ES5000 Series

User Manual

ES5000-MM01-EN_00
01/2022

Pro-face™

by Schneider Electric

www.pro-face.com

Table of Contents

	Safety Information	5
	About the Book	7
Chapter 1	**Important Information**	11
	Certifications and Standards	12
Chapter 2	**Physical Overview**	13
	Model Numbers	14
	Package Contents	15
	Description	16
Chapter 3	**Characteristics**	21
	Characteristics	22
	Interface Characteristics	24
	Environmental Characteristics	25
Chapter 4	**Dimensions / Installation**	26
	Dimensions	27
	Installation Requirements	29
	Installation	33
Chapter 5	**Getting Started**	38
	At First Startup	39
	UWF Manager	40
	Cybersecurity	41
	Windows Update	42
Chapter 6	**Industrial PC Connections**	43
	Grounding	44
	Connecting the DC Power Cord	47
	Industrial PC Interface Connections	50
Chapter 7	**Hot Key and BIOS**	52
7.1	**Hot Key Description**	53
7.2	**BIOS Main** Menu	54
	Advanced Menu	55
	Chipset Menu	58
	Boot Menu	60
	Security Menu	60
	Save & Exit Menu	61
Chapter 8	**Hardware Modifications**	62
8.1	Before Modifications	63

8.2 Storages Modifications 65
HDD/SSD Drive Description and Installation 66
8.3 COM Switch Description and Setting 70
Chapter 9 Maintenance 74
Reinstallation Procedure 75
Regular Cleaning and Maintenance 76
Appendices 78
Appendix A Accessories and Setting 79
Accessories for the Industrial PC 80

Safety Information

Important Information

NOTICE

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

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

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

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

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

PLEASE NOTE

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

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

About the Book

At a Glance

Document Scope

This manual describes how to use this product.
The Industrial PC is designed to operate in an industrial environment.

Validity Note

The technical characteristics of the devices described in the present document also appear online. To access the information online,go to our website.

https://www.pro-face.com

The characteristics that are presented in this manual should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If 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.

Intel®, and Core i5® are registered trademarks of Intel corporation.

Product Related Information

⚠ DANGER

POTENTIAL FOR EXPLOSION IN HAZARDOUS LOCATION

Do not use this product in hazardous locations.

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

⚠ 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.
- 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.(1)
- Each implementation of a ES5000 Series must be individually and thoroughly tested for proper operation before being placed into service.

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

(1) 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 other applicable standards in your location.*

⚠ WARNING

LOSS OF CONTROL

- Do not touch the touch screen with the edge tools area during Operating System.
- Do not operate when the touch screen surface is dust.
- If the touch screen surface is dust, remove dust with a soft cloth before operation.

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

NOTE:

The following characteristics are specific to the LCD 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 cross-talk, 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 over time.
- When the same image is displayed on the screen for a long period, an after-image may appear when the image is changed. If this happens, turn off the unit, wait 10 seconds, and then restart it.
- 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 customer support.
  https://www.pro-face.com/trans/en/manual/1015.html

NOTE: Do not display the same image for a long time. Change the screen image periodically.

NOTE: The Industrial PC 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
Use only Pro-face software with the devices described in this manual.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Chapter 1
Important Information

General

This chapter describes specific aspects related to the operation of the ES5000 Series.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Certifications and Standards	12

Certifications and Standards

Compliance Standards

Pro-face tested this product for compliance with the following compulsory standards:

- EN 61000-6-2:2005 Electromagnetic compatibility (EMC) part 6-2:Generic standards-immunity for industrial environments
- EN 61000 6-4:2007/+A1:2011 Electromagnetic compatibility (EMC) part 6-4:Generic standards-Emission standard for industrial environments

Qualification Standards

Pro-face voluntarily tested this product to additional standards. The additional tests performed, and the standards under which the tests were conducted, are identified in the environmental characteristics.

Hazardous Substances

This product is compliant with:

- RoHS China, Standard GB/T26572
- RoHS European,Directive 2011/65/EU + RoHS directive amendment 2015/863
- REACH regulation EC 1907/2006

NOTE: Documentation about sustainable development is available on Pro-face website (Product Environmental Profile and End of Life Instruction, RoHS, and REACH certificates).

End of Life (WEEE)

The product contains electronic boards. It must be disposed of in specific treatment channels. The product contains cells and/or storage batteries which must be collected and processed separately when they have run out and at the end of product life.
Directive 2012/19/EU.

Refer to the section Maintenance to extract cells and batteries from the product. These batteries do not contain a weight percentage of heavy metals over the threshold notified by European . Directive 2006/66/EC.

European (CE) Compliance

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

Chapter 2
Physical Overview

Subject of this Chapter

This chapter provides a physical overview of the ES5000 Series.

What Is in This Chapter?

This chapter contains the following topics:

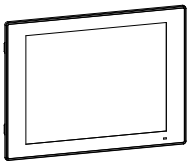
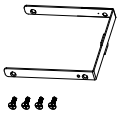
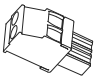
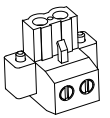
Topic	Page
Model Numbers	14
Package Contents	15
Description	16

Model Numbers

Series	Model name	Model number
ES5000 Series	ES-5700TA	PFXES5700TADW
	ES-5700WA	PFXES5700WADW

Package Contents

The following items are included in the package of the ES5000 Series. Before using the Industrial PC, confirm that all items listed here are present:

• Industrial PC x 1	
• HDD/SSD bracket installation adpter x 1	
• Screw installation fasteners 15” x 8 W15.6" x 8	
• Quick Installation Guide x 1 • Chinese RoHS flyer x 1	
• Warning/Caution Information x 1	
• Remote Switch connnector x 1	
• DC power connector x 1	

The Industrial PC has been carefully packed, with special attention to quality. However, should you find anything damaged or missing contact your local distributor immediately.

Description

Introduction

During operation, the surface temperature of the heat sink may exceed 70 °C (158 °F).

⚠ WARNING

RISK OF BURNS

Do not touch the surface of the heat sink during operation.

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

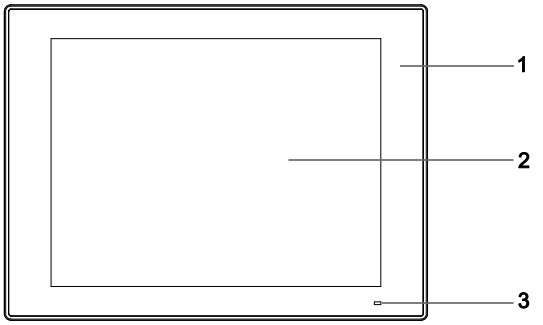
⚠ WARNING

LOSS OF CONTROL

- Do not touch the touch screen with the edge tools area during Operating System.
- Do not operate when the touch screen surface is dust.
- If the touch screen surface is dust, remove dust with a soft cloth before operation.

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

ES5000 Series 15" Front View

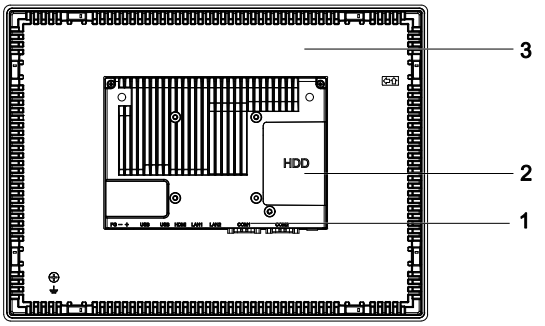


1 Panel
2 Single-touch panel
3 Status indicator

The table describes the meaning of the status indicator:

Color	State	Meaning
Green	On	Industrial PC is OK.
Red	On	Stand by.
No light	Off	Industrial PC is off.

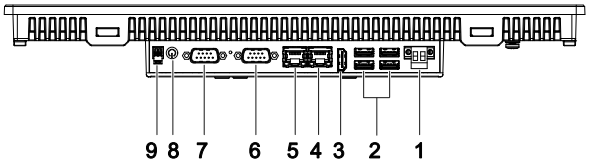
ES5000 Series 15" Rear View



1 Industrial PC interface
2 Cover for access HDD/SSD drive
3 Panel

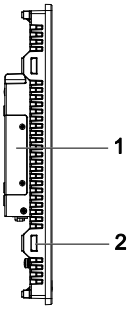
NOTE: The cooling method is passive heat sink.

