

SP5000 Series 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 Pro-face nor any of its affiliates or subsidiaries 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 Pro-face 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, 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 Pro-face 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/otasuke/>.

The characteristics presented in this manual 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 manual 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 website "Otasuke Pro" at <http://www.pro-face.com/otasuke/>.

Product Related Information

**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.
- Unplug the power cable from both this product and the power supply.
- 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.
- Use only the specified voltage when operating this product. The DC unit is designed to use 12 to 24 Vdc. Always check whether your device is DC powered before applying power.

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

Critical alarm indicators and system functions require independent and redundant protection hardware and/or mechanical interlocks.

When you cycle power, wait at least 10 seconds after it has been turned off. If this product is restarted too quickly, it may not operate correctly.

In the event the screen cannot be properly read, for example, if the backlight is not functioning, 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 possibility of the backlight no longer functioning and the operator being unable to control the machine or making mistakes in the control of the machine.

WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop, power outage and restart.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
- Observe all accident prevention regulations and local safety guidelines.
- Each implementation of this product must be individually and thoroughly tested for proper operation before being placed into service.
- The machine control system design must take into account the possibility of the backlight no longer functioning and the operator being unable to control the machine, or making errors in the control of the machine.

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.

NOTE: Open Box is a highly configurable device and is not based on a real-time operating system. Changes to the software and settings of the following must be considered new implementations as discussed in the previous warning messages. Examples of such changes include:

- System BIOS
- Operating System
- Installed hardware
- Installed software

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.

WARNING

UNINTENDED EQUIPMENT OPERATION

- Do not use this product as the only means of control for critical system functions such as motor start/stop or power control.
- Do not use this equipment as the only notification device for critical alarms, such as device overheating or overcurrent.
- Use only the software provided with this product. If you use another software, please confirm the operation and safety before use.

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

The following characteristics are specific to the LCD panel and are considered normal behavior:

- LCD screen may show unevenness in the brightness of certain images or may appear different when seen from outside the specified viewing angle. Extended shadows, or crosstalk may also appear on the sides of screen images.
- LCD screen pixels may contain black and white colored spots and color display may seem to have changed.
- When the same image is displayed on the screen for a long period, an afterimage may appear when the image is changed.
- The panel brightness may decrease when used for a long time in an environment continuously filled with inert gas. To prevent deterioration of panel brightness, regularly ventilate the panel. For more information, please contact your local distributor.
<http://www.pro-face.com/trans/en/manual/1015.html>

NOTE: Change the screen image periodically and try not to display the same image for a long period of time.

CAUTION

SERIOUS EYE AND SKIN INJURY

The liquid in the LCD panel contains an irritant:

- Avoid direct skin contact with the liquid.
- Wear gloves when you handle a broken or leaking unit.
- Do not use sharp objects or tools in the vicinity of the LCD panel.
- Handle the LCD panel carefully to prevent puncture, bursting, or cracking of the panel material.
- If the panel is damaged and any liquid comes in contact with your skin, immediately rinse the area with running water for at least 15 minutes. If the liquid gets in your eyes, immediately rinse your eyes with running water for at least 15 minutes and consult a doctor.

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

Chapter 1

Overview

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Model Number Configuration	14
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Package Contents	16
Certifications and Standards	18
Federal Communication Commission Radio Frequency Interference Statement - For USA	20
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Model Number Configuration

The following describes the configuration of model numbers.

Box Module

Digit Position	1	2	3	4	5	6	7	8	9
	P	F	X	(model)		(series)	(-)	(class)	
				SP		5	B: BOX	10: Power 40: Open	

Display Module

Digit Position	1	2	3	4	5	6	7	8	9	10	11	12
	P	F	X	(model)		(series)	(size)	(type)		(LCD)	(touch panel)	(power supply)
				SP		5	4: 7" 5: 10.1"/ 10.4" 6: 12.1" 7: 15"	00: Normal 60: Wireless LAN		T: TFT W: Wide TFT	A: Analog P: Multi	D: DC

Model Numbers

Series		Model Names	Model Numbers
SP5000 Series	Power Box	SP-5B10	PFXSP5B10
	Open Box	SP-5B40	PFXSP5B40
	Premium Display	SP-5500TP	PFXSP5500TPD
		SP-5600TP	PFXSP5600TPD
		SP-5660TP	PFXSP5660TPD
		SP-5700TP	PFXSP5700TPD
	Advanced Display	SP-5400WA	PFXSP5400WAD
		SP-5500WA	PFXSP5500WAD
		SP-5600WA	PFXSP5600WAD

NOTE: You can connect any Display Module to any Box Module.

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.

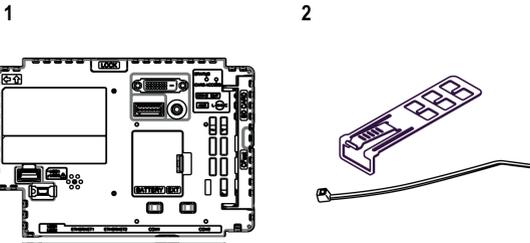
<http://www.pro-face.com/product/globalcode.html>

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.

Box Module

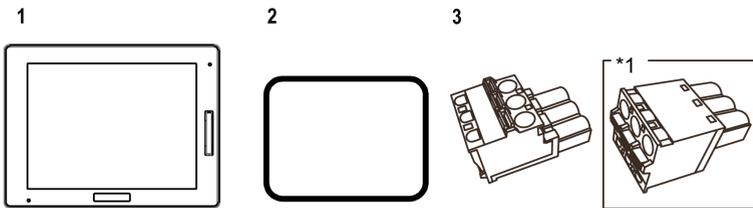
Verify all items listed here are present in your package:



- 1 SP5000 Series Box Module: 1
- 2 USB Clamp Type A (1 port): 2 sets for Power Box, 3 sets for Open Box (1 clip and 1 tie)
- 3 SP5000 Series (Box Module) Installation Guide: 1
- 4 Warning/Caution Information: 1
- 5 End-user License Agreement (only for Open Box): 2

Display Module

Verify all items listed here are present in your package:

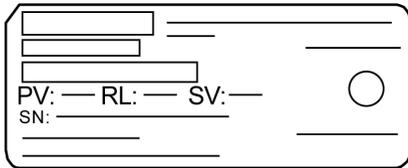
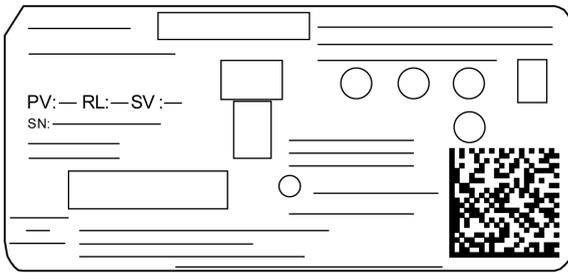


- 1 SP5000 Series Display Module: 1
- 2 Installation Gasket: 1 (attached to this product)
- 3 DC Power Supply Connector (Right-angle*1): 1
- 4 SP5000 Series (Display Module) Installation Guide: 1
- 5 Warning/Caution Information: 1

*1 Straight type for SP-5400WA

Revision

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



Certifications and Standards

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

For information on certifications and standards, such as certified models and certificates, see the product markings or the following URL.

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

Agency Certifications

Pro-face submitted this product for independent testing and qualification by third-party listing agencies. These agencies have certified this product as meeting the following standards.

- Underwriters Laboratories Inc., UL 508 and CSA C22.2 N^o142, Industrial Control Equipment
- Underwriters Laboratories Inc., ANSI/ISA 12.12.01 and CSA C22.2 N^o213, Electrical Equipment for Use in Class I, Division 2 Hazardous (Classified) Locations
- IECEx / ATEX for use in zones 2/22
- GOST-R or EAC certification (Russia, Belarus, Kazakhstan)
- American Bureau of Shipping (ABS)
- Bureau Veritas (BV)
- China Classification Society (CCS)
- Det Norske Veritas (DNV)
- Germanischer Lloyd (GL)
- Lloyd's Register (LR)
- Registro Italiano Navale (RINA)
- Nippon Kaiji Kyokai (NK)

Compliance Standards

Europe:

CE

- Directive 2006/95/EC (Low Voltage)
- Directive 2004/108/EC (EMC)
 - Programmable Controllers: EN 61131-2 (ED 3)
 - EN61000-6-4
 - EN61000-6-2
- Directive 94/9/EC (ATEX)
 - EN60079-0
 - EN60079-15
 - EN60079-31
- Directive 1995/5/EC (RTTE)
 - EN300 328
 - EN301 489
 - EN60950-1

Australia

- RCM
 - EN61000-6-4

Korea

- KC
 - KN11
 - KN61000-4 series

Qualifications Standards

Pro-face voluntarily tested this product to additional standards. The additional tests performed, and the standards under which the tests were conducted, are specifically identified in Structural Specifications (see page 60).

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
- RoHS China, Standard SJ/T 11363-2006
- REACH regulation EC 1907/2006

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 ANSI/ISA 12.12.01 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 ANSI/ISA 12.12.01 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 ANSI/ISA 12.12.01 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 ANSI/ISA 12.12.01 or CSA C22.2 N°213 hazardous location rating of your device before installing or using it in a hazardous location.
- To apply or remove the supply power from this product installed in a Class I, Division 2 hazardous location, you must either:
 - Use a switch located outside the hazardous environment, or;
 - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- 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.
- Use only non-incendiary USB devices.
- 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.

 **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.
- Unplug the power cable from both this product and the power supply.
- 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.
- Use only the specified voltage when operating this product. The DC unit is designed to use 12 to 24 Vdc. Always check whether your device is DC powered before applying power.

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, observe the following rules 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.
- Install this product in an enclosure suitable for the specific application. IP65F, IP66F, IP67F, Type 1, Type 4X [Indoor Use Only], or Type 13 enclosures are recommended even when not required by regulations.

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

NOTE: IP65F, IP66F and IP67F are not part of UL certification.

European (CE) Compliance

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	사 용 자 안 내 문
A급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Wireless LAN Information

Wireless LAN Information

USA

SP-5660TP contains Transmitter Module FCC ID: N6C-SDMGN.

FCC CAUTION

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the 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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65. This equipment should be installed and operated keeping the radiator at least 20 cm or more away from person's body (excluding extremities: hands, wrists, feet and ankles).

Canada

SP-5660TP contains Transmitter Module IC: 4908B-SDMGN.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the IC radio frequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 20 cm or more away from person's body (excluding extremities: hands, wrists, feet and ankles).

Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'IC. Cet équipement doit être installé et utilisé en gardant une distance de 20 cm ou plus entre le dispositif rayonnant et le corps (à l'exception des extrémités : mains, poignets, pieds et chevilles).

Europe



EN300 328, EN301 489, EN60950-1

SP-5660TP may be operated in Belgium, Bulgaria, Czech Republic, Denmark, Germany, Estonia, Greece, Spain, France, Ireland, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Malta, Hungary, Netherlands, Austria, Poland, Portugal, Romania, Slovak Republic, Slovenia, Finland, Sweden, United Kingdom.

EN	Hereby, Pro-face, declares that this SP-5660TP is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
BG	С настоящето, Pro-face, декларира, че SP-5660TP е в съответствие със съществените изисквания и другитеприложими разпоредби на Директива 1999/5/EC.
CS	Pro-face tímto prohlašuje, že SP-5660TP splňuje základní požadavky a všechna příslušná ustanovení Směrnice 1999/5/ES.
DA	Undertegnede Pro-face erklærer herved, at følgende udstyr SP-5660TP overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
DE	Hiermit erkläre Pro-face, dass sich das Gerät SP-5660TP in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
ET	Käesolevaga kinnitab Pro-face seadme SP-5660TP vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
EL	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ Ο ΚΑΤΑΣΚΕΥΑΣΤΗΣ Pro-face ΔΗΛΩΝΕΙ ΟΤΙ SP-5660TP ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΠΙΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ ΕΚ

ES	Por la presente, Pro-face, declara que este SP-5660TP cumple con los requisitos esenciales y otras exigencias relevantes de la Directiva 1999/5/EC.
FR	Par la présente, Pro-face déclare que l'appareil SP-5660TP est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
IT	Con la presente Pro-face dichiara che questo SP-5660TP è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
LV	Ar šo Pro-face deklarē, ka SP-5660TP atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
LT	Šiuo Pro-face deklaruoja, kad šis SP-5660TP atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas
HU	A Pro-face ezzennel kijelenti, hogy a SP-5660TP típusú beren-dezés teljesíti az alapvető követelményeket és más 1999/5/EK irányelvben meghatározott vonatkozó rendelkezéseket.
NL	Hierbij verklaart Pro-face dat het toestel I SP-5660TP in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
PL	Niniejszym Pro-face deklaruje że SP-5660TP jest zgodny z zasadniczymi wymaganiami i innymi właściwymi postanowieniami Dyrektywy 1999/5/EC.
PT	Eu, Pro-face, declaro que o SP-5660TP cumpre os requisitos essenciais e outras provisões relevantes da Directiva 1999/5/EC.

RO	Prin prezenta, Pro-face, declară că aparatul SP-5660TP este în conformitate cu cerințele esențiale și cu alte prevederi pertinente ale Directivei 1999/5/CE.
SK	Pro-face týmto vyhlasuje, že SP-5660TP spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
SL	Pro-face izjavlja, da je ta SP-5660TP v skladu z bistvenimi zahtevami in drugimi relevantnimi določili direktive 1999/5/ES.
FI	Pro-face vakuuttaa täten että SP-5660TP tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
SV	Denna utrustning är i överensstämmelse med de väsentliga kraven och andra relevanta bestämmelser i direktiv 1999/5/EC.

China

1. SP-5660TP 的使用方法

- 使用频率：2.4 - 2.4835 GHz
等效全向辐射功率(EIRP)：
天线增益 < 10dBi时：≤100 mW 或≤20 dBm
- 最大功率谱密度：
天线增益 < 10dBi时：≤10 dBm / MHz(EIRP)
- 载频容限：20 ppm
- 带外发射功率(在2.4-2.4835GHz频段以外) ≤-80 dBm / Hz (EIRP)
- 杂散发射(辐射)功率(对应载波±2.5倍信道带宽以外)：
 - ≤-36 dBm / 100 kHz (30 - 1000 MHz)
 - ≤-33 dBm / 100 kHz (2.4 - 2.4835 GHz)
 - ≤-40 dBm / 1 MHz (3.4 - 3.53 GHz)
 - ≤-40 dBm / 1 MHz (5.725 - 5.85 GHz)
 - ≤-30 dBm / 1 MHz (其它1 - 12.75 GHz)

2.

不得擅自更改发射频率、加大发射功率(包括额外加装射频功率放大器)，
不得擅自外接天线或改用其它发射天线；

3.使用时不得对各种合法的无线电通信业务产生有害干扰；一旦发现有害干扰现象时，应立即停止使用，并采取措施消除干扰后方可继续使用；

4.使用微功率无线电设备，必须忍受各种无线电业务的干扰或工业、科学及医疗应用设备的辐射干扰；

5.不得在飞机和机场附近使用。

Korea

해당 무선설비는 운용 중 전파혼신 가능성이 있음

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.

해당 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없습니다

Taiwan

低功率電波輻射性電機管理辦法

第十二條

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Japan

SP-5660TP には、認証済み無線機器を搭載しています。

Chapter 2

Device Connectivity

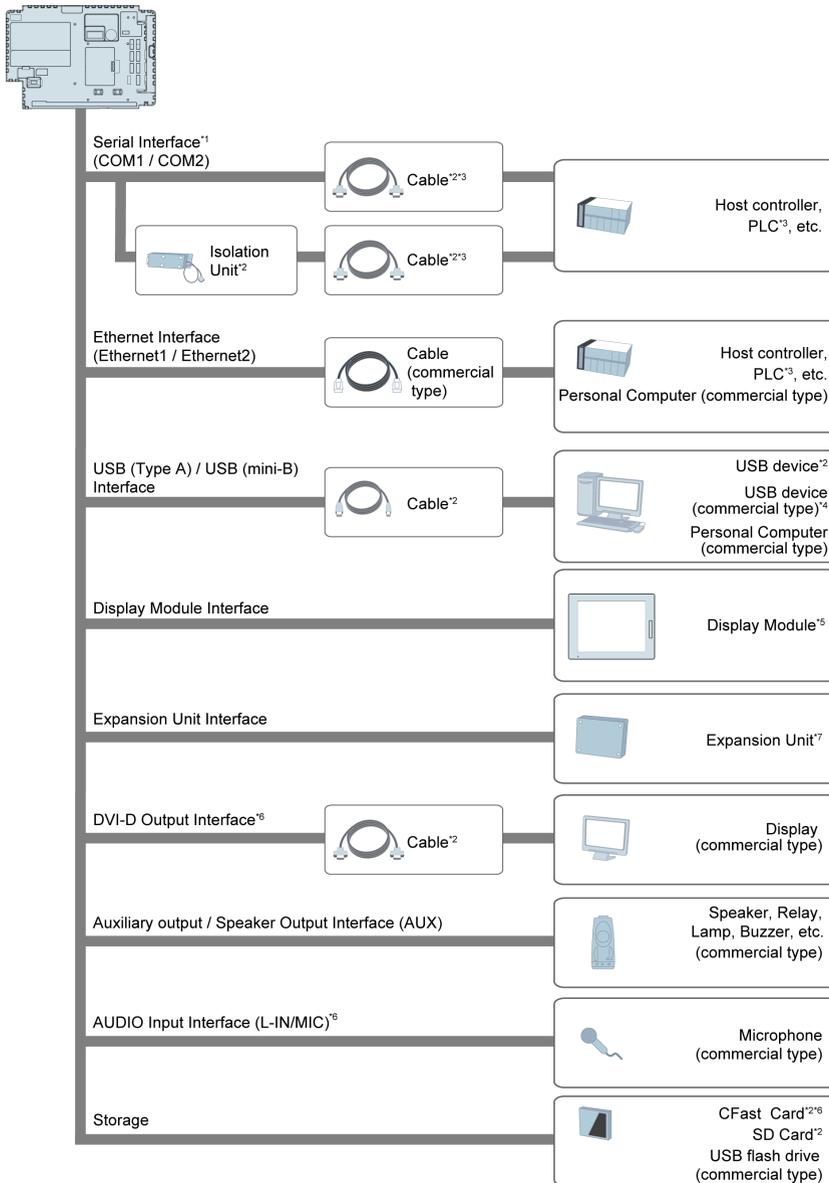
What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
System Design	32
Accessories	34

System Design

Box Module



*1 In order to use this as an isolation port, Isolation Unit is required. To use RS-232C isolation unit, set the #9 pin of the COM port to VCC.

*2 Refer to Accessories (see page 34).

*3 For information on how to connect controllers and other types of equipment, refer to the corresponding device driver manual of your screen editing software.

*4 For supported models, refer to Pro-face's support site "Otasuke Pro!" (<http://www.proface.com/otasuke/>).

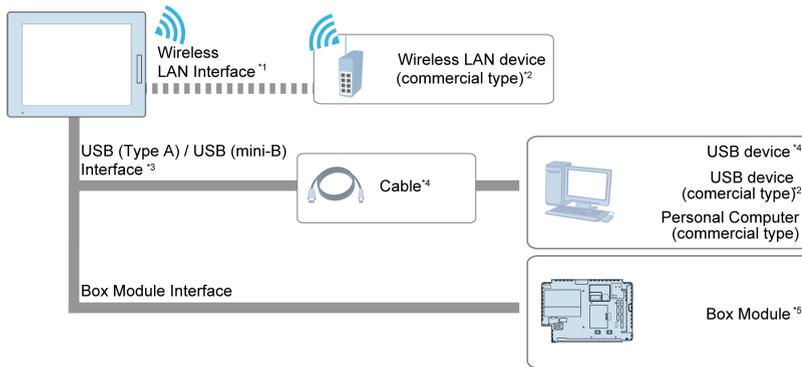
*5 Refer to the Model Numbers (see page 15).

*6 Only for Open Box.

*7 For supported models, refer to Pro-face's website (<http://www.pro-face.com/>).

NOTE: When working with the Open Box, refer to both this manual and the SP5000 Series Open Box Reference Manual.

Display Module



*1 Only for Wireless LAN model (see page 14).

*2 For supported models, refer to Pro-face's support site "Otasuke Pro!" (<http://www.pro-face.com/otasuke/>).

*3 Only for Premium Display. Refer to the Model Numbers (see page 15).

*4 Refer to Accessories (see page 34).

*5 Refer to the Model Numbers (see page 15).

NOTE: When using wireless LAN models with the Open Box, for the wireless LAN settings, refer to the SP5000 Series Open Box Wireless LAN Setting Manual. When using wireless LAN models with the Power Box, refer to your screen editing software manual.

Accessories

For host controllers and connection cables, refer to the corresponding device driver manual of your screen editing software.

Product Name		Product Number	Supported Product	Description
Serial Interface	9-pin-to-25-pin RS-232C Conversion Cable (0.2 m)	CA3-CBLCBT232-01	Box Module	Cable for converting a D-Sub 9-pin plug to a D-Sub 25-pin socket (RS-232C).
	RS-422 9/25-pin Conversion Cable (0.2 m)	PFXZCBCBCVR41	Box Module	Cable for converting a D-Sub 9-pin plug to a D-Sub 25-pin socket (RS-422).
	COM Port Conversion Adapter	CA3-ADPCOM-01	Box Module	Connects optional RS-422 communication items to Serial Interface.
	RS-422 Terminal Block Conversion Adapter	PFXZCBADTM1	Box Module	Connects output from a Serial Interface (D-sub 9 pin plug) directly to an RS-422 terminal block.
	RS-232C Isolation Unit	CA3-ISO232-01	Box Module	Connects a host controller to this product and provides isolation. (RS-232C and RS-422 are switchable).

Product Name		Product Number	Supported Product	Description
USB (Type A) Interface	USB Transfer Cable (2 m) ^{*1*3}	CA3-USBCB-01	Box Module Premium Display	Downloads project data via USB Interface.
	USB Cable (5 m)	FP-US00	Box Module	Connects a USB printer (Type B).
	USB Front Cable (1 m)	CA5-USBEXT-01	Box Module	Extension cable attaching USB interface to front panel.
	USB-Serial (RS-232C) Conversion Cable (0.5 m)	CA6-USB232-01	Power Box	Cable for converting a USB interface into a serial interface (RS-232C). Allows connection to modems ^{*2} or bar code readers ^{*2} that support RS-232C.
	USB/RS-422/485 Conversion Adapter	PFXZCBCBCVUSR41	Power Box	Adapter for connecting this product (USB Type A) to an external device (RS-422/RS-485).
	EZ Illuminated Switch ^{*3}	PFXZCCEUSG1	Power Box	A unit of 5 illuminated switches with multiple color LED connected to this product via USB.
	EZ Fingerprint Recognition Unit ^{*3}	PFXZCCEUSS1	Box Module	Fingerprint recognition unit connected to this product via USB.
	EZ Numpad ^{*3}	PFXZCCEUKB1	Box Module Premium Display	Numpad connected to this product via USB.
	EZ Tower Light tube mounting with fixing plate	PFXZCETWHA1	Box Module	USB Connection Type Monolithic EZ Tower Light tube mounting with fixing plate 3 tiers, Ø60, lighting and flashing with a buzzer
	EZ Tower Light with base mounting	PFXZCETWW1	Box Module	USB Connection Type Monolithic EZ Tower with base mounting 3 tiers, Ø60, lighting and flashing with a buzzer
USB (mini-B) Interface	USB Transfer Cable (USB Type A/mini-B) (1.8 m) ^{*1}	ZC9USCBMB1	Box Module Premium Display	Cable for transferring screen data from a PC (USB Type A) to this product (USB mini-B).
	USB Panel-mount Extension Cable (USB mini-B) (1 m)	ZC9USEXMB1	Box Module	Extension cable that attaches to the USB (mini-B) interface on the front side of the operation panel.
	USB Clamp mini-B (1 port)	ZC9USCLMB1	Box Module	Clamp to prevent disconnection of USB cable (USB/mini-B, 1 port, 5 clamps/set).
DVI-D Output Interface	DVI-D Cable (5 m)	FP-DV01-50	Open Box	DVI-D cable used to send the image signal from this product to Pro-face's flat panel displays and other commercial-type displays. DVI 1.0 compliant (DVI-D 24-pin plug) (5 m).

