

ST-3300 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)
(Attached to the ST unit)



- (7) USB Cable Clamp (1 port) (1)
(Holder: 1, Clamp: 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.

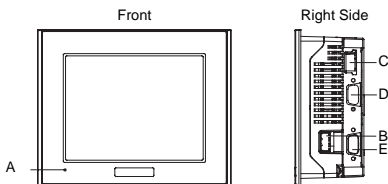
- ST3000 Series Hardware Manual
- Maintenance/Troubleshooting

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	Power Connector	—	
C	USB Host Interface (USB)	USB1.1 Host I/F Connector: USB TYPE-A x 1 Power supply voltage: DC 5V±5% Output current: 500mA (max.) The maximum communication distance: 5m	
D	Serial Interface (COM1)	D-Sub 9-pin plug type. RS-232C is supported.	
E	Serial Interface (COM2)	D-Sub 9-pin plug type. RS-422/RS-485 ^{*1} is supported. AST3302-B1-D24 has D-Sub 9-pin socket type and supports RS-485 (MPI only).	

*1 RS-485 is compliant with AST3301-B1-D24 / AST3301-S1-D24 with revision code "B" or later. For all other models, all revisions support RS-485.

(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	18W (max.)
	In-Rush Current	30A (max.)
Voltage Endurance	AC1,000V 20mA for 1 minute (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*1
	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.

*1 When using Monochrome / STN Color LCD model in an environment where the temperature reaches or exceeds 40°C for an extended period of time, the screen contrast level may decrease from its original level of brightness.

External Interfaces

IMPORTANT

- This ST unit's serial interface is not isolated (except for COM2 on the AST3302-B1-D24). When the host (PLC) unit is also not isolated, and to reduce the risk of damaging the RS-232C/RS-422/RS-485 circuit, be sure to connect pin #5 SG (Signal Ground) terminal.
- Similarly shaped connectors are used for COM1 and COM2 of the ST (except for AST3302-B1-D24). 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 RS-232C 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 #	RS-232C	
	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.>
	XM2A-0901 <made by OMRON Corp.> (AST3302-B1-D24 only)
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 #	RS-422/RS-485 ^{*1}		RS-485 (MPI only) (AST3302-B1-D24 only)	
	Signal Name	Meaning	Signal Name	Meaning
1	RDA	Receive Data A(+)	NC	—
2	RDB	Receive Data B(-)	NC	—
3	SDA	Send Data A(+)	LINE(+)	Line(+)
4	ERA	Data Terminal Ready A(+)	RS(RTS)	Request to Send
5	SG	Signal Ground	SG	Signal Ground ^{*2}
6	CSB	Clear to Send B(-)	5V	5V External Output ^{*3*4}
7	SDB	Send Data B(-)	NC	—
8	CSA	Clear to Send A(+)	LINE(-)	Line(-)
9	ERB	Data Terminal Ready B(-)	NC	—
Shell	FG	Frame Ground (Common with SG)	FG	Frame Ground ^{*2}

*1 RS-485 is compliant with AST3301-B1-D24 / AST3301-S1-D24 with revision code "B" or later. For all other models, all revisions support RS-485.

(SEE→) *Revision (page 11)*

*2 In COM2 on the AST3302-B1-D24, the SG and FG terminals are isolated.

*3 The 5V output for Pin #6 is not protected against overcurrent. To prevent damage or unit malfunctions, use only the rated current.

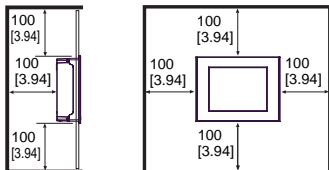
*4 When providing power via the Siemens Co.'s Profibus connector, power cannot be connected to the Device/PLC.

Installations

1. Installation Requirements

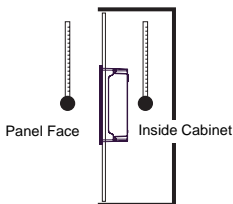
- For easier maintenance, operation, and improved ventilation, be sure to install the ST at least 100 mm [3.94 in.] away from adjacent structures and other equipment.

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.

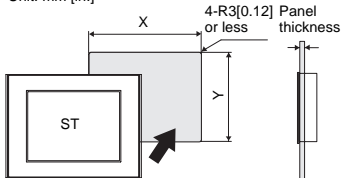


- Be sure that heat from surrounding equipment does not cause the ST to exceed its standard operating temperature.

2. ST Installation

- Create a Panel Cut following the dimensions in the table below. Also, determine the panel thickness according to the panel thickness range with due consideration of panel strength.

Unit: mm [in.]



X	Y	Panel thickness
156.0 ⁺¹ ₋₀ [6.14 ^{+0.04} ₋₀]	123.5 ⁺¹ ₋₀ [4.86 ^{+0.04} ₋₀]	1.6[0.06] to 5.0[0.20]

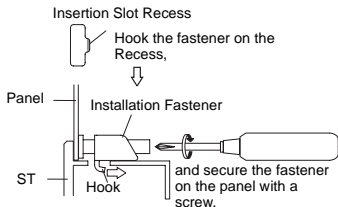
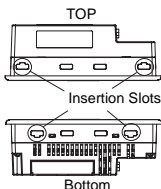
- Confirm that the installation gasket is attached to the ST unit and then place the ST unit into the Panel from the front.

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”.

- (3) 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 (18 - 12 AWG)
Conductor Type	Simple or Stranded Wire*1
Conductor Length	7 mm [0.28in]

*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.)

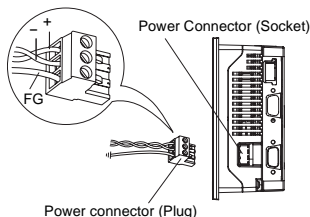
Recommended Driver	SZF 1-0.6x3.5 (1204517)
Recommended Pin Terminals	AI 0.75-8GY (3200519) AI 1-8RD (3200030) AI 1.5-8BK (3200043) AI 2.5-8BU (3200522)
Recommended Pin Terminal Crimp Tool	CRIMPFOX ZA 3 (1201882)

■ Connecting the ST Power Cord

- (1) Confirm that the ST unit's Power Cord is unplugged from the power supply.
- (2) Remove the power connector (plug) from the main unit.
- (3) 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 slot 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.
- (4) Attach the Power connector (Plug) to the Power Connector.



2. Power Supply Cautions

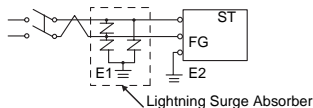
- Input and Output signal lines must be separated from the power control cables for operational circuits.
- To improve the noise resistance, be sure to twist the ends of the power cord wires before connecting them to the Power connector (Plug).
- The ST unit's power supply cord should not be bundled 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 maximum temperature rating of field installed conductors is 75°C.

IMPORTANT

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

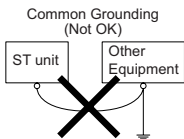
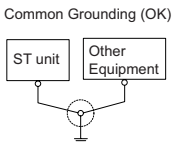
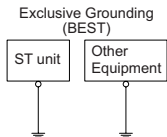
IMPORTANT

- 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 (except for COM2 on the AST3302-B1-D24) 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.



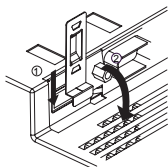
4. Input/Output Signal Line Cautions

- 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.

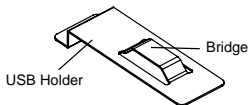
To prevent the USB cable from coming off

■ Attaching the USB Cable Clamp

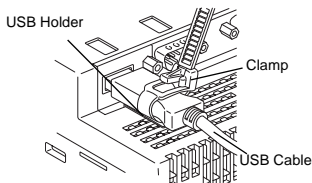
- (1) Insert the USB holder into the slot in front of the ST unit's USB port and pull it down and forward.



- (2) Pass the band of the USB cable clamp through the bridge of the USB holder.

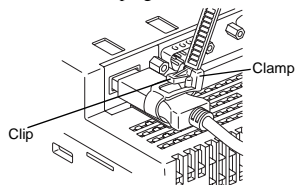


- (3) Insert the USB cable into the port. Fasten the band around the plug and secure it with the clamp.



■ Removing the USB Cable Clamp

- (1) Lower the clip and lift the clamp to release the plug.



UL/c-UL Approval

The ST-3300 Series units are UL/c-UL listed products.

(UL File No.E220851)

Product Model No.	UL/c-UL Registration Model No.
AST3301-B1-D24	3580207-02
AST3301-S1-D24	3580207-01
AST3301-T1-D24	3710010-01
AST3302-B1-D24	3710010-02

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 AST3301-B1-D24, AST3301-S1-D24, AST3301-T1-D24 and AST3302-B1-D24 units are CE marked, EMC compliant products. These units 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 or comments about this product? Please access our site any time 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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PFX105091E .AST3300-MT11E-BTH
2009.2 SS/A