ES5000 Series 15" Bottom View



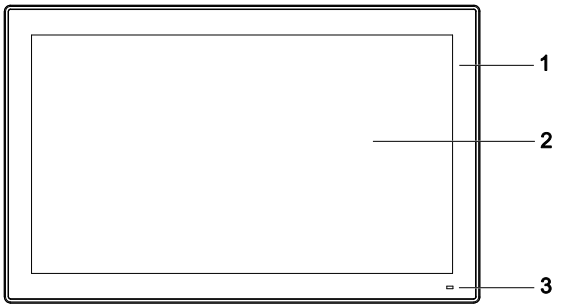
1 12...24 Vdc power connector
2 USB3.0 x 4
3 HDMI port
4 LAN1 (10/100/1000 Mbit/s)
5 LAN2 (10/100/1000 Mbit/s)
6 COM1 port RS-232/422/485
7 COM2 port RS-232/422/485
8 Power Switch
9 Remote Switch

ES5000 Series 15" Side View



1 Cover for access HDD/SSD drive
2 Slot for the installation fasteners

ES5000 Series W15.6" Front View

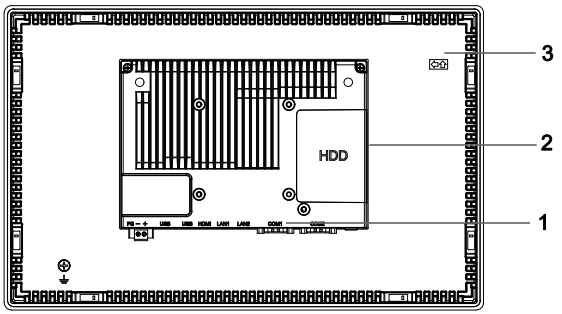


1 Panel
2 Single-touch panel
3 Status indicator

The table describes the meaning of the status indicator:

Color	State	Meaning
Green	On	Industrial PC is OK.
Red	On	Stand by.
No light	Off	Industrial PC is off.

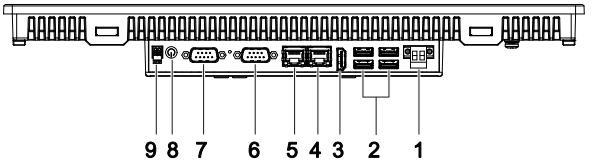
ES5000 Series W15.6" Rear View



1 Industrial PC interface
2 Cover for access HDD/SSD drive
3 Panel

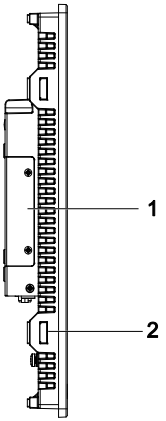
NOTE: The cooling method is passive heat sink.

ES5000 Series W15.6" Bottom View



1 12...24 Vdc power connector
2 USB3.0 x 4
3 HDMI port
4 LAN1 (10/100/1000 Mbit/s)
5 LAN2 (10/100/1000 Mbit/s)
6 COM1 port RS-232/422/485
7 COM2 port RS-232/422/485
8 Power Switch
9 Remote Switch

ES5000 Series W15.6" Slide View



1 Cover for access HDD/SSD drive
2 Slot for the installation fasteners

Chapter 3
Characteristics

Subject of this Chapter

This chapter lists the product characteristics of ES5000 Series.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Characteristics	22
Interface Characteristics	24
Environmental Characteristics	25

Characteristics

Industrial PC Characteristics

The characteristics are shown below:

Element	Characteristics
Intel chipset and processor	Celeron™3855U
Expansion slot	2.5" SATA(SATA-III) x 1
Memory	4GB, DDR4 2133MHz SDRAM
Storage memory	M.2(2280 NVMe1.3) x 1
Watch dog timer	255 level timer interval, programmable 1...255 sec/min
Buzzer	Yes
Cooling method	Passive heat sink
Weight	ES-5700TA : Approximately 3.50 kg (7.72 lbs) ES-5700WA : Approximately 3.62 kg (7.98 lbs)

Display Characteristics

Element	15" Screen size	W15.6" Screen size
Display type	TFT LED LCD	
Display size	15"	15.6"
Display resolution	1024 x 768	1366 x 768
Brightness	350 cd/m^2	400 cd/m^2
Number of colors	16.7M	
Brightness control	Step less adjustment	
View angle	Horizontal:160 Vertical:160	Horizontal:170 Vertical:160
Backlight life	Life span > 50,000 h at 25 °C (77 °F)	
Contrast ratio	800:1	500:1
Touch screen light transmission	81% ± 3%	
Touch screen resolution	2048 x 2048 pixel	
Single-touch	5-wire resistance screen	
Anti-scratch surface	3 H hardness	

DC Power Supply

The following table describes the DC power supply:

Element	Characteristics
Rated voltage	12...24 Vdc -15 % +20% (the fuse becomes an open circuit if the input level exceeds 10A)
Consumption	ES-5700TA: 25W typical ES-5700WA: 28W typical

Operating Systems

Each product is delivered with a preinstalled operating system according to the configuration:

Operating Systems	Part number
Windows 10 LTSC 2019	PFXES5700TADW PFXES5700WADW

Interface Characteristics

Serial Interface

Element	Characteristics
Type	RS-232/422/485, (RS-485 with auto data flow control), not eletrically isolated
Amount	2
Transfer rate	Maximum 115.2 kbps
Connection	D-Sub 9-pin, plug

USB Interface

Element	Characteristics
Type	USB 3.0
Amount	4
Transfer rate	speed (5 Gbit/s)
Current load	Maximum 900 mA per connection
Connection	Type A

Ethernet Interface

Element	Characteristics
Type	RJ45
Amount	2
Speed	10/100/1000 Mbit/s
Ethernet controller	supporting IEEE 1588

NOTE: I/O ports (such as serial, USB, and Ethernet interfaces) on this product have internal port numbers that may differ from physical port numbers, such as "COM1", "USB1" or "ETH1", printed on the product and used for identification in this manual. Check the port numbers in your environment.

Environmental Characteristics

Characteristics	Value
Degree of protection	IP65 front side of display
Pollution degree	For use in pollution degree 2 environment
Operating temperature	0...55 °C (32...131 °F) with SSD,mSATA or M.2(2280 NVMe1.3)
Storage temperature	- 20...60 °C (- 4...140 °F)
Operating altitude	2,000 m (6,560 ft) max
Vibration	3...150 Hz: 1 G_{rms} with SSD,three-dimensional
Storage humidity	10...95 % RH at max 60 °C (140 °F), no condensation

Chapter 4
Dimensions / Installation

Subject of this Chapter

This chapter describes ES5000 Series dimensions and installation.

What Is in This Chapter?

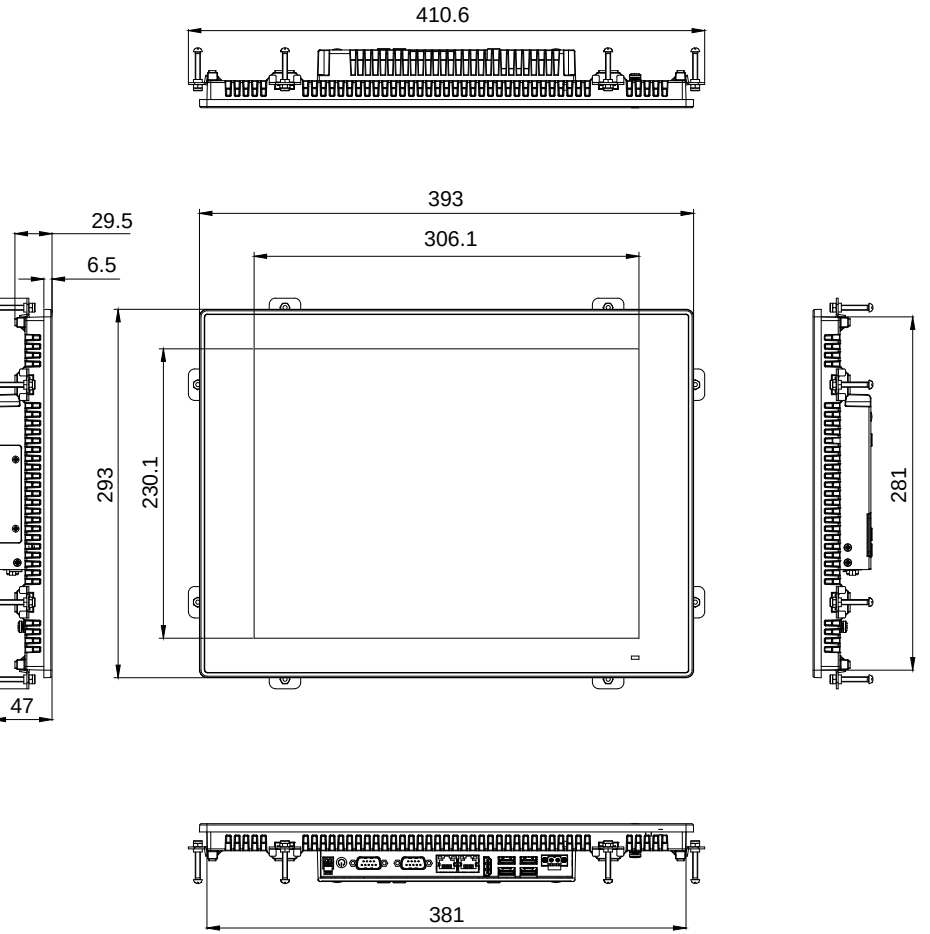
This chapter contains the following topics:

