

GP-4100 Series Installation Guide

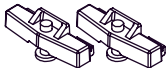
Please read the "Warning/Caution Information" on the attached sheet before using the product.

GP-4100 Series Connection Types

RS-232C type	GP4105G1D GP4105W1D
RS-422/485 type	GP4106G1D GP4106W1D
RS-485 (isolation) type	GP4107G1D GP4107W1D
Ethernet type	GP4104G1D GP4104W1D

Package Contents

- (1) GP Unit (1)
- (2) Installation Guide (1) <This Guide>
- (3) Warning/Caution Information (1)
- (4) Installation Gasket (1, attached to the GP unit)
- (5) Installation Fasteners (Set of 2)



- (6) COM I/F Connector (1)
(For RS-232C and RS-422/485 types)



- (7) DC Power Supply Connector (1)
(For the Ethernet type and a portion of models*¹)
(Attached to unit)



*¹ Not included with models that have the following type of power connector.



This unit has been carefully packed, with special attention to quality. However, should you find anything damaged or missing, please contact your local GP distributor immediately.

About the Manual

This manual describes wiring and installation procedures. For more detailed information, refer to the manuals indicated below.

Manual	Contents
GP-4100 Series Hardware Manual	Specifications, dimensions, accessories, system design, overseas standards, and other details.
Device/PLC Connection Manual	System configuration of connected devices (PLCs and other devices), communication settings examples, connection wiring diagram, and other details.
Maintenance/Troubleshooting	<ul style="list-style-type: none">• Troubleshooting Help for solving problems. <ul style="list-style-type: none">• Maintenance Details on the GP unit's Offline Mode

The manuals can be selected from the help menu of GP-Pro EX or downloaded from Pro-face Home Page.

URL

<http://www.pro-face.com/otasuke/>

Global Code

A global code is assigned to every Pro-face product as a universal model number.

For more information on product models and their matching global codes, please refer to the following URL.

<http://www.pro-face.com/product/globalcode.html>

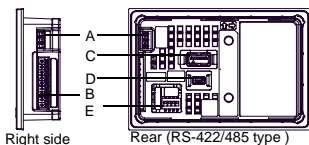
Electrical Specifications

		GP4104* GP4105*	GP4106*	GP4107*
Power Supply	Input Voltage	DC24V		
	Rated Voltage	DC19.2 to 28.8V		
	Allowable Voltage Drop	3ms or less		
	Power Consumption	6.0 W or less	6.2 W or less	6.5 W or less
		2.7 W or less*1	3.0 W or less*1	3.4 W or less*1
	In-Rush Current	30 A or less		
Voltage Endurance	AC1,000V, 20mA for 1 min (between charging and FG terminals)			
Insulation Resistance	DC500V, 10MΩ or more (between charging and FG terminals)			

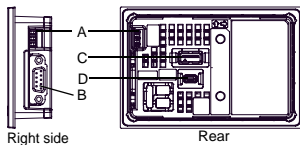
*1 When power is not supplied to USB devices.

Part Names and Functions

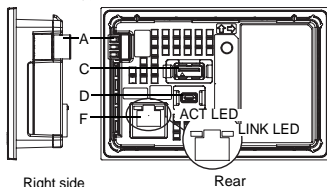
◆ RS-232C type, RS-422/485 type



◆ RS-485 (isolation) type



◆ Ethernet type



- (A) Power Connector
- (B) Serial Interface (COM1)
- (C) USB (Type A) Interface (USB1)
- (D) USB (mini B) Interface (USB2)
- (E) DIP Switch (SW1)
Only on RS-422/485 type.
- (F) Ethernet Interface
The Ethernet transmission interface (10BASE-T/100BASE-TX). An RJ-45 type modular jack connector (8-pole) is used.

LED	Status	Indicates
LINK	Green ON	Data transmission available
	Green OFF	No connection or subsequent transmission failure
ACT	Green ON	Data transmission is occurring.
	Green OFF	No data transmission

External Interfaces

IMPORTANT

- For instructions on how to connect to other devices, always refer to the "GP-Pro EX Device/PLC Connection Manual".

1. Serial Interface

IMPORTANT

- For detailed information on pins, refer to the GP-4100 Series Hardware Manual.
- The serial interface of the RS-232C and RS-422/485 types is not isolated. Always connect pin #5 SG (Signal Ground) to the connected device, especially if the connected device is also not isolated. Failure to do so may damage the RS-232C/RS-422/RS-485 circuit.
- An SG (Signal Ground) and FG (Frame Ground) are connected internally in the RS-232C and RS-422/485 types. When connecting an external device to the GP using the SG terminal, be sure to check that no short-circuit loop is created when you setup the system.

