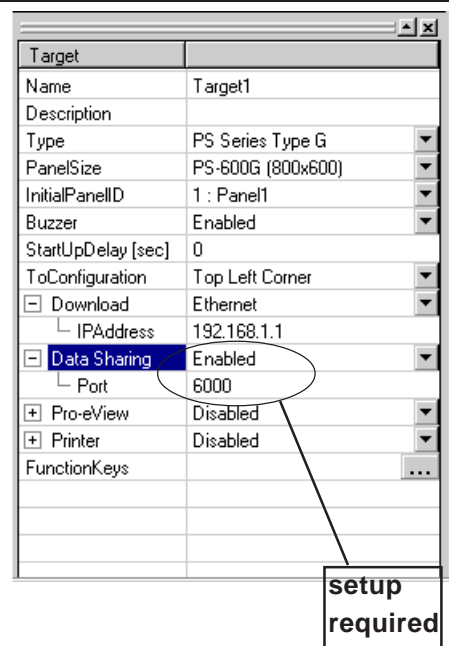After configuration is complete, build and download the project to the target machine.

**Diagram 3–2
Pro-Designer Target Properties**

Pro-Server Communication Tool Operation Manual

3.1.2   PD-Adapter – Startup

Start up PD-Adapter.

Click the Windows Start button, then point to Programs, Pro-face, Pro-Series, and Tools, and then click Pro-Server Comm. Tool. The PD-Adapter Tool is registered in the task tray [icon] 15:35 , and the following status window starts up.
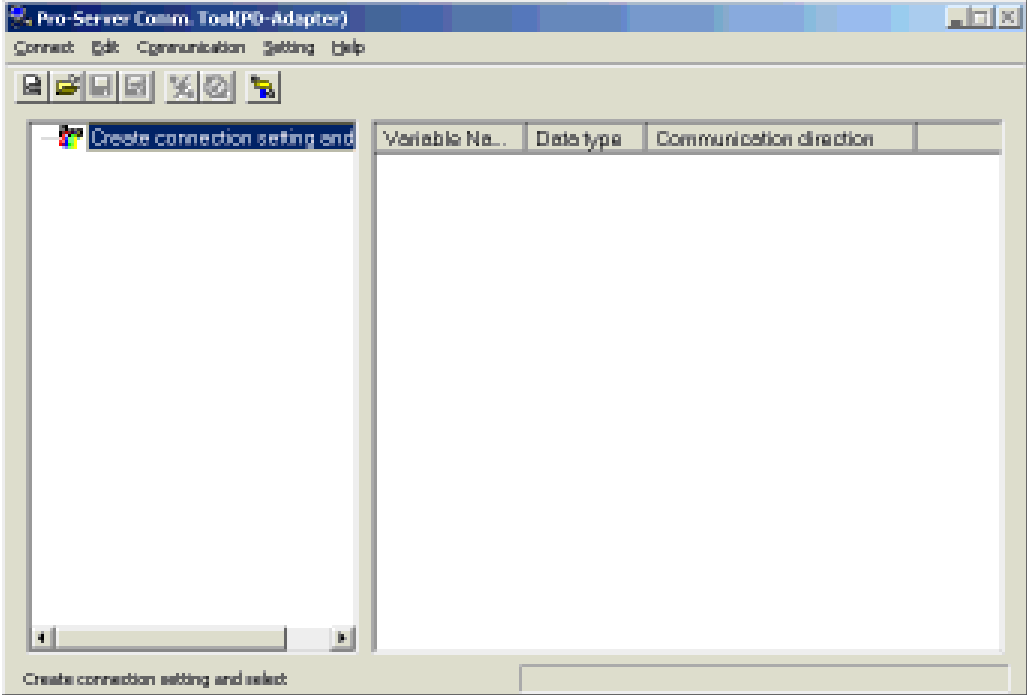

Diagram 3–3 Status Window

To close the status window, open the Connect menu and click Close. In this format, the PD-Adapter icon remains in the task tray. To redisplay the status window, double-click the icon, or right-click the icon and click Display Window.

To exit the PD-Adapter application, right-click the icon in the task tray and click Exit PD-Adapter.

Operation

The following table describes the commands in the status window menu bar.