Topic	Page
Dimensions	27
Installation Requirements	29
Installation	33

Dimensions

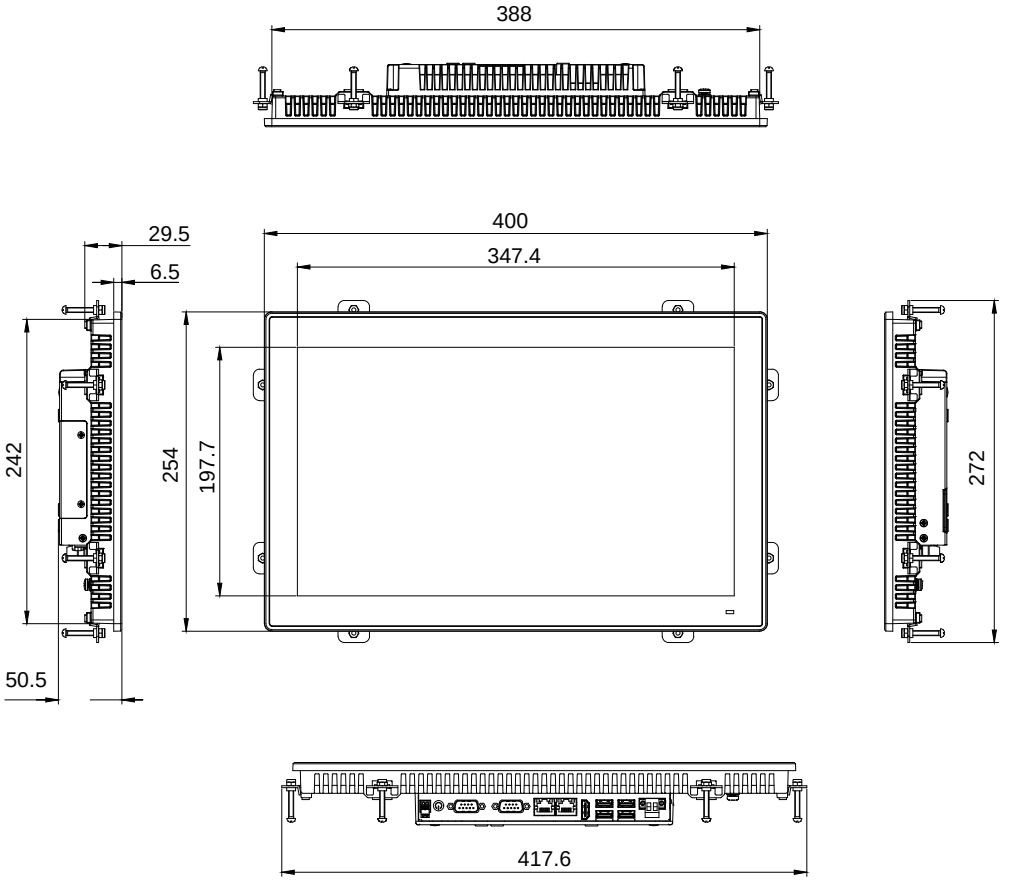
15" Dimensions

unit:mm



W15.6" Dimensions

unit:mm



Installation Requirements

Important Mounting Information

Overheating of the system can cause incorrect software behavior. To prevent the system from overheating, be aware of the following:

- The environment characteristics of the system must be respected.
- The Industrial PC is only permitted for operation in closed rooms.
- The Industrial PC can not be situated in direct sunlight.
- The Industrial PC vent holes must not be covered.
- When mounting the Industrial PC,adhere to the allowable mounting angle.

⚠ WARNING

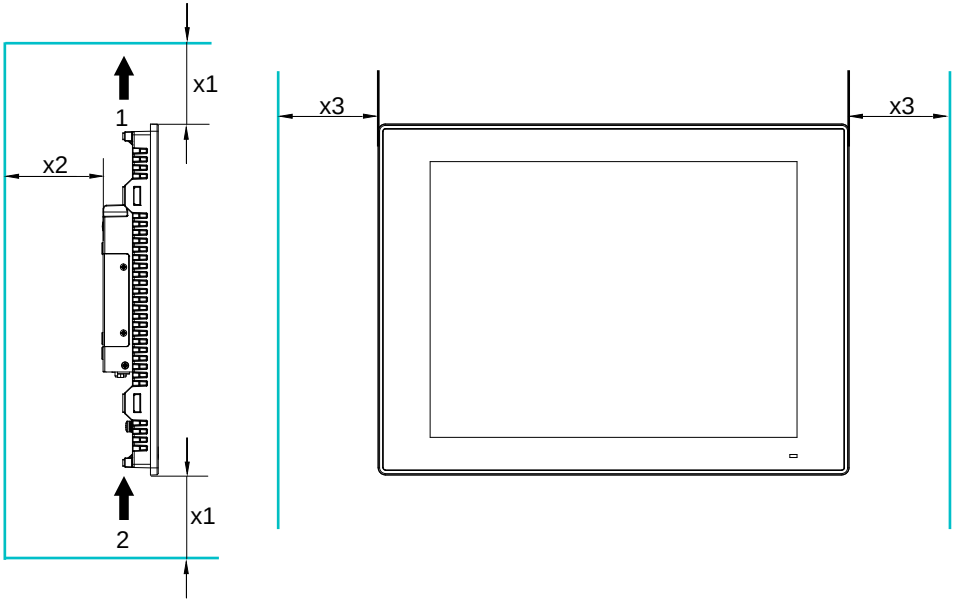
UNINTENDED EQUIPMENT OPERATION

- Do not place the ES5000 Series next to other devices that might cause overheating.
- Keep the ES5000 Series away from arc-generating devices such as magnetic switches and non-fused breakers.
- Avoid using the ES5000 Series in environments where corrosive gases are present.
- Install the ES5000 Series in a location providing a minimum clearance of 100 mm (3.94 in) or more on the left and right sides, 100 mm (3.94 in) or more on the rear side, and 100mm (3.94 in) or more above and below the product from all adjacent structures and equipment.
- Install the ES5000 Series with sufficient clearance for cable routing and cable connectors.

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

Spacing Requirements

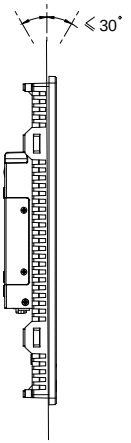
In order to provide sufficient air circulation, mount the Industrial PC so that the spacing above, below, and on the sides of the unit is as follows:



1 Air out
2 Air in
x1 > 100 mm (3.94 in)
x2 > 100 mm (3.94 in)
x3 > 100 mm (3.94 in)

Mounting Orientation

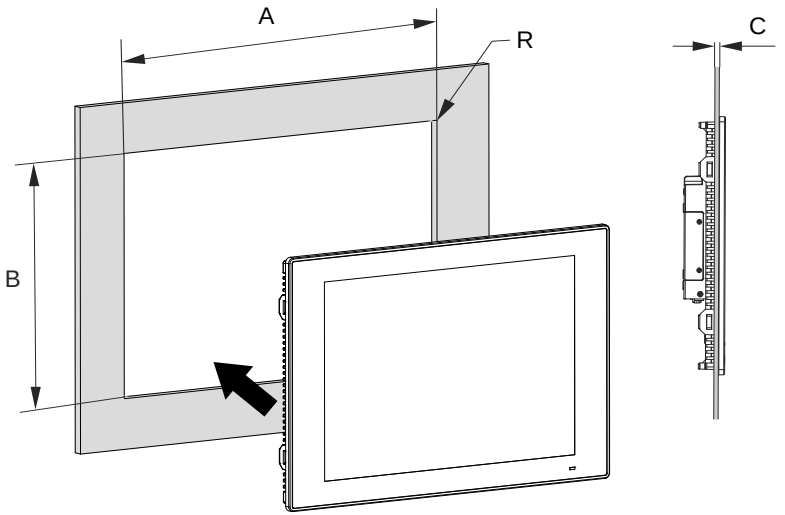
The following figure shows the allowable mounting orientation for the Industrial PC:



Panel Cut Dimensions

For cabinet installation, you need to cut the correct sized opening in the installation panel.

The dimensions of the opening for installing the Industrial PC are shown below:



ES5000 Series Cut-out	A	B	C	R
15”	383 ±1.0 mm (15.08 ±0.04 in)	283 ±1.0 mm (11.14 ±0.04 in)	1...4 mm (0.04...0.16 in)	2 mm (0.08 in)
W15.6”	390 ±1.0 mm (15.35 ±0.04 in)	244 ±1.0 mm (10.30 ±0.04 in)		

NOTE:

- Ensure that the thickness of the installation panel is from 1 to 4 mm (0.04 to 0.16 in).
- All installation panel surfaces used should be strengthened. Due consideration should be given to the weight of the Industrial PC, especially if high levels of vibration are expected and the installation panel can move. Attach metal reinforcing strips to the inside of the panel near the panel cut-out to increase the strength of the installation panel.
- Ensure that all installation tolerances are maintained.
- The Industrial PC is designed for use on a flat surface of a Type NEMA 12 enclosure (indoor use only).

Installation

Vibration and Shocks

Take extra care with respect to vibration levels when installing or moving the Industrial PC. If you move the Industrial PC while it is installed in a rack equipped with caster wheels, it may undergo excessive shock and vibration.

⚠ CAUTION

EXCESSIVE VIBRATION

- Plan your installation activities so that shock and vibration tolerances in the unit are not exceeded.
- Ensure that the installation panel opening and thickness are within the specified tolerances.
- Before mounting the ES5000 Series into a cabinet or panel, ensure that the installation gasket is in place. The installation gasket provides additional protection from vibration.
- Tighten the installation fasteners using a torque of 0.5 Nm (4.5 lb-in).

