Pro-face

Digital
Human Machine Interface

Device/PLC Connection Manuals

About the Device/PLC Connection Manuals

Prior to reading these manuals and setting up your device, be sure to read the "Important: Prior to reading the Device/PLC Connection manual" information. Also, be sure to download the "Preface for Trademark Rights, List of Units Supported, How to Read Manuals and Documentation Conventions" PDF file. Furthermore, be sure to keep all manual-related data in a safe, easy-to-find location.

12.10 ► CHINO Corporation Controllers
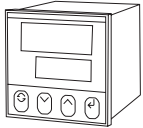
12.10.1 ► System Structure

The following describes the system configuration used when connecting the GP/GLC/LT to a CHINO Controller.

⚠️ **Important**

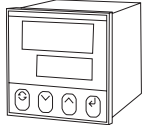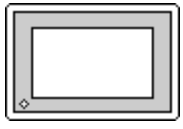**GP/GLC/LT's System Area (LS0 to LS19) Settings**

The GP/GLC/LT's system area (20 words) cannot be allocated to the Controller's own data area. When you are entering the system area settings via the screen editor software or via the GP/GLC/LT's OFFLINE screen, be careful that you do not use the Controller's own data area.

■ LT230 Series

Controller [1]	Cable Diagram	GP/GLC/LT
LT23□□□200-□□□ LT23□□□S00-□□□	RS-422 2-wire (Cable Diagram 4)	GP/GLC Series LT Type C
	RS-422 2-wire 1:n Connection (Cable Diagram 5)	

1 The model data "□" will vary depending on the type of option. For detailed controller information, refer to that unit's catalog. Serial data transfer option types use a "2" for RS-485 and "3" for RS-485+2 External Input.
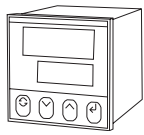
■ **LT300 Series**

Controller [*1]	Cable Diagram		GP/GLC/LT
LT3□□□□R□0-□□□	RS-232C (Cable Diagram 1)	Chino's RS-232C Cable RZ-CRS2□□ [*2]	
LT3□□□□A□0-□□□	RS-422 4-wire (Cable Diagram 2)	Digital's GP230-IS11-O	
	RS-422 4-wire 1:n Connection (Cable Diagram 3)		GP/GLC Series LT Type C
LT3□□□□S□0-□□□	RS-422 2-wire (Cable Diagram 4)		
	RS-422 2-wire 1:n Connection (Cable Diagram 5)		

*1 The model data "□" will vary depending on the type of option. For detailed controller information, refer to that unit's catalog. Serial data transfer option types use a "R" for RS-232C, "A" for RS-422A and "S" for RS-485.

*2 The Cable cannot be connected directly to a GP-377/GP-377R/GP2300 Series unit because of the connectors cover size.
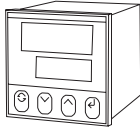
■ **LT400 Series**

Controller [1]	Cable Diagram		GP/GLC/LT
LT4□□□□R□□-□□□	RS-232C (Cable Diagram 1)	Chino's RS-232C Cable RZ-CRS2□□ [1]	
LT4□□□□A□□-□□□	RS-422 4-wire (Cable Diagram 2)	Digital's GP230-IS11-O	GP/GLC Series LT Type C
	RS-422 4-wire 1:n Connection (Cable Diagram 3)		
LT4□□□□S□□-□□□	RS-422 2-wire (Cable Diagram 4)		
	RS-422 2-wire 1:n Connection (Cable Diagram 5)		

*1 The model data "□" will vary depending on the type of option. For detailed controller information, refer to that unit's catalog. Serial data transfer option types use a "R" for RS-232C, "A" for RS-422A and "S" for RS-485. With LT-400 Series units, be sure to use units with a Serial Number of LT4037**** or later. When using LT 400 Series units with a Serial Number of LT4036**** or earlier, an error "PLC NOT RESPONDING (02:FE:**)" will appear on GP/GLC/LT display.

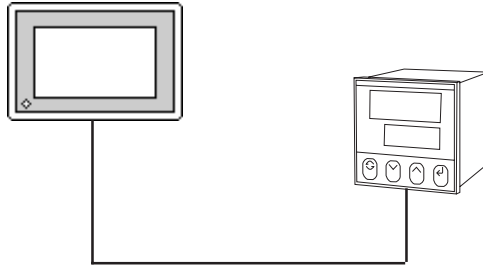*2 The Cable cannot be connected directly to a GP-377/GP-377R/GP2300

■ **JU Series**

Thyristor [*1]	Cable Diagram	GP/GLC/LT
JU□□□□□□□513 JU□□□□□□□613	RS-422 2-wire (Cable Diagram 4)	
	RS-422 2-wire 1:n Connection (Cable Diagram 5)	GP/GLC Series LT Type C
	RS-422 2-wire 1:n Connection (JU+Communication between units) (Cable Diagram 6)	

*1 JU Series Thyristors models vary, depending on each unit's communication specifications. The two groups are identified by model numbers with a "5" (Unit space Master - with temperature controller feature), and a "6" (Unit space Slave - without temperature controller feature). For details, refer to the Thyristor catalog. thyristors with no temperature controller feature (JU□□□□□□□613) cannot be connected directly to the GP. The unit must first be connected to a "5" series unit (JU□□□□□□□513), and communication is performed via the "5" series unit's Master-Slave communication. For inter-unit communication methods, refer to your Thyristor unit's Installation Guide.