Menu	Command	Description	Reference
Connect	New	Set up new communication.	3.1.3 PD-Adapter – New
	Open	Open an existing file.	3.1.11 PD-Adapter – Select
	Save	Save the communication setting.	3.1.4 PD-Adapter – Save
	Export Pro-Server file	Output network project file (.npj).	3.1.9 PD-Adapter – Export Pro-Server file
	Close	Close status window.	3.3.1 PD-Adapter – Close
	Exit PD-Adapter	Exit PD-Adapter.	3.3.2 PD-Adapter – Exit PD-Adapter
Edit	Edit Target	Edit target.	3.1.10 PD-Adapter – Edit
	Edit Variable	Edit variable.	3.1.10 PD-Adapter – Edit
Commu-nication	Start Communication	Start communication.	3.2.2 PD-Adapter – Communication
	Abort Communication	Abort communication.	3.2.2 PD-Adapter – Communication
Setting	Communication Setting	Set up new communication.	3.1.5 PD-Adapter – Communication Setting
	Auto Communication	Start communication at startup.	3.1.8 PD-Adapter – Auto Communication
Help	Manual	Displays the manual	
	About PD-Adapter	Displays version information	

3.1.3 PD-Adapter – New

To set up new communication variables, open the Connect menu and click New.
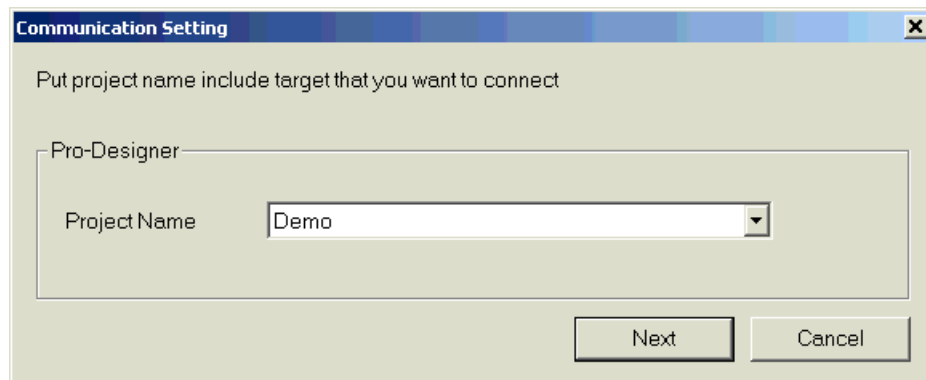
The following dialog box appears.

Diagram 3–4 Communication Setting Dialog Box

Select the name of the project created in Pro-Designer, then click Next to display the Target Setting dialog box (Diagram 3–5), or click Cancel to return to the status window.

> ⚠️ *Important*
>
> **Be sure to build the project in Pro-Designer before adding variables with PD-Adapter. PD-Adapter uses the project, target, and variable information from the user application that is created when Pro-Designer performs a build. If the project is not built, the correct information may not be available. Therefore, perform build before adding variables.**
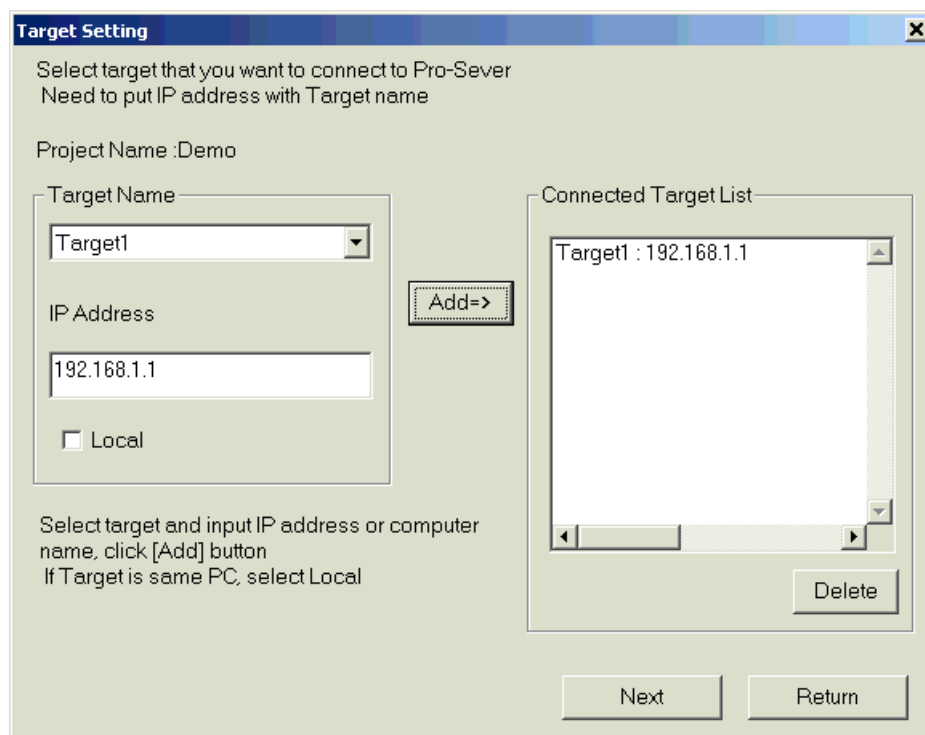

Diagram 3–5 Target Setting Dialog Box

In the Target Setting dialog box, the Target Name list contains all the targets included in the project that was selected in the Communication Setting dialog box (Diagram 3–4).