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

Installation Gasket

The gasket is required to meet the protection ratings (IP••/NEMA 12 indoor) of the Industrial PC. It provides additional protection from vibration.

NOTE: IP••/NEMA 12 indoor is not part of UL certification.

⚠ CAUTION

LOSS OF SEAL

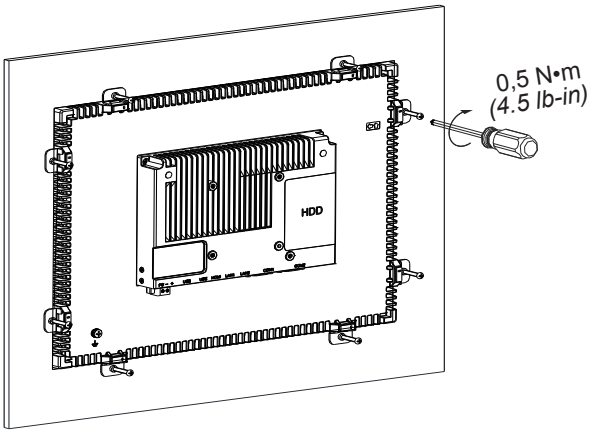
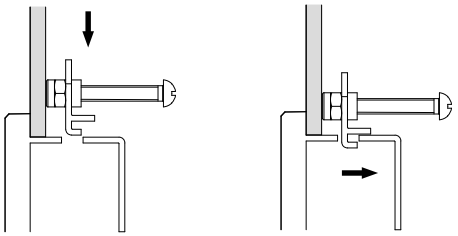
- Inspect the gasket prior to installation or reinstallation, and periodically as required by your operating environment.
- Replace the complete ES5000 Series if visible scratches, tears, dirt, or excessive wear are noted during inspection.
- Do not stretch the gasket unnecessarily or allow the gasket to contact the corners or edges of the frame.
- Ensure that the gasket is fully seated in the installation groove.
- Install the ES5000 Series into a panel that is flat and free of scratches or dents.
- Tighten the installation fasteners using a torque of 0.5 Nm (4.5 lb-in).

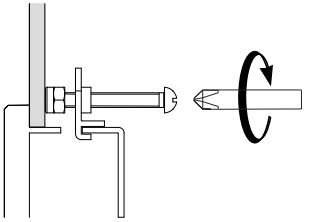
Failure to follow these instructions can result in injury or equipment damage.

Installation of the Industrial PC

NOTE: For easy installation of the Industrial PC, the suggested mounting panel thickness can be up to 2 mm (0.079 in).

Follow these steps for the easy installation of the Industrial PC:

Step	Action
1	Check that the gasket is correctly attached to the Industrial PC. **NOTE:** When checking the gasket, avoid contact with the sharp edges of the Industrial PC frame, and insert the gasket completely into its groove.
2	Insert the installation fasteners securely into the slots at the top, bottom, left, and right side of the industrial PC: 
3	Insert each fastener in its corresponding slot and pull the fastener back until it is flush with the rear of the fastener hole: 

Step	Action
4	Tighten each of the cross-slotted fastener screws, and fasten the Industrial PC in place:  **NOTE:** To ensure a high degree of moisture resistance, use a torque of 0.5 Nm (4.5 lb-in).
5	The angle of the unit is tilted no more than the amount allowed by the mounting orientation requirements.

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

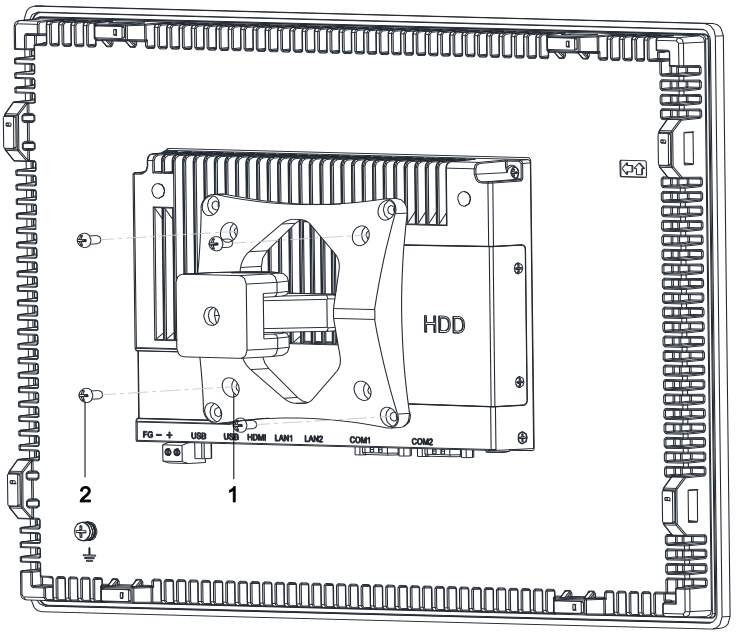
- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the installation fastener.
- When fastening or removing screws, ensure they do not fall inside the ES5000 Series chassis.

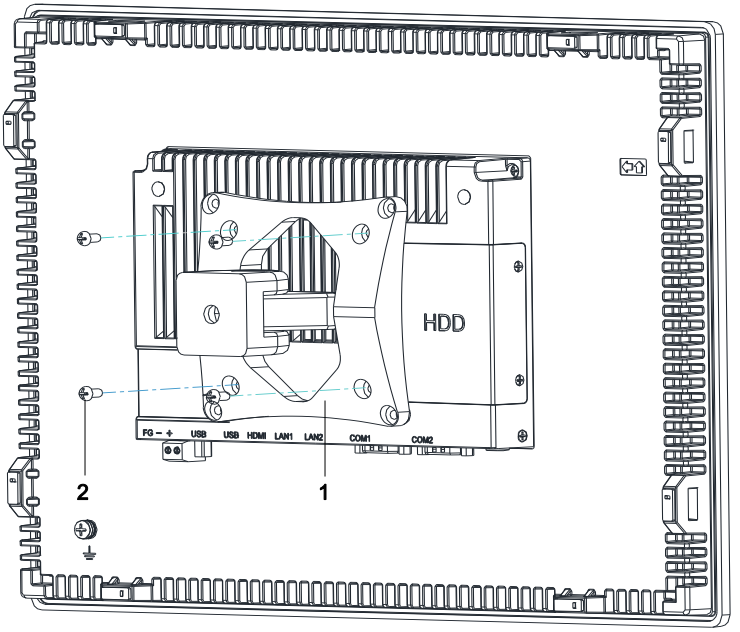
Failure to follow these instructions can result in injury or equipment damage.

NOTE: The installation fasteners are required for IP••/NEMA 12 indoor protection. IP••/NEMA 12 indoor is not part of UL certification.

Installation of the VESA Mounting Kit

Follow these steps when installing the VESA (video electronics standards association) mounting kit:

Step	Action
1	Fasten the VESA mounting kit on the rear side of the Industrial PC:  **1** VESA plate position (size 75 x 75 mm) **2** 4 x VESA mount screws for attachment

Step	Action
2	Use the 4 screws into the dedicated holes for installing the VESA. The angle of the unit is tilted no more than the amount allowed by the mounting orientation requirements: 

Chapter 5
Getting Started

Subject of this Chapter

This chapter describes ES5000 Series At First Startup,UWF Manager,Cybersecurity and Windows Update.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
At First Startup	39
UWF Manager	40
Cybersecurity	41
Windows Update	42

At First Startup

The first time you start up the product, the initial settings for the operating system is executed.

NOTE:

This product requires the sign-in password to be set in order to reduce the risks of unauthorized access, intrusion and infection of malicious software.The conditions for the sign-in password are as follows.

No. of characters: From the usable characters below, at least 3 types and at least 8 characters are required. The sign-in password should not contain the character strings used in the account name.

Usable characters:

- Uppercase letters of European languages (A through Z, with diacritic marks, Greek and Cyrillic characters)
- Lowercase letters of European languages (a through z, sharp-s, with diacritic marks, Greek and Cyrillic characters)
- Base 10 digits (0 through 9)
- Non-alphanumeric characters (special characters): (~!@#$%^&*_-+=`|\(){}[]:;"'<>,.?/) Currency symbols such as the Euro or British Pound are not counted as special characters for this policy setting.
- Any Unicode character that is categorized as an alphabetic character but is not uppercase or lowercase. This includes Unicode characters from Asian languages.

License Agreement

Limitations on your usage of the Microsoft Windows Operating System are noted in Microsoft's End User License Agreement (EULA). This EULA is included on the recovery media containing the software required to reinstall the operating system. Read this document before the first power-up.

To customize and set the system parameters during the first power-up of your Industrial PC, refer to the ES5000 Series Installation guide.
Install and customize the Pro-face applications (Blue Open Studio).

⚠ CAUTION

EQUIPMENT DAMAGE

Regardless of the Write Filter setting, do not turn off the power immediately after turning on the product.

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

NOTICE

LOSS OF DATA

Do not turn off the power during initial setup.

Failure to follow these instructions can result in equipment damage.

UWF Manager

The ES5000 Series operating system is installed on a Solid State Drive(SSD). This SSD can enable approximately 80 TBW(Tera-Byte Written).

