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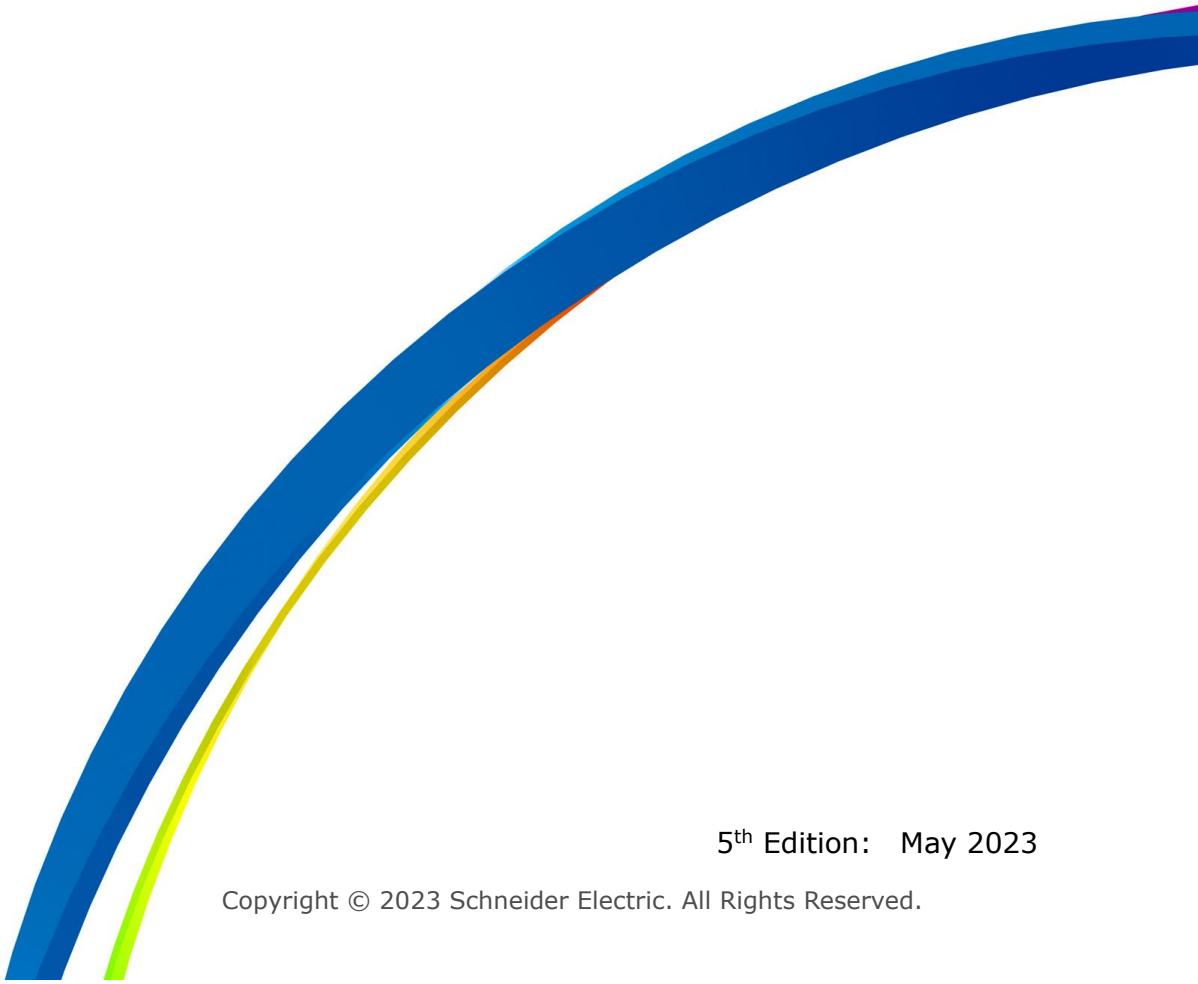
LT Type H → LT-3300T
Replacement Guidebook



5th Edition: May 2023

Preface

This guidebook introduces the procedures to replace your unit in the LT Type H series with a unit in the LT-3300 series.

Model in use	Replacement model
LT Type H Series Color model	LT-3300T *1
LT Type H Series Monochrome model	

*1 To use the analog input, analog output, thermocouple input, and/or Pt100 input features on the LT-3300 series, the EX module is required.

Safety Information

HAZARD OF OPERATOR INJURY, OR UNINTENDED EQUIPMENT DAMAGE
Before operating any of these products, be sure to read all related manuals thoroughly.
Failure to follow these instructions can result in death, serious injury or unintended equipment damage.

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Chapter 1. Specification Comparison

1-1. Notes on Replacement of LT Type H Series with LT-3300 Series (Hardware)

The followings are notes on replacement of the LT Type H series with the LT-3300 series:

	Notes on replacement (Hardware)		LT Type H Series								
	Descriptions	Remark	GLC150-SC41-ADK-24V	GLC150-SC41-ADTK-24V	GLC150-SC41-ADPK-24V	GLC150-BG41-ADK-24V	GLC150-BG41-ADTK-24V	GLC150-BG41-ADPK-24V	GLC150-BG41-ADC-24V	GLC150-BG41-ADTC-24V	GLC150-BG41-ADPC-24V
1	Panel cutout dimensions and external dimensions are different.		○	○	○	○	○	○	○	○	○
2	The touch method is different.		○	○	○	○	○	○	○	○	○
3	Maintenance tools such as a transfer cable and software are different.		○	○	○	○	○	○	○	○	○
4	The shpe of the internal DIO and the position of the cable are different.		○	○	○	○	○	○	○	○	○
5	The LT-3300 series doesn't have the analog input/output, themperature input (thermocouple, Pt100) interfaces. Installation of a unit is required.		○	○	○	○	○	○	○	○	○
6	The LT-3300 series doesn't have an alarm output terminal.		○	○	○	○	○	○	○	○	○
7	The shape of power input terminal is different.		○	○	○	○	○	○	○	○	○
8	The body material and color are different.		○	○	○	○	○	○	○	○	○
9	The rated current, the input impedance, and the common design of the standard inputs are different.	*1	○	○	○	○	○	○	○	○	○
10	The maximum load current, the output delay time, the common design, and the internal fuse of the standard outputs are different.	*1	○	○	○	○	○	○	○	○	○
11	The count speed, the high-speed count frequency, and the count register of the high-speed counter are different.	*1	○	○	○	○	○	○	○	○	○
12	The maximum pulse output frequency and the differences of the ON duty of the pulse output are different.	*1	○	○	○	○	○	○	○	○	○
13	The maximum PWM output frequency, and the range and the differences of the ON duty of the PWM output are different.	*1	○	○	○	○	○	○	○	○	○
14	The input range, resolution, linearity, input impedance, input delay time, input filter, and the input/output characteristics of the analog input are different.	*1	○	○	○	○	○	○	○	○	○
15	The output range, resolution, external allowable load, and the input/output characteristics of the analog output are different.	*1	○	○	○	○	○	○	○	○	○
16	The temperature conversion data, conversion time, error detection, disconnect processing, and the input/output characteristics of the thermocouple (K) input are different.	*1		○			○			○	
17	The temperature conversion data, conversion time, error detection, disconnect processing, and the input/output characteristics of the thermocouple (J) input are different.	*1		○			○			○	
18	The measurable temperature range, conversion time, error detection, disconnect processing, and the input/output characteristics of the Pt100 input are different.	*1			○			○			○

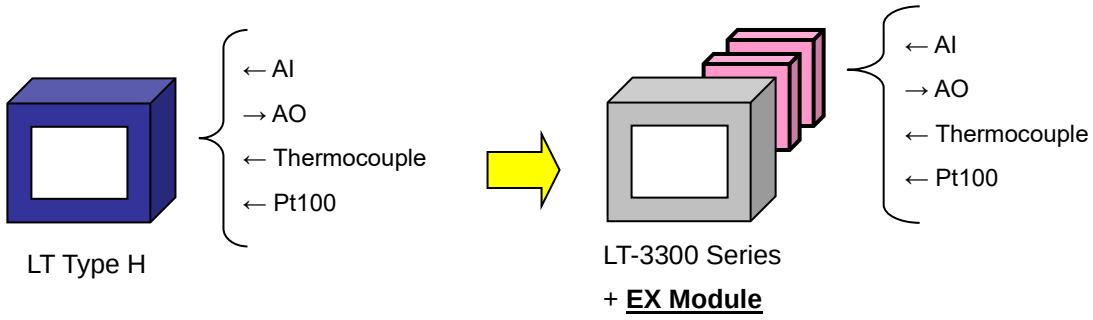
*1 Make sure to check the performance for the external I/Os operation.

1-2. Replacement models

The LT Type H series can be replaced with the LT-3300 series.

However, if you used any of the following functions on the LT Type H series, you need to add an EX module on the LT-3300 series as an external unit.

- Analog Input (Voltage, current)
- Analog Output (Voltage, current)
- Thermocouple Input (K, J)
- Pt100 Input



LT Type H Series	Replacement Models				
Model Number	LT-3300 Series	Analog Input Unit (EX Module)	Analog Output Unit (EX Module)	Thermocouple Input Unit (EX Module)	Pt100 Input Unit (EX Module)
GLC150-SC41-ADK-24V	LT3300-T1-D24-K	EXM-AMI2HT EXM-AMM3HT	EXM-AMO1HT EXM-AMM3HT EXM-ALM3LT	-	-
GLC150-SC41-ADTK-24V	LT3300-T1-D24-K			EXM-ALM3LT	-
GLC150-SC41-ADPK-24V	LT3300-T1-D24-K			-	EXM-ALM3LT
GLC150-BG41-ADK-24V	LT3300-T1-D24-K			-	-
GLC150-BG41-ADTK-24V	LT3300-T1-D24-K			EXM-ALM3LT	-
GLC150-BG41-ADPK-24V	LT3300-T1-D24-K			-	EXM-ALM3LT
GLC150-BG41-ADC-24V	LT3300-T1-D24-C			-	-
GLC150-BG41-ADTC-24V	LT3300-T1-D24-C			EXM-ALM3LT	-
GLC150-BG41-ADPC-24V	LT3300-T1-D24-C			-	EXM-ALM3LT

1-3. Hardware Specifications

1-3-1. Specifications of LT Type H and LT-3300T

Table 1/2

		LT Type H	LT-3300T
			
Model Number		GLC150-SC41-ADK -24V GLC150-SC41-ADTK-24V GLC150-SC41-ADPK-24V GLC150-BG41-AD* -24V GLC150-BG41-ADT* -24V GLC150-BG41-ADP* -24V *1	LT3300-T1-D24-* *1
Display Type	**Color Model**	Blue-mode monochrome LCD	**UP!** TFT color LCD ->see 2-13
	Monochrome Model	STN color LCD	
Display Colors, Levels	**Color Model**	64 colors (3-Speed Blink)	**UP!** 65,536 Colors (No blink)/16,384 Colors (Blink) ->see 2-13
	Monochrome Model	Blue mode 8 levels (3-Speed Blink)	
Display Resolution		QVGA (320×240 pixels)	
Panel Cut Dimensions (mm [in.])		W191.5 × H141.5 [7.54 × 5.57]	W156 × H123.5 [6.14 × 4.86]
External Dimensions (mm [in.])		W207 × H157 × D75.8 [8.15 × 6.18 × 2.98]	W167.5 × H135 × D78 [6.59 × 5.31 × 3.07]
Touch Panel Type		Matrix	**NEW!** Resistive film (Analog)
Serial Interface		No	**NEW!** 9-pin D-sub (plug) RS-232C/422/485
Memory: Application		1MB	**UP!** 6MB
Memory: SRAM		96KB	**UP!** 128KB
Memory: Variable Area		32KB	**UP!** 64KB
Memory: Program Area		128KB	**UP!** 132KB
Ethernet Interface		No	**NEW!** Yes
CF Card Interface		No	
USB Host Interface (Type A)		No	**NEW!** Yes
Power Input		Terminal block	European terminal block

Transfer Port	Tool connector		**NEW!** USB
EX Module Interface *2	No		**NEW!** Yes (Up to 3 modules)
Alarm Output	Yes		No
DIO *3	Input: 16 points, Output: 16 points (Spring clamp type connector)		
Sink/Source Output Method	Yes *4		
High-Speed Counter Input *3	Single phase: 4 points Double phase: 1 point		Single phase: 4 points Double phase: 1 or 2 points
Pulse Output, PWM Output *3	4 points		
Pulse Catch *3	No		**NEW!** Yes
Analog Input	2 points		**NEW!** For installation of EX module
Analog Output	-AD* *5	1 point	**NEW!** For installation of EX module
	-ADT* *5	2 points	
	-ADP* *5	2 points	
Thermocouple (K/J) Input	-AD* *5	None	**NEW!** For installation of EX module
	-ADT* *5	3 points	
	-ADP* *5	None	
Pt100 Input	-AD* *5	None	**NEW!** For installation of EX module
	-ADT* *5	None	
	-ADP* *5	2 points	

*1 The model number varies depending on the type of the DIO output (K for the sink output, C for the source output).

*2 For installation of an EX module on the LT-3300 series, set the I/O driver to [EXM Driver] in GP-Pro EX.

*3 DIO input/output terminals can be used as the high-speed counter input, pulse output, PWM output, or pulse catch. Set the functions of each terminal via software.

*4 The output type (sink output or source output) varies depending on the model. For example, the output type of GLC150-SC41-AD*K and LT3300-T1-D24-K is sink output, and that of LT3300-T1-D24-C is source output.

*5 The model type varies depending on the DIO output type (K for the sink output, C for the source output).

1-4. Recommended Replacement Models for LT Type H Series

The followings are recommended combinations of a replacement LT-3300 unit and EX module units for the LT Type H series. Select a desired combination for your system. Up to 3 EX module units can be installed on an LT-3300 unit.

LT TypeH Model No.	LT3000 Series	Expansion 1	Expansion 2	Expansion 3
GLC150-SC41-ADK-24V	LT3300-T1-D24-K	EXM-AMM3HT		
GLC150-SC41-ADTK-24V	LT3300-T1-D24-K	EXM-AMM3HT	EXM-ALM3LT	EXM-ALM3LT
GLC150-SC41-ADPK-24V	LT3300-T1-D24-K	EXM-AMM3HT	EXM-ALM3LT	
GLC150-BG41-ADK-24V	LT3300-T1-D24-K	EXM-AMM3HT		
GLC150-BG41-ADTK-24V	LT3300-T1-D24-K	EXM-AMM3HT	EXM-ALM3LT	EXM-ALM3LT
GLC150-BG41-ADPK-24V	LT3300-T1-D24-K	EXM-AMM3HT	EXM-ALM3LT	
GLC150-BG41-ADC-24V	LT3300-T1-D24-C	EXM-AMM3HT		
GLC150-BG41-ADTC-24V	LT3300-T1-D24-C	EXM-AMM3HT	EXM-ALM3LT	EXM-ALM3LT
GLC150-BG41-ADPC-24V	LT3300-T1-D24-C	EXM-AMM3HT	EXM-ALM3LT	

The LT Type H series models have analog inputs, analog outputs, thermocouple inputs, and Pt100 inputs. The maximum numbers of points for each input/output on the LT Type H models are as follows:

LT TypeH Model No.	Analog Input (Max.point)	Analog Output (Max.point)	Thermocouple Input(Max.point	PT100 Input (Max.point)
GLC150-SC41-ADK-24V	2	1	0	0
GLC150-SC41-ADTK-24V	2	2	3	0
GLC150-SC41-ADPK-24V	2	2	0	2
GLC150-BG41-ADK-24V	2	1	0	0
GLC150-BG41-ADTK-24V	2	2	3	0
GLC150-BG41-ADPK-24V	2	2	0	2
GLC150-BG41-ADC-24V	2	1	0	0
GLC150-BG41-ADTC-24V	2	2	3	0
GLC150-BG41-ADPC-24V	2	2	0	2

The LT-3300 series models don't have analog inputs, analog outputs, thermocouple inputs, or Pt100 inputs. However, these inputs and outputs are available by installing an EX module on the LT unit. The maximum numbers of points that each EX module allows are as follows:

EX Module Model No.	Analog Input (Max.point)	Analog Output (Max.point)	Thermocouple Input(Max.point	Pt100 Input (Max.point)
EXM-AMI2HT	2	0	0	0
EXM-ALM3LT	0	1	2 (*1)	2 (*1)
EXM-AMM3HT	2	1	0	0
EXM-AMO1HT	0	1	0	0

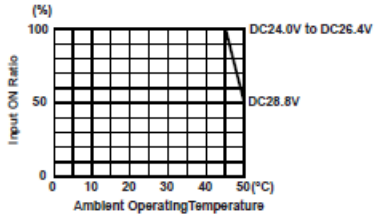
*1 Select the thermocouple input or the Pt100 input via software.

1-5. EX Modules

EX module units for input/output other than the analog input/output, thermocouple input, Pt100 input are also available. Install them as necessary for your system environment. Up to 3 EX module units can be installed on an LT-3300 unit.