Select the target to connect to, and enter the IP address of the corresponding target machine. When the local computer is the target machine, select the Local check box.

Click Add to move the Target and IP Address information into the Connected Target List box. Add all the targets to be viewed to the Connected Target List.

To delete a target in the Connected Target List, select the target and click Delete.

To return to the Communication Setting dialog box (Diagram 3–4), click Return.

> ⚠️ *Important*
>
> **A target and an IP address cannot be duplicated.**

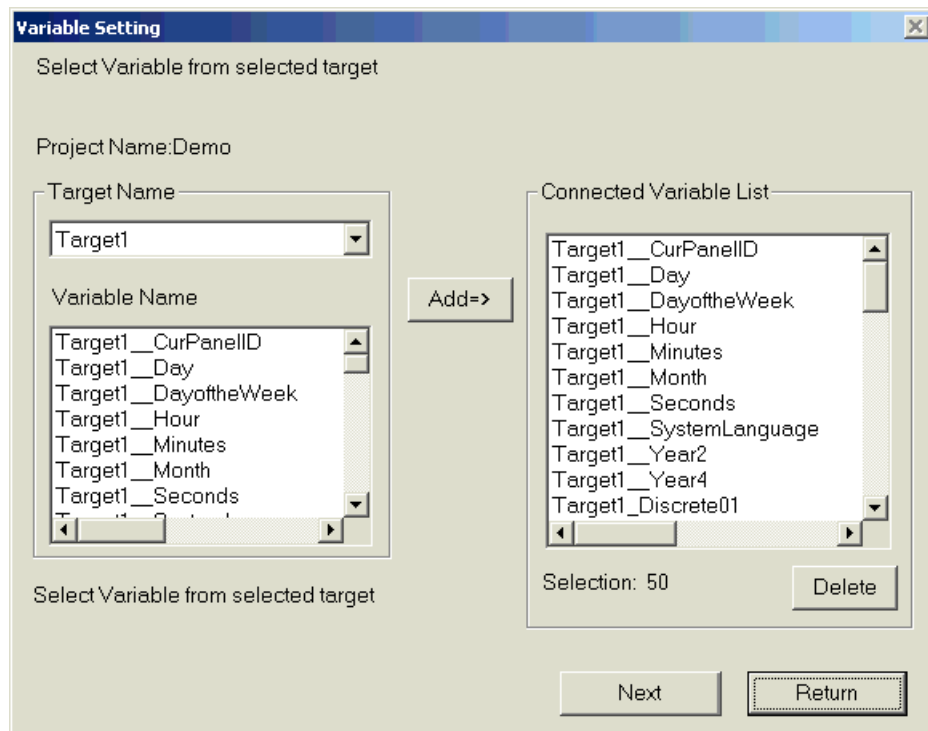In the Target Setting dialog box, click Next to display the Variable Setting dialog box (Diagram 3–6).

Diagram 3–6 Variable Setting Dialog Box

In the Variable Setting dialog box, the Variable Name list contains the names of all the variables in the target that was selected in the Target Setting dialog box (Diagram 3–5).

Select the variables to connect to, then click Add. The variable names are added to the Connected Variable List box, using the following format:

TargetName_Variable name

To connect to multiple target machines, in the Target Name list, change the target and add the variables from that target to connect to.

To delete a variable in the Connected Variable List, select the variable and click Delete.

To return to the Target Setting dialog box (Diagram 3–5), click Return.

In the Variable Setting dialog box, click Next to return to the status window (Diagram 3–3). You can view all the variables set up for communication in the status window.

3.1.4 PD-Adapter – Save

To save the communication settings in the status window (Diagram 3–3) as a PD-Adapter communication setup file (*.pda), open the Connect menu and click Save.

3.1.5 PD-Adapter – Communication Setting

To display the Communication Setting dialog box (Diagram 3–7), open the Setting menu and click Communication Setting.
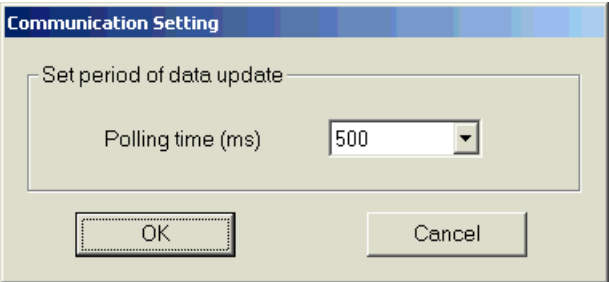

Diagram 3–7
Communication Setting Dialog Box

You can set the interval of variable value updates in the Communication Setting dialog box. PD-Adapter performs communication based on the Polling time setting.