◆ **Connections**

•1:1 connection (RS-232C or RS-422)

•1:n connection (RS-422)

31 units max.
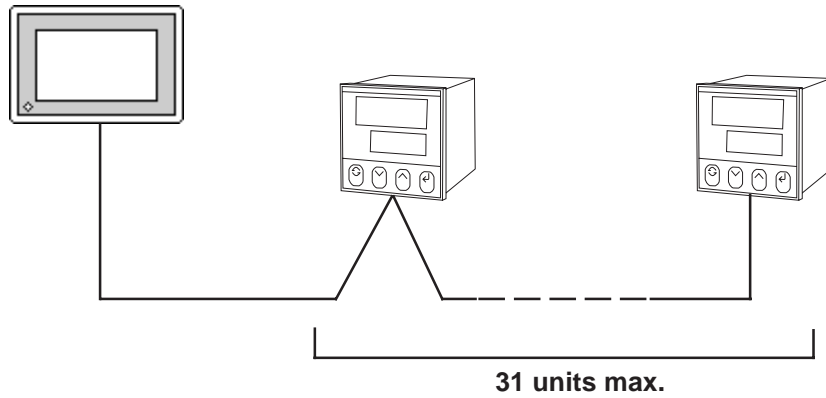
•1:n connection (JU Series inter-unit communication) (RS-422)

Total is combination of Temperature Controller Master and Slave units: 31 units max.

Thyristor (Master)   **Thyristor (Slave)**   **Thyristor (Slave)**

Maximum No. of Slave units : 5 units per 1 Master unit.

Thyristor (Master)   **Thyristor (Slave)**   **Thyristor (Slave)**
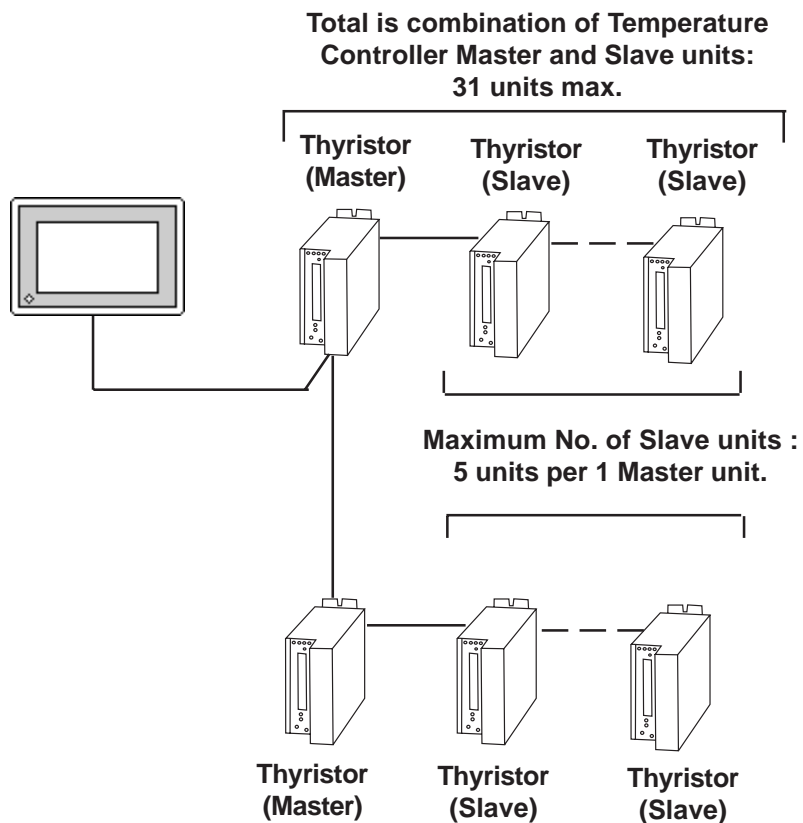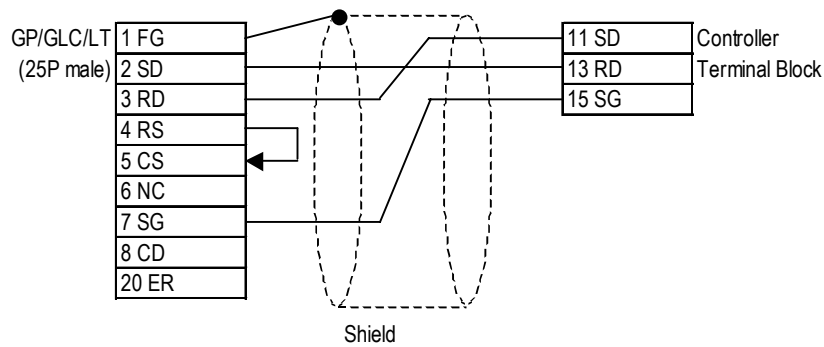
12.10.2 Cable Diagrams

The cable diagrams shown below and the cable diagrams recommended by CHINO Corporation may differ, however, using these cables for your Controller's operations will not cause any problems.