Product Name		Product Number	Supported Product	Description
Auxiliary output/Speaker Output Interface	AUX Connector	PFXZCDCNAUX1	Box Module	AUX connector required in case an external output is used (5 pcs/set).
Storage	SD Memory Card (4 GB) ^{*4*5}	PFXZCBSD4GC41	Box Module	SD Memory Card (4 GB, MLC, CLASS 4)
	CFast (32 GB) ^{*4}	PFXZCDSCCFA321	Open Box	CFast Card (32 GB, SLC) for CFast Card Slot (Storage)
10.4-inch Screen Protection Sheet		PFXZCBDS101	10.4-inch Display Module	Disposable, dirt-resistant sheet for the display (5 sheets/set)
12.1-inch Screen Protection Sheet		CA7-DFS12-01	12.1-inch Display Module	
15-inch Screen Protection Sheet		CA3-DFS15-01	15-inch Display Module	
7.0-inch Wide Screen Protection Sheet		PFXZCBDS72	7.0-inch Wide Display Module	
10.1-inch Wide Screen Protection Sheet		PFXZCDDS102	10.1-inch Wide Display Module	
12.1-inch Wide Screen Protection Sheet		PFXZCDDS122	12.1-inch Wide Display Module	
Panel Cutout Adapter		CA4-ATM10-01	10.4-inch Display Module	
Panel Cutout Adapter		PFXZCDAT72	7.0-inch Wide Display Module	Panel cutout adapter for mounting 7.0-inch Wide Display Module in cutout for GP-2400, GP-3400, and GP-4400 Series.
10.4-inch Environment Cover		PFXZCDOP101	10.4-inch Display Module	Environmental resistant cover for the display (1 piece)
12.1-inch Environment Cover		PFXZCDOP121	12.1-inch Display Module	
15-inch Environment Cover		PFXZCDOP151	15-inch Display Module	
Enhanced Front USB Cover (With Screw)		PFXZCDCVUS1	Premium Display	Front USB cover with fixing screw, corresponding to IP66F, IP67F, Type 1/4X Indoor Use Only/13 or ATEX certifications (5 pieces/set)
Battery for Memory Backup		PFXZCBBT1	Box Module	Primary battery for time data backup (1 piece)

- *1 You can connect using just one of the available USB interfaces.
- *2 For supported models, refer to Pro-face's support site "Otasuke Pro!" (<http://www.pro-face.com/otasuke/>).
- *3 Make sure your screen editing software supports the product.
- *4 You can also use a commercial type.
- *5 SD/SDHC card of up to 32 GB.

Maintenance Accessories

Product Name	Product Number	Supported Product	Description
10.4-inch Installation Gasket	PFXZCDWG101	10.4-inch Display Module	Provides dust and moisture resistance when this product is installed into a solid panel (1 piece)
12.1-inch Installation Gasket	PFXZCDWG121	12.1-inch Display Module	
15-inch Installation Gasket	PFXZCDWG151	15-inch Display Module	
7.0-inch Wide Installation Gasket	PFXZCDWG72	7.0-inch Wide Display Module	
10.1-inch Wide Installation Gasket	PFXZCDWG102	10.1-inch Wide Display Module	
12.1-inch Wide Installation Gasket	PFXZCDWG122	12.1-inch Wide Display Module	
USB Clamp Type A (1 port)	PFXZCBCLUSA1	Box Module	Clamp to prevent disconnection of USB cable (USB/A, 1 port, 5 clamps/set)
DC Power Supply Connector	PFXZCBCNDC1	Display Module	Connector to connect DC power supply cables
DC Power Supply Connector (Right-angle)	PFXZCBCNDC2	Display Module (except 7.0-inch Wide Display Module)	Right-angle connector to connect DC power supply cables (5 pcs/set)
SD Memory Card (1 GB)	PFXZCDS1GC61	Power Box	SD System Card (1 GB, SLC, CLASS 6)
CFast (16 GB)	PFXZCDSCCFA162	Open Box	CFast System Card (16 GB, MLC)

Chapter 3

Parts Identification and Functions

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
3.1	Box Module	40
3.2	Display Module	46

Section 3.1

Box Module

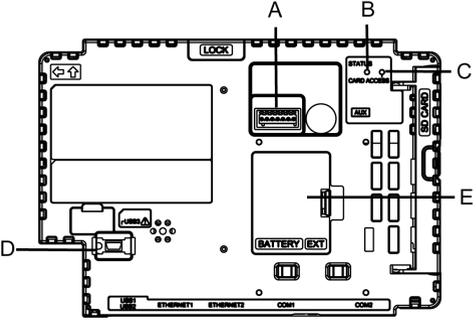
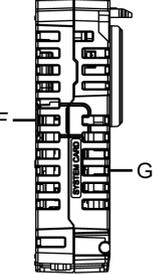
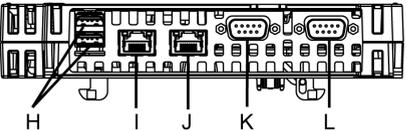
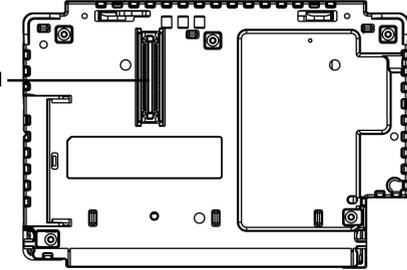
What Is in This Section?

This section contains the following topics:

Topic	Page
Power Box	41
Open Box	43
LED Indications	45

Power Box

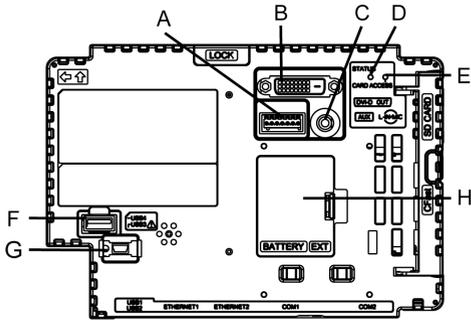
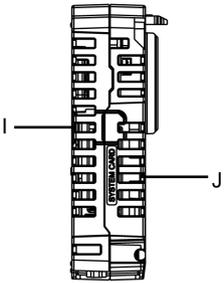
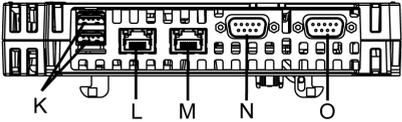
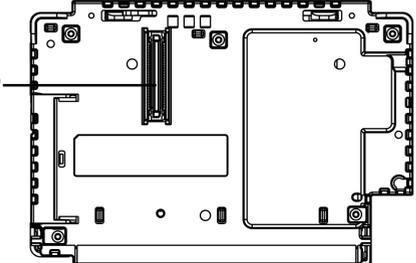
SP-5B10

Side	SP-5B10
Front	 <p>Diagram of the front view of the SP-5B10 Power Box. Labels A through E point to various components: A points to the battery compartment, B points to the battery cover, C points to the battery cover latch, D points to the battery cover release, and E points to the battery cover latch mechanism. Other visible components include a LOCK button, a BATTERY (EXT) label, and various ports at the bottom labeled ETHERNET1, ETHERNET2, COM1, and COM2.</p>
Right	 <p>Diagram of the right side view of the SP-5B10 Power Box. Label F points to the battery cover latch mechanism, and label G points to the battery cover latch mechanism.</p>
Bottom	 <p>Diagram of the bottom view of the SP-5B10 Power Box. Labels H through L point to various ports and connectors: H points to the USB port, I points to the Ethernet port, J points to the Ethernet port, K points to the COM1 port, and L points to the COM2 port.</p>
Rear	 <p>Diagram of the rear view of the SP-5B10 Power Box. Label M points to the battery cover latch mechanism.</p>

Part	Name	Description
A	Auxiliary Output/Speaker Output Interface (AUX)	This interface is Alarm Output or Buzzer Output, and Sound Output.
B	Status LED	<i>(see page 45)</i>
C	Card Access LED	<i>(see page 45)</i>
D	USB (mini-B) Interface	Conforms to USB2.0 (mini-B) x 1. Maximum transmission distance: 5 m (16.4 ft)
E	Expansion Unit Interface Cover (EXT)	The Expansion Unit can be embedded in the Expansion Unit Interface Cover opening, and Battery for Memory Backup can be connected or replaced.
F	Storage Card Cover	The SD Card is located in the Storage Card Cover opening.
G	System Card Cover	The system card is located in the System Card Cover opening. You cannot open this cover when the Box Module is in operation.
H	USB (Type A) Interface	Conforms to USB2.0 (Type A) x 2. Power supply voltage: 5 Vdc+/-5% Maximum current supplied: 500 mA Maximum transmission distance: 5 m (16.4 ft)
I	Ethernet Interface (Ethernet1)	Ethernet transmission interface (10BASE-T/100BASE-TX/100BASE-T) Connector: Modular jack (RJ-45) x 1
J	Ethernet Interface (Ethernet2)	Ethernet transmission interface (10BASE-T/100BASE-TX/100BASE-T) Connector: Modular jack (RJ-45) x 1
K	Serial Interface (COM1)	RS-232C/422/485 Serial Interface (you can switch the communication method via software). Connector: D-Sub 9 pin (plug) x 1
L	Serial Interface (COM2)	RS-232C/422/485 Serial Interface (you can switch the communication method via software.) Connector: D-Sub 9 pin (plug) x 1
M	Display Module Interface	Interface that connects the Display Module and Box Module.

Open Box

SP-5B40

Side	SP-5B40
Front	 <p>A detailed technical drawing of the front panel of the SP-5B40 device. The drawing shows the internal layout of the device with various components labeled with letters A through H. A 'LOCK' mechanism is indicated near the top center. On the right side, there are several ports labeled 'ETHERNET', 'COM1', and 'COM2'. A 'BATTERY (EXT)' compartment is shown in the lower central area. Other labels include 'F' and 'G' near the bottom left, and 'E' near the top right.</p>
Right	 <p>A technical drawing showing the right side of the SP-5B40 device. It highlights the edge connector area, which is labeled with 'I' and 'J'. The drawing shows the physical arrangement of the pins and connectors on the side of the device.</p>
Bottom	 <p>A technical drawing of the bottom of the SP-5B40 device. It shows the connector area with labels K through O. The drawing illustrates the layout of the connectors and the internal components visible from this perspective.</p>
Rear	 <p>A technical drawing of the rear of the SP-5B40 device. It shows the internal layout of the device, including the main board and various components. A connector labeled 'P' is shown on the left side. The drawing provides a clear view of the internal structure and the placement of various parts.</p>

Part	Name	Description
A	Auxiliary Output/Speaker Output Interface (AUX)	This interface is Alarm Output or Buzzer Output, and Sound Output.
B	DVI-D Output Interface	DVI-D Output Interface
C	AUDIO Input Interface (L-IN/MIC)	This interface connects a microphone. Use for mini jack connector (Ø3.5 mm [0.14 in]).
D	Status LED	(see page 45)
E	Card Access LED	(see page 45)
F	USB (Type A) Interface	Conforms to USB2.0 (Type A) x 1. Power supply voltage: 5 Vdc+/-5% Maximum current supplied: 500 mA Maximum transmission distance: 5 m (16.4 ft)
G	USB (mini-B) Interface	Conforms to USB2.0 (mini-B) x 1. Maximum transmission distance: 5 m (16.4 ft)
H	Expansion Unit Interface Cover (EXT)	The Expansion Unit can be embedded in the Expansion Unit Interface Cover opening, and Battery for Memory Backup can be connected or replaced.
I	Storage Card Cover	The SD and CFast Card are located in the Storage Card Cover opening.
J	System Card Cover	The system card is located in the System Card Cover opening. Do not open this cover when the Box Module is in operation.
K	USB (Type A) Interface	Conforms to USB2.0 (Type A) x 2. Power supply voltage: 5 Vdc+/-5% Maximum current supplied: 500 mA Maximum transmission distance: 5 m (16.4 ft)
L	Ethernet Interface (Ethernet1)	Ethernet transmission interface (10BASE-T/100BASE-TX/1000BASE-T) Connector: Modular jack (RJ-45) x 1
M	Ethernet Interface (Ethernet2)	Ethernet transmission interface (10BASE-T/100BASE-TX/1000BASE-T) Connector: Modular jack (RJ-45) x 1
N	Serial Interface (COM1)	RS-232C/422/485 Serial Interface (you can switch the communication method via software). Connector: D-Sub 9 pin (plug) x 1
O	Serial Interface (COM2)	RS-232C/422/485 Serial Interface (you can switch the communication method via software). Connector: D-Sub 9 pin (plug) x 1
P	Display Module Interface	Interface that connects the Display Module and Box Module.

LED Indications

Status LED

Color	Indicator	SP-5B10		SP-5B40	
		HMI Operation	Logic Program Operation ^{*1}	HMI Operation	Logic Program Operation ^{*1}
Green	ON	Offline	--	Offline	--
		In operation	RUN	In operation	RUN
	Flashing	In operation	STOP	In operation	STOP
Orange	Flashing	Software starting up			
Red	ON	Power is turned ON.			
	Flashing	In operation	Major error	In operation	Major error
Red/Green	Alternating	Display Module connection error.			
Orange/Red	Alternating	SD Card boot error.		--	
--	OFF	Power is turned OFF.			

*1 Only when your screen editing software supports the Logic Program.

Card Access LED

Color	Indicator	SP-5B10	SP-5B40
Green	ON	Storage Card is being accessed.	Storage Card or System Card (OS) is being accessed.
--	OFF	Storage Card is not inserted or accessed.	Storage Card or System Card (OS) is not accessed.

Section 3.2

Display Module

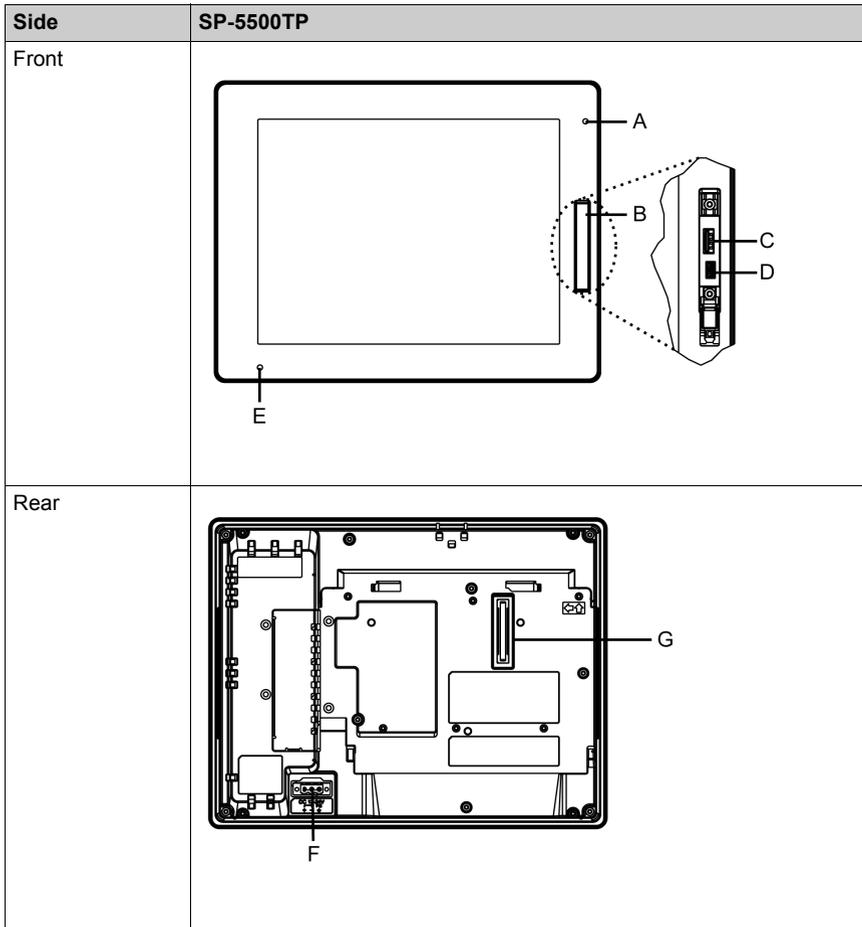
What Is in This Section?

This section contains the following topics:

Topic	Page
Premium Display	47
Advanced Display	50
LED Indications	53

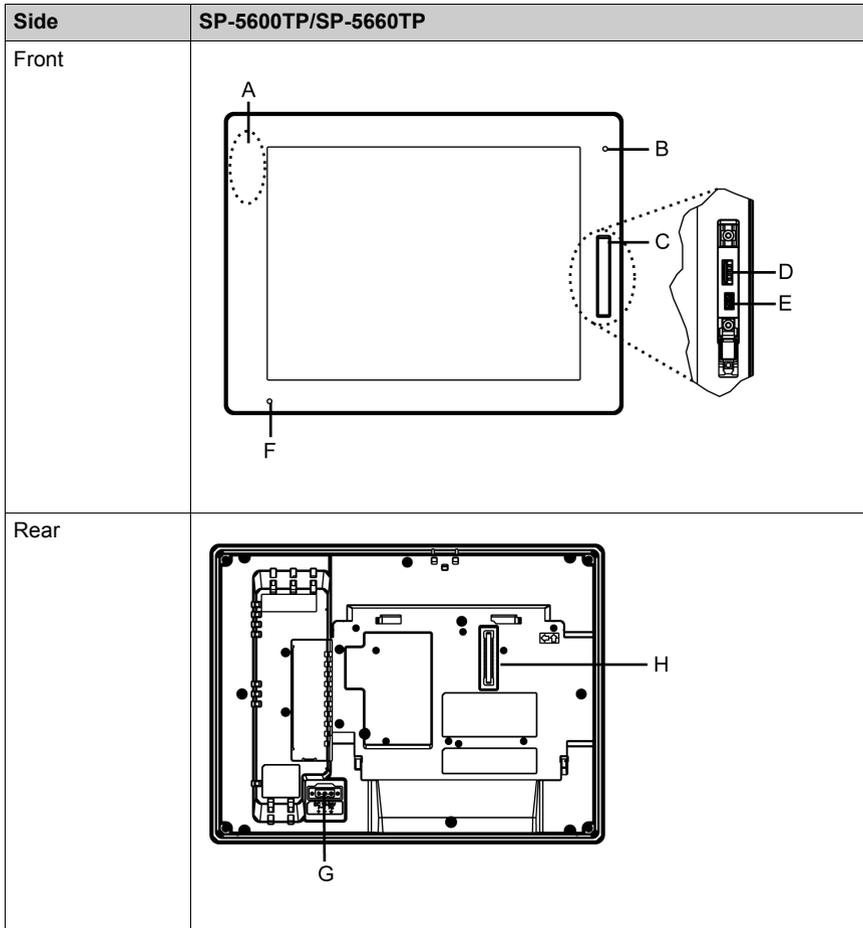
Premium Display

SP-5500TP



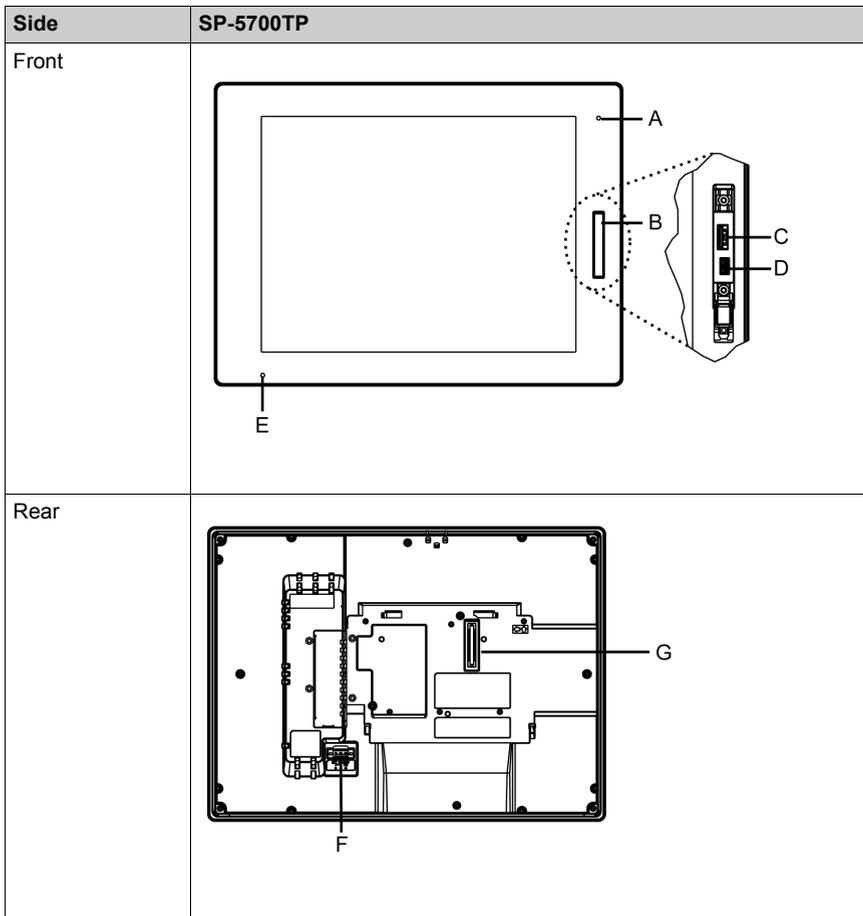
Part	Name	Description
A	Brightness Sensor	Brightness sensor which automatically controls the brightness of the backlight.
B	Front USB Cover	USB (Type A) Interface and USB (mini-B) Interface are located in the Front USB Cover opening.
C	USB (Type A) Interface	Conforms to USB2.0 (Type A) x 1. Power supply voltage: 5 Vdc+/-5% Maximum current supplied: 500 mA Maximum transmission distance: 5 m (16.4 ft)
D	USB (mini-B) Interface	Conforms to USB2.0 (mini-B) x 1. Maximum transmission distance: 5 m (16.4 ft)
E	Status LED	(see page 53)
F	Power Plug Connector	-
G	Box Module Interface	Interface that connects the Display Module and Box Module.

SP-5600TP/SP-5660TP



Part	Name	Description
A	Wireless LAN Antenna	A built-in antenna for wireless LAN (only for SP-5660TP).
B	Brightness Sensor	Brightness sensor which automatically controls the brightness of the backlight.
C	Front USB Cover	USB (Type A) Interface and USB (mini-B) Interface are located in the Front USB Cover opening.
D	USB (Type A) Interface	Conforms to USB2.0 (Type A) x 1. Power supply voltage: 5 Vdc \pm 5% Maximum current supplied: 500 mA Maximum transmission distance: 5 m (16.4 ft)
E	USB (mini-B) Interface	Conforms to USB2.0 (mini-B) x 1. Maximum transmission distance: 5 m (16.4 ft)
F	Status LED	(see page 53)
G	Power Plug Connector	-
H	Box Module Interface	Interface that connects the Display Module and Box Module.

