

Pro-face

by **Schneider** Electric

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Your Automation Partner



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J1939 Unit Hardware Manual

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries (hereinafter, referred to as Schneider Electric) shall be responsible or liable for misuse of the information that is contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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Safety Information



Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book



At a Glance

Document Scope

This manual describes how to use this product.

Validity Note

This documentation is valid for this product.

The technical characteristics of the device(s) described in this manual also appear online at <http://www.pro-face.com>.

The characteristics presented in the present document should be the same as those that appear online. In line with our policy of constant improvement we may revise content over time to improve clarity and accuracy. In the event that you see a difference between the document and online information, use the online information as your reference.

Registered Trademarks

Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries.

Product names used in this manual may be the registered trademarks owned by the respective proprietors.

Related Documents

You can download the manuals related to this product, such as the software manual, from our support site at <http://www.pro-face.com/trans/en/manual/1001.html>.

Product Related Information

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In the event this product does not run properly due to whatever reason, it may be difficult or impossible to identify a function. Functions that may present a hazard if not immediately executed, such as a fuel shut-off, must be provided independently of this product. The machine's control system design must take into account the operator being unable to control the machine or making mistakes in the control of the machine.

WARNING

UNINTENDED EQUIPMENT OPERATION

- The application of this product requires expertise in the design and programming of control systems. Only persons with such expertise should be allowed to program, install, alter, and apply this product.
- Follow all local and national safety standards.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

For additional information, refer to NEMA ICS 1.1 (latest edition), "Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control" and to NEMA ICS 7.1 (latest edition), "Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems" or their equivalent governing your particular location.

Chapter 1

Overview

What Is in This Chapter?

This chapter contains the following topics:

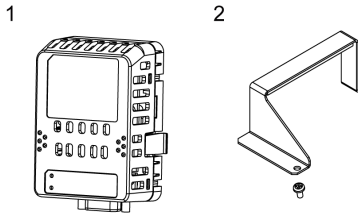
Topic	Page
Package Contents	10
Certifications and Standards	11
Federal Communication Commission Radio Frequency Interference Statement - For USA	13
Hazardous Location Installation - For USA and Canada	14
European (CE) Compliance and KC Markings	16

Package Contents

Package Contents

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

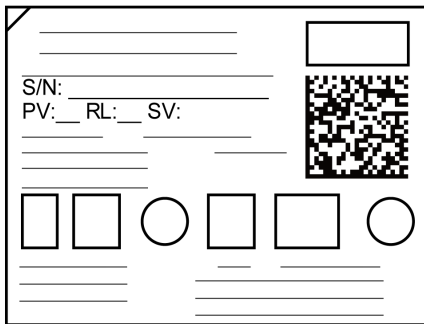
Verify all items listed here are present in your package:



- 1. J1939 Unit (model number: PFXZCHEUJ1): 1
- 2. Fixing bracket and screw x 1
- 3. Installation Guide: 1

Revision

You can identify the product version (PV), revision level (RL), and the software version (SV) from the product label.



Certifications and Standards

Some products are not subject to certification and standards. And some products have not received their certification and standards but are scheduled for assessment.

The certifications and standards listed below may include those that are not yet acquired for this product. For the latest certifications and standards that this product has acquired, please check the product marking or the following URL.

<http://www.pro-face.com/trans/en/manual/1002.html>

Agency Certifications

- Underwriters Laboratories Inc., UL 61010-2-201 and CSA C22.2 N°61010-2-201, Industrial Control Equipment
- Underwriters Laboratories Inc., UL 121201 and CSA C22.2 N°213, Electrical Equipment for Use in Class I, Division 2 Hazardous (Classified) Locations
- IECEx/ATEX for use in zones 2/22
- EAC certification (Russia, Belarus, Kazakhstan)

Compliance Standards

Europe:

CE

- Directive 2014/35/EU (Low Voltage)
- Directive 2014/30/EU (EMC)
 - Programmable Controllers: EN 61131-2
 - EN61000-6-4
 - EN61000-6-2
- Directive 2014/34/EU (ATEX)
 - EN60079-0
 - EN60079-15
 - EN60079-31

Australia:

RCM

- EN61000-6-4

Korea:

KC

- KN11
- KN61000-6-2

Qualifications Standards

Schneider Electric voluntarily tested this product to additional standards. The additional tests performed, and the standards under which the tests were conducted, are specifically identified in General Specifications (*see page 26*).