Product	Model No.	Description
8-point input module	EXM-DDI8DT	8-point sink/source I/O unit
16-point input module	EXM-DDI16DT	16-point sink/source I/O unit
8-point relay output module	EXM-DRA8RT	8-point relay output / 2 common type I/O unit
16-point relay output module	EXM-DRA16RT	16-point relay output / 2 common type I/O unit
8-point sink output module	EXM-DDO8UT	8-point transistor output sink I/O unit
16-point sink output module	EXM-DDO16UK	16-point transistor output sink I/O unit
8-point source output module	EXM-DDO8TT	8-point transistor output source I/O unit
16-point source output module	EXM-DDO16TK	16-point transistor output source I/O unit
4-point input/4-point relay output module	EXM-DMM8DRT	4-point input sink-source/4-point relay output/ 1 common type I/O unit
2ch analog input module	EXM-AMI2HT	2ch analog input unit
Thermocouple/Pt100 input/ 1ch analog output module	EXM-ALM3LT	2ch temperature input/ 1ch analog output unit
2ch analog input/1ch analog output module	EXM-AMM3HT	2ch analog input/ 1ch analog output unit
1ch analog output module	EXM-AMO1HT	1ch analog output unit

1-6. Specifications of LT Type H Series and LT-3300 Series (DIO Input)

	LT Type H Series	LT-3300 Series
	Input Specifications	
Rated Voltage	DC24V	
Allowable Voltage	DC28.8V	
Input Method	Sink/Source Input	
Rated Current	9mA (DC24V) (IN0, IN2, IN4, IN6) 5mA (DC24V) (Other inputs)	6.5mA (DC24V) (IN0, IN2, IN4, IN6) 4.1mA (DC24V) (Other inputs)
Input Impedance	Approx. 2.7kΩ (IN0, IN2, IN4, IN6) Approx. 4.7kΩ (Other inputs)	Approx. 3.7kΩ (IN0, IN2, IN4, IN6) Approx. 5.9kΩ (Other inputs)
Input Derating *1		
ON Voltage	DC19V min.	
OFF Voltage	DC5V max.	
Input Delay Time **(OFF to ON, ON to OFF)**	0.5 to 20ms *2	0.5 to 20ms *2 *3
Common Lines	2	1
Common Design	8 points/1 common line	16 points/1common line
Input Points	16	
Input Signal Display	LED lights when each point turns on	No LED indicators
Isolation Method	Photocoupler isolation	
Polarity	No	
External Power Supply	For signal: DC24V	

*1 Exceeding the LT unit's input rated voltage may affect the input ON voltage, input points, or ambient operating temperature; the unit's input terminals may be damaged due to excessive heat. Use Input Derating within the range shown in the chart.

*2 The digital filter can be set at intervals of 0.5ms.

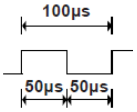
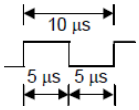
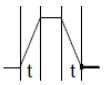
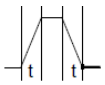
*3 In the case of IN0, IN2, IN4, or IN6, the input delay time generates a 5µs-delay. For example, in the case of a 0.5ms-cycle sampling: 5µs (ON to OFF) + 0.5ms (sampling cycle) + 5µs (OFF to ON) = 0.51ms
A minimum 0.51ms-restriction is imposed on the input pulse width. In the case of IN1, IN3, IN5, or from IN7 to 15, the input delay time generates a 0.5ms-delay. For example, in the case of a 0.5ms-cycle sampling: 0.5ms (ON to OFF) + 0.5ms (sampling cycle) + 0.5ms (OFF to ON) = 1.5ms
A minimum 1.5ms-restriction is imposed on the input-pulse width.

1-7. Specifications of LT Type H Series and LT-3300 Series (DIO Output)

<table>
<tr><th></th><th colspan="3">LT Type H Series</th><th colspan="2">LT-3300 Series</th></tr>
<tr><td></td><td colspan="5">Output specifications</td></tr>
<tr><td>Rated Voltage</td><td colspan="5">DC24V</td></tr>
<tr><td>Allowable Voltage</td><td colspan="5">DC20.4V to DC28.8V</td></tr>
<tr><td>Output Method (Sink/Source)</td><td colspan="5">Depends on the model *1</td></tr>
<tr><td rowspan="3">Max. Load Current</td><td>OUT0 to 7</td><td colspan="2">OUT8 to 15</td><td colspan="2">OUT0 to OUT15</td></tr>
<tr><td>0.2A</td><td colspan="2">0.5A</td><td colspan="2">0.2A/1 point</td></tr>
<tr><td>0.8A</td><td colspan="2">2A</td><td colspan="2">1.6A/1 common</td></tr>
<tr><td>Output Voltage Drop</td><td colspan="5">0.5V max. (OFF→ON)</td></tr>
<tr><td rowspan="2">Output Delay Time
(OFF to ON, ON to OFF)</td><td colspan="3" rowspan="2">0.5ms max.</td><td>OUT0 to 3</td><td>OUT4 to 15</td></tr>
<tr><td>5μs max.
(with output
DC24V,
200mA)</td><td>0.5ms max.
(with output
DC24V,
200mA)</td></tr>
<tr><td>Current Leakage when OFF</td><td colspan="5">0.1mA max.</td></tr>
<tr><td>Type of Output</td><td colspan="5">Transistor Output</td></tr>
<tr><td>Common Lines</td><td colspan="5">2</td></tr>
<tr><td>Common Design</td><td colspan="5">8 points/1 common line</td></tr>
<tr><td>Output Points</td><td colspan="5">16 points</td></tr>
<tr><td>Output Protection Type</td><td colspan="5">Unprotected Output</td></tr>
<tr><td rowspan="2">Internal Fuse</td><td>OUT0 to 7</td><td colspan="2">OUT8 to 15</td><td colspan="2" rowspan="2">3.5A internal fuse,
125V chip fuse ×2
(Non-replaceable)</td></tr>
<tr><td>2A chip fuse
(Non-replaceable)</td><td colspan="2">5A chip fuse
(Non-replaceable)</td></tr>
<tr><td>Surge Control Circuit</td><td colspan="3">Zener diode
(DC39V±1V)</td><td colspan="2">Zener diode</td></tr>
<tr><td>Output Signal Display</td><td colspan="3">LED lights when each point
turns on</td><td colspan="2">No LED indicators</td></tr>
<tr><td>Isolation Method</td><td colspan="5">Photocoupler isolation</td></tr>
<tr><td>External Power Supply</td><td colspan="5">For signal: DC24V</td></tr>
</table>

*1 The model number ending with K is the sink output type, and the model number ending with C is the source type.

1-8. Specifications of LT Type H Series and LT-3300 Series (High-Speed Counter)

	LT Type H Series		LT-3300 Series	
	High-Speed Counter Specifications			
Input Method	Single phase	Double phase	Single phase	Double phase
	4 points	1 point	4 points	1 or 2 points
Input Points (User defined)	CT0 (IN0), CT1 (IN2), CT2 (IN4), CT3 (IN6)	CT0 (IN0), CT1(IN2) used in a pair CT0: Phase A, CT1: Phase B	CT0 (IN0), CT1 (IN2), CT2 (IN4), CT3 (IN6)	[1] CT0 (IN0), CT1 (IN2) used in a pair CT0: Phase A CT1: Phase B [2] CT2 (IN4), CT3 (IN6) used in a pair CT2: Phase A CT3: Phase B
Input Voltage ON	DC19V min.			
Input Voltage OFF	DC5V max.			
Input Impedance	2.7kΩ		3.9kΩ	
Minimum Pulse Width (Pulse Input)				
Count Speed (Rise, Fall Time)	 t=10µs max. (10kpps)		 t = 1 µs or less (100kpps)	
Phase	Single phase	90° phase differential 2-phase signal/ 1-phase + directional signal	Single phase	90° phase differential 2-phase signal/ 1-phase + directional signal
High-Speed Count Frequency	10Kpps		100Kpps	50Kpps
Count Edge Designation	Available	Not available	Available	Not available
Count Register	16-bit UP/DOWN counter		32-bit UP/DOWN counter	
Counter Mode Change	Set through software			
Upper/Lower Limit Settings	Not available			
Preload/Prestrobe	Available			
ON/OFF Preset Value Limitation	None		FFFFh and 0000h of lower 16 bits cannot be used.	
Marker Input (Clear Counter Value)	None	IN3	None	IN3, IN7

1-9. Specifications of LT Type H Series and LT-3300 Series (Pulse Output)

	LT Type H Series	LT-3300 Series
	Pulse Output Specifications	
Output Points	4 points	
Output Method (Used defined)	PLS0 to PLS3 (OUT0 to OUT3)	
Load Voltage	DC24V	
Min. Load Current	1mA	
Pulse Array Max. Output Frequency	5kHz (Total number of used channels)	65kHz max. per point (set via software)
Pulse Acceleration/ Deceleration Speed	Available	
ON Duty	50%±20% (at 5kHz) *1	50%±10% (at 65kHz) *2

*1 The ON duty error (20%) will be reduced if the output frequency is low.

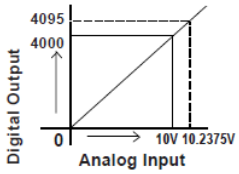
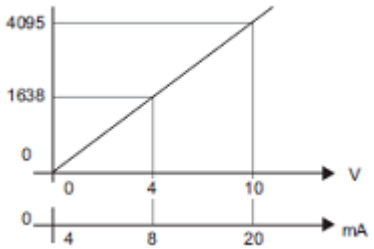
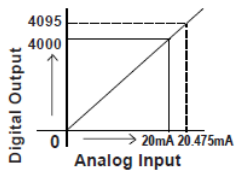
*2 The ON duty error (10%) will be reduced if the output frequency is low.

1-10. Specifications of LT Type H Series and LT-3300 Series (PWM Output)

	LT Type H Series	LT-3300 Series
	PWM Output Specifications	
Output Points	4 points	
Output Method (Used defined)	PWM0 to PWM3 (OUT0 to OUT3)	
Load Voltage	DC24V	
Min. Load Current	1mA	
PWM Max. Output Frequency	2.5kHz	65kHz max. per point (set via software)
ON Duty	10 to 90% (at 2.5kHz) *1	19 to 81% (at 65kHz) *1

*1 The ON duty error (effective range) will be widened if the output frequency is low.

1-11. Specifications of LT Type H Series and EX Module (Analog Input)

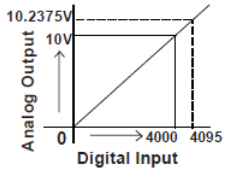
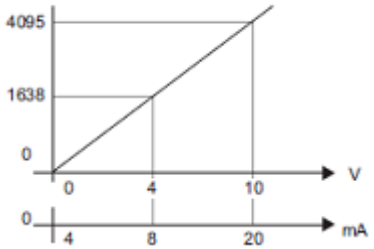
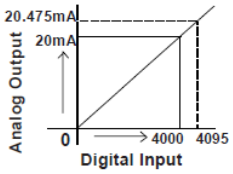
	LT Type H Series	EX Module EXM-AMI2HT EXM-AMM3HT
	Analog Input Specifications	
Input Range: Voltage Setup	0 to 10V (10.2375V max.) *1	DC0V to 10V *1
Input Range: Current Setup	0 to 20mA (20.475mA max.) *1	DC4mA to 20mA *1
Resolution: Voltage Setup	12-bit (0 to 4,000 (0 to 10V), 4,095 max. (at 10.2375V))	12-bit, 4,096 increments 0 to 4,095
Resolution: Current Setup	12-bit (0 to 4,000 (0 to 20mA), 4,095 max. (at 20.475mA))	
Accuracy	±1.0% of full scale (0 to 50°C)	±1% of full scale
Linearity	±3 LSB max.	±0.2% of full scale
Input Impedance: **Voltage Setup**	100kΩ	1MΩ min.
Input Impedance: **Current Setup**	250Ω	10Ω
Input Delay Time	40ms/2 channels	105ms+1 scan time *2 60ms+1 scan time *3
Absolute Max. Input	DC15V(voltage)/60mA(current)	DC13V(voltage)/40mA(current)
Input Filter	Running average sampling time 2ms	None
Power Supply	DC24V External power supply	
Isolation Method	Channel to Internal: Isolation Channel to channel: No isolation Channel to Analog power: Isolation	
Input/Output Characteristics: **Voltage Input**		
Input/Output Characteristics: **Current Input**		

*1 Switching the voltage input or current input can be set separately, for each channel.

*2 Compatible with models whose revision number is “PV:03 RL:07 SV: 1.2.”

*3 Compatible with models whose revision number is “PV:04 RL:08 SV: 2.0.”

1-12. Specifications of LT Type H Series and EX Module (Analog Output)

	LT Type H Series	EX Module EXM-AMM3HT EXM-ALM3LT EXM-AMO1HT
	Analog Output Specifications	
Output Range: Voltage Setup	0 to 10V (10.2375V max.) *1	DC0V to 10V *1
Output Range: Current Setup	0 to 20mA (20.475mA max.) *1	DC4mA to 20mA *1
Resolution: Voltage Setup	12-bit (0 to 4000(0 to 10V) 4,095 max. (at 10.2375V))	12-bit, 4,096 increments 0 to 4,095
Resolution: Current Setup	12-bit (0 to 4000(0 to 20mA) 4,095 max. (at 20.475mA))	
Accuracy	±1.0% of full scale (0 to 50°C)	±1% of full scale
External Allowable Load: Voltage Setup	10kΩ min.	2kΩ min. *2 1kΩ min. *3
External Allowable Load: Current Setup	500Ω max.	300Ω max.
Power Supply	DC24V External Power Supply	
Isolation Method	Channel to Internal: Isolation Channel to channel: No isolation Channel to Analog power: Isolation	
Input/Output Characteristics: Voltage Output		
Input/Output Characteristics: Current Output		

*1 Switching the voltage input or current input can be set separately, for each channel.

*2 Compatible with models whose revision number is “PV:03 RL:07 SV:1.2.”

*3 Compatible with models whose revision number is “PV:04 RL:08 SV:2.0.”

1-13. Specifications of LT Type H Series and EX Module (Thermocouple Input)

	LT Type H Series	EX Module EXM-ALM3LT
	Thermocouple Input Specifications	
Measurable Temperature Range: J Type	Celsius: -100 to +700°C Fahrenheit: -148 to +1,292°F	Celsius: 0 to 1,200°C Fahrenheit: 32 to 2,192°F
Measurable Temperature Range: K Type	Celsius: -100 to +1,200°C Fahrenheit: -148 to +2,192°F	Celsius: 0 to +1,300°C Fahrenheit: 32 to 2,372°F
Accuracy	±1.0% (Full scale)	
Temperature Conversion Data: J Type	Celsius: -1,000 to +7,000 Fahrenheit: -1,480 to +12,920	Celsius: 0 to 12,000 Fahrenheit: 320 to 21,920
Temperature Conversion Data: K Type	Celsius: -1,000 to +12,000 Fahrenheit: -1,480 to +21,920	Celsius: 0 to 13,000 Fahrenheit: 320 to 23,720
External Wiring Length	Each channel: 50m max. (by compensating conductors)	Not specified
Conversion Time	Approx. 170ms × filter frequency (1 to 64) *1	Sample repetition time: 20ms max. Total input system transfer time *2: 200ms +1 scan time *3 60ms+1 scan time *4
Isolation Method	Channel to channel: No isolation Input to internal: Photocoupler isolation	
Error Detection	Temperature conversion data when exceeding measured temperature range Exceeding the upper limit: +32767 Exceeding the lower limit: -32768	Error code 130 is stored in #L_IOStatus[1]
Disconnect Processing	Temperature conversion data is 32767	Error code 130 is stored in #L_IOStatus[1]

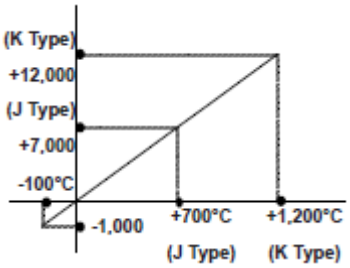
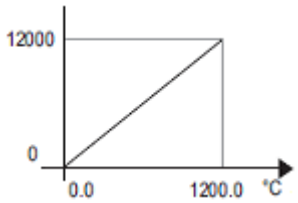
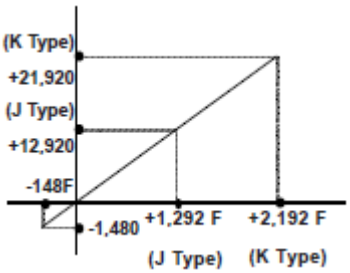
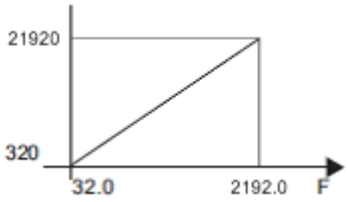
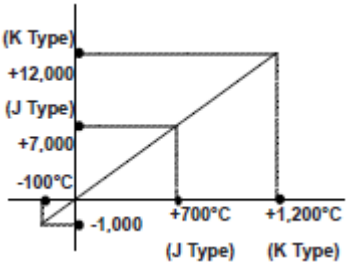
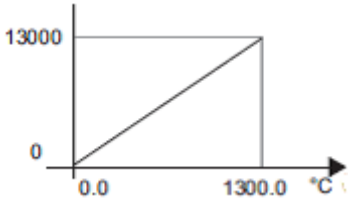
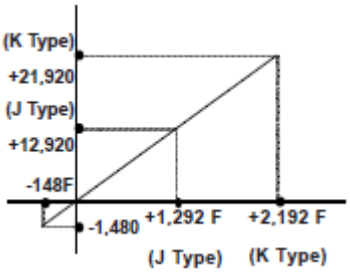
*1 Except for delay time, depending on the LT Type H series unit's scan time.

*2 Total input system transfer time = sample repetition × 2 + internal operation time +1 scan time
The value is the maximum time.

*3 Compatible with models whose revision number is "PV:03 RL:07 SV: 1.2."

*4 Compatible with models whose revision number is "PV:04 RL:08 SV: 2.0."