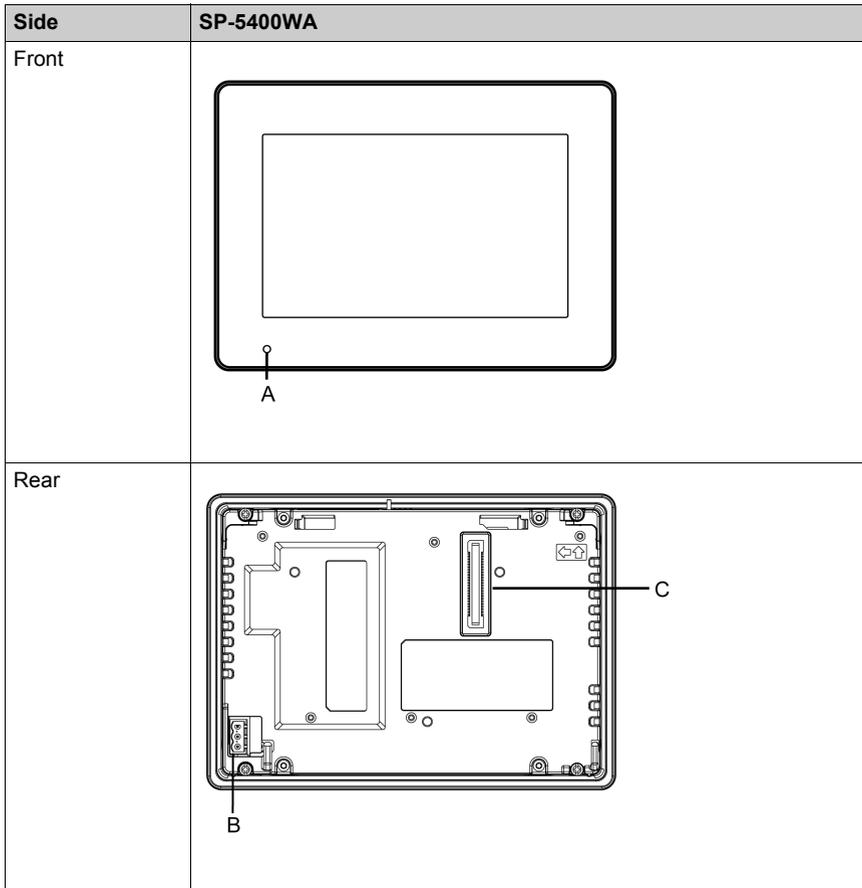
SP-5700TP



Part	Name	Description
A	Brightness Sensor	Brightness sensor to automatically control the brightness of the backlight.
B	Front USB Cover	USB (Type A) Interface and USB (mini-B) Interface are located in the Front USB Cover opening.
C	USB (Type A) Interface	Conforms to USB2.0 (Type A) x 1. Power supply voltage: 5 Vdc+/-5% Maximum current supplied: 500 mA Maximum transmission distance: 5 m (16.4 ft)
D	USB (mini-B) Interface	Conforms to USB2.0 (mini-B) x 1. Maximum transmission distance: 5 m (16.4 ft)
E	Status LED	<i>(see page 53)</i>
F	Power Plug Connector	-
G	Box Module Interface	Interface that connects the Display Module and Box Module.

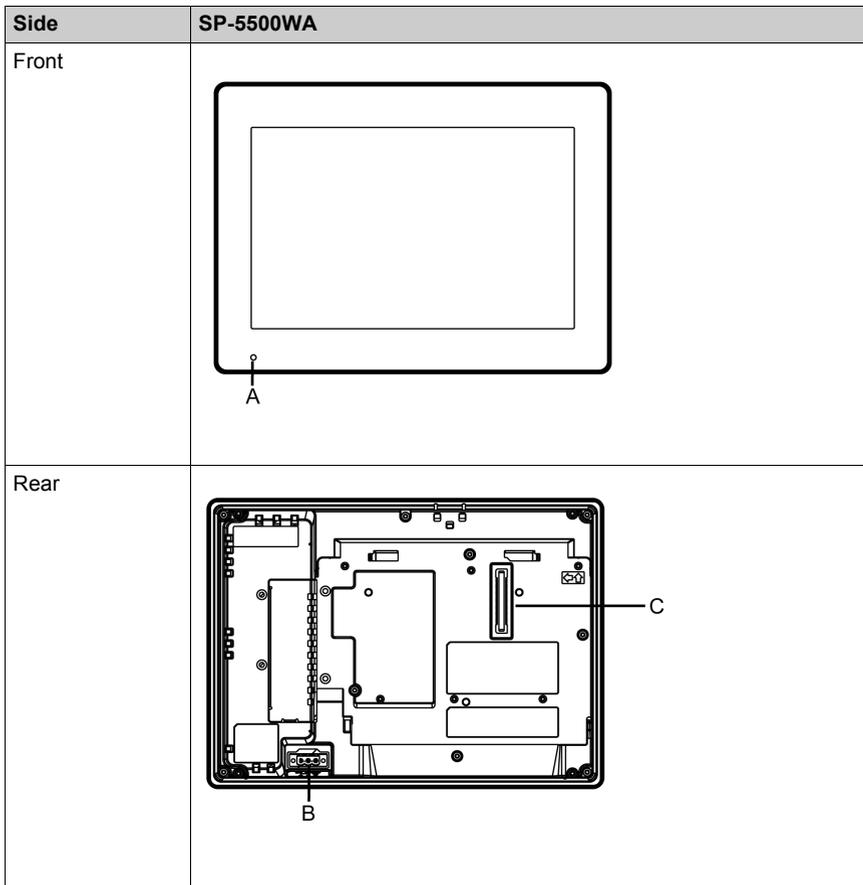
Advanced Display

SP-5400WA



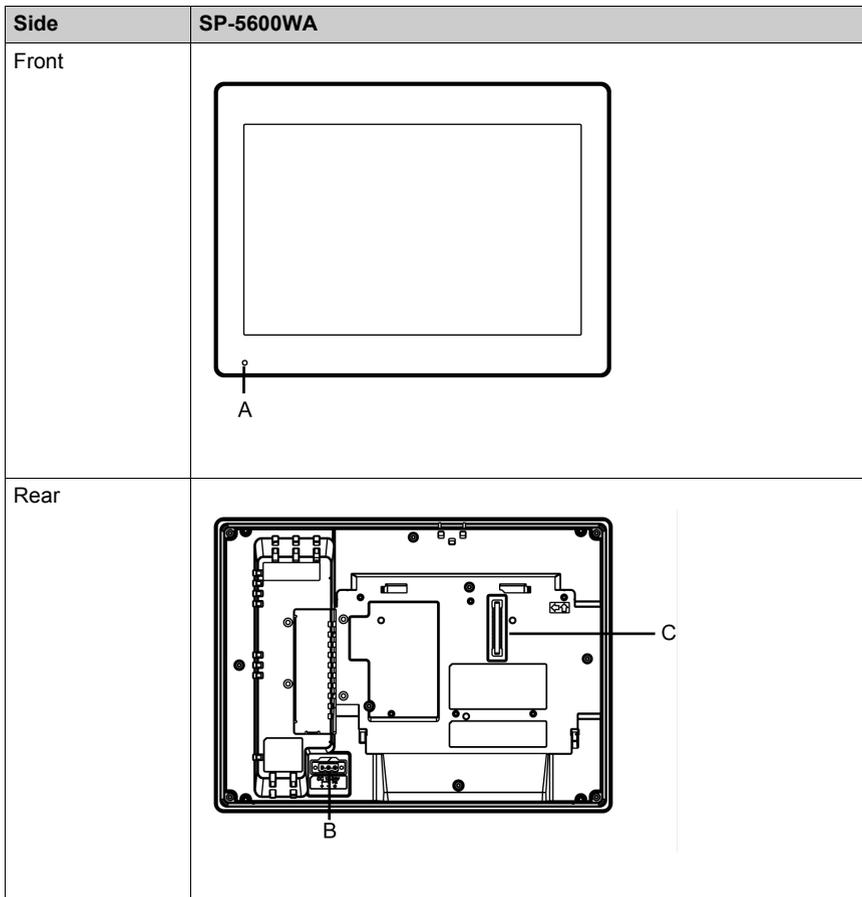
Part	Name	Description
A	Status LED	(see page 53)
B	Power Plug Connector	-
C	Box Module Interface	Interface that connects the Display Module and Box Module.

SP-5500WA



Part	Name	Description
A	Status LED	(see page 53)
B	Power Plug Connector	-
C	Box Module Interface	Interface that connects the Display Module and Box Module.

SP-5600WA



Part	Name	Description
A	Status LED	(see page 53)
B	Power Plug Connector	-
C	Box Module Interface	Interface that connects the Display Module and Box Module.

LED Indications

Status LED

Color	Indicator	Connected to SP-5B10		Connected to SP-5B40	
		HMI Operation	Logic Program Operation ^{*1}	HMI Operation	Logic Program Operation ^{*1}
Green	ON	Offline	--	Offline	--
		In operation	RUN	In operation	RUN
	Flashing	In operation	STOP	In operation	STOP
	LED fade	Backlight OFF (Standby Mode)			
Orange	Flashing	Software starting up			
Red	ON	Power is turned ON.			
	Flashing	In operation	Major error	In operation	Major error
Red/Green	Alternating	Box Module connection error.			
Orange/Red	Alternating	SD Card boot error.		--	
Orange/Red/ Green	Alternating	Display Module connection error.			
--	OFF	Power is turned OFF.			

*1 Only when your screen editing software supports the Logic Program.

NOTE: When the SP-5B40 is connected, even if its operating system is shut down, the status LED on the Display Module will display red if connected to a power supply.

Chapter 4

Specifications

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
4.1	General Specifications	56
4.2	Functional Specifications	63
4.3	Interface Specifications	68

Section 4.1

General Specifications

What Is in This Section?

This section contains the following topics:

Topic	Page
Electrical Specifications	57
Environmental Specifications	59
Structural Specifications	60

Electrical Specifications

NOTE: The power consumption for the combined unit of Box Module and Display Module equals the sum of power consumption of the two modules.

Box Module

Specification		SP-5B10	SP-5B40	
Power Supply	Rated Input Voltage	12 Vdc (Supply from Display Module)		
	Power Consumption (Primary Power Supply (including power loss))	Max	25 W	35 W
		When power is not supplied to external devices	12.5 W or less	22.5 W or less

Display Module

Specification		SP-5500TP	SP-5600TP	SP-5660TP	SP-5700TP	
Power Supply	Rated Input Voltage	12...24 Vdc				
	Input Voltage Limits	10.8...28.8 Vdc				
	Voltage Drop	12 Vdc: 1.25 ms or less 24 Vdc: 5 ms or less				
	Power Consumption (Primary Power Supply (including power loss))	Max (Including Box Module)	50 W	56 W	58 W	57 W
		Max (Display Module only) ^{*1}	15 W	21 W	23 W	22 W
		When power is not supplied to external devices (Display Module only) ^{*1}	12 W or less	18 W or less	20 W or less	19 W or less
		When screen turns off the backlight (Standby Mode) (Display Module only) ^{*1}	6 W or less		8 W or less	6 W or less
		When screen backlight 20% (Display Module only) ^{*1}	8 W or less	11 W or less	13 W or less	11 W or less
In-Rush Current	30 A or less					
Voltage Endurance	1,000 Vac, 20 mA for 1 minute (between charging and FG terminals)					
Insulation Resistance	500 Vdc, 10 MΩ or more (between charging and FG terminals)					

*1 The power consumption for the combined unit of Box Module and Display Module equals the sum of the power consumption for the Modules.

Specification		SP-5400WA	SP-5500WA	SP-5600WA	
Power Supply	Rated Input Voltage	12...24 Vdc			
	Input Voltage Limits	10.8...28.8 Vdc			
	Voltage Drop	12 Vdc: 1.25 ms or less 24 Vdc: 5 ms or less			
	Power Consumption (Primary Power Supply (including power loss))	Max (Including Box Module)	41 W	43 W	45 W
		Max (Display Module only) ^{*1}	6.5 W	8.5 W	11.5 W
		When power is not supplied to external devices (Display Module only) ^{*1}	-		
		When screen turns off the backlight (Standby Mode)(Display Module only) ^{*1}	2 W or less	2.5 W or less	2.5 W or less
		When screen backlight 20% (Display Module only) ^{*1}	4 W or less	5 W or less	6 W or less
In-Rush Current	30 A or less				
Voltage Endurance	1,000 Vac, 20 mA for 1 min (between charging and FG terminals)				
Insulation Resistance	500 Vdc, 10 MΩ or more (between charging and FG terminals)				

*1 The power consumption for the combined unit of Box Module and Display Module equals the sum of the power consumption for the Modules.

Environmental Specifications

Box Module / Display Module

Physical Environment	Surrounding Air Temperature	0...60 °C (32...140 °F)
	Storage Temperature	-20...60 °C (-4...140 °F)
	Surrounding 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	Free of corrosive gases
	Atmospheric Pressure (Operating Altitude)	800...1,114 hPa (2,000 m [6,561 ft] or lower)
Mechanical Environment	Vibration Resistance	IEC/EN 61131-2 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 (approx. 100 min.)
	Shock Resistance	IEC/EN 61131-2 compliant 147 m/s ² , X, Y, Z directions for 3 times
Electrical Environment	Noise Immunity	Noise Voltage: 1,000 Vp-p Pulse Duration: 1 μs Rise Time: 1 ns (via noise simulator)
	Electrostatic Discharge Immunity	Contact Discharge Method: 6 kV (IEC/EN 61000-4-2 Level 3)

NOTE: When using any of the options for this product, make sure to check the specifications for any special conditions or cautions that may apply to this product.

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 the panel case.

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

Structural Specifications

Box Module

	SP-5B10	SP-5B40
Cooling Method	Natural air circulation	
External Dimensions (W x H x D)	188 x 131 x 35 mm (7.4 x 5.16 x 1.38 in)	
Weight	0.9 kg (1.98 lb) or less	

Premium Display

	SP-5500TP	SP-5600TP SP-5660TP	SP-5700TP
Grounding	Functional grounding: Grounding resistance of 100 Ω , 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 *1	When using a factory-installed front USB cover: IP65F, IP67F, Type 1. When using a front USB cover as an option: IP66F, IP67F, Type 1, Type 4X (Indoor Use Only)/13. * on the front panel when properly installed in an enclosure and not using the front panel USB port. NOTE: The option is a front USB cover with screw manufactured by Pro-face (Model Number PFXZCDCVUS1).		
External Dimensions (W x H x D)	272.5 x 214.5 x 67 mm (10.73 x 8.44 x 2.64 in)	315 x 241 x 67 mm (12.4 x 9.49 x 2.64 in)	397 x 296 x 67 mm (15.63 x 11.65 x 2.64 in)
Panel Cut Dimensions (W x H)	259 x 201 mm (10.2 x 7.91 in) ^{*2} Panel thickness area: 1.6...5 mm (0.06...0.2 in) ^{*3}	301.5 x 227.5 mm (11.87 x 8.96 in) ^{*2} Panel thickness area: 1.6...5 mm (0.06...0.2 in) ^{*3}	383.5 x 282.5 mm (15.1 x 11.12 in) ^{*2} Panel thickness area: 1.6...5 mm (0.06...0.2 in) ^{*3}
Weight	2.7 kg (5.9 lb) or less	3.2 kg (7.1 lb) or less	4.5 kg (9.9 lb) or less

*1 The front face of this product, installed in a solid panel, has been tested using conditions equivalent to the standards shown in the specification. Even though this product's level of resistance is equivalent to these standards, oils that should have no effect on this product can possibly harm this product. This can occur in areas where either vaporized oils are present, or where low viscosity cutting oils are allowed to adhere to this product for long periods of time. If this product's front face protection sheet peels off, these conditions can lead to the ingress of oil into this product and separate protection measures are suggested.

Also, if non-approved oils are present, they may cause deformation or corrosion of the front panel's plastic cover. Therefore, prior to installing this product, be sure to confirm the type of conditions that will be present in this product's operating environment. If the installation gasket is used for a long period of time, or if this product and its gasket are removed from the panel, the original level of protection cannot be kept. To maintain the original protection level, be sure to replace the installation gasket regularly.

*2 For dimensional tolerance, everything +1/-0 mm (+0.04/-0 in) and R in angle are below R3 (R0.12 in).

*3 Even if the installation wall thickness is within the recommended range for the "Panel Cut Dimensions", depending on wall's material, size, and installation location of this product and other devices, the installation wall could warp. To prevent warping, the installation surface may need to be strengthened.

Advanced Display

	SP-5400WA	SP-5500WA	SP-5600WA
Grounding	Functional grounding: Grounding resistance of 100 Ω, 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 *1	IP66F, IP67F, Type 1, Type 4X (Indoor Use Only)/13 * on the front panel when properly installed in an enclosure.		
External Dimensions (W x H x D)	203.6 x 148.6 x 36 mm (8.02 x 5.85 x 1.42 in)	268.5 x 198.5 x 67 mm (10.57 x 7.81 x 2.64 in)	308.5 x 230.5 x 67 mm (12.15 x 9.07 x 2.64 in)
Panel Cut Dimensions (W x H)	190 x 135 mm (7.48 x 5.31 in) ^{*2} Panel thickness area: 1.6...5 mm (0.06...0.2 in) ^{*3}	255 x 185 mm (10.04 x 7.28 in) ^{*2} Panel thickness area: 1.6...5 mm (0.06...0.2 in) ^{*3}	295 x 217 mm (11.61 x 8.54 in) ^{*2} Panel thickness area: 1.6...5 mm (0.06...0.2 in) ^{*3}
Weight	1.2 kg (2.6 lb) or less	2.5 kg (5.5 lb) or less	3 kg (6.6 lb) or less

*1 The front face of this product, installed in a solid panel, has been tested using conditions equivalent to the standards shown in the specification. Even though this product's level of resistance is equivalent to these standards, oils that should have no effect on this product can possibly harm this product. This can occur in areas where either vaporized oils are present, or where low viscosity cutting oils are allowed to adhere to this product for long periods of time. If this product's front face protection sheet peels off, these conditions can lead to the ingress of oil into this product and separate protection measures are suggested.

Also, if non-approved oils are present, they may cause deformation or corrosion of the front panel's plastic cover. Therefore, prior to installing this product, be sure to confirm the type of conditions that will be present in this product's operating environment. If the installation gasket is used for a long period of time, or if this product and its gasket are removed from the panel, the original level of protection cannot be kept. To maintain the original protection level, be sure to replace the installation gasket regularly.

*2 For dimensional tolerance, everything +1/-0 mm (+0.04/-0 in) and R in angle are below R3 (R0.12 in).

*3 Even if the installation wall thickness is within the recommended range for the "Panel Cut Dimensions", depending on wall's material, size, and installation location of this product and other devices, the installation wall could warp. To prevent warping, the installation surface may need to be strengthened.

CAUTION

EQUIPMENT DAMAGE

- Ensure the panel is not in permanent and direct contact with oils.
- Do not press on the display of this product with excessive force or with a hard object.
- Do not press on the touch panel with a pointed object, such as the tip of a mechanical pencil or a screwdriver.

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

⚠ CAUTION

EQUIPMENT DAMAGE

Do not expose the device to direct sunlight

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

NOTICE

STORAGE AND OPERATION OUTSIDE OF SPECIFICATIONS

- Store the panel in areas where temperatures are within the panel's specifications.
- Do not restrict or block the panel's rear-face ventilation slots.

Failure to follow these instructions can result in equipment damage.

NOTICE

GASKET AGING

- Inspect the gasket periodically as required by your operating environment to keep the initial IP level.
- Change the gasket at least once a year, or as soon as scratches or dirt become visible.

Failure to follow these instructions can result in equipment damage.

Section 4.2

Functional Specifications

What Is in This Section?

This section contains the following topics:

Topic	Page
Display Specifications	64
Memory	65
Clock	66
Touch Panel	67

Display Specifications

Premium Display

	SP-5500TP	SP-5600TP SP-5660TP	SP-5700TP
Display Type	TFT Color LCD		
Display Size	10.4"	12.1"	15"
Resolution	800 x 600 pixels (SVGA)	1,024 x 768 pixels (XGA)	
Resolution Input from Box Module*1	640 x 480 pixels (VGA)*2, 800 x 600 pixels (SVGA), 1,024 x 768 pixels (XGA)		
Effective Display Area (W x H)	211.2 x 158.4 mm (8.31 x 6.24 in)	245.76 x 184.32 mm (9.68 x 7.26 in)	304.1 x 228.1 mm (11.97 x 8.98 in)
Display Colors	16 million colors For details about display colors, refer to the manual for your screen editing software.		
Backlight	White LED (Not user replaceable. When replacement is required, contact your local distributor.)		
Backlight Service Life	50,000 hours or more (continuous operation at 25 °C [77 °F] before backlight brightness decreases to 50%)		
Brightness Control	0...100 (Adjusted with touch panel or software)		

*1 For the resolution settings in your screen editing software, refer to the manual provided with your screen editing software.

*2 Not supported by Open Box.

Advanced Display

	SP-5400WA	SP-5500WA	SP-5600WA
Display Type	TFT Color LCD		
Display Size	7"	10.1"	12.1"
Resolution	800 x 480 pixels (WVGA)	1,280 x 800 pixels (WXGA)	
Effective Display Area (W x H)	154.08 x 95.92 mm (6.06 x 3.78 in)	216.96 x 135.6 mm (8.54 x 5.34 in)	261.12 x 163.2 mm (10.28 x 6.43 in)
Display Colors	262,144 colors		
Backlight	White LED (Not user replaceable. When replacement is required, contact your local distributor.)		
Backlight Service Life	50,000 hours or more (continuous operation at 25 °C [77 °F] before backlight brightness decreases to 50%)		
Brightness Control	0...100 (Adjusted with touch panel or software)		

Memory

	SP-5B10	SP-5B40
System Card	SD Card 1 GB (operating system, project data, and other data)	CFast Card 16 GB (operating system, project data, application, and other data)
Backup Memory	NVRAM 320 KB	NVRAM 320 KB

Clock

± 60 seconds per month (deviation at room temperature and power is OFF). Variations in operating conditions and battery life can cause clock deviations from -380 to +90 seconds per month.

For systems where this level of precision is insufficient, the user should monitor and make adjustments when required.

Backup clock data uses a supercapacitor (electric double-layer capacitor) for power. When the voltage from the supercapacitor is low, clock data is lost*¹ when this product is turned OFF.

The average period for backup is as follows:

Initial: Approximately 100 days

After 5 years: Approximately 30 days (used at ambient temperature of 25 °C [77 °F])

By connecting the Battery for Memory Backup (Model Number PFXZCBBT1) accessory, you can set up a backup period of up to 10 years or more.

*1 If clock data is lost, a clock data error message appears when starting up this product. When this happens, leave this product ON for at least 5 minutes, and then set the clock again. Refer to your screen editing software manual on how to set up the clock.

NOTE: When using the Open Box, make sure you shut down the unit after changing clock data.

Touch Panel

	Premium Display	Advanced Display
Touch Panel Type	Resistive Film (analog, multi-touch)	Resistive Film (analog)
Touch Panel Resolution	1,024 x 1,024	1,024 x 1,024
Touch Panel Service Life	1 million times or more	1 million times or more

Section 4.3

Interface Specifications

What Is in This Section?