Communication data in large quantities may not be transferred at the defined polling rate. The Polling time setting cannot be set during communication. Stop communication to change this setting.

3.1.6 PD-Adapter – Communication Direction

When variables are listed in the status window (Diagram 3–3), right-click a variable to change the direction of data communication. Three settings are available for changing a variable's data direction (Diagram 3–8):

- Pro-Designer <–> Pro-Server: from Pro-Designer to Pro-Server and from Pro-Server to Pro-Designer (both directions)
- Pro-Designer –> Pro-Server : from Pro-Designer to Pro-Server
- Pro-Designer <– Pro-Server : from Pro-Server to Pro-Designer

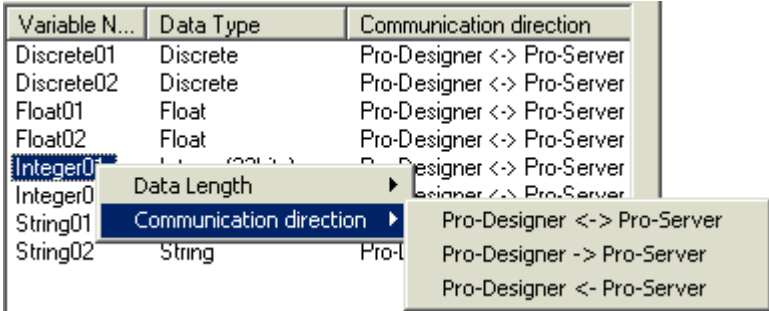The default setting transfers data changes in both directions.

Diagram 3–8
Communication Direction Settings

3.1.7 PD-Adapter – Data Length

When variables are listed in the status window (Diagram 3–3), right-click a variable to change the length of integer variables. Data length can be 16 or 32 bits. The initial data length conditions will depend on Pro-Designer's data length settings.

The data length of discrete, real and character string variable data cannot be changed.

Diagram 3–9
Data Length Settings

3.1.8 PD-Adapter – Auto-Communication

Open the Setting menu and click Auto Communication. The Auto Communication Setting dialog box is displayed (Diagram 3–10).
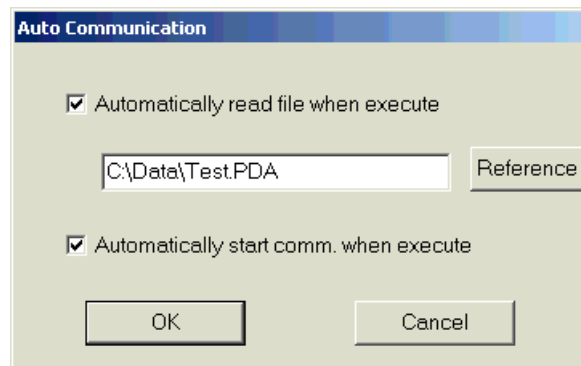
Diagram 3–10
Automatic Communication Setting Dialog Box

When you select the "Automatically read file when execute" check box, enter the path to the PD-Adapter communication setup file (*.pda) that is loaded into PD-Adapter when started. The "Automatically start communication when execute" check box becomes available.

When you select the "Automatically start communication when execute" check box, and the PD-Adapter application is started, PD-Adapter is registered in the task tray and is started up without the status window.

3.1.9 PD-Adapter – Export Pro-Server File

To export the network project file (*.npj) used by Pro-Server, open the Connect menu and click Export Pro-Server file to display the following dialog box:
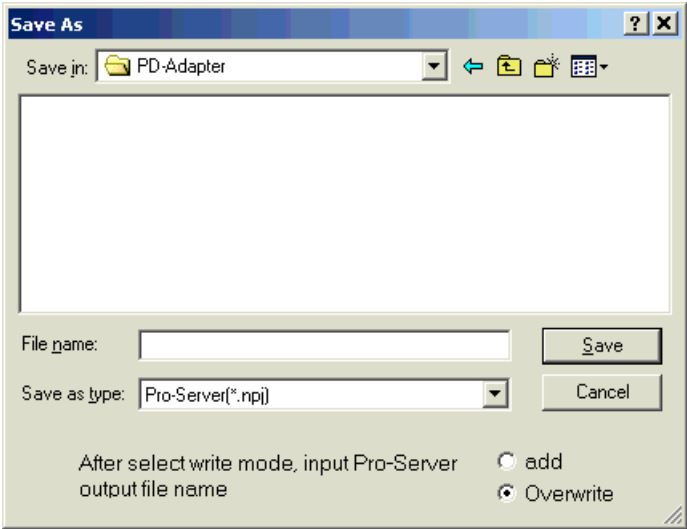

Diagram 3–11
Export Pro-Server File Dialog Box

Select the Overwrite option to replace any Network Nodes that already exist with the same name in the selected file. A Network Node corresponds to a Pro-Designer project.

