OMRON

IPC Application Controller

User's Manual

I632-E-03

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Introduction

Thank you for purchasing the IPC Application Controller.

This manual contains information that is necessary to use the IPC Application Controller (hereafter also named as IPC). Please read this manual and make sure you understand the functionality and performance of the IPC before attempting to use it.

Keep this manual in a safe place where it will be available for reference during operation.

Intended Audience

This manual is intended for the following personnel, who must also have knowledge of electrical systems (an electrical engineer or the equivalent).

- Personnel in charge of introducing Factory Automation systems.
- Personnel in charge of designing Factory Automation systems.
- Personnel in charge of installing and maintaining Factory Automation systems.
- Personnel in charge of managing Factory Automation systems and facilities.

Applicable Products

This manual covers following IPC Application Controller products:

Product	Model
IPC Application Controller	AC1-152000

Additional Information

Refer to *1-4 Product Configuration* on page 1-5 for configuration details.

Sections in this Manual

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Manual Information

This section provides information about this manual.

Page Structure

The following page structure is used in this manual.
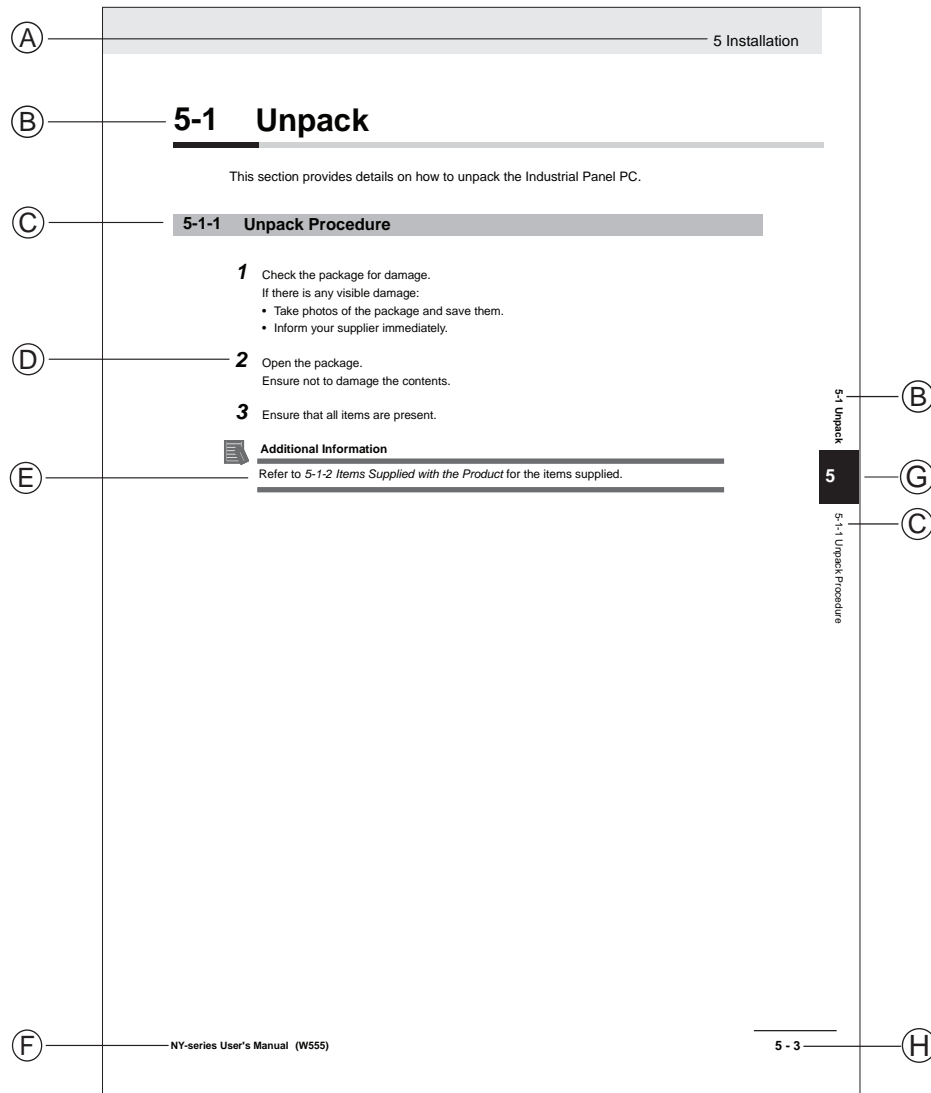
Note: This illustration is provided as a sample. It will not literally appear in this manual.

Item	Explanation	Item	Explanation
A	Level 1 heading	E	Special Information
B	Level 2 heading	F	Manual name
C	Level 3 heading	G	Page tab with the number of the main section
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Special Information

Special information in this manual is classified as follows:

Precautions for Safe Use

Precautions on what to do and what not to do to ensure safe usage of the product.

Precautions for Correct Use

Precautions on what to do and what not to do to ensure proper operation and performance.

Additional Information

Additional information to read as required.
This information is provided to increase understanding or make operation easier.

Version Information

Information on differences in specifications and functionality between different versions.

Terms and Conditions Agreement

Warranty, Limitations of Liability

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Change in Specifications

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

Safety Precautions

Definition of Precautionary Information

The following notation is used in this manual to provide precautions required to ensure safe usage of the IPC Application Controller. The safety precautions that are provided are extremely important to safety.
Always read and heed the information provided in all safety precautions.
The following notation is used.

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Additionally, there may be severe property damage.
⚠ Caution	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.

Symbols

🚫	The circle and slash symbol indicates operations that you must not do. The specific operation is shown in the circle and explained in text. This example indicates prohibiting disassembly.
⚡	The triangle symbol indicates precautions (including warnings). The specific operation is shown in the triangle and explained in text. This example indicates a precaution for electric shock.
⚠	The triangle symbol indicates precautions (including warnings). The specific operation is shown in the triangle and explained in text. This example indicates a general precaution.
❗	The filled circle symbol indicates operations that you must do. The specific operation is shown in the circle and explained in text. This example shows a general precaution for something that you must do.

Warnings

⚠ WARNING

Disassembly and Dropping

Do not attempt to disassemble, repair, or modify the product in any way. Doing so may result in malfunction or fire.

Installation

Always connect to a ground of 100 Ω or less when installing the product.

Ensure that installation and post-installation checks of the product are performed by personnel in charge who possess a thorough understanding of the machinery to be installed.

Fail-safe Measures

Provide safety measures in external circuits to ensure safety in the system if an abnormality occurs due to malfunction of the product or due to other external factors affecting operation. Not doing so may result in serious accidents due to incorrect operation.

Emergency stop circuits, interlock circuit, limit circuits, and similar safety measures must be provided in external control circuits.

Unintended behavior may occur when an error occurs in internal memory of the product. As a countermeasure for such problems, external safety measures must be provided to ensure safe operation of the system.

The use of an uninterruptible power supply (UPS) allows normal operation to continue even if a momentary power failure occurs, possibly resulting in the reception of an erroneous signal from an external device affected by the momentary power failure. Take external fail-safe measures. Where necessary, monitor the power supply voltage on the system for external devices and use it as an interlock condition.

Actual Operation

Security setting adjustments should only be performed by the engineer in charge that possesses a thorough understanding of the security settings. Selecting non-recommended security settings can put your system at risk.	❗
Changing BIOS information is only allowed for the engineer in charge that possesses a thorough understanding of the BIOS settings because it can change the behavior of the product.	❗

Cautions

⚠ Caution

Installation

When installing or removing a PCIe card, ensure to grip the Card Clip on the sides to prevent contact with the sharp edges of the sheet metal frame tab. Injury may result.

⚠

Wiring

The product has an internal non-isolated DC power supply. Circuit ground (0 VDC) and frame ground are connected together. When connecting a non-isolated device or a non-isolated interface to the product, take appropriate actions to avoid communication failures or damage to the mentioned ports.

⚠
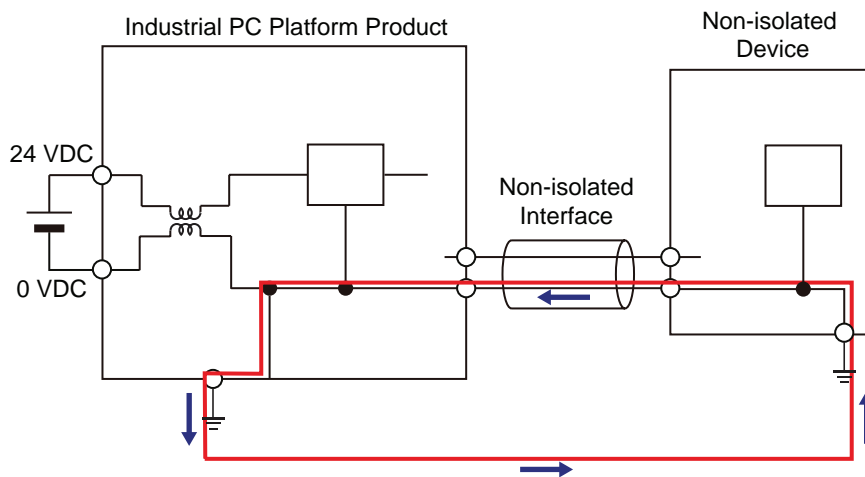
Never ground the 24 VDC side of the power supply. This may cause a short circuit.

⚠

Precautions for Safe Use

Disassembly, Dropping, Mounting, Installation and Storage

- Do not drop the product or subject it to abnormal vibration or shock. Doing so may result in product malfunction or burning.
- When unpacking, check carefully for any external scratches or other damages. Also, shake the product gently and check for any abnormal sound.
- Always use the devices specified in the relevant manual.
- The product must be installed in a control panel.
- Always install equipment that is included in the product specifications. Not doing so may result in failure or malfunction.
- If the storage period exceeds 6 months, check the performance of the Fan Unit before production starts.
- Install the product in the correct orientation and temperature according to the specifications in the manual to prevent overheating. Not doing so may result in malfunction.
- When connecting peripheral devices to the product, ensure sufficient countermeasures against noise and static electricity during installation of the peripheral devices.
- Always use the CFast Card slot cover to fully insert the CFast Card. Attempting to fully insert the CFast Card using your finger can result in injury of your finger due to sharp edges around the CFast Card bay.
- When closing the PCIe drawer ensure the power cable is not stressed or damaged.

Wiring

- Follow the instructions in the manual to correctly perform connector wiring and insertion. Double-check all wiring and connector insertion before turning ON the power supply.
- Always ensure connectors, cables, PCIe Cards and Storage devices are completely locked in place to prevent accidental disconnection.
- Before you connect a computer to the product, disconnect the power supply plug of the computer from the AC outlet. Also, if the computer has an FG terminal, make the connections so that the FG terminal has the same electrical potential as the product. A difference in electrical potential between the computer and the product may cause failure or malfunction.
- Do not bend or pull the cables beyond normal limit. Do not place heavy objects on top of the cables or other wiring lines. Doing so may break the cables.
- Always use power supply wires with sufficient wire diameters to prevent voltage drop and burning. Make sure that the current capacity of the wire is sufficient. Otherwise, excessive heat may be generated. When cross-wiring terminals, the total current for all the terminals will flow in the wire. When wiring cross-overs, make sure that the current capacity of each of the wires is not exceeded.
- Be sure that all mounting bracket screws and cable connector screws are tightened to the torque specified in the relevant manuals. The loose screws may result in fire or malfunction.
- Use crimp terminals for wiring.
- For an NY Monitor Link connection, always follow the cable type and connection method specifications in the manual. Otherwise, communications may be faulty.

Power Supply Design and Turning ON/OFF the Power Supply

- Always use a power supply that provides power within the rated range.
- Do not perform a dielectric strength test.
- Always use the recommended uninterruptible power supply (UPS) to prevent data loss and other system file integrity issues caused by unexpected power interruption. Back up the system files in the planned way to prevent data loss and other system file integrity issues caused by incorrect operation.
- Use an Omron S8BA UPS with the correct revision number to prevent improper system shutdown.
- Power ON after the DVI or NY Monitor Link cable is connected between the product and an external monitor.
- Always check the power supply and power connections before applying power. Incorrect power connections can damage the product or cause burning.
- Always turn OFF the power supply to system before you attempt any of the following.
  - Inserting or removing PCIe Cards
  - Connecting cables
  - Connecting or disconnecting the connectors
  - Wiring the system
  - Replacing or removing the HDD/SSD
  - Replacing the Battery
  - Replacing the Fan Unit

Actual Operation

- Choose a OS password that is not obvious to prevent unauthorized access.
- Remember the OS user name and password. The product is inaccessible without it.
- Before operating the system , please make sure the appropriate software is installed and configured. Doing so may prevent unexpected operation.
- Install all updates and ensure the browser stays up-to-date.
- Install all updates and ensure the firewall stays up-to-date.
- Make sure that your OS environment is protected against malicious software and viruses.
- Install all updates and ensure virus definitions stay up-to-date.
- Do not remove the fan cover while the power is ON. Contact with a rotating fan may result in injury.
- Virtual memory settings can affect the performance of the system. Disable the paging file after installation of applications or updates.
- Correctly perform wiring and setting, and ensure that the shutdown by the UPS can be executed.
- Always use the SMART monitoring feature for storage devices that do not comply to the Omron Storage Device Specifications. Monitor the operating temperature and vibrations to ensure they stay within the environmental specifications of the storage device.

Operation

- Do not carry out the following operations when accessing a USB device or an SD Memory Card.
  - Turn OFF the power supply of the product.
  - Press the Power Button of the product.
  - Remove a USB device or SD memory card.

- Do not attempt to remove or touch the fan unit while the product is powered ON or immediately after the power supply is turned OFF. If you attempt to replace the fan unit then, there is a risk of personal injury due to hot or rotating parts.
- Press the power button for several seconds to force the product shutdown. Always back up files in the planned way to prevent data loss or system file corruption.
- Do not touch any product housing when power is being supplied or immediately after the power supply is turned OFF. Doing so may result in burn injury.

General Communications

- Separate the machine network segment from the office network to avoid communication failures.

Battery Replacement

Applicable for products with a cooling layer that has a removable cover.

- Dispose of any Battery that has been dropped on the floor or otherwise subjected to excessive shock. Batteries that have been subjected to shock may leak if they are used.
- UL standards require that only an experienced engineer replace the Battery. Make sure that an experienced engineer is in charge of Battery replacement.
- The Battery may leak, rupture, heat, or ignite. Never short-circuit, charge, disassemble, heat, or incinerate the Battery or subject it to strong shock.