Important

- *Connect the FG line of the Shield cable to the GP/GLC/LT side.*
- *If a communications cable is used, be sure to connect its SG (signal ground) terminal.*
- *RS-232C cables should be 15 meters or less.*
- *RS-422 cables should be 600 meters or less.*

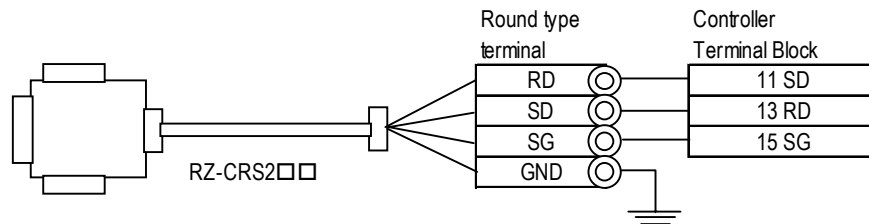**Cable Diagram 1**   RS-232C

<When making your own cable connections>

<When using Chino's RS-232C Cable RZ-CRS2□□>

(□□ indicates the Cable length. 15m max.)

Important

Chino's RS-232C Cable RZ-CRS2□□ cannot be connected to GP-377/GP-377RS/GP2300 Series unit because of the connector size.

Cable Diagram 2   RS-422 4-Wire
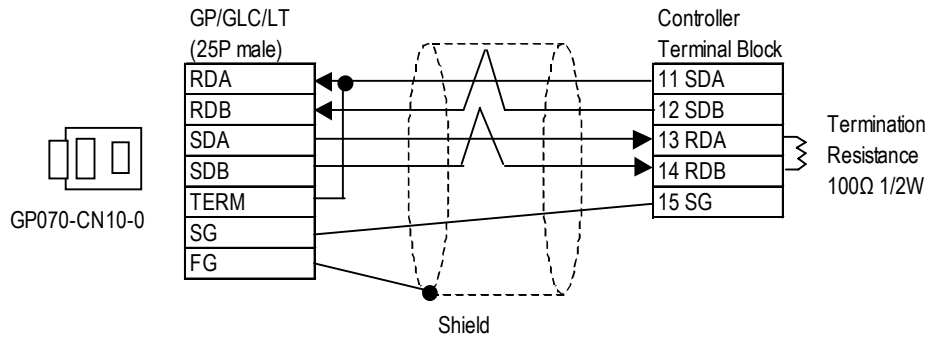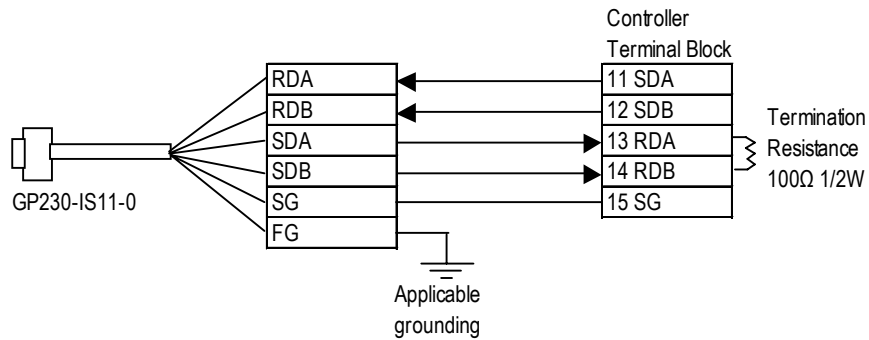
<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>

<When using Digital's RS-422 Cable GP230-IS11-0>

<When making your own cable>

Note:

When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.

Cable Diagram 3   (1:n) RS-422 4-Wire

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>

<When using Digital's RS-422 Cable GP230-IS11-0>

<When making your own cable>

Note: **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Cable Diagram 4 RS-422 2-Wire

The controller terminal number will differ depending on the type of controller used. The controller pin assignment diagrams are shown below. When using JU series, SA and SB will be called SA1 and SB1. JU Series unit has no SG.

Signal name	Terminal number			
	LT230	LT300	LT400	JU+ (Master)
SA	6	11	11	14
SB	7	12	12	15
SG	8	15	15	---

\<When using Digital's RS-422 connector terminal adapter GP070-CN10-0\>

\<When using Digital's RS-422 Cable GP230-IS11-0\>
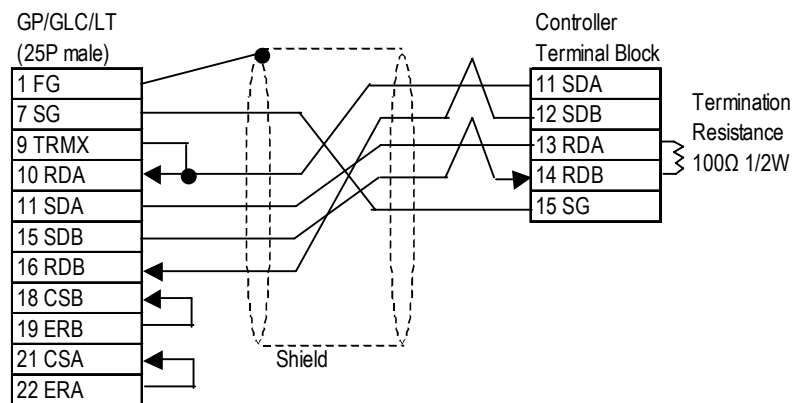

