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.

12.9   Fenwal Controllers

12.9.1   System Structure

This section describes the system structure in which the temperature controller made by Fenwal and the GP/GLC are connected.

> **!** *Important*
>
> • **The GP/GLC data area ranging from LS0 through LS19 (20 words) cannot be allocated to the data area available for control and measurement. Even if the system area is set for this using GP-PRO/PBIII or when the GP/GLC is offline, this allocation is not possible.**
>
> • **Read Area Information:**
>
>   **The GC, GA, and GP devices specified at the first address of the system area are exclusively for reads. When they are used as read areas, take care not to write data to those areas. Otherwise, a host communication error (02:FA) will be generated.**

■ AL series

◆1:1 connection

Temperature controller	Cable Diagram	GP/GLC
AL24R-□□□-□□□-□□□*1*2	RS-422 <Cable Diagram1 >	GP Series GLC Series
	RS-422 (1:n communication) <Cable Diagram2 >	

*1 The "□" indicates that that temperature controller model number varies depending upon the options specified. For further model information, refer to the AL series catalog.

*2 The production number of the temperature controller should be 02010023 or later and the serial number 0204 or later.

12.9.2 **Cable Diagram**

The following cable diagram may differ from the one recommended by Fenwal. However, using this cable diagram will not cause any problems.

Important

- *Use a communication cable conforming to IEEE485.*

- *For multi-drop connections, the wiring unit (model AL-W) made by Fenwal can be used for the transition wiring for RS-485 communication. The length of the wiring can be from 57 mm to 1 m.*
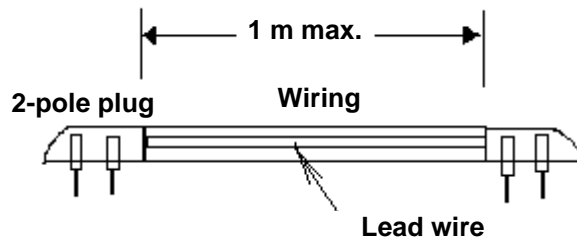

- *The maximum transmission distance is 600 m.*

- *The FG of the GP-GLC should be grounded according to your country's specifications.*

- *No terminating resistor is required for a temperature controller connected to a terminator.*

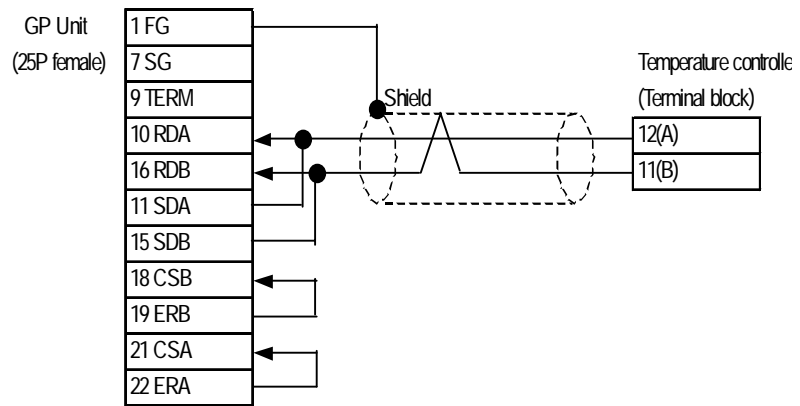**Cable Diagram 1** 1:1 RS-422 2-wire type