The UWF manager (Unified Write Filter manager) minimizes the number of write operations to help extend the life of the SSD Drive. The UWF manager loads temporary data (for example, system updates and software operations) into RAM, and does not write this information to the SSD Drive.

As a result, when using the UWF manager, restarting the Industrial PC overwrites changes that the user has made to the system. The following types of changes may be overwritten if the UWF manager is active and the system is restarted:

- Newly installed applications.
- Newly installed peripherals.
- Newly created or modified user accounts.
- Network configuration changes (such as IP addresses or default gateways).
- Operating System customizations (such as desktop background).

NOTICE
DATA AND CONFIGURATION LOSS ● Disable the UWF Manager before making any permanent changes to the hardware, software, or Operating System of the ES5000 Series. ● Re-enable the UWF Manager after making permanent changes. This helps extend the operating life of the SSD. ● Back up all SSD data regularly to another storage media. **Failure to follow these instructions can result in equipment damage.**

Enabling/Disabling the UWF Manager

You can change the status of the UWF Manager by running the uwfmgr.exe. After running this program, restart the system for the change to take effect. You need administrator privileges to enable and disable the UWF Manager.

Run Command Prompt (cmd.exe) as administrator

Enable the UWF Manager: uwfmgr filter enable

Open C: Write Protection: uwfmgr volume protect c:

Close C: Write Protection: uwfmgr volume unprotect c:

Disable the UWF Manager: uwfmgr filter disable

More related commands or arguments: uwfmgr.exe

Right Click from Touch Screen Interface

To access the **right-click** function from the touch screen, keep touching the screen for 2 seconds and the corresponding **right-click** function is activated (for instance, displaying the shortcut menu).

Cybersecurity

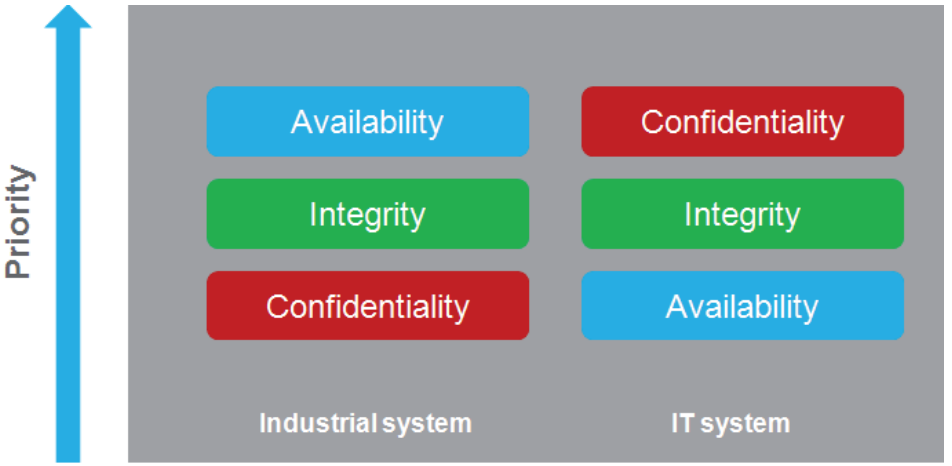
It is a fact that Industrial and control systems are more and more vulnerable to cyber attacks due to their modern design:

- They use commercial technologies.
- They are more and more connected.
- They can be remotely accessible.
- Their strategic location in the industrial processes is a point of interest for hackers.

Industrial systems have also different cyber security objectives compared to typical IT systems. To secure properly the industrial installation, it is important to understand these differences. Three fundamental characteristics have to be considered:

- Availability of the system: how to ensure that the system remains operational?
- Integrity of the data: how to maintain the integrity of information?
- Confidentiality: how to avoid information disclosure?

The priorities between an industrial system and a typical IT system are not the same as described the following diagrams:



A good recommendation to address these security objectives is to adopt a defense-in-depth approach matching these priorities.

To help keep your Pro-face products secure and protected, we recommend that you implement the cybersecurity best practices. Following the recommendations may help significantly reduce your company's cybersecurity risk. For the recommendations,refer to the following URL.
https://www.pro-face.com/trans/en/manual/1087.html

This product requires the sign-in password to be set in order to reduce the risks of unauthorized access, intrusion and infection of malicious software.Refer to At First Startup.

NOTE: In order to build and operate a secure system, we strongly recommend that you use a different authority account in each phase as follows.

Phase	Account type (authority)
System development	Administrator
Operation	Standard User
Maintenance	Administrator

Use this product in an environment that takes into account the above items to reduce security risks.

NOTE:

- Due to lack of secure boot, its OS and BIOS firmware's authenticity cannot be guaranteed via hardware mechanism. Consequently, customers must validate their authenticity by themselves, for example, ensure if you follow the standards of Microsoft OS upgrading process.
- Due to lack of secure hardware module, critical and sensitive assets cannot be protected via hardware mechanism. Consequently, customers must ensure that all critical and sensitive assets are protected in a proper way.

Windows Update

The Windows OS of the Industrial PC is updated yearly or in case of Microsoft cybersecurity notification. Strong recommendation to enable Windows Updater. Updates to Windows operating systems can make your computer more secure and stable. Please ensure its up-to-date not just at first startup but also the long-term running.

Chapter 6
Industrial PC Connections

Subject of This Chapter

This chapter describes the connection of the Industrial PC to the main power supply. It also describes the LAN ports and identifies the serial interface pin assignments.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Grounding	44
Connecting the DC Power Cord	47
Industrial PC Interface Connections	50

Grounding

Overview

The grounding resistance between the Industrial PC ground wire and the ground must be 100 Ω or less. When using a long grounding wire, check the resistance and, if required, replace the wire with a thicker wire and place it in a duct.

The table shows the maximum length for the wires:

Wire cross-section	Maximum line length
2.5 mm^2 (AWG 14)	30 m (98 ft)
	60 m (196 ft) round trip

Grounding Procedure

⚠ WARNING

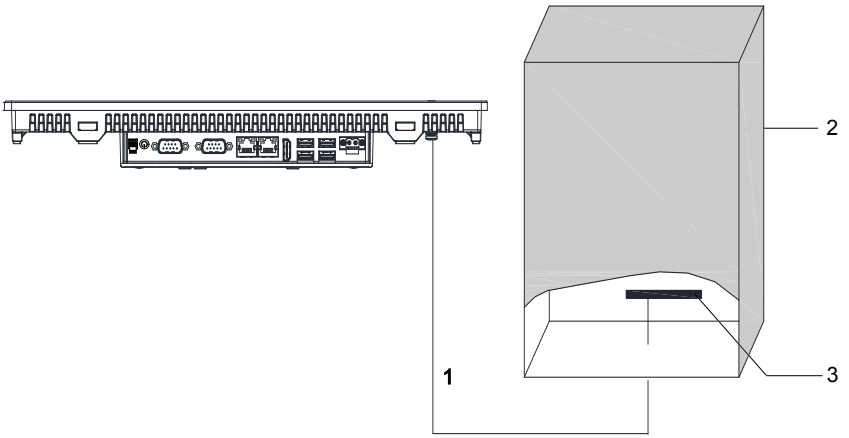
UNINTENDED EQUIPMENT OPERATION

- Use only the authorized grounding configurations shown below.
- Confirm that the grounding resistance is 100 Ω or less.
- Test the quality of your ground connection before applying power to the device. Excess noise on the ground line can disrupt operations of the ES5000 Series.

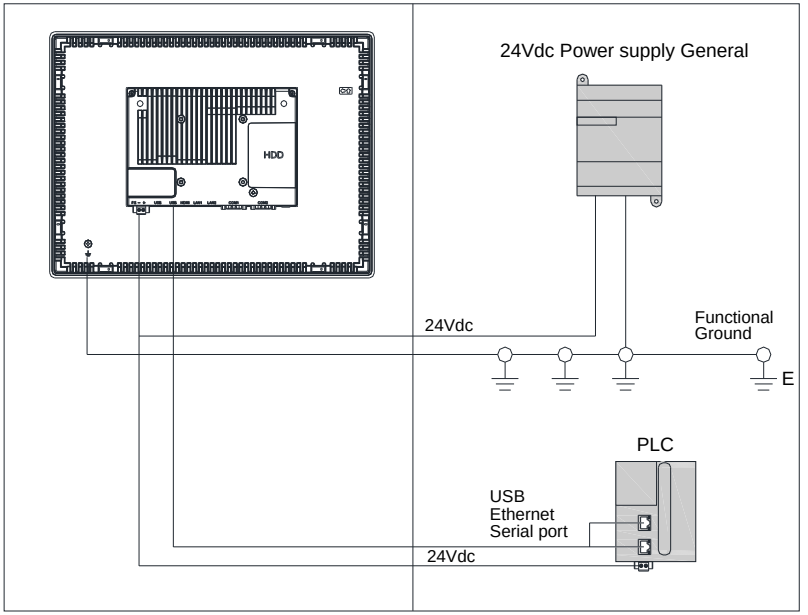
Failure to follow these instructions can result in death, serious injury, or equipment damage.

The Industrial PC ground has 1 connections:

- Ground connection pin



1 Ground connection pin (functional ground connection pin)
2 Switching cabinet
3 Grounding strip



⚠ DANGER

POTENTIAL FOR EXPLOSION IN HAZARDOUS LOCATION

Do not use this product in hazardous locations.