■ RS-232C and RS-422/485 Types

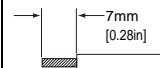
Included COM I/F connector
(9-pin, 2-piece terminal block)

RS-232C type		RS-422/485 type	
Label	Signal Name	Label	Signal Name
CI	CI(RI)	CSB	CSB
CD	CD	CSA	CSA
CS	CS(CTS)	ERB	ERB
RS	RS(RTS)	ERA	ERA
SG	SG	SG	SG
DR	DR(DSR)	RDB	RDB
ER	ER(DTR)	RDA	RDA
RD	RD(RXD)	SDB	SDB
SD	SD(TXD)	SDA	SDA

NOTE

- A termination resistor can be set using the DIP Switch (4-bit) on the rear of the RS-422/485 type. Factory default settings are all set to "OFF" (no termination resistor). Check the termination resistor required for connection to the connected device (PLC) and install if necessary. For detailed information, refer to the GP-Pro EX Device/PLC Connection Manual.

◆ Communications Cable Specifications

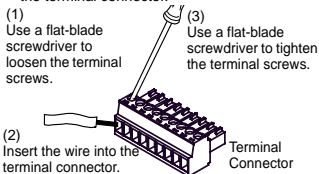
Communications Cable Diameter* ¹	0.14 to 1.5mm ² (28 - 16 AWG)
Conductor Type	Simple or Stranded Wire* ²
Conductor Length	

- *1 When inserting two wires into one terminal connector, the simple wire diameter is 0.08 to 0.5mm² (28 - 22 AWG), and the stranded wire diameter is 0.08 to 0.75mm² (28 - 20 AWG).
- *2 If the Conductor's end (individual) wires are not twisted correctly, the end wires may either short against each other, or against an electrode.

◆ Wiring the COM Interface Connector

IMPORTANT

- Always ensure that the connector has been removed from the GP unit before wiring the connector. Failure to do so may result in electric shock.
- Use a flat-blade screwdriver (Size 0.4 X 2.5) to loosen the terminal screws.
 - Strip the communications cable, and attach it to the terminal connector.



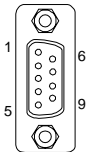
- Use a flat-blade screwdriver to tighten the appropriate terminal screws on the terminal connector from step 2.

IMPORTANT

- The torque required to tighten these screws is 0.196N•m (1.735[Lb•in]).
- Insert the connector into the GP unit's serial interface.

■ RS-485 (isolation) type

D-Sub 9-pin socket type connector

Pin Connection	RS-485 (isolation) type	
	PIN #	Signal Name
 (GP unit side)	1	NC
	2	NC
	3	LINE(+)
	4	RS(RTS)
	5	SG ^{*1}
	6	5V ^{*2,3}
	7	NC
	8	LINE(-)
	9	NC
	Shell	FG ^{*1}

*1 The SG and FG terminals are isolated.

*2 When providing power of termination resistor via the Siemens PROFIBUS, power cannot be connected to the Device/PLC.

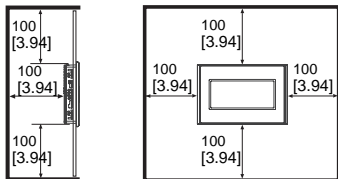
*3 The 5V output for Pin # 6 is not protected against overcurrent.

Installations

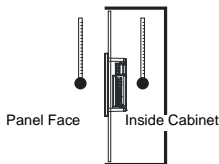
1. Installation Requirements

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

Unit: mm [in.]



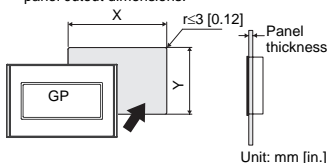
- Be sure that the surrounding air temperature and the ambient humidity are within their designated ranges. (Surrounding air temperature: 0 to 50°C, Ambient humidity: 10 to 90%RH, Wet bulb temperature: 39°C max.) When installing the GP on the panel of a cabinet or enclosure, "Surrounding air temperature" indicates both the panel face and cabinet or enclosure's internal temperature.



- Be sure that heat from surrounding equipment does not cause the GP to exceed its standard operating temperature.

2. GP Installation

- Cut a hole in the panel according to the GP unit panel cutout dimensions.

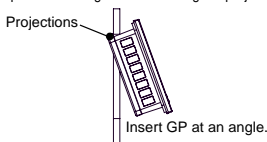


GP	X	Y	Panel thickness
GP-4100 Series	105.0 ⁺¹ ₋₀ [4.13 ^{+0.04} ₋₀]	66.0 ⁺¹ ₋₀ [2.60 ^{+0.04} ₋₀]	1.0 [0.04] to 5.0 [0.20]

- Confirm that the installation gasket is attached to the GP unit and then place the GP unit into the Panel from the front.