This section contains the following topics:

Topic	Page
Interface Specifications	69
Interface Connection	71
Serial Interface (RS-232C and RS-422/RS-485) for COM1/COM2	74
Auxiliary Output/Speaker Output Interface (AUX)	76
DVI-D Output Interface (for SP-5B40)	77

Interface Specifications

Box Module

		SP-5B10	SP-5B40
Serial Interface COM1	Asynchronous Transmission	RS-232C/422/485	
	Data Length	7 or 8 bits	
	Stop Bit	1 or 2 bits	
	Parity	None, odd, or even	
	Data Transmission Speed	2,400 (1,200)...115,200 bps	
	Connector	D-Sub 9 pin (plug)	
Serial Interface COM2	Asynchronous Transmission	RS-232C/422/485	
	Data Length	7 or 8 bits	
	Stop Bit	1 or 2 bits	
	Parity	None, odd, or even	
	Data Transmission Speed	2,400 (1,200)...115,200 bps, 187,500 bps (MPI)	2,400 (1,200)...115,200 bps
	Connector	D-Sub 9 pin (plug)	
USB (Type A) Interface	Connector	USB 2.0 (Type A) x 2	USB 2.0 (Type A) x 3
	Power Supply Voltage	5 Vdc \pm 5%	
	Maximum Current Supplied	500 mA/port	500 mA/port, 1 A total for 3 ports
	Maximum Transmission Distance	5 m (16.4 ft)	
USB (mini-B) Interface	Connector	USB 2.0 (mini-B) x 1	
	Maximum Transmission Distance	5 m (16.4 ft)	
Ethernet Interface	Standard	IEEE802.3i/IEEE802.3u/IEEE802.3ab, 10BASE-T/ 100BASE-TX/1000BASE-T	
	Connector	Modular jack (RJ-45) x 2	
SD Card Interface	SD Card	SD Card Slot (System) x 1 SD Card Slot (Storage) x 1	SD Card Slot (Storage) x 1
CFast Card Interface	CFast Card	-	CFast Card Slot (System) x 1 CFast Card Slot (Storage) x 1
Expansion Unit Interface	Expansion Unit	Fieldbus Unit x 1	
Video Interface	DVI-D	-	DVI-D OUT
	Connector		DVI-D 24 pin (socket) x 1
Sound Input Interface	Sound Input	-	MIC or LINE input (software switch)
	Connector		MINI-JACK \varnothing 3.5 x 1
Sound Output Interface	Speaker Output	300 mW (Rated Load: 8 Ω , Frequency: 1 kHz)	
	LINE Output	Rated load: 10 k Ω or more	
	Connector	2-piece terminal block (AUX) x 1	
AUX Output Interface	AUX Output	Alarm Output/Buzzer Output	
	Rated Voltage	24 Vdc	
	Rated Current	50 mA	
	Connector	2-piece terminal block (AUX) x 1	

Display Module

		Premium Display
USB (Type A) Interface	Connector	USB 2.0 (Type A) x 1
	Power Supply Voltage	5 Vdc \pm 5%
	Maximum Current Supplied	500 mA
	Maximum Transmission Distance	5 m (16.4 ft)
USB (mini-B) Interface	Connector	USB 2.0 (mini-B) x 1
	Maximum Transmission Distance	5 m (16.4 ft)
Wireless LAN Interface *1	Standards	IEEE802.11b/IEEE802.11g/IEEE802.11n
	Frequency Bandwidth	2.4 GHz
	Channel Bandwidth	20 MHz
	Channel	Access Point mode*2: 1...11 ch Client mode*3: <ul style="list-style-type: none"> • North America US: 1...11 ch • Japan JP: 1...13 ch • Europe EU: 1...13 ch • Korea KR: 1...13 ch • China CN: 1...13 ch • Taiwan TW: 1...11 ch
	Transmission Speed	IEEE802.11b: max 11 Mbps IEEE802.11g: max 54 Mbps IEEE802.11n: max 72.2 Mbps
	Transmission Distance*4	Distance varies depending on application software and surrounding environment
	Action Mode	Client mode/Access Point mode
	Communication Mode	Infrastructure
	Network Authentication	Open, WPA-Personal, WPA2-Personal
	Data Encryption	WEP (128 bit) (Open)*5, AUTO/TKIP (WPA-Personal), AES (WPA2-Personal)
	Maximum Client Connections	10*6
	Antenna	Built into the bezel

*1 Only for SP-5660TP

*2 In Access Point mode, IEEE802.11d is not supported.

*3 Based on the country information regarding surrounding Access Point. If the surrounding access points do not support IEEE802.11d, channels are limited, from 1 to 11 ch.

*4 You can connect only from the front of the display. The connection angle and distance depend on your operating environment, applications in use, and target communication devices. Conduct an operation test, including directivity, in the operating environment before use.

*5 In Access Point mode, WEP is not supported.

*6 Request for the eleventh connection will be denied. The maximum number of connections you can have with reasonable communication performance depends on the operating environment, applications in use, and target communication devices. Conduct an operation test, including the number of connections, in the operating environment before use.

WARNING

UNINTENDED OPERATION

- Do not use wireless communication to control machinery.
- Wireless communication system design must take into account the possibility of communication interference.

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

Interface Connection

Cable Connections

⚠ DANGER

POTENTIAL FOR EXPLOSION

- Always confirm the ANSI/ISA 12.12.01 or CSA C22.2 N°213 hazardous location rating of your device before installing or using it in a hazardous location.
- To apply or remove the supply power from this product installed in a Class I, Division 2 hazardous location, you must either:
 - Use a switch located outside the hazardous environment, or;
 - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- 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.
- Use only non-incendiary USB devices.
- 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. Use only non-incendive USB devices as USB connections do not provide adequate strain relief to allow the use of the USB connections of this product (see page 71). 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.

USB Connection

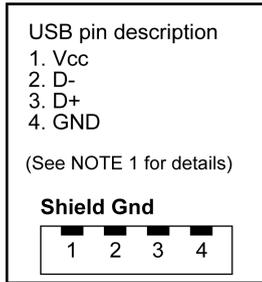
Non-incendive field wiring apparatus (keyboards, mouse) are permitted for use on the front USB port (Type A) of associated field wiring non-incendive apparatus (this product). Non-incendive field wiring apparatus (this product) are permitted for use on front USB port (mini B) of associated field wiring non-incendive apparatus (Computer).

In addition to being non-incendive, any equipment connected to the front USB ports must satisfy the following criteria.

The following figure shows the USB cable wiring:

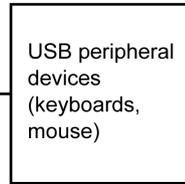
<Type A>

Associated non-incendive field wiring apparatus



Class I, Division 2, Groups A, B, C, D or non-hazardous location

Non-incendive field wiring apparatus

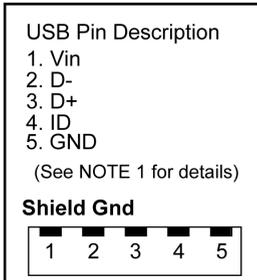


Class I, Division 2
 Groups A, B, C, D

Circuit Parameters	Front USB (Type A)
Open-circuit voltage = V_{oc}	5.25 V
Short-circuit current = I_{sc}	1300 mA
Associated capacitance = C_a	265 μ F
Associated inductance = L_a	16 μ H

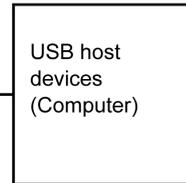
<mini B>

Non-incendive Field Wiring Apparatus



Class I, Division 2
 Groups A, B, C, D

Associated Non-incendive Field Wiring Apparatus



Class I, Division 2
 Groups A, B, C, D
 or non-hazardous location

Circuit Parameters	Front USB (mini B)
Maximum input voltage = V_{max}	5.25 V
Maximum load current = I_{max}	0.1 mA
Internal capacitance = C_i	0.24 μ F
Internal inductance = L_i	16 μ H

NOTE:

1. The previous tables list the non-incendive circuit parameters.

The Entity Concept allows interconnection of non-incendive apparatus with associated apparatus – not specifically examined combinations – as a system when the approved values of V_{oc} (or U_o) and I_{sc} (or I_o) for the associated apparatus are less than or equal to V_{max} (U_i) and I_{max} (I_i) for the non-incendive apparatus, and the approved values of C_a (C_o) and L_a (L_o) for the associated apparatus are greater than or equal to $C_i + C_{cable}$ and $L_i + L_{cable}$, respectively, for the non-incendive field wiring apparatus.

2. Associated non-incendive field wiring apparatus and non-incendive field wiring apparatus shall satisfy the following:

Associated Non-incendive Field Wiring Apparatus	-	Non-incendive Field Wiring Apparatus
V_{oc}	\leq	V_{max}
I_{sc}	\leq	I_{max}
C_a	\geq	$C_i + C_{cable}$
L_a	\geq	$L_i + L_{cable}$

3. If the electrical parameters of the cable are unknown, the following values may be used:

$$C_{cable} = 196.85 \text{ pF/m (60 pF/ft)}$$

$$L_{cable} = 0.656 \text{ } \mu\text{H/m (0.20 } \mu\text{H/ft)}$$

4. Wiring methods must be in accordance with the electrical code of the country where it is used.

This product must be installed in an enclosure. If installed in a Class I, Division 2 Location, the enclosure must be capable of accepting one or more Division 2 wiring methods.

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.
- Use only commercially available USB cables.
- Use only non-incendive USB configurations.
- Suitable for use in Class I, Division 2, Groups A, B, C, D Hazardous Locations.
- Confirm that the USB cable has been attached with the USB cable clamp before using the USB interface.

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

Serial Interface (RS-232C and RS-422/RS-485) for COM1/COM2

Introduction

NOTE: For information on how to connect controllers and other types of equipment, refer to the corresponding device driver manual of your screen editing software.

You can switch the communication method between RS-232C and RS-422/RS-485 via the software.

The serial interface is not isolated. The SG (signal ground) and FG (functional ground) terminals are connected inside this product. When the serial interface connector is D-Sub, connect the FG wire to the shell.

 **DANGER**

ELECTRIC SHOCK AND FIRE

When using the SG terminal to connect an external device to this product:

- Verify that a short-circuit loop is not created when you set up the system.
- Connect the SG terminal to remote equipment when the external device is not isolated.
- Connect the SG terminal to a known reliable ground connection to reduce the risk of damaging the circuit.

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

 **CAUTION**

LOSS OF COMMUNICATION

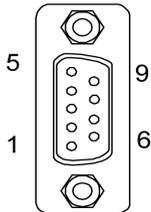
- All connections to the communication ports must not put excessive stress on the ports.
- Securely attach communication cables to the panel wall or cabinet.

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

NOTE: Use within the rated current.

RS-232C

D-Sub 9 pin plug connector

Product side	Pin No.	RS-232C		
		Signal Name	Direction	Meaning
	1	CD	Input	Carrier Detect
	2	RD (RXD)	Input	Receive Data
	3	SD (TXD)	Output	Send Data
	4	ER (DTR)	Output	Data Terminal Ready
	5	SG	–	Signal Ground
	6	DR (DSR)	Input	Data Set Ready
	7	RS (RTS)	Output	Request to Send
	8	CS (CTS)	Input	Send possible
	9	CI (RI)/VCC	Input/–	Called Status Display +5V±5% Output 0.25 A ^{**2}
	Shell	FG	–	Functional Ground (Common with SG)

*1 You can switch pin #9 between RI and VCC via the software. The VCC output is not protected against overcurrent. To prevent damage or malfunction, use only within the rated current.

*2 When using Open Box, use external equipment so that the sum of COM1 VCC output and COM2 VCC output totals 0.25 A.

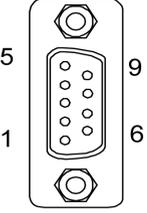
Interfit bracket is #4-40 (UNC).

Recommendations:

- Cable Connector: XM3D-0921 manufactured by OMRON Corporation.
- Cable Cover: XM2S-0913 manufactured by OMRON Corporation.
- Jack Screw (#4-40 UNC): XM2Z-0073 manufactured by OMRON Corporation.

RS-422/485

D-Sub 9 pin plug connector

Product side	Pin No.	RS-422/RS-485		
		Signal Name	Direction	Meaning
	1	RDA	Input	Receive Data A (+)
	2	RDB	Input	Receive Data B (-)
	3	SDA	Output	Send Data A (+)
	4	ERA	Output	Data Terminal Ready A (+)
	5	SG	–	Signal Ground
	6	CSB	Input	Send Possible B (-)
	7	SDB	Output	Send Data B (-)
	8	CSA	Input	Send possible A (+)
	9	ERB	Output	Data Terminal Ready B (-)
	Shell	FG	–	Functional Ground (Common with SG)

Interfit bracket is #4-40 (UNC).

Recommendations:

- Cable Connector: XM3D-0921 manufactured by OMRON Corporation.
- Cable Cover: XM2S-0913 manufactured by OMRON Corporation.
- Jack Screw (#4-40 UNC): XM2Z-0073 manufactured by OMRON Corporation.

Auxiliary Output/Speaker Output Interface (AUX)

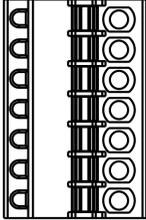

DANGER

ELECTRIC SHOCK AND FIRE

When using the SG terminal to connect an external device to this product:

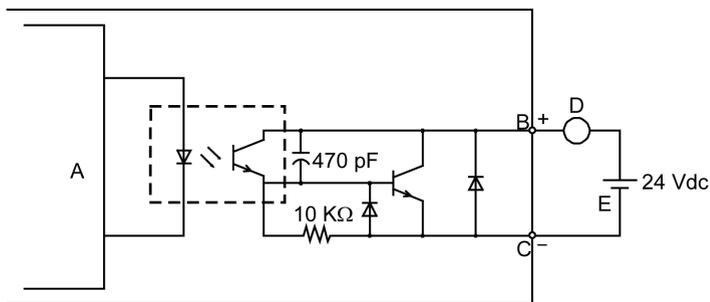
- Verify that a short-circuit loop is not created when you set up the system.
- Connect the SG terminal to remote equipment when the external device is not isolated.
- Connect the SG terminal to a known reliable ground connection to reduce the risk of damaging the circuit.

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

Cable connection side	Pin No.	Signal Name	Direction	Meaning
	1	LineOut	Output	Line Out
	2	LineOut_GND	Output	Line Out Ground
	3	SP+	Output	Speaker +
	4	SP-	Output	Speaker -
	5	NC	-	No Connection
	6	ALARM+/ BUZZER+	Output	(Can be changed via software)
	7	ALARM-/ BUZZER-	Output	

AUX Connector: PFXZCDCNAUX1 manufactured by Pro-face

Output Circuit



- A Internal Circuit
- B Pin Number 6: ALARM+ / BUZZER+
- C Pin Number 7: ALARM- / BUZZER-
- D Load
- E External Power

DVI-D Output Interface (for SP-5B40)

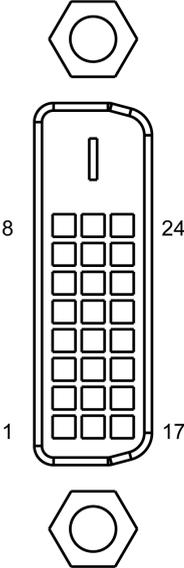
⚡ ⚠ DANGER

ELECTRIC SHOCK AND FIRE

When using the SG terminal to connect an external device to this product:

- Verify that a short-circuit loop is not created when you set up the system.
- Connect the SG terminal to remote equipment when the external device is not isolated.
- Connect the SG terminal to a known reliable ground connection to reduce the risk of damaging the circuit.

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

Product side	Pin No.	Signal Name	Direction
	1	TMDS DATA 2-	Output
	2	TMDS DATA 2+	Output
	3	TMDS DATA 2 SHIELD	–
	4	NC	–
	5	NC	–
	6	DDC Clock	Output
	7	DDC Data	Input/Output
	8	NC	–
	9	TMDS DATA 1-	Output
	10	TMDS DATA 1+	Output
	11	TMDS DATA 1 SHIELD	–
	12	NC	–
	13	NC	–
	14	+5V Power	–
	15	GND	Ground
	16	NC	–
	17	TMDS DATA 0-	Output
	18	TMDS DATA 0+	Output
	19	TMDS DATA 0 SHIELD	–
	20	NC	–
	21	NC	–
	22	TMDS CLOCK SHIELD	–
	23	TMDS CLOCK+	Output
	24	TMDS CLOCK-	Output
Shell	FG	Functional Ground	

Recommendations:

DVI-D Cable manufactured by Pro-face (FP-DV01-50 <5 m>)

NOTE:

- For noise-free operation, use the recommended DVI-D cable.
- DVI-D output supports the display resolution up to XGA (1,024 x 768). When the screen output mode is set to clone mode, the maximum display resolution of the display module side is the same as the display resolution of DVI-D output side which is XGA (1,024 x 768).
- DVI-D output does not support Hot Plug Detect (HPD). Even when the main unit power is on while connected to an external display, this product outputs the display signal as XGA. If the external display does not support XGA Input, the screen will not display.

Chapter 5

Dimensions

What Is in This Chapter?

This chapter contains the following sections:

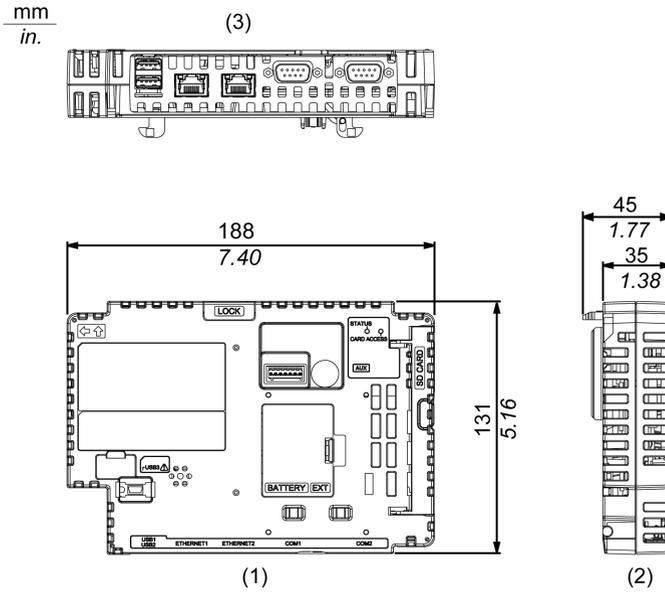
Section	Topic	Page
5.1	Power Box	80
5.2	Open Box	81
5.3	Premium Display	82
5.4	Advanced Display	86
5.5	Box and Display Modules - Combined Dimensions	90

Section 5.1

Power Box

SP-5B10

External Dimensions



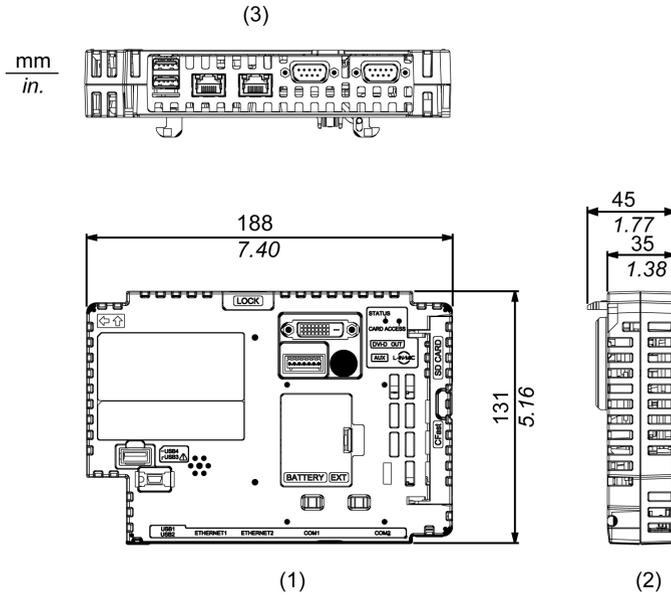
- 1 Front
- 2 Left
- 3 Bottom

Section 5.2

Open Box

SP-5B40

External Dimensions



- 1 Front
- 2 Left
- 3 Bottom

Section 5.3

Premium Display

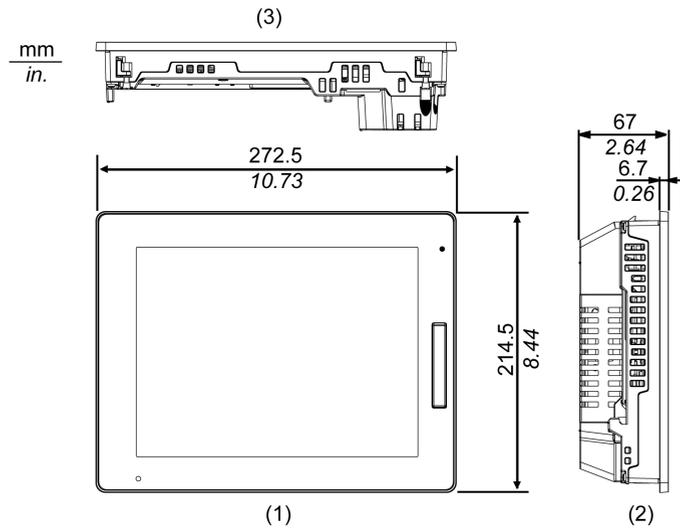
What Is in This Section?

This section contains the following topics:

Topic	Page
SP-5500TP	83
SP-5600TP/SP-5660TP	84
SP-5700TP	85

SP-5500TP

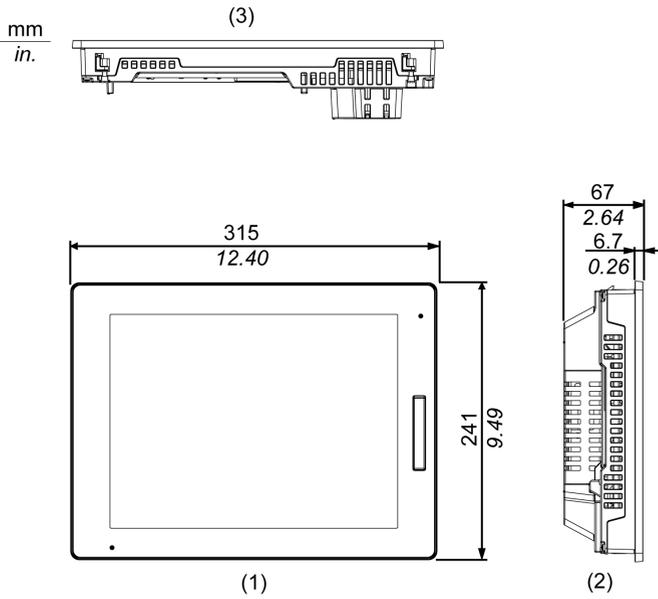
External Dimensions



- 1 Front
- 2 Left
- 3 Bottom

SP-5600TP/SP-5660TP

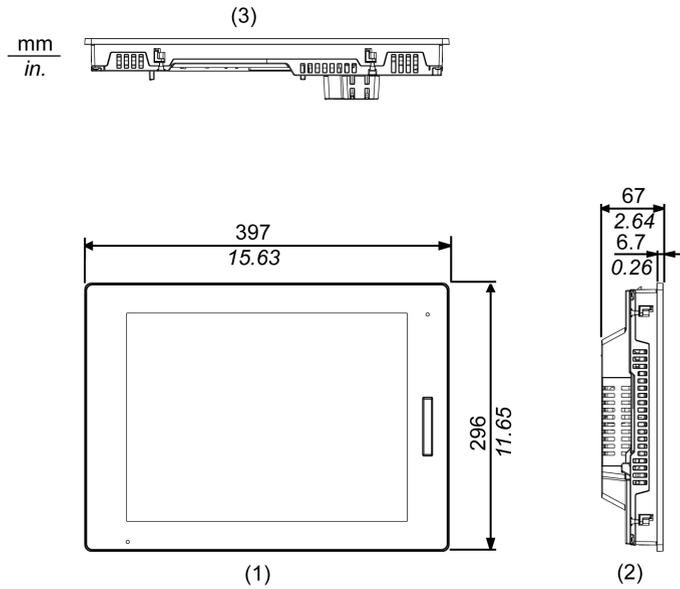
External Dimensions



- 1 Front
- 2 Left
- 3 Bottom

SP-5700TP

External Dimensions



- 1 Front
- 2 Left
- 3 Bottom

Section 5.4

Advanced Display

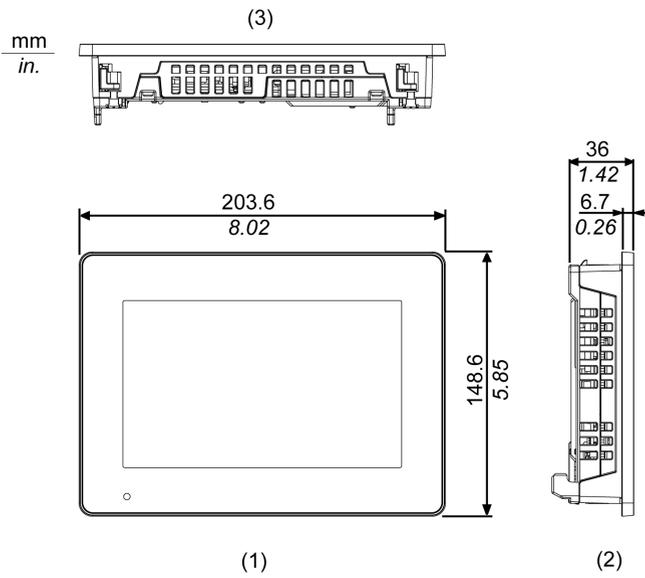
What Is in This Section?

This section contains the following topics:

Topic	Page
SP-5400WA	87
SP-5500WA	88
SP-5600WA	89

SP-5400WA

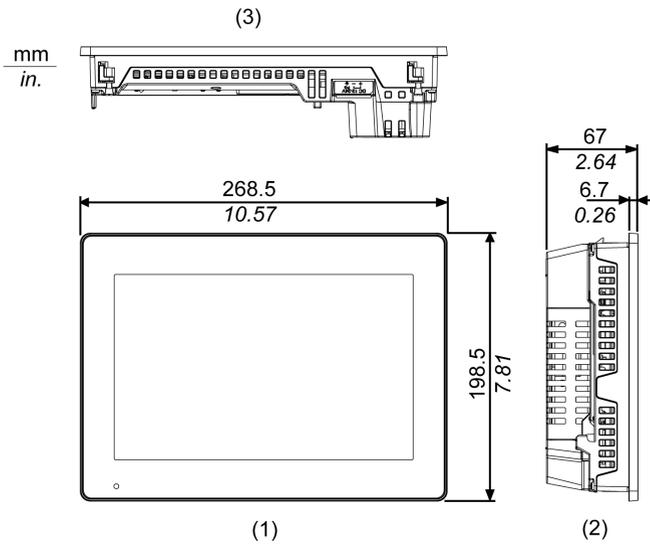
External Dimensions



- 1 Front
- 2 Left
- 3 Bottom

SP-5500WA

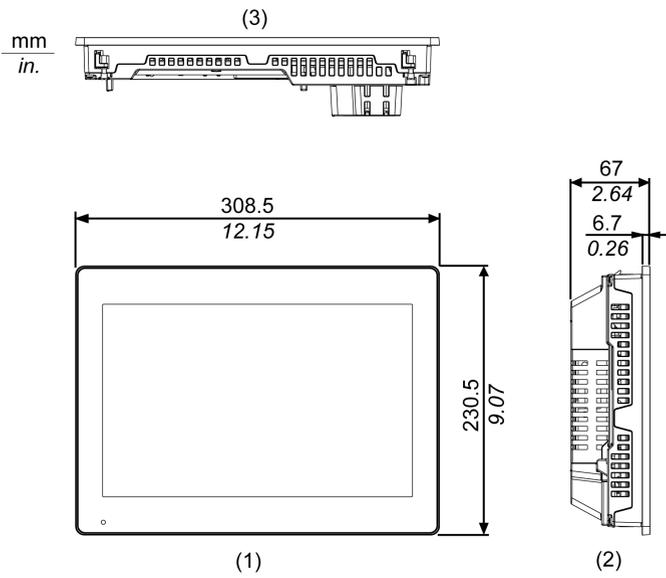
External Dimensions



- 1 Front
- 2 Left
- 3 Bottom

SP-5600WA

External Dimensions



- 1 Front
- 2 Left
- 3 Bottom

Section 5.5

Box and Display Modules - Combined Dimensions

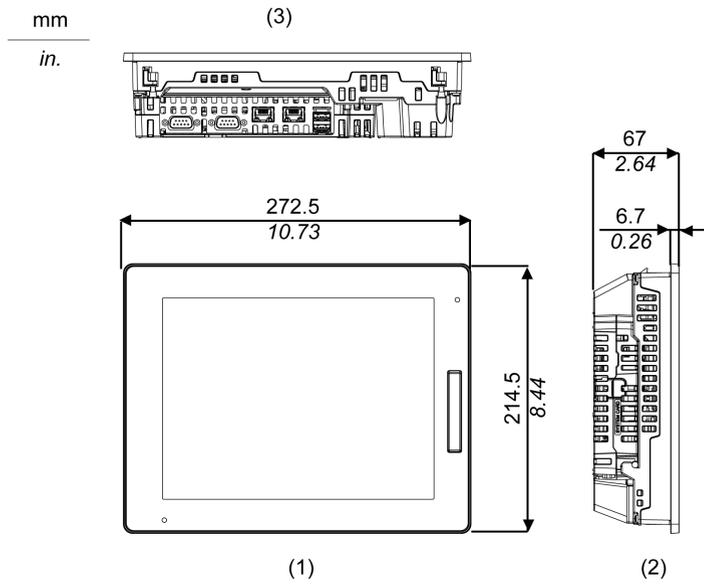
What Is in This Section?

This section contains the following topics:

Topic	Page
SP-5500TP with Box Module	91
SP-5600TP/SP-5660TP with Box Module	93
SP-5700TP with Box Module	95
SP-5400WA with Box Module	97
SP-5500WA with Box Module	99
SP-5600WA with Box Module	101

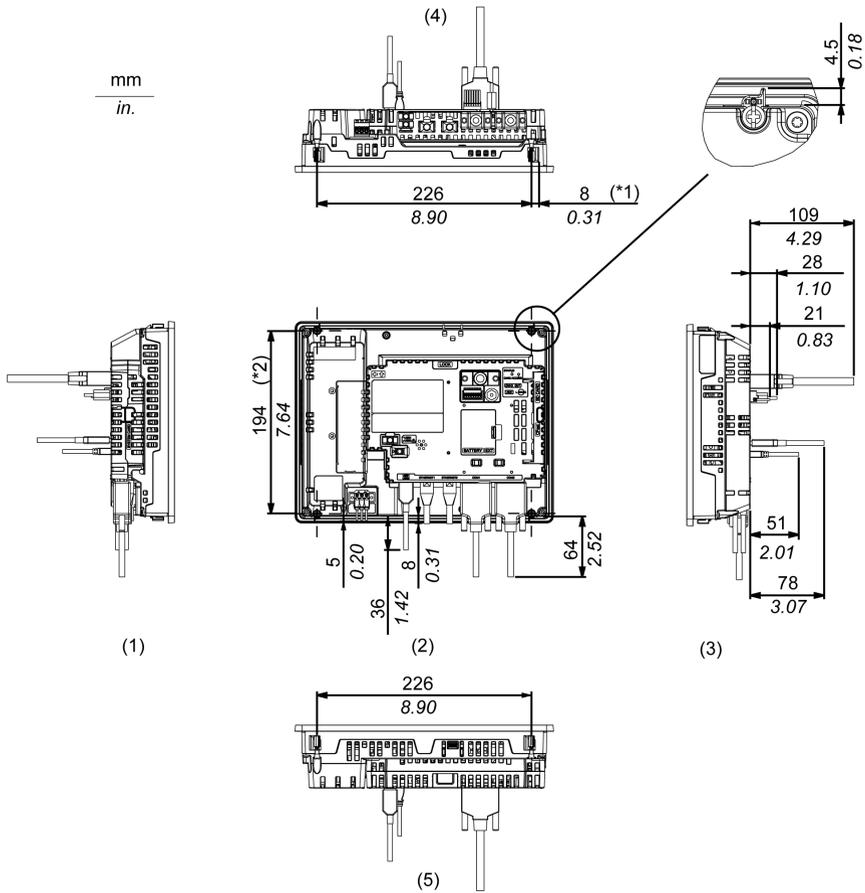
SP-5500TP with Box Module

External Dimensions



- 1 Front
- 2 Left
- 3 Bottom

Dimensions with Cables



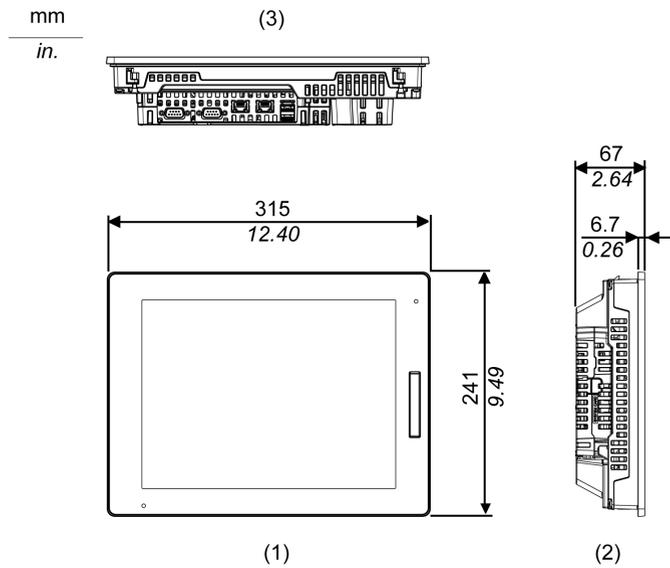
- *1 Rotation area of the fastener
- *2 Pitch of the center of installation fastener screws

- 1 Right
- 2 Front
- 3 Left
- 4 Bottom
- 5 Top

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.

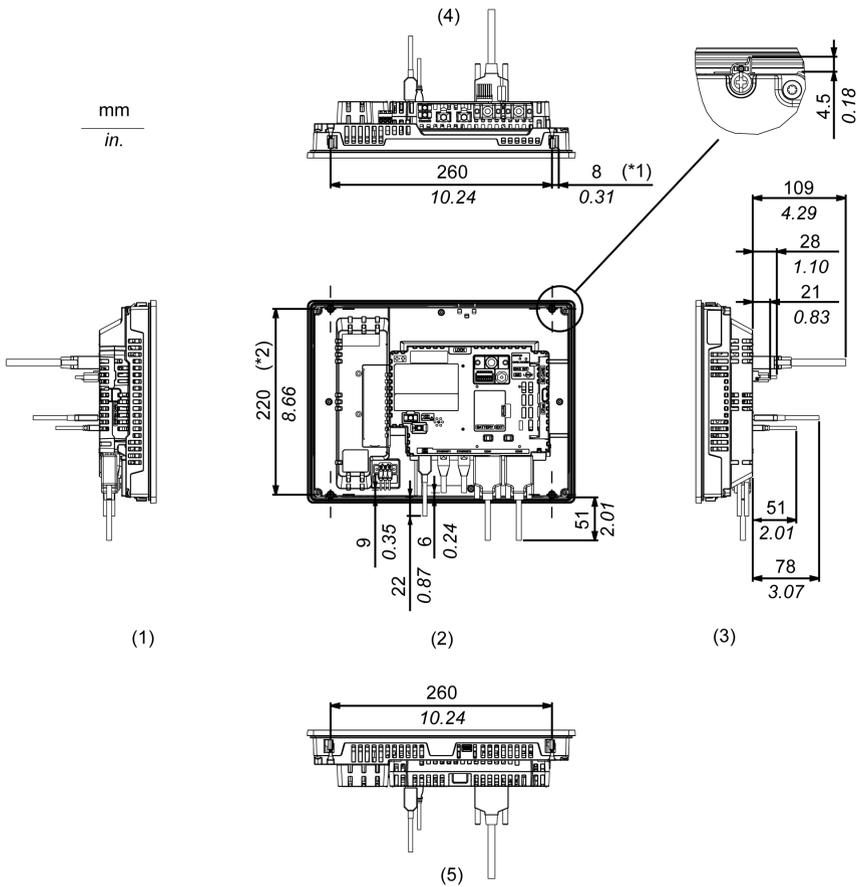
SP-5600TP/SP-5660TP with Box Module

External Dimensions



- 1 Front
- 2 Left
- 3 Bottom

Dimensions with Cables

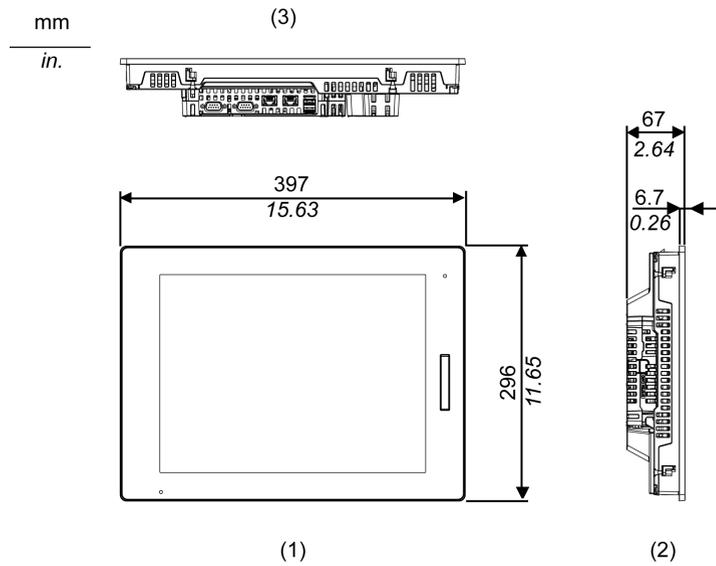


- *1 Rotation area of the fastener
- *2 Pitch of the center of installation fastener screws
- 1 Right
- 2 Front
- 3 Left
- 4 Bottom
- 5 Top

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.

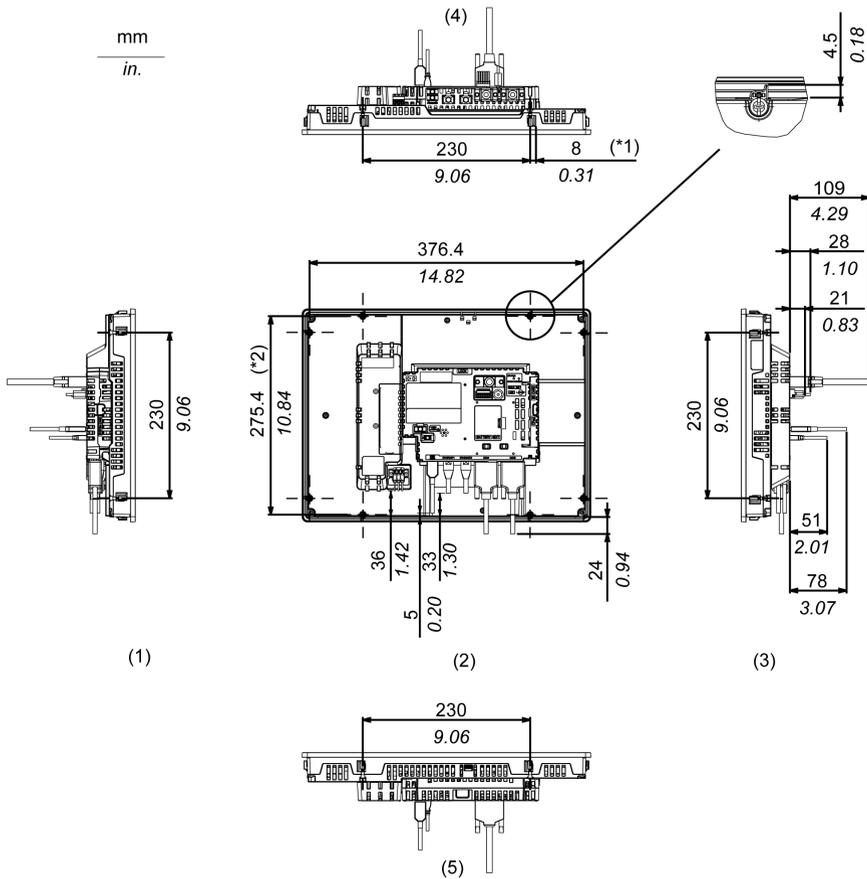
SP-5700TP with Box Module

External Dimensions



- 1 Front
- 2 Left
- 3 Bottom

Dimensions with Cables

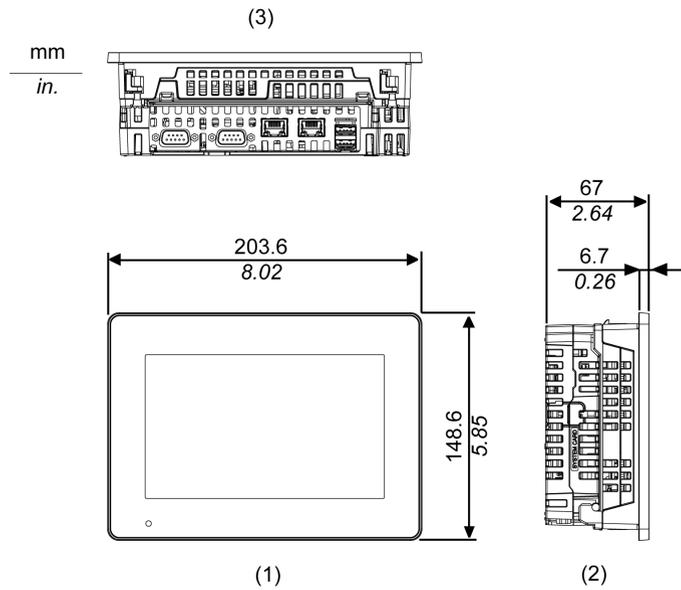


- *1 Rotation area of the fastener
 - *2 Pitch of the center of installation fastner screws
- 1 Right
 - 2 Front
 - 3 Left
 - 4 Bottom
 - 5 Top

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.

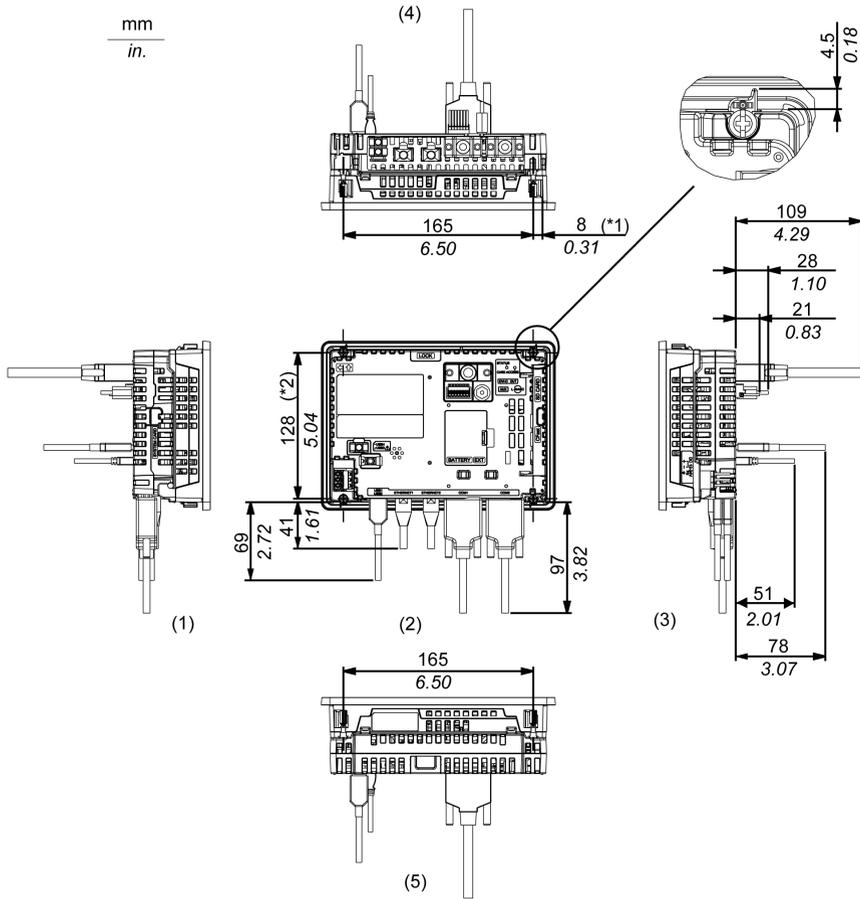
SP-5400WA with Box Module

External Dimensions



- 1 Front
- 2 Left
- 3 Bottom

Dimensions with Cables



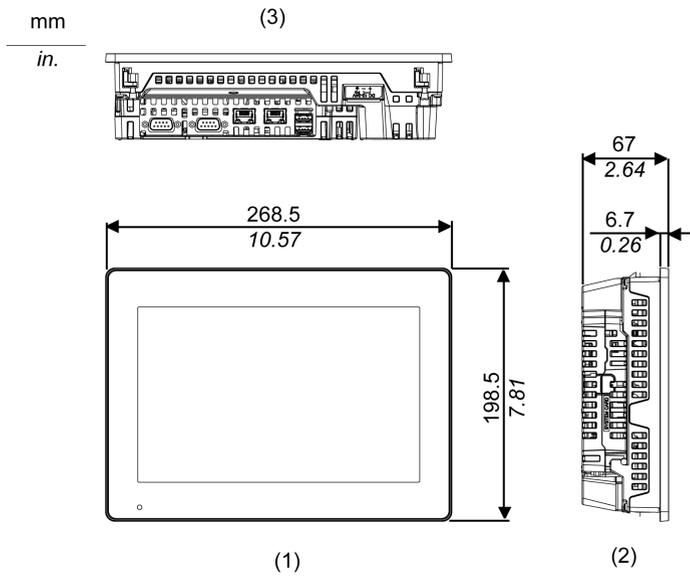
- *1 Rotation area of the fastener
- *2 Pitch of the center of installation fastener screws

- 1 Right
- 2 Front
- 3 Left
- 4 Bottom
- 5 Top

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.

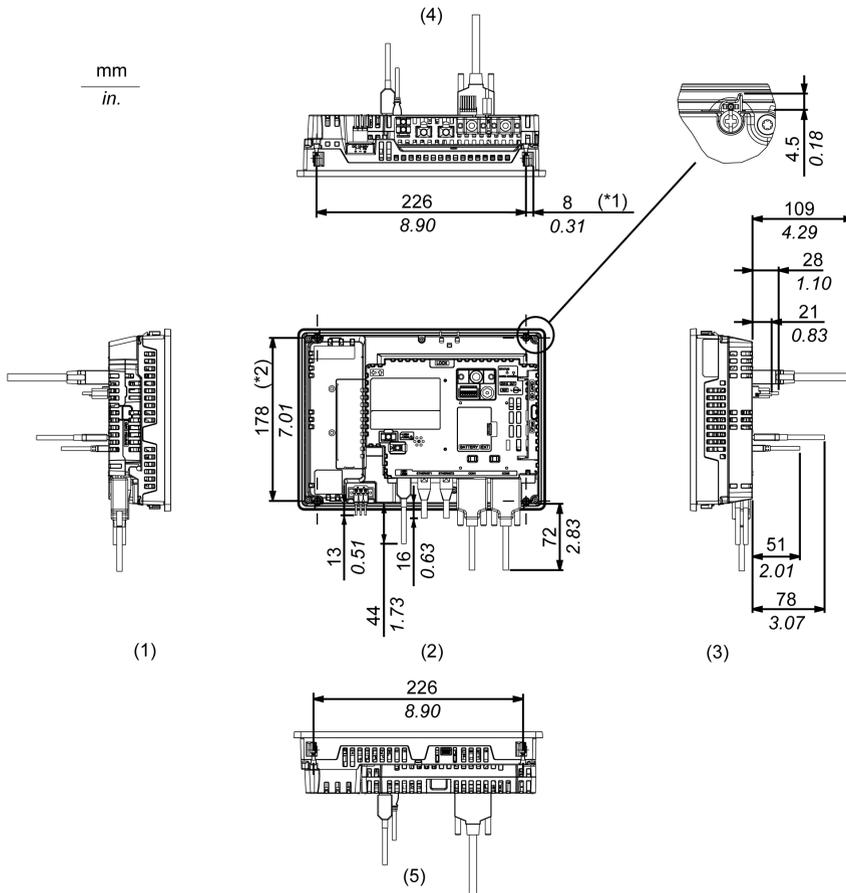
SP-5500WA with Box Module

External Dimensions



- 1 Front
- 2 Left
- 3 Bottom

Dimensions with Cables



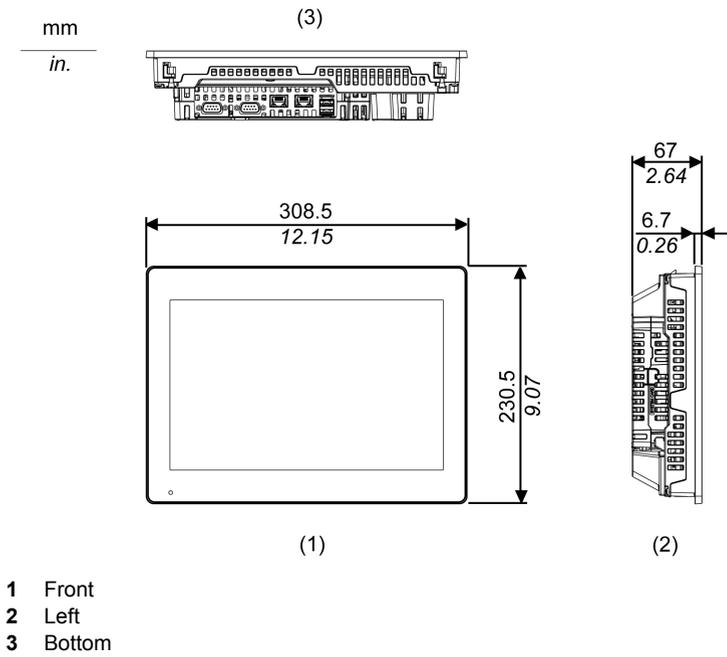
- *1 Rotation area of the fastener
- *2 Pitch of the center of installation fastener screws

- 1 Right
- 2 Front
- 3 Left
- 4 Bottom
- 5 Top

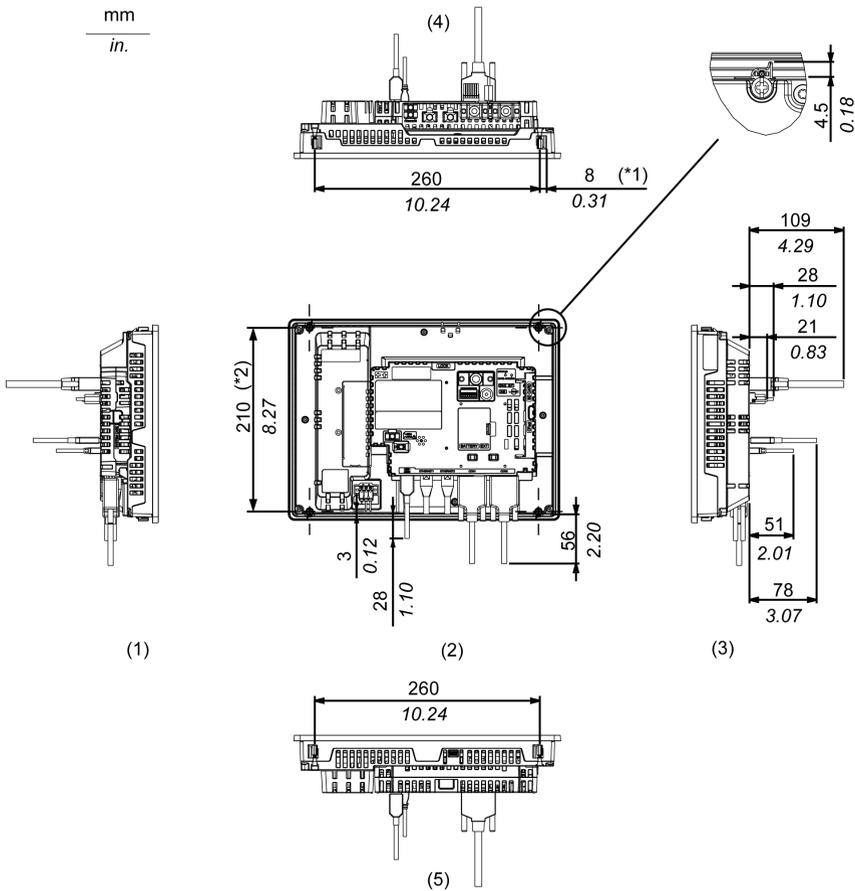
NOTE: All the above values are designed with cable bending in mind. The dimensions given here are representative values depending on the type of connection cable in use. Therefore, these values are intended for reference only.

SP-5600WA with Box Module

External Dimensions



Dimensions with Cables



- *1 Rotation area of the fastener
- *2 Pitch of the enter of installation fastener screws

- 1 Right
- 2 Front
- 3 Left
- 4 Bottom
- 5 Top

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.

Chapter 6

Installation and Wiring

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
6.1	Installation	104
6.2	Wiring Principles	117
6.3	USB Cable Clamp	124
6.4	AUX Connector	130
6.5	SD Card Insertion/Removal	131
6.6	CFast Card Insertion/Removal	136
6.7	Front USB Cover	141
6.8	Isolation Unit and USB/RS-422/485 Conversion Adapter	143

Section 6.1

Installation

Installation Procedures

Introduction

This product is designed for use on flat surfaces of Type 1, Type 4X (Indoor Use Only) or Type 13 Enclosure.

Mount this product in an enclosure that provides a clean, dry, robust and controlled environment (IP65F^{*1}, IP66F^{*1}, IP67F^{*1}, Type 1, Type 4X [Indoor Use Only], or Type 13 Enclosure).

For Advanced Display, the front surface is IP66F^{*1}, IP67F^{*1}, Type 1, Type 4X (Indoor Use Only) or Type 13 Enclosure.

For Premium Display, when using a factory-installed front USB cover (without screw), the front surface is IP65F^{*1}, IP67F^{*1}, or Type 1 Enclosure. When using a front USB cover (with screw^{*2}) manufactured by Pro-face (Model Number PFXZCDCVUS1), the front surface is IP66F^{*1}, IP67F^{*1}, Type 1, Type 4X (Indoor Use Only) or Type 13 Enclosure.

Display Front Surface		Advanced Display	Enclosure Front Surface
Premium Display			
Without Screw	With Screw		
IP65F, IP67F, Type 1	IP66F, IP67F, Type 1, Type 4X (Indoor Use Only), Type 13	IP66F, IP67F, Type 1, Type 4X (Indoor Use Only), Type 13	IP65F, IP66F, IP67F, Type 1, Type 4X (Indoor Use Only), Type 13

For Premium Display, regardless of using a factory-installed front USB cover or a front USB cover with screw, when the cover is open, the front surface is Type 1 Enclosure.

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

- The rear face of this product is not approved as an enclosure. When building this product into an end-use product, be sure to use an enclosure that satisfies standards as the end-use product's overall enclosure.
- This product must be used indoors only.
- Install and operate this product with its front panel facing outward.

*1 IP65F, IP66F and IP67F are not part of the UL certification.

*2 The necessary torque is 0.5 N•m (4.4 lb-in).

Installation Requirements

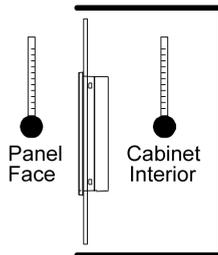
⚠ CAUTION
RISK OF BURNING INJURY
Do not touch the rear chassis during operation.
Failure to follow these instructions can result in injury or equipment damage.

Check that the installation wall or cabinet surface is flat, in good condition and has no jagged edges. Metal reinforcing strips may be attached to the inside of the wall, near the panel-cut, to increase its rigidity.

Decide on the thickness of the enclosure wall, based on the level of strength required: 1.6...5 mm (0.06...0.2 in).

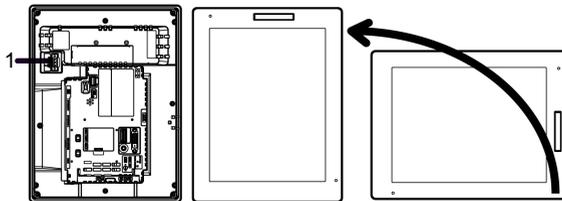
Even if the installation wall thickness is within the recommended range for the "Panel Cut Dimensions", depending on wall's material, size, and installation location of this product and other devices, the installation wall could warp. To prevent warping, the installation surface may need to be strengthened.

Be sure that the surrounding air temperature and the ambient humidity are within their designated ranges. Surrounding air temperature: 0 to 60 °C (32 to 140 °F) (see the Environment Specifications for this product); ambient humidity: 10 to 90% RH; wet bulb temperature: maximum 39 °C (102 °F). When installing this product in a cabinet or enclosure, the surrounding air temperature is the cabinet's or enclosure's internal temperature.



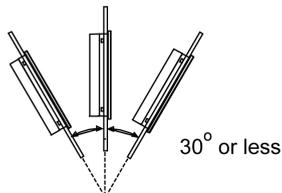
Be sure that heat from surrounding equipment does not cause this product to exceed its standard operating temperature.

When mounting this product vertically, ensure that the right side of this product faces up. In other words, the DC power connector should be at the top.



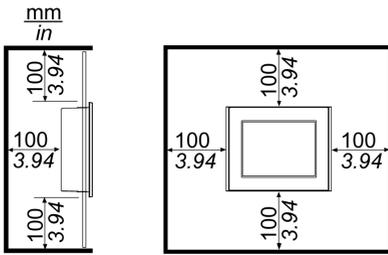
1 Power connector

When installing this product in a slanted position, the product face should not incline more than 30°.



When installing this product in a slanted position with an incline more than 30°, the ambient temperature must not exceed 40 °C (104 °F). You may need to use forced air cooling (fan, A/C) to ensure the ambient operating temperature is 40 °C or less (104 °F or less).

For easier maintenance, operation and improved ventilation, install this product at least 100 mm (3.94 in) away from adjacent structures and other equipment as shown in the following illustration:



Please ensure you have enough space to insert and remove the storage card.

For Wireless LAN models, do not block the wireless LAN antenna area with your hand, body or other objects. It may cause interference in wireless LAN communications.

Wireless LAN Models

WARNING

ELECTROMAGNETIC/RADIO INTERFERENCE

If you are uncertain of the policy that applies to the use of the Wireless LAN model, ask the administrator about its use before you turn it on.

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

2.4 GHz Wireless Devices

The Wireless LAN model uses the 2.4 GHz frequency range, which is used by a wide range of wireless equipment. Example usage includes industrial, scientific, and medical equipment such as microwave ovens, on-site wireless stations (requiring licenses), low-power wireless stations (not requiring licenses) as well as amateur wireless stations (requiring licenses).

- 1 Before use, confirm that no on-site wireless stations and specified low-power wireless stations or amateur wireless stations operate in your vicinity.
- 2 In the event that the Wireless LAN model causes harmful interference to any other "on-site wireless stations", immediately change the channel frequency of the Wireless LAN model, or change its location, or halt operation of radio emissions and contact the administrator of the wireless network to resolve the issue.

Security on Your Wireless LAN

Because wireless LANs do not normally provide adequate data security, the following problems may occur.

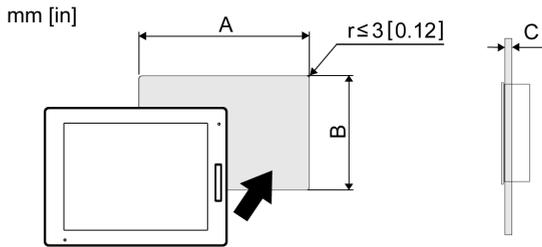
1. Unlawful access of communication information.
 - There is a chance that information found in emails, and personal information such as user IDs, passwords, and credit card numbers, may be intentionally intercepted by a malicious third party.
2. Illegal Access
 - A malicious third party may be able to access personal or company data over the company's local area network without permission, to:
 - Obtain personal and confidential information (information leak)
 - Impersonate someone by communicating as that person and disseminating invalid information (spoofing)
 - Alter intercepted communications and re-transmitting tolerated content (falsification)
 - Cause critical damage to data and or systems due to a computer virus (damage).

This wireless LAN product includes security features that enable you to configure security-related settings that reduce the likelihood of the above-mentioned problems.

We recommend that you make yourself fully acquainted with the possible implications of what might happen if you use a wireless product without enabling security features, and that you configure security-related settings and use wireless products at your own responsibility.

Panel Cut Dimensions

Based on the panel cut dimensions, open a mount hole on the panel.



Model Name	A	B	C
SP-5500TP	259 mm (+1/-0 mm) (10.2 in [+0.04/-0 in])	201 mm (+1/-0 mm) (7.91 in [+0.04/-0 in])	1.6...5 mm (0.06...0.2 in)
SP-5600TP SP-5660TP	301.5 mm (+1/-0 mm) (11.87 in [+0.04/-0 in])	227.5 mm (+1/-0 mm) (8.96 in [+0.04/-0 in])	
SP-5700TP	383.5 mm (+1/-0 mm) (15.1 in [+0.04/-0 in])	282.5 mm (+1/-0 mm) (11.12 in [+0.04/-0 in])	
SP-5400WA	190 mm (+1/-0 mm) (7.48 in [+0.04/-0 in])	135 mm (+1/-0 mm) (5.31 in [+0.04/-0 in])	
SP-5500WA	255 mm (+1/-0 mm) (10.04 in [+0.04/-0 in])	185 mm (+1/-0 mm) (7.28 in [+0.04/-0 in])	
SP-5600WA	295 mm (+1/-0 mm) (11.61 in [+0.04/-0 in])	217 mm (+1/-0 mm) (8.54 in [+0.04/-0 in])	

Installing onto Display Module

⚡ ⚠ 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.
- Unplug the power cable from both the Display Module and the power supply.
- 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 the Display Module.

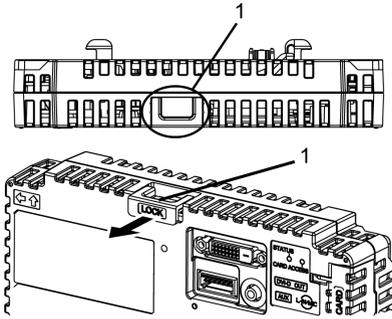
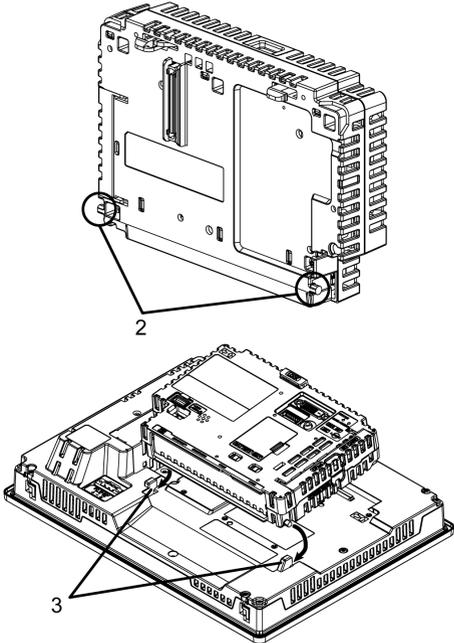
Failure to follow these instructions will result in death or serious injury.

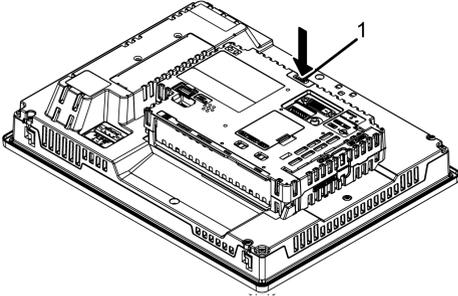
NOTICE

EQUIPMENT DAMAGE

- When mounting this product vertically, first install the Box Module onto the Display Module before attaching the Display Module to the panel. When installing the Box Module onto the Display Module, place the Display Module on a clean and level surface with the screen facing downward.
- Only qualified personnel can change the primary battery.

Failure to follow these instructions can result in equipment damage.

Step	Action
1	<p data-bbox="322 218 1130 243">Pull the LOCK forward on the top of the Box Module to release the lock as illustrated.</p>  <p data-bbox="322 610 422 635">1 LOCK</p>
2	<p data-bbox="322 649 1214 701">Insert the protruding points on the bottom left and right of the Box Module into the two holes on the back of the Display Module to attach the Box Module and Display Module together.</p>  <p data-bbox="322 1387 526 1412">2 Protruding points</p> <p data-bbox="322 1414 536 1439">3 Holes for insertion</p>

Step	Action
3	<p>Fully push on the LOCK on the top of the Box Module to mount the Box Module on the Display Module.</p>  <p>1 LOCK</p>

NOTE: For instructions on how to mount the Display Module to the panel, refer to *Installing to the Panel* (see page 112).

Removing from Display Module

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.
- Unplug the power cable from both the Display Module and the power supply.
- 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 the Display Module.

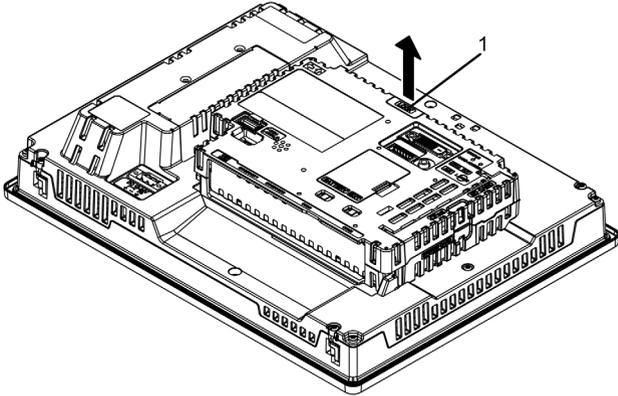
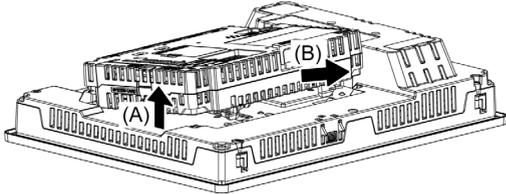
Failure to follow these instructions will result in death or serious injury.

NOTICE

EQUIPMENT DAMAGE

When this product is mounted vertically, first remove the Display Module from the panel, then remove the Box Module from the Display Module.

Failure to follow these instructions can result in equipment damage.

Step	Action
1	When mounting this product vertically, remove the Display Module from the panel and place the Display Module on a clean and level surface with the screen facing down (see page 115).
2	Release the LOCK on the top of the Box Module as illustrated. <div style="text-align: center;">  </div> <p>1 LOCK</p>
3	Lift up the Box Module in the direction indicated by arrow (A) in the diagram and remove it by sliding in the direction indicated by arrow (B). <div style="text-align: center;">  </div>

⚠ CAUTION

RISK OF INJURY

Do not drop the Box Module when you remove it from the Display Module.

- Hold the unit in place after removing the fasteners.
- Use both hands.

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

Installing to the Panel

⚡ ⚠ 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.
- Unplug the power cable from both the Display Module and the power supply.
- 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 the Display Module.

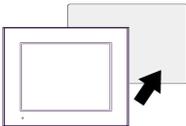
Failure to follow these instructions will result in death or serious injury.

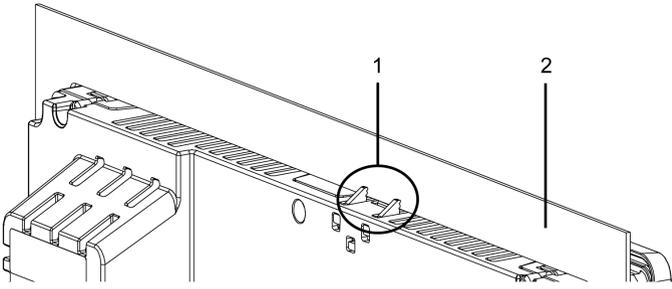
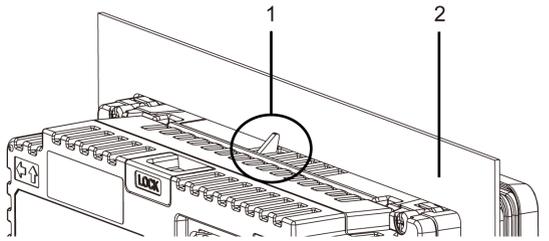
NOTICE

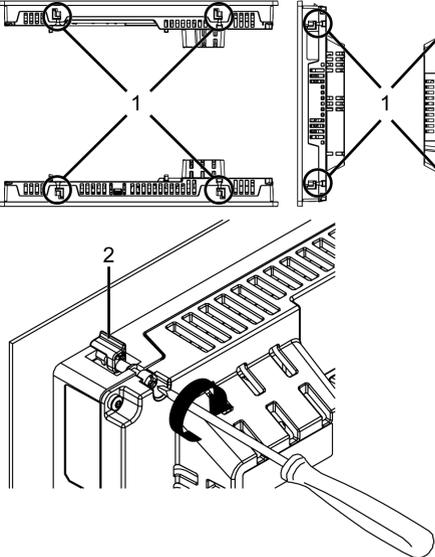
EQUIPMENT DAMAGE

- When mounting this product vertically, first install the Box Module onto the Display Module before attaching the Display Module to the panel.
- Keep this product stabilized in the panel-cut while you are installing or removing the screw fasteners.

Failure to follow these instructions can result in equipment damage.

Step	Action
1	When mounting this product vertically, place the Display Module on a clean and level surface with the screen facing down and mount the Box Module to the Display Module (see page 108).
2	Check that the Display Module's gasket is seated securely into the gasket's groove, which runs around the perimeter of the display panel frame. NOTE: Always use the installation gasket, since it absorbs vibration in addition to repelling water. For the procedure on replacing the installation gasket, refer to Replacing the Installation Gasket (see page 150).
3	Based on the Display Module's panel cut dimensions (see page 108), open a mount-hole on the panel and attach the Display Module to the panel from the front side. 

Step	Action
4	<p>Confirm that the anti-drop lock on the top of the Display Module are attached to the panel.</p> <p>Except for SP-5400WA</p>  <p>SP-5400WA</p>  <p>1 Anti-drop lock 2 Panel</p>

Step	Action
5	<p>Using a Phillips screwdriver, gradually tighten (turn clockwise) the screws for the fasteners (top, bottom, left, and right), alternating diagonally between screws until all are secure. Be sure that the L-shaped part of the installation fastener (2 in figure below) is completely vertical. The necessary torque is 0.5 N•m (4.4 lb-in).</p> <p>NOTE:</p> <ul style="list-style-type: none"> • If the Display Module is not mounted properly, it may fall. • If the panel is thick (approx. 5 mm [0.2 in]), you may have trouble straightening the L-shaped part of the installation fastener. If this happens, push the display module from the front as you tighten the screws.  <p>1 Installation fastener 2 L-shaped part of the installation fastener</p> <p>Number of Installation Fasteners</p> <p>15-inch models:</p> <ul style="list-style-type: none"> • Top - 2, Bottom - 2, Right - 2, Left - 2 <p>Models less than 12-inch:</p> <ul style="list-style-type: none"> • Top - 2, Bottom - 2, Right - None, Left - None

NOTICE

BROKEN ENCLOSURE

Do not exert more than 0.5 N•m (4.4 lb-in) of torque when tightening the fastener's screws.

Failure to follow these instructions can result in equipment damage.

Removing from the Panel

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.
- Unplug the power cable from both the Display Module and the power supply.
- 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 the Display Module.

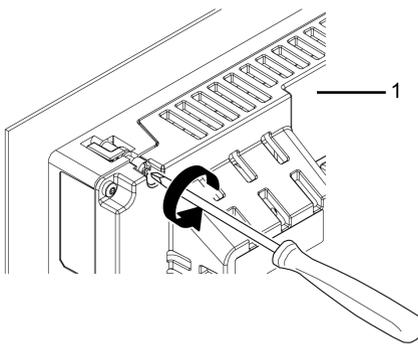
Failure to follow these instructions will result in death or serious injury.

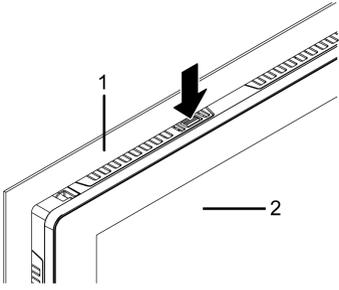
NOTICE

EQUIPMENT DAMAGE

- When this product is mounted vertically, first remove the Display Module from the panel, then remove the Box Module from the Display Module.
- Keep this product stabilized in the panel-cut while you are installing or removing the screw fasteners.

Failure to follow these instructions can result in equipment damage.

Step	Action
1	<p>Using a Phillips screwdriver, gradually loosen (turn counterclockwise) the screws for the fasteners (top, bottom, left, and right), alternating diagonally between screws until all screws are loose.</p>  <p>1 Rear side</p> <p>NOTE:</p> <ul style="list-style-type: none"> ● For the number of installation fasteners on your model, see Number of Installation Fasteners in Step 5 of Installing to the Panel (see page 112). ● If the panel is thick (approx. 5 mm [0.2 in]), you may have trouble straightening the L-shaped part of the installation fastener. If this happens, push the display module from the front as you loosen the screws.

Step	Action
2	<p>While pushing on the anti-drop lock on the top of the Display Module with a tool such as a screwdriver, slowly remove the Display Module from the panel.</p>  <p>1 Panel 2 Front side</p>

⚠ CAUTION

RISK OF INJURY

Do not drop this product when you remove it from the panel.

- Hold this product in place after removing the fasteners.
- Use both hands.
- While pushing on the anti-drop lock, be careful not to hurt your fingers.

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

NOTICE

EQUIPMENT DAMAGE

To avoid damage, remove this product while pushing the anti-drop lock or by making sure the lock does not touch the panel.

Failure to follow these instructions can result in equipment damage.

Section 6.2

Wiring Principles

What Is in This Section?

This section contains the following topics:

Topic	Page
Connecting the DC Power Cord	118
Connecting the Power Supply	121
Grounding	123

Connecting the DC Power Cord

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.
- Remove power before wiring this product's power terminals.
- 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.
- Use only the specified voltage when operating this product. The DC unit is designed to use 12 to 24 Vdc power. Always check whether your device is DC powered before applying power.
- Since this product is not equipped with a power switch, be sure to connect a power switch to the power supply.
- Be sure to ground this product's FG terminal.

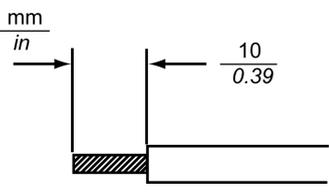
Failure to follow these instructions will result in death or serious injury.

NOTE:

- The SG (signal ground) and FG (functional ground) terminals are connected internally in this product.
- When the FG terminal is connected, be sure the wire is grounded. Not grounding this product can result in excessive electromagnetic interference (EMI).

DC Power Cord Preparation

- Make sure the ground wire is either the same or heavier gauge than the power wires.
- Do not use aluminum wires in the power supply's power cord.
- To prevent the possibility of a terminal short, use a pin terminal that has an insulating sleeve.
- If the ends of the individual wires are not twisted correctly, the wires may create a short circuit.
- The conductor type is solid or stranded wire.
- Use copper wire rated for 75 °C (167°F).

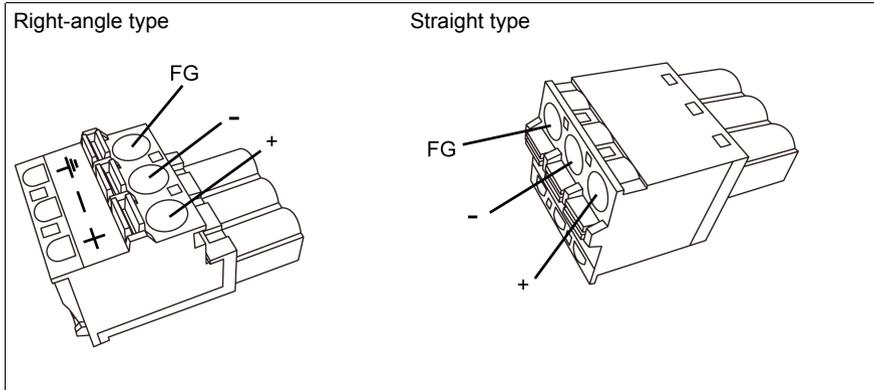
Power Cord Diameter	0.75...2.5 mm ² (18...13 AWG) ^{*1}
Conductor type	Solid or stranded wire
Conductor length	
Recommended Driver ^{*2}	SZS 0.6x3.5 (1205053)
Recommended Pin Terminals ^{*2}	3201288 AI 0,75-10 GY 3200182 AI 1 -10 RD 3200195 AI 1,5 -10 BK 3202533 AI 2,5 -10 BU
Recommended Pin Terminal Crimp Tool ^{*2}	CRIMPFOX 6

*1 For UL compatibility, use AWG14 or AWG13.

*2 Items are manufactured by Phoenix Contact.

DC Power Supply Connector Specifications: Spring Clamp Terminal Blocks

Models except for SP-5400WA come with the right-angle-type power connector, and the SP-5400WA comes with the straight-type power connector.



Connection	Wire
+	12...24 Vdc
-	0 Vdc
FG	Grounded terminal connected to the panel chassis.

NOTE:

- You cannot connect the right-angle type to the SP-5400WA.
- Right-angle type: PFXZCBCNDC2 manufactured by Pro-face.
Straight type: PFXZCBCNDC1 manufactured by Pro-face.

How to connect the DC Power Cord

Step	Action
1	Confirm the power cord is not connected to the power supply.
2	Check the rated voltage and remove the "DC24V" sticker on the DC power supply connector.
3	Connect each wire from the power cable to a pin terminal.
4	Push the Opening button with a small and flat screwdriver to open the desired pin hole.
5	<p>Insert each power cord wire into its corresponding hole. Release the Opening button to clamp the wire in place.</p> <div style="text-align: center;"> </div> <p>When using stranded wire, do not short with neighboring wires.</p>
6	After inserting all three power cord wires, insert the DC power supply connector into the power connector on this product.

NOTE: Do not solder the wire directly to the power crimp pin.

Connecting the Power Supply

Precautions

Excessive stress on the power connection or attempting to install this product with the power cables connected may disconnect or cause damage to the power connections. This can cause short circuits, fire or unintended equipment operation.

⚡ ⚠ DANGER

SHORT CIRCUIT, FIRE, OR UNINTENDED EQUIPMENT OPERATION

Avoid excessive force on the power cable to prevent accidental disconnection

- Securely attach power cables to an installation panel or cabinet.
- Use the designated torque to tighten this product's terminal block screws.
- Install and fasten this product on installation panel or cabinet prior to connecting power supply and communication lines.

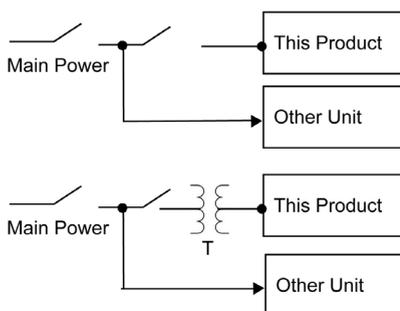
Failure to follow these instructions will result in death or serious injury.

Improving Noise/Surge

- This product'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 lightning surge absorber to handle power surges.
- To increase noise resistance, attach a ferrite core to the power cable.

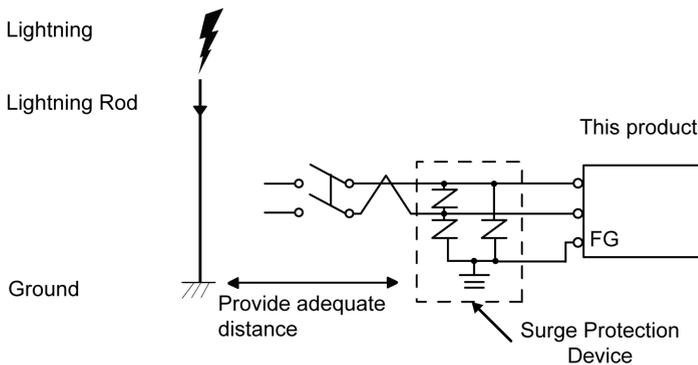
Power Supply Connections

- When supplying power to this product, connect the power as shown below.

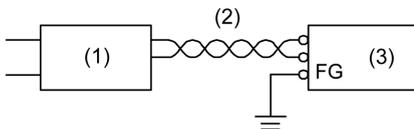


- Branch Circuit Protective device shall be used for rating 20 A for 12 to 24 Vdc input device on the models except for SP-5400WA.
- You must use DC input with an isolating source for the models except for SP-5400WA.
- You must use DC input with a Class 2 power supply for SP-5400WA.

- The following shows a surge protection device connection:

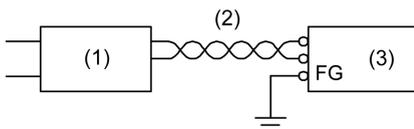


- Attach a surge device to prevent damage to this product as a result of a lightning-induced power surge from a large electromagnetic field generated from a direct lightning strike. We also strongly recommend to connect the crossover grounding wire of this product to a position close to the ground terminal of the surge protection device. It is expected that there will be an effect on this product due to fluctuations in grounding potential when there is a large surge flow of electrical energy to the lightning rod ground at the time of a lightning strike. Provide adequate distance between the lightning rod grounding point and the surge protection device grounding point.
- If the voltage variation is outside the prescribed range, connect a regulated power supply.



- 1 Regulated power supply
- 2 Twisted-pair cord
- 3 This product

- Select a power supply low in noise for between the line and ground. If there is an excessive amount of noise, connect an insulating transformer. Use isolating transformers with capacities exceeding the maximum power consumption, including that of the Box Module. Refer to the Electrical Specification for the Display Module (see page 57).

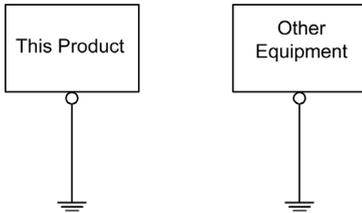


- 1 Insulating transformer
- 2 Twisted-pair cord
- 3 This product

Grounding

Exclusive Grounding

Always ground the FG (functional ground) terminal. Be sure to separate this product from the FG of other devices as shown below.



Precautions

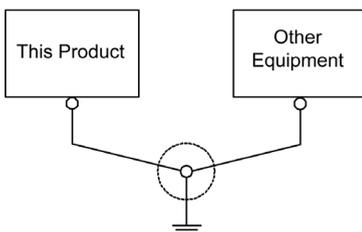
- Check that the grounding resistance is $100\ \Omega$ or less.*1
- The FG wire should have a cross sectional area greater than $2\ \text{mm}^2$ (AWG14)*1. Create the connection point as close to this product as possible, and make the wire as short as possible. When using a long grounding wire, replace the thin wire with a thicker wire, and place it in a duct.
- The SG (signal ground) and FG (functional ground) terminals are connected internally in this product. When connecting the SG line to another device, be sure that no shorting loops are formed.

*1 Observe local codes and standards.

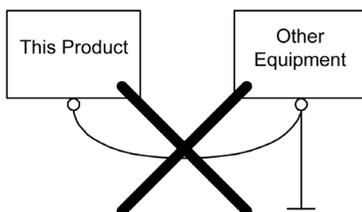
Common Grounding

Electromagnetic Interference (EMI) can be created if devices are improperly grounded. EMI can cause loss of communication. If exclusive grounding is not possible, use a common grounding point as shown in the configuration below. Do not use any other configuration for common grounding.

Correct grounding



Incorrect grounding



Section 6.3

USB Cable Clamp

What Is in This Section?

This section contains the following topics:

Topic	Page
USB Cable Clamp Type A (1 port)	125
USB Clamp mini-B (1 port)	128

USB Cable Clamp Type A (1 port)

Introduction

When using a USB device, attach a USB cable clamp to the USB interface to prevent the USB cable from being disconnected.

⚠ DANGER

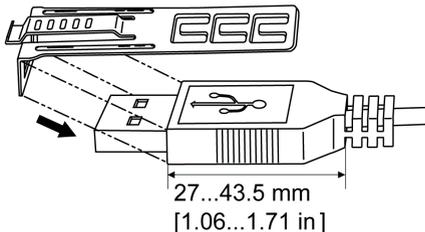
POTENTIAL FOR EXPLOSION

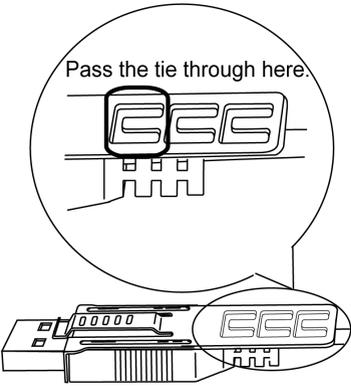
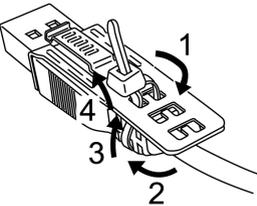
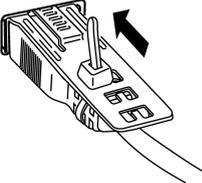
- Verify the power, input, and output (I/O) wiring are in accordance with Class I, Division 2 wiring methods.
- Substitution of any components may impair suitability for Class I, Division 2.
- Do not disconnect equipment while the circuit is live or unless the area is known to be free of ignitable concentrations.
- 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.
- Use only commercially available USB cables.
- Use only non-incendive USB configurations.
- Suitable for use in Class I, Division 2, Groups A, B, C, D Hazardous Locations.
- Confirm that the USB cable has been attached with the USB cable clamp before using the USB interface.

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

Attaching USB Clamp Type A (1 port)

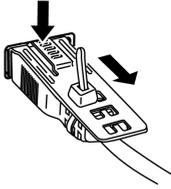
NOTE: Watch your fingers. The edge of the clip is sharp.

Step	Action
1	<p>Mount the clip to the USB mark  connector shell so that it overlaps. The clip matches the 27 to 43.5 mm [1.06 to 1.71 in] length of the USB connector.</p>  <p>NOTE: When installing clamps to reduce cable stress onto both USB1 and USB2, at USB1 overlay the clip on the side with the USB mark, and on USB2 the side without the USB mark. Make sure the ties do not interfere with the other.</p>

Step	Action
2	<p>Align the clip and the USB cable connector shell. Adjust the position of the holes where the clip is attached. To ensure stability, select the clip-hole position that is closest to the base of the connector shell.</p> 
3	<p>As shown, pass the tie through the clip hole. Next, turn the tie and pass it through the head so that the USB cable can pass through the center of the tie loop. The clip is now attached to the USB cable.</p>  <p>NOTE:</p> <ul style="list-style-type: none"> • Check the direction of the head beforehand. Make sure the USB cable is through the center of the tie loop and that the tie can pass through the head. • You can substitute the tie provided with PFXZCBCLUSA1 (manufactured by Pro-face), or other commercially available ties with a width of 4.8 mm [0.19 in] and thickness of 1.3 mm [0.05 in].
4	<p>While pressing the grip on the clip, insert the cable from step 3 all the way into the USB host interface. Make sure that the clip tab is secured to the USB cable attached to this product.</p> 

Removing USB Cable Clamp Type A (1 port)

Remove the USB cable while pushing the grip section of the clip.



USB Clamp mini-B (1 port)

Introduction

When using a USB device, you can attach a USB clamp to the USB (mini-B) interface to prevent the USB cable from being disconnected.

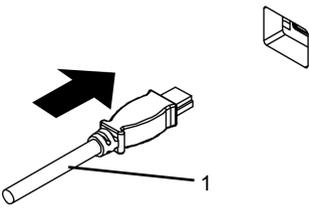
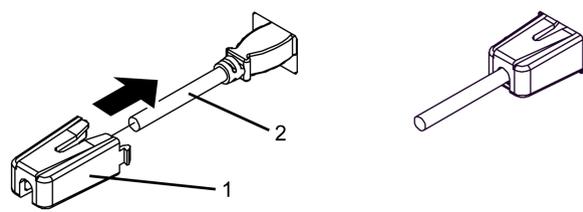
 **DANGER**

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.
- Confirm that the USB cable has been fixed with the USB cable clamp before using the USB interface.
- Remove power before attaching or detaching any connectors to or from this product.

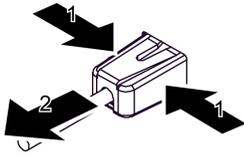
Failure to follow these instructions will result in death or serious injury.

Attaching the USB Clamp

Step	Action
1	<p>Insert the USB cable into the USB (mini-B) interface.</p>  <p>1 USB cable</p>
2	<p>Attach the USB clamp to fix the USB cable in place. Insert the USB holder into the USB (mini-B) interface.</p>  <p>1 USB clamp 2 USB cable</p>

Removing the USB Clamp

Remove the USB clamp by pressing the tabs from the sides.



- 1 USB clamp
- 2 USB cable

Section 6.4

AUX Connector

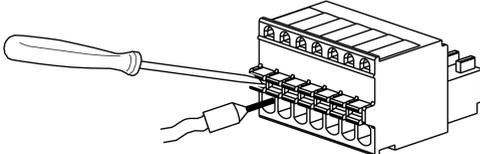
Introduction


DANGER

ELECTRIC SHOCK

- Remove the AUX connector from this product prior to wiring.
- Strip wires only to the required length.
- Do not solder the wire itself.

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

Step	Action
1	Insert the screwdriver into the opening button. This will open the wire's round-shaped hole.
2	Hold the screwdriver and insert the wire into the wire's round-shaped hole.
3	Take out the screwdriver from the opening button. The round-shaped hole will then close, and the wire will be held securely in place. To remove the wire, re-insert the screwdriver into the opening button and when the wire's spring clamp releases, pull the wire out.
	
4	Insert the wired AUX connector into the Auxiliary Output/Speaker Output Interface (AUX) of this product.

Recommendations:

- AUX Connector: PFXZCDCNAUX1 manufactured by Pro-face
 - Screwdriver: SZS 0.4 X 2.0 (Product No. 1205202) manufactured by Phoenix Contact
- If you use another manufacturer, be sure the part has the following dimensions:
- point depth: 0.4 mm [0.02 in]
 - point height: 2.0 mm [0.08 in]
- Point shape should have isolation properties meeting DIN 5264 and EN60900.

NOTE:

- Wire should be AWG 28 to AWG 20 thick and twisted.
- Applicable wire sizes are Style 1015 and Style 1007.
- Be sure to strip 8.0 mm (0.31 in) of cover from the wire.

Section 6.5

SD Card Insertion/Removal

What Is in This Section?

This section contains the following topics:

Topic	Page
Introduction	132
Inserting the SD Card	133
Removing the SD Card	134
SD Card Data Backup	135

Introduction

NOTICE

LOSS OF DATA

When using a SD Card:

- Make sure you regularly back up the SD Card data since the SD Card has a life span and accidental data loss can occur at any time.
- While a SD Card is accessed, do not turn OFF or reset this product, and do not insert or remove the SD Card. Doing so could damage the SD Card, or corrupt its data.
- Before removing the SD Card from this product, stop all operations on the SD Card.
- Make sure of the SD Card's orientation before inserting it into the SD Card slot.

Failure to follow these instructions can result in equipment damage.

NOTICE

LOSS OF DATA

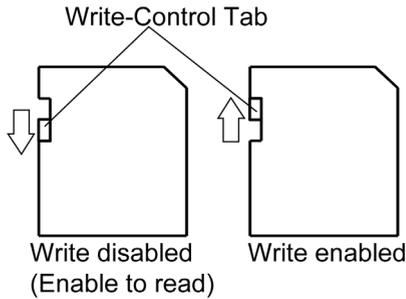
When handling the SD Card:

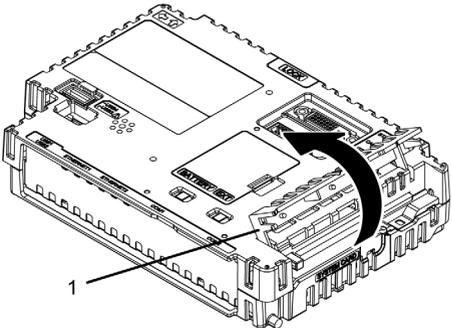
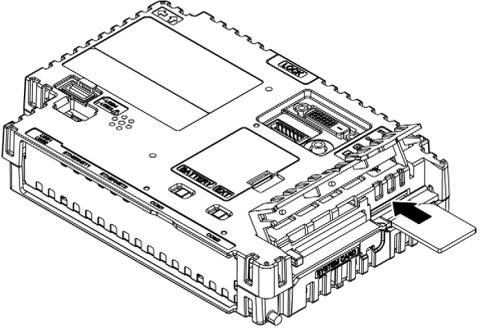
- Avoid storing the SD Card where there is static electricity or electromagnetic waves.
- Avoid storing the SD Card in direct sunlight, near a heater, or other locations where high temperatures can occur.
- Do not bend the SD Card.
- Do not drop or strike the SD Card against another object.
- Keep the SD Card dry.
- Do not touch the SD Card connectors.
- Do not disassemble or modify the SD Card.
- Use the SD Card initialized by this product. You may not be able to use the SD Card initialized by other devices.

Failure to follow these instructions can result in equipment damage.

Inserting the SD Card

NOTE: As shown in the image below (example on the left-hand side), you can set the Write-Control Tab to prevent write operations to the SD Card. Push the tab up, as shown in the example on the right-hand side, to release the lock and enable writing to the SD Card. Before using a commercial-type SD Card, read the manufacturer's instructions.



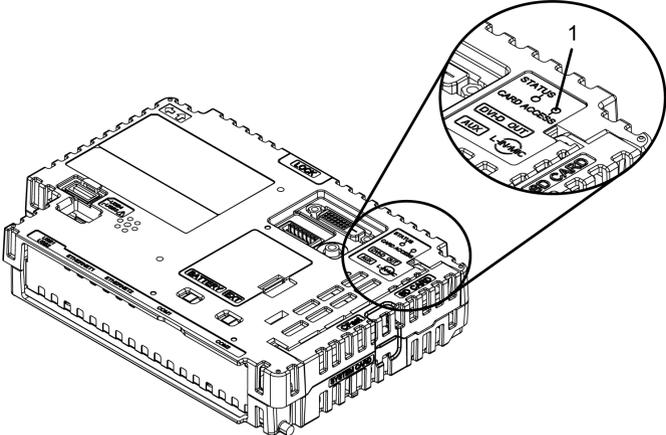
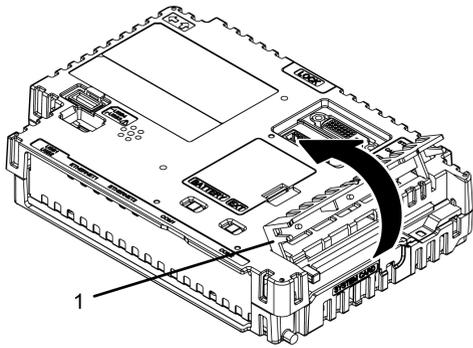
Step	Action
1	Open the Storage Card Cover. 
2	Insert the SD Card into the SD Card Slot with the front face of the SD Card facing up and push until you hear it "click". 
3	Close the Storage Card Cover.

Removing the SD Card

If you remove the SD Card while it is in use, you risk corrupting your data. Before removing the SD Card from this product, stop all operations on the SD Card.

For instructions on removing the SD Card safely, refer to the corresponding topic in the manual of your screen editing software.

When using the Open Box, you can either use Windows® hardware removal tool or use the launcher to safely remove the SD Card. For information about the launcher, refer to the SP5000 Series Open Box Reference Manual.

Step	Action
1	<p>Make sure the Card Access LED is off.</p>  <p>1 Card Access LED</p>
2	<p>Open the Storage Card Cover.</p>  <p>1 Storage Card Cover</p>
3	<p>Push the SD Card once to release, and pull out the card.</p> <p>NOTE: After using the SD Card, store the SD Card in its case or other safe location.</p>
4	<p>Close the Storage Card Cover.</p>

SD Card Data Backup

To make your backups, you can either insert the SD Card directly into the SD Card Slot on your computer, or use a commercially available SD Card reader.

Section 6.6

CFast Card Insertion/Removal

What Is in This Section?

This section contains the following topics:

Topic	Page
Introduction	137
Inserting the CFast Card	138
Removing the CFast Card	139
CFast Card Data Backup	140

Introduction

NOTICE

LOSS OF DATA

When using a CFast Card:

- Make sure you regularly back up the CFast Card data since the CFast Card has a life span and accidental data loss can occur at any time.
- While a CFast Card is accessed, do not turn OFF or reset this product, and do not remove the CFast Card. Doing so could damage the CFast Card, or corrupt its data.
- Turn OFF this product when inserting or removing the CFast Card.
- Make sure of the CFast Card's orientation before inserting it into the CFast Card slot.

Failure to follow these instructions can result in equipment damage.

NOTICE

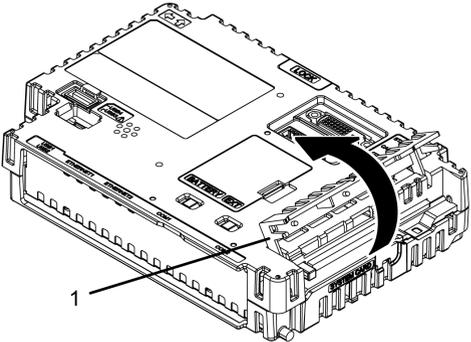
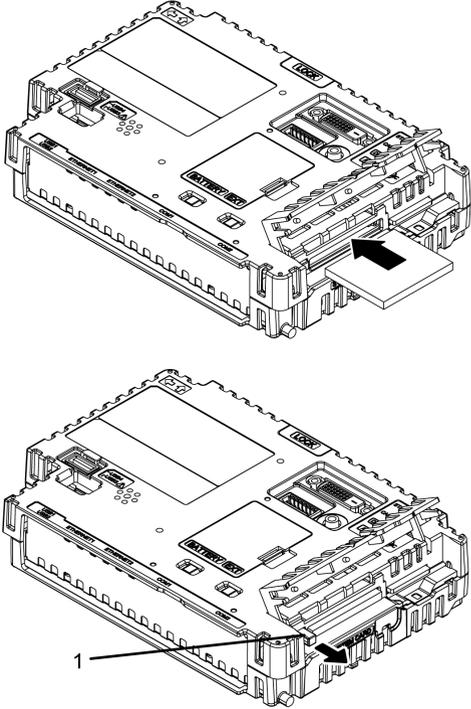
LOSS OF DATA

When handling the CFast Card:

- Avoid storing the CFast Card where there is static electricity or electromagnetic waves.
- Avoid storing the CFast Card in direct sunlight, near a heater, or other locations where high temperatures can occur.
- Do not bend the CFast Card.
- Do not drop or strike the CFast Card against another object.
- Keep the CFast Card dry.
- Do not touch the CFast Card connectors.
- Do not disassemble or modify the CFast Card.
- Use the CFast Card initialized by this product. You may not be able to use the CFast Card initialized by other devices.

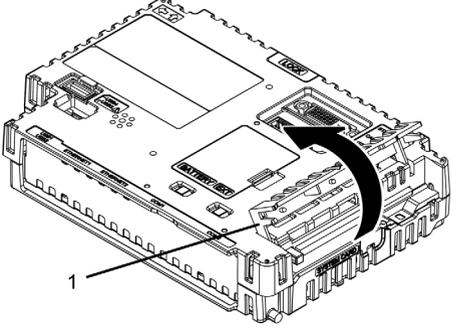
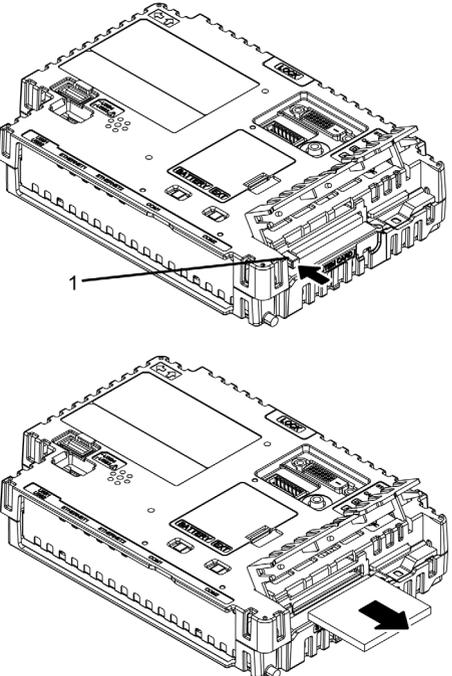
Failure to follow these instructions can result in equipment damage.

Inserting the CFast Card

Step	Action
1	<p>Open the Storage Card cover.</p>  <p>1 Storage Card Cover</p>
2	<p>Insert the CFast Card into the CFast Card Slot with the front face of the CFast Card facing up, and push until the eject button comes out.</p>  <p>1 Eject button</p>
3	<p>Close the Storage Card Cover.</p>

Removing the CFast Card

If you remove the CFast Card while it is in use, you risk corrupting your data. Turn OFF this product when removing the CFast Card.

Step	Action
1	Make sure that this product is turned OFF.
2	<p>Open the Storage Card Cover.</p>  <p>1 Storage Card Cover</p>
3	<p>Push the eject button to release, and pull out the card.</p>  <p>1 Eject button</p>
4	<p>Close the Storage Card Cover.</p> <p>NOTE: After using the CFast Card, store the CFast Card in its case or other safe location.</p>

CFast Card Data Backup

To make your backups, you can either insert the CFast Card directly into the CFast Card Slot on your computer, or use a commercially available CFast Card reader.

Section 6.7

Front USB Cover

Opening the Front USB Cover

For Premium Display, when using a factory-installed front USB cover (without screw), the front surface is IP65F^{*1}, IP67F^{*1}, or Type 1 Enclosure. When using a front USB cover (with screw^{*2}) manufactured by Pro-face (Model Number PFXZCDCVUS1), the front surface is IP66F^{*1}, IP67F^{*1}, Type 1, Type 4X (Indoor Use Only) or Type 13 Enclosure.

Regardless of using a factory-installed front USB cover or a front USB cover with screw, when the cover is open, the front surface is Type 1 Enclosure.

NOTE: The Advanced Display does not have a front USB port.

⚠ CAUTION

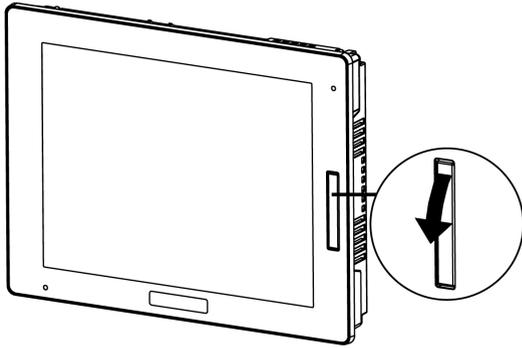
RISK OF INJURY

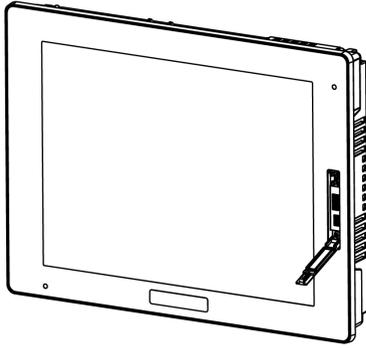
When opening the Front USB Cover, be careful not to injure your fingers.

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

*1 IP65F, IP66F and IP67 are not part of the UL certification.

*2 The necessary torque is 0.5 N•m (4.4 lb-in).

Step	Action
1	<p>Place your finger or a tool (such as a screwdriver) in the gap on the top of the front USB cover and pull down as illustrated.</p>  <p>NOTE:</p> <ul style="list-style-type: none"> • When using front USB cover (PFXZCDCVUS1 manufactured by Pro-face), loosen the top screw using a Phillips screwdriver. • The required torque is 0.5 N•m (4.4 lb-in).

Step	Action
2	<p>The USB interface can be seen once you pull down the front USB cover.</p>  <p>The diagram shows a rectangular device with a screen. On the right side, there is a vertical panel with a USB port. A small cover is shown being pulled down from the top of this panel, revealing the USB interface.</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.

Section 6.8

Isolation Unit and USB/RS-422/485 Conversion Adapter

What Is in This Section?

This section contains the following topics:

Topic	Page
Introduction	144
Installing to the Box Module	145

Introduction

NOTE: For details such as settings when using the Isolation Unit or USB/RS-422/485 Conversion Adapter, refer to the product manual.

DANGER

HAZARD OF ELECTRIC SHOCK OR EXPLOSION

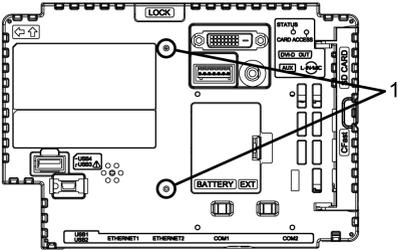
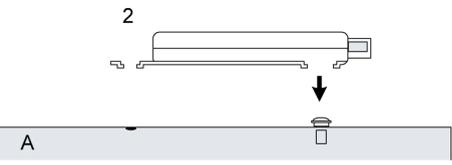
To avoid an electric shock, prior to connecting the Isolation Unit or USB/RS-422/485 Conversion Adapter to this product, confirm that this product's power supply is completely turned OFF.

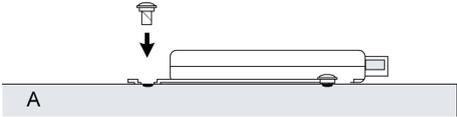
Failure to follow these instructions will result in death or serious injury.

Installing to the Box Module

You can install the Isolation Unit or USB/RS-422/485 Conversion Adapter to the back of the Box Module or to the installation panel. For more information on how to attach the Isolation Unit or USB/RS-422/485 Conversion Adapter to the installation panel, please refer to the product installation guide.

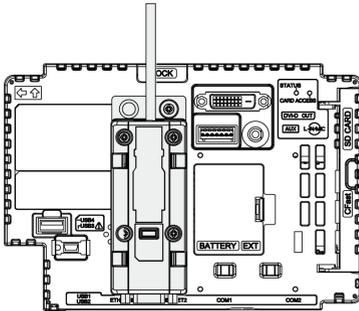
NOTE: Installing the USB/RS-422/485 Conversion Adapter to the Box Module is the same as the following procedures.

Step	Action
1	<p>Check the locations of two screw holes on the front of the Box Module.</p>  <p>1 Hole</p>
2	<p>Install one of the two Attachment Screws included in the Isolation Unit to the Box Module. Use a torque of 0.5 N•m (4.4 lb-in).</p>  <p>1 Attachment Screw A Box Module</p>
3	<p>Attach the Isolation Unit to the Box Module.</p>  <p>2 Isolation Unit A Box Module</p>
4	<p>Slide the Isolation Unit in the direction of the arrow so the Isolation Unit is hooked by the screw from Step 2.</p>  <p>A Box Module</p>

Step	Action
5	<p>Secure the Isolation Unit in place with another Attachment Screw. Use a torque of 0.5 N•m (4.4 lb-in).</p>  <p>A Box Module</p>

NOTE:

- Attach the Isolation Unit to a stable surface. Do not leave the Isolation Unit or USB/RS-422/485 Conversion Adapter hanging by its cord.
- Be careful with wire placement. Overlapping cords may cause noise.
- When attaching the Isolation Unit or USB/RS-422/485 Conversion Adapter to the Box Module, be careful with the attachment position.
- See the illustration below for recommended installation.



Chapter 7

Maintenance

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Regular Cleaning	148
Periodic Check Points	149
Replacing the Installation Gasket	150
Replacing the Primary Battery	151
Replacing the System Card (SD Card)	154
Replacing the System Card (CFast Card)	156
Replacing the Backlight	159
After-sales Service	160

Regular Cleaning

Cleaning the display

NOTICE

EQUIPMENT DAMAGE

- Power off this product before cleaning it.
- Do not use hard or pointed objects to operate the touch panel as you may damage the panel surface.
- 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 the surface or the frame of the display gets dirty, soak a soft cloth in water with a neutral detergent, wring the cloth tightly and wipe the display.

Periodic Check Points

Operation Environment

- Is the operating temperature within the allowable range? (0...60 °C [32...140 °F])
- Is the operating humidity within the specified range? (10%RH to 90%RH, dry bulb temperature of 39 °C [102.2 °F] or less)
- Is the operating atmosphere free of corrosive gasses?

When this product is inside a panel, the ambient environment refers to the interior of the panel.

Electrical Specifications

Is the input voltage appropriate? (10.8...28.8 Vdc)

- Are all power cords and cables connected properly? Are there any loose cables?
- Are all mounting brackets holding the unit securely?
- Are there scratches or traces of dirt on the installation gasket?

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.

Replacing the Installation Gasket

Introduction

The installation gasket provides protection against dust and moisture.

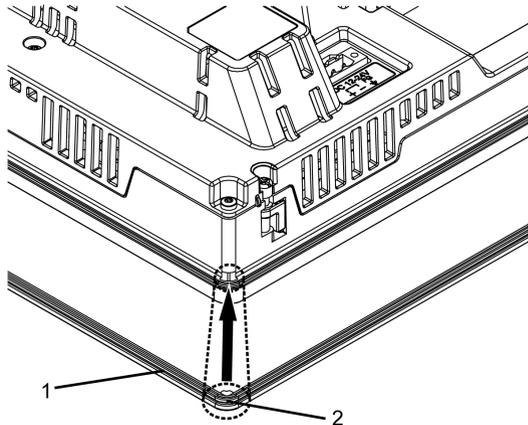
NOTICE

GASKET AGING

- Inspect the gasket periodically as required by your operating environment to keep the initial IP level.
- Change the gasket at least once a year, or as soon as scratches or dirt become visible.

Failure to follow these instructions can result in equipment damage.

Installing the Installation Gasket

Stage	Description
1	Place the Display Module on a flat, level surface, with the display face pointing down.
2	Remove the gasket from the Display Module.
3	<p>Attach the new gasket to the Display Module. Insert the protrusions from the four corners of the gasket into the corresponding holes in the corners of the Display Module.</p> <p>NOTE: When using a tool to insert the gasket, make sure the tool does not catch the rubber gasket and cause a tear.</p>  <p>1 Installation Gasket 2 Protruding point</p>

The gasket must be inserted correctly into the groove for moisture resistance for the Display Module.

⚠ CAUTION

EQUIPMENT DAMAGE

Since the gasket is flexible but not elastic, be careful not to stretch it unnecessarily.

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

Replacing the Primary Battery

Introduction

Backup clock data uses a Supercapacitor (electric double-layer capacitor) for power. When the voltage from the Supercapacitor is low, clock data is lost*¹ when this product is turned OFF. The average period for backup is as follows:

Initial: approximately 100 days

After 5 years: approximately 30 days (used at ambient temperature of 25 °C [77 °F])

By connecting the Battery for Memory Backup (Model Number PFXZCBBT1) accessory, you can set up a backup period of up to 10 years or more.

*1 If clock data is lost, a clock data error message appears when starting up this product. When this happens, please set up the clock again. Refer to your screen editing software manual on how to set up the clock.

NOTE:

- The lithium battery's lifetime is: 10 years when the battery's ambient temperature is 40 °C (104 °F) or less, 4.1 years when the battery's ambient temperature is 50 °C (122 °F) or less, and 1.5 years when the battery's ambient temperature is 60 °C (140 °F) or less.

When the voltage of the Supercapacitor drops at the same time as the voltage in the Battery for Memory Backup, clock data is lost when power is disconnected. If the clock data error message appears while the Battery for Memory Backup is connected, the Battery for Memory Backup is low and requires replacement.

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.
- Unplug the power cable from both this product and the power supply.
- 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.
- Use only the specified voltage when operating this product. The DC unit is designed to use 12 to 24 Vdc. Always check whether your device is DC powered before applying power.

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

DANGER

EXPLOSION, FIRE, OR CHEMICAL HAZARD

- Use only the replacement battery manufactured by Pro-face.
- Do not cause a short circuit.
- Recycle or properly dispose of used batteries.

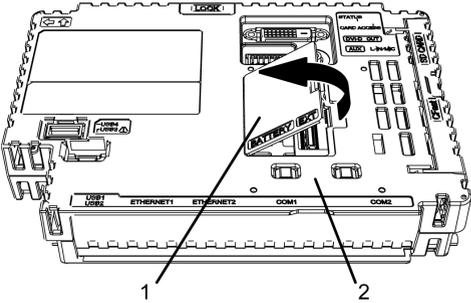
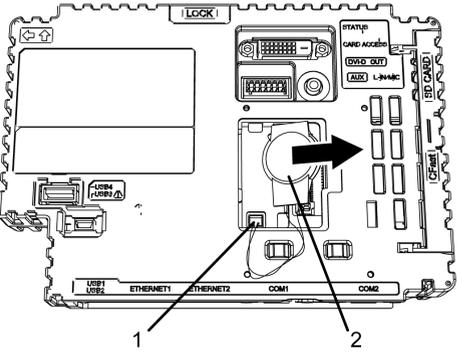
Failure to follow these instructions will result in death or serious injury.

NOTICE

LOSS OF DATA

- Before replacing the Battery for Memory Backup, supply power to the Box Module for 5 minutes or more.
- Replace the Battery for Memory Backup regularly every five years after you purchase this product.
- Allow only qualified personnel to change the Battery for Memory Backup

Failure to follow these instructions can result in equipment damage.

Step	Action
1	Disconnect the power supply from this product.
2	Touch the housing or ground connection to discharge any electrostatic charge from your body.
3	Place the Box Module on a flat, level surface, with the front side pointing up.
4	Open the Expansion Unit Interface Cover on the Box Module. <div style="text-align: center;">  </div> <p>1 Expansion Unit Interface Cover 2 Box Module</p>
5	If the Battery for Memory Backup is already installed, slide the Battery for Memory Backup in the direction of the arrow as illustrated. Unplug the cable from the connector. <div style="text-align: center;">  </div> <p>1 Connector 2 Battery</p>

Replacing the System Card (SD Card)

The System Card is an SD Card with the operating system installed on it.

To replace the System Card, use a SD Card manufactured by Pro-face. See the Accessories (see page 34).

NOTICE

LOSS OF DATA

When using a SD Card:

- Make sure you regularly back up the SD Card data since the SD Card has a life span and accidental data loss can occur at any time.
- While a SD Card is accessed, do not turn OFF or reset this product, and do not insert or remove the SD Card. Doing so could damage the SD Card, or corrupt its data.
- Make sure of the SD Card's orientation before inserting it into the SD Card slot.

Failure to follow these instructions can result in equipment damage.

NOTE: For information on backing up your SD card, used as a system card, refer to Pro-face's support site "Otasuke Pro!" (<http://www.pro-face.com/otasuke>).

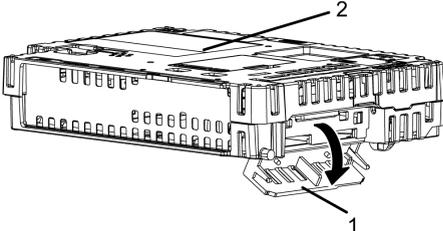
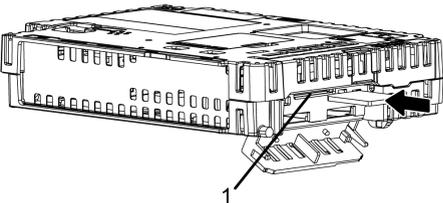
NOTICE

LOSS OF DATA

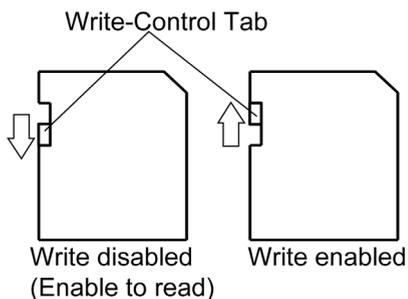
When handling the SD Card:

- Avoid storing the SD Card where there is static electricity or electromagnetic waves.
- Avoid storing the SD Card in direct sunlight, near a heater, or other locations where high temperatures can occur.
- Do not bend the SD Card.
- Do not drop or strike the SD Card against another object.
- Keep the SD Card dry.
- Do not touch the SD Card connectors.
- Do not disassemble or modify the SD Card.

Failure to follow these instructions can result in equipment damage.

Step	Action
1	Turn OFF this product.
2	Remove the Box Module from the Display Module. NOTE: Refer to Installation (see page 104)
3	As illustrated, open the System Card Cover in the direction of the arrow.  1 System Card Cover 2 Box Module
4	Push the SD Card once to release, and pull out the card. NOTE: After using the SD Card, store the SD Card in its case or other safe location.
5	Insert the SD Card into the System Card Slot with the front face of the SD Card facing down, and push until you hear it “click”.  1 System Card Slot
6	Close the System Card Cover.
7	Mount the Box Module on the Display Module.

NOTE: As shown in the image below (example on the left-hand side), you can set the Write-Control Tab to prevent write operations to the SD Card. Push the tab up, as shown in the example on the right-hand side, to release the lock and enable writing to the SD Card.



Replacing the System Card (CFast Card)

The System Card is a CFast Card with the operating system installed on it.

To replace the System Card, use CFast Card manufactured by Pro-face. See the "Accessories (see page 34)".

NOTICE

LOSS OF DATA

When using a CFast Card:

- Make sure you regularly back up the CFast Card data since the CFast Card has a life span and accidental data loss can occur at any time.
- While a CFast Card is accessed, do not turn OFF or reset this product, and do not insert or remove the CFast Card. Doing so could damage the CFast Card, or corrupt its data.
- Turn OFF this product when inserting or removing the CFast Card.
- Make sure of the CFast Card's orientation before inserting it into the CFast Card slot.

Failure to follow these instructions can result in equipment damage.

NOTE: For information on backing up your CFast card, which is used as a system card, refer to Pro-face's support site "Otasuke Pro!" (<http://www.pro-face.com/otasuke>). You can also use commercially available system backup software.

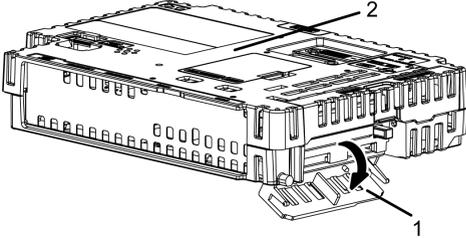
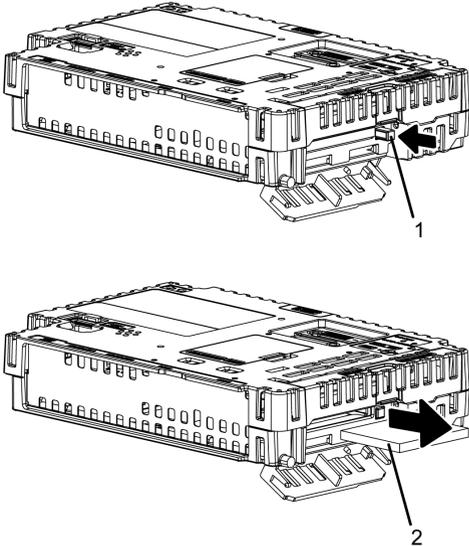
NOTICE

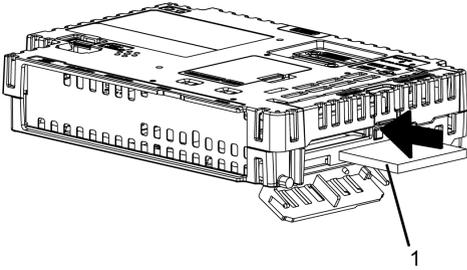
LOSS OF DATA

When handling the CFast Card:

- Avoid storing the CFast Card where there is static electricity or electromagnetic waves.
- Avoid storing the CFast Card in direct sunlight, near a heater, or other locations where high temperatures can occur.
- Do not bend the CFast Card.
- Do not drop or strike the CFast Card against another object.
- Keep the CFast Card dry.
- Do not touch the CFast Card connectors.
- Do not disassemble or modify the CFast Card.

Failure to follow these instructions can result in equipment damage.

Step	Action
1	Turn OFF this product.
2	Remove the Box Module from the Display Module. NOTE: Refer to Installation (see page 104).
3	As illustrated, open the System Card Cover in the direction of the arrow.  1 System Card Cover 2 Box Module
4	Push the eject button once to release, and pull out the card.  NOTE: After using the CFast card, store the CFast Card in its case or other safe location. 1 Eject button 2 System Card

Step	Action
5	<p data-bbox="353 200 1223 253">Insert the CFast Card into the System Card Slot with the front face of the CFast Card facing down, and push until the eject button comes out.</p>  <p data-bbox="353 620 518 645">1 System Card</p>
6	Close the System Card Cover.
7	Mount the Box Module on the Display Module.

Replacing the Backlight

Not user replaceable. When replacement is required, contact your local distributor.

After-sales Service

Information

For details on after-sales service, refer to the Pro-face website at:
<http://www.pro-face.com/trans/en/manual/1001.html>