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

Electromagnetic radiation may interfere with the control communications of the Industrial PC.

Connecting the DC Power Cord

Precaution

When connecting the power cord to the power connector on the Industrial PC, first ensure that the power cord is disconnected from the DC power supply.

⚠⚠ 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 ES5000 Series 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 unit.
- Use only the specified voltage when operating the ES5000 Series. The DC unit is designed to use 12...24 Vdc input.

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

⚠ WARNING

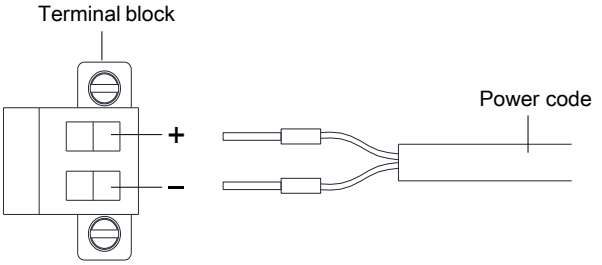
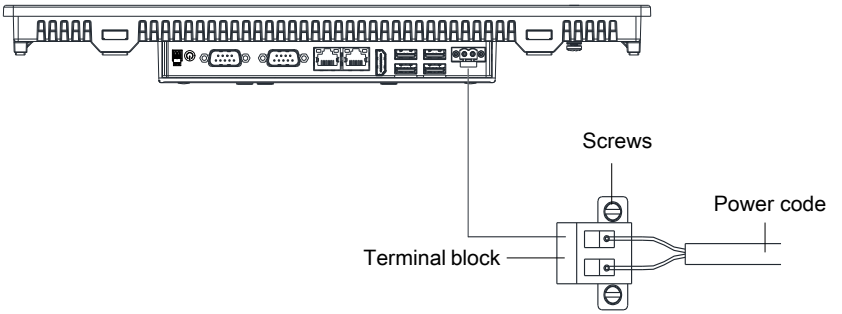
EQUIPMENT DISCONNECTION OR UNINTENDED EQUIPMENT OPERATION

- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration in the environment.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.
- Use only D-Sub 9-pin connector cables with a locking system in good condition.
- Use only commercially available USB cables.

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

Wiring and Connecting the Terminal Block

The table below describes how to connect the power cord to the DC terminal block of the Industrial PC:

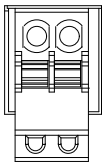
Step	Action
1	Remove all power from the Industrial PC and confirm that the power adapter is disconnected from its power source.
2	Remove the terminal block from the power connector and connect the power cord to the terminal block:  Use copper wire rated for 75 °C (167 °F) with a section of 0.75 to 2.5 mm^2 (AWG 18 to AWG 14) and use 2.5 mm^2 wire to make the ground connection.
3	Place the terminal block in the power connector and tighten the screws:  **NOTE:** The recommended torque to tighten these screws is 0.5 Nm (4.5 lb-in).

⚠ CAUTION
OVERTORQUE AND LOOSE HARDWARE ● Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the installation fastener. ● When fastening or removing screws, ensure they do not fall inside the ES5000 Series chassis. **Failure to follow these instructions can result in injury or equipment damage.**

Wiring and Connecting the Remote Switch

When connecting the power cord to the Remote Switch terminal block on the Industrial PC, first ensure that the power cord is disconnected from the DC power supply.

The table below describes how to connect the cord to the Remote Switch terminal block of the Industrial PC:

Remote Switch terminal block	Description
	2-pin terminal block that supports remote Power On/Off function Use copper wire rated for 75 °C (167 °F) with a section of 0.20 to 0.50 mm^2 (AWG 24 to AWG 20) . String length: 8mm

Industrial PC Interface Connections

Introduction

⚠ DANGER

POTENTIAL FOR EXPLOSION IN HAZARDOUS LOCATION

Do not use this product in hazardous locations.

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

⚠ WARNING

EQUIPMENT DISCONNECTION OR UNINTENDED EQUIPMENT OPERATION

- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration in the environment.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.
- Use only D-Sub 9-pin connector cables with a locking system in good condition.
- Use only commercially available USB cables.

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

Serial Interface Connections

This interface is used to connect Industrial PC to remote equipment, via a serial interface cable. The connector is a D-Sub 9-pin plug connector.

By using a long PLC cable to connect to the Industrial PC, it is possible that the cable can be at a different electrical potential than the panel, even if both are connected to ground.

The Industrial PC serial port is not isolated. The shield ground and the functional ground terminals are connected inside the panel.

⚠ ⚠ DANGER

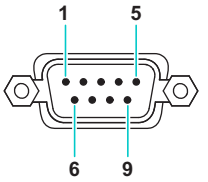
ELECTRIC SHOCK

- Make a direct connection between the ground connection screw and ground.
- Do not connect other devices to ground through the ground connection screw of this device.
- Install all cables according to local codes and requirements. If local codes do not require grounding, follow a reliable guide such as the US National Electrical Code, Article 800.

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

The table shows the D-Sub 9-pin assignments (COM1/2):

Pin	Assignment		
	RS-232	RS-422/485	
1	DCD	- / -	D-Sub 9-pin plug connector:
2	RxD	Rx+ / -	
3	TxD	Tx- / Data-	
4	DTR	- / -	
5	GND	- / -	
6	DSR	- / -	
7	RTS	Tx+ / Data+	
8	CTS	Rx- / -	
9	RI / VCC	- / VCC	

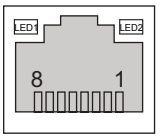


Plug

Any excessive weight or stress on communication cables may disconnect the equipment.

NOTE: You can select RS-232, RS-422 or RS-485 to COM1/2 port (see page 71) .The RS-485 port is designed with auto data flow control capability and automatically detects the data flow direction.

The table shows the RJ45 8-pin assignments :

Pin Connection	Pin	Signal
	1	TX_D1+
	2	TX_D1-
	3	RX_D2+
	4	BI_D3+
	5	BI_D3-
	6	RX_D2-
	7	BI_D4+
	8	BI_D4-

Socket

The table shows the RJ45 LED description :

LED	Status	Meaning
1	OFF	Ethernet link down
	ON Orange	Ethernet link up but no comm. traffic
	Flashing Orange	Ethernet comm. traffic is detected
2	OFF	10Mbps
	ON Red	100Mbps
	ON Green	1Gbps

Chapter 7
Hot Key and BIOS

Subject of This Chapter

This chapter describes the Hot Key and configuration of the BIOS.

What Is in This Chapter?

This chapter contains the following topics:

Section	Topic	Page
7.1	**Hot Key Description**	53
7.2	**BIOS Main** Menu	54
	Advanced Menu	55
	Chipset Menu	58
	Boot Menu	60
	Security Menu	60
	Save & Exit Menu	61

Section 7.1
Hot Key Description

Hot Key Description

Hot Key	Description
DEL	Press DEL key during startup, to enter BIOS setup.
F7	Press F7 key during startup,to select Boot Device.

Section 7.2
BIOS Main Menu

BIOS Main Menu

General Information

BIOS stands for **Basic Input Output System**.

The **BIOS Setup Utility** lets you modify basic system configuration settings.

NOTE: To enter BIOS setup, press **DEL** key during startup.

Main Tab

When you press the [DEL] key during startup, the **Main** BIOS setup menu appears.

This screen, like all the BIOS screens, is divided into three frames:
- Left: This frame displays the options available on the screen.
- Upper right: This frame gives a description of the user selected option.
- Lower right: This frame displays how to move to other screens and the screen edit commands.

This table shows the **Main** menu options that can be set by the user:

BIOS setting	Description
System Time	This is the current time setting. The time must be entered in HH:MM:SS format. The time is maintained by the battery (CMOS battery) when the unit is turned off.
System Date	This is the current date setting. The date must be entered in MM/DD/YY format. The date is maintained by the battery (CMOS battery) when the unit is turned off.

NOTE: The grayed-out options on all BIOS screens cannot be configured. The blue options can be configured by the user.

Advanced Menu

Advanced BIOS Features Tab

For details about the Advanced submenus, refer to:

- ACPI Settings
- IT8768E Super I/O Configuration
- Hardware Configuration
- Serial Port Console Redirection
- CPU Configuration
- SATA Configuration
- CSM Parameters
- NVME Configuration
- USB Configuration

ACPI Settings Submenu

BIOS setting	Description
Enable ACPI Auto Configuration	Enables or disables BIOS ACPI auto configuration.
Enable Hibernation	Enables or disables hibernation. This option may be not effective with some OS.
ACPI Sleep State	Sets the ACPI sleep state.
Lock Legacy Resources	Enables or disables Lock of Legacy Resource.

IT8768E Super IO Configuration Submenu

BIOS setting	Description
Serial Port 1 Configuration	**Serial Port**: Enable or disable the COM port.
Serial Port 2 Configuration	**Serial Port**: Enable or disable the COM port.
Serial Port 3 Configuration	**Serial Port**: Enable or disable the COM port.
Serial Port 4 Configuration	**Serial Port**: Enable or disable the COM port.
Serial Port 5 Configuration	**Serial Port**: Enable or disable the COM port.
Serial Port 6 Configuration	**Serial Port**: Enable or disable the COM port.