Select the Add option to display a confirmation dialog box if either a Network Node or Symbols exist in the network project file (*.npj) under the same name. The dialog box confirms whether to overwrite or cancel adding the Node or Symbol.

3.1.10 PD-Adapter – Edit

To edit the settings in the status window (Diagram 3–3), open the Edit menu and click either Edit Target or Edit Variable.

When you click Edit Target, the Target Setting dialog box (Diagram 3–5) displays.

When you click Edit Variable, the Variable Setting dialog box (Diagram 3–6) displays.

When the status window cannot read the communication settings, the menu is dimmed and this feature is unavailable.

3.1.11 PD-Adapter – Open

To read previously set up data into the status window (Diagram 3–3), open the Connect menu and click Open.
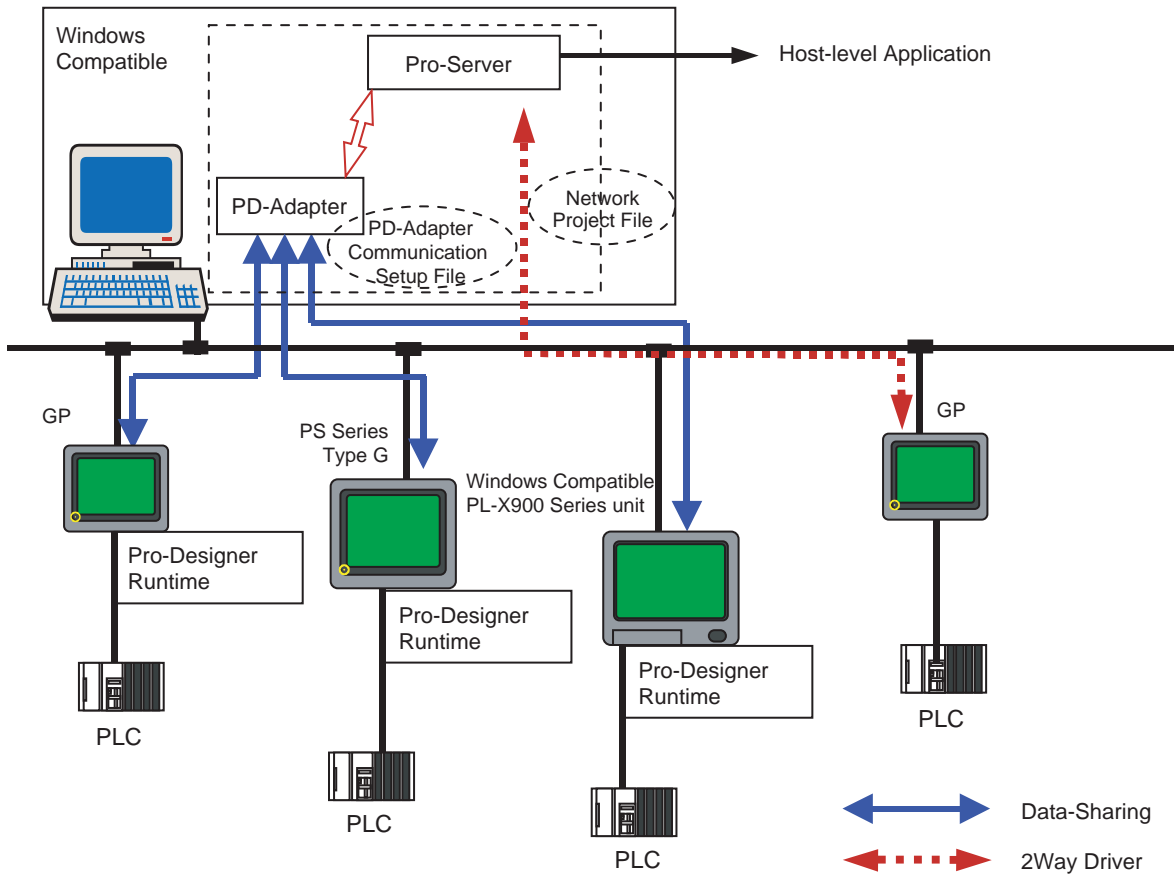
3.2   Communication Process

Diagram 3–12 System setup Data Communication

3.2.1 PD-Adapter – Pro-Server Connection Setting

In Pro-Studio, open the network project file (*.npj) exported from PD-Adapter.