Hazardous Substances

This product is a device for use in factory systems. When using this product in a system, the system should comply with the following standards in regards to the installation environment and handling:

- WEEE, Directive 2012/19/EU
- RoHS, Directive 2011/65/EU and 2015/863/EU
- RoHS China, Standard GB/T 26572
- REACH regulation EC 1907/2006

Unit Disposal

When disposing this product, dispose it in a manner appropriate to, and in accordance with, your country's industrial machinery disposal/recycling standards.

Federal Communication Commission Radio Frequency Interference Statement - For USA

FCC Radio Interference Information

This product has been tested and found to comply with the Federal Communications Commission (FCC) limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial, industrial or business environment. This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause or be subject to interference with radio communications. To minimize the possibility of electromagnetic interference in your application, observe the following two rules:

- Install and operate this product in such a manner that it does not radiate sufficient electromagnetic energy to cause interference in nearby devices.
- Install and test this product to ensure that the electromagnetic energy generated by nearby devices does not interfere with the operation of this product.
- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this product.

WARNING

ELECTROMAGNETIC / RADIO INTERFERENCE

Electromagnetic radiation may disrupt the operation of this product leading to unintended equipment operation. If electromagnetic interference is detected:

- Increase the distance between this product and the interfering equipment.
- Reorient this product and the interfering equipment.
- Reroute power and communication lines to this product and the interfering equipment.
- Connect this product and the interfering equipment to different power supplies.
- Always use shielded cables when connecting this product to a peripheral device or another computer.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Hazardous Location Installation - For USA and Canada

General

This product has been designed with the intention of meeting the requirements of Class I, Division 2 hazardous location application. Division 2 locations are those locations where ignitable concentrations of flammable substances are normally confined, prevented by ventilation, or present in an adjacent Class I, Division 1 location, but where an abnormal situation might result in intermittent exposure to such ignitable concentrations.

While this product is a non-incendive device under UL 121201 and CSA C22.2 N°213, it is not designed for, and should never be used within a Division 1 (normally hazardous) location.

This product is suitable for use in Class I, Division 2, Groups A, B, C, and D hazardous locations or in non-hazardous locations. Before installing or using this product, confirm that the UL 121201 or CSA22.2 N°213 certification appears on the product labeling.

NOTE: Some products are not yet rated as suitable for use in hazardous locations. Always use your product in conformance with the product labeling and this manual.

DANGER

POTENTIAL FOR EXPLOSION

- Do not use this product in hazardous environments or locations other than Class I, Division 2, Groups A, B, C, and D.
- Substitution of any component may impair suitability for Class I, Division 2.
- Do not connect or disconnect this product unless power has been switched off or the area is known to be non-hazardous.
- Always confirm that this product is suitable for use in hazardous locations by checking the UL 121201 or CSA C22.2 N°213 certification appears on the product labeling.
- Do not install any Pro-face or OEM components, equipment, or accessories unless these have also been qualified as suitable for use in Class I, Division 2, Groups A, B, C, and D locations.
- Do not attempt to install, operate, modify, maintain, service, or otherwise alter this product except as permitted in this manual. Unpermitted actions may impair the suitability of this product for Class I, Division 2 operation.

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

DANGER

POTENTIAL FOR EXPLOSION

- Always confirm the UL 121201 or CSA C22.2 N°213 hazardous location rating of your device before installing or using it in a hazardous location.
- Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

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

Make sure that this product is properly rated for the location. If the intended location does not presently have a Class, Division and Group rating, then users should consult the appropriate authorities having jurisdiction in order to determine the correct rating for that hazardous location.