(Continued to the next page)

Input Output Characteristics: Type J (°C)		
Input Output Characteristics: Type J (°F)		
Input Output Characteristics: Type K (°C)		
Input Output Characteristics: Type K (°F)		

1-14. Specifications of LT Type H Series and EX Module (Pt100 Input)

	LT Type H Series	EX Module EXM-ALM3LT
	Pt100 Input Specifications	
Measurable Temperature Range	Celsius: -50 to +400°C Fahrenheit: -58 to +752°F	Celsius: -100 to +500°C Fahrenheit: -148 to +932°F
Accuracy	±1.0% (Full scale)	
Temperature Conversion Data	Celsius: -500 to +4,000 Fahrenheit: -580 to +7,520	Celsius: -1,000 to +5,000 Fahrenheit: -1,480 to +9,320
External Wiring Length	Each channel: 50m max.	Not specified
Conversion Time	Approx. 85ms × filter frequency (1 to 64) *1	Sample repetition time: 20ms max. *2 40ms max. *3 Total input system transfer time *4: 200ms +1 scan time *2 80ms+1 scan time *3
Filtering	Filter frequency: 1-64	No
Isolation Method	Channel to channel: No isolation Input to internal: Photocoupler isolation	
Error Detection	Temperature conversion data when exceeding measured temperature range Exceeding the upper limit: 32,767 Exceeding the lower limit: -32,768	Error code 130 is stored in #L_IOStatus[1]
Disconnect Processing	Temperature conversion data is 32,767	Error code 130 is stored in #L_IOStatus[1]
Wiring	3-wire type	

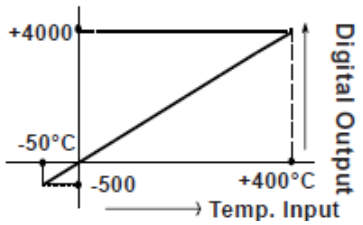
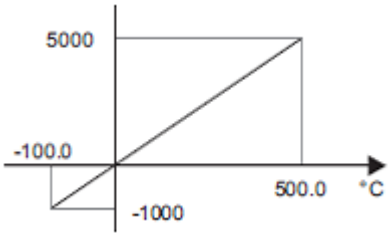
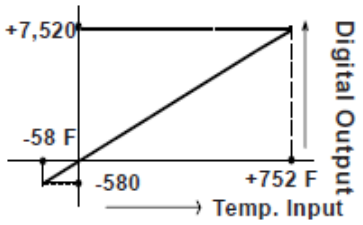
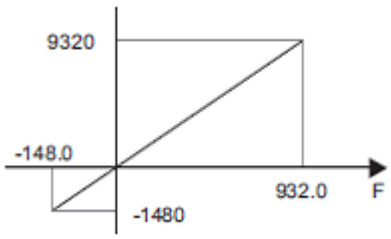
*1 Except for delay time, depending on the LT Type H series unit's scan time.

*2 Compatible with models whose revision number is "PV:03 RL:07 SV:1.2."

*3 Compatible with models whose revision number is "PV:04 RL:08 SV:2.0."

*4 Total input system transfer time = sample repetition × 2 + internal operation time +1 scan time
The value is the maximum time.

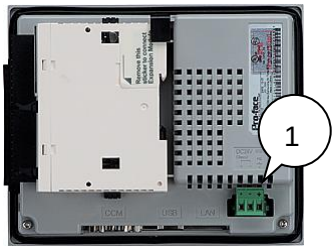
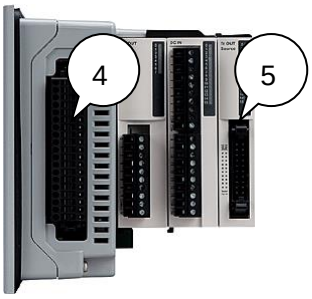
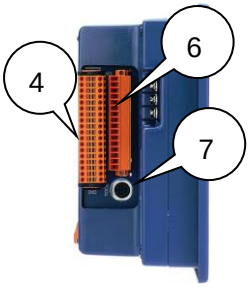
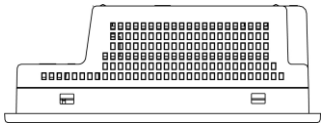
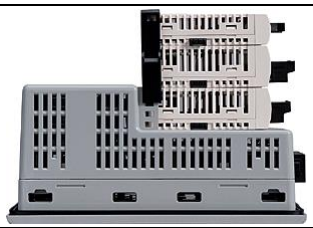
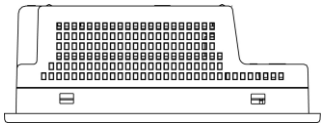
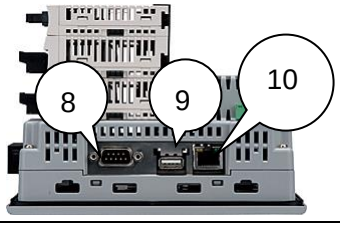
(Continued to the next page)

Input Output Characteristics (°C)		
Input Output Characteristics (°F)		

Chapter 2. Replacement of Hardware

2-1. Locations of Interfaces

Locations of connectors on the LT Type H series and the LT-3300 series are as follows:

	LT Type H Series	LT-3300 Series
Rear		
Right		
Left		
Top		
Bottom		

	LT Type H Series	LT-3300 Series
1	Power Input Terminal Block	Power Plug Connector
2	Alarm Output Circuit	-
3	Temperature Input Interface	-
4	DIO Input/Output Connector *1 *2	DIO Interface *1 *2
5	-	EX Module Interface *2
6	Analog Connector	-
7	Tool Connector	-
8	-	Serial Interface
9	-	USB Host Interface
10	-	Ethernet Interface *3

*1 Can be changed to the high-speed counter, pulse output, or PWM output via software settings.

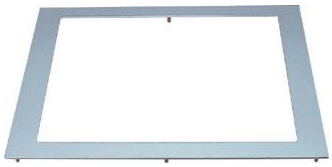
*2 The cable location on the LT Type H series is different from that of the LT-3300 series.

*3 LT-3300T only

2-2. Panel Cut Dimensions

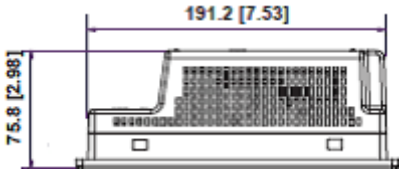
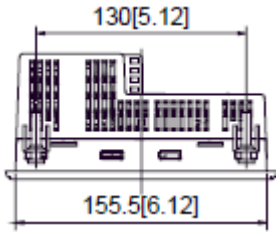
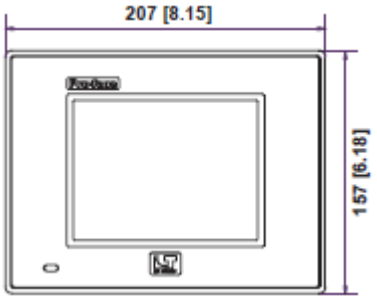
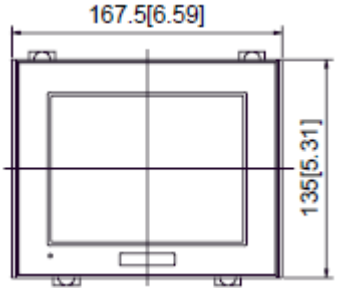
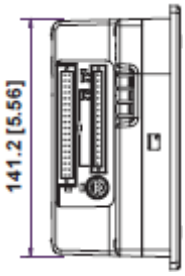
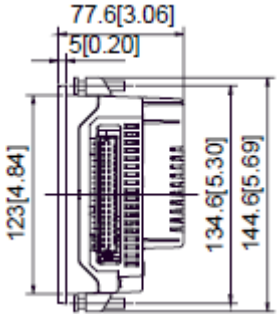
The LT-3300 series is designed smaller for space saving and it is different in the panel cut dimensions from the LT Type H series. To replace the LT Type H series with the LT-3300 series, an attachment (model: CA4-ATM5-01) is required for installation.

Attachment for installation (Reference: smaller than the actual size)



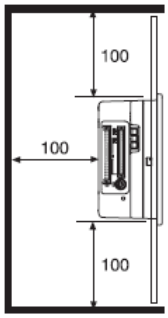
2-3. External Dimensions

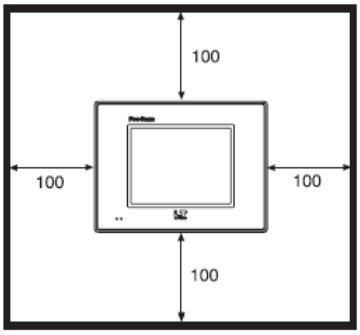
External dimensions (mm [in.])

	LT Type H Series	LT-3300 Series
Top		
Front		
Side		

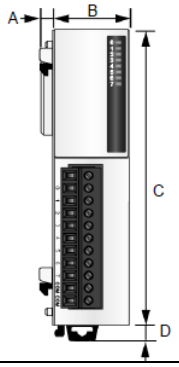
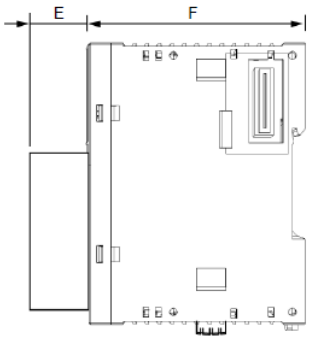
2-4. Required Space for Installation

For easier maintenance, operation, and improved ventilation, be sure to install the LT Type H or LT-3300 unit at least 100mm [3.94 in.] away from adjacent structures and other equipment.





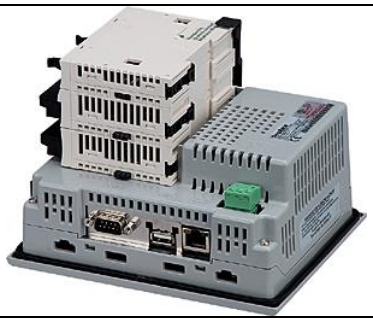
2-5. EX Module External View

Front	Side
	

Dimensions (mm [in.])

Model No.	A	B	C	D	E	F
EXM-DDI16DT	3.8 [0.15]	23.5 [0.93]	90 [3.54]	4.5 [0.18]	14.6 [0.57]	70 [2.76]
EXM-DDI8DT						
EXM-DRA8RT						
EXM-DRA16RT						
EXM-DDO8UT						
EXM-DDO8TT						
EXM-DMM8DRT						
EXM-AMI2HT						
EXM-ALM3LT						
EXM-AMM3HT						
EXM-AMO1HT						
EXM-DDO16UK	3.8 [0.15]	17.6 [0.69]	90 [3.54]	4.5 [0.18]	11.3 [0.44]	70 [2.76]
EXM-DDO16TK						

2-6. External Dimension (depth) with EX Modules installed on LT-3300 Series

	EX Module (1 unit)	EX Module (3 units)
External view		
Depth	77.6 mm [3.06 in.] *1	123.0 mm [4.9 in.] (when installing 3 EX modules with 23.5 mm [0.93 in.] width) *1 *2

*1 For easier maintenance, operation, and improved ventilation, be sure to install the unit, at least 100 mm [3.94 in.] away from adjacent structures and other equipment.

*2 Depth = 52.5 mm [2.1 in.] (LT-3300 unit) + 23.5 mm [0.93 in.] × 3 units (EX module)

The depth depends on the number of EX modules installed on the LT unit.

2-7. Touch Panel Type

The LT-3300 series is analog resistive. An analog resistive touch panel does not recognize the touch input even if you touch two points at the same time. If you applied the two-point touch input on the LT Type H series, we recommend you change to the one-point touch input using the switch delay function. For the settings, see the separate guidebook “Compatibility of Software.”

2-8. Transfer Cable

To transfer screen data to the LT-3300 series, use a USB transfer cable (model:CA3-USBCB-01). Please note that any commercially available USB cable cannot be used. The LT Type H series uses the tool port for screen data transfer, but the LT-3300 series doesn’t have one. The transfer cable for the LT Type H series (model: GPW-CB02, GPW-CB03, GP430-CU02-M) cannot be used on the LT-3300 series.

2-9. Printer Connection

The LT-3300 series allows you to connect a printer via its USB interface. The LT-3300 series does not have a tool port. If you used a serial-interfaced printer connecting to the tool port on the LT Type H series with a transfer cable and a serial cable, you can use the printer with the LT-3300 series by connecting it to the serial interface.

2-10. Barcode Reader Connection

The LT-3300 series allows you to connect a barcode reader via its USB interface or serial interface.

However, the LT-3300 series is not equipped with a tool port. A barcode reader that connected to the tool port on the LT Type H series cannot be used with the LT-3300 series.

2-11. Power Connector

The power supply connector on the LT-3300 series is a European terminal, which is different from that of the LT Type H series.

2-12. Body Material/Color

The body material of the LT-3300 series is resin as same as the LT Type H series. Its material characteristics are same, but its body color is different from that of the LT Type H series.

2-13. Display Colors

The display color of GLC150-BG41-AD*K-24V/ GLC150-BG41-AD*C-24V is monochrome.

As LT-3300T does not support monochrome display, if you change the model to LT-3300T, the display color will be changed to Color display. Therefore, after changing the model, be sure to check the color of the screen data with GP-Pro EX.

Chapter 3. Replacement of Software

3-1. Notes on Replacement of LT Type H Series with LT-3300 Series (Software)

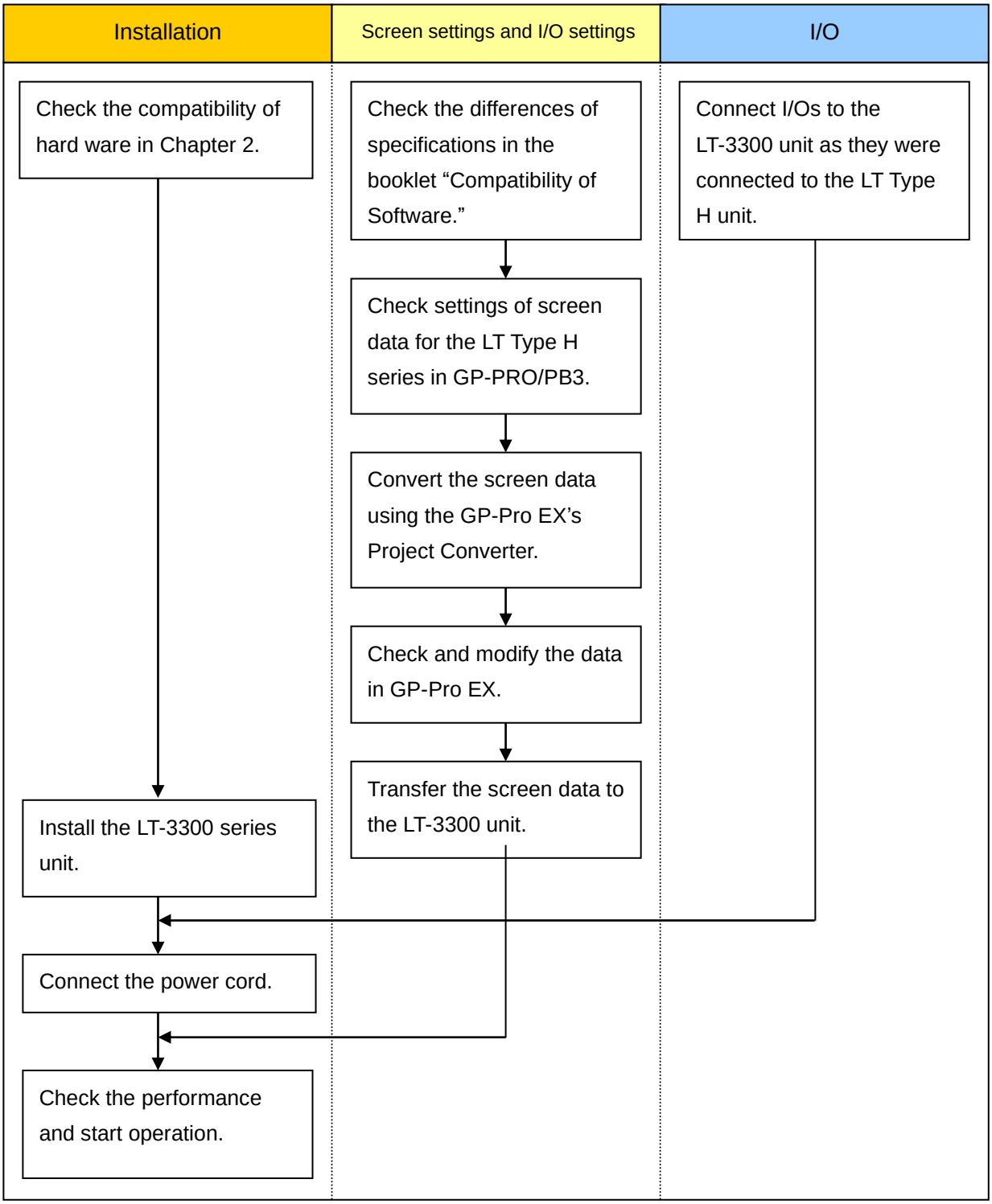
The followings are notes on replacement of the LT Type H series with the LT-3300 series:

	Notes on Replacement (Software)		LT Type H Series								
	Description	Remark	GLC150-SC41-ADK-24V	GLC150-SC41-ADTK-24V	GLC150-SC41-ADPK-24V	GLC150-BG41-ADK-24V	GLC150-BG41-ADTK-24V	GLC150-BG41-ADPK-24V	GLC150-BG41-ADC-24V	GLC150-BG41-ADTC-24V	GLC150-BG41-ADPC-24V
1	Software for screen development and screen transfer is different.		○	○	○	○	○	○	○	○	○
2	The project file requires to be converted due to different file format.		○	○	○	○	○	○	○	○	○
3	The project file may not be converted correctly because of different software specifications.		○	○	○	○	○	○	○	○	○
4	The variable settings in the logic program is different. If you used the Fix Variable mode, change the settings via GP-Pro EX.		○	○	○	○	○	○	○	○	○
5	Configurations via software are different. Check the I/O settings via GP-PRO/PB3 C-Package before conversion.		○	○	○	○	○	○	○	○	○
6	Configurations via software are different. Reconfigurate the I/O settings in the converted screen data via GP-Pro EX.	*1	○	○	○	○	○	○	○	○	○
7	The count range and the frequency of the high-speed counter are different. The restrictions of the ON/OFF preset value are different.		○	○	○	○	○	○	○	○	○
8	The output pulse count and the output frequency of the pulse output are different.		○	○	○	○	○	○	○	○	○
9	The output frequency of the PWM output is different.		○	○	○	○	○	○	○	○	○
10	The LT-3300 series doesn't have the filter function of the analog input. The conversion range is different.	*1	○	○	○	○	○	○	○	○	○
11	The conversion range for the analog output is different.	*1	○	○	○	○	○	○	○	○	○
12	The LT-3300 series doesn't have the filter function of the thermocouple (K) input. The input range is different.	*1		○			○			○	
13	The LT-3300 series doesn't have the filter function of the thermocouple (J) input. The input range is different.	*1		○			○			○	
14	The LT-3300 series doesn't have the filter function of the Pt100 input. The input range is different.	*1			○			○			○