In the Pro-Studio main window (Diagram 3-14), the Pro-Designer project name set in PD-Adapter has become a Pro-Server node name.

Also, among the variables registered to the Pro-Designer variable list (Diagram 3-13), those selected in the PD-Adapter Variable Setting Dialog Box (Diagram 3-6) are now displayed as symbol names (*Target Name_Variable Name*) in the window's right-side pane.

The PC's IP address is used for the IP address. The LS Area is automatically used to map the symbol addresses.

After using Pro-Studio to overwrite the Network Project File (*.npj), PD-Adapter can be used for data transfer.

Pro-Designer Project Name

Target Name

Variable Name

Target Name_Variable Name
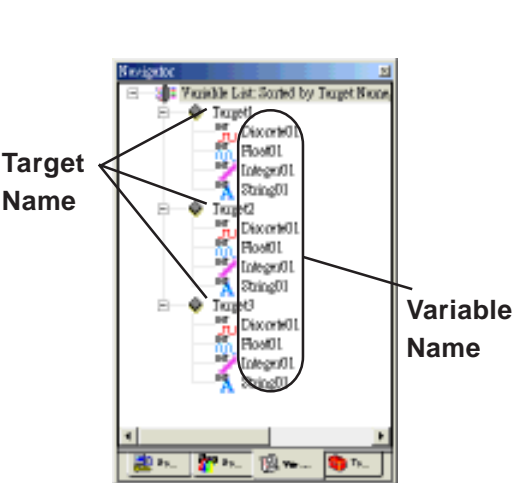
Diagram 3–13
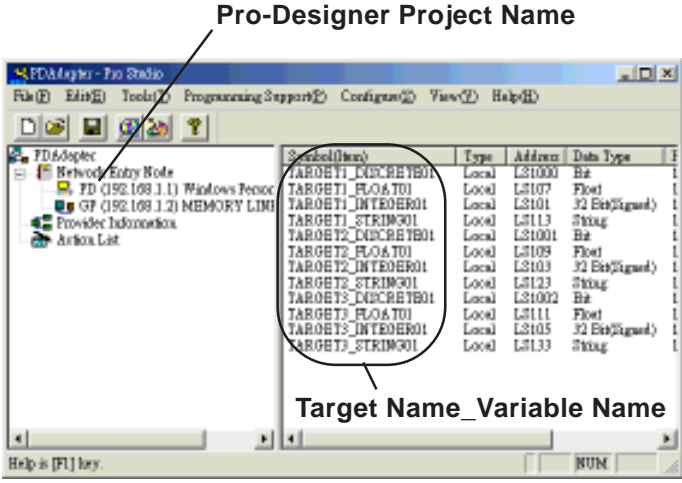**Pro-Designer Variable List**

Diagram 3–14
Pro-Studio Main Window

Note: In the PLC Type list, select Windows Personal Computer.
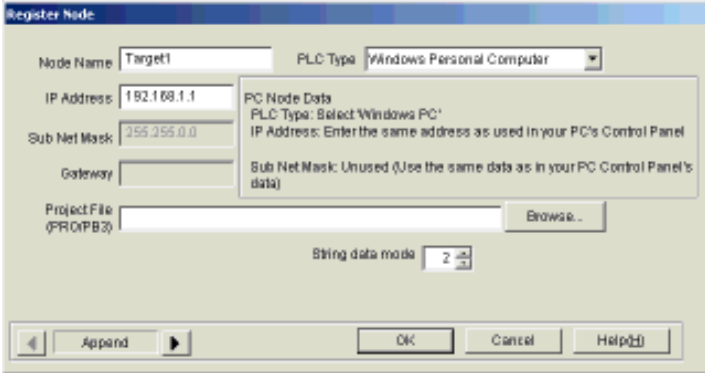
Diagram 3–15 Pro-Server Node Setting

3.2.2 PD-Adapter – Communication

To start communication, open the Communication menu and click Start Communication. During communication, other menus are dimmed and unavailable.

To end communication, open the Communication menu and click Abort Communication.

Before starting communication in PD-Adapter, be sure that the Pro-Designer Runtime target is running, and that the network project file (*.npj) has been exported from PD-Adapter and imported into Pro-Server.

Important

3.2.3 PD-Adapter – Option

You can start PD-Adapter from the DOS prompt or Pro-Designer scripts. Use the following options to run different processes with the command.