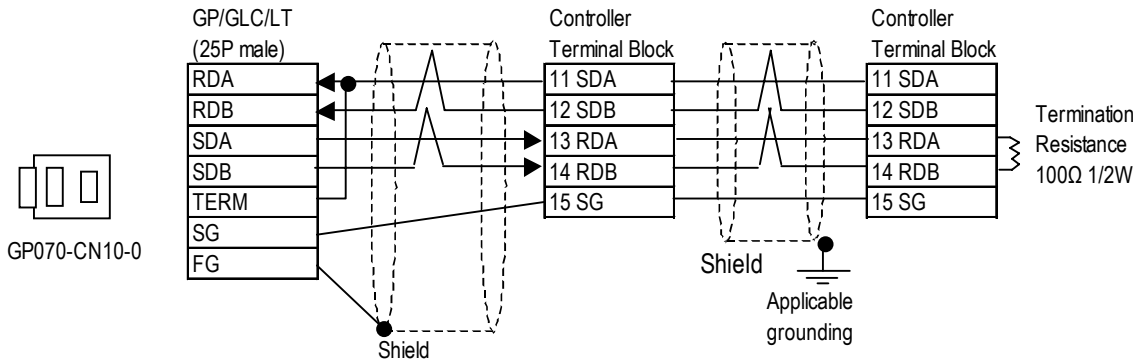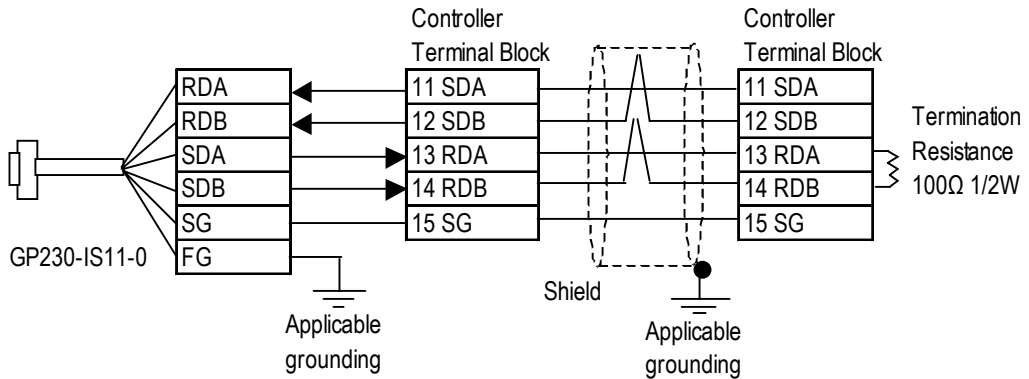\<When making your own cable\>

Note: **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**
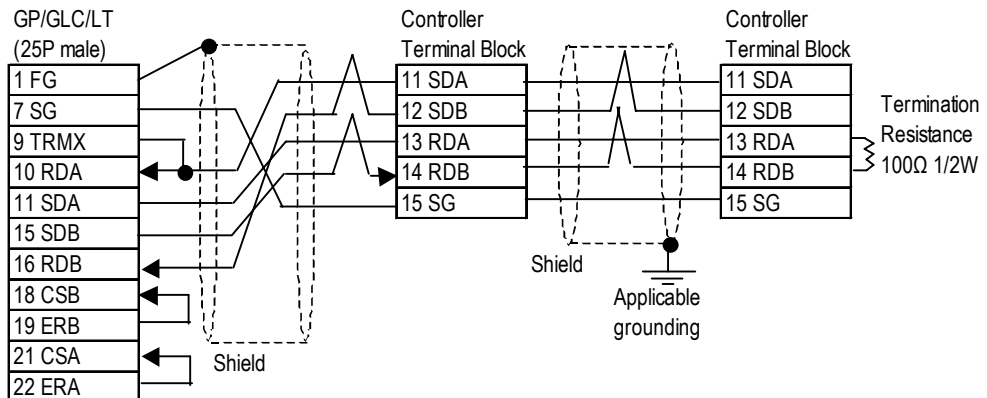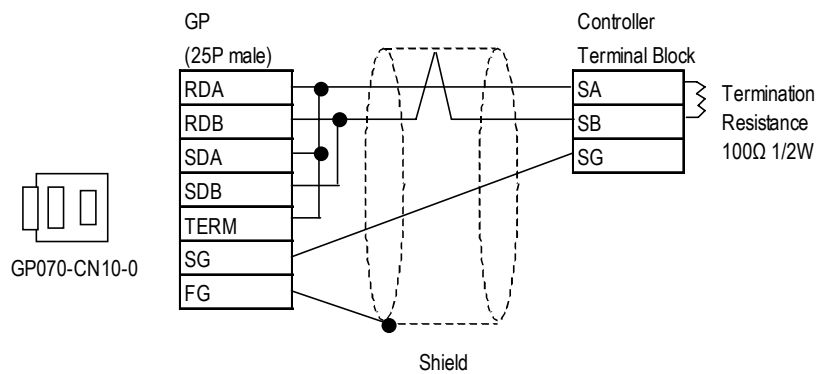
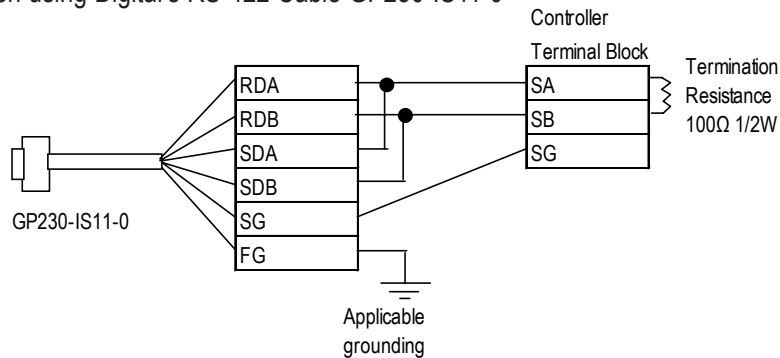**Cable Diagram 5**   (1:n) RS-422 2-Wire