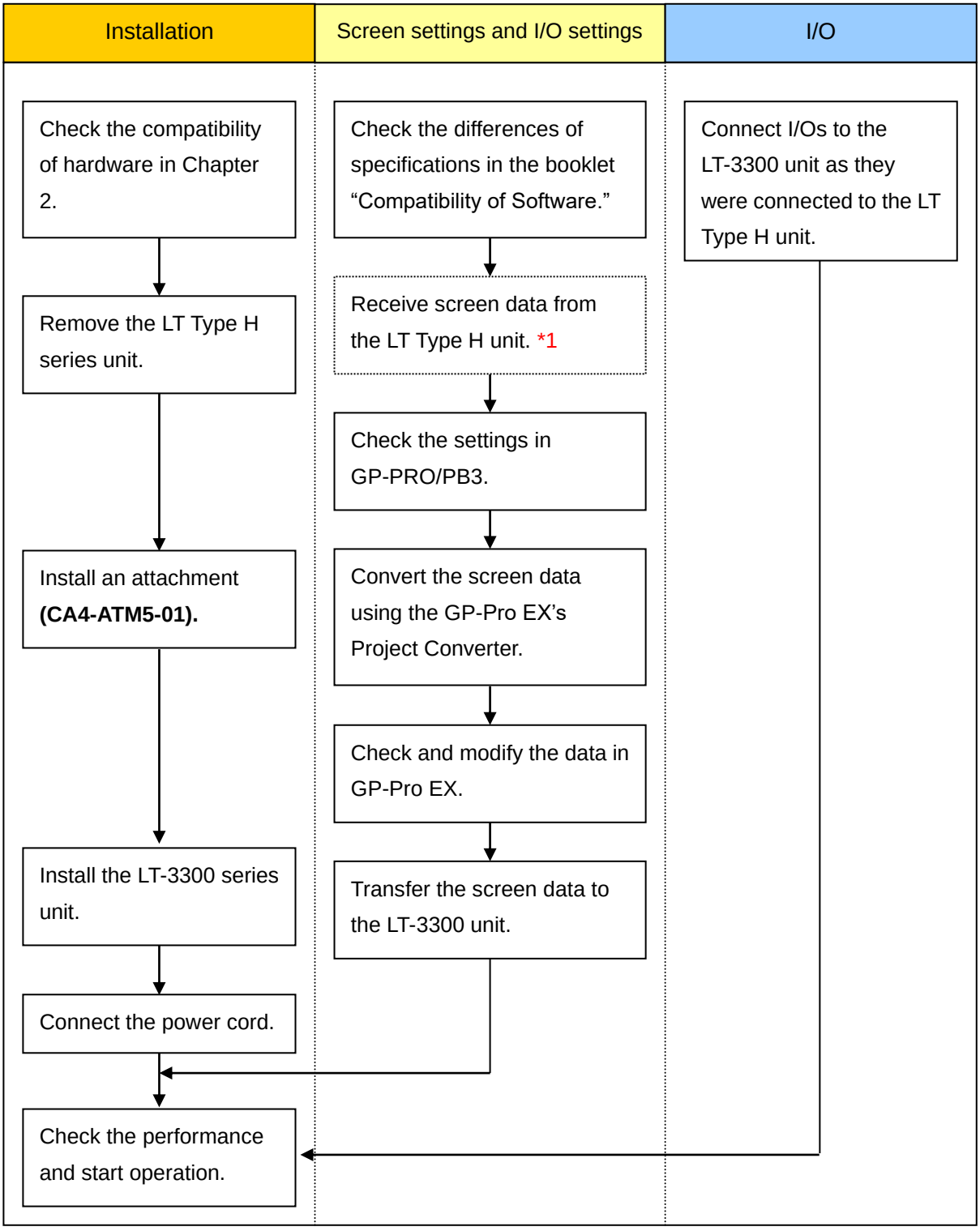
*1 To use the analog input/output, thermocouple input, Pt100 input functions, installation of the EX module is required.

3-2. Work Flow

◆ Replace the LT Type H series under development with the LT-3300 series



◆ Replace the LT Type H series installed on a panel with the LT-3300 series

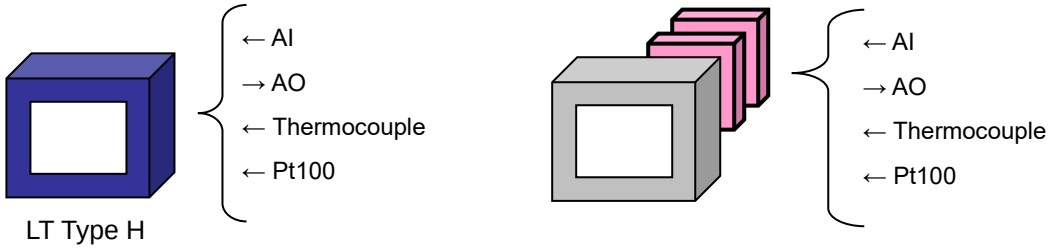


*1 If you have backup LT Type H data, screen data reception is not necessary.

I/O configuration check and reconfiguration after conversion

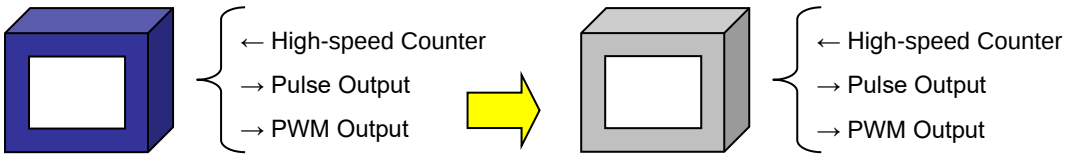
To use the following inputs and outputs on the LT-3300 series, setups are required after conversion as follows:

1) Analog Input/Output, Temperature (Thermocouple, Pt100) Input



The LT-3300 series doesn't have analog input/output and temperature (thermocouple, Pt100) input interfaces. To use these inputs and outputs, you need to install the EX module on the LT unit. Add the EX module settings in the converted project file and configure its I/O settings (temperature input unit, analog input/output range, input range).

2) High-Speed Counter, PWM Output, Pulse Output



The LT-3300 series allows you to allocate the high-speed counter, pulse output, and PWM output functions to its I/O terminals as well as the LT Type H series. Allocation and variables of each terminal are converted automatically. However, you may need to change some settings depending on the variables used on the LT Type H series.

3-3. Preparation

Requirements for receiving screen data from the LT Type H series *1	PC in which GP-PRO/PB3 for Windows Ver.7.0 or later is installed * The software version must be the same or higher than the version that you used when creating screen data for the LT Type H series. We recommend you upgrade to the latest version. (Ver.7.29 as of August 2009)
	Transfer cable (the following three types of cable are available) ▪ GPW-CB02 (9-pin D-sub to the PC) ▪ GPW-CB03 (USB to the PC) *2 ▪ GP430-CU02-M or GPW-SET
Requirements for converting screen data of the LT Type H series and transferring it to the LT-3300 series	LT-3300T: GP-Pro EX Ver. 3.01.200 or later
	USB transfer cable (model: CA3-USBCB-01) The LT-3300 series allows you to transfer screen data via Ethernet *3 or USB flash drive *4.

*1 This step is not necessary if you have backup data in your PC.

*2 To use this cable, you may need to install the driver.

Go to our support website Otasuke Pro!

-> Download

-> Updates/Drivers

-> GP-PRO/PB3: USB Data Transfer Cable (GPW-CB03)

*3 LT-3300T only

***4** Use a USB flash device that conforms to **USB1.1 Mass Storage Class.**

For the details on how to transfer screen data using a USB flash device, see the GP-Pro EX Reference Manual.

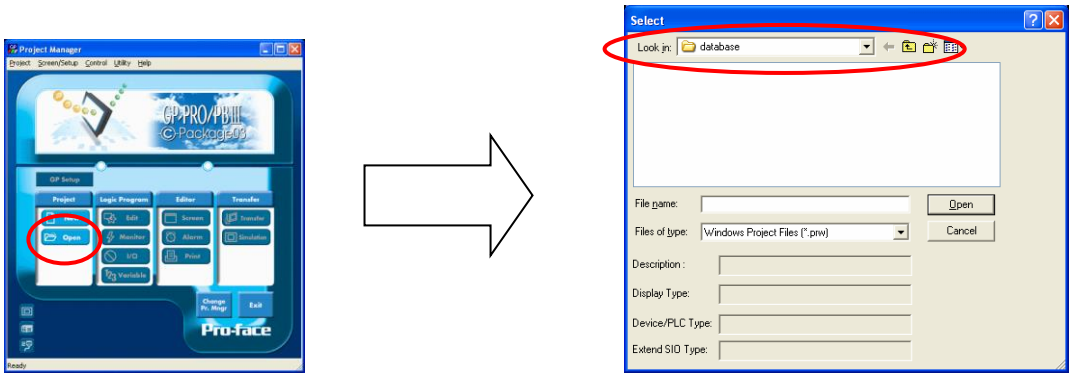
3-4. Use the backup data of the LT Type H series

In case that you have backup data of the LT Type H series, open it in GP-PRO/PB3 C-Package. There are 2 types of project data for the LT Type H series, and the method to open the file depends on the file format.

1. PRW format

A project file created in GP-PRO/PB3 C-Package. Its file extension is ".prw".

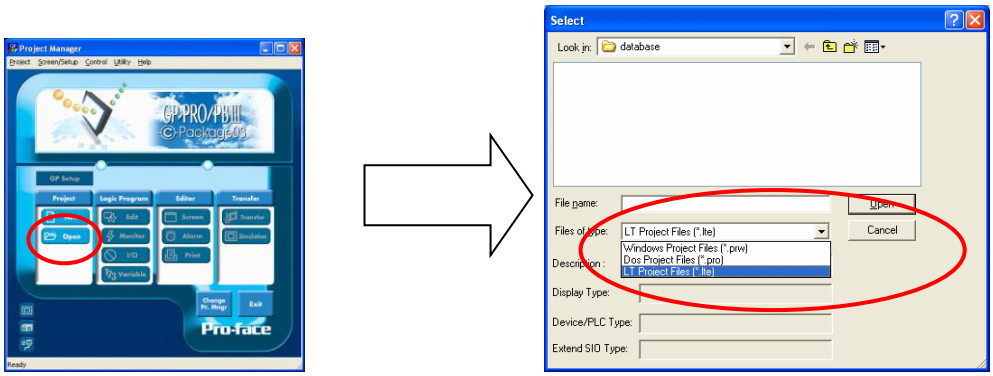
To open a PRW file, click the Open button on the Project Manager and specify the folder the backup data is saved in.



2. LTE format

A project file created in LT Editor. Its file extension is ".lte".

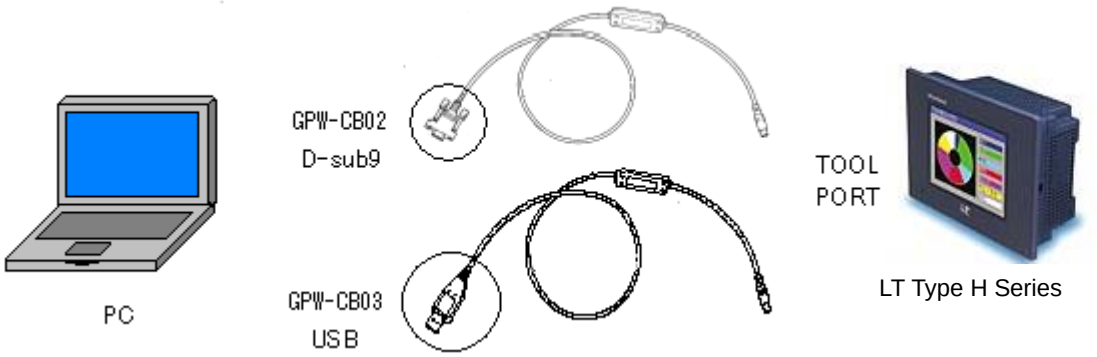
To open an LTE file, click the Open button on the Project Manager, select [LT Project File] from the File of type pull-down menu, and specify the folder the backup data is saved in.



3-5. Receive screen data from the LT Type H series to PC

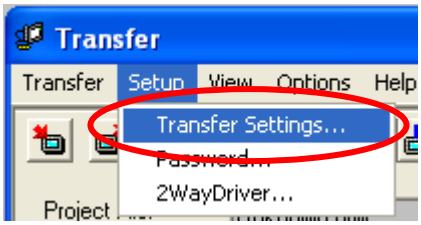
This section explains, as an example, how to receive screen data from the LT Type H series to a PC using a transfer cable GPW-CB02 or GPW-CB03.

1. Connect a transfer cable with the LT Type H series and a PC.

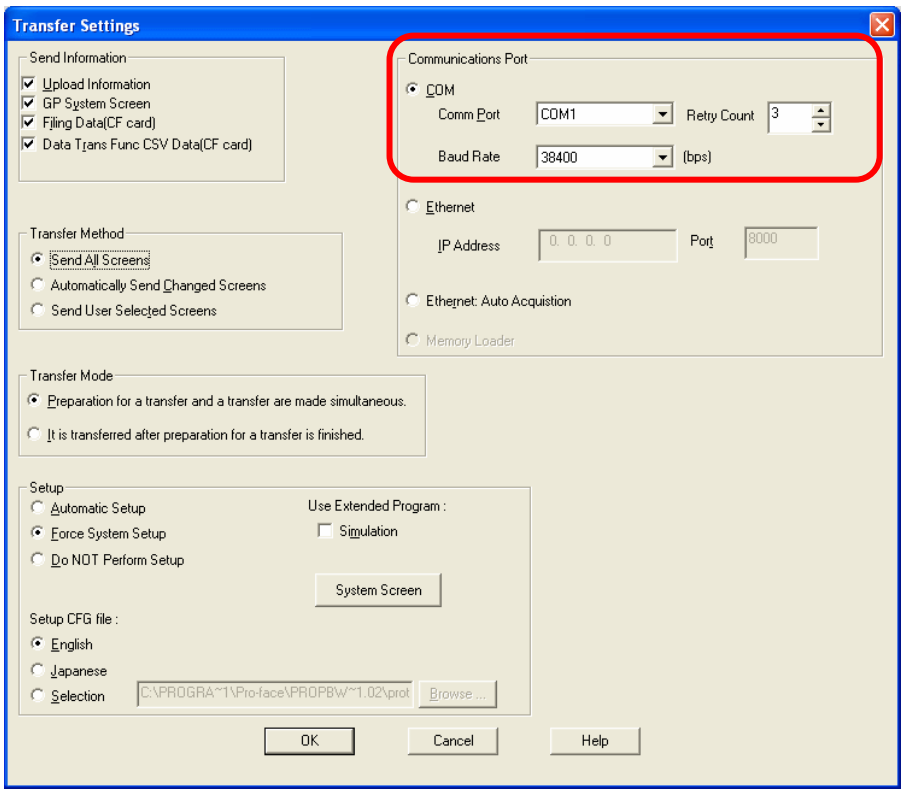


2. Start up GP-PRO/PB3 C-Package and click the [Transfer] icon on the Project Manager. (Specify a desired project file.)

3. On the [Transfer] window, select the [Setup] menu and click [Transfer Settings…].

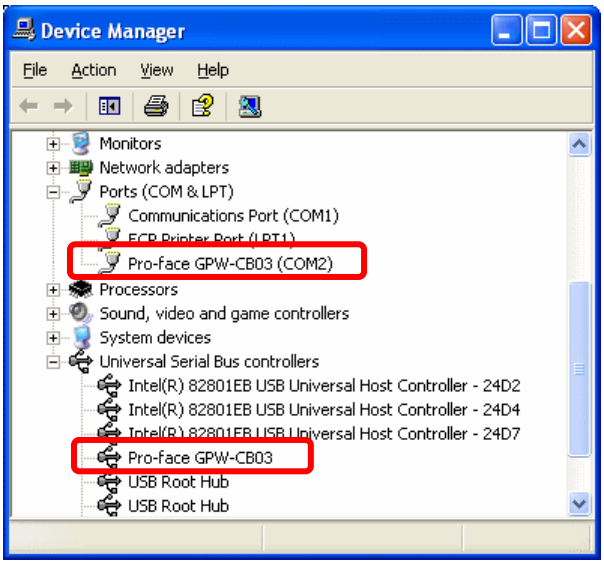


4. In the Communications Port field, select [COM], specify the COM port to which the cable is connected, and click [OK].

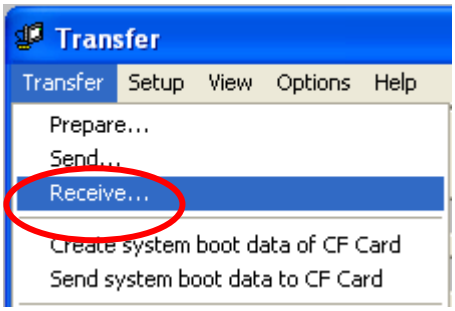


If you use a USB transfer cable (GPW-CB03)…

You can check the COM port for the USB transfer cable (GPW-CB03), which is assigned to the PC with the Device Manager of Windows.



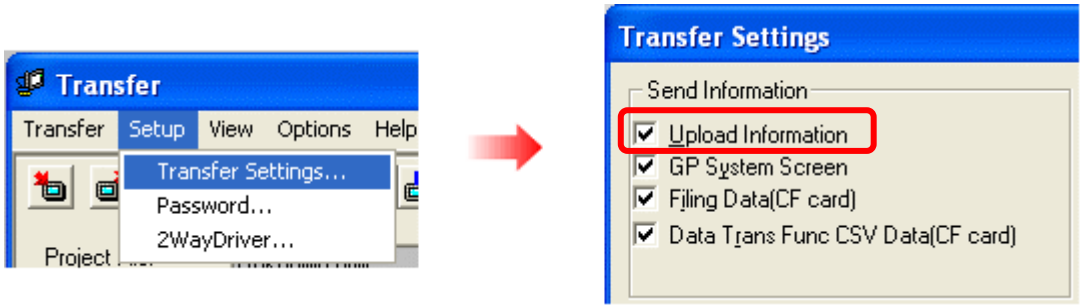
5. Select the [Transfer] menu and click [Receive…].