FILE OPTION

/f　　　　[File name]

Use the file option to specify the file to read at startup. The file assigned here takes precedence over the file set in the Auto Communication dialog box (Diagram 3–10).

Example: PDAdapter.exe/f FileName.pda

To include a space in a file name, use quotation marks around the file name.

AUTO OPTION

/a

Use the auto option to automatically connect and start communication. The status window (Diagram 3–3) does not display. PD-Adapter is registered in the task tray and starts up.

Example: PDAdapter.exe/a

3.2.4 PD-Adapter – Close

To close the status window (Diagram 3–3), open the Connect menu and click Close. In this condition, PD-Adapter continues to communicate with Pro-Server, and the PD-Adapter icon remains in the task tray. To redisplay the status window, double-click the icon, or right-click the icon and click Display Window.

To display the status window again, right-click the PD-Adapter icon in the task tray and click Display Window.

3.2.5 PD-Adapter – Exit

To exit PD-Adapter, open the Connect menu and click Exit PD-Adapter. If communication is not currently taking place, a message box (Diagram 3–16) displays to confirm the Exit operation.

You can also exit PD-Adapter, right-click the PD-Adapter icon in the task tray, and click Exit PD-Adapter.

If communication is taking place, a message box (Diagram 3–17) displays to confirm the Disconnect and Exit operation.
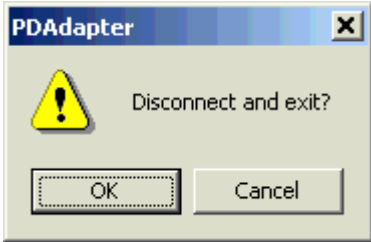
Diagram 3–16
PD-Adapter Exit Message

Diagram 3–17
**PD-Adapter Disconnect
and Exit Message**

Chapter

4 Restrictions

The following explains restrictions related to use of the PD-Adapter.

4.1 Setup Restrictions

- When a project name contains characters other than alphanumeric characters and the underscore (_), PD-Adapter cannot select the project. The project name is used as the registered node in Pro-Server, and characters are restricted by Pro-Server. When characters other than those mentioned above have been used in the project name, click on Pro-Designer editor's File menu, and select Name Project and Save to change the project name. Next, do a build and create the PD-Adapter communication setup file (*.pda).

- When variables are registered in PD-Adapter's Variable Setting dialog box (Diagram 7–6), the number of characters in the target and variable names, combined, cannot exceed 30 characters. Pro-Server symbols support up to 31 characters. Symbol names for Pro-Server are generated by PD-Adapter using the following format:

  TargetName_VariableName

  If the combined target and variable name is too long, it may not be added. If you cannot add the name, shorten either the target or variable name in Pro-Designer and try again.

- When PD-Adapter communication is run, each target must be set up with Data-Sharing in Pro-Designer.

- PD-Adapter can connect only targets in the same project, and can connect a maximum of 16 targets at the same time.

- The maximum number of variables that can be connected with PD-Adapter in all targets is 400. However, the transferring of variable values is limited by the number of variables that can be shared using the Data-Sharing protocol.

  ▼Reference▲ *For details, refer to the **Data-Sharing API User Manual.***

- You cannot start up multiple instances of the PD-Adapter application.

4.2 Communication Restrictions

- When starting communication in PD-Adapter, connected Pro-Designer Runtime applications must be running. Pro-Designer Runtime should be started before PD-Adapter communication starts.

- If communication is started in PD-Adapter while Pro-Designer Runtime is not running, start Pro-Designer Runtime, and then reconnect with PD-Adapter.

- When Pro-Designer Runtime is communicating with another application — such as another instance of Pro-Designer Runtime or a Data-Sharing API application — the number of connectible variables in PD-Adapter depends on the number of variables already being used by the other applications.

- When changing the length of an integer variable, be sure to check that the new data does not overlap any addresses set in Pro-Server. Be especially careful of Pro-Server data lengths when changing the data length from 16 bits to 32 bits.

4.3   Pro-Server Restrictions

- Only one Network node is created in a Pro-Server file exported from PD-Adapter, even if several targets are set up. The project name becomes the Network node name, and the combined target and variable name becomes the symbol name.

- When Pro-Server is started, the network project (NPJ) file that runs communications in the server must be loaded. Either start Pro-Studio before communication begins, or set up auto-load in Pro-Studio.

▼Reference▲   *For information about setting up auto load, refer to* **Pro-Server with Pro-Studio for Windows Operation Manual**.

4.4   Pro-Server Action Features

When using PD-Adapter, the following Pro-Server action features are available:

Features 4 through 6 are not supported. Action features 7 through 12, which write multiple data at the same time, are not currently supported.