Cleaning, Maintenance and Disposal

- Do not use corrosive substances to clean the product. Doing so may result in the failure or malfunction.
- Dispose of the product and batteries according to local ordinances as they apply.

廢電池請回收

- The following information must be displayed for all products that contain primary lithium batteries with a perchlorate content of 6 ppb or higher when shipped to or transported through the State of California, USA.

    Perchlorate Material - special handling may apply.
    See http://www.dtsc.ca.gov/hazardouswaste/perchlorate.

- The product contains a lithium battery with a perchlorate content of 6ppb or higher. When exporting an end product containing the product to or shipping through California, USA, label all packing and shipping containers appropriately.

Precautions for Correct Use

Storage, Installation and Mounting

- Do not operate or store the product in the following locations. Operation may stop or malfunctions may occur.
  - Locations subject to direct sunlight
  - Locations subject to temperatures or humidity outside the range specified in the specifications
  - Locations subject to condensation as the result of severe changes in temperature
  - Locations subject to corrosive or flammable gases
  - Locations subject to dust (especially iron dust) or salts
  - Locations subject to exposure to water, oil or chemicals
  - Locations subject to shock or vibration
  - Locations outdoors subject to direct wind and rain
  - Locations subject to strong ultraviolet light
- Always install the product with sufficient surrounding space to allow for adequate heat dissipation and cooling effect.
- Take appropriate and sufficient countermeasures when installing the product in the following locations
  - Locations subject to strong, high-frequency noise
  - Locations subject to static electricity or other forms of noise
  - Locations subject to strong electromagnetic fields
  - Locations subject to possible exposure to radioactivity
  - Locations close to power lines
- Always touch a grounded piece of metal to discharge static electricity from your body before starting an installation or maintenance procedure.
- Insert USB devices and PCIe devices correctly to avoid the burning, failure or malfunction.
- Execute a backup of the product before PCIe addition or replacement. Be sure that the PCIe device works correctly before you use them for actual operation. PCIe devices and their related software may cause an OS boot failure or crash.
- Ensure the selected operating system supports ACPI to enable operating system shutdown using the power button.
- Download the enhanced Video Driver from the OMRON Download Center and install it on the Industrial PC.

Wiring

- Always ensure the rated supply voltage is connected to the product.
- Do not allow wire clippings, shavings, or other foreign material to enter the product. Otherwise, burning, failure, or malfunction may occur. Cover the product or take other suitable countermeasures, especially during wiring work.
- Do not use cables exceeding the maximum specified length. Doing so may cause malfunction.
- Do not connect an AC power supply to the DC power connector.
- Observe the following precautions to prevent broken wires.
  - When you remove the sheath, be careful not to damage the conductor.
  - Connect the conductor without twisting the wires.

• Do not weld the conductors. Doing so may cause the wires to break with vibration.

Actual Operation and Operation

• After an OS update or a peripheral device driver update for the product is executed, the product behavior might be different. Confirm that operation is correct before you start actual operation.
• Ensure the fan is operational to provide adequate cooling while the power is turned ON.
• HDD and SSD storage devices, SD Memory Cards, power buttons, fan units and batteries have finite lives and if those are exceeded, the product may fail or malfunction.
• Ensure the maximum PoE port power is not exceeded. The PoE port is disabled while the maximum PoE port power is exceeded.
• Ensure the maximum PCIe PoE card power is not exceeded. The PCIe PoE card will be disabled when the maximum PCIe PoE power is exceeded until the power supply is switched OFF.
• Always monitor the fan status. If a fan is used beyond its service life, the *Low Revolution Speed* warning message is displayed and the product overheating may occur.
• Always monitor the battery warning message. When a battery has low voltage, the system time will be lost.
• If the product experiences a sudden loss of power or disconnecting the cable while saving a setting or transfer of data is underway, the changes may not be stored and unexpected behavior may occur.
• Ensure that available software checks are performed by personnel in charge who possess a thorough understanding of the software.
• Diagnostic information is not available when the Industrial PC Support Utility is not installed.

Battery Replacement

Applicable for products with a cooling layer that has a removable cover.

• Turn ON the power after replacing the battery for a product that has been unused for an extended period of time. Leaving the product unused without turning ON the power even once after the battery is replaced may result in a shorter battery life.
• Make sure to use a battery of the correct type, install the battery properly.
• Apply power for at least five minutes before changing the battery. Mount a new battery within five minutes after turning OFF the power supply. If power is not supplied for at least five minutes, the clock data may be lost. Check the clock data after changing the battery.

SD Memory Cards

• Insert an SD Memory Card completely and ensure it is in place.

Regulations and Standards

Conformance to EU Directives

The IPC Application Controller complies with EU Directives. To ensure that the machine or device in which the IPC Application Controller is used complies with EU Directives, the following precautions must be observed:
- The IPC Application Controller must be installed within a control panel.
- The IPC Application Controller that complies with EU Directives also conforms to the Common Emission Standard. Radiated emission characteristics (10-m regulations) may vary depending on the configuration of the control panel used, other devices connected to the control panel, wiring, and other conditions. You must therefore confirm that the overall machine or equipment in which the IPC Application Controller is used complies with EU Directives.
- This is a Class A product (for industrial environments). In a residential environment, it may cause radio interference. If radio interference occurs, the user may be required to take appropriate measures.

Applicable Directive

EMC Directive

EMC Directive

OMRON devices that comply with EU Directives also conform to the related EMC standards so that they can be more easily built into other devices or the overall machine. The actual products have been checked for conformity to EMC standards.
Applicable EMC (Electromagnetic Compatibility) standards are as follows:
- EMS (Electromagnetic Susceptibility): EN 61131-2
- EMI (Electromagnetic Interference): EN 61131-2 (Radiated emission: 10-m regulations)

Whether the products conform to the standards in the system used by the customer, however, must be checked by the customer. EMC-related performance of the OMRON devices that comply with EU Directives will vary depending on the configuration, wiring, and other conditions of the equipment or control panel on which the OMRON devices are installed. The customer must, therefore, perform the final check to confirm that devices and the overall machine conform to EMC standards.

Conformance to KC Certification

When you use this product in South Korea, observe the following precautions.

사 용 자 안 내 문
이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

This product meets the electromagnetic compatibility requirements for business use. There is a risk of radio interference when this product is used in home.

Conformance to UL and CSA Standards

Some Industrial PC Platform products comply with UL and CSA standards. If you use a product that complies with UL or CSA standards and must apply those standards to your machinery or devices, refer to this manual. This manual provides the application conditions for complying with the standards. If the product is used in a manner not specified in the Instruction Sheet or in the product manuals then the protection provided by the equipment may be impaired.

Software Licenses and Copyrights

This product incorporates certain third party software. The license and copyright information associated with this software is available at http://www.fa.omron.co.jp/nj_info_e/.

Related Manuals

The following manuals are related. Use these manuals for reference.

Related Products Manuals

Manual name	Cat. No.	Model numbers	Application	Description
UPS S8BA User's Manual	U702	S8BA	Learning the information that is necessary to use the Uninterruptible Power Supply (UPS) Unit.	An introduction to the UPS is provided along with the following information: • Overview • Preparation • Installation and Connection • Check and Start Operation • Maintenance and Inspection • Shutdown Processing • I/O Signal Functions • Troubleshooting
UPS Power Attendant Lite for Windows User's Manual	---	S8BA	Learning the information that is necessary to use the software to monitor, test and control the UPS and to configure all settings.	An introduction to the software is provided along with the following information: • Overviews • Connection and Installation • The Simple Usage and Operation Test • Settings

Related Application Controller Manuals

Manual name	Cat. No.	Model numbers	Application	Description
Automation Control Environment	I603	- - -	Learning the information that is necessary to use the Adept Automation Control Environment (ACE)	An introduction to the Adept Automation Control Environment (ACE) software is provided along with the following information: • Robot Concepts • User Interface • V+ System Configuration Tools • Robot and Motor Configuration • Vision • Programming ACE • Process Control • Application Samples • User Interface Designer • Emulation Mode • Diagnostic Tools

Industrial Monitor Manual

This table contains the related manual of the Industrial Monitor.

Manual name	Cat. No.	Model numbers	Application	Description
Industrial Monitor User's Manual	W554	NYM12W-C1□□□ NYM15W-C1□□□ NYM19W-C1□□□	Learning all basic information about the Industrial Monitor. This includes introductory information with features, hardware overview, specifications, mounting, wiring, connecting, operating and maintaining the Industrial Monitor.	An introduction to the Industrial Monitor is provided along with the following information: • Overview • Hardware • Software • Specifications • Installation • Operating Procedures • Maintenance

Terminology and Abbreviations

Industrial PC Platform

Term / Abbreviation	Description
Industrial PC Platform	An integrated range of OMRON products designed for use in any industrial application that will benefit from advanced PC technology
Industrial Monitor	An industrial monitor with a touchscreen as the user interface designed to work in industrial environments
Industrial Panel PC	An industrial PC with an integrated touchscreen monitor designed to work in industrial environments
Industrial Box PC	A box-shaped industrial PC including an OS designed to work in industrial environments
IPC	Industrial PC

Hardware

Term / Abbreviation	Description
BMC	Board Management Controller
CFast	An SSD CFast storage device
CPU	A Central Processing Unit is the hardware within a computer that executes the instructions of a computer program
DVI	Digital Visual Interface
DVI-D	A Digital Visual Interface with only Digital signals
DVI-I	A Digital Visual Interface with Analog and Digital signals
Ethernet	A network communication protocol used in TCP/IP network
HDD	A Hard Disk Drive storage device
HMI	A Human Machine Interface that facilitates machine operation and control
MLC	Multi-Level Cell type of SSD storage device
NYML	NY Monitor Link interface with video signals and USB signals
PCIe	The PCI Express is a high-speed computer bus standard called Peripheral Component Interconnect Express
PoE	Power over Ethernet
pSLC	Pseudo Single Level Cell type of SSD storage device
SATA	The Serial AT Attachment is a serial bus interface primarily used with mass storage devices such as hard disk drives
SLC	Single-Level Cell type of SSD storage device
SO-DIMM	Small Outline Dual Inline Memory Module
SSD	A Solid State Drive storage device
USB	Universal Serial Bus

Software

Term / Abbreviation	Description
ACPI	Advanced Configuration and Power Interface protocol for operating systems
API	Application Programming Interface
BIOS	Basic Input Output System. The first software run by a PC when powered on.
Developer	Any person involved with the development of software
DST	Daylight Saving Time
EWF	Enhanced Write Filter
FBWF	File-Based Write Filter
IIoT	Industrial Internet of Things
Linux	An open source Operating System
MBR	Master Boot Record
Merge module	A module providing a standard method by which developers deliver shared Windows installer components and setup logic to their applications
MSDN	Microsoft Developer Network
NUI	Natural User Interface
OS	Operating System
PLC	Programmable Logic Controller
RTOS	Realtime Operating System
SDK	Software Development Kit
TCP/IP	Transmission Control Protocol / Internet Protocol, a core member of the Internet protocol suite
TPM	Trusted Platform Module
VxWorks	A Realtime Operating System designed by Wind River
Windows	An Operating System designed by Microsoft

Revision History

A manual revision code appears as a suffix to the catalog number on the front and back covers of the manual.

Cat. No.	I632-E-03

Revision code

Revision code	Date	Revised content
03	November 2019	• Replaced model ID 'NYB45-313K1' with 'AC1-152000' • Updated bracket details • Minor modifications
02	July 2019	Updated Conformance to KC certification
01	May 2019	Original production

Overview

This section provides general information about the IPC Application Controller.

1-1 Intended Use

The IPC Application Controller is an industrial-grade PC intended for use within factory automation environments. This IPC Application Controller simultaneously uses the standard Windows operating system and programs as well as third-party software to serve as a powerful PC platform.

The IPC Application Controller can easily be integrated in manufacturing innovations like big data, NUI and IIoT.

The IPC Application Controller has a compact design that offers flexibility, expandability and easy maintenance for applications in factory automation environments.

1-2   Hardware Features

The IPC Application Controller provides the following hardware features:
- Compact design with two mounting orientation options
  The IPC has a compact design to minimize panel space while allowing for two mounting orientations.
- Powerful CPU options
  Powerful CPU options provide high performance for various applications.
- Easy access to storage devices
  Adding or changing storage devices (HDD, SSD) is fast and simple.
- RAID support

  RAID 0 and RAID 1 are supported. For 4th generation CPUs starting with Main BIOS

  version A□27R110. Hot-swap of storage devices is not supported.
- LED indicators
  LED indicators provide a clear indication of the operational status of the IPC.
- DVI visual interface
  The video interface for the IPC is provided with a DVI connector for connection to a monitor.
  An extra (optional) DVI interface is available for connection to a second monitor.
- 3 Ethernet ports 1Gb/s

  Interface with multiple networks. An extra (optional) 4th 1Gb/s Ethernet port can be added.
- 4 Power over Ethernet ports 1Gb/s

  Ethernet ports with power, available for connections to e.g. GigE cameras.
- Built-in I/O
  Built-in I/O for UPS status and IPC shutdown control are provided.
- 4 USB ports
  2 USB2.0 ports and 2 USB3.0 ports are provided for connection to external USB devices such as keyboards, memory sticks, or other peripheral hardware.
- Built-in SD Memory Card slot
  An SD Memory Card slot is provided for removable memory.

1-3 ID Information Label Application Controller

The ID information label contains relevant information about the IPC Application Controller.
The following example will be different from your product label.

Item	Name	Description
A	Product name	The name of your product
B	Model *1	Model and configuration details
C	Power rating	Power rating details and optional UL related information
D	Standards and QR code	The applicable standards and a QR code for OMRON internal use
E	Custom ID	A custom product ID. Only applicable for customized IPC platform products.
F	LOT number and serial number	Production details, consisting of: • The lot number of the IPC Application Controller in the format DDMYY□. DDMYY with Month number 1 to 9 for January to September, X for October, Y for November, and Z for December. □: For use by OMRON • Serial number (4 digits)
G	MAC ADDRESS *2	• PORT 1: the MAC address of Ethernet port 1 • PORT 2: the MAC address of Ethernet port 2 • PORT 3: the MAC address of Ethernet port 3 • PORT 4: the MAC address of Ethernet port 4 (Optional)

*1. Refer to *1-4 Product Configuration* on page 1-5 for model details.
*2. Refer to *4-2-4 Ethernet Connector Specifications* on page 4-17 for Ethernet specifications.