- When using Digital's RS-422 connector terminal adapter, GP070-CN10-O
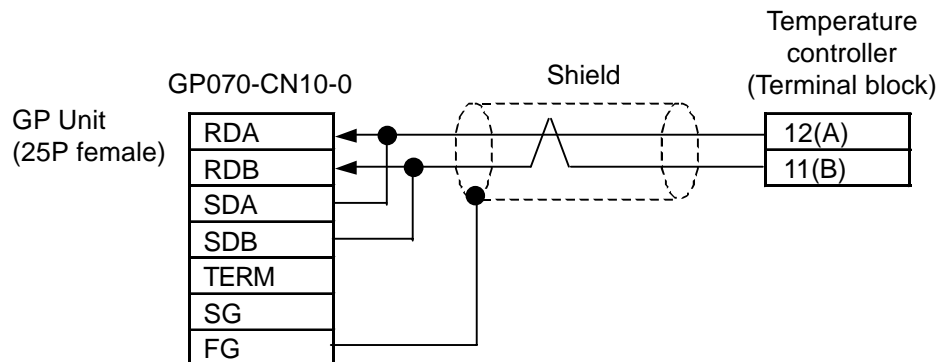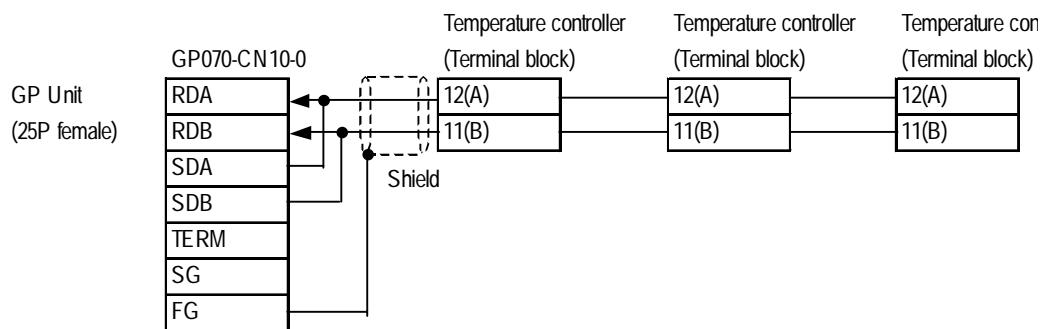
• When using Digital's RS-422 cable, GP230-IS12-O
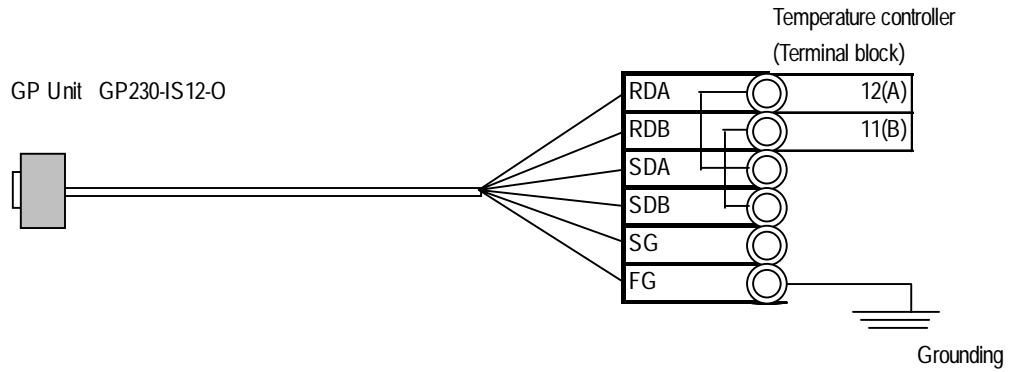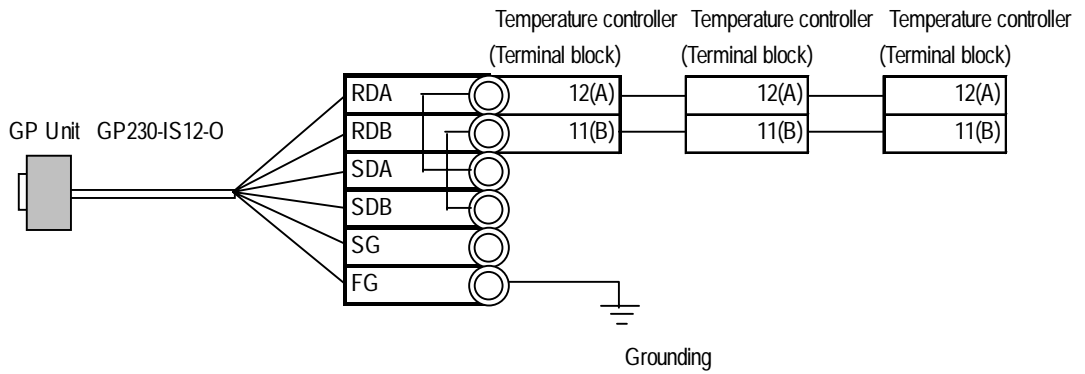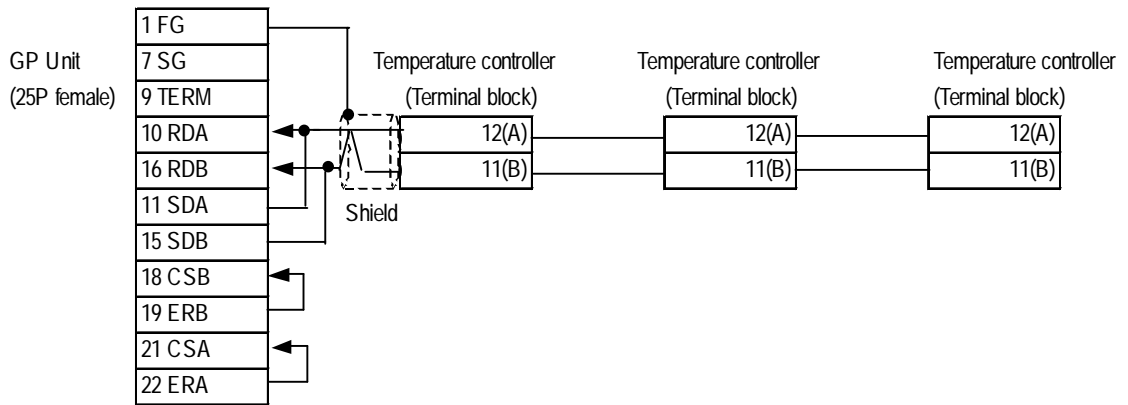