⚠️ *Important*

The controller terminal number will differ depending on the type of controller used. The controller pin assignment diagrams are shown below. When using JU series, SA and SB will be called SA1 and SB1. JU Series unit has no SG.

Signal name	Terminal number			
	LT230	LT300	LT400	JU+ (Master)
SA	6	11	11	14
SB	7	12	12	15
SG	8	15	15	---

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>
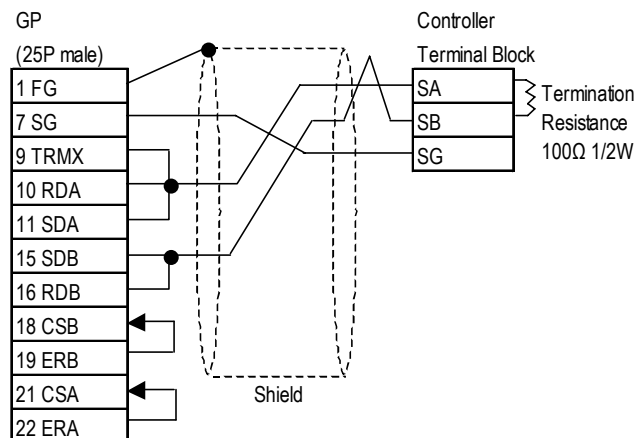

<When using Digital's RS-422 Cable GP230-IS11-0>

<When making your own cable>

📝*Note:*   **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

Cable Diagram 6 (1:n) RS-422 2-Wire (JU Series inter-unit communication)

Cable length used between the temperature controller master and the slave should be less than 10 meters.