📝 **Additional Information**

Refer to *2-1-2 Base Layer* on page 2-4 for the ID label location.

1-4 Product Configuration

This section provides an overview of the product configuration details for the IPC Application Controller.

Description	Option / Description
Series name	AC, for Application Controller
Processor	Intel Core i5-7440EQ, 7th generation CPU with active cooling
Main memory	8 GB, non-ECC
Expansion slots	1 PCIe slot
Operating system	Windows 10 IoT Enterprise LTSB - 64 bit
Storage	128 GB, SSD iMLC
Optional interface	RS-232C

2

Hardware

This section provides an overview of the hardware of the IPC Application Controller.

2-1   Layers and Components

This section shows the layers of the IPC Application Controller.
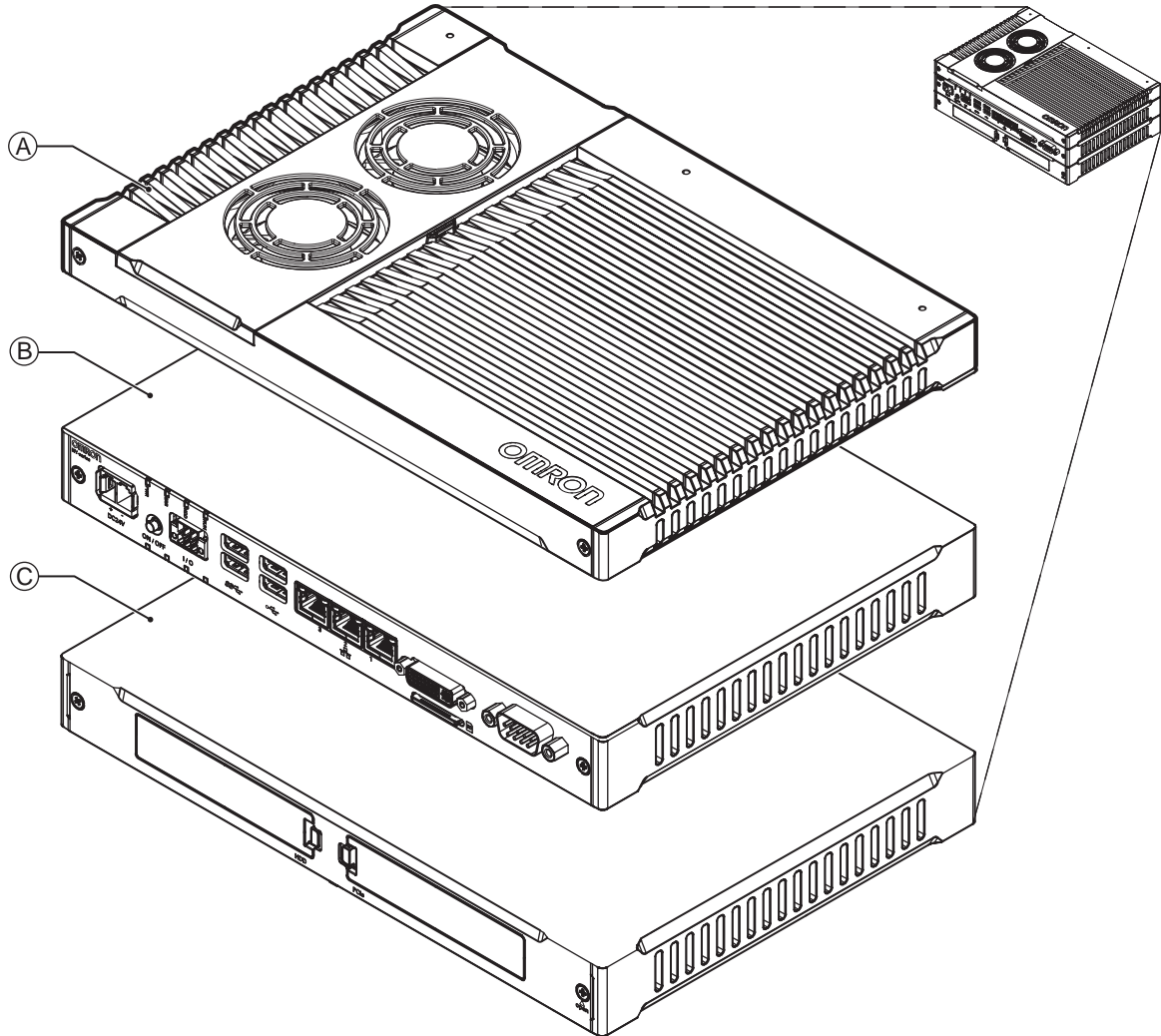
Item	Name	Description
A	Cooling layer	Layer to cool the base layer Depending on the product configuration fans can be present and the thickness can vary.
B	Base layer	The layer with the CPU and the main interfaces The connector layout and the installed option board depend on the product configuration.
C	Expansion layer	Depending on the product configuration this optional layer can add additional storage devices or a PCIe Card.

2-1-1 Cooling Layer

This section gives details on the cooling layer.

The cooling layer will dissipate excessive heat from the IPC.

Thickness and design details of the cooling layer can vary, depending on the product configuration.

Cooling layer with re-
movable cover and ac-
tive cooling
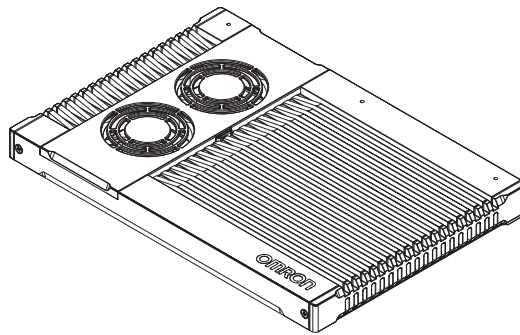
The cover provides access to:

- The battery
- The battery replacement date
- The fans, only for IPCs that have active cooling

2-1-2 Base Layer

This section shows the component names and functions for the base layer.

The base layer houses most of the functionality of the IPC.

Frontside

Backside
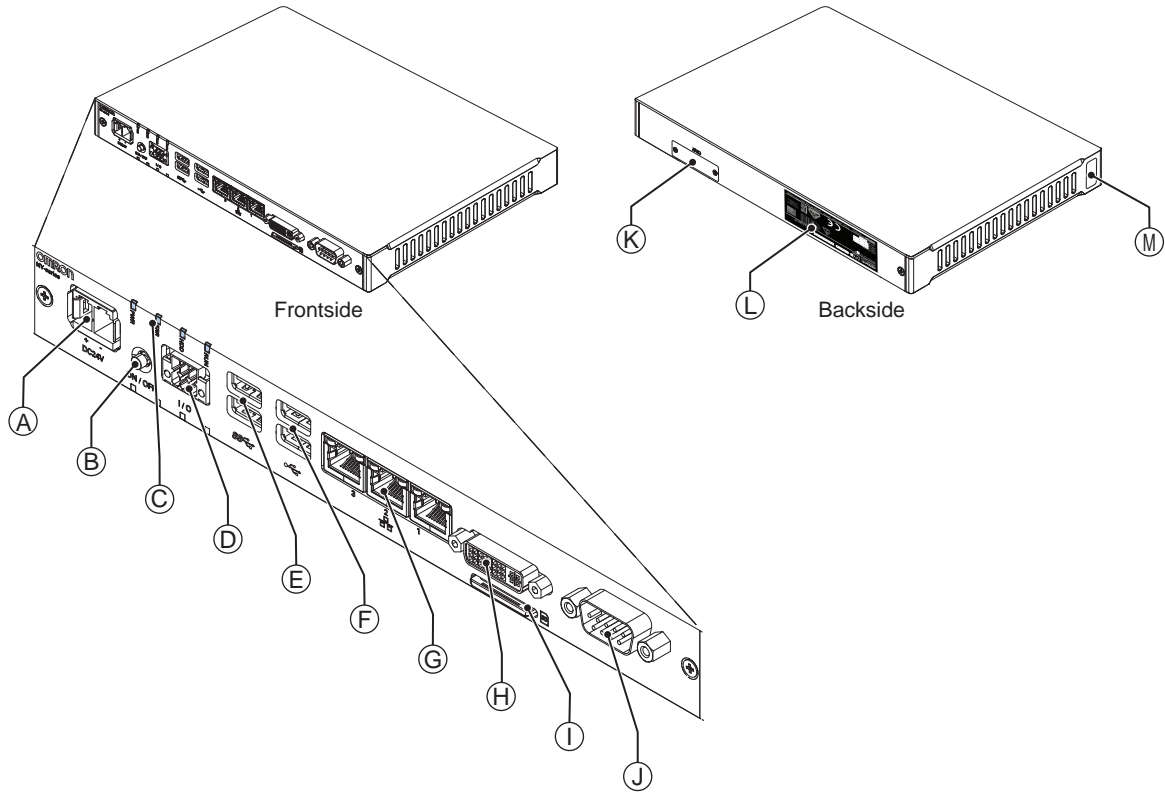
The connector layout and the available components can differ depending on the product configuration. Refer to *1-4 Product Configuration* on page 1-5 for configuration details.

Item	Name	Description
A	Power connector	Lockable power connector
B	Power button	Pushbutton to manually power ON/OFF the IPC
C	LED indicators	Visual indicators for the operating state of the IPC
D	I/O connector	2 inputs (Power ON/OFF Input and UPS Mode Input) and 1 output (Power Status Output)
E	USB 3.0 connectors	2 USB 3.0 interface connectors
F	USB 2.0 connectors	2 USB 2.0 interface connectors
G	10BASE-T / 100BASE-TX / 1000BASE-T Ethernet con-nectors	3 RJ45 Gb Ethernet interface connectors
H	DVI connector	Digital Visual Interface connector
I	SD Memory Card slot	SD Memory Card slot
J	Option port	Interface connection options for peripheral devices or an additional monitor. Possible option ports are: • RS-232C connector • DVI-D connector • NYML connector • RJ45 Gb Ethernet connector
K	CFast Card slot	Optional CFast Card slot for models with CFast storage

Item	Name	Description
L	ID information label	Label containing Model ID., LOT No. and other product specific information. Refer to *1-3 ID Information Label Application Controller* on page 1-4 for label details.
M	Product key	The product key for the operating system (optional). The product key is inside the cover of the cooling layer for lotnumbers before 22Z17.

2-1-3 Expansion Layer (Optional)

This section shows the component names and functions for the expansion layer.

The expansion layer adds additional functionality to the base layer.

The Expansion Layer is installed for models:

• AC1-152000

Refer to *1-4 Product Configuration* on page 1-5 for model details.

Frontside   Backside
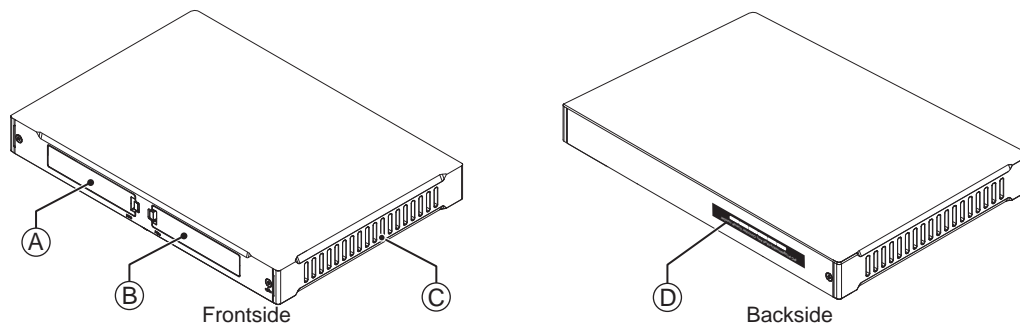
Item	Name	Description
A	Drive bays *1	Two 2.5 inch drive bays for HDD/SSD storage devices: • Drive bay A is the bay at the side of the base layer. • Drive bay B is the bay at the opposite side of the base layer.
B	PCIe bay	PCI Express mounting slot
C	PCIe drawer	Mounting location for the PCIe Card
D	Label (Optional)	Label with license key, only for an Industrial PC with Programmable Multi Axis Controller

*1. Depending on the model one or two drives are supported.
Refer to *4-1-7 Storage Device Specifications* on page 4-7 for the number of supported drives and for bay details.

2-2 LED Indicators

The IPC Application Controller has LED indicators located at the base layer. These LED indicators provide the current operating status of the IPC.

Models with an Expansion layer have a second row with four LED indicators that have the same function.

The following LED indicators are available:
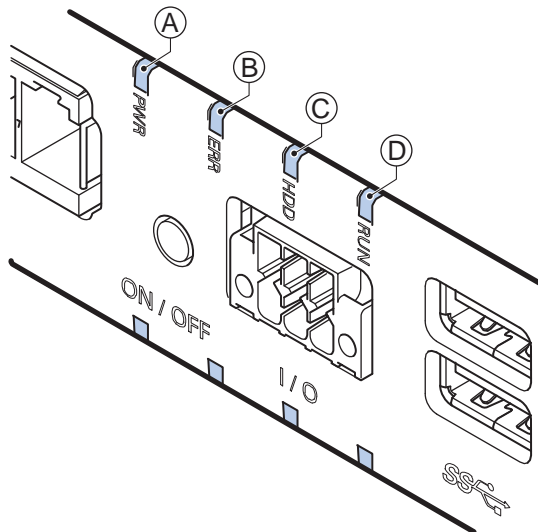
Item	LED Indicator	Name	Description
A	PWR	Power	Indicates the operating mode of the IPC Application Controller.
B	ERR	Error	Indicates the presence and type of an error.
C	HDD	Hard Disk Drive	Indicates HDD/SSD activity.
D	RUN	Run	Indicates the status of a user-defined function. [1]

*1.   Not for products NY512-A□□□.
      Refer to *1-4 Product Configuration* on page 1-5 for configuration details.

2-2-1 PWR LED Indicator

The Power LED (PWR) indicates the operating mode of the IPC.

Color	Status		Meaning
Green	□	Not lit	There is no power supplied or the IPC is OFF.
		Blinking	Power is currently supplied and the IPC is in stand-by mode.
		Lit	Power is currently supplied and the IPC is turned ON.

2-2-2 ERR LED Indicator

The Error LED (ERR) indicates the presence and type of an error within the IPC Application Controller.