6. Specify the location to save the received screen data in and the project file name and save.

In case there is no Upload Information…

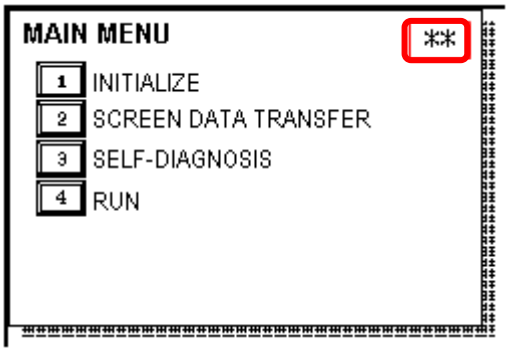
"Upload Information" is necessary to receive screen data from the display unit. It needs to be included in screen data when transferring screen data to the display unit beforehand. The Upload Information is sent to the display unit by default, however, you may check off the box of Upload Information to prevent screen reception by a third party.



In this case, a message, which indicates there is no Upload Information," appears and you cannot receive the data.

You can check if the Upload Information has been sent or not in the following way.

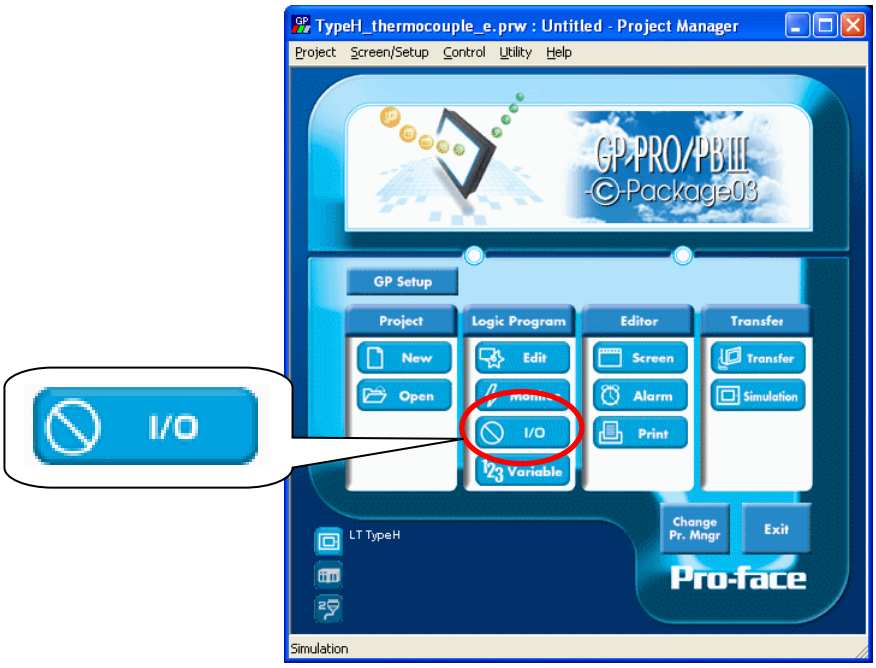
Enter into the GP's Offline mode. If there are 2 asterisk (*) marks in the Main menu as below, the Upload Information has been sent. If not, there is no Upload Information sent.



3-6. Check the I/O configuration of the LT Type H series on GP-PRO/PB3 C-Package

Procedures

Open a project file of the LT Type H series in GP-PRO/PB3 C-Package and check the I/O settings



Refer to the section of input/output you use.

3-6-1. Analog Input/Output Configuration Check

3-6-2. Thermocouple Input Configuration Check

3-6-3. Pt100 Input Configuration Check

3-6-4. High-Speed Counter, Pulse Output, PWM Output Configuration Check

3-6-1. Analog Input/Output Configuration Check

The LT Type H series has the analog input/output functions, but the LT-3300 series doesn't. To use these functions, a separate EX module unit is required.

Since the Project Converter cannot convert the I/O settings, be sure to check the I/O settings before conversion in C-Package and reconfigure them in GP-Pro EX after conversion.

1. On the Configure I/O dialog box, check the items related with the analog input and take a note of them.

   As an example here, the driver [TypeH-AD] is selected and following variables are used.

   General Item

   I/O Board Version: Version

   Analog Input Data Enable Display: Analog

   Temperature Input Data Enable Display: Temperature

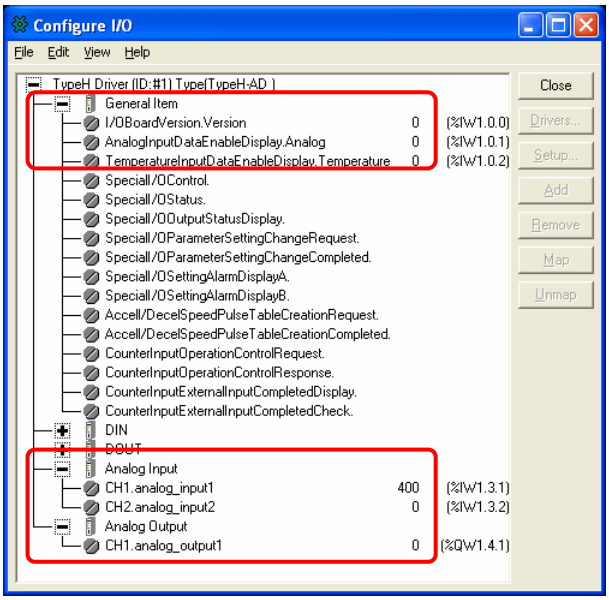
   Analog Input

   CH1: analog_input1

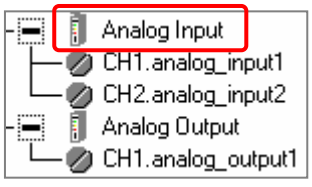
   CH2: analog_input2

   Analog Output

   CH1: analog_output1



2. Double-click [Analog Input].



3. Check the following items in the Analog Input Setup dialog box and take a note of them.

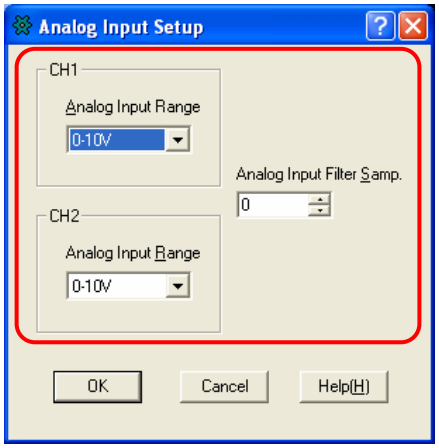
Example:

Analog Input Range

CH1: 0-10V, 0-20mA, or 4-20mA

CH2: 0-10V, 0-20mA, or 4-20mA

Analog Input Filter Samp.: 0-64



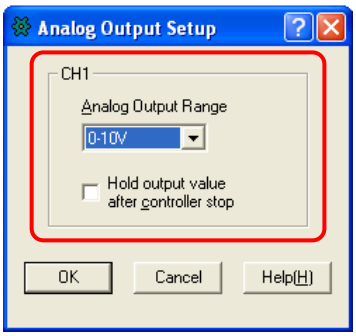
4. Check the analog output setup as well and take a note of them.

Analog Output Range

Ch1: 0-10V, 0-20mA, or 4-20mA

Hold output value after controller stop: Not checked

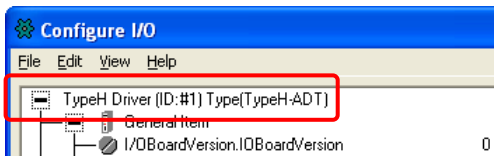
If you set both CH1 and CH2 on [TypeH-ADT] or [ADP], take a note of both settings.



3-6-2. Thermocouple Input Configuration Check

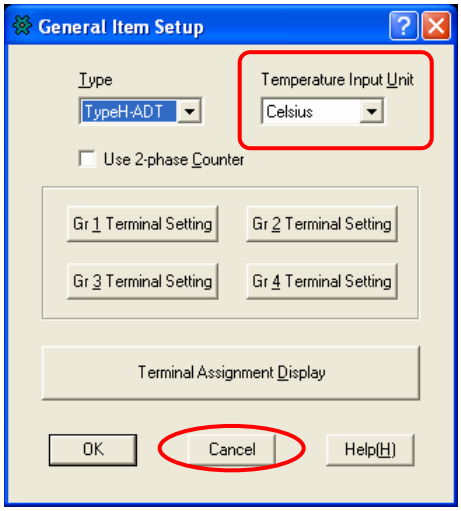
The LT Type H series has the thermocouple input function, but the LT-3300 series doesn't. To use this function, a separate EX module unit is required. Since the Project Converter cannot convert the I/O settings, be sure to check the I/O settings before conversion in C-Package and reconfigure them in GP-Pro EX after conversion.

1. Confirm in the Configure I/O dialog box that the Type H driver is set to [TypeH-ADT] (thermocouple input type) and double-click it.



2. The General Item Setup dialog box opens.
Check which temperature input unit is set.
Here, [Celsius] is set.

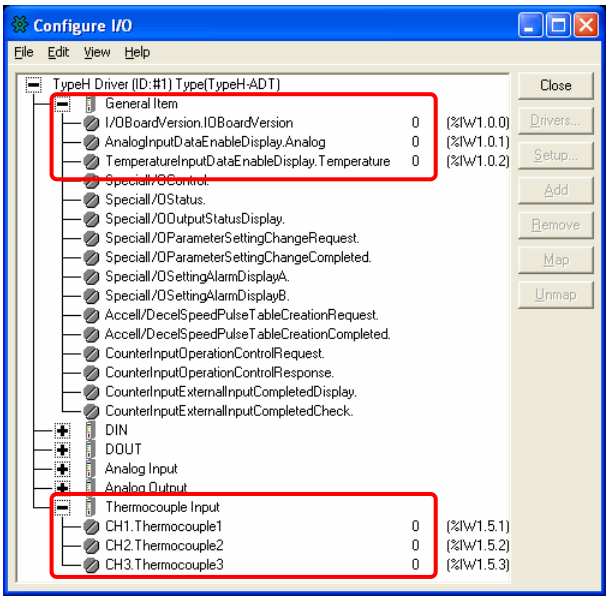
Click [Cancel] to close the window.



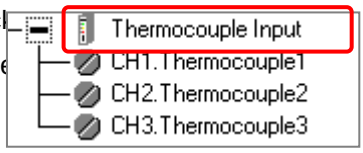
3. In the Configure I/O dialog box, check the items and variables related with the thermocouple input and take a note of them.
As an example here, the following variables are used.

General Item
I/O Board Version: Version
Analog Input Data Enable Display: Analog
Temperature Input Data Enable Display: Temperature

Thermocouple Input
CH1: Thermocouple1
CH2: Thermocouple2
CH3: Thermocouple3



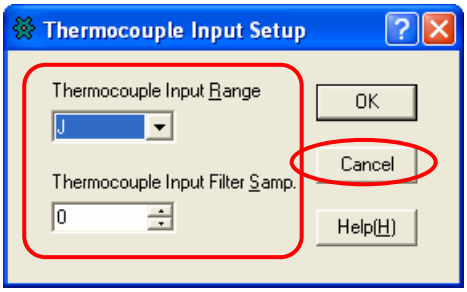
4. Double-click [Thermocouple Input] to check the detailed settings of the thermocouple input.



5. The Thermocouple Input Setup dialog box opens.
   Check the following items:

Thermocouple Input Range: K or J
Thermocouple Input Filter Samp: 0-64

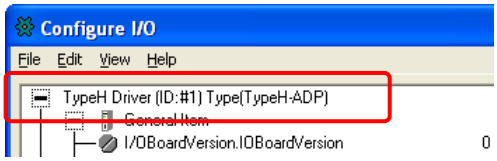
Click [Cancel] to close the window.



3-6-3. Pt100 Input Configuration Check

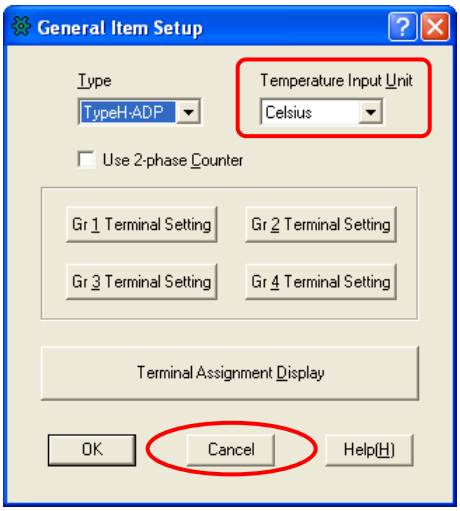
The LT Type H series has the Pt100 input function, but the LT-3300 series doesn't. To use this function, a separate EX module unit is required. Since the Project Converter cannot convert the I/O settings, be sure to check the I/O settings before conversion in C-Package and reconfigure them in GP-Pro EX after conversion.

1. Confirm in the Configure I/O dialog box that the Type H driver is set to [TypeH-ADP] (Pt100 input type) and double-click it.



2. The General Item Setup dialog box appears. Check which temperature input unit is set. Here, [Celsius] is set.

   Click [Cancel] to close the dialog box.



3. In the Configure I/O dialog box, the items and variables related with the Pt100 input and take a note of them.

As an example here, the following variables are used.

General Item

I/O Board Version: Version

Analog Input Data Enable Display: Analog

Temperature Input Data Enable Display: Temperature

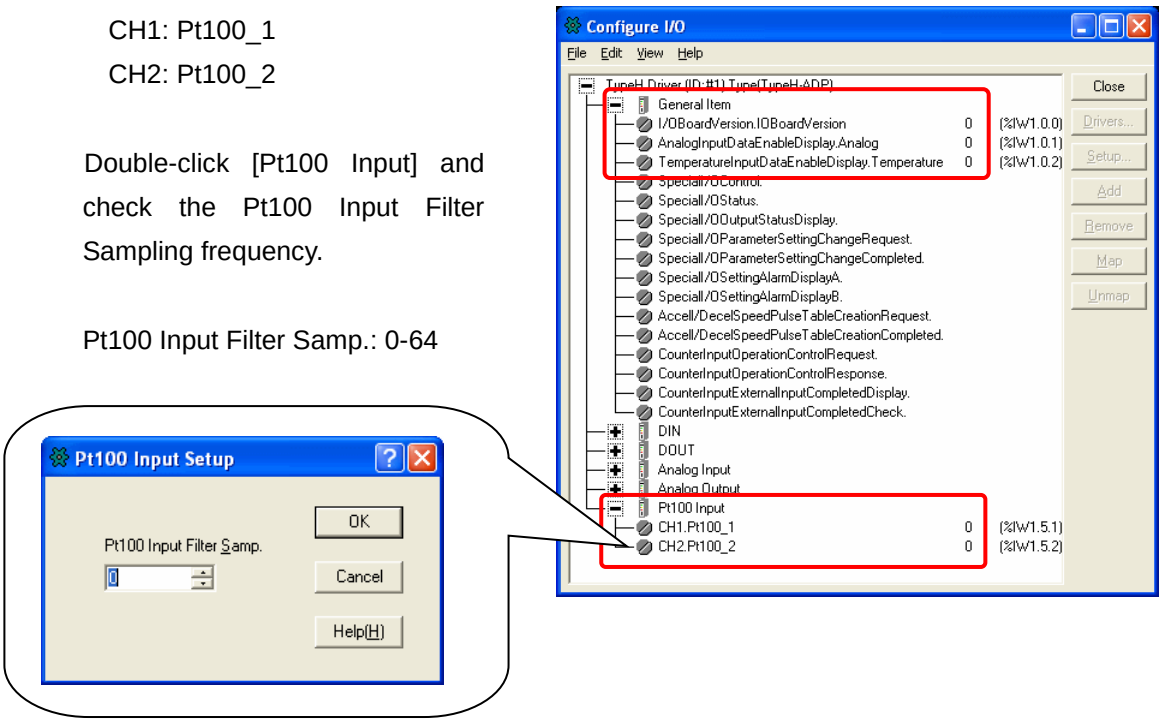
Pt100 Input

CH1: Pt100_1

CH2: Pt100_2

Double-click [Pt100 Input] and check the Pt100 Input Filter Sampling frequency.

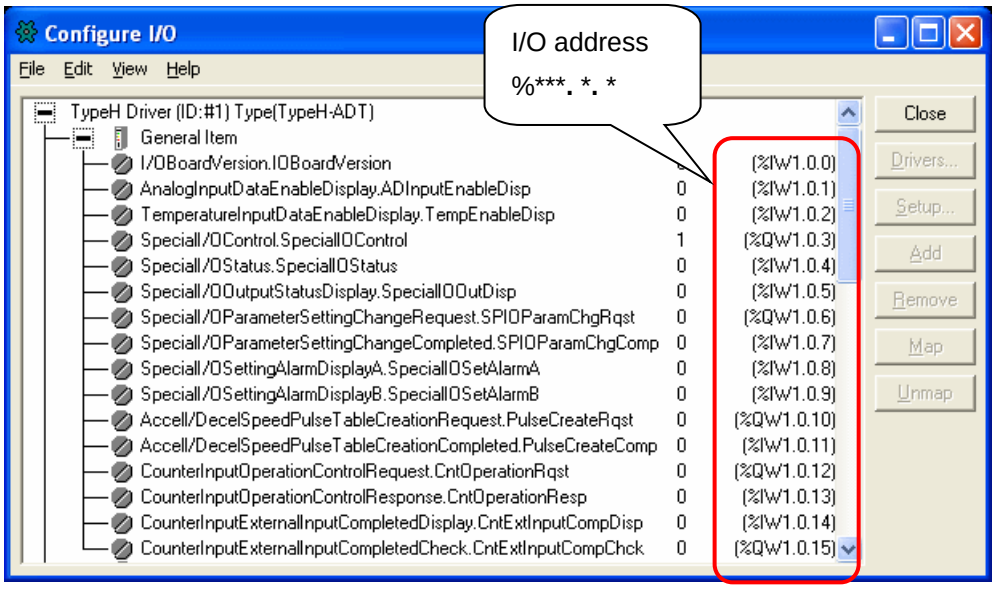
Pt100 Input Filter Samp.: 0-64



3-6-4. High-Speed Counter, Pulse Output, PWM Output Configuration Check

Both the LT Type H series and the LT-3300 series have the high-speed counter, pulse output, PWM output functions. Settings of each can be converted by the Project Converter. However, you may need to change the settings after conversion because of the specifications differences between the LT Type H series and the LT-3300 series. Make sure to check the followings in C-Package before conversion.