<When using Digital's RS-422 connector terminal adapter GP070-CN10-0>

<When using Digital's RS-422 Cable GP230-IS11-0>

<When making your own cable>

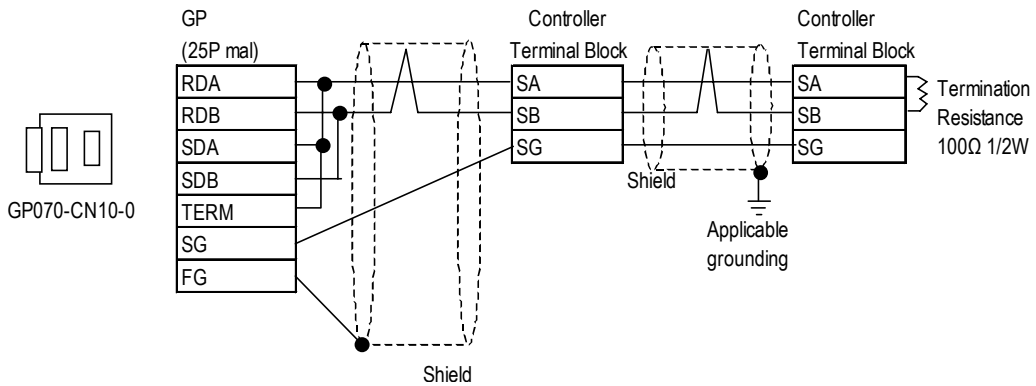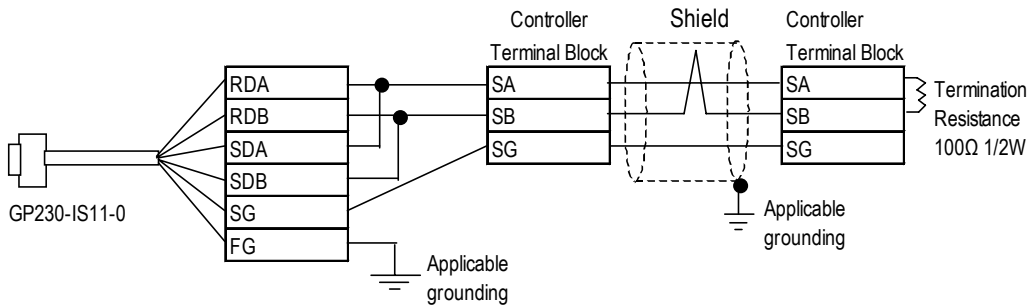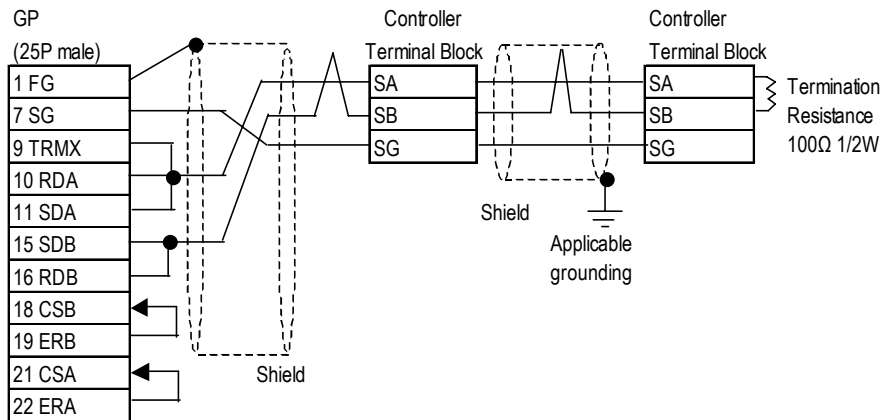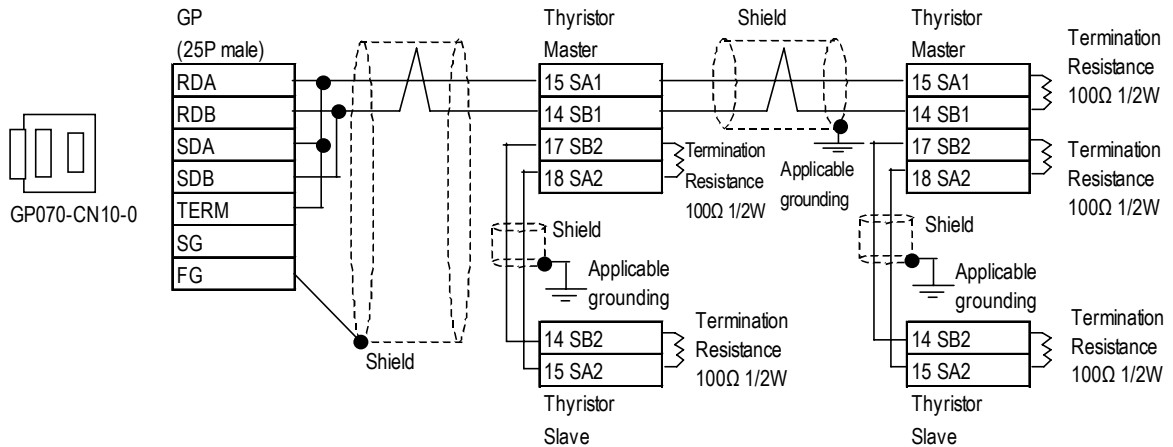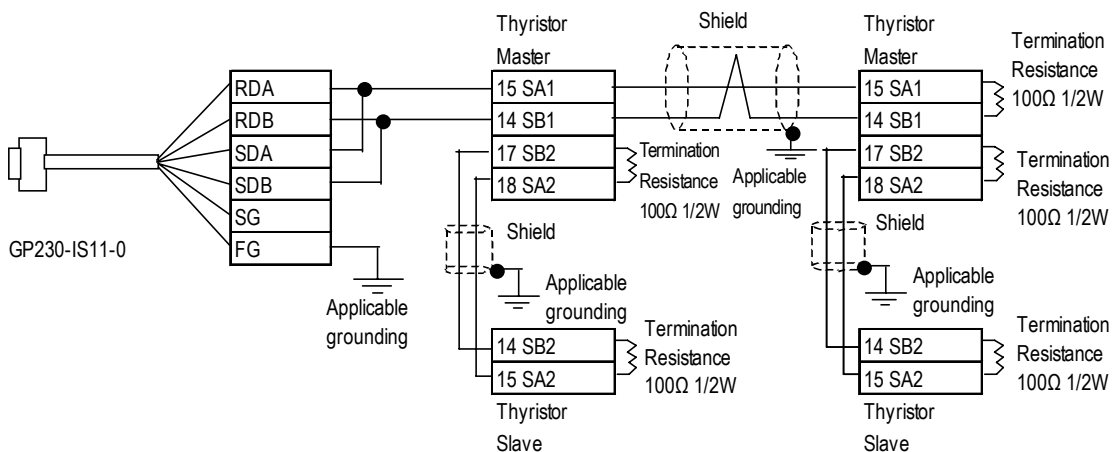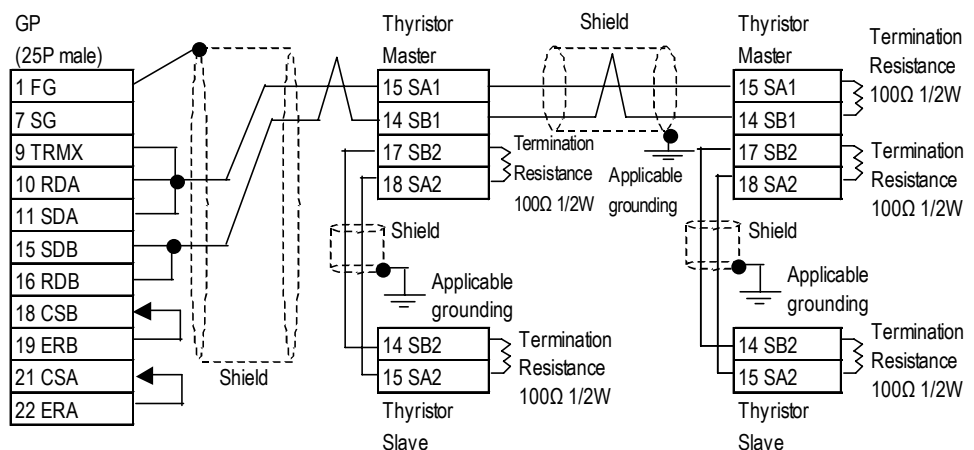*Note:* **When connecting the #9 and #10 pins in the GP Serial I/F, a termination resistance of 100Ω is added between RDA and RDB.**

12.10.3 Supported Devices

The following list shows the range of devices supported by the GP/GLC/LT.