IMPORTANT

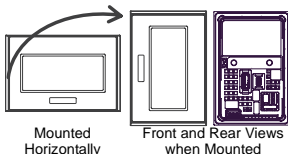
- GP unit has two projections^{*1} on the top to prevent falling during installation. Please insert the GP unit into the panel at an angle to avoid hitting the projections.



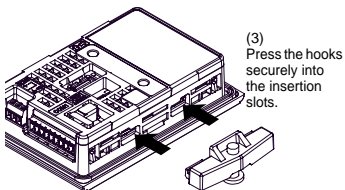
- *1 GP units with Rev.1 or higher have projections. More information, please see the nameplate on the GP unit.
- It is strongly recommended that you use the installation gasket, since it absorbs vibration in addition to repelling water. For the procedure for replacing the installation gasket, refer to "GP-4100 Series Hardware Manual".

NOTE

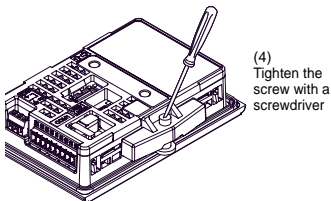
- When mounting the GP unit vertically, ensure that the left side of the unit faces up (i.e. the power connector and serial interface should be at the bottom).



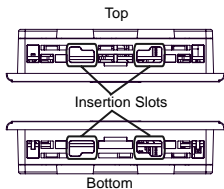
- Press the installation fastener hooks securely into the insertion slots on the GP unit. (Press the hooks in again to release the lock and remove the installation fasteners.)
- Tighten the installation fasteners with a screwdriver. There are two insertion slots on both the top and bottom of the GP unit.



- Press the hooks securely into the insertion slots.



- Tighten the screw with a screwdriver

**IMPORTANT**

- Tightening the screws with too much force can damage the GP unit's plastic case.
- In order to guarantee water repelling effect the necessary torque is 0.52N•m [4.60Lb•in].

Wiring**IMPORTANT**

- If the power connector is the following type, please read "1. Wiring the Power Cord No.1".



- If the power connector is the following type, please read "2. Wiring the Power Cord No.2".

**! WARNING****HAZARD OF ELECTRIC SHOCK**

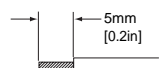
- Prior to connecting the GP unit's power cord terminals to the power terminal block, confirm that the GP unit's power supply is completely turned OFF, via a breaker, or similar unit.
- Supplying a power voltage other than that specified will damage the power source and the GP unit.
- Since there is no power switch on the GP unit, be sure to attach a breaker-type switch to its power cord.
- When the FG terminal is connected, be sure the wire is grounded.

Failure to follow these instructions will result in death or serious injury.

1. Wiring the Power Cord No.1

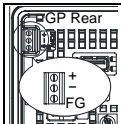
■ Power Cord Specifications

Use copper conductors only.

Power Cord Diameter	Simple Wire: 0.75 to 1.5mm ² Stranded Wire: 0.75 to 1mm ² (18 - 16 AWG)
Conductor type	Simple or Stranded Wire ^{*1}
Conductor Length	

*1 If the Conductor's end (individual) wires are not twisted correctly, the end wires may either short against each other, or against an electrode.

■ Power Connector Specifications

	+	24V
	-	0V
	FG	Grounding Terminal connected to the GP chassis

■ Connecting the GP Power Cord

- (1) Confirm that the GP unit's Power Cord is unplugged from the power supply.
- (2) Use a flat-blade screwdriver (Size 0.4 X 2.5) to loosen the terminal screws.
- (3) Strip the power cord, and attach it to the power connector.
- (4) Use a flat-blade screwdriver to tighten the appropriate terminal screws on the terminal connector from step 3.

IMPORTANT

- The torque required to tighten these screws is 0.28N•m (2.5 [Lb•in]).
- The power connector cannot be removed because it is mounted to GP unit. Do not attempt to remove or tamper with the power connector. It may damage the power connector.
- Be sure to loosen the terminal screws before pulling out the power cord. The power connector may be damaged by pulling the power cord when attached to the power connector.
- Do not solder the cable connection. Doing so may damage the unit due to abnormal heat or cause a fire.

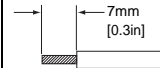
NOTE

- Be sure to twist the power cords together, up to the power connector.

2. Wiring the Power Cord No.2

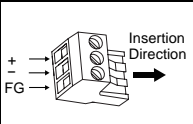
■ Power Cord Specifications

- Use copper conductors only.

Power Cord Diameter	0.75 to 1.5mm ² (18 - 16 AWG)
Conductor type	Simple or Stranded Wire ^{*1}
Conductor Length	

*1 If the Conductor's end (individual) wires are not twisted correctly, the end wires may either short against each other, or against an electrode.