Hardware Monitor Submenu

BIOS setting	Description
Hardware Monitor	Display all information about system Temperature / voltage / Current .

Serial Port Console Redirection Submenu

BIOS setting	Description
COM 0 Console Redirection	Enables or disables console redirection for Microsoft Windows Emergency Mangement Servies(EMS).
Console Redirection	Configuration console redirection detail settings.

CPU Configuration Submenu

BIOS setting	Description
Intel Virtualization Technology	Enable or disable Intel virtualization technology. When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool technology.

SATA Configuration Submenu

BIOS setting	Description
SATA Controllers	Enable or disable SATA devices.
SATA Mode	Select SATA mode selection. (Determines how SATA controllers operate).
SATA test Mode	Select SATA test mode selection. (Determines how SATA controllers operate).
SATA Speed Support	Indicates the maximum speed the SATA controller can support.
Serial ATA Port 0	Enable or disable serial ATA port.
Serial ATA Port 0 HotPlug	Designates this port as hot pluggable.
Serial ATA Port 1	Enable or disable serial ATA port.
Serial ATA Port 1 HotPlug	Designates this port as hot pluggable.

NVMe Configuration Submenu

BIOS setting	Description
NVMe Configuration	HDD information.

CSM Parameters Submenu

BIOS setting	Description
CSM Support	Enable or disable CSM Support.
GateA20 Active	UPON REQUEST-GA20 can be disable using BIOS services. ALWAYS-do not allow disabling GA20;This option is useful when any RT code is executed above 1MB.
Option ROM Messages	Setting the display mode for Option ROM.
Boot option filter	Control the priority of Legacy / UEFI ROM.
Network	Control the execution of UEFI and traditional PXE OpROM.
Storage	Control the execution of UEFI and traditional storage OpROM.
Video	Control the execution of UEFI and traditional video OpROM.
Other PCI devices	Determine OpROM execution policy for devices other than Network, Storage or Video.

USB Configuration Submenu

BIOS setting	Description
Legacy USB Support	Enable or disable legacy USB support. Auto option disables legacy support if no USB devices are connected. Disable option keeps USB devices available only for EFI applications.
XHCI Hand-off	Enable or disable XHCI hand-off. This is a work around for OS without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
EHCI Hand-off	Enable or disable EHCI hand-off. This is a workrooms for OS without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.
USB Mass Storage Driver Support	Enable or disable USB mass storage driver support.
USB transfer time-out	Select time-out section. The time-out value for control, bulk, and interrupt transfers.
Device reset time-out	Select device time-out section. USB mass storage devices start unit command time-out.
Device power-up delay	Select device power-up section. Maximum time the device takes before it properly reports itself to the host controller. **Auto** uses a default value: for a root port it is 100 ms, for a hub port the delay is taken from the hub descriptor.

Chipset Menu

Chipset BIOS Features Tab

For details about the **Chipset** submenus, refer to:

- System information
- Interface I/O information

System Agent(SA) Configuration Menu

BIOS setting	Description
Graphics Configuration	Configurating Graphics.
Memory Configuration	Configurating Memory.

Graphics Configuration Submenu

BIOS setting	Description
Primary IGFX Boot Display	Select the Video Device which will be activated during POST.This has no effect if an external graphics present.Secondary boot display selection will appear based on your selection.VGA modes will be supported only on primary display.
LCD Panel Type	Select LCD panel type of internal devices.
Active LVDS	Select LFP using detail.

Memory Configuration Submenu

BIOS setting	Description
Memory Configuration	Display memory frequency and size information.

PCH-I/O Configuration Menu

PCI Express Configuration Submenu

BIOS setting	Description
PCI Express Port 1	Enables or disables PCIE port of the chipset.
Hot Plug	Enables or disables PCIE device hot plug.
PCIe Speed	Select speed of the PCIE port.

HD Audio Configuration Submenu

BIOS setting	Description
HD Audio	Control Detection of the HD-Audio.

Boot Menu

Boot Settings Configuration Menu

Boot setting	Description
Setup Prompt Timeout	Select the number of seconds to wait for setup activation key.
Bootup NumLock state	Select the keyboard **NumLock** state.
Quiet Boot	Enables or disables **Quiet Boot** option.
Fast Boot	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. It has no effect for BBS boot options.

Security Menu

Security Setup

Select **Security Setup** from the main BIOS setup menu. All **Security Setup** options, such as password protection, are described in this section. To access the submenu for the following items, select the item and press **Enter**.

To change the administrator or user password, select the **Administrator / User Password** option, press **Enter** to access the submenu, and then type the password.

Save & Exit Menu

Menu

BIOS setting	Description
Save Changes and Exit	When the system configuration is complete, select this option to save changes, exiting the BIOS setup and, if necessary, reboot the computer to take into account all system configuration parameters.
Discard Changes and Exit	Select this option to quit setup without making any permanent changes to the system configuration.
Save Changes and Reset	Selecting this option displays a confirmation message box. On confirming, you save changes to the BIOS settings, save the settings to CMOS, and restart the system.
Discard Changes and Reset	Select this option to quit BIOS setup without making any permanent changes to the system configuration and reboot the computer.
Save Changes	Select this option to save the system configuration changes without exiting the BIOS setup menu.
Discard Changes	Select this option to discard any current changes and load previous system configuration.
Restore Defaults	Select this option to configure automatically all BIOS setup items to the optimal default settings. The optimal defaults are designed for maximum system performance, but may not work best for all computer applications. Do not use the optimal defaults if the user's computer is experiencing system configuration problems.
Save User Defaults	When the system configuration is complete, select this option to save changes as the user defaults without exit BIOS setup menu.
Restore User Defaults	Select this option to restore the user defaults.

Chapter 8
Hardware Modifications

Subject of This Chapter

This chapter describes the hardware modifications for the ES5000 Series.

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
8.1	Before Modifications	63
8.2	Storages Modifications	65
8.3	COM Switch Description and Setting	70

Section 8.1
Before Modifications

Before Making Modifications

Introduction

For detailed installation procedures for optional units, refer to the OEM (original equipment manufacturer) installation guide included with the optional unit.

⚠⚠ 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 ES5000 Series 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 unit.
- Use only the specified voltage when operating the ES5000 Series. The DC unit is designed to use 12...24 Vdc input.

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

⚠ DANGER

POTENTIAL FOR EXPLOSION IN HAZARDOUS LOCATION

Do not use this product in hazardous locations.

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

During operation, the surface temperature of the heat sink may exceed 70 °C (158 °F).

⚠ WARNING

RISK OF BURNS

Do not touch the surface of the heat sink during operation.

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

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the installation fastener.
- When fastening or removing screws, ensure they do not fall inside the ES5000 Series chassis.

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

⚠ CAUTION

STATIC SENSITIVE COMPONENTS

ES5000 Series Internal components, including accessories such as RAM modules and expansion boards, can be damaged by static electricity.

- Keep static-producing materials (plastic, upholstery, carpeting) out of the immediate work area.
- Do not remove ESD-sensitive components from their anti-static bags until you are ready to install them.
- When handling static-sensitive components, wear a properly grounded wrist strap (or equivalent).
- Avoid unnecessary contact with exposed conductors and component leads with skin or clothing.

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

Section 8.2
Storages Modifications

Overview

This section shows the installation of the HDD/SSD drive.

What Is in This Section?

This section contains the following topics:

Topic	Page
HDD/SSD Drive Description and Installation	66

HDD/SSD Drive Description and Installation

Overview

This device does not support hot swapping. Before any hardware modification, shut down Windows in an orderly fashion and remove all power from the device.

⚠⚠ 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 ES5000 Series 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 unit.
- Use only the specified voltage when operating the ES5000 Series. The DC unit is designed to use 12...24 Vdc input.

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

HDD/SSD Drive Installation

NOTICE

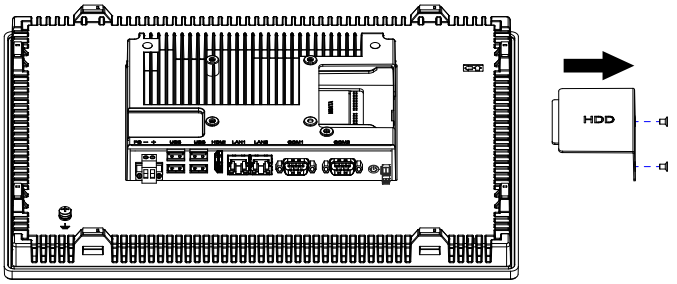
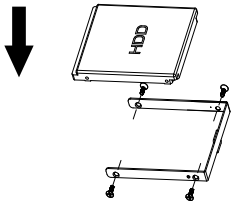
ELECTROSTATIC DISCHARGE

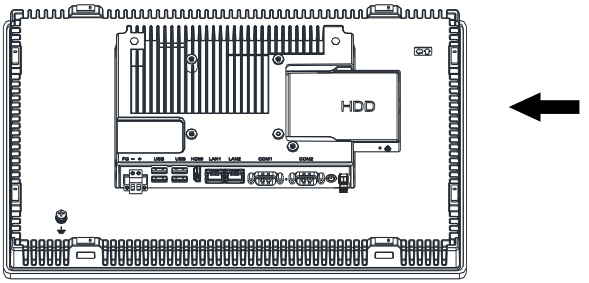
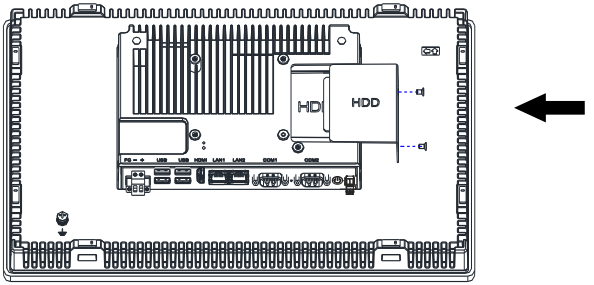
Take the necessary protective measures against electrostatic discharge before attempting to remove the ES5000 Series cover.

Failure to follow these instructions can result in equipment damage.

NOTE: Be sure to remove all power before attempting this procedure.

This table describes how to install an HDD/SSD drive:

Step	Action
1	Disconnect the power cord to the Industrial PC.
2	Touch the housing or ground connection (not the power supply) to discharge any electrostatic charge from your body.
3	Remove the 2 screws of the HDD/SSD cover: 
4	Install the 2.5" SATA HDD/SSD on the HDD/SSD bracket. Tighten the 4 screws on the side of HDD/SSD bracket: 

Step	Action
5	Slide the HDD/SSD into the slot. 
6	Replace the HDD/SSD cover and fasten it with the 2 screws:  **NOTE:** The recommended torque to tighten these screws is 0.5 Nm (4.5 lb-in).

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the installation fastener.
- When fastening or removing screws, ensure they do not fall inside the ES5000 Series chassis.

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

Section 8.3
COM Switch Description and Setting

Overview

This section describes the RS-232/422/485 Switch Setting.

What Is in This Section?

This section contains the following topics:

Topic	Page
COM Switch Description and Setting	71

COM Switch Description and Setting

Overview

This device does not support hot swapping. Before any hardware modification, shut down Windows in an orderly fashion and remove all power from the device.

⚠⚠ 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 ES5000 Series 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 unit.
- Use only the specified voltage when operating the ES5000 Series. The DC unit is designed to use 12...24 Vdc input.

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

Switch Setting

NOTICE

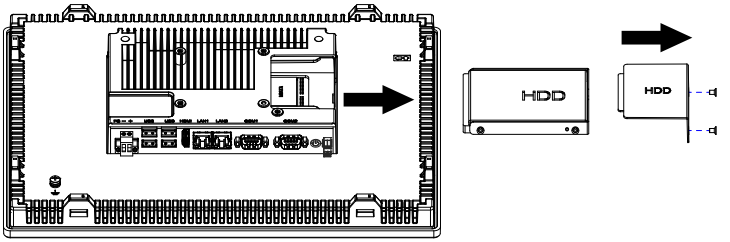
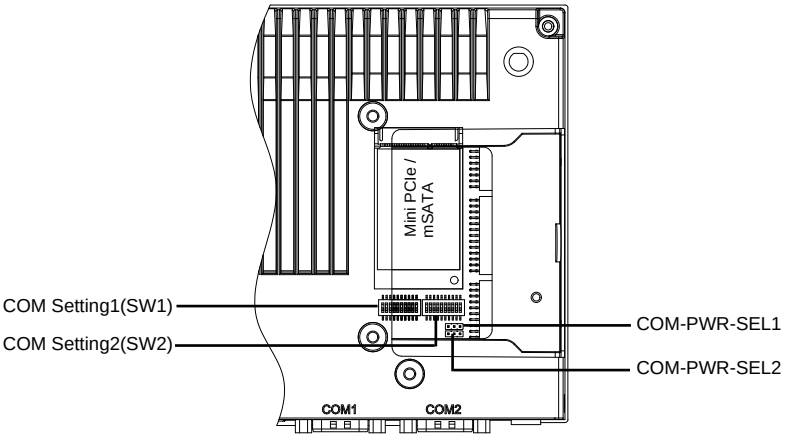
ELECTROSTATIC DISCHARGE

Take the necessary protective measures against electrostatic discharge before attempting to remove the ES5000 Series cover.

Failure to follow these instructions can result in equipment damage.

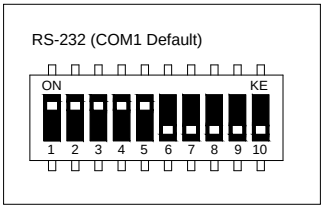
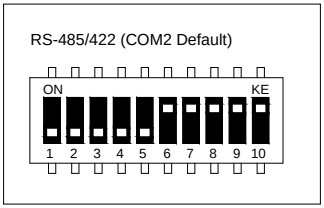
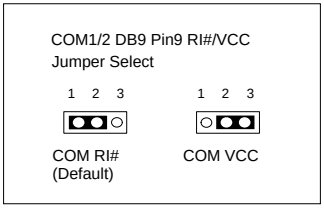
NOTE: Be sure to remove all power before attempting this procedure.

This table describes how to adjust COM1/2 RS-232/422/485:

Step	Action
1	Disconnect the power cord to the Industrial PC.
2	Touch the housing or ground connection (not the power supply) to discharge any electrostatic charge from your body.
3	Remove the HDD/SSD cover and HDD/SSD: 
4	As shown in the following figure: 

RS-232/422/485 Mode Setting

This table describes the RS-232/422/485 mode settings for COM1/2

Mode	SW1/2
RS-232	
RS-485/422	
COM1/2 DB9 Pin9 RI#/VCC Jumper Select	

* COM BIOS "Advanced" >> " IT8786 Super IO Configuration" >> " Serial Port 1...4 Configuration " Setting
  - RS-232 : " RS485 AUTO FLOW " = " Disabled "
  - RS-485/422 : " RS485 AUTO FLOW " = " Enabled "

- COM Setting1 (SW1) : COM1 RS-232/422/485 Switch setting
- COM Setting2 (SW2) : COM2 RS-232/422/485 Switch setting
- COM-PWR-SEL1 : COM1 voltage Jumper setting
- COM-PWR-SEL2 : COM2 voltage Jumper setting

Chapter 9
Maintenance

Subject of this Chapter

This chapter covers maintenance of the ES5000 Series.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Reinstallation Procedure	75
Regular Cleaning and Maintenance	76

Reinstallation Procedure

Introduction

In certain cases, it may be necessary to reinstall the operating system.

Precautions to take:

- Keep static-producing materials (plastic, upholstery, carpeting) out of the immediate workpace.
- Do not remove ESD-sensitive components from their anti-static bags until you are ready to install them.
- When handling static-sensitive components, wear a properly grounded wrist strap (or equivalent).
- Avoid contact with exposed conductors and component leads.

Before Reinstallation

Setting up the hardware:

- Shut down Windows operating system in an orderly fashion and remove all power from the device.
- Disconnect all external peripherals.

NOTE: Save all main data onto a hard drive or a memory card. The reinstallation process returns the computer to its factory settings and erases all data.

Regular Cleaning and Maintenance

Introduction

Inspect the Industrial PC periodically to determine its general condition. For example:

- Are all power cords and cables connected properly? Have any become loose?
- Are all installation fasteners holding the unit securely?
- Is the ambient temperature within the specified range?
- Are there any scratches or traces of dirt on the installation gasket?

NOTE: HDD/SSD health must be regularly checked with system monitor according to the usage. HDD/SSD is rotative media requiring to be changed regularly according to usage. Data on HDD/SSD must be saved regularly.

The following sections describe maintenance procedures for the Industrial PC, which can be carried out by a trained, qualified user.

⚠⚠ 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 ES5000 Series 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 unit.
- Use only the specified voltage when operating the ES5000 Series. The DC unit is designed to use 12...24 Vdc input.

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

During operation, the surface temperature of the heat sink may exceed 70 °C (158 °F).

⚠ WARNING

RISK OF BURNS

Do not touch the surface of the heat sink during operation.

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

Cleaning Solutions

⚠ CAUTION

HARMFUL CLEANING SOLUTIONS

- Do not clean the unit or any component of the unit with paint thinner, organic solvents, or strong acids.
- Use only a mild soap or detergent that will not harm the poly carbonate material of the screen.

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

Lithium Battery

The ES5000 Series contains one battery, for backing up the real-time clock (RTC).

⚠ DANGER

EXPLOSION, FIRE, OR CHEMICAL HAZARD

- The battery must always be replaced with identical type.
- For battery replacement, contact the field services department.
- Do not recharge, disassemble, heat above 100 °C (212 °F), or incinerate.
- Recycle or properly dispose of used batteries.

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

Appendices

Appendix A
Accessories and Setting

Subject of this Chapter

This chapter concerns the accessories relating to the products and the setting.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Accessories for the Industrial PC	80

Accessories for the Industrial PC

Available Accessories

Accessories are available as options. The table shows the list of accessories available for the Industrial PC:

Reference	Description
Drives	
PFXZPBSSD122	MLC SSD 128 GB
PFXZPBSSD252	MLC SSD 256 GB
Accessories	
PFXYPACCKTPSX1	Screw installation fasteners,DC power connector,HDD/SSD bracket installation adapter,Remote Switch connector