Color		Status	Meaning
Red	☐	Not lit	• The 24 VDC power is not supplied • No error is present
	🔲	Blinking	• Fan Error • Battery low
	🟥	Lit	• Thermal shutdown • Watchdog Error • Power Supply undervoltage error • Power Supply overvoltage error • Power supply defective

Additional Information

• The status of this LED can also be defined by users using the Industrial PC System API.
• Refer to *7-2 Corrective Maintenance* on page 7-15 for actions to solve errors.

2-2-3 HDD LED Indicator

The Hard Disk Drive LED (HDD) indicates activity of the HDD or SSD.

Color		Status	Meaning
Yellow	🟨	Flickering	The HDD or SSD or CFast is active.

2-2-4 RUN LED Indicator

The RUN LED is available for user applications.

Color		Status	Meaning
Green	☐	Not lit	User-defined. The status can be defined in a user program using the Industrial PC System API.
	🟩	Blinking	
	🟩	Lit	

2-3   Power Button

The power button is located at the base layer.

The power button is used to manually switch the IPC ON and OFF.
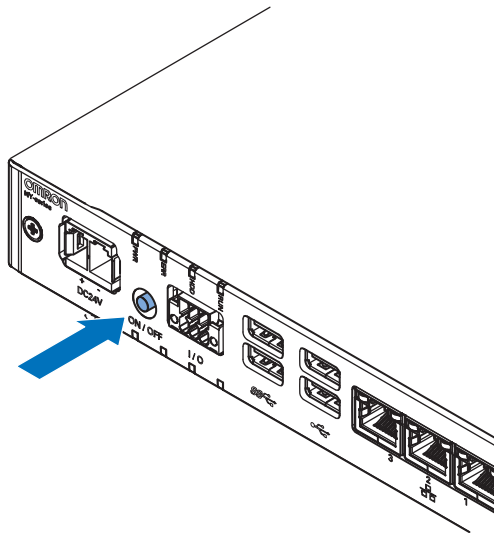
> **Additional Information**
>
> • Refer to *6-1 Power ON* on page 6-2 for ON details.
> • Refer to *6-2 Power OFF* on page 6-3 for OFF details.

2-4   Connectors

This section gives an overview of the connectors located at the base layer of the IPC Application Controller.

2-4-1   Power Connector

The power connector on the IPC is used to supply 24 VDC power to the IPC.
The power connector is supplied with the IPC.
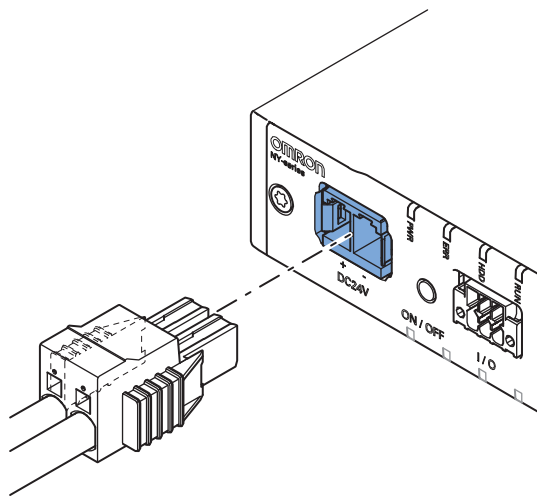
> **Additional Information**
>
> • Refer to *4-2-1 Power Connector Specifications* on page 4-11 for specifications.
> • Refer to *5-4-3 Wire the Power Connector* on page 5-28 for wiring details.
> • Refer to *5-5 Connect* on page 5-34 for connection details.

2-4-2   I/O Connector

The I/O connector on the IPC Application Controller provides discrete signals with the following functions.
• Input signal to the IPC when a connected UPS switches to battery power.
• Input signal to the IPC to perform a shutdown or power ON when the signal turns ON.
• Output signal from the IPC to indicate the power status of the IPC.
The I/O connector is supplied with the IPC.
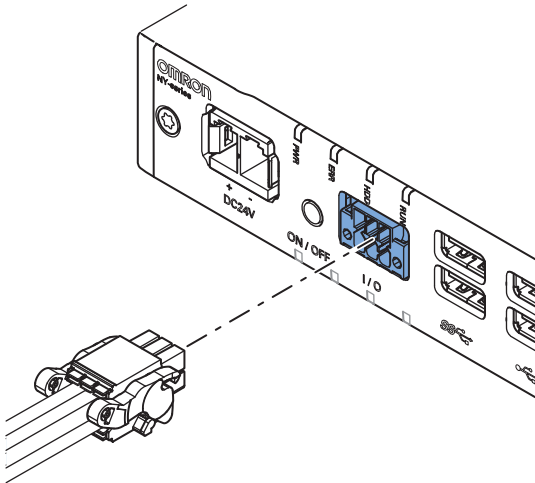
Additional Information

- Refer to *4-2-2 I/O Connector Specifications* on page 4-12 for specifications.
- Refer to *5-4-4 Wire the I/O Connector* on page 5-31 for wiring details.
- Refer to *5-5 Connect* on page 5-34 for connection details.

2-4-3   USB Connectors

Two USB connectors support USB 2.0 and two USB connectors support USB 3.0 specifications. All USB interfaces are protected against overcurrent and support Wake-on-USB.
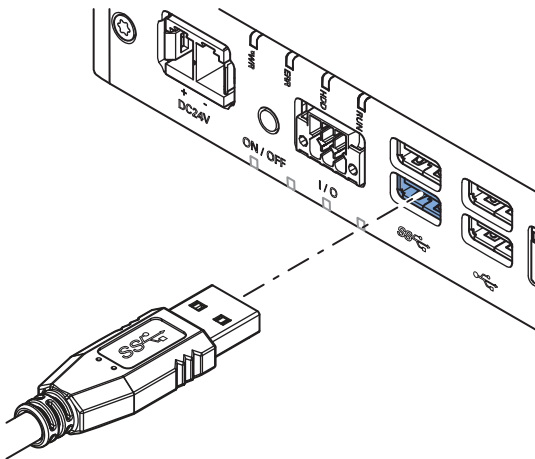
Additional Information

- Refer to *4-2-3 USB Connector Specifications* on page 4-16 for specifications.
- Refer to *5-5 Connect* on page 5-34 for connection details.

2-4-4   Ethernet Connectors

The Ethernet connectors provide 3 individual Ethernet ports on the IPC Application Controller.
Each port offers 10BASE-T/100BASE-TX/1000BASE-T Ethernet speeds.
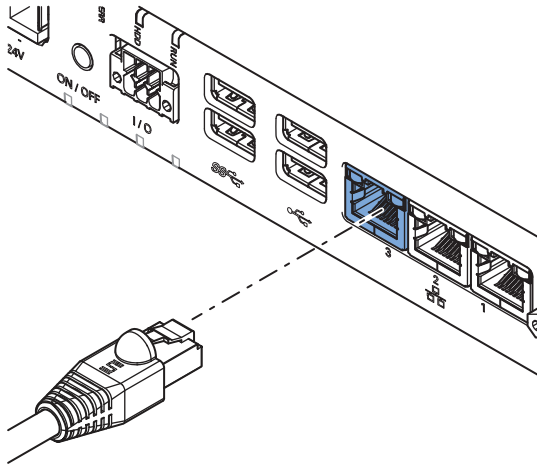
Additional Information

- Refer to *4-2-4 Ethernet Connector Specifications* on page 4-17 for specifications.
- Refer to *5-5 Connect* on page 5-34 for connection details.

2-4-5   DVI Connector

The DVI interfaces supported on this connector are dependent on the configuration of the IPC Application Controller.
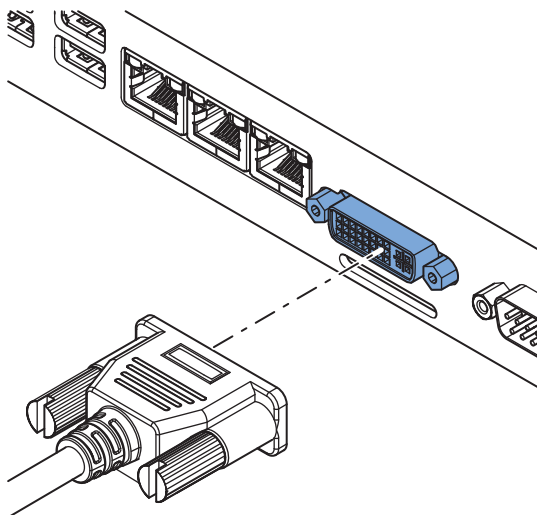
Additional Information

- Refer to *1-4 Product Configuration* on page 1-5 for configuration details.
- Refer to *4-2-5 DVI Connector Specifications* on page 4-19 for specifications.
- Refer to *5-5 Connect* on page 5-34 for connection details.

2-4-6   RS-232C Connector (Optional)

Depending on the product configuration an optional RS-232C connector is available.
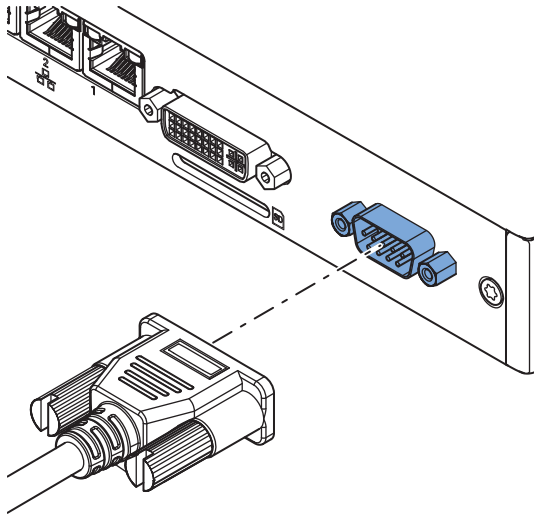
> **Additional Information**
>
> • Refer to *1-4 Product Configuration* on page 1-5 for configuration details.
> • Refer to *4-2-6 RS-232C Connector Specifications* on page 4-20 for specifications.
> • Refer to *5-5 Connect* on page 5-34 for connection details.

2-4-7   PCIe PoE Connectors

The PCI Express (PCIe) Card in the Expansion layer contains a pre-installed PoE Card with Ethernet connectors. The ports offers 10BASE-T/100BASE-TX/1000BASE-T Ethernet speeds.
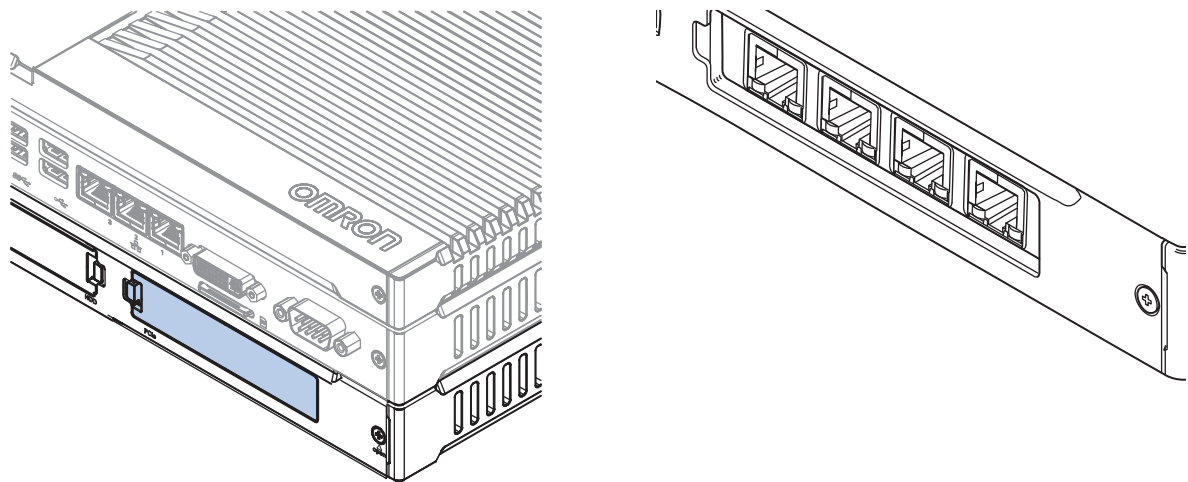
> **Additional Information**
>
> • Refer to *4-2-7 PCIe PoE Connectors Specifications* on page 4-21 for specifications.
> • Refer to *5-5 Connect* on page 5-34 for connection details.

2-5   SD Memory Card Slot

The SD Memory Card slot is located at the base layer.

The SD Memory Card slot on the IPC Application Controller accepts SD Memory Cards with the following specifications.

- SDHC type (SD 2.0 specification)
- Up to 32 GB capacity
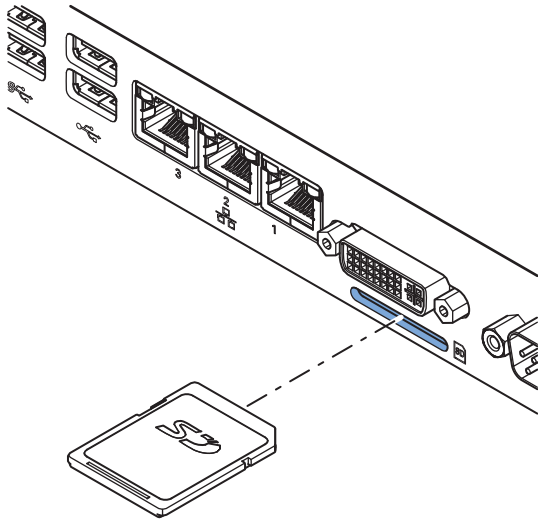
> **Additional Information**
>
> Refer to *2-9-2 SD Memory Cards* on page 2-18 for SD Memory Card details.

2-6   Drive Bays

The drive bays are located in the expansion layer.