Confirm in the Configure I/O dialog box that variables are allocated to the following general items. An item to which a variable is allocated has an I/O address on the right.



Write down the variable names allocated to the following items:

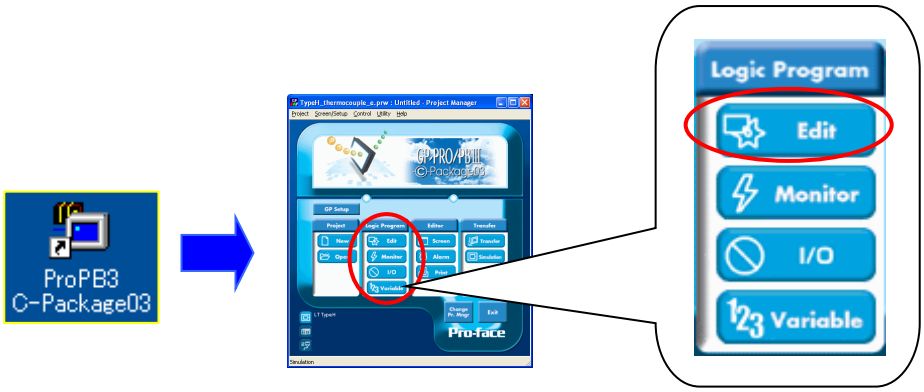
- Special I/O Status (Example variable name: SpecialIOStatus)
- Special I/O Parameter Settings Change Completed (SPIOParamChgComp)
- Special I/O Setting Alarm Display A (SpecialIOSetAlarmA)
- AccelI/DecelI Speed Pulse Table Creation Completed (PulseCreateComp)
- Counter Input Operation Control Response (CntOperationResp)
- Counter Input External Input Completed Check (CntExtInputCompChck)

Using the setting details that you have checked, you will adjust the I/O configuration in GP-Pro EX after conversion. For details, see **3-9-3. High-Speed Counter, Pulse Output, PWM Output Configuration.**

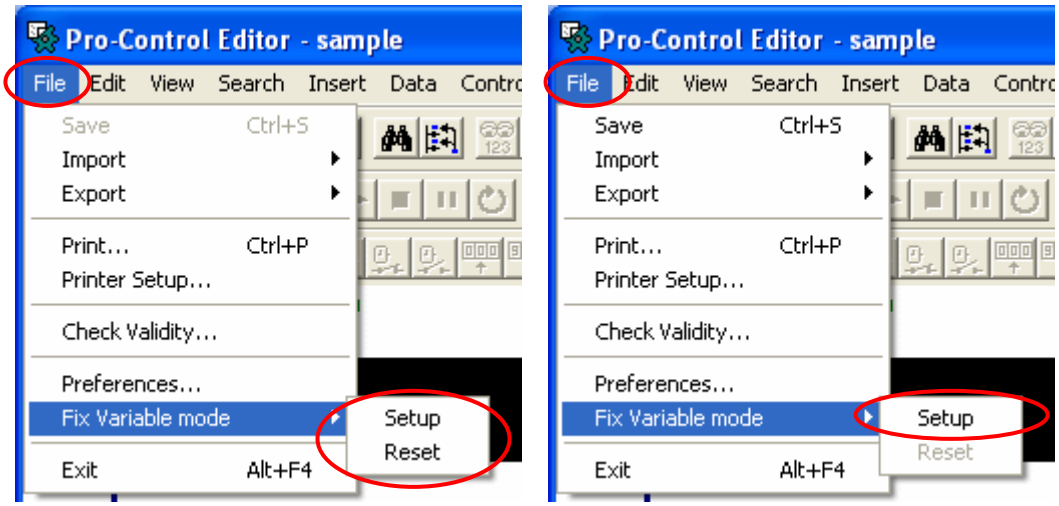
3-7. Check the address settings of the LT Type H series

The LT Type H series has 2 address settings modes. Check the address mode in GP-PRO/PB3 C-Package before conversion.

1. Start GP-PRO/PB3 C-Package and click [Edit] on the Project Manager.



2. On the Pro-Control Editor, select the [File] menu -> [Fix Variable mode]. If the menu has both [Setup] and [Reset] (figure on the left), the address mode is the fix variable mode, and if the menu shows only [Setup] (on the right), the mode is variable mode, which is normal.



Fix Variable Mode　　Variable Mode

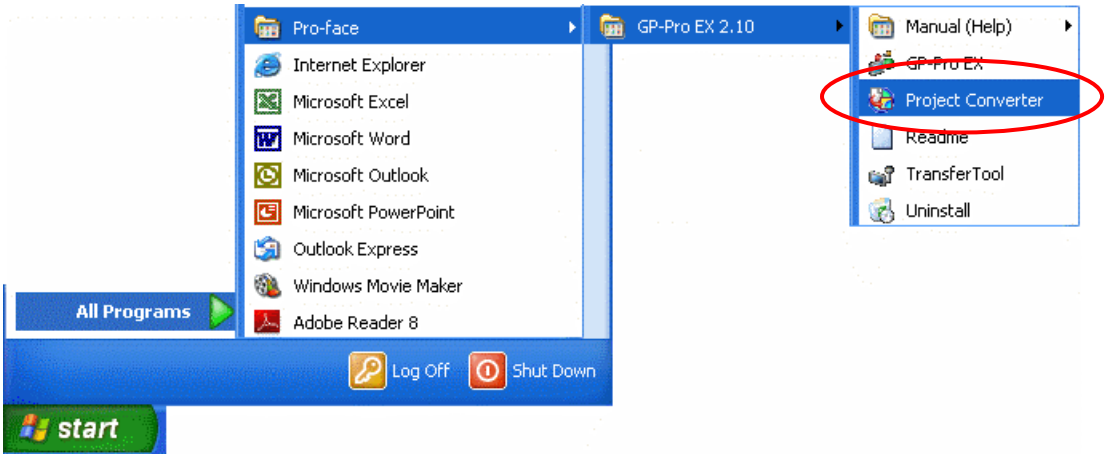
Screen data created in the Fix Variable mode has different precautions for conversion. For the details, see **3-9-4. Precautions for screen data created in the Fix Variable mode.**

“Variable Mode” in GP-PRO/PB3 C-Package is called “Variable Format” in GP-Pro EX and “Fix Variable Mode” is “Address Format.”

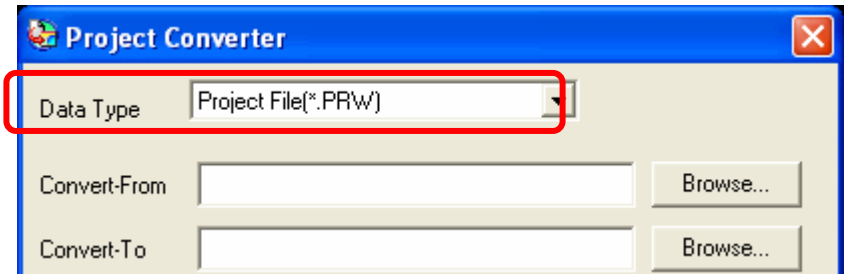
3-8. Convert screen data with the Project Converter

Convert a project file (*.prw) for the LT-Type H series with the GP-Pro EX's Project Converter.

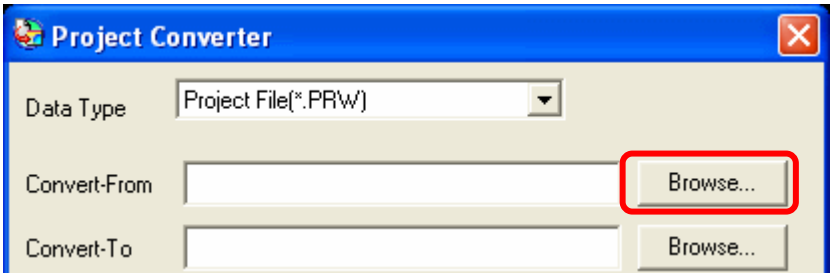
1. Click the [Start] button, select the [All Programs] ([Programs] on Windows® 2000 menu) -> [Pro-face] -> [GP-Pro EX *.**]. (Where *.** is the version of the software you use.)

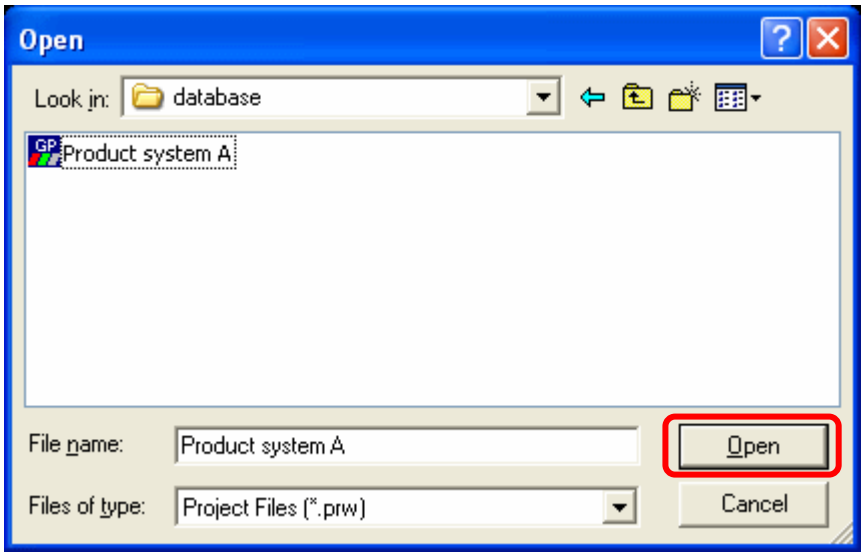


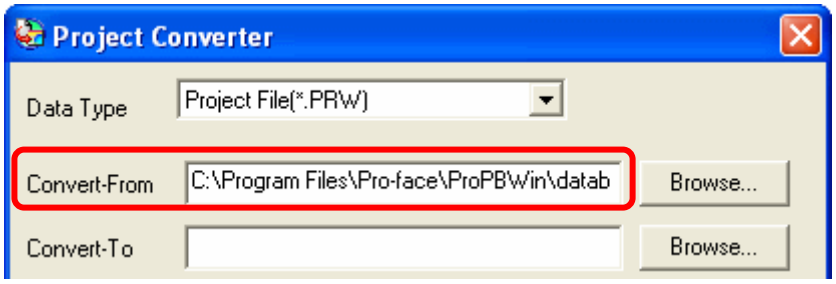
2. The Project Converter starts up and the [Project Converter] dialog box opens. Select [Project File (*.PRW)] in the [Data Type].



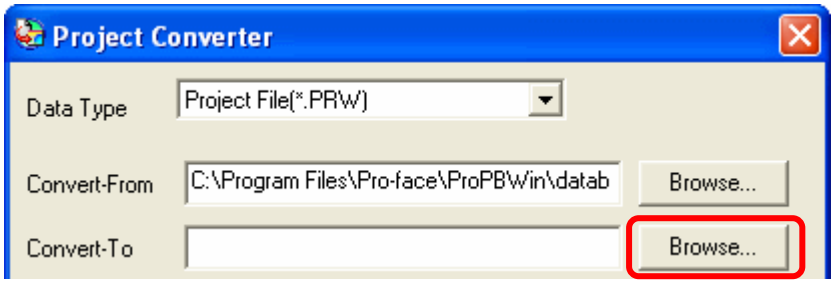
3. Designate a GP-PRO/PB3 for Windows' project file (*.prw) in [Convert-From].
   Click the [Browse…] button and select a project file (e.g.: "Project system A.prw"). Click [Open], and the file will be set in [Convert-From].

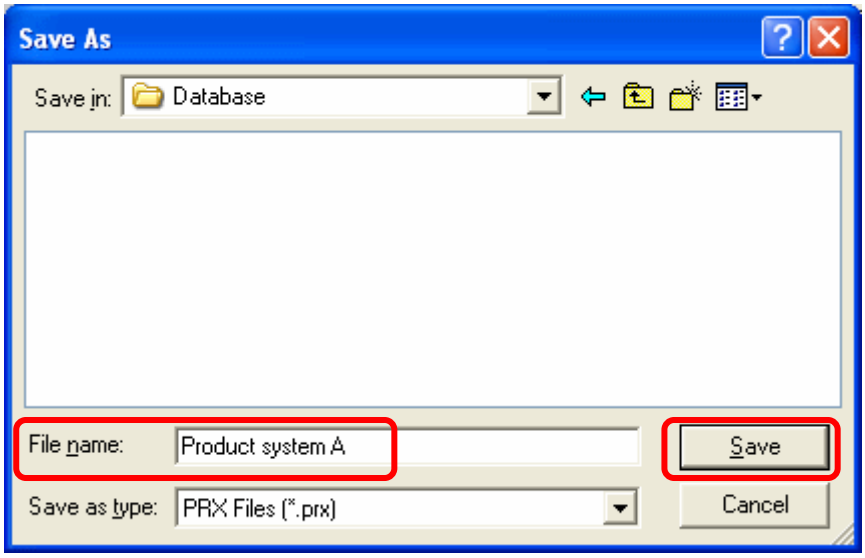


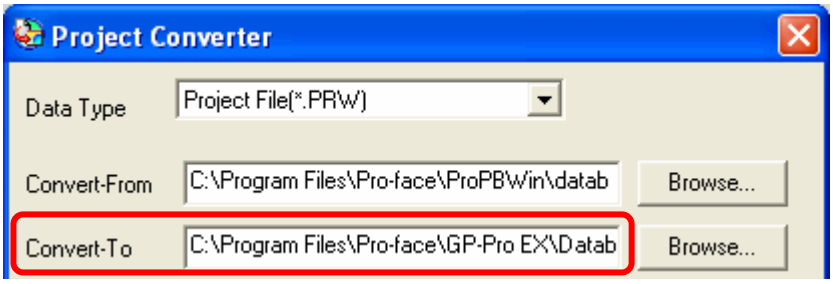




4. In [Convert-To], designate a GP-Pro EX's project file (*.prx). Click the [Browse…] button and enter a new [File Name] (e.g.: "Product system A.prx"). Click [Save], and a new project file will be set to [Convert-To].

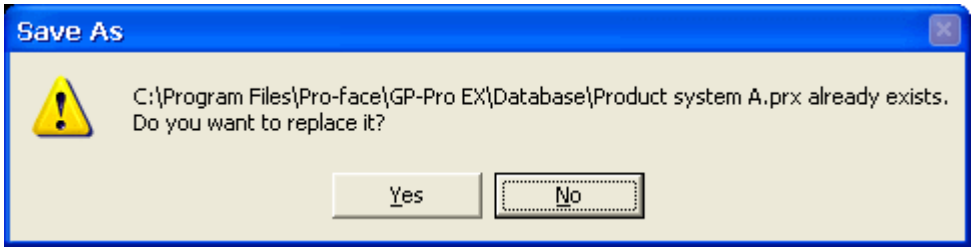




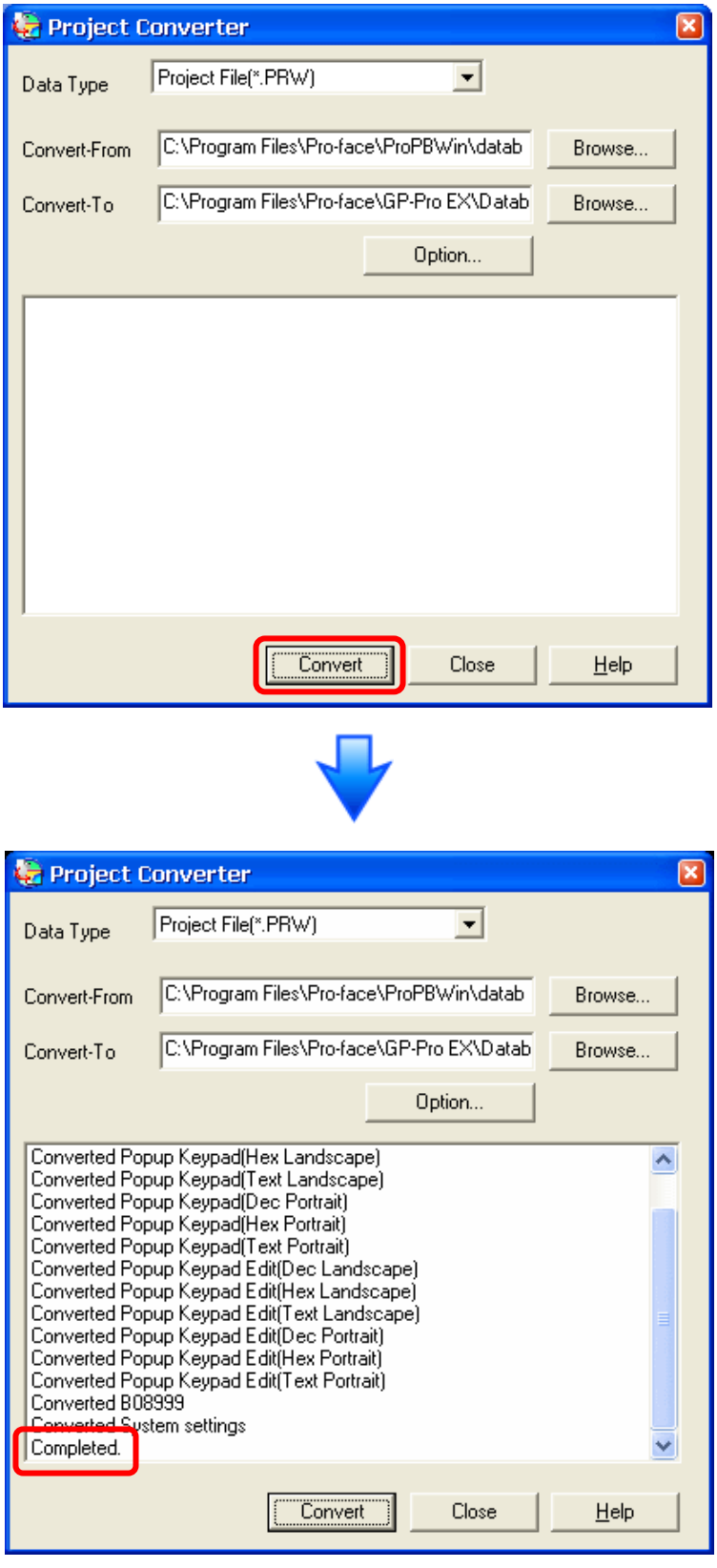


NOTE

When a convert-to file exists, the window that confirms whether or not to overwrite the file is displayed.