• When making your own cable connections

Cable Diagram 2 1:n RS-422 2-wire type

• When using Digital's RS-422 connector terminal adapter, GP070-CN10-O

• When using Digital's RS-422 cable, GP230-IS12-O

• When making your own cable connections

12.9.3 Supported Devices

The following table describes the range of devices supported by the GP/GLC.

■ AL series

☐ Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Input signal	——	IN1	Bit 15	
Decimal place in linear input	——	UN1	Bit 15	
With or without IRr/c 2-point correction	——	IR1	Bit 15	
Control mode	——	CM1	Bit 15	
Filter constant	——	FS1	Bit 15	
Control LED illumination direction	——	OD1	Bit 15	
Control output direction	——	OA1	Bit 15	
Burnout direction	——	BO1	Bit 15	
Output limit method	——	LT1	Bit 15	
Warning type	——	AK1	Bit 15	
Warning 1: Alarm warning code	——	HA1	Bit 15	
Warning 1: Temperature warning code	——	A11	Bit 15	
Warning 2: Temperature warning code	——	A21	Bit 15	
Warning 3: Temperature warning code	——	A31	Bit 15	H/L
Warning LED illumination direction	——	LE1	Bit 15	
CT type	——	CT1	Bit 15	
Upper and lower limits of setting range	——	HL1 ~ HL2	Bit 15	*3
Linear input scaling H and L	——	L1 ~ L2	Bit 15	*3
Upper and lower output limits	——	OL1 ~ OL2	Bit 15	*3
Proportional time	——	PT1	Bit 15	
Proportional band	——	PB1	Bit 31	*1
Integral action time	——	IT1	Bit 31	*1
Derivative action time	——	DT1	Bit 31	*1
ARW	——	AR1	Bit 15	
ON/OFF sensitivity	——	DI1	Bit 15	
Manual reset	——	RT1	Bit 15	
Sensor error correction	——	SA1	Bit 15	

□ Setup System Area here.