■ Power Connector Specifications

	+	24V
	-	0V
	FG	Grounding Terminal connected to the GP chassis

■ Connecting the GP Power Cord

- (1) Confirm that the power cord is unplugged from the power supply.
- (2) Check the rated voltage, and remove the sticker on the power connector that reads "DC 24V".
- (3) Remove the power connector (plug) from the main unit.
- (4) Strip the membrane of the power cord, and connect them to the Power Connector.

IMPORTANT

- Use a flat-blade screwdriver (Size 0.4 x 2.5 mm (0.015 to 0.098 in.)) to tighten the terminal screws. The torque required to tighten these screws is 0.22 to 0.25N•m [1.95 to 2.2Lb•in.].
 - Do not solder the cable connection. Doing so may damage the unit due to abnormal heat or cause a fire.
- (5) Reattach the Power Connector (plug).

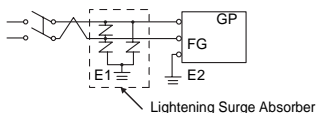
NOTE

- Be sure to twist the power cords together, up to the power connector.

3. Wiring Cautions

■ Improving Noise/Surge Resistance

- The GP unit's power supply cord should not be bundled with or kept close to main circuit lines (high voltage, high current), power lines, or input/output lines, and their various systems should be kept separate. When power lines cannot be wired via a separate system, use shielded cables for input/output lines.
- Make the power cord as short as possible, and be sure to twist the ends of the wires together (i.e. twisted pair cabling) from close to the power supply unit.
- If there is an excess amount of noise on the power supply line, connect a noise reducing transistor before turning on the power.
- Connect a surge absorber to handle power surges. Be sure to ground the surge absorber (E1) separately from the GP unit (E2).

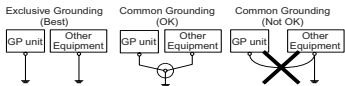


■ Short Circuit Prevention

- The SG (signal ground) and FG (frame ground) terminals are connected internally in the GP unit. When connecting the SG line to another device, be sure that no shorting loops are formed.

■ Grounding

- Use an exclusive grounding wire with a grounding resistance of 100Ω or greater and a wire of 2mm² or thicker, or your country's applicable standard.



UL/c-UL Approval

<Cautions>

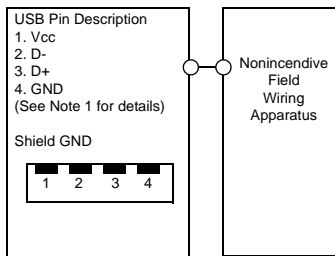
Be aware of the following items when building the GP unit into an end-use product:

- For use on a flat surface of a Type 4X (Indoor Use Only) and/or Type 13 Enclosure.
- The temperature rating of field installed conductors: 75°C only.
- Must be used with a Class 2 Power Supply. (24 VDC)
- For use in Pollution Degree 2 environment, or equivalent.
- Surrounding air temperature rating 50°C maximum or equivalent.

<Compliance and Handling Cautions in Hazardous Locations>

- SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D HAZARDOUS LOCATIONS, OR NONHAZARDOUS LOCATIONS ONLY.
- WARNING - EXPLOSION HAZARD - SUBSTITUTION OF ANY COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
- WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.
- Control Drawing of USB (Type A) Interface (USB1).

The information below concerns the use of the USB interface used in Class I, Division 2, Groups A, B, C, and D hazardous locations (from Doc No. 3910017-USB).



Notes:

- Nonincendive Circuit Parameters:
USB interface:
Voc = 5.25 V

Isc = 0.7 A
Ca = 16 μ F
La = 10 μ H

2. Selected Associated Nonincendive Field Wiring Apparatus shall satisfy the following:

Associated Nonincendive Field Wiring Apparatus for USB (Type A) interface of the GP-4100 Series	-	Nonincendive Field Wiring Apparatus
Voc	\leq	Vmax
Isc	\leq	Imax
Ca	\geq	Ci + C cable
La	\geq	Li + L cable

3. If the electrical parameters of the cable are unknown, the following values may be used:
Capacitance = 60 pF/ft
Inductive = 0.20 μ H/ft
4. Nonincendive Field Wiring must be installed in accordance with article 501.10(B) of the National Electrical Code ANSI/NFPA 70.
5. Nonincendive Field Wiring Apparatus shall not contain or be connected to another source of power.
- USB (mini B) Interface (USB2) is for temporary connection only during maintenance and setup of the device. Do not use, connect, or disconnect unless area is known to be non-hazardous. Connection or disconnection in an explosive atmosphere could result in an explosion.

Inquiry

Do you have any questions about difficulties with your GP?

Please access our site anytime that you need help with a solution.

<http://www.pro-face.com/otasuke/>

Note

Please be aware that Digital Electronics Corporation shall not be held liable by the user for any damages, losses, or third party claims arising from the uses of this product.

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