The drive bays in the IPC Application Controller accept 2.5 inch Hard Disk Drives (HDD) or Solid State Drives (SSD). Depending on the model one or two drives are supported.
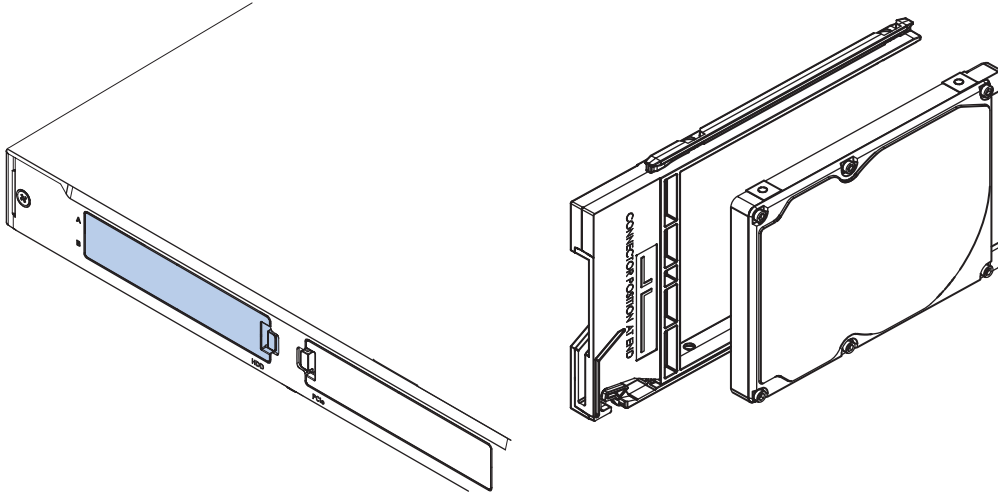
> **Additional Information**
>
> • Refer to *4-1-5 CPU Specifications* on page 4-6 for the number of supported drives.
> • Refer to *4-1-7 Storage Device Specifications* on page 4-7 for storage device specifications.
> • Refer to *5-2-1 Install a Drive* on page 5-5 for install information.
> • Refer to *7-2-5 Replace a Drive* on page 7-22 for maintenance information.

2-7   PCIe PoE Card Slot

The PCI Express (PCIe) Card slot is located in the expansion layer.

The PCI Express (PCIe) Card slot of the IPC Application Controller is pre-installed with a PCIe PoE card. This PCIe Card is pre-installed and can not be replaced. For replacement contact your local OMRON representative.

The PCIe PoE Ethernet connectors are available behind the cover Ⓐ and the PCIe Card is mounted in the PCIe drawer Ⓑ.
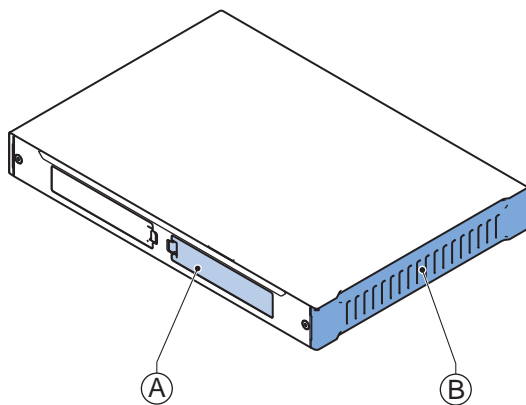
Additional Information

- Refer to *2-4-7 PCIe PoE Connectors* on page 2-12 for connector details.
- Refer to *4-2-7 PCIe PoE Connectors Specifications* on page 4-21 for specifications.

2-8 Spare Parts
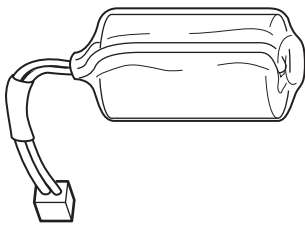
The following spare parts for the IPC Application Controller are available.

2-8-1 Battery

One battery is located inside the IPC. The battery supplies power to the real-time clock.
The battery is:

• not replaceable for products with a cooling layer that has a non-removable cover.
   The non-replaceable battery has a lifetime for at least 10 years at 40°C.

• replaceable for products with a cooling layer that has a removable cover.
   Details replaceable battery:

Model	Appearance	Specifications
CJ1W-BAT01		Service life: 5 years at 25°C
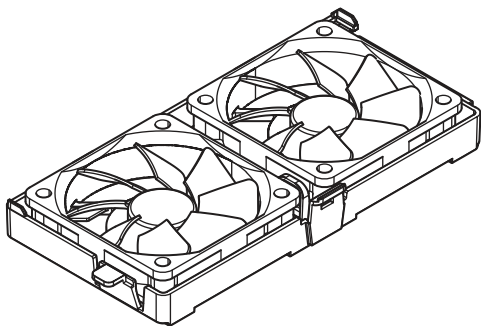
> **Additional Information**
>
> Refer to *7-2-4 Replace the Battery* on page 7-20 for the replacement procedure.

2-8-2 Fan Unit

The Fan Unit is available for the IPC that has active cooling.

Model	Appearance	Specifications
NY000-AF00		• Service life: 70,000 hours of continuous operation at 40°C with 15% to 65% relative humidity • Shelf life: 6 months This is the storage limitation with no power supplied. We highly recommend performance testing if the Fan Unit has been stored over 6 months.
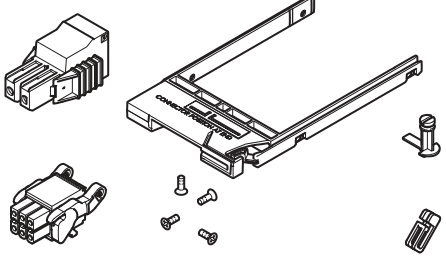
> **Additional Information**
>
> Refer to *7-2-3 Replace the Fan Unit* on page 7-18 for the replacement procedure.

2-8-3　Accessory Kit

The accessory kit for the IPC.

Model	Appearance	Specifications
NY000-AK00		Accessory Kit containing all accessories supplied with the IPC. • Power connector • I/O connector • Drive bracket for drive installation • 4 mounting screws for drive installation • PCIe Card support for PCIe Card installation • PCIe Card clip for PCIe Card installation

2-9   Optional Hardware
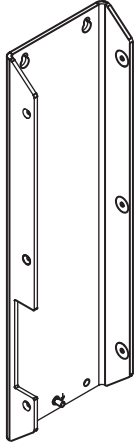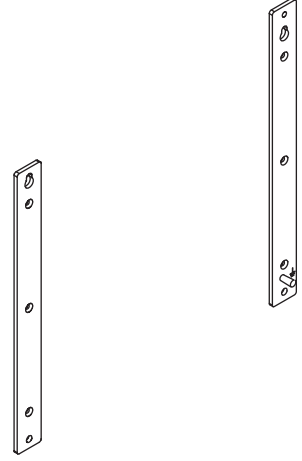
The following optional hardware is available for the IPC Application Controller.

2-9-1   Mounting Brackets

Mounting brackets are available for different models of the Industrial Box PC.
The model ID is available on the ID information label.

- Refer to *1-3 ID Information Label Application Controller* on page 1-4 for label details.
- Refer to *2-1-2 Base Layer* on page 2-4 for label location details.
- Refer to *1-4 Product Configuration* on page 1-5 for configuration details.

Bracket details per model ID.

Model		Bracket ID and appearance	
Model ID	Model details	Book mount details	Wall mount details
• AC1-152000	• With Expansion layer • With Cooling layer with re-movable cover	NY000-AB00 	NY000-AB01

Refer to *4-1-8 Bracket Specifications* on page 4-9 for bracket dimension details.

2-9-2   SD Memory Cards

SD Memory Card details are provided below.
OMRON is not responsible for the operation, performance or write life of any other brand of SD Memory Card.
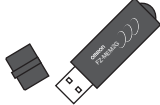
Model	Appearance	Card type	Capacity	Format
HMC-SD291		SD Card	2 GB	FAT16
HMC-SD491		SDHC Card	4 GB	FAT32
HMC-SD1A1		SDHC Card	16 GB	FAT32

2-9-3 USB Flash Drives

USB Flash Drive details are provided below.

OMRON is not responsible for the operation, performance, or write life of any other brand of USB Flash Drives.
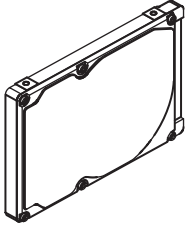
Model	Appearance	Capacity
FZ-MEM2G		2 GB
FZ-MEM8G		8 GB

2-9-4   HDD and SSD Storage Devices

HDD and SSD storage devices can only be installed in models with an Expansion Layer.
Refer to *1-4 Product Configuration* on page 1-5 for model details.

HDD and SSD storage device details are provided below.
OMRON is not responsible for the operation, performance, or write life of any other storage device.

Model	Appearance	Storage type	Capacity	Details
NY000-AH00		HDD	320 GB	Toshiba MQ01ABF032
NY000-AH01			500 GB	Toshiba MQ01ABF050
NY000-AH02			1 TB	WD HTS541010B7E610
NY000-AS00		SSD SLC	32 GB	Apacer APS25AB7032G-AT
NY000-AS01 [1]			64 GB	Apacer APS25AB7064G-AT
NY000-AS03 [2]			64 GB	Hagiwara HFD25S-064GD(A23AE)-HC
NY000-AS06		SSD-pSLC	128 GB	Innodisk DHS25-A28M41BC1DC
NY000-AS04 [2][3]		SSD iMLC	128 GB	Innodisk DES25-A28M41BC1DC
NY000-AS05			500 GB	Innodisk DES25-C12D08BC1QC

*1.   Default for IPC models: NY□25-□1, NY□17-□1 and NY□1C-□1
*2.   Default for IPC models: NY□35-□1, NY□2C-□1 and NY□1E-□1
*3.   Default for IPC models: NY□45-313K1

> **Additional Information**
>
> Refer to *4-1-7 Storage Device Specifications* on page 4-7 for storage device specifications.

Storage Device Considerations

For a storage device that is not an OMRON NY000-A□□□ consider the following:
- OMRON is not responsible for the operation, performance or write life of any storage device other than those supplied by OMRON.
- Test and measure the environmental performance of the intended storage device before actual operation, using the SMART monitoring feature of the selected storage device.
- Ensure the temperature and vibrations of the storage device are within the operating temperature specifications and vibration specifications during actual operation.
- Using a storage device with maximum power consumption exceeding 2W is not advised. Ensure that the SMART monitor features of the storage device are used to detect overheating.

> **Additional Information**
>
> - Refer to *4-1-7 Storage Device Specifications* on page 4-7 for storage device specifications.
> - Refer to *4-4-1 Operation Environment Specifications* on page 4-23 for environment specifications, specifically temperature and vibration specifications.

2-9-5 DVI Cables

DVI cable details are provided below.

OMRON is not responsible for the operation or performance of any other brand of DVI cable.

Model	Appearance	Cable length	Specifications
NY000-AC00 2M		2 m	• Supports DVI-D
NY000-AC00 5M		5 m	• Minimum bend radius: 36 mm

DVI Cable Clearance

The DVI cable requires a minimum clearance of 90 mm from the connector entry to prevent excessive strain on the connector and cable assembly.
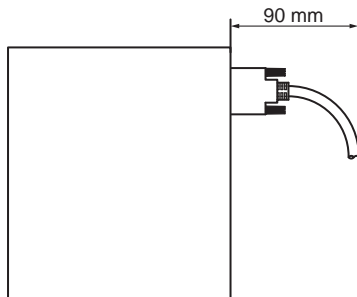
2-9-6 USB Type-A to USB Type-B Cables

USB Type-A to USB Type-B cable details are provided below.

OMRON is not responsible for the operation or performance of any other brand of USB Type-A to USB Type-B cable.

Model	Appearance	Cable length	Specifications
FH-VUAB 2M		2 m	• USB 2.0
FH-VUAB 5M		5 m	• Minimum bend radius: 25 mm

USB Type-A to USB Type-B Cable Clearance
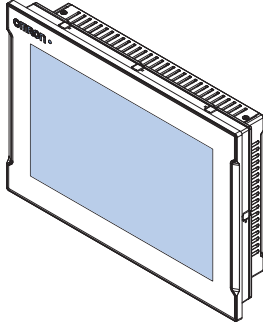
The USB Type-A to USB Type-B cable requires a minimum clearance of 60 mm from the connector entry to prevent excessive strain on the connector and cable assembly.
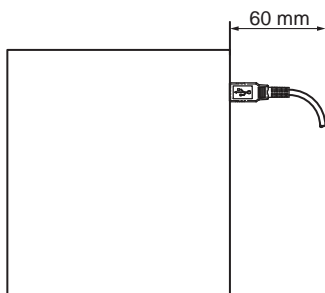
2-9-7 Industrial Monitor

Details for the recommended monitor are provided below.

OMRON is not responsible for the operation or performance of any other monitor.

Model	Appearance	Specifications
NYM12W-C1□□□ NYM15W-C1□□□ NYM19W-C1□□□		• LCD touchscreen • Multi-touch functionality • Supply voltage: 24 VDC • Up to 1,280 x 800 pixels at 60 Hz (12", 15") or 1,920 x 1,080 pixels at 60 Hz (19") • 2 USB Type-A Connectors • Programmable brightness control
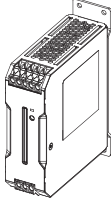
Additional Information

Refer to the OMRON website for specifications and manuals.

2-9-8 Power Supply

Details for the recommended power supply are provided below.

OMRON is not responsible for the operation or performance of any other power supply.

Model	Appearance	Specifications
S8VK-G□□□24		Output voltage: 24 VDC

Additional Information
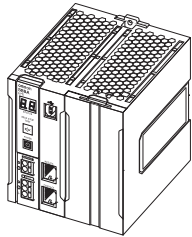
• Refer to *4-1-3 Power Consumption Specifications* on page 4-4 for power consumption details.
• Refer to the OMRON website for specifications and manuals of the S8VK-G.
  Note that the power consumption details of the IPC determine the minimum power rating of your power supply.

2-9-9 UPS

Details for the recommended UPS are provided below.

OMRON is not responsible for the operation or performance of any other UPS.

Model	Appearance	Specifications
S8BA with revision number 04 or higher. [1]		Output voltage during backup operation: 24 VDC±5%

[1]. The revision number of the UPS can be retrieved from the serial number label on the product and the product packaging.

A3□ □□□□□□□□□□ □□□ □
　　1　　　　　2　　　　3　 4

Item	Description
1	Product code
2	Product period and sequential number
3	Revision number
4	RoHS status

Precautions for Safe Use

Use an Omron S8BA UPS with the correct revision number to prevent improper system shutdown.
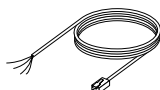
Additional Information

- Refer to *2-9-8 Power Supply* on page 2-22 for power supply details.
- Refer to *4-1-3 Power Consumption Specifications* on page 4-4 for power consumption details.
- Refer to the OMRON website for S8BA specifications or to the *UPS S8BA User's Manual (Cat. No. U702)* for the UPS manual.
  Note that the power consumption details determine the output current/capacity of your UPS.