Operation and Maintenance

The systems have been designed for compliance with relevant spark ignition tests.

DANGER

POTENTIAL FOR EXPLOSION

In addition to the other instructions in this manual, when installing this product in a hazardous location, wire the equipment in accordance with the National Electrical Code article 501.10 (B) for Class I, Division 2 hazardous locations.

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

European (CE) Compliance and KC Markings

CE Compliance Note

The product described in this manual comply with the European Directives concerning Electromagnetic Compatibility and Low Voltage (CE marking) when used as specified in the relevant documentation, in application for which they are specifically intended, and in connection with approved third-party products.

KC Markings

사용자안내문

기종별	사용자안내문
A급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Chapter 2

Device Connectivity

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
System Design	18
Maintenance Accessories	19

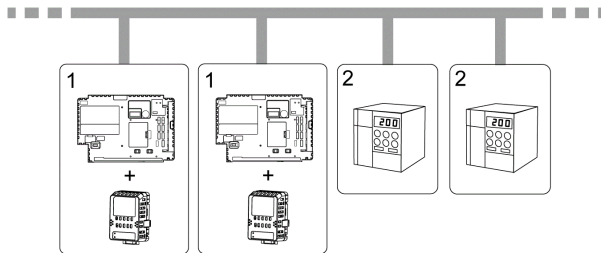
System Design

This product is an expansion unit for the SP5000X Series eXtreme Box and SP5000 Series Power Box, hereafter referred to as “Box Module”.

By attaching this product to the Box Module, you can join a J1939 communication network and communicate with other J1939 compliant devices.

NOTE:

- For model numbers of the Box Module, refer to the SP5000X Series Hardware Manual and SP5000 Series Hardware Manual.
- For details on the system structure or connection methods, refer to the corresponding device driver manual of your screen editing software.



1. Box module + J1939 Unit (this product)
2. J1939 communication supported devices

Maintenance Accessories

Product name	Product number	Description
Fieldbus Unit Fixing Bracket	PFXZCHFUB1	Bracket for fixing fieldbus unit to Box Module (1 piece).

Chapter 3

Parts Identification and Functions

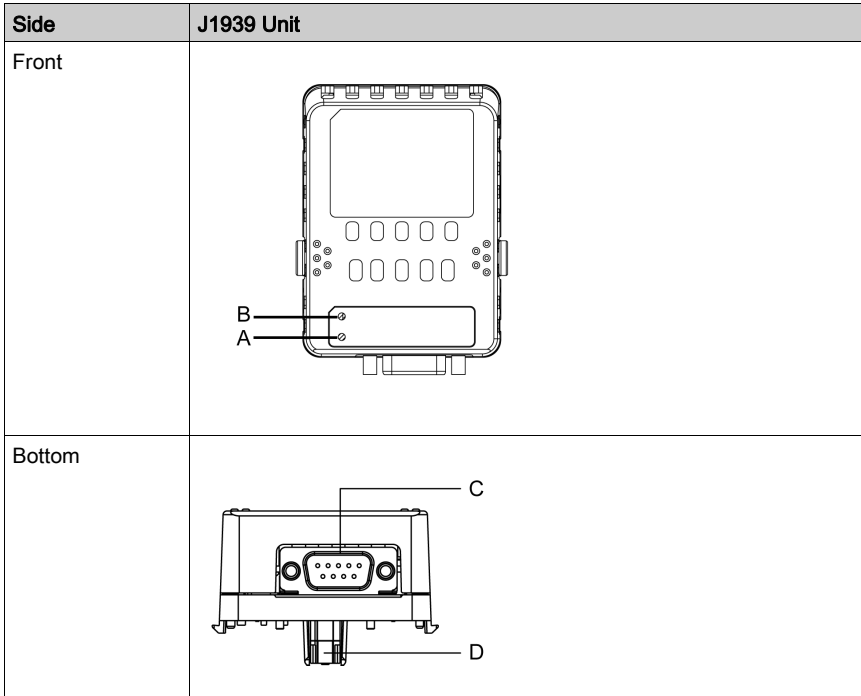
What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Parts Identification	22
LED Indications	23