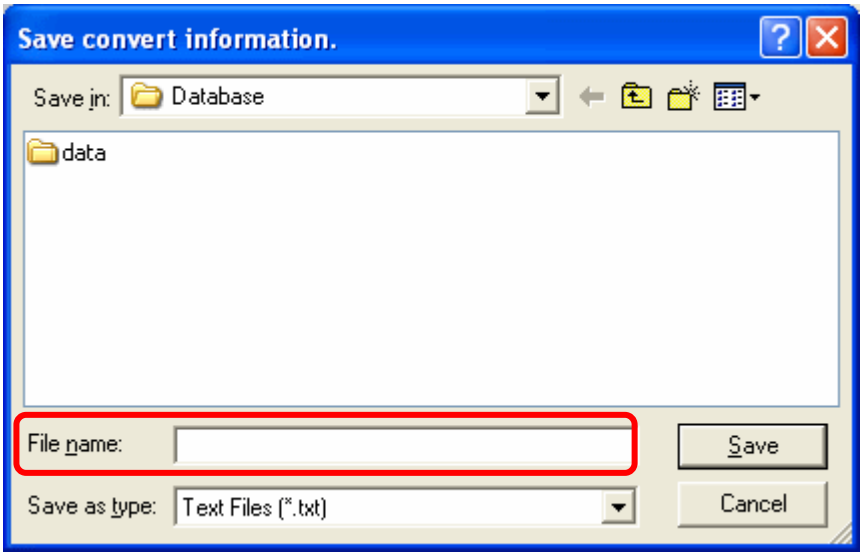


5. Click [Convert] and start the conversion.



NOTE
Depending on the model you are converting from, the [Convert Destination] dialog box may appear and you can select the type and the model.

6. After conversion, the [Save convert information] dialog box appears. If you click [Save], you can save the conversion information in a text file.

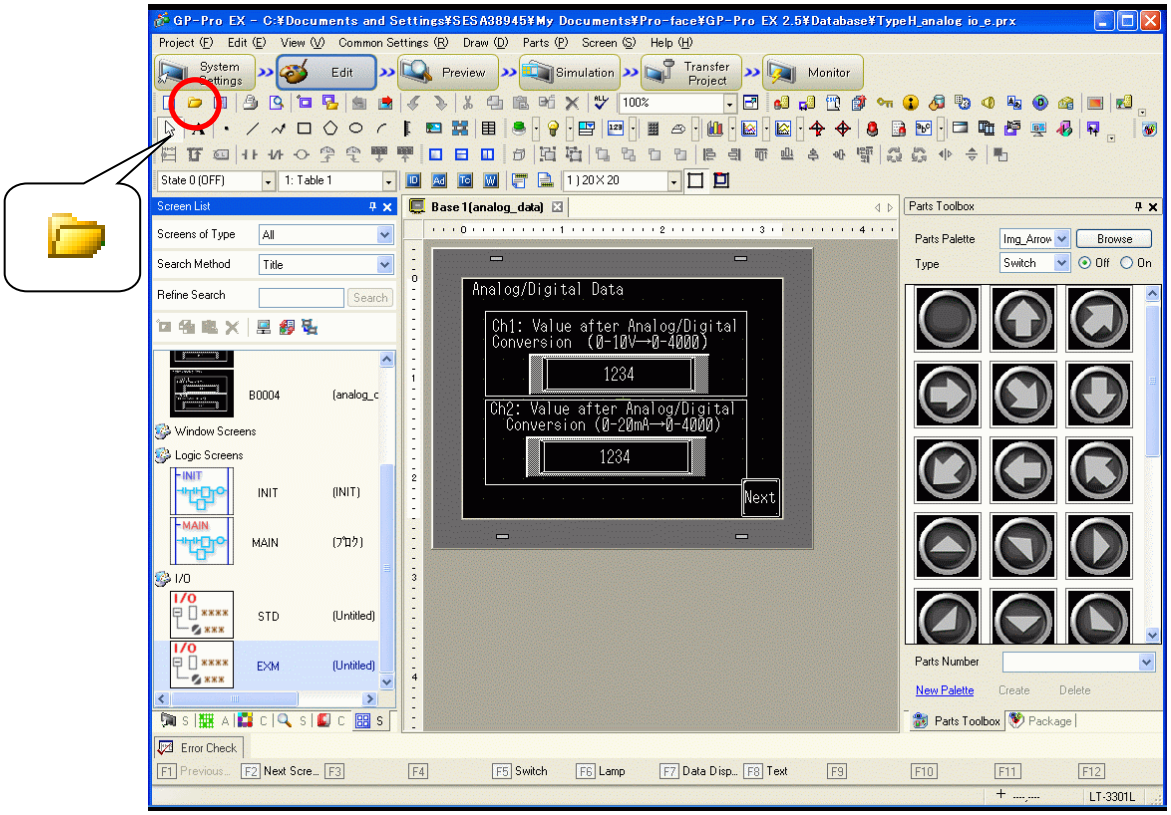


7. Click [Close] to close the [Project Converter] dialog box.

3-9. Configure the I/O with GP-Pro EX

Procedures

Open the converted projected file in GP-Pro EX.



Refer to the section of input/output you will use.

3-9-1. Analog Input/Output Configuration

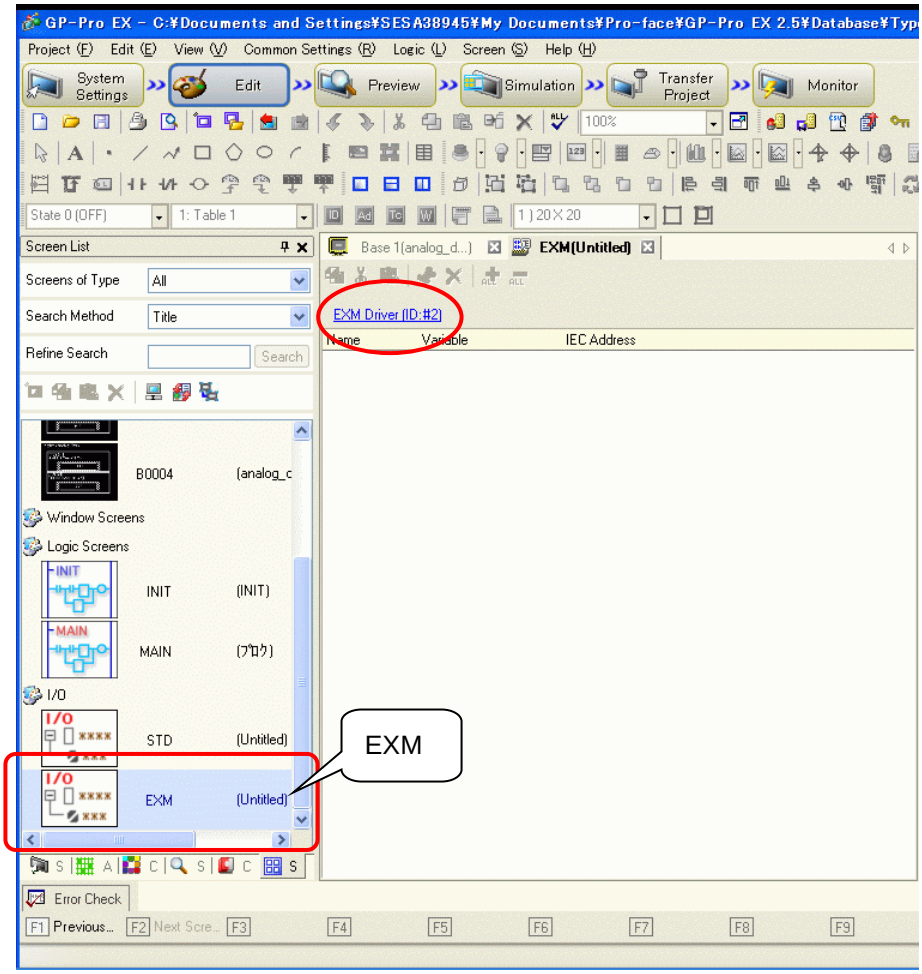
3-9-2. Thermocouple Input/Pt100 Input Configuration

3-9-3. High-Speed Counter, Pulse Output, PWM Output Configuration

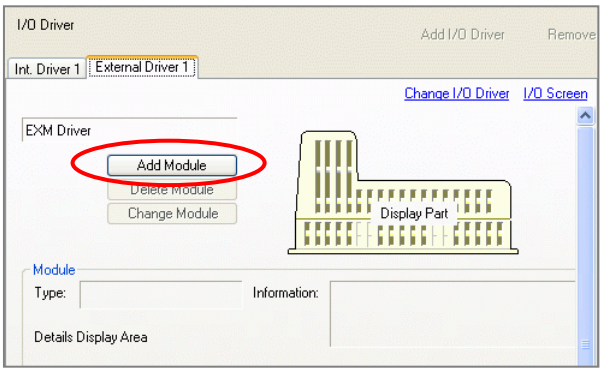
3-9-4. Precautions for screen data created in the Fix Variable mode

3-9-1. Analog Input/Output Configuration

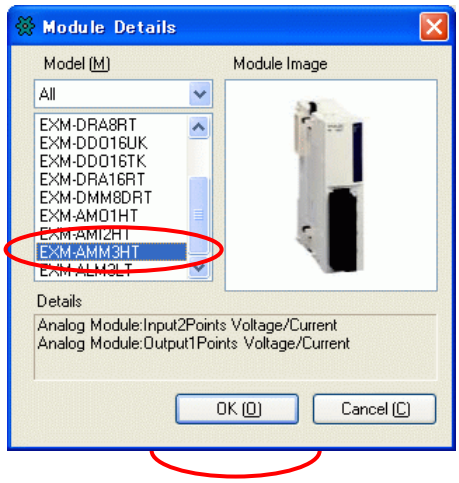
1. Double-click [EXM] of the I/O screens in the Screen List window.
   Click [EXM Driver (ID#2)] to open the EX module setting screen.



2. Click [Add Module] to add external drivers (EX modules.)



3. In the Module Details window, select [EXM-AMM3HT] and click [OK].

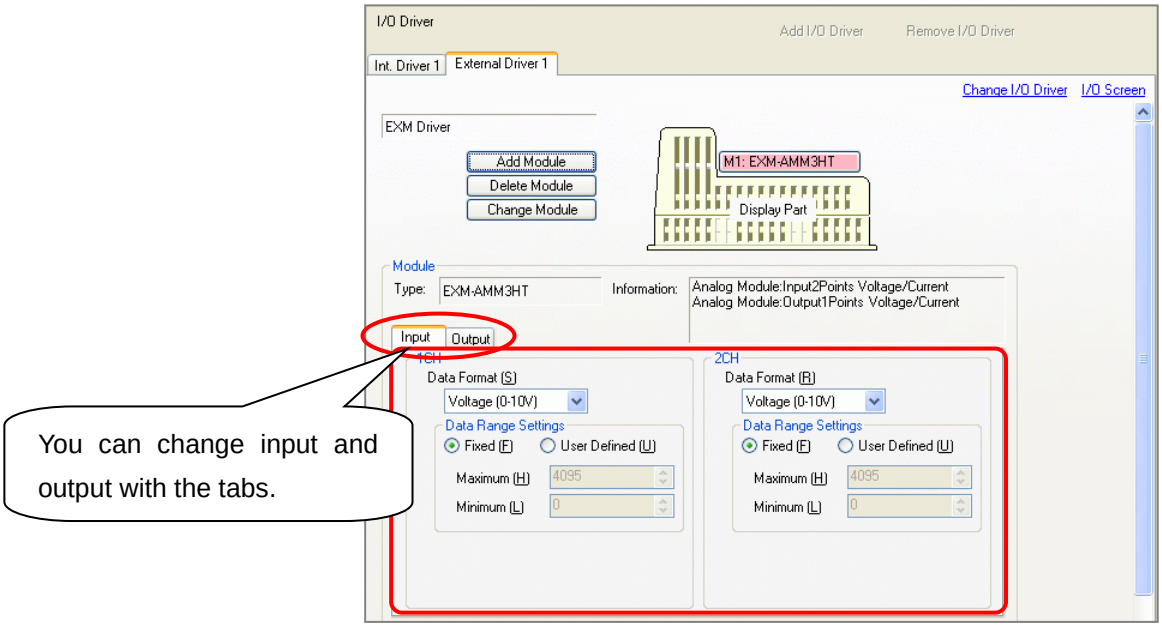


4. Configure analog inputs and outputs as you checked before conversion.

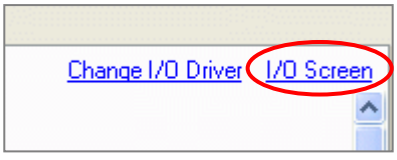
Example:

Input 1CH: 0-10V, Output 1CH: 0-10V

When Stopping Logic Settings: Retentive Output [No]



5. Click [I/O Screen] on the top right on the window for variable allocation to each I/O.



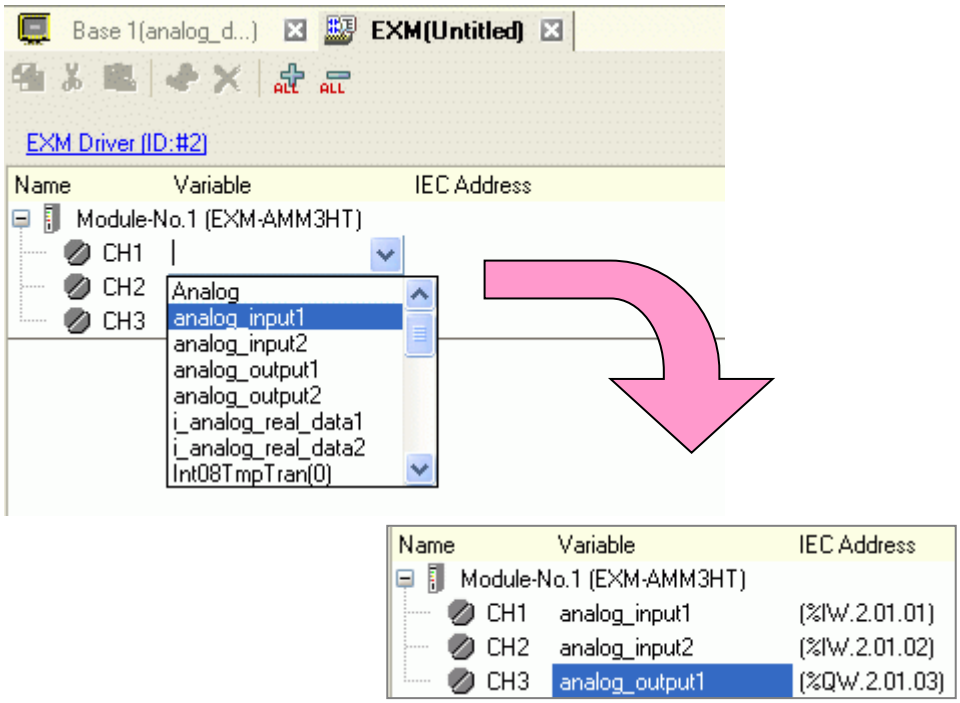
6. Allocate variable names same as ones allocated before conversion to I/O terminals of the EXM driver.

As an example here, the following variable names are used.

CH1 Input: analog_input1

CH2 Input: analog_input2

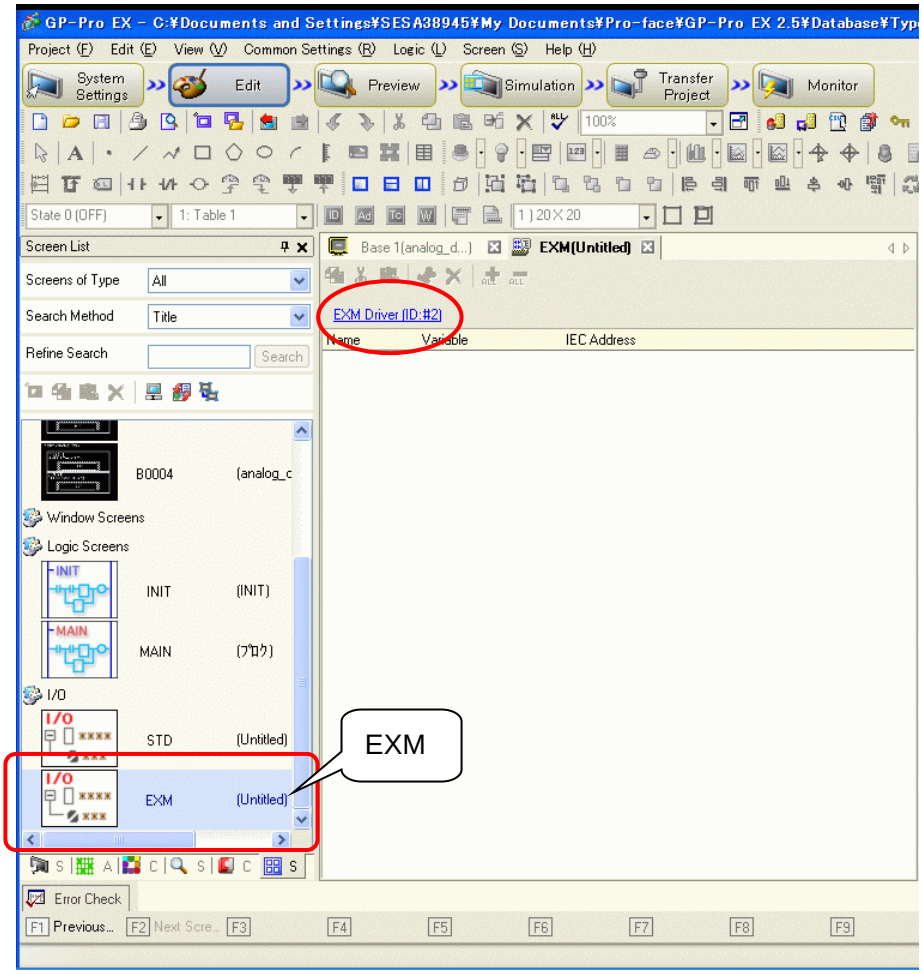
CH3 Output: analog_output1



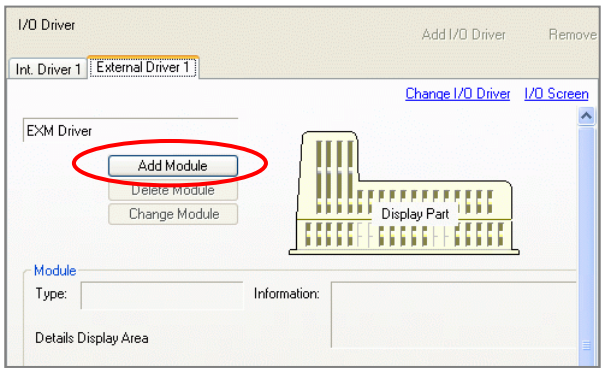
IMPORTANT
1) The EX module doesn't have the input filter function. If you have set the input filter frequency on the LT Type H series, the average value of the set frequency is stored in a variable. You can prevent it by programming the logic for the input filter on the LT-3300 series. 2) Variables allocated to the following terminals via the LT Type H I/O settings will lose their functions and be converted to internal variables. If you use variables set in the following items on screens or the logic, delete them. ▪ I/O Board VersionAnalog Input Data Enable Display ▪ Temperature Input Data Enable Display

3-9-2. Thermocouple Input, Pt100 Input Configuration

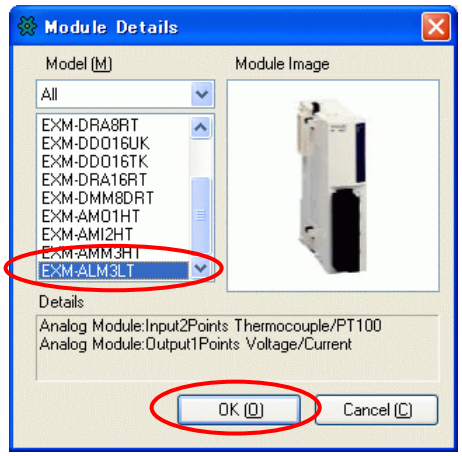
1. Double-click [EXM] of the I/O Screens in the Screen List window.
   Click [EXM Driver (ID#2) to open the EX module setting screen.