2-9-10 UPS Communication Cable

Communication cable details are provided below.

OMRON is not responsible for the operation or performance of any other brand of communication cable.

Model	Appearance	Cable length	Specifications
S8BW-C02		2 m	Signals for • Signal output (BL, TR, BU, WB) • Remote ON/OFF input • UPS Stop Signal input (BS)

3

Software

This section provides software information for the IPC Application Controller.

3-1 Windows Operating System

This section provides an overview of Windows Operating System information.

3-1-1 Determine Your Version of the Windows Operating Systems

This section provides methods to find version details of your Windows Operating System.

Windows 10

To determine your version of the Windows Operating System:

1 Select the **Search** Button.

2 Enter *System Information* in the search box.

3 Select **System Information** in the pop-up that appears.
An overview of your System Information will appear, including the Windows Operating System details.

3-2 ACE

The software package ACE is preinstalled on the IPC and is ready to use after completing the Initial Power ON procedure.

> **Additional Information**
>
> Refer to *Related Application Controller Manuals* on page 25 for ACE details.

3-3　Support Software

This section provides an overview of the support software available for your IPC Application Controller.

3-3-1　Overview IPC Support Software for Windows

This section gives an overview of the software utilities available for all Industrial PC Platform products with a Windows operating system.

Product	Software utility
Industrial Monitor	Industrial Monitor Utility
	Industrial Monitor Brightness Utility [1]
	Industrial PC Tray Utility [1][2][3]
Industrial Box PC	Industrial PC Support Utility
	Industrial PC Tray Utility [1][2][3]
	Rescue Disk Creator
Industrial Panel PC	Industrial Monitor Utility
	Industrial Monitor Brightness Utility [1]
	Industrial PC Support Utility
	Industrial PC Tray Utility [1][2][3]
	Rescue Disk Creator

*1.　Included in the Industrial Monitor Utility installer
*2.　Included in the Industrial PC Support Utility installer
*3.　Together with the Industrial PC Tray Utility also Microsoft .NET Framework 4.6 is installed.

Select and download the required utilities from the OMRON website.

> **Additional Information**
>
> An internet connection is required to install support software.

3-3-2 Installed IPC Support Software

This section gives an overview of the installed IPC support software available for your Industrial Box PC.

Product	Specifications
Industrial PC Support Utility	Refer to *3-3-3 Industrial PC Support Utility* on page 3-6 for details.
Industrial PC Tray Utility	Refer to *3-3-5 Industrial PC Tray Utility* on page 3-18 for details.
Industrial PC System API	For the Industrial PC Support Utility.
Industrial Monitor API	For the optional OMRON Industrial Monitor.
congatec CGOS API	For the Industrial PC Support Utility.
Microsoft .NET Framework 4.6	For the Industrial PC Tray Utility.
Rescue Disk Creator	Refer to *3-3-4 Rescue Disk Creator* on page 3-11 for details.
Industrial Monitor Brightness Utility	For the optional OMRON Industrial Monitor.
Industrial Monitor Utility	For the optional OMRON Industrial Monitor.

3-3-3 Industrial PC Support Utility

This section provides an overview of the Industrial PC Support Utility.

Industrial PC Support Utility Overview

The Industrial PC Support Utility is a software utility to assist in diagnosing and resolving problems of the IPC Application Controller.
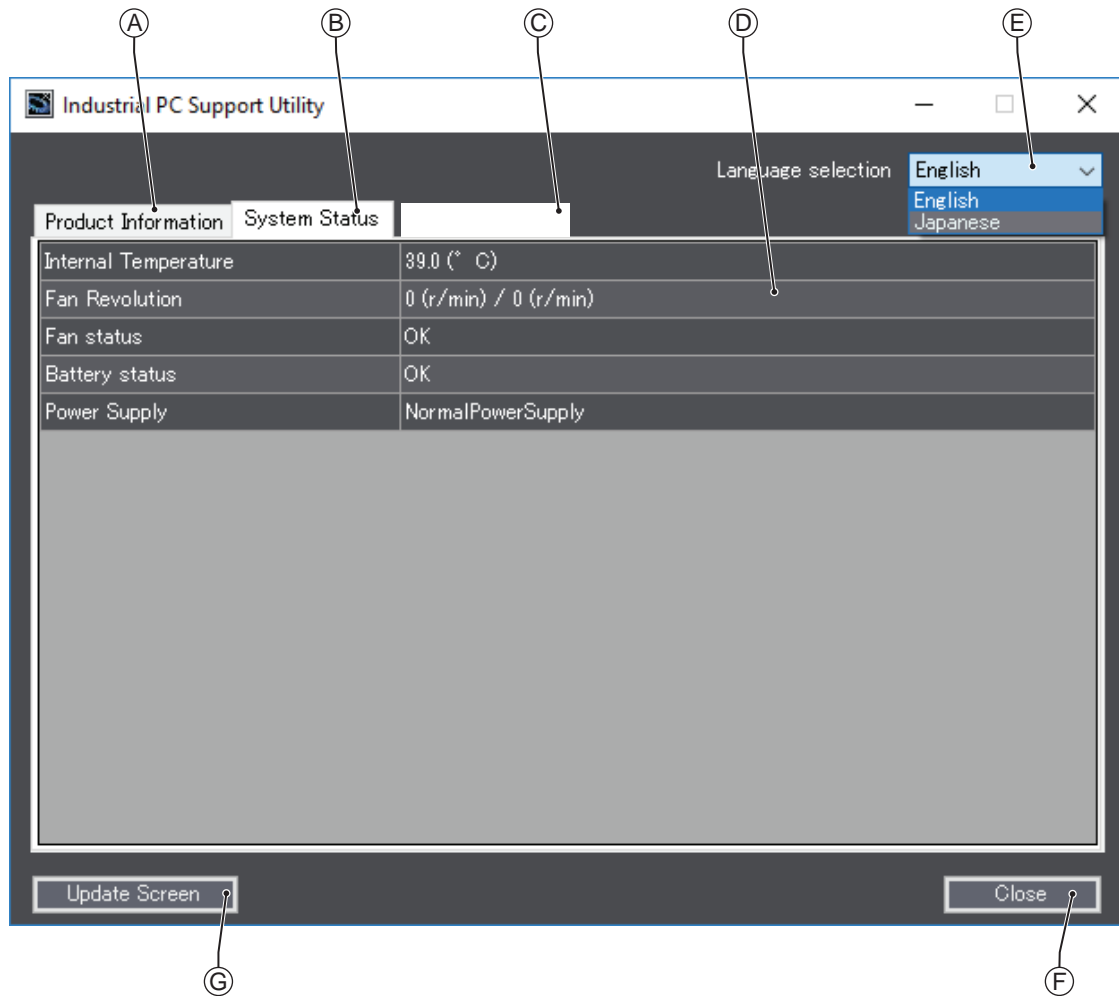
Item	Description	Details
A	Production Data Tab	Select to display Production Data details in the Tab details area Ⓓ. Refer to *Product Information Tab* on page 3-7 for details.
B	System Status Tab	Select to display System Status details in the Tab details area Ⓓ. Refer to *System Status Tab* on page 3-8 for details.
C	Machine Controller Tabs	A series of tabs that is only availabel for an Industrial PC with Machine Automation Control Software. Refer to *Machine Controller Tabs* on page 3-9 for details.
D	Tab details	Details of the selected Tab page.
E	Language Selector	Select to display and choose the UI language of the Industrial PC Support Utility.
F	Close Button	Close the Industrial PC Support Utility.

Item	Description	Details
G	Update Screen Button	Use this button to retrieve updated values from the IPC Application Controller.

Product Information Tab

The Production Data tab displays generic IPC Application Controller information. These are e.g. Model name, Lot number, Serial number, Hardware version, BIOS version, BMC version, and software versions (Industrial PC Support Utility and Industrial PC System API).
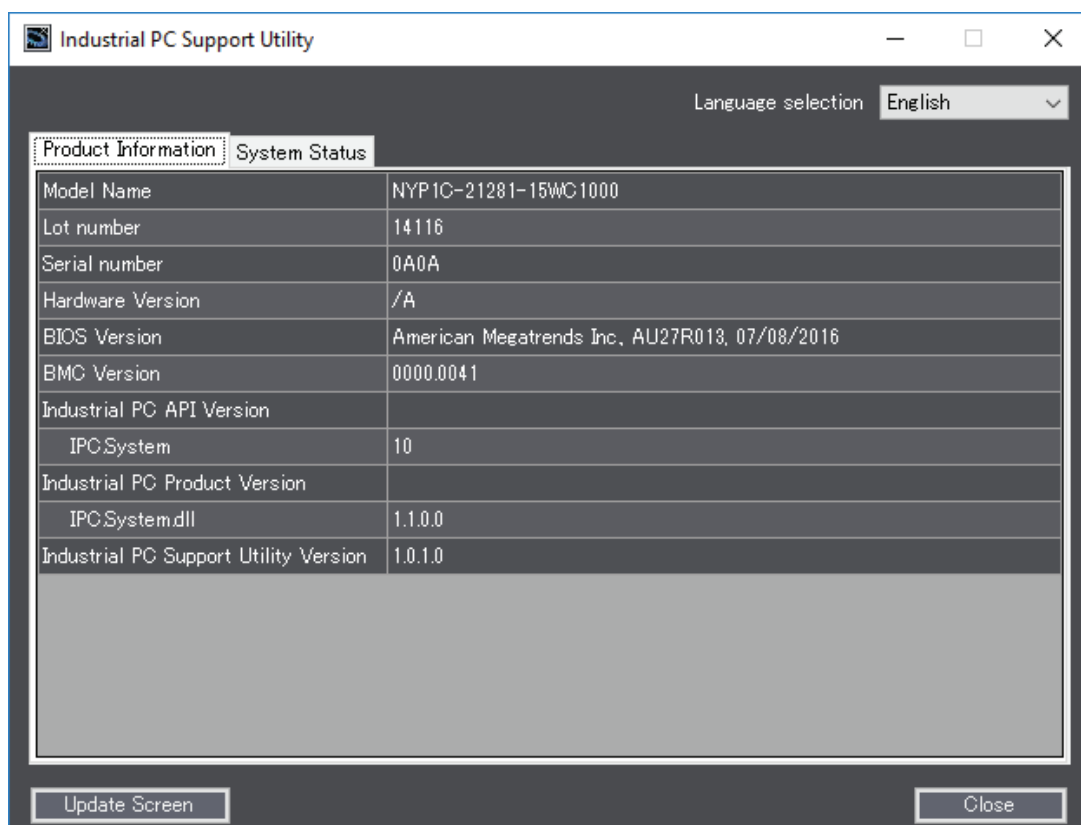
- Model Name is the configuration code of this model.
  Refer to *1-4 Product Configuration* on page 1-5 for details.
- BMC Version is the firmware version of the Board Management Controller.

Values are not updated automatically. Select the **Update Screen** Button to display the latest values.

System Status Tab

The System Status tab displays actual states and diagnostic information like internal temperature, fan revolution, battery and power supply status.

A status that requires attention is indicated with a red bar.

Item	Description
Internal Temperature	The average CPU temperature.
Fan Revolution [1]	The actual rotation speed for each fan in revolutions per minute (r/min). • First number = rotation speed of fan located closest to Power button. • Second number = rotation speed of fan located closest to battery.
Fan Status [2]	The target speed for the fans is dynamically set based on the CPU temperature. The target speed is compared with the actual fan speed. • **OK** indicates both fans are running on the target speed. • **Low revolution speed** indicates one or both fans do not reach the target speed. Clean the fans and replace the Fan Unit if the problem persists.
Battery Status	The battery status. • **OK** indicates the battery is full. • **Low** indicates the battery voltage is low. Replace the battery.
Power Supply	The power supply status is determined by the UPS and reported to the IPC via the I/O connector. • **NormalPowerSupply** indicates the IPC is powered by the 24V power supply. • **UPS Power Supply** indicates that there is no power from the 24V power supply and the IPC runs on battery power from the UPS.

*1. The Fan Revolution will always show 0 (r/min) / 0 (r/min) for fanless models

Refer to *1-4 Product Configuration* on page 1-5 for fan details.

*2. The Fan Status will always show OK for fanless models

Values are not updated automatically. Select the **Update Screen** Button to display the latest values.

Machine Controller Tabs

The Industrial PC with Machine Automation Control Software has additional tabs available.
Examples are:
- Controller Status, to display operation mode and current errors.
- Controller Operation, to change operating mode or backup / restore the controller.
- Network Setting, to display and change network settings
- Virtual SD Memory Card Settings, to change the Virtual SD Memory Card Settings. .

These Machine Controller tabs are only relevant for an Industrial PC with Machine Automation Control Software. Refer to *NY-series IPC Machine Controller Industrial Panel PC / Industrial Box PC Setup User's Manual (Cat. No. W568)* for details.

Installation

The Industrial PC Support Utility is pre-installed on the Industrial PC if it comes with a Windows operating system installed.
Download the Industrial PC Support Utility from the OMRON website if reinstallation is required.

> **Additional Information**
>
> A new installation on a Windows 10 PC will require the installation of the .net Framework.
> The .net Framework software can be downloaded from a Microsoft website.

Startup

The Industrial PC Support Utility can be started from:
- Windows Start Menu
  Select **OMRON** and then **Industrial PC Support Utility**.
- Industrial PC Tray Utility
- Windows desktop shortcut

Messages

The Industrial PC Support Utility does not display messages in the Industrial PC Tray Utility.
A battery warning and a fan warning are not displayed in the Industrial PC Tray Utility.

Logging

The Industrial Monitor Utility and the Industrial PC Support Utility record the operation history in the Windows event log.
Refer to *7-2-8 Windows Event Viewer* on page 7-38 for the logged messages.

3-3-4   Rescue Disk Creator

This section provides an overview of the Rescue Disk Creator.

Rescue Disk Creator Overview

The Rescue Disk Creator creates a Rescue Disk.
A Rescue Disk is a disk with the Rescue Disk Utility; this is the software that performs the system backup and system restore procedures.
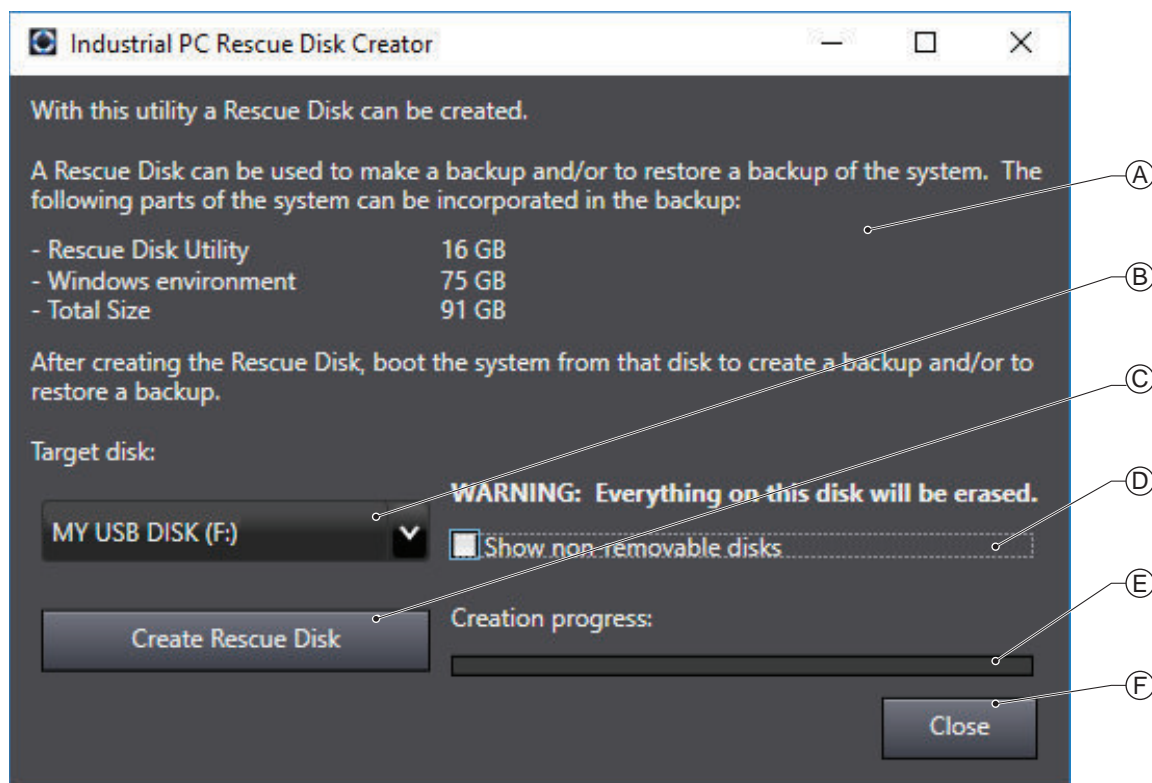
Item	Description	Details
A	Explanation area	Information about the utility and the backup. In the right bottom corner messages are displayed when applicable.
B	Target disk selection	Selection of the disk that will become the Rescue Disk.
C	Create Rescue Disk Button	Start the Rescue Disk creation.
D	Show non-removable disks	Check the box to display not only the removable storage devices but also the non-removable (internal) storage devices and USB Flash Drives and other USB storage devices.
E	Creation progress bar	Display the progress of the Rescue Disk creation.
F	Close Button	Close the Rescue Disk Creator.

> **Additional Information**
>
> - Refer to *Create a System Backup with the Rescue Disk* on page 7-7 for system backup details.
> - Refer to *Restore a System Backup with the Rescue Disk* on page 7-28 for system restore details.

Compatibility

This software utility can be used on the IPC but also on any other PC with one of the following operating systems:

• Windows 10
• Windows 7

Installation

The Rescue Disk Creator is preinstalled on the Industrial PC if it comes with a Windows operating system installed.

Use the following procedure to reinstall the Rescue Disk Creator:

1 Use Windows Explorer to open the Rescue Disk folder (This PC\Local Disk(C:)\Program Files (x86)\OMRON\Industrial PC\Rescue Disk).

2 Activate the installer file **setup.exe**.
A progress bar will visualize the extraction process and then a language selection window opens.

3 Select your language and then select **OK**.
The installer window opens.

4 Follow the installer steps to complete the Rescue Disk Creator installation.

The Rescue Disk Creator is installed and available in the OMRON folder in the Windows Start Menu.
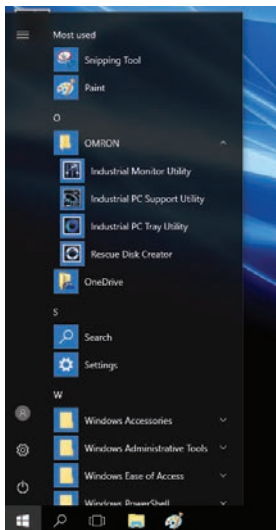
Startup

To manually start the Rescue Disk Creator:

1 Locate the Rescue Disk Creator using the Windows **Start** menu or the Windows search box.

2 Use the option **Run as administrator** to start the Rescue Disk Creator.

> **Additional Information**
>
> The procedure to use **Run as administrator** is:
> - For Windows 10 using the **Start** menu:
>   Rightclick the **Rescue Disk Creator**, select **More** and then **Run as administrator**.
> - For Windows 10 using **Search**:
>   Rightclick the **Rescue Disk Creator** in the search results and select **Run as administrator**.
> - For Windows 7 using the **Start** menu or **Search**:
>   Rightclick the **Rescue Disk Creator** and select **Run as administrator**.

3 Follow the on-screen instructions to complete the rescue disk.

Use a USB storage device with a capacity of at least the Windows partition size + 16 GB. The recommended minimum read/write speed is 190 MB/s.

A Rescue Disk is created by the Rescue Disk Creator.

Messages

The Rescue Disk Creator creates a rescue disk in two steps:

1. Format the target disk

2. Copy the rescue disk image to the target disk

Messages can inform the user of an error when applicable.

Refer to *Messages Creating the Rescue Disk* on page 3-14 for details.

Use the rescue disk to create a backup or restore your disk.

Messages can inform the user of a backup or restore error when applicable.

Refer to *Messages Using the Rescue Disk* on page 3-16 for details.

● **Messages Creating the Rescue Disk**

The Rescue Disk Creator can display the following messages:

Message type	Message	Description
Error	Creation progress: Failed to format the disk. Reason: • Access denied • Call canceled • Call cancellation request too late • Cluster size is beyond 32 bits • Cluster size is too large • Cluster size is too small • Incompatible media in drive • Invalid volume label • Input/Output (I/O) error • No media in drive • Unable to quick format • Unknown error • Unsupported file system • Volume lock failed • Volume is not mounted • Volume is too large • Volume is too small • Volume write protected	The mentioned reason prevented formatting of the connected storage device. Ensure the connected storage device: • Is not write protected or read-only • Has a cluster size too small or more than the maximum 32 bits • Has a valid volume label • Has sufficient storage capacity to store the rescue disk utility and a full system backup
Error	Creation progress: Failed to copy image to rescue disk. Reason: • Unable to revoke access to the disk • Unable to revoke access to the drive • Disk write failed • Unable to dismount the drive • Invalid drive • Unable to obtain exclusive access to the drive • The disk could not be accessed • The drive could not be accessed • Unable to revoke exclusive access to the drive	The mentioned reason prevented copying the image to the connected storage device. Ensure the connected storage device: • Is not used by other programs • Is not write protected or read-only

To solve an error:

1. Check that the correct target disk was selected.

2. Check that the target disk has sufficient storage capacity to store the rescue disk utility and a full system backup

3. If the storage device is removable, check that it is inserted properly and is of the correct type.

4. Check whether the storage device is write protected. SD Memory Cards often have a small mechanical write protection switch on them.

5. Check that the user has the necessary access rights for the target disk.

6. Check that the Rescue Disk Creator is running "As Administrator".

7. Check that no other applications are using the target disk.

8. Retry the operation with the same target disk.

9. Retry the operation with a different target disk.

10. Restart the IPC and then retry the operation.

11. If the issue persists, contact your OMRON representative.

● **Messages Using the Rescue Disk**

Using the Rescue Disk the rescue disk utility can display the following error messages:

Error ID	Message
10	Backup creation of [*1]partition failed. Please try again or contact an Omron service representative if the problem persists
11	Restore action of [*1]partition failed. Please try again or contact an Omron service representative if the problem persists
12	Cannot allocate the partition for storing backup data. There may be a problem with the target USB device. Create the Rescue Disk utility on another USB device and try again
13	Cannot create a partition for storing backup data. There may be a problem with the target USB device. Create the Rescue Disk utility on another USB device and try again
14	The partition for storing backup data cannot be identified. There may be a problem with the target USB device. Create the Rescue Disk utility on another USB device and try again
15	The partition for storing backup data cannot be prepared for use. There may be a problem with the target USB device. Create the Rescue Disk utility on another USB device and try again
16	Unable to identify an Omron Industrial PC. Power cycle the system using the power connector, then try again
17	Unable to identify an Omron Industrial PC. Power cycle the system using the power connector, then try again
18	Backup creation of [*1]partition failed. Please try again or contact an Omron service representative if the problem persists
19	Restore action of [*1]partition failed. Please try again or contact an Omron service representative if the problem persists
20	Cannot mount the partition for storing backup data. There may be a problem with the target USB device. Create the Rescue Disk utility on another USB device and try again
21	Failed creating [*1]partition verification files. Please try again or contact an Omron service representative if the problem persists
22	Failed to verify [*1]partition backup files. Please try again or contact an Omron service representative if the problem persists
23	Cannot create a backup. An Omron NY-series Industrial PC has not been detected. Please contact an Omron service representative
24	Cannot restore the backup. An Omron NY-series Industrial PC has not been detected. Please contact an Omron service representative
25	Cannot find a destination device. Please ensure that there is an SSD or HDD inserted in the IPC
26	Cannot find the Rescue Disk medium. Please ensure the Rescue Disk USB device is connected to the Industrial PC, then restart the system and try again
27	Cannot mount Windows partition. Please ensure that you have a functional Windows system before creating a backup
28	Cannot restore. The backup of the Boot partition is corrupted
29	Cannot deploy OSB due to an invalid Boot partition. Please perform a restore operation of the complete MBR and Boot partition and try again
30	OSB deployment was unsuccessful. Please restart the Rescue Disk utility and try again
31	Multiple Rescue Disk media detected. Ensure there is only a single Rescue Disk USB device connected to the Industrial PC, then reboot the system and try again
32	Cannot create backup records data due to missing OSB data
33	Cannot create backup records due to missing NX data
34	Cannot create backup records due to a missing Boot partition

Error ID	Message
35	Cannot find a source device. Please ensure that there is an SSD or HDD inserted in the IPC
36	Multiple disks detected with the same partition layout. Please ensure there is only one SSD or HDD inserted in the IPC to restore the backup
37	Multiple source devices detected. To backup the correct disk, please ensure that there is only one SSD or HDD inserted in the IPC
38	Unable to create a partition in the AI database disk
39	AI database disk creation (partitioning and formatting) failed
40	Unable to identify a suitable disk to format as AI database disk. Please ensure there is one SSD or HDD that has no Windows OS
41	Multiple disks detected suitable to format as AI database disk. Please ensure there is only one SSD or HDD that has no Windows OS
42	Unable to identify any Windows disk. Please ensure that a Windows disk is inserted in the IPC
43	Multiple Windows disks detected. Please ensure that there is only one Windows disk inserted in the IPC

*1.   The partition name will be indicated. Examples are 'Boot partition' or 'Master Boot Record' .

3-3-5 Industrial PC Tray Utility

This section provides an overview of the Industrial PC Tray Utility.

Industrial PC Tray Utility Overview

The Industrial PC Tray Utility is a software utility that provides information about the current state of the Industrial PC, its related devices, and associated software.

When running, the Industrial PC Tray Utility is always present as a status icon Ⓐ in the system tray area Ⓑ of Windows.
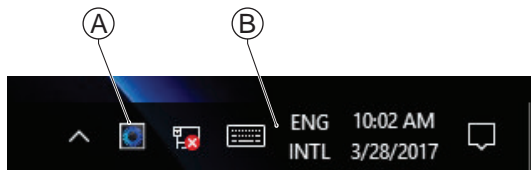
Windows 10

Features

The Industrial PC Tray Utility provides the following features:
- Display the overall state of all installed OMRON utilities in the icon in the system tray area.
- Display a menu that can start all installed utilities and show the state of each installed utility.
- Display notification messages in popup windows that inform the user about the state of applications or hardware. The Industrial PC Tray Utility displays the messages provided by installed OMRON utilities. Refer to the OMRON utilities information for the messages that can be displayed.
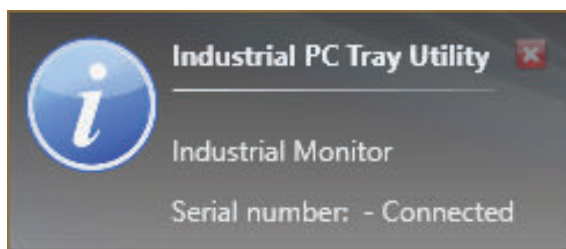
Menu

Select the Industrial PC Tray Utility icon Ⓕ to display the menu.
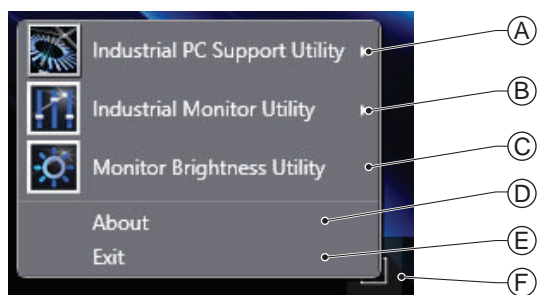
- The application displays the available utilities.
  - Select an entry to launch the associated utility, if applicable.

- The icons of menu items in the Industrial PC Tray Utility menu will have a warning or error symbol when applicable.
- The Industrial PC Support Utility Ⓐ is available in the menu when installed.
- The Industrial Monitor Utility Ⓑ is available in the menu when installed.
- The Industrial Monitor Brightness Utility Ⓒ is available in the menu when installed.
- The application area can be configured to show and launch both OMRON and third party utilities.
- The **About** entry Ⓓ shows details of the Industrial PC Tray Utility.
  Refer to *About the Industrial PC Tray Utility* on page 3-19 for details.
- The **Exit** entry Ⓔ closes the utility.

About the Industrial PC Tray Utility

The About window shows the version of the Industrial PC Tray Utility and copyright information.
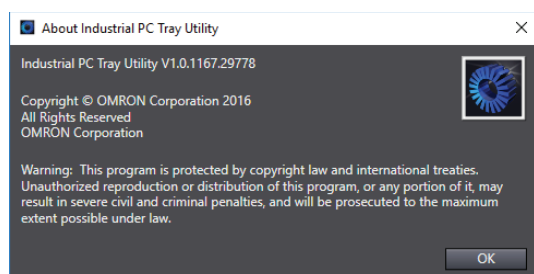
Status Indicators on Icons

The following table provides the indicator details of the Industrial PC Tray Utility.

Overlay type	Icon	Description
None		No OMRON utility has issued warning or error notifications.
Warning sign		At least one OMRON utility has issued a warning notification.
Error sign		At least one OMRON utility has issued an error notification.

Installation

The Industrial PC Tray Utility is pre-installed on the Industrial PC if it comes with a Windows operating system installed.
The Industrial PC Tray Utility is included in the installers of the Industrial PC Support Utility and Industrial Monitor Utility. Install the Industrial PC Support Utility or Industrial Monitor Utility to install the Industrial PC Tray Utility.

Compatibility

This software utility can be used on the IPC but also on any other PC with one of the following operating systems:

- Windows 10
- Windows 7

Startup

By default the Industrial PC Tray Utility is configured to start automatically at Windows startup.

To manually start the Industrial PC Tray Utility:

1 Locate the Industrial PC Tray Utility using the Windows **Start** menu or the Windows search box.

2 Use the option **Run as administrator** to activate the Industrial PC Tray Utility.

📝 **Additional Information**

The procedure to use **Run as administrator** is:
- For Windows 10 using the **Start** menu:
  Rightclick the Industrial PC Tray Utility, select **More** and then **Run as administrator**.
- For Windows 10 using **Search**:
  Rightclick the Industrial PC Tray Utility in the search results and select **Run as administrator**.
- For Windows 7 using the **Start** menu or **Search**:
  Rightclick the Industrial PC Tray Utility and select **Run as administrator**.

The Industrial PC Tray Utility started.

3-3-6 Power Attendant Lite Utility

This section provides an overview of the Power Attendant Lite Utility (PAL).

Power Attendant Lite Utility Overview

The Power Attendant Lite Utility is a software utility that constantly monitors the status of the UPS that is connected to the IPC.
When the Power Attendant Lite Utility discovers a power interruption it will send a signal to the IPC to shut down.
Refer to the *UPS Power Attendant Lite for Windows User's Manual* for details.

Features

The Power Attendant Lite Utility provides the following features:
• Signal the IPC to shut down when a power interruption is detected.
• Configure the shutdown conditions when a power interruption is detected.
• Display the state of the connected UPS using the icon in the system tray area.

Icon	Description
	Normal operation
	Power Attendant Lite service stopped
	UPS is supplying power from the internal battery
	Communication error

Compatibility

This software utility can be used on the IPC but also on any other PC with one of the following operating systems:
• Windows 10
• Windows 7

Installation

The Power Attendant Lite Utility is not pre-installed on a IPC.
The Power Attendant Lite Utility installer is included in the installers directory (D:\OMRON-NY\Installers). Download the installer from the OMRON website if required.

To install the Power Attendant Lite Utility:

1 Ensure the revision number of the UPS is correct.
Refer to the Hardware Manual for details.

2 Ensure the UPS is connected to the IPC with a USB cable.

3 Open the Power Attendant Lite Utility installer folder and activate the installer file **setup.exe**.

4 Follow the installer steps to complete the installation.
The Power Attendant Lite Utility is installed.

Configuration

Configure the Power Attendant Lite Utility before using the IPC with a UPS connected using USB.

To configure the Power Attendant Lite Utility:

1 Activate the icon of the Power Attendant Lite Utility to start the software.
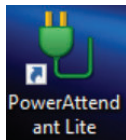
A UPS selection window will be displayed.

2 Select the connected UPS.
A Login window will be displayed.

3 Login with ID **Admin** and password **omron**.
The Top window with UPS status information will be displayed.
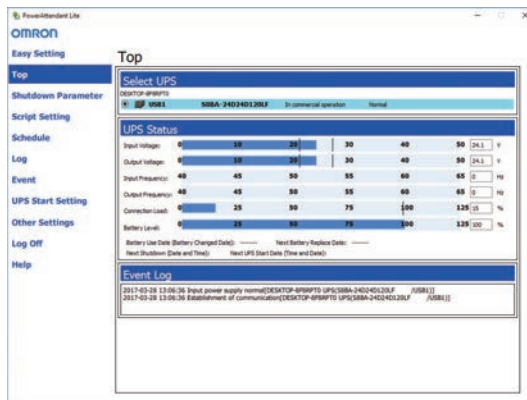
4 Configure the parameters for your specific situation.
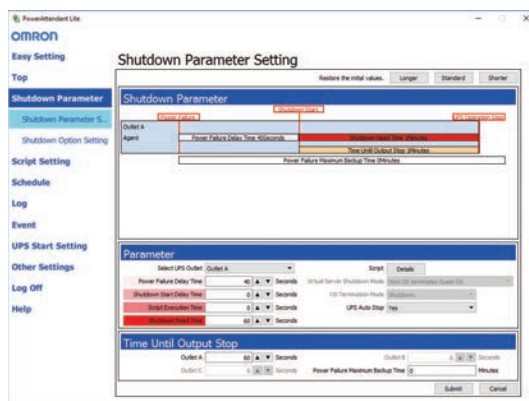
Refer to *UPS Power Attendant Lite for Windows User's Manual* for details.

5 Select **Detailed Setting / Other Settings / Communication Setting / UPS Communication Port** to display the parameter **COM search to UPS detection**.

6 Set the parameter to **Do not search for COM ports** to prevent interference for the COM ports.

7 Select **Submit** to save the setting.

8 Select the close button in the right top corner to exit the Power Attendant Lite Utility software.

9 Select the restart behavior of the IPC with the BIOS Boot Menu parameter **Power Loss Control**.
Set this parameter to **Turn On** to restart automatically after a power down from the Power Attendant Lite Utility.

10 Test the UPS shutdown behavior.

1) Start the IPC

2) Start applications

3) Create a power interruption

4) Monitor the shutdown sequence and confirm a correct shutdown
When the shutdown sequence is not correct change parameters in the Power Attendant Lite Utility software and test the UPS shutdown behavior again.

The Power Attendant Lite Utility is configured.
The IPC will shut down properly in case of a power supply interruption and restart automatically when the power is restored.

4

Specifications

This section provides specifications of the IPC Application Controller.

4-1 General Specifications

This section provides general specifications of the IPC Application Controller.

4-1-1 Dimensions and Weight

The following table provides specification details on dimensions and weights.
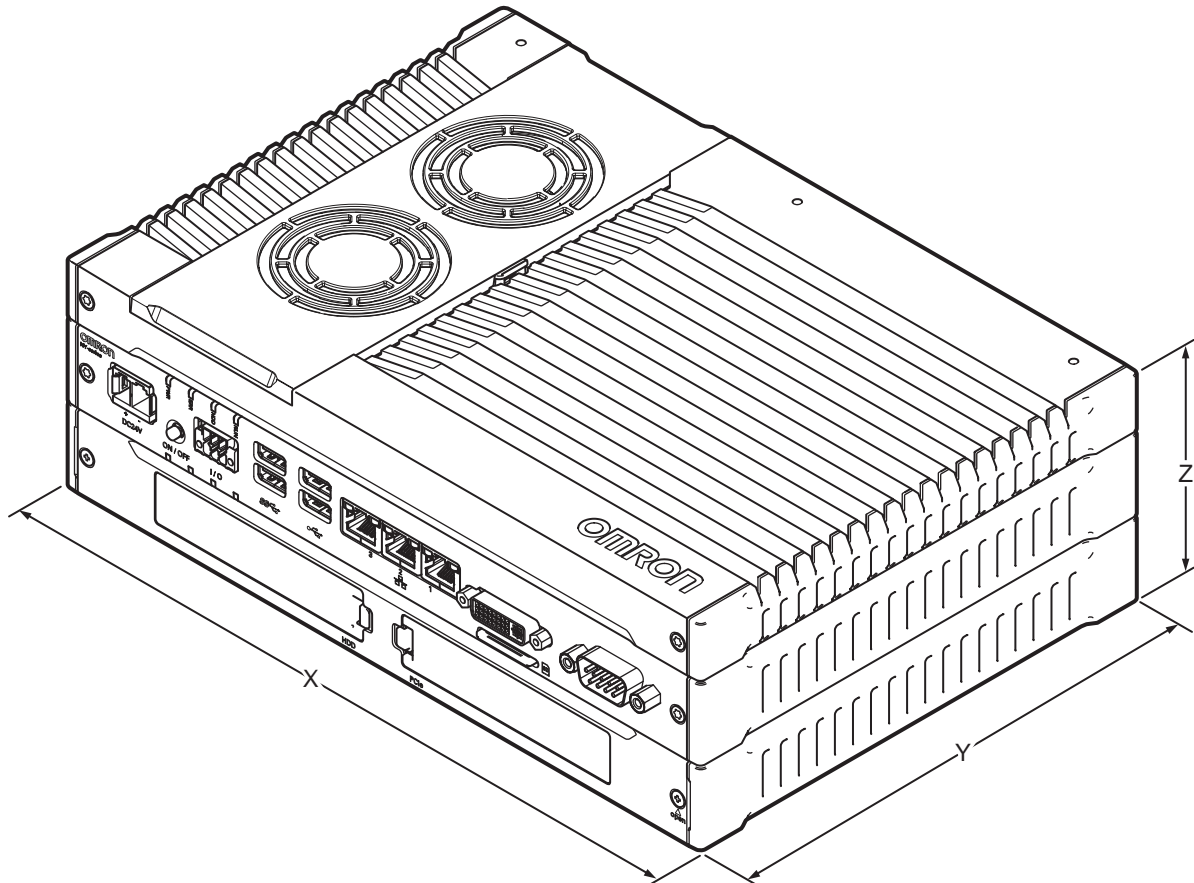
Model			Specifications			
Model ID [1] [2]	Model details	Mount details	Width X	Depth Y [3]	Height Z	Weight
• AC1-152000	• With Expansion layer • With Cooling layer with re-movable cover	Not mounted	282 mm	200 mm	89 mm	3.8 kg
		Book mount	319 mm [4]	211 mm	96 mm [4]	4.2 kg
		Wall mount	282 mm	245 mm [4]	92 mm	3.9 kg

*1.   Refer to *1-4 Product Configuration* on page 1-5 for product configuration details.
*2.   Refer to *1-3 ID Information Label Application Controller* on page 1-4 for label details. Refer to *2-1-2 Base Layer* on page 2-4 for label location details.
*3.   This includes the 5 mm of the protruding DVI connector.
*4.   This is the mounting bracket dimension.

4-1-2 General Electrical Specifications

The following table provides the general electrical specifications.

Item	Specifications
Rated power supply voltage	24 VDC
Allowable power supply voltage range	20.4 to 28.8 VDC
Power supply standard	SELV
Grounding method	Ground to less than 100 Ω
Inrush current	At 24 VDC: 12 A / 6 ms max. for cold start at room temperature
Overvoltage category	JIS B3502 and IEC 61131-2: Category II
EMC immunity level	IEC 61131-2: Zone B
RTC accuracy	At ambient temperature of 55°C: −3.5 to +0.5 min error per month At ambient temperature of 25°C: −1.5 to +1.5 min error per month At ambient temperature of 0°C: −3 to +1 min error per month
Power button life	100,000 operations
Fan life	Only for models with active cooling: 8 years of continuous operation at 40°C. Refer to *1-4 Product Configuration* on page 1-5 for details.
Battery life	Refer to *2-8-1 Battery* on page 2-16 for details.

4-1-3 Power Consumption Specifications

The total power consumption for the IPC is the sum of the power consumption of all installed components.

Refer to *1-4 Product Configuration* on page 1-5 for product configuration details.

The following tables provide an overview of the components and their power consumption.

The IPC

Model ID	Power consumption
AC1-152000	71 W

Installed drives

Drives	Power consumption
Bay A	Refer to *4-1-7 Storage Device Specifications* on page 4-7 for Omron drive details. For other drives refer to the applicable specifications for maximum power consumption details.
Bay B	

Connected expansions

Expansions	Power consumption
USB	Refer to the power consumption specifications of your connected USB devices. Refer to *4-2-3 USB Connector Specifications* on page 4-16 for maximum power consumption details.
PCIe	Refer to the power consumption specifications of the installed PCIe Card. Refer to *4-2-7 PCIe PoE Connectors Specifications* on page 4-21 for maximum power consumption details.

Calculation for the total power consumption:

IPC Application Controller with my specific model-ID	…...…….. W
Depending on the configuration:	
• Drive in bay A	…...…….. W
• Drive in bay B	…...…….. W
• Expansion USB	…...…….. W
• Expansion PCIe	…...…….. W +
	_____
Total power consumption	…...…….. W

> **Additional Information**
>
> Ensure to use a power supply with sufficient capacity.
> Refer to *4-1-4 Power Supply Specifications* on page 4-5 for details.

4-1-4　Power Supply Specifications

The minimum power supply requirements depend on the maximum power consumption of the IPC. Refer to *4-1-3 Power Consumption Specifications* on page 4-4 for details.

With a UPS installed the minimum power requirements are:

Model	Minimum power requirements	
	Power supply [1]	UPS [2]
• AC1-152000	240 W	120 W

[1]. Refer to *2-9-8 Power Supply* on page 2-22 for power supply products.

[2]. Refer to *2-9-9 UPS* on page 2-23 for UPS products.

4-1-5 CPU Specifications

This section gives the specifications of the CPUs that are available for the IPC Application Controller.
Refer to *1-4 Product Configuration* on page 1-5 for product configuration details.

Intel Core i5-7440EQ CPU Specifications

CPU specifications for an Intel Core i5-7440EQ CPU.

Item	Specifications
Cores / Threads	4 / 4
CPU base frequency	2.9 GHz
Maximum turbo frequency	3.6 GHz
Cache	6 MB
Cooling details	Requires active cooling (fan)
Graphics controller	Intel ® HD Graphics 630
DDR type	DDR4-2400, Non-ECC

4-1-6 Memory Specifications

This section provides the memory specifications of the IPC Application Controller.

DDR4 Non-ECC

The following table provides specification details of the DDR4 memory.

Item		Model Specifications [1]			
		4 GB	8 GB	16 GB	32 GB
Memory configuration		1 x 4 GