Pro-face
for the best interface

FP5000 Series

User Manual

Table of Contents 📖

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 form 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.
> - This product uses 12 to 24 Vdc power. Using any other level of power can damage both the power supply and this product.
>
> **Failure to follow these instructions will result in death or serious injury.**

Critical alarm indicators and system functions require independent an 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.

⚠ 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

Introduction

This chapter describes the panels of this product and general topics such as package contents and standards.

What Is in This Chapter?

This chapter contains the following topics:

Model Number Configuration

The following describes the configuration of model numbers.

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)
				FP		5	6: 12.1-inch 7: 15-inch	00: Standard		T: TFT	P: Multi	D: DC

Model Numbers

Series	Display size	Model names	Model numbers
FP5000 Series	12.1-inch	FP-5600TPD	PFXFP5600TPD
	15-inch	FP-5700TPD	PFXFP5700TPD

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.

Verify all items listed here are present in your package:
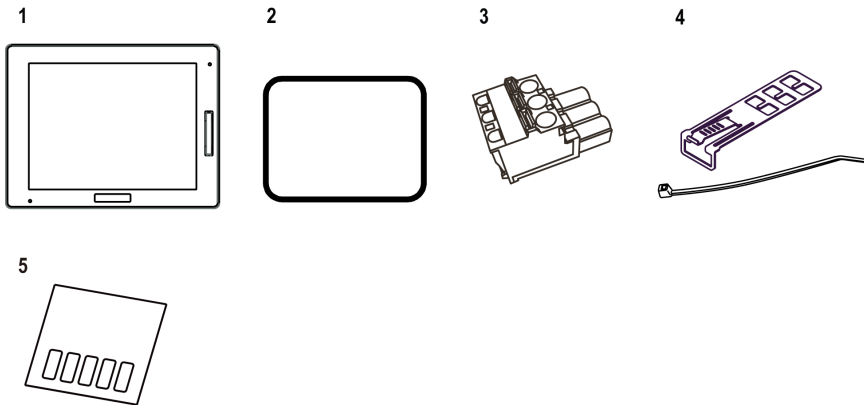
1 FP5000 Series: 1
2 Installation gasket: 1 (attached to this product)
3 DC power supply connector (right angle): 1
4 USB clamp (Type B): 1 set (1 clip and 1 tie)
5 USB masking sticker (mini-B)[*1]: 1
6 FP5000 Series Installation Guide: 1
7 Warning/Caution Information: 1

*1 See Parts Identification and Functions *(see page 27)*.

Revision

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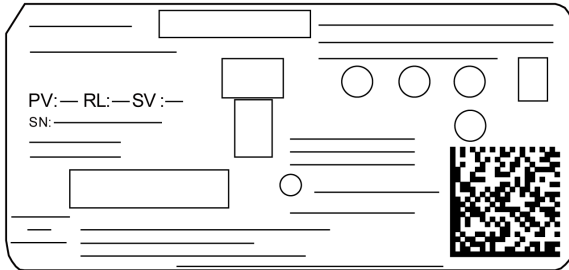
Certifications and Standards

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)
- Germanischer Lloyd (GL)

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

Australia

- RCM Mark
  - EN61000-6-4

Korea

- KC Markings
  - 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 35)*.

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 U.S.A.

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.

⚠ **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. ● Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this product.
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, Division2, Group 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 form 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 AC or 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

<p align="center">사용자안내문</p>

기 종 별	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.

Chapter 2
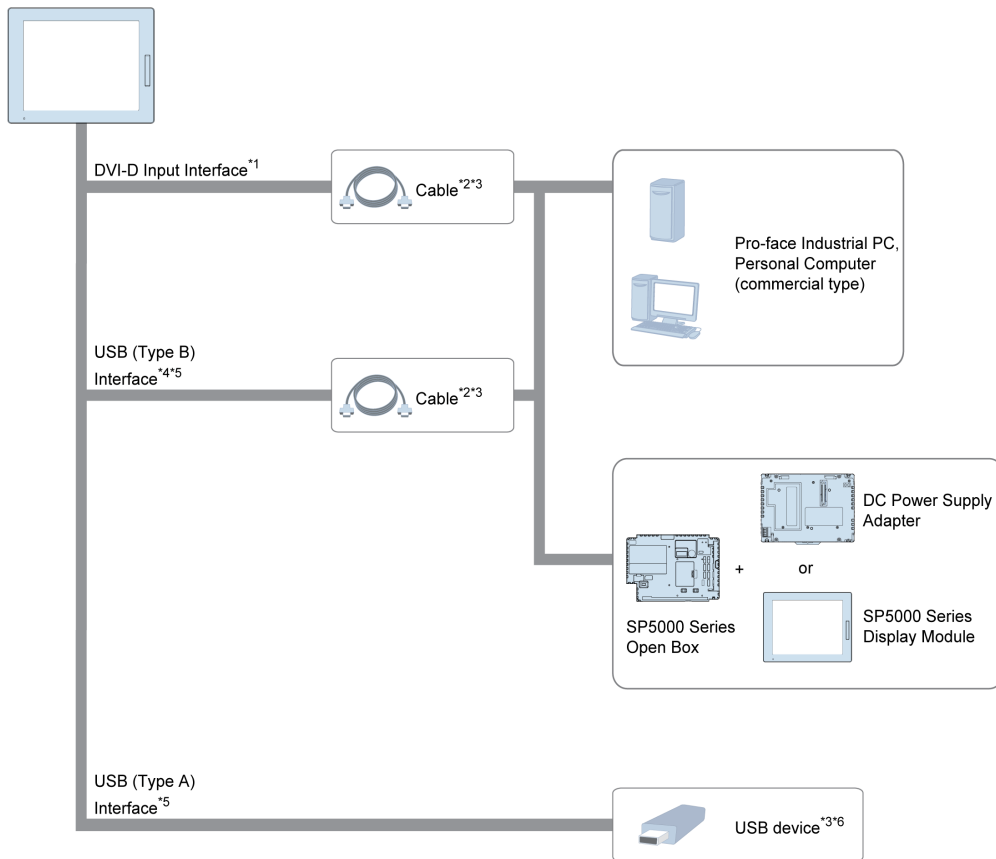## Device Connectivity

Introduction

This chapter presents the equipment you can connect to this product.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
System Design	24
Accessories	25

System Design

DVI-D Input Interface[*1]

Cable[*2*3]

USB (Type B)
Interface[*4*5]

Cable[*2*3]

Pro-face Industrial PC,
Personal Computer
(commercial type)

DC Power Supply
Adapter

SP5000 Series
Open Box

+

or

SP5000 Series
Display Module

USB (Type A)
Interface[*5]

USB device[*3*6]

*1 For image signal reception.

*2 Refer to Accessories *(see page 25)*.

*3 You can also use a commercial type.

*4 For touch panel data transmission.

*5 When you connect a USB (Type B) interface to the host with a USB cable, you can use the front USB (Type A) interface.

*6 Manufactured by Pro-face. Refer to our website (*http://www.pro-face.com*).

NOTE: When you connect more than one display to the host in the following combinations, a touch operation on one display prevents touch operations on the other.

- This Product + This Product
- This Product + SP5000 Series Display Module

Be careful when you connect displays in any other combination, as touch operations become possible from any of the displays.

Accessories

Product name		Product number	Description
USB (Type B) Interface	USB Cable (5 m)[*1]	FP-US00	Cable used for touch panel data transmission between a host (USB Type A) and this product (USB Type B).
DVI-D Input Interface	DVI-D Cable (5 m)[*1]	FP-DV01-50	DVI-D cable used to receive the image signal from host. DVI 1.0 compliant (DVI-D 24-pin plug) (5 m).
12.1-inch Screen Protection Sheet		CA7-DFS12-01	Disposable, dirt-resistant sheet for the display (5 sheets/set)
15-inch Screen Protection Sheet		CA3-DFS15-01	
12.1-inch Environment Cover		PFXZCDOP121	Environmental resistant cover for the display (1 piece)
15-inch Environment Cover		PFXZCDOP151	
Enhanced Front USB Cover (With Screw)		PFXZCDCVUS1	Front USB cover with fixing screw, corresponding to IP66F, IP67F, Type 1/4X Indoor Use Only/13 or ATEX certifications (5 pieces/set)
DC Power Supply Connector (Straight)		PFXZCBCNDC1	Connector to connect DC power supply cables (5 pcs/set)

*1 You can also use a commercial type.

Maintenance Accessories

Product name	Product number	Description
12.1-inch Installation Gasket	PFXZCDWG121	Provides dust and moisture resistance when this product is installed into a solid panel (1 piece)
15-inch Installation Gasket	PFXZCDWG151	
DC Power Supply Connector (Right-angle)	PFXZCBCNDC2	Right-angle connector to connect DC power supply cables (5 pcs/set)
USB Clamp (Type B)	PFXZFP5000USCLB1	Clamp to prevent disconnection of USB cable (USB/Type B, 1 port, 5 clamps/set).

Chapter 3
Parts Identification and Functions

Introduction
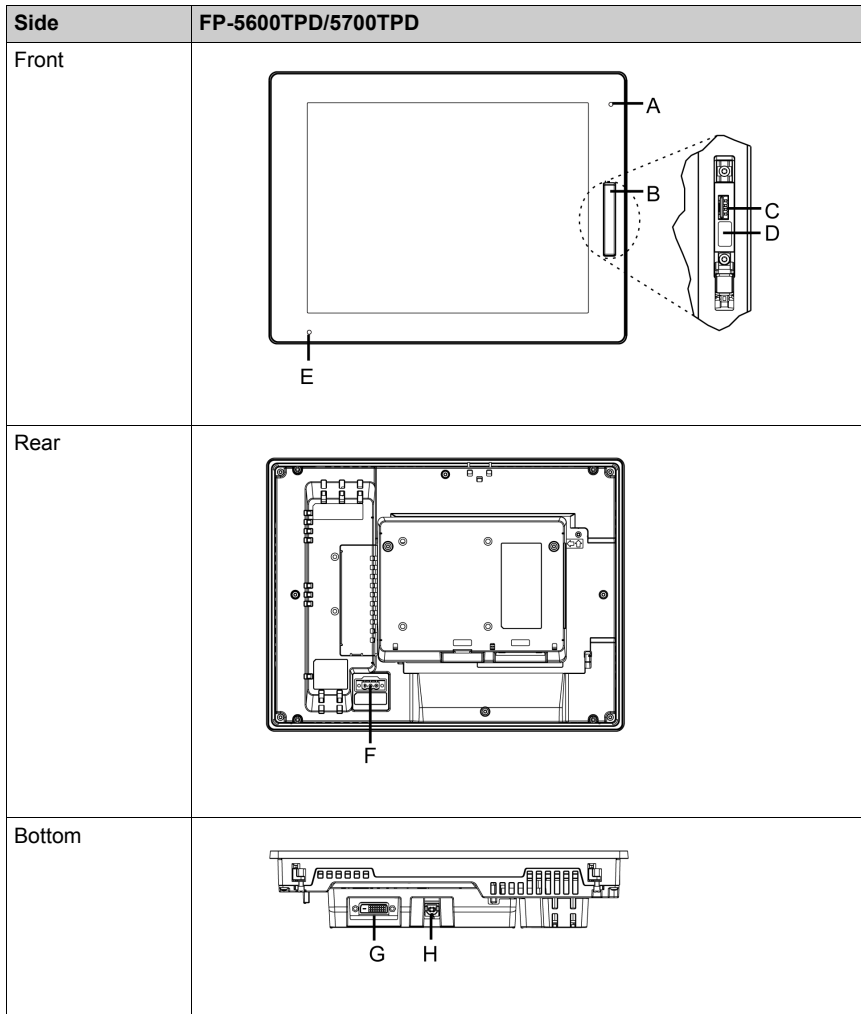
This chapter presents the part locations and functions.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
FP-5600TPD/5700TPD	28
LED Indications	29

FP-5600TPD/5700TPD

NOTE: The figures below show FP-5600TPD.

Side	FP-5600TPD/5700TPD
Front	
Rear	
Bottom	

Part	Name	Description
A	Brightness sensor	Brightness sensor that automatically controls the brightness of the backlight.
B	Front USB cover	USB (Type A) interface is located behind the front USB cover.
C	Front USB (Type A) interface	Conforms to USB 2.0 (Type A) x 1.
D	USB masking sticker (mini-B)	You cannot use the USB (mini-B) interface. Affix the provided USB masking sticker.
E	Status LED	*(see page 29)*
F	Power connector	–
G	DVI-D input interface	DVI-D input interface
H	USB (Type B) interface	Conforms to USB 2.0 (Type B) x 1.

LED Indications

Status LED

Color	Indicator	Description
Green	ON	In operation
	LED fade	Backlight is OFF (Standby Mode), or no video input signal
Green/Orange	Alternating	Launcher is being configured *(see page 81)*
Orange	Flashing	Software is starting up
Red	ON	Power is turned ON
Orange/Red/Green	Alternating	Display unit error[1]
–	OFF	Power is turned OFF

[1] The product may be malfunctioning. Please contact your local distributor.

NOTE: If the screen does not display and the status LED is not in the LED fade state, this indicates the backlight is burned out. When the screen does not display, always check the LED status and do not perform touch operations.

Chapter 4
Specifications

Introduction

This chapter presents the product specifications.

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
4.1	General Specifications	32
4.2	Functional Specifications	37
4.3	Interface Specifications	40

Section 4.1
General Specifications

What Is in This Section?

This section contains the following topics:

Topic	Page
Electrical Specifications	33
Environmental Specifications	34
Structural Specifications	35

Electrical Specifications

Specification			FP-5600TPD	FP-5700TPD
Power supply	Rated input voltage		12...24 Vdc	
	Input voltage limits		10.8...28.8 Vdc	
	Voltage drop		12 Vdc: 2.5 ms or less 24 Vdc: 10 ms or less	
	Power consumption (primary power supply including power loss)	Backlight ON: 100% (Power is supplied to external devices)	17 W or less	21 W or less
		Backlight ON: 100% (Power is not supplied to external devices)	14 W or less	18 W or less
		Backlight adjusted: 20% (Power is not supplied to external devices)	9 W or less	11 W or less
		Backlight OFF (Power is not supplied to external devices)	7 W or less	8 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)	

Environmental Specifications

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

	FP-5600TPD	FP-5700TPD
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	W315 x H241 x D67 mm (W12.4 x H9.49 x D2.64 in)	W397 x H296 x D67 mm (W15.6 x H11.7 x D2.64 in)
Panel cut dimensions	W301.5 x H227.5 mm (W11.87 x H8.96 in)[*2] Panel thickness area: 1.6...5 mm (0.06...0.2 in)[*3]	W383.5 x H282.5 mm (W15.1 x H11.12 in)[*2] Panel thickness area: 1.6...5 mm (0.06...0.2 in)[*3]
Weight	3.9 kg (8.6 lb) or less	5.2 kg (11.5 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, since it can damage the display. Also, do not press on the touch panel with a pointed object, such as the tip of a mechanical pencil or a screwdriver. since doing so can damage the touch panel.

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	38
Touch Panel	39

Display Specifications

	FP-5600TPD	FP-5700TPD
Display type	TFT Color LCD	
Display size	12.1-inch	15-inch
Resolution	1,024 x 768 pixels (XGA)	
Effective display area	W245.76 x H184.32 mm (W9.68 x H7.26 in)	W304.1 x H228.1 mm (W11.97 x H8.98 in)
Display colors	16 million colors	
Backlight	White LED (Not user replaceable. When replacement is required, contact your local distributor.)	
Backlight service life	50,000 hours or more (continuos operation at 25 °C [77 °F] before backlight brightness decreases to 50%)	
Brightness control	0...100 (Adjusted with the launcher)	

Touch Panel

Touch panel type	Resistive film (analog, multi-touch)
Touch panel resolution	1,024 x 1,024
Touch panel service life	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	41
Interface Connection	42
DVI-D Input Interface	45

Interface Specifications

USB (Type A) interface	Connector	USB 2.0 (Type A) x 1
	Power supply voltage	5 Vdc ±5%
	Maximum supply current	500 mA
	Maximum transmission distance	5 m (16.4 ft)
USB (Type B) interface	Connector	USB 2.0 (Type B) x 1
	Maximum transmission distance	5 m (16.4 ft)
Video interface	DVI-D	DVI-D input
	Connector	DVI-D 24 pin (socket) x 1
	Maximum transmission distance	5 m (16.4 ft)

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 42)*. 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).

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
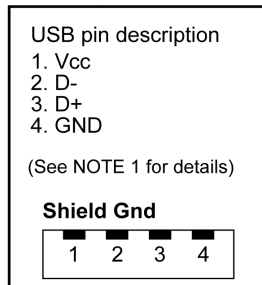
Non-incendive field
wiring apparatus

USB pin description
1. Vcc
2. D-
3. D+
4. GND

(See NOTE 1 for details)

USB cable

USB peripheral
devices
(keyboards,
mouse)

Shield Gnd

| 1 | 2 | 3 | 4 |

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

Class I, Division 2, Groups A, B,
C, D or non-hazardous location
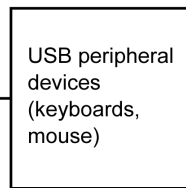
Circuit parameters	Front USB (Type A)
Open-circuit voltage = V_{oc}	5.25 V
Short-circuit current = I_{sc}	1300 mA
Associated capacitance = C_a	265 μF
Associated inductance = L_a	16 μH

<mini B>

NOTE: The front USB port (mini-B) cannot be used.

Non-incendive
field wiring apparatus
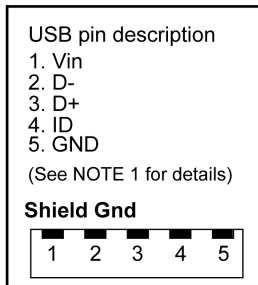
Associated non-incendive
field wiring apparatus

USB pin description
1. Vin
2. D-
3. D+
4. ID
5. GND

(See NOTE 1 for details)

USB cable

USB host
devices
(computer)

Shield Gnd

| 1 | 2 | 3 | 4 | 5 |

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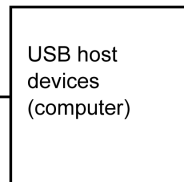
Class I, Division 2
Groups A, B, C, D
or non-hazardous location

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 μF
Internal inductance = L_i	16 μH

NOTE:

1. The above table lists 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 pF/m (60 pF/ft)

L_{cable} = 0.656 µH/m (0.20 µH/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 either a Pro-face manufactured USB cable or a commercial-type USB cable.
- Use only non-incendive USB configurations.
- The associated non-incendive field wiring apparatus shall not be connected in parallel unless approved by the associated non-incendive apparatus.
- This product is suitable for use and provides non-incendive field wiring to apparatus in Class I, Division 2, Groups A, B, C, D.

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

DVI-D Input Interface
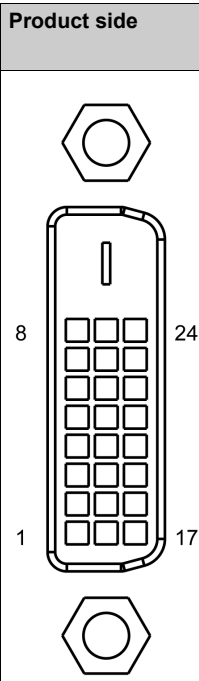
> ### ⚠ ⚠ DANGER
>
> **ELECTRIC SHOCK AND FIRE**
>
> When using the SG terminal to connect an external device to this product:
> - Verify that a short-circuit loop is not created when you set up the system.
> - Connect the SG terminal to remote equipment when the external device is not isolated. Connect 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-	Input
	2	TMDS DATA 2+	Input
	3	TMDS DATA 2 SHIELD (SG)	–
	4	NC	–
	5	NC	–
	6	DDC Clock	Input
	7	DDC Data	Input/Output
	8	NC	–
	9	TMDS DATA 1-	Input
	10	TMDS DATA 1+	Input
	11	TMDS DATA 1 SHIELD (SG)	–
	12	NC	–
	13	NC	–
	14	NC	–
	15	SHIELD (SG)	–
	16	Hot Plug Detect	Output
	17	TMDS DATA 0-	Input
	18	TMDS DATA 0+	Input
	19	TMDS DATA 0 SHIELD (SG)	–
	20	NC	–
	21	NC	–
	22	TMDS CLOCK SHIELD (SG)	–
	23	TMDS CLOCK+	Input
	24	TMDS CLOCK-	Input
	Shell	FG	Functional Ground (Common with SG)

Recommendations:

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

NOTE:

- For noise-free operation, use the recommended DVI-D cable.
- When you use a commercial-type cable, the maximum length is 5 m.

Display Resolution

Resolution	H. sync. (kHz)	V. sync. (Hz)	Dot clock (MHz)
640 x 480	31.469	59.940	25.175
800 x 600	37.879	60.317	40.000
1024 x 768	48.363	60.004	65.000
1280 x 1024	63.981	60.000	108.000

Chapter 5
Dimensions

Introduction

This chapter presents the product external dimensions.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
FP-5600TPD	48
FP-5700TPD	50

FP-5600TPD

External Dimensions

mm / in

(3)

315 / 12.40

67 / 2.64

6.7 / 0.26

241 / 9.49
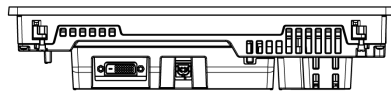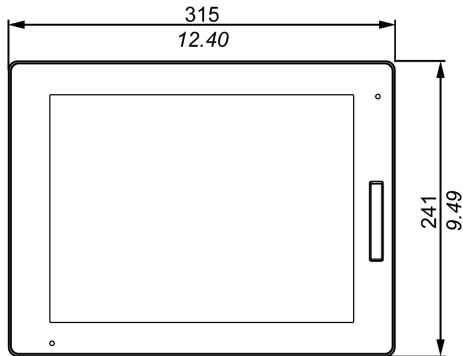
(1)

(2)
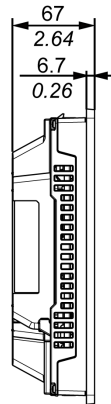
1 Front
2 Left
3 Bottom

Dimensions with Cables

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

1 Right
2 Rear
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.

FP-5700TPD

External Dimensions
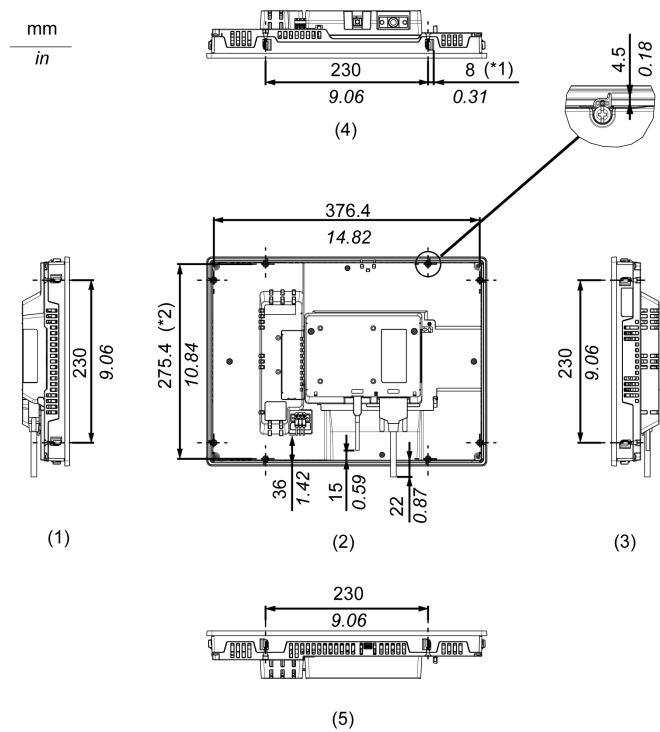
$$\frac{mm}{in}$$

(3)

397
15.63

296
11.65

(1)

67
2.64

6.7
0.26

(2)

1 Front
2 Left
3 Bottom

Dimensions with Cables

mm
―――
in

(4)

230
9.06

8 (*1)
0.31

4.5
0.18

376.4
14.82

(1)

230
9.06

275.4 (*2)
10.84

230
9.06

36
1.42

15
0.59

22
0.87

(2)

(3)

230
9.06

(5)

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

1 Right
2 Rear
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

Introduction

This chapter describes the installation procedures and wiring principles for this product and peripheral devices.

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
6.1	Installation	54
6.2	Wiring Principles	61
6.3	USB Cable Clamp	67
6.4	Front USB Cover	70

Section 6.1
Installation

Installation Procedures

Introduction

This product is designed for use on a flat surface 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).

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		Enclosure front surface
Without screw	**With screw**	
IP65F, IP67F, Type 1	IP66F, IP67F, Type 1, Type 4X (Indoor Use Only), Type 13	IP65F, IP66F, IP67F, Type 1, Type 4X (Indoor Use Only), Type 13

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

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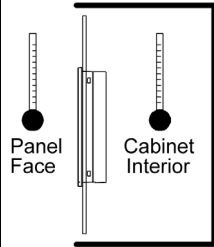
Be sure that heat from surrounding equipment does not cause this product to exceed its standard operating temperature.

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.
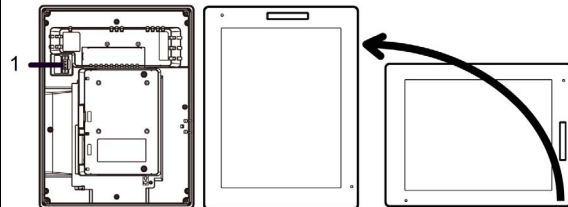
1 Power connector

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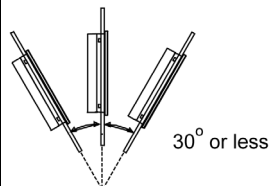
30° or less

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:
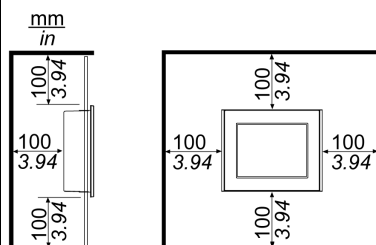
You can attach a commercial-type arm or wall-mount adapter using the arm mounting holes (VESA 75 mm specification) at the back of this product. Attach the four (4) M4 attachment screws (screw length: 10 mm [0.4 in]). The torque required for these screws is 0.7 to 0.8 N•m (6.2 to 7.1 lb•in).

Panel Cut Dimensions

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

mm [in]
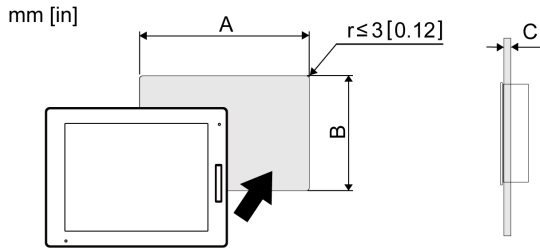
Display size	A	B	C
12.1-inch models	301.5 mm (+1/-0 mm) (11.87 in [+0.04/-0 in])	227.5 mm (+1/-0 mm) (8.96 in [+0.04/-0 in])	1.6...5 mm (0.06...0.2 in)
15-inch models	383.5 mm (+1/-0 mm) (15.1 in [+0.04/-0 in])	282.5 mm (+1/-0 mm) (11.12 in [+0.04/-0 in])	

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 this product and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
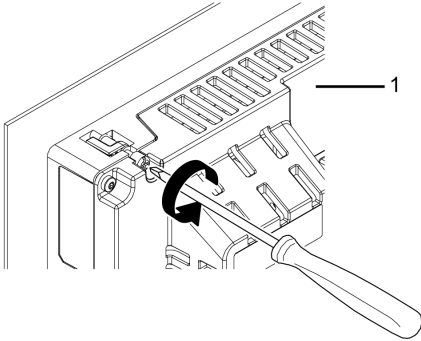- Replace and secure all covers or elements of the system before applying power to this product.

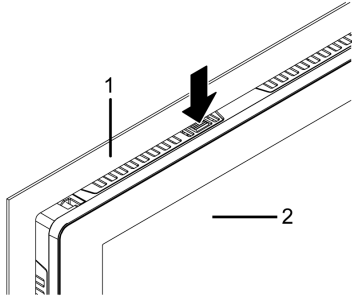**Failure to follow these instructions will result in death or serious injury.**

NOTICE

EQUIPMENT DAMAGE

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	Place this product on a clean and level surface with the screen facing down.
2	Check that the gasket of this product 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 92)*.
3	Based on the panel cut dimensions of this product *(see page 56)*, open a mount-hole on the panel and attach this product to the panel from the front side.
4	Confirm that the anti-drop lock on the top of this product is attached to the panel. **1** Anti-drop lock **2** Panel

Step	Action
5	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).
	NOTE:
	● If this product 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 this product from the front as you tighten the screws.
	1 Installation fastener
	2 L-shaped part of the installation fastener
	Number of Installation Fasteners
	15-inch models:
	● Top - 2, Bottom - 2, Right - 2, Left - 2
	12-inch models:
	● 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 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.
Failure to follow these instructions will result in death or serious injury.

NOTICE
EQUIPMENT DAMAGE
• Keep this product stabilized in the panel-cut while you are installing or removing the screw fasteners. • 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.

Step	Action
1	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. **1** Rear side **NOTE:** • For the number of installation fasteners on your model, see Number of Installation Fasteners in Step 5 of Installing to the Panel *(see page 56)* • 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 this product from the front as you loosen the screws.

Step	Action
2	While pushing on the anti-drop lock on the top of this product with a tool such as a screwdriver, slowly remove this product from the panel. **1** Panel **2** Front side

⚠ 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.

Section 6.2
Wiring Principles

What Is in This Section?

This section contains the following topics:

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.
- This product uses only 12...24 Vdc power. Using any other level of power can damage both the power supply and this product.
- 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.
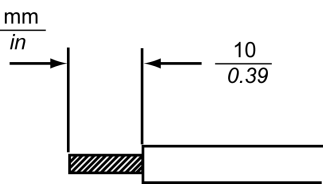
Failure to follow these instructions will result in death or serious injury.

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 electromagentic 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 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 0.6 x 3.5 (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.

Power Supply Connector Specifications: Spring Clamp Terminal Blocks

This product comes with the right-angle-type power connector.

NOTE:

- You can also use a straight-type power connector.
- Right-angle type: PFXZCBCNDC2 manufactured by Pro-face.
  Straight type: PFXZCBCNDC1 manufactured by Pro-face.
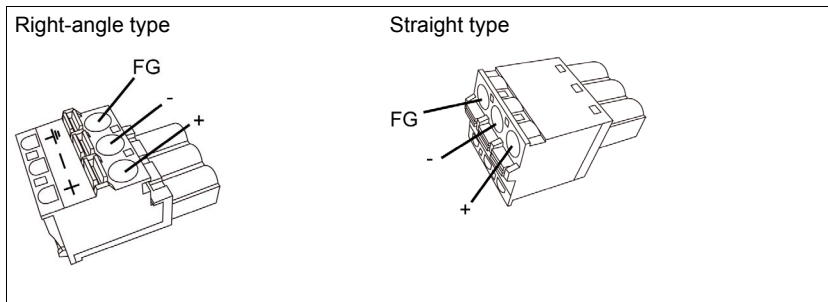
Connection	Wire
+	12...24 Vdc
-	0 Vdc
FG	Grounded terminal connected to the panel chassis.

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	Insert each power cord wire into its corresponding holder. Release the opening button to clamp the wire in place. When using stranded wire, do not short with neighboring wires.
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.

⚠ **WARNING**
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 can result in death, serious injury, or equipment damage.**

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.
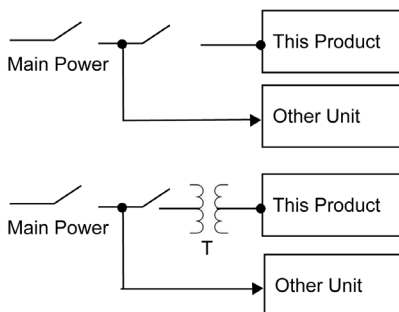
● Branch circuit protective device shall be used for rating 20 A for 12 to 24 Vdc input device for this product.
● You must use DC input with an isolating source for this product.
● The following shows a surge protection device connection:

Lightning

Lightning Rod

This product

Ground

Provide adequate distance

Surge Protection Device

FG
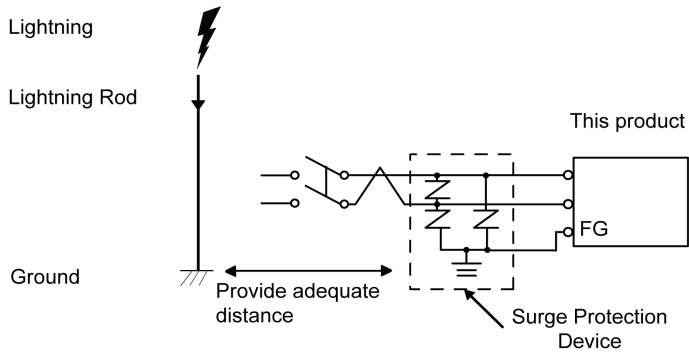
- Attach a surge device to prevent damage to this product as a result of a lightning-induced power surge from a large electromagnetic field generated from a direct lightning strike. We also strongly recommend to connect the crossover grounding wire of this product to a position close to the ground terminal 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)   (2)   FG   (3)
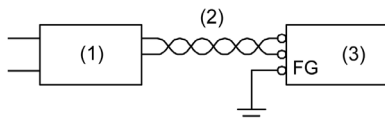
1 Regulated power supply
2 Twisted-pair cord
3 This product

- 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. Refer to Electrical Specifications *(see page 33)*.

(1)   (2)   FG   (3)
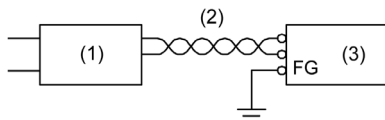
1 Insulating transformer
2 Twisted-pair cord
3 This product

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.
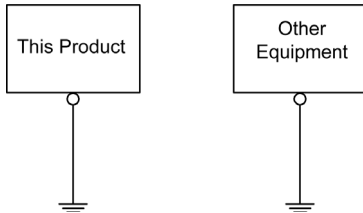
Precautions

- Check that the grounding resistance is 100 Ω or less[1].
- The FG wire should have a cross sectional area greater than 2 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
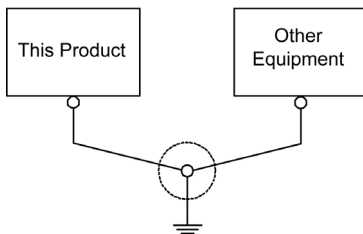
Incorrect grounding
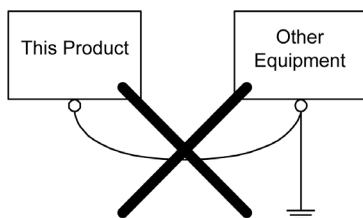
Section 6.3
USB Cable Clamp

USB Clamp (Type B)

Introduction

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

<table>
<tr><td colspan="2" align="center">⚠ DANGER</td></tr>
<tr><td colspan="2">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 either a Pro-face manufactured USB cable or a commercial-type USB cable.
● Use only non-incendive USB configurations.
● The associated non-incendive field wiring apparatus shall not be connected in parallel unless approved by the associated non-incendive apparatus.
● This product is suitable for use and provides non-incendive field wiring to apparatus in Class I, Division 2, Groups A, B, C, D.

Failure to follow these instructions will result in death or serious injury.</td></tr>
</table>

Attaching USB Clamp (Type B)

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

Step	Action
1	Mount the clip to the USB mark ⬥⟨ connector shell so that it overlaps. The clip matches the 32 to 48.5 mm (1.26 to 1.91 in) length of the USB connector. $\frac{mm}{in}$ $\frac{32...48.5}{1.26...1.91}$

Step	Action
2	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. Pass the tie through here.
3	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. **NOTE:** ● 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. ● If the provided ties are lost, you can substitute them with Pro-face manufactured ties (PFXZFP5000USCLB1) or commercially available ties of 4.8 mm (0.19 in) width and 1.3 mm (0 05 in) thickness.
4	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.

Removing USB Clamp (Type B)

Remove the USB cable while pushing the grip section of the clip.
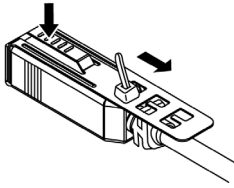
Section 6.4
Front USB Cover

Opening the Front USB Cover

When using a factory-installed front USB cover (without screw), the front surface is IP65F[*1], P67F[*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.
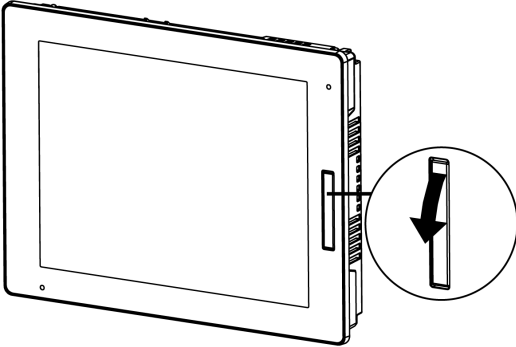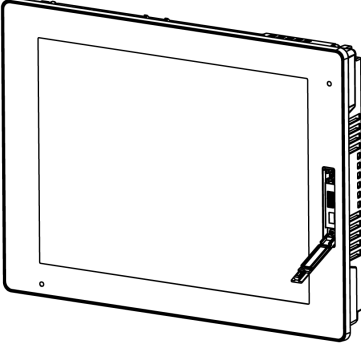
⚠ **CAUTION**
RISK OF INJURY
When opening the Front USB Cover, be careful not to injure your fingers.
Failure to follow these instructions can result in injury or equipment damage.

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

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

Step	Action
1	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. **NOTE:** ● When using the Pro-face manufactured front USB cover (PFXZCDCVUS1), loosen the top screw using a Phillips screwdriver. ● The required torque is 0.5 N•m (4.4 lb•in).

Step	Action
2	The USB interface can be seen once you pull down the front USB cover.

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.

Chapter 7
System Specifications and Launcher

Introduction

This chapter describes the system specifications for this product and the Launcher.

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
7.1	System Specifications	74
7.2	Launcher	80

Section 7.1
System Specifications

What Is in This Section?

This section contains the following topics:

Topic	Page
Operating System, Drivers, Utilities	75
Settings Workflow	76
Installing the Drivers	77
Installing the Utilities	79

Operating System, Drivers, Utilities

Introduction

This section describes the required software environment for this product.

Compatible Operating Systems

- Windows® XP 32-bit
- Windows® 7 32-bit/64-bit
- Windows® 8 32-bit/64-bit
- Windows® Embedded Standard 2009 for Pro-face products[1]
- Windows® Embedded Standard 7 for Pro-face products[1]

[1] For supported models, contact your local distributor.

Dedicated drivers and utilities

Dedicated drivers and utilities are required for touch input data communication between this product and the host, and adjustment of the screen display.

You can download the drivers and utilities from our website "Otasuke Pro!" at *http://www.pro face.com/otasuke*.

Name		Description
Driver	Communication driver	This driver enables communication between this product and the utilities *(see page 77)*.
	Touch panel driver (only when using Windows® XP)	This driver sets cursor movement on the target display for touch operations *(see page 78)*.
Utility	Launcher • Brightness • Buzzer • Front USB • T/P (Touch Panels) Calibration • Launcher Settings	*(see page 81)*

Settings Workflow
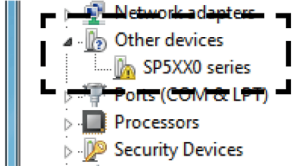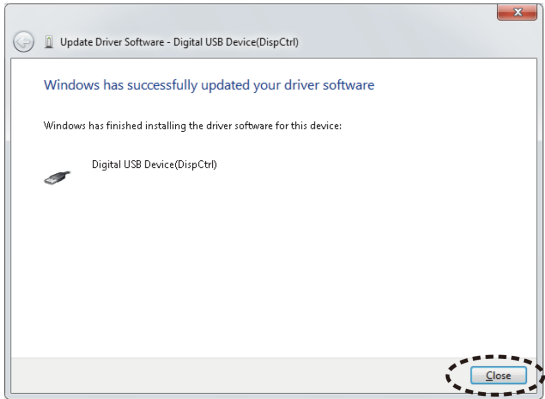
Follow the steps below to configure the software.

Step	Action
1	Configure the display settings from the screen properties (Screen Resolution) for your host.
2	Install the drivers *(see page 77)*.
3	Install the utilities *(see page 79)*.
4	Configure **Tablet PC** *(see page 87)*.
5	Configure **Launcher Settings** *(see page 84)*.
6	Configure the following as needed, in any order. ● **Brightness** *(see page 83)* ● **Buzzer** *(see page 83)* ● **Front USB** *(see page 83)* ● **T/P Calibration** *(see page 84)* ● **Display** *(see page 87)* ● **Power Option** *(see page 87)*
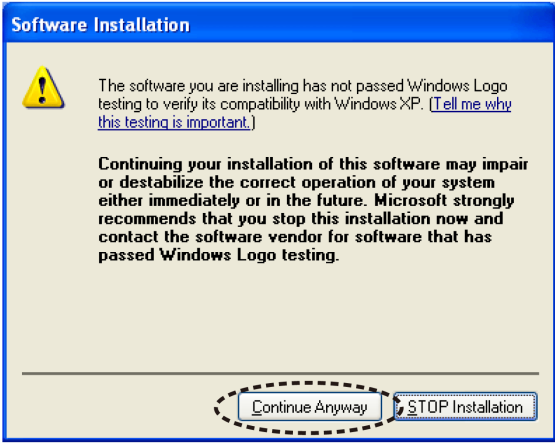
When changing **PC Settings (Display, Power Option, Tablet PC)**, always ensure that the Write Filter is disabled. If the Write Filter is enabled, the setting information will be erased when the operating system is restarted. After you change the setting, we recommend that you re-enable the Write Filter.

Installing the Drivers
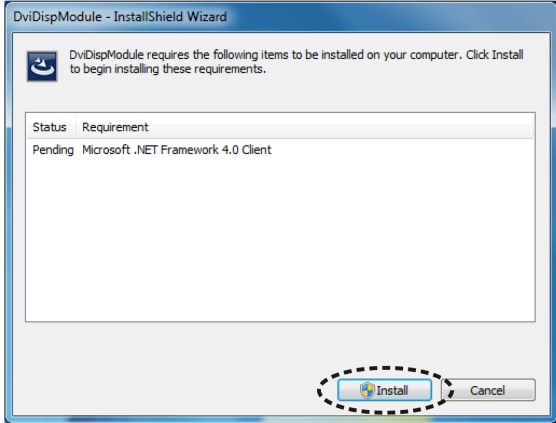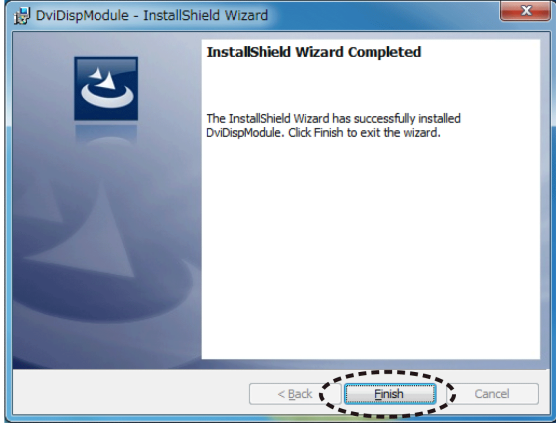
Communication driver

Step	Action
1	Connect this product to the host with a DVI-D cable and USB cable *(see page 24)*.
2	Turn on this product and the host, and start Windows®.
3	Download the drivers onto the host *(see page 75)*.
4	From **Control Panel** → **Device manager**, check that **SP5XX0 series** is displayed under **Other devices**.
5	Right click **SP5XX0 series**, and select **Update Driver Software.**
6	Click **Browse my computer for driver software.**
7	Click **Let me pick from a list of device drivers on my computer**.
8	Click **Next**.
9	Click **Have Disk**.
10	Click **Browse**.
11	From the folder containing the downloaded drivers, open **Drivers** → **CommunicationDriver** → the folder for your operating system.
12	Select **dispctrl.inf** and click **Open**.
13	Click **OK**.
14	Click **Next**.
15	Click **Install**.
16	Click **Close** to complete the installation.

Touch panel driver (only when using Windows® XP)

Step	Action
1	Connect this product to the host with a DVI-D cable and USB cable *(see page 24)*.
2	Turn on this product and the host, and start Windows®.
3	Touch the screen and confirm that the curser moves.
4	Download the drivers onto the host *(see page 75)*.
5	From the folder containing the downloaded drivers, open **Drivers** → **TouchPanelDriver** → **wxp**.
6	Run **Setup.bat**, and follow the on-screen instructions to install the drivers. If the following dialog box appears during installation, select **Continue Anyway**. **Software Installation** ⚠ The software you are installing has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.) Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the software vendor for software that has passed Windows Logo testing. [Continue Anyway] [STOP Installation]
7	Click **Finish** to complete the installation.

Installing the Utilities

Step	Action
1	Download the utilities onto the host. *(see page 75)*
2	From the folder containing the downloaded utilities, open **Drivers** → **Utilities**.
3	Run **setup.exe**, and follow the on-screen instructions to install the utilities. **NOTE:** To use these utilities, Microsoft®.NET Framework is required. If Microsoft®.NET Framework is not installed on your host, follow the on-screen instructions to install it.
4	Click **Finish** to complete the installation.

Section 7.2
Launcher

What Is in This Section?

This section contains the following topics:

Topic	Page
About the Launcher	81
Display Settings	83
PC Settings	87
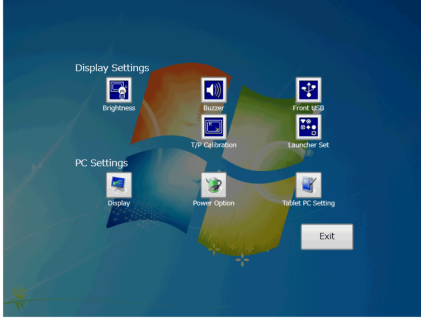
About the Launcher

Introduction
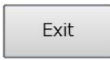
The Launcher is a utility that displays icons to configure settings on this product with convenient touch operation.

NOTE: Before using the Launcher, you need to install the required drivers and utilities. You can download the drivers and utilities from our website "Otasuke Pro!" at *http://www.pro face.com/otasuke*. For more detailed information, refer to Installing the Drivers *(see page 77)* and Installing the Utilities *(see page 79)*.

How to Display the Launcher

Step	Action
1	On this product's screen, press and hold the locations below in the order indicated within 5 seconds.
2	The Launcher is displayed. **NOTE:** If multiple displays are connected to the host, the Launcher is displayed on the primary display (main display) by default in the factory setting.

Icons

Display settings		Brightness	Sets the backlight brightness. You can select **Manual** or **Auto**. When **Auto** is selected, a brightness sensor automatically adjusts the brightness *(see page 83)*.
		Buzzer	Sets the sound on/off when starting the Launcher and performing touch operations *(see page 83)*.
		Front USB	Enables/disables the front USB port *(see page 83)*.
		T/P Calibration	Calibrates the touch coordinates *(see page 84)*.
		Launcher Set	Sets the display parameters so that the screen can be adjusted through the Launcher *(see page 84)*.
PC settings		Display	Adjusts the contrast and black level of the display. This is a standard feature of Windows® *(see page 87)*.
		Power Option	Sets the amount of time before the display is turned off. This is a standard feature of Windows® *(see page 87)*.
		Tablet PC	Makes the host recognize that the display is touchscreen. This is a standard feature of Windows® 7 or later *(see page 87)*.
Exit		Exit	Closes the Launcher.

Display Settings
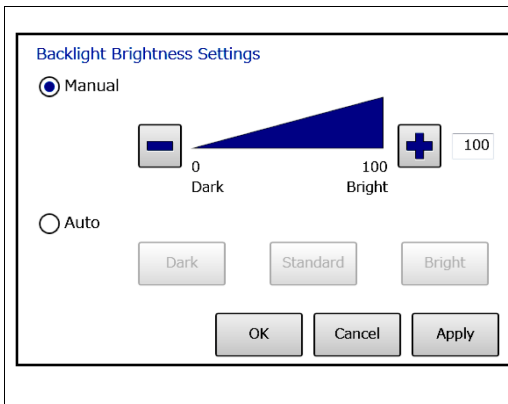
Brightness

Manual: Sets the brightness to a fixed value from 0 to 100.

Auto: Automatically adjusts the brightness to the selected level using a brightness sensor.

Buzzer
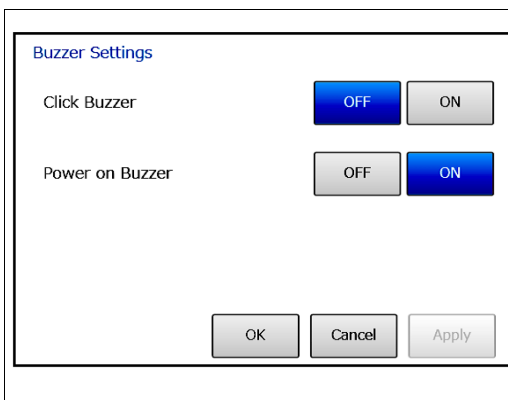
Click Buzzer: Sets the sound on/off when you perform touch-panel operations.

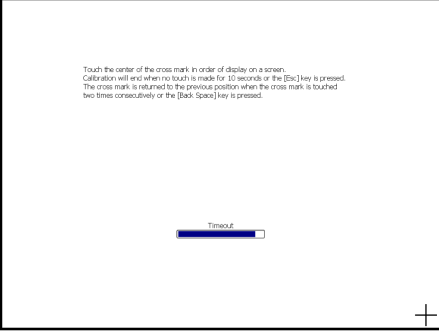**Power on Buzzer**: Sets the sound on/off when you turn on this product.

Front USB
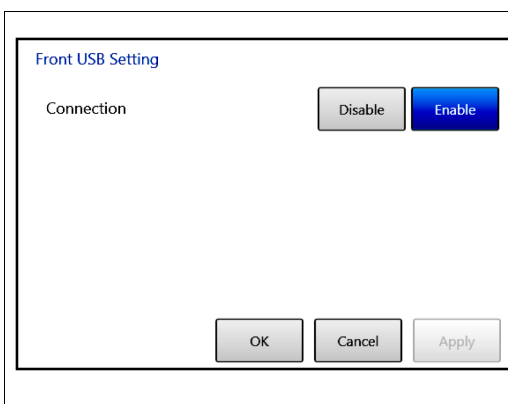
Enables/disables the front USB port.

T/P (Touch Panel) Calibration

Calibrates the touch panel via the on-screen instructions.

Touch the center of the cross mark in order of display on a screen.
Calibration will end when no touch is made for 10 seconds or the [Esc] key is pressed.
The cross mark is returned to the previous position when the cross mark is touched two times consecutively or the [Back Space] key is pressed.

Timeout

NOTE: Do not calibrate the touch panel using **Adjustment** in **Tablet PC**. If touch panel calibration is required, be sure to use **T/P Calibration**.

Launcher Settings

After you connect this product to the host, set the display parameters so that the screen can be adjusted through the Launcher.

| Step	Action
1	Touch or click the **Launcher Set** icon. In the **Launcher Set** dialog box, the FP5000 Series display connected to the host is displayed.

Step	Action
2	Select any number. The status LED on the display for the selected number alternates between green and orange. **1** Status LED **NOTE:** If multiple FP5000 Series displays are connected, you cannot determine through the display which number corresponds to which display. Check the status LED.
3	Select the **Screen No** (screen identification number) for the display where the status LED is alternating green and orange.

Step	Action
4	Following the dialog box instructions, touch the screen that has its status LED alternating between green and orange. After displaying the Launcher *(see page 81)*, you can configure the settings for that screen. Launcher Set Screen No.　　　Screen1 Please touch the screen of the display which Front LED blinks. OK　　Cancel **NOTE:** If multiple displays are connected in extension mode (**Extend these displays** is selected), confirm that the above message appears on the display where the status LED is alternating green and orange, and touch this screen.
5	If multiple FP5000 Series displays are connected, repeat Steps 2 to 4 for each display as required. Launcher Set No.　Screen No.　Touch panel 1　Screen1　OK Setup　Exit **NOTE:** When the FP5000 Series display is configured, OK appears in the **Touch panel** column.

NOTE: If you extend your desktop across multiple monitors connected to DVI-D ports, and you switch their DVI-D cables, touching one screen will operate the mouse pointer on the other screen. If you switch DVI-D cables, change the **Screen No** setting on the Launcher.
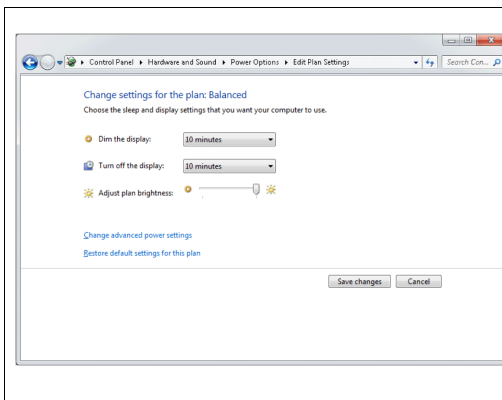
PC Settings

Display
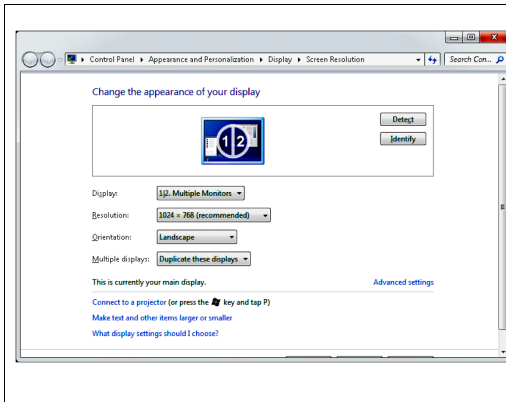
The Windows® standard setting window is displayed. For adjustment of screen contrast and black level, from **Advanced settings**, make the settings in the setting screen for your graphic driver.

Power Option

The Windows® standard setting window is displayed. Set the time duration before this product automatically turns off and other settings.

Tablet PC
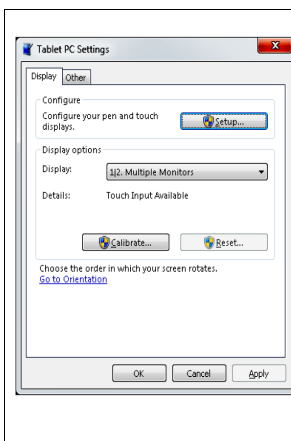
The Windows® standard setting window is displayed. In **Setup**, confirm that the display is recognized as touchscreen.

NOTE: Do not calibrate the touch panel using **Adjustment** in **Tablet PC**. If touch panel calibration is required, be sure to use **T/P Calibration**.

Chapter 8
Maintenance

Introduction

This chapter explains how to maintain this product.

What Is in This Chapter?

This chapter contains the following topics:

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.

<table>
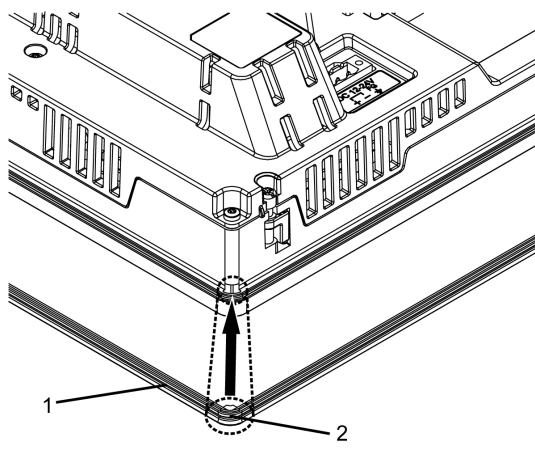<tr><td colspan="2" align="center">NOTICE</td></tr>
<tr><td colspan="2">GASKET AGING</td></tr>
<tr><td colspan="2">

● 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.
</td></tr>
</table>

Installing the Installation Gasket

Step	Action
1	Place this product on a flat, level surface, with the display face pointing down.
2	Remove the gasket from this product.
3	Attach the new gasket to this product. Insert the protrusions from the four corners of the gasket into the corresponding holes in the corners of this product. **NOTE:** When using a tool to insert the gasket, make sure the tool does not catch the rubber gasket and cause a tear. **1** Installation Gasket **2** Protruding point

The gasket must be inserted correctly into the groove for moisture resistance for this product.

<table>
<tr><td colspan="2" align="center">⚠ CAUTION</td></tr>
<tr><td colspan="2">EQUIPMENT DAMAGE</td></tr>
<tr><td colspan="2">

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.
</td></tr>
</table>

Replacing the Backlight

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

Troubleshooting Checklist

Introduction

When a problem occurs, make sure to go through the checklist and follow the instructions given.

Here are the main issues that may occur when using this product:

- The display is blank:
  - No display appears after this product is switched on
  - The screen disappears during standard operation
  - The screen does not display normally

- The touch panel does not respond

NOTE: If the following checklists do not solve your problem, please contact your local distributor.

No Display

The table below suggests actions to take if this product's display is blank or if the screen turns itself off.

Step	Check/Operation	Solution
1	Is the status LED red?	- If No, go to Step 2. - If Yes, go to Step 8.
2	Is the status LED blinking orange?	- If No, go to Step 3. - If Yes, check the cable connection and restart the host.
3	Is the status LED green?	- If No, go to Step 4. - If Yes, go to Step 8.
4	Is the status LED fading in and out?	- If No, go to Step 5. - If Yes, reconnect the DVI-D cable properly.
5	Are you using the correct voltage to power the product?	- If No, use the correct voltage *(see page 33)*. - If Yes, go to Step 6.
6	Turn off the power.	Go to Step 7.
7	Is the power cable connected properly?	- If No, connect it properly *(see page 64)*. - If Yes, go to Step 8.
8	Did you solve your problem?	If none of the previous steps fixed the problem, then there is a problem with the product. Contact your local distributor.

After-sales Service

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