	Pro-Server Action List	**Actions Available in PD-Adapter**
1	Start up arbitrary application	O
2	Alarm log (with sound notification feature)	O
3	Data transfer by mail	O
4	GP log data upload	–
5	GP filing data auto download	–
6	GP filing data auto upload	–
7	Access data auto upload	x
8	Access data auto download	x
9	Excel recipe download	x
10	Write data to Excel book	x
11	Upload database	x
12	Download database	x

Chapter

5 Appendix

5.1 Troubleshooting

Error messages in PD-Adapter and possible solutions

5.1.1 Error Message List

No.	Error Message	Problem	Solution
1	Pro-Server Communi-cation Tool is already running. Only one copy may be running at a time.	PD-Adapter is currently running.	Right-click icon in task tray and click Display Window.
2	Invalid execution option	Execution option assigned is invalid.	Check execution option used in DOS prompt or script.
3	Cannot find project. Create project using Pro-Designer, and try again.	No project has been created using Pro-Designer.	Create a project in Pro-Designer. Build and create new connection.
4	Select target name.	Project Name has not been selected in the Communi-cation Setting dialog box.	In the Communication Setting dialog box, select project before clicking Next.
5	Project name exceeds maximum length (31 characters). Change project name using Pro-Designer.	The project name for the Pro-Server node exceeds the maximum, 31 characters. The node name cannot be assigned.	In the Pro-Designer project's File menu, click Save As, and shorten the project name. Build the project and set up a new connection in PD-Adapter.
6	Invalid character used in project name. Change project name using Pro-Designer.	The project name that serves as the Pro-Server node name contains characters not supported by Pro-Server.	In the Pro-Designer project's File menu, click Save As. Use only alphanumeric and underscore to name the project. Build project and set up a new connection.
7	Cannot find connection node.	The connection node on the network does not exist.	Enter the correct IP address and computer name.
8	Cannot find target. Create target using Pro-Designer, and try again.	No target has been created in Pro-Designer.	Create a target in Pro-Designer. Build and create connection.
9	Reached maximum number of registered targets. Limit is 16.	16 targets are currently registered.	Cannot add another target to the connection list. Limit is 16.
10	Target name or IP address is already registered.	A target with the same name or same IP address is currently registered.	Register the correct target. If already registered, delete previous then register again.

5.1.1 Error Message List (cont.)

No.	Error Message	Problem	Solution
11	Reached maximum number of registered variables. Limit is 400.	400 variables are currently registered.	You cannot register more than 400 variables.
12	Target name plus variable name cannot exceed 30 characters. Change variable name using Pro-Designer.	The Pro-Server symbol name (target name_variable name) exceeds the maximum 32 characters. The symbol name cannot be assigned.	In Pro-Designer, open the File menu, click Save As, and shorten the symbol name. Build the project and create a new PD-Adapter connection.
13	Invalid file.	The file has not been properly saved.	Select the correct PD-Adapter communication setup file (*.pda) or create a new connection.
14	DAO is not installed.	The DAO file that is necessary to output Pro-Server file does not exist.	Reinstall PD-Adapter.
15	Cannot find PD-Adapter structure file. Reinstall PD-Adapter.	File that is necessary for communication cannot be found.	Reinstall PD-Adapter.

5.1.2 Status Display List (Status Window)

No.	Error Message	Problem	Solution
1	Fail to create thread. Cannot start communication.	Communication cannot be established due to lack of memory or resource.	Restart computer.
2	Fail to connect Pro-Designer Runtime.	Failed to connect to Pro-Designer Runtime.	Make sure Pro-Designer Runtime is running.
3	Registered target or variable not available in Pro-Designer Runtime.	Defined variable and target names do not exist in Pro-Designer Runtime.	Check the settings in the PD-Adapter connection.
4	Pro-Designer Runtime has exceeded variable connections limit.	Exceeds the number of variables Pro-Designer Runtime can share.	Reduce the number of connected variables.
5	Pro-Designer Runtime version is different.	The version of Pro-Designer Runtime is different from the version of PD-Adapter.	On the target machine, check the Pro-Designer Runtime version. If different, install Runtime and restart communication. (requires use of the same version of PD-Adapter and Pro-Designer Runtime.)
6	Cannot write data to Pro-Designer Runtime.	Cannot write data to Pro-Designer Runtime during communication.	Check Pro-Designer target IP address or variable name.
7	Cannot read data from Pro-Server.	Cannot read data from Pro-Server during communication.	Be sure the node and symbol are registered in Pro-Server. Be sure data can be viewed through the Pro-Server device monitor.
8	Cannot write data to Pro-Server.	Cannot write data to Pro-Server during communication.	