2. Click [Add Module] to add external drivers (EX modules.)



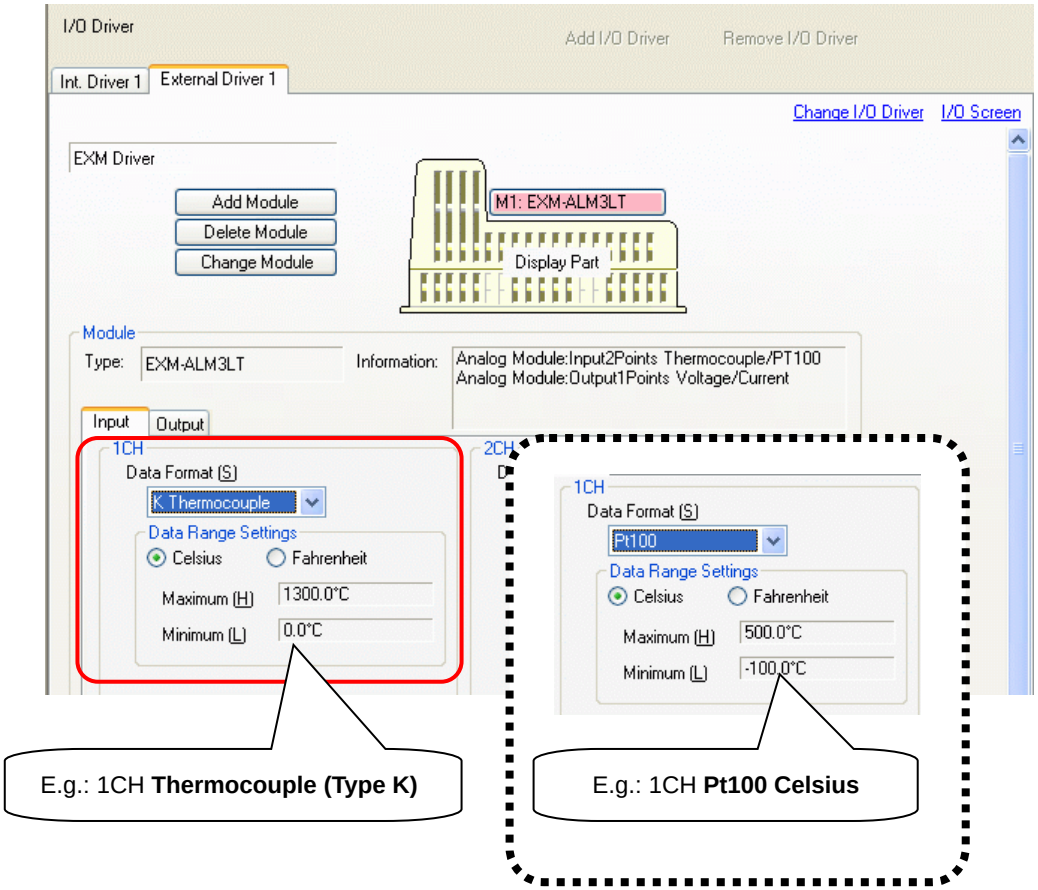
3. In the Module Details dialog box, select [EXM-ALM3LT] and click [OK.]



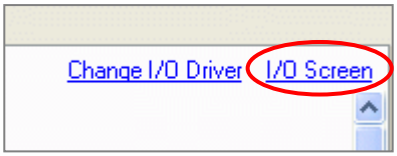
4. Configure the module settings and I/O settings of the thermocouple input and the Pt100 input.

1) Module Settings

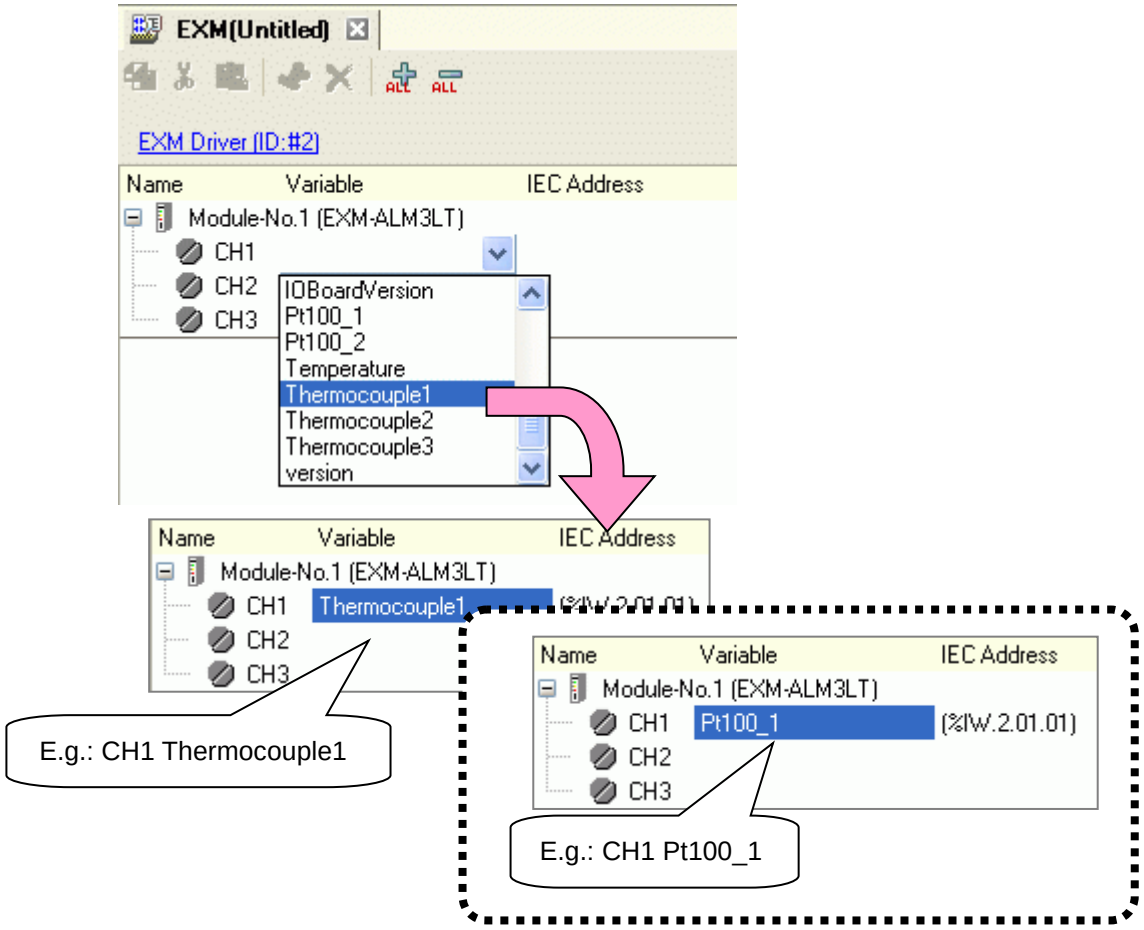
Set the following items same as ones set before conversion.



2) Click [I/O Screen] on the top right on the window for variable allocation to each I/O.



3) Allocate variable names same as ones allocated before conversion to I/O terminals of the EXM driver.

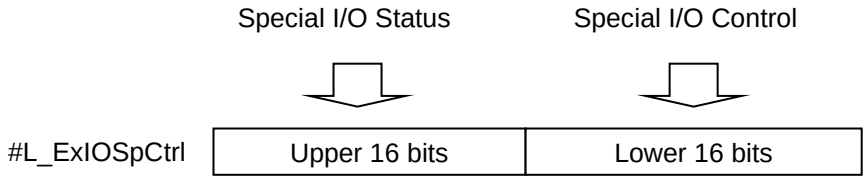


IMPORTANT

1) The EX module doesn't have the input filter function. If you have set the input filter frequency on the LT Type H series, the average value of the set frequency is stored in a variable. You can prevent it by programming the logic for the input filter on the LT-3300 series.
2) Variables allocated to the following terminals via the LT Type H I/O settings will lose their functions and be converted to internal variables. If you use variables set in the following items on screens or the logic, delete them.
   - I/O Board Version
   - Analog Input Data Enable Display
   - Temperature Input Data Enable Display

3-9-3. High-Speed Counter, Pulse Output, PWM Output Configuration

For the items, in the following table, of the general items of the LT Type H series, two variables in a pair are converted to the upper bits and lower bits of one system variable. For example, the “Special I/O Status” and “Special I/O Control” are converted to the upper and lower bits respectively of a system variable [#L_ExIOSpCtrl].



Items to allocate variables to	**R/W** *1	System variables	Remark
Special I/O Control	R/W	#L_ExIOSpCtrl	Lower 16 bits
Special I/O Status	R		**Upper 16 bits** *2
Special I/O Parameter Setting Change Request	R/W	#L_ExIOSpParmChg	Lower 16 bits
Special I/O Parameter Setting Change Completed	R		**Upper 16 bits** *2
Special I/O Setting Alarm Display A	R	#L_ExIOSpParmErr	**Upper 16 bits** *2
Special I/O Setting Alarm Display B	R		Lower 16 bits
Accel/Decel Speed Pulse Table Creation Request	R/W	#L_ExIOAccelPlsTbl	Lower 16 bits
Accel/Decel Speed Pulse Table Creation Completed	R		**Upper 16 bits** *2
Counter Input Operation Control Request	R/W	#L_ExIOCntInCtrl	Lower 16 bits
Counter Input Operation Control Response	R		**Upper 16 bits** *2
Counter Input External Input Completed Display	R	#L_ExIOCntInExtCtrl	Lower 16 bits
Counter Input External Input Completed Check	R/W		**Upper 16 bits** *2

*1 R: readable only, R/W: readable and writable

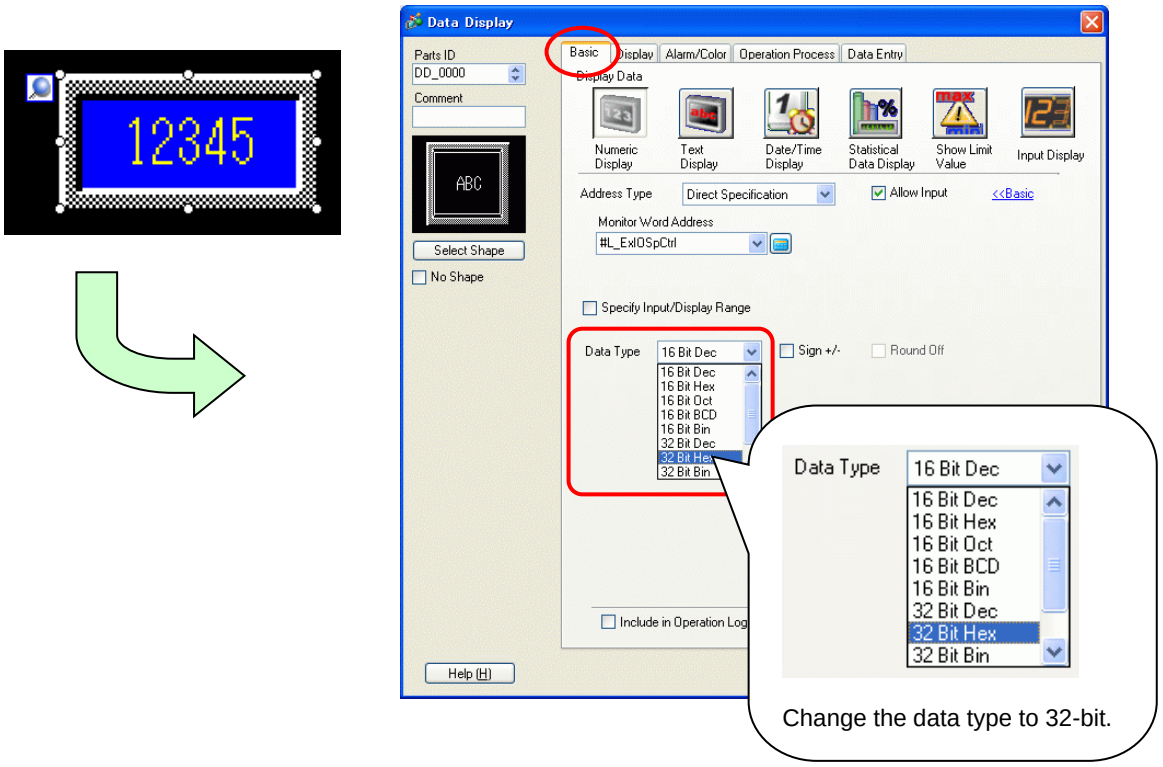
*2 If you used as a word address on a screen, see the following page.

<Measures>

If you used any variable, described in the table on the previous page, as a word address on a screen of the LT Type H series, the variable is converted remaining on the screen. However, because GP-Pro EX doesn't allow word specification (*****.w[0]/[1]) of a system variable on the screen, any of the following measures is necessary.

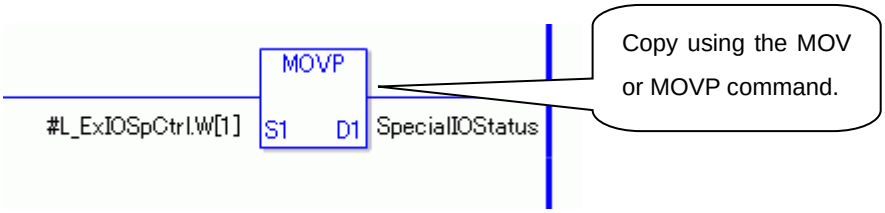
1. Measure on a screen (E.g.: Special I/O Status)

   If there is a Data Display which shows the lower 16 bits on a screen, change the data type to 32-bit to show the data of both the upper and lower bits.



2. Measure on the logic program (E.g.: Special I/O Status)

   Specify the upper 16 bits of the system variable as a word (.W[1]) on the logic and copy it to the variable.



   If you specified them as bits on a screen or logic, they will be converted correctly.

3-9-4. Precautions for screen data created in the Fix Variable mode

In case that you convert screen data created in the Fix Variable mode, an error may occur.
If any I/O device (e.g.: I_0001) in the following table is used on a screen of the LT Type H series, an error will occur in GP-Pro EX (error no.: 2034, uses an I/O variable not allocated to the terminal) and the screen data cannot be transferred.

In this case, find where the I/O device is set using the GP-Pro EX's error check function and the cross reference, and remove the I/O device, which is not converted (see the table below), from the screen and the logic or replace it with a system variable.

Item to allocate variable to	C-Package	Convert-to system variables	GP Pro EX	
	I/O Device		Variables on logic program	Variables on screen
Analog Input Data Enable Display	XW_0001	N/A	I_0001 *1	I_0001 *1
Temperature Input Data Enable Display	XW_0002	N/A	I_0002 *1	I_0002 *1
Special I/O Status	XW_0003	#L_ExIOSpCtrl	#L_ExIOSpCtrl.W[1]	I_0003 *2
Special I/O Parameter Setting Change Completed	XW_0005	#L_ExIOSpParmChg	#L_ExIOSpParmChg.W[1]	I_0005 *2
Special I/O Setting Alarm Display A	XW_0006	#L_ExIOSpParmErr	#L_ExIOSpParmErr.W[1]	I_0006 *2
Accel/Decel Speed Pulse Table Creation Completed	XW_0008	#L_ExIOAccelPlsTbl	#L_ExIOAccelPlsTbl.W[1]	I_0008 *2
Counter Input Operation Control Response	XW_0009	#L_ExIOCntInCtrl	#L_ExIOCntInCtrl.W[1]	I_0009 *2
Counter Input External Input Completed Check	YW_0004	#L_ExIOCntInExtCtrl	#L_ExIOCntInExtCtrl.W[1]	Q_0004 *2

*1 Remove the variable from the screen and the logic.
E.g.: Remove I_0001.

*2 Replace the variable on the screen with a convert-to system variable.
E.g.: Change I_0003 to #L_ExIOSpCtrl