

ST-3400 Series Installation Guide

Caution

Be sure to read the "Warning/Caution Information" on the attached sheet before using the product.

Package Contents

- (1) ST Unit (1)
- (2) English and Japanese Installation Guides (one of each) <This Guide>
- (3) Warning/Caution Information (1)
- (4) Installation Gasket (1)
(Attached to the ST unit)
- (5) Installation Fasteners (Set of 4)



- (6) Power Connector (1)



- (7) USB Cable Clamp (1 set)
(Holder: 1, Cover: 1)



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

About the Manual

For the detailed information on ST3000 series, refer to the following manual.

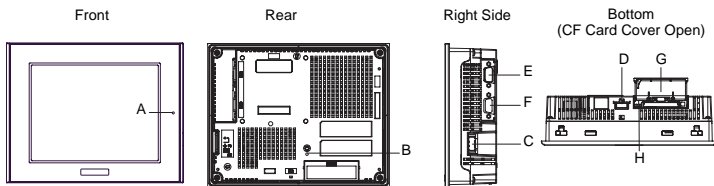
- ST3000 Series Hardware Manual
- Maintenance/Troubleshooting

ST3000 Series Hardware Manual 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/>

Part Names and Functions



Name		Description	
A	Status LED	LED	ST Status
		Green (lit)	Normal operation (power is ON.) or OFFLINE operation.
		Orange (blinking)	During software startup.
		Red (lit)	When power is turned ON.
		Not lit	Power is OFF.
B	CF Card Access LED	Lit in green when the CF Card is inserted and the cover is closed, or when the CF Card is being accessed.	
C	Power Connector (Socket)	—	
D	USB Host Interface (USB)	USB1.1 Host I/F Connector: USB TYPE-A x 1 Power supply voltage: 5VDC±5% Output current: 500mA (max.) The maximum communication distance: 5m	
E	Serial Interface (COM1)	Dsub 9-pin plug type. RS232C is supported.	
F	Serial Interface (COM2)	Dsub 9-pin plug type. RS422/RS485*1 is supported.	
G	CF Card Cover	—	
H	Dip Switches	Located inside the CF Card Cover.	

*1 RS485 is compliant with ST-3400 series units with revision code "A" or later.

(SEE→) *Revision (page 11)*

General Specifications

■ Electrical Specifications

Power Supply	Input Voltage	DC24V
	Rated Voltage	DC19.2 to 28.8V
	Allowable Voltage Drop	10ms (max.)
	Power Consumption	22W (max.)
	In-Rush Current	30A (max.)
Voltage Endurance	AC1000V 20mA for 1minute (between charging and FG terminals)	
Insulation Resistance	DC500V 10M Ω (min.) (between charging and FG terminals)	

■ Environmental Specifications

Physical	Surrounding Air Temperature	0 to +50°C
	Storage Temperature	-20 to +60°C
	Ambient Humidity	10 to 90% RH (Wet bulb temperature: 39°C max. - no condensation.)
	Storage Humidity	10 to 90% RH (Wet bulb temperature: 39°C max. - no condensation.)
	Dust	0.1mg/m ³ and below (non-conductive levels)
	Pollution Degree	For use in Pollution Degree 2 environment.

External Interfaces

IMPORTANT

- This ST unit's serial interface is not isolated. When the host (PLC) unit is also not isolated, and to reduce the risk of damaging the RS232C/RS422/RS485 circuit, be sure to connect pin #5 SG (Signal Ground) terminal.
- Similarly shaped connectors are used for COM1 and COM2 of the ST. Therefore, be sure to connect the correct connectors. Communication is not available unless the connectors are connected correctly.

NOTE

- When isolation is necessary, you can use the RS232C isolation unit (CA3-ISO232-01) on COM1.