■ **LT230 Series**

Device	Bit Address	Word Address	Comments	
Digital Setting Value	00101	————		*1
Digital Input Data	10004~10120	————		*2
Analog Input Data	————	30101~30142	Bit 15	*2 H/L
Analog Setting Value	————	40008~40251		*1
		49501~49512	Bit 15	

*1 When writing data, be sure to set the Controller's Key Lock to [Lock 4]. When Writing with Key Lock [Lock 4], a Host communication error (02:12:**) will appear.
▼Reference▲ 12.10.5 Error Codes

*2 Only data read-out is possible. Data write is not possible. If data write is attempted, a Host communication error (02:01:**) will appear. ▼Reference▲ 12.10.5 Error Codes

■ **LT300 Series**

Device	Bit Address	Word Address	Comments	
Digital Setting Value	00101	————		*1
Digital Input Data	10004~10122	————		*2
Analog Input Data	————	30101~30142	Bit 15	*2 H/L
Analog Setting Value	————	40008~40251		*1
		49501~49512	Bit 15	

*1 When writing data, be sure to set the Controller's Key Lock to [Lock 4]. When Writing with Key Lock [Lock 4], a Host communication error (02:12:**) will appear.
▼Reference▲ 12.10.5 Error Codes

*2 Only data read-out is possible. Data write is not possible. If data write is attempted, a Host communication error (02:01:**) will appear. ▼Reference▲ 12.10.5 Error Codes

■ **LT400 Series**

Device	Bit Address	Word Address	Comments	
Digital Setting Value	00101	————		*1
Digital Input Data	10004~10124	————		*2
Analog Input Data	————	30101~30142	Bit 15	*2 H/L
Analog Setting Value	————	40001~40388		*1
		49501~49512	Bit 15	

*1 When writing data, be sure to set the Controller's Key Lock to [Lock 4]. When Writing with Key Lock [Lock 4], a Host communication error (02:12:**) will appear.
▼Reference▲ 12.10.5 Error Codes

*2 Only data read-out is possible. Data write is not possible. If data write is attempted, a Host communication error (02:01:**) will appear. ▼Reference▲ 12.10.5 Error Codes

■ JU Series

Device	Bit Address	Word Address	Comments	
Digital Setting Value	00101~00106	————	*1	
	01102~01612			
Digital Input Data	10002~10122	————	*2	
	11109~11614			
Analog Input Data	————	30101~30142	[Bit 15] *2	H/L
		31101~31612		
		39001~39080		
Analog Setting Value	————	40001~40384	[Bit 15]	
		41102~41627	*1	
		48111~48618		
		49501~49525		

*1 When writing data, be sure to set the Thyristor's Key Lock to [Lock 4]. When Writing with Key Lock [Lock 4], a Host communication error (02:12:**) will appear. ▼Reference▲ *12.10.5 Error Codes*

*2 Only data read-out is possible. Data write is not possible. If data write is attempted, a Host communication error (02:01:**) will appear.
▼Reference▲ *12.10.5 Error Codes*

Note: **Indicating Controller Slave Address settings can be entered in your screen editor software. If a unit number is not indicated, the previously entered station number is automatically used. (The default value is 1.)**

E.g. When entering Device Address 40001

Enter the Device Name "4", and the Word Address "0001".
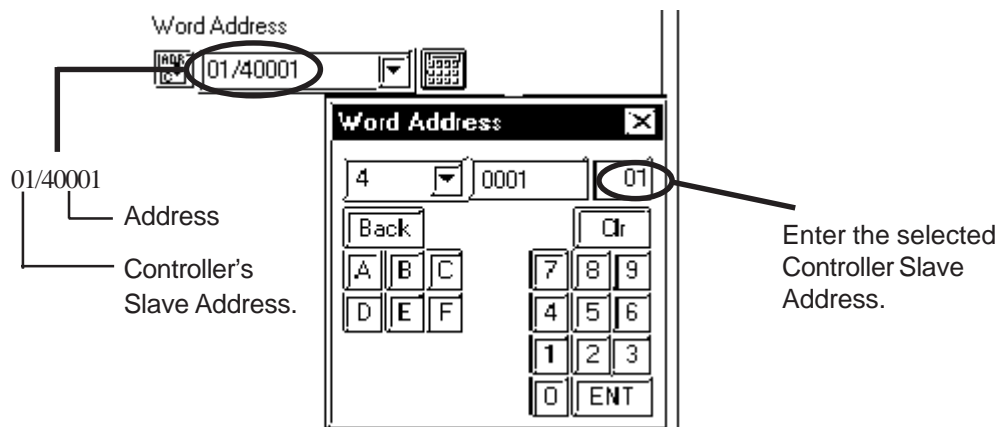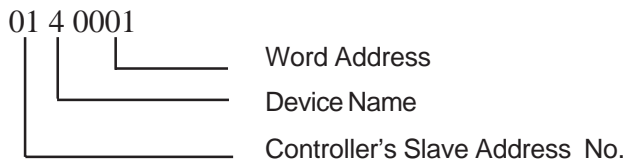
01 4 0001
Word Address
Device Name
Controller's Slave Address No.