Device	Bit Address	Word Address	Particulars	
Temperature value before high-point correction for IRr/c 2-point correction value	——	IA1	Bit 15]	
Temperature value after high-point correction for IRr/c 2-point correction value	——	IB1	Bit 15]	
Temperature value after low-point correction for IRr/c 2-point correction value	——	IC1	Bit 15]	
Temperature value after low-point correction for IRr/c 2-point correction value	——	ID1	Bit 15]	
Transmission output scaling H and L	——	DS1 ~ DS2	Bit 15] *3	
Setting value for heater breakage current	——	CA1	Bit 15]	
Warning sensitivity	——	AD1	Bit 15]	
Main temperature setting	——	S1	Bit 15]	
Warning 1: 1 point	——	SP1	Bit 31] *1	
Warning 1: Bands H and L	——	SB1 ~ SB2	Bit 31] *1*3	
Warning 2: 1 point	——	DP1	Bit 31] *1	H/L
Warning 2: Bands H and L	——	DB1 ~ DB2	Bit 31] *1*3	
Warning 3: 1 point	——	TP1	Bit 31] *1	
Warning 3: Bands H and L	——	TB1 ~ TB2	Bit 31] *1*3	
Output method	——	OU1	Bit 15] *2	
Number of warnings	——	AN1	Bit 15] *2	
RUN/STOP	——	RS1	Bit 15]	
Auto tuning	——	AT1	Bit 15]	
Key locking	——	KY1	Bit 15]	
Mode locking	——	ML1	Bit 15]	
POWER ON/OFF	——	ON1	Bit 15]	
Current temperature	——	PV1	Bit 15] *2	
Operation panel	——	MV1	Bit 15] *2	
Temperature control	——	GC1 ~ GC8	Bit 15] *2*3	
Warning	——	GA1 ~ GA8	Bit 15] *2*3	
Panel data	——	GP1 ~ GP8	Bit 15] *2*3	

*1 This indicates a double-word device (all others without this mark are word devices)

*2 No writes are possible.

*3 If there are two device address ranges or more, refer to "Detailed List of Data Types for AL series ID Codes" for the definition of each address.

Detailed List of Data Types for AL Series ID Codes

Item	ID code	Data type
Upper and lower limits of setting range	HL1	Lower limit of setting range
	HL2	Upper limit of setting range
Linear input scaling H and L	L1	Scaling L
	L2	Scaling H
Upper and lower output limits	OL1	Lower output limit
	OL2	Upper output limit
Transmission output scaling H and L	DS1	Scaling L
	DS2	Scaling H
Warning 1: Bands H and L	SB1	Band L
	SB2	Band H
Warning 2: Bands H and L	DB1	Band L
	DB2	Band H
Warning 3: Bands H and L	TB1	Band L
	TB2	Band H
Temperature control	GC1	Setting temperature
	GC2	Current temperature
	GC3	Operation amount
	GC4	Control output current value
	GC5	ON/OFF status of control LED
	GC6	ON/OFF status of control output
	GC7	Reserved
	GC8	Reserved
Warning	GA1	Error number
	GA2	Alarm list
	GA3	1, 2, and 3: ON/OFF status of LED
	GA4	Warnings 1, 2, and 3: ON/OFF status of output
	GA5	Setting value for heater breakage current
	GA6	Heater current value
	GA7	Reserved
	GA8	Reserved
Panel data	GP1	Setting temperature
	GP2	Current temperature
	GP3	ON/OFF status of control LED
	GP4	1, 2, and 3: ON/OFF status of LED
	GP5	Error number
	GP6	Reserved
	GP7	Reserved
	GP8	Reserved

Note:
- **To set up Parts and Tags in GP-PRO/PBIII, specify the unit number of the AL series unit when entering addresses. If no unit number is specified, the last unit number entered is assumed (the default value is 01). See the following:**

Enter the communication address of the AL unit you want to specify.

01 / IN 1

Device address (access address for data in the communication frame's data segment)

Device name (ID code)

Communication address of AL series

Important
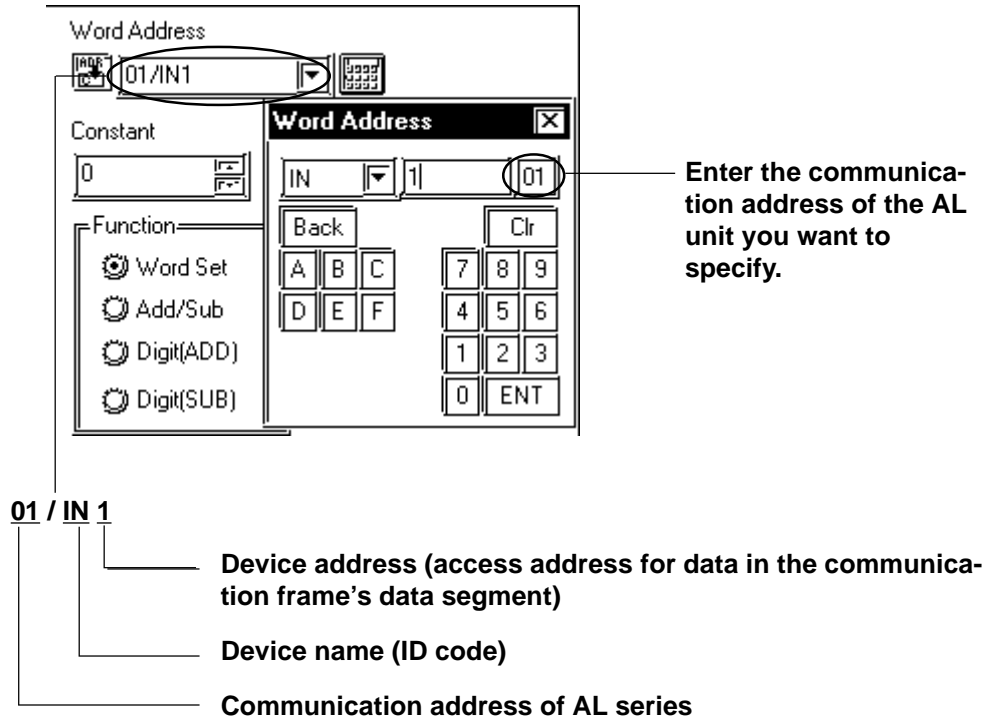
- ***About the GP/GLC system data area***

  The GP/GLC system data area from LS0 to LS19 (20 words) cannot be allocated to the data area available for the temperature controller. Even if this system area is set up using GP-PRO/PBIII or when the GP/GLC is offline, this allocation is not possible.

- ***About the read area:***

  The GC, GA, and GP devices that may be specified at the first address of the system area are exclusively for reads. When they are used as read areas, take care not to write data to those areas. Otherwise, a host communication error (02:FA) will be generated.

12.9.4 ▶ **Environment Setup**

The following table lists Digital's recommended temperature controller and GP/GLC communication setup.

■ **AL series**

GP Setup		Temperature Controller Setup	
Baud Rate	19200 bps (fixed)	————	
Data Length	8 bits (fixed)	————	
Stop Bit	2 bits (fixed)	————	
Parity Bit	Even (fixed)	————	
Data Flow Control	ER Control (fixed)	————	
Communication Format	2-wire type	————	
Unit No.	1	Communication Address	01 [*1]

*1 Specify the communication address of the temperature controller from 01 to 31.

Procedure: Select AdrS from Setup Parameter Display and then enter the desired 2-digit number (e.g., 01 for number 1).

12.9.5 ▶ **Error Codes**

<Temperature controller error codes>

The following lists error codes supported by the temperature controllers.

Each error message will display as "host communication error (02:**:##)" in the lower left corner of GP/GLC screen. "**" stands for an error code specific to the temperature controller and "##" the temperature controller number where the error has occurred.

Error code	Description	Details
01	The specified value is out of the range.	The data written with a write tag is out of the range specified for the temperature controller.
02	The setting is invalid.	The GP has tried to read or write when the specified device is invalid. Example: When the ON/OFF control is selected, the devices related to the PID control become invalid.
03	The execution is not possible.	When the temperature control is under special processing, any write for status change is not possible. This error code appears if the GP tries any write in the above state. Example: During the auto tuning of the PID control, any write for status change is not possible.

For the details of error codes, refer to the Communication Production Specification of Temperature Controller for AL Users by Fenwal.

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