■ COM1

Recommended Cable Connector	XM2D-0901 <made by OMRON Corp.>
Recommended Jack Screw	XM2Z-0073 <made by OMRON Corp.>
Recommended Cable Cover	XM2S-0913 <made by OMRON Corp.>
Interfit Bracket	#4-40 inch screws are used.

Pin #	RS232C	
	Signal Name	Meaning
1	CD	Carrier Detect
2	RD(RXD)	Receive Data
3	SD(TXD)	Send Data
4	ER(DTR)	Data Terminal Ready
5	SG	Signal Ground
6	DR(DSR)	Data Set Ready
7	RS(RTS)	Request to Send
8	CS(CTS)	Clear to Send
9	CI(RI)/VCC	Called status display/ +5V±5% Output 0.25A ^{*1}
Shell	FG	Frame Ground (Common with SG)

^{*1} The RI/VCC selection for Pin #9 is switched via software. The VCC output is not protected against overcurrent. To prevent damage or unit malfunctions, use only the rated current.

■ COM2

Recommended Cable Connector	XM2D-0901 <made by OMRON Corp.>
Recommended Jack Screw	XM2Z-0073 <made by OMRON Corp.>
Recommended Cable Cover	XM2S-0913 <made by OMRON Corp.>
Interfit Bracket	#4-40 inch screws are used.

Pin #	RS422/RS485*1	
	Signal Name	Meaning
1	RDA	Receive Data A(+)
2	RDB	Receive Data B(-)
3	SDA	Send Data A(+)
4	ERA	Data Terminal Ready A(+)
5	SG	Signal Ground
6	CSB	Clear to Send B(-)
7	SDB	Send Data B(-)
8	CSA	Clear to Send A(+)
9	ERB	Data Terminal Ready B(-)
Shell	FG	Frame Ground (Common with SG)

*1 RS485 is compliant with ST-3400 series units with revision code "A" or later.

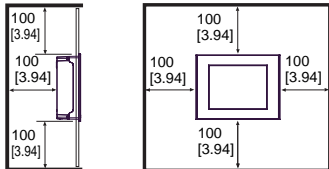
(SEE→) *Revision (page 11)*

Installations

1. Installation Requirements

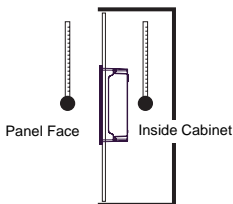
- For easier maintenance, operation, and improved ventilation, be sure to install the ST at least 100 mm [3.94 in.] away from adjacent structures and other equipment.

Unit:mm[in.]



- Be sure that the ambient operation temperature and the ambient humidity are within their designated ranges. (Ambient operation temperature: 0 to 50°C, Ambient humidity: 10 to 90%RH, Wet bulb temperature: 39°C max.)

When installing the ST on the panel of a cabinet or enclosure, “Ambient operation temperature” indicates both the panel face and cabinet or enclosure’s internal temperature.

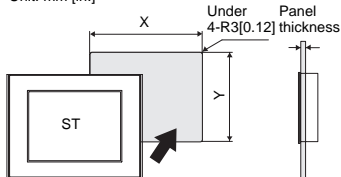


- Be sure that heat from surrounding equipment does not cause the ST to exceed its standard operating temperature.

2. ST Installation

- Create a Panel Cut following the dimensions in the table below.

Unit: mm [in.]



X	Y	Panel thickness
204.5 ⁺¹ ₋₀	159.5 ⁺¹ ₋₀	1.6[0.06]
[8.05 ^{+0.04} ₋₀]	[6.28 ^{+0.04} ₋₀]	to 10.0[0.39]

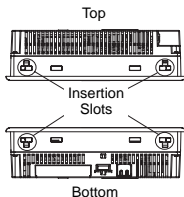
- Confirm that the installation gasket is attached to the ST unit and then place the ST unit into the Panel from the front.

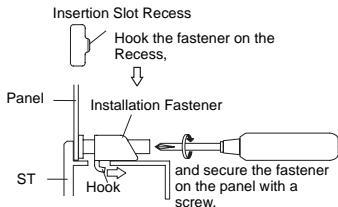
IMPORTANT

- 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 “ST3000 Series Hardware Manual”.

- The following figures show the four (4) fastener insertion slot locations. Insert each fastener’s hook into the slot and tighten it with a screwdriver. Insert the installation fasteners securely into the insertion slot recess.





IMPORTANT

- Tightening the screws with too much force can damage the ST unit's plastic case.
- The necessary torque is 0.5N•m.

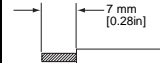
Wiring

⚠ WARNING

- To avoid an electric shock, prior to connecting the ST unit's power cord terminals to the power terminal block, confirm that the ST unit's power supply is completely turned OFF, via a breaker, or similar unit.
 - Any other power level can damage both the ST and the power supply.
 - When the FG terminal is connected, be sure the wire is grounded.
1. Wiring the DC type power supply cable

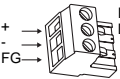
■ Power Cord Specifications

Use copper conductors only.

Power Cord Diameter	0.75 to 2.5mm ² [0.0009 to 0.0097 inch ²] (18 - 12 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 (Plug) Specifications

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

NOTE

- The power connector (plug) is CA5-DCCNM-01 made by Pro-face or MSTB2,5/3-ST-5,08 made by Phoenix Contact.

When connecting the Power Cord, use the following items when performing wiring. (Items are made by Phoenix Contact.)

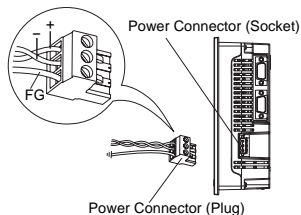
Recommended Driver	SZF 1-0.6x3.5 (1204517)
Recommended Pin Terminals	AI 0.75-8GY (3200519) AI 1-8RD (3200030) AI 1.5-8BK (3200043) AI 2.5-8BU (3200522)
Recommended Pin Terminal Crimp Tool	CRIMPFOX ZA 3 (1201882)

■ Connecting the ST Power Cord

- (1) Confirm that the ST unit's Power Cord is unplugged from the power supply.
- (2) Strip the power cord, twist the conductor's wire ends, insert them into the pin terminal and crimp the terminal. Attach the terminal to the power connector.

IMPORTANT

- Use a flat-blade screwdriver (Size 0.6 X 3.5) to tighten the terminal screws. The torque required to tighten these screws is 0.5 to 0.6 N•m [5-7Lb•In.].
 - Do not solder the cable connection.
- (3) Attach the Power connector (Plug) to the Power Connector.



2. Power Supply Cautions

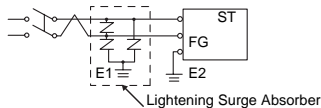
- Input and Output signal lines must be separated from the power control cables for operational circuits.
- To improve the noise resistance, be sure to twist the ends of the power cord wires before connecting them to the Power connector (Plug).
- The ST unit's power supply cord should not be bundled with or kept close to main circuit lines (high voltage, high current), or input/output signal lines.
- To reduce noise, make the power cord as short as possible.
- If the supplied voltage exceeds the ST unit's range, connect a voltage transformer.
- Between the line and the ground, be sure to use a low noise power supply. If there is an excess amount of noise, connect a noise reducing transformer.
- The temperature rating of field installed conductors: 75°C only.

IMPORTANT

- Use voltage and noise reducing transformers with capacities exceeding Power Consumption value.
- Must be used with a Class 2 Power Supply. (24VDC)
- Connect a surge absorber to handle power surges.

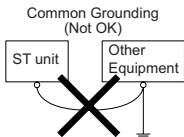
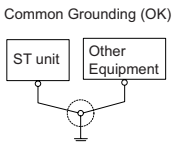
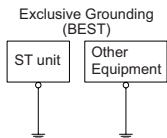
IMPORTANT

- Be sure to ground the surge absorber (E1) separately from the ST unit (E2). Select a surge absorber that has a maximum circuit voltage greater than that of the peak voltage of the power supply.



3. Grounding Cautions

- Be sure to create an exclusive ground for the Power Cord's FG terminal. Use a grounding resistance of 100Ω , a wire of 2mm^2 or thicker, or your country's applicable standard.
- The SG (signal ground) and FG (frame ground) terminals are connected internally in the ST unit.
When connecting the SG line to another device, be sure that the design of the system/connection does not produce a shorting loop.
- The grounding wire should have a cross sectional area greater than 2mm^2 . Create the connection point as close to the ST unit as possible, and make the wire as short, as possible. When using a long grounding wire, replace the thin wire with a thicker wire, and place it in a duct.



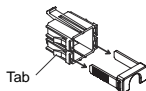
4. Input/Output Signal Line Cautions

- All ST Input and Output signal lines must be separated from all operating circuit (power) cables.
- If this is not possible, use a shielded cable and ground the shield.

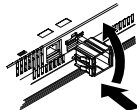
To prevent the USB cable from coming off

■ Attaching the USB Holder

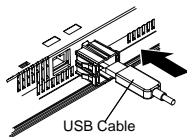
- (1) Before starting the procedure, lift up the tab on both sides of the USB Holder and remove the USB Cover.



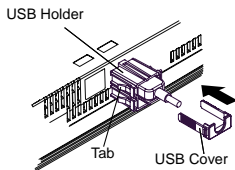
- (2) Attach the USB holder to the USB Host Interface part of the main unit. Hook the lower pick of the USB holder to the attachment hole of the main unit and then insert the upper pick as shown below to fix the USB holder.



- (3) Insert the USB cable into the USB Host Interface.



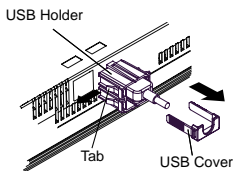
- (4) Attach the USB cover to fix the USB cable. Insert the USB cover into the tab of the USB holder.



IMPORTANT

- Check the up/down orientation of the USB cover to ensure that the USB cable is secured properly.
- Removing the USB Holder

- (1) Lift up the tab of the USB holder and then remove the USB cover as shown below.



- (2) After removing the USB cable, remove the picks pushing the USB holder from both top and bottom.

UL/c-UL Approval

The ST-3400 Series units are UL/c-UL listed products.

(UL File No.E220851)

Product Model No.	UL/c-UL Registration Model No.
AST3401-T1-D24	3580206-01

These products conform to the following standards:

- UL508
Industrial Control Equipment
- CSA-C22.2 No.142-M1987
(c-UL Approval)
Process Control Equipment

<Cautions>

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

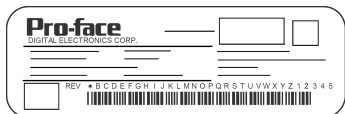
- The ST unit's rear face is not approved as an enclosure. When building the ST unit into an end-use product, be sure to use an enclosure that satisfies standards as the end-use product's overall enclosure.
- The ST unit must be used indoors only.
- Install and operate the ST with its front panel facing outwards.
- If the ST is mounted so as to cool itself naturally, be sure to install it in a vertical panel. Also, it's recommended that the ST should be mounted at least 100mm away from any other adjacent structures or machine parts. The temperature must be checked on the final product in which the ST is installed.
- For use on a flat surface of a Type 4X (Indoor Use Only) and/or Type 13 Enclosure.

CE Marking

- The AST3401-T1-D24 unit is CE marked, EMC compliant product. This unit also conform to EN55011 Class A, EN61131-2 directives.

Revision

The revision code of the ST is shown in the label affixed to the ST. In the example shown below, an asterisk "*" is displayed in the position where "A" should be, meaning "Rev. A".



Inquiry

Do you have any questions about difficulties with this product? 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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