01/40001
└─ Address
└─ Controller's Slave Address.

Enter the selected Controller Slave Address.

! *Important*

• *GP/GLC/LT's System Area (LS0 to LS19) Settings*

The GP/GLC/LT's system area (20 words) cannot be allocated to the Controller's own data area. When you are entering the system area settings via the screen editor software or via the GP/GLC/LT's OFFLINE screen, be careful that you do not use the Controller's own data area.

• *With system versions later than the following, even if the system area is allocated, the GP/GLC/LT will not send the system area data to a Controller. To check the system version, refer to the GP/GLC/LT's User Manual.*

GP/GLC/LT Series	GP77R	GP377	GP2000	GLC300	GLC2000	LT Type C
System Version	Ver.2.60	Ver.2.60	Ver.2.60	Ver.2.45	Ver.3.10	Ver.1.00

Note:

Decimal point data is included in temperature controller data. The GP/GLC/LT unit handles decimal point data as follows:

<When reading out data>

Data read out from a temperature controller will be converted to a non-decimal integer.

EX.)   Temperature controller's value is 100.0
        Temperature controller value   100.0
        Value on the GP/GLC/LT unit (set for no value after decimal)1000

When displaying decimal values on a GP/GLC/LT(via an N-tag, etc.) the data will be displayed according to the [Display Data Format]'s [Decimal Places] setting. For example, if the temperature controller's setting is for one digit after the decimal place, enter "1" for the [Decimal Places].

EX.)   Temperature controller's value is 100.0
        Temperature controller value   100.0
        Value on the GP/GLC/LT unit (set for no value after decimal) 1000
        Value on the GP/GLC/LT unit (set for one digit after decimal point)   100.0

<When writing data>

Writing data from a temperature controller to the GP/GLC/LT will always be set for no value after the decimal point.

For detailed information about data setting ranges and decimal values, refer to Chino Corporation's Communication Interface Installation guide for each type of temperature controller.

12.10.4	**Environment Setup**

The following table lists Pro-face's recommended CHINO Corporation Controller and GP/GLC/LT communication settings.

■ **LT230/LT300Series**

GP/GLC/LT Settings		Controller Settings	
Baud Rate	9600bps	Communication Rate	9600bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Non	Parity Bit	Non
Communication Format When using RS-232C	RS-232C	———	———
Communication Format When using RS-422	4-wire	———	———
Communication Format When using RS-485	2-wire	———	———
Unit No.	1	Slave Address [*1]	1
———	———	Protocol	MODBUS RTU
———	———	Communication Feature	Host Communication

1 Even though slave addresses can be set from 1 to 99, be sure to set them only from 1 to 32 when connecting to a GP.

■ **LT400 Series**

GP/GLC/LT Settings		Controller Settings	
Baud Rate	9600bps	Communication Rate	9600bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Non	Parity Bit	Non
Communication Format When using RS-232C	RS-232C	———	———
Communication Format When using RS-422	4-wire	———	———
Communication Format When using RS-485	2-wire	———	———
Unit No.	1	Slave Address [*1]	1
———	———	Protocol	MODBUS RTU
———	———	Communication Feature	Host Communication
Send Wait	30ms	———	———

1 Even though slave addresses can be set from 1 to 99, be sure to set them only from 1 to 32 when connecting to a GP.

■ JU Series

GP/GLC/LT Settings		Controller Settings	
Baud Rate	9600bps	Communication Rate	9600bps
Data Length	8 bits	Data Length	8 bits
Stop Bit	1 bit	Stop Bit	1 bit
Parity Bit	Non	Parity Bit	Non
Communication Format When using RS-232C	RS-232C	———	———
Communication Format When using RS-485	4-wire	———	———
Unit No.	1	Slave Address [*1]	1
———	———	Communication Code	RTU
Send Wait	30ms	———	———

1 Even though the GP unit's Station number can be set from 1 to 32, be sure to use only 1 to 31, which is the range allowed for temperature controller slave addresses.
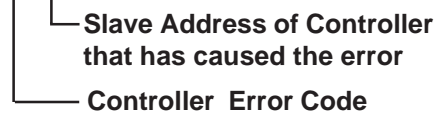
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12.10.5   Error Codes
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■ Controller Error Codes

◆ LT/JU Series

Error messages (Ex. Host communication error (02:**:##)) are displayed in the lower left corner of the GP/GLC/LT screen (** stands for an error code specific to the Controller).

Host Communication Error (02:**:##)

Slave Address of Controller that has caused the error

Controller Error Code

Error Code	Description
01	Incorrect function code
02	Incorrect indirect number (reference number)
03	Incorrect amount of data
09 [*1]	Either a data transfer error occurred between units, or the initial resistance value could not be set.
11	Outside of value setting range

1 Error Code "09" is only for JU Series.

Refer to the Controller's manual for error code details.