Parts Identification

J1939 Unit



Part	Name	Description
A	RUN LED	<i>(see page 23)</i>
B	ERR LED	
C	CAN interface	-
D	Expansion unit interface	-

LED Indications

Status LED

Position	LED name	Color	Indicator	Description
A	RUN	Green	ON	Online
B	ERR	Red	OFF	No error
			ON	Communication error

Chapter 4

Specifications

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
4.1	General Specifications	26
4.2	Functional Specifications	31
4.3	Interface Specifications	32

Section 4.1

General Specifications

What Is in This Section?

This section contains the following topics:

Topic	Page
Electrical Specifications	27
Environmental Specifications	28
Structural Specifications	30

Electrical Specifications

Power supply	Rated input voltage	3.3 Vdc ^{*1}
	Power consumption	0.4 W or less
Dielectric strength	1,000 Vac for 1 minute (between power terminal and FG terminal), leakage current: 20 mA or less	
Insulation resistance	500 Vdc, 100 MΩ or more (between power terminal and FG terminal)	

*1 Power for this product is supplied by the Box Module.

Environmental Specifications

NOTE: Review specifications of this product along with specifications of the connected unit (SP5000 or SP5000X Series). Use in an environment that satisfies specification ranges of both this product and the connected unit.

Physical environment	Ambient air temperature	-30...70 °C (-22...158 °F) (T5) When installing and wiring: -5...70 °C (23...158 °F)
	Storage temperature	-30...70 °C (-22...158 °F)
	Ambient air and storage humidity	10%...90% RH (non-condensing, wet bulb temperature 39 °C [102.2 °F] or less)
	Dust	0.1 mg/m ³ (10 ⁻⁷ oz/ft ³) or less (non-conductive levels)
	Pollution degree	For use in Pollution Degree 2 environment
	Corrosive gases	IEC/EN 60721-3-3 Class 3C3 ^{*2}
	Atmospheric pressure (operating altitude)	800...1,114 hPa (2,000 m [6,561 ft] or lower)
Mechanical environment	Vibration resistance ^{*1}	IEC 60068-2-6 compliant 5...9 Hz Single amplitude 3.5 mm (0.14 in) 9...150 Hz Fixed acceleration: 9.8 m/s ² X, Y, Z directions for 10 cycles (approximately 100 minutes) IEC 61373: 1999 (Category 1, Class B) 5≤f≤150 Hz (weight < 500 kg: f1=5 Hz, f2=150 Hz) acceleration: Up and down: 7.90 m/s ² , Right and left: 3.50 m/s ² , Back and forward: 5.50 m/s ²
	Shock resistance	IEC 60068-2-27 compliant 147 m/s ² , X, Y, Z directions for 3 times
Electrical environment	Electrostatic discharge immunity	Contact discharge method: 6 kV Air discharge method: 8 kV (IEC/EN 61000-4-2 Level 3)

*1 When this product is combined with a 15-inch or larger display module, vibration resistance is as follows.

IEC 60068-2-6 compliant

5...9 Hz Single amplitude: 1.75 mm (0.069 in)

9...150 Hz Fixed acceleration: 4.9 m/s² X, Y, Z directions for 10 cycles (approximately 100 minutes)

*2 Test levels are as follows.

Standard	Levels
IEC/EN 60721-3-3	Flowing mixed gas; class 3C3, 25 °C (77 °F), 75% relative humidity, t = 7 days Concentrations (ppm): H ₂ S: 2.5 / Cl ₂ : 0.1 / SO ₂ : 2.0

Apply grease (Nyogel 760G) for corrosion prevention to the expansion unit interface.

Air quality requirements

Do not operate or store the panel where chemicals evaporate, or where chemicals are present in the air:

- Corrosive chemicals: Acids, alkalines, liquids containing salt.
- Flammable chemicals: Organic solvents.

 **CAUTION****INOPERATIVE EQUIPMENT**

Do not allow water, liquids, metal, and wiring fragments to enter inside this product.

Failure to follow these instructions can result in injury or equipment damage.

Structural Specifications

Grounding	Functional grounding: Grounding resistance of 100 Ω or less, 2 mm ² (AWG 14) or thicker wire, or your country's applicable standard (same for FG and SG terminals).
Cooling method	Natural air circulation
Structure	IP20
External dimensions (W x H x D)	60 x 82 x 41 mm (2.36 x 3.23 x 1.61 in)
Weight	90 g (3.17 oz) or less

Section 4.2

Functional Specifications

Transmission Specifications

NOTE: J1939 is a networking standard based on the international standard CAN. This product conforms to SAE J1939 standardized by SAE (Society of Automotive Engineers).

Communication type	1:N
Connection method	Bus configuration
Transfer method	CSMA/NBA, half-duplex serial transmission
Transfer speed (bps) ^{*1} / Transfer distance	250 K: 40 m
	500 K: 40 m
Number of nodes	Up to 30 nodes

*1 Set with the screen editing software.

Section 4.3

Interface Specifications

What Is in This Section?

This section contains the following topics:

Topic	Page
Interface Connection	33
Fieldbus Interfaces	34

Interface Connection

Cable Connections

DANGER

POTENTIAL FOR EXPLOSION

- Always confirm the UL 121201 or CSA C22.2 N°213 hazardous location rating of your device before installing or using it in a hazardous location.
- Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

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

Division 2 hazardous location regulations require that all cable connections be provided with adequate strain relief and positive interlock. Never connect or disconnect a cable while power is applied at either end of the cable. All communication cables should include a chassis ground shield. This shield should include both copper braid and aluminum foil. The D-sub style connector housing must be a metal conductive type (for example, molded zinc) and the ground shield braid must be terminated directly to the connector housing. Do not use a shield drain wire.

The outer diameter of the cable must be suited to the inner diameter of the cable connector strain relief so that a reliable degree of strain relief is maintained. Always secure the D-sub connectors to the workstation-mating connectors via the two screws located on both sides.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to this product.
- Be sure to ground this product's FG terminal.

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

Fieldbus Interfaces

⚠ CAUTION

LOSS OF COMMUNICATION

- Do not put excessive stress on the communication ports of all connections.
- Securely attach communication cables to the panel wall or cabinet.
- Use a D-Sub 9 pin connector that has jack screws.

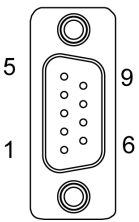
Failure to follow these instructions can result in injury or equipment damage.

NOTE:

- Use within the rated current.
- Use only the SELV (Safety Extra-Low Voltage) circuit to CAN interfaces.

CAN Interface

D-Sub 9 pin plug connector

Product side	Pin No.	Signal name	Direction	Meaning
	1	NC	-	No connection
	2	CAN_L	I/O	CAN_L bus line
	3	CAN_GND	-	CAN ground
	4	NC	-	No connection
	5	(CAN_SHLD)	-	No connection
	6	GND	-	Ground
	7	CAN_H	I/O	CAN_H bus line
	8	NC	-	No connection
	9	NC	-	No connection
	Shell	FG	-	Functional ground

Interfit bracket is #4-40 (UNC).

Chapter 5

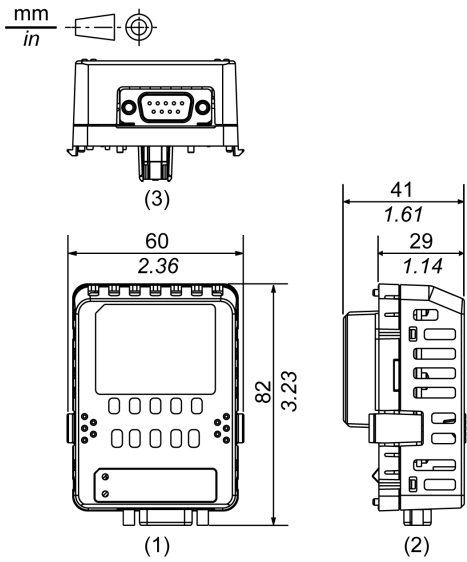
Dimensions

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
External Dimensions	36
Dimensions with Cables	37

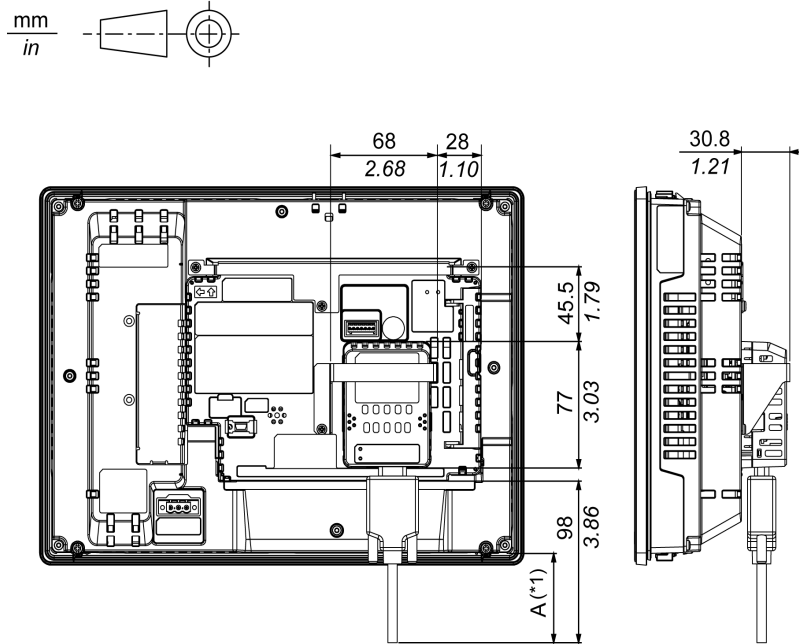
External Dimensions



- 1. Front
- 2. Left
- 3. Bottom

Dimensions with Cables

NOTE: The following illustration is of the SP-5690WA.



1. Rear
2. Left

*1 Refer to the following table for the length of A.

Series		Size	Model name	A
SP5000X Series	eXtreme Display	7 inch Wide	SP-5490WA	95 mm (3.74 in)
		12 inch Wide	SP-5690WA	54 mm (2.13 in)
		15 inch Wide	SP-5790WA	38 mm (1.50 in)
SP5000 Series	Premium Display	10 inch	SP-5500TP	62 mm (2.44 in)
		12 inch	SP-5600TP	49 mm (1.93 in)
			SP-5660TP	
		15 inch	SP-5700TP	22 mm (0.87 in)
		15 inch Wide	SP-5700WC	37 mm (1.46 in)
		19 inch Wide	SP-5800WC	3 mm (0.12 in)
	Advanced Display	7 inch Wide	SP-5400WA	95 mm (3.74 in)
		10 inch Wide	SP-5500WA	70 mm (2.76 in)
		12 inch Wide	SP-5600WA	54 mm (2.13 in)
		12 inch	SP-5600TA	49 mm (1.93 in)

NOTE:

- All the above values are designed with cable bending in mind. The dimensions given here are representative values depending on the type of connection cable in use. Therefore, these values are intended for reference only.
- For information on the dimensions when the Box Module and Display Module are attached together, refer to the SP5000X Series Hardware Manual and SP5000 Series Hardware Manual.

Chapter 6

Installation

Installation

Installation Procedures

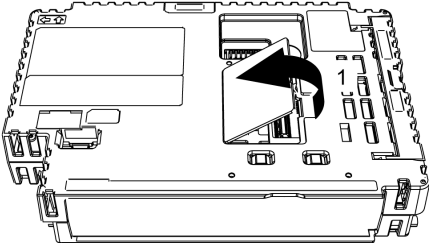
⚠ DANGER

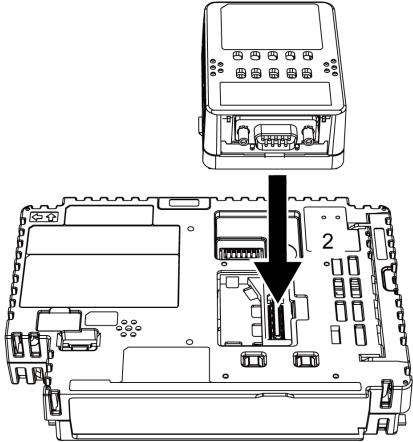
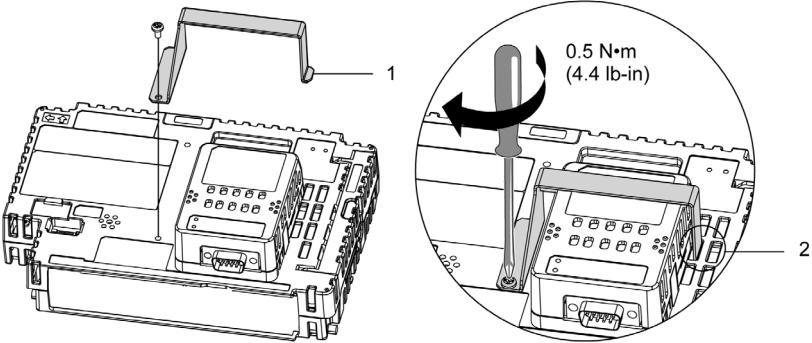
POTENTIAL FOR EXPLOSION

- Verify the power, input, and output (I/O) wiring are in accordance with Class I, Division 2 wiring methods.
- Substitution of any components may impair suitability for Class I, Division 2.
- Do not disconnect equipment while the circuit is live or unless the area is known to be free of ignitable concentrations.
- Remove power before attaching or detaching any connectors to or from this product.
- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration in the environment when making this determination.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.

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

Attaching to Box Module

Step	Action
1	<p>At the rear of the Box Module, open the cover in the direction shown by arrow 1 in the figure below.</p> 

Step	Action
2	<p>As shown by arrow 2, connect the interface at the back of this product to the interface inside the cover.</p> 
3	<p>Continue pressing until you hear a click. Check to make sure this product is fastened securely.</p>
4	<p>Hook the end of the fixing bracket in the ventilation hole on the back of the Box Module and secure with a screw (1 point). The necessary torque is 0.5 N·m (4.4 lb-in).</p>  <p>1. End of the fixing bracket 2. Ventilation hole</p>

NOTICE

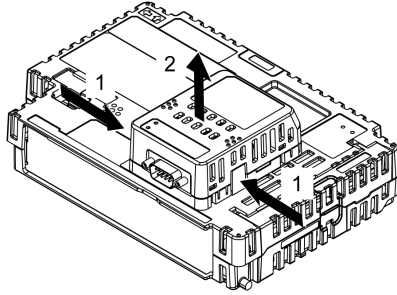
BROKEN ENCLOSURE

Do not exert more than 0.5 N·m (4.4 lb-in) of torque when tightening the screw.

Failure to follow these instructions can result in equipment damage.

Removing from Box Module

Step	Action
1	Remove the fixing bracket.
2	Push and hold the hooks at both sides of this product in the direction shown by the arrows 1, then lift the product as shown by arrow 2 to unfasten it.
3	After removing this product, reattach the cover that you removed during product installation back onto the rear of the Box Module.



Chapter 7

Maintenance

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Regular Cleaning	44
After-sales Service	45

Regular Cleaning

Cleaning this product

<i>NOTICE</i>

EQUIPMENT DAMAGE

- Confirm that power is not supplied to this product before cleaning it.
- Do not use paint thinner, organic solvents, or a strong acid compound to clean the unit.

Failure to follow these instructions can result in equipment damage.

When this product gets dirty, soak a soft cloth in water with a neutral detergent, wring the cloth tightly and wipe this product.

After-sales Service

Information

For details on after-sales service, refer to our website at

<http://www.pro-face.com/trans/en/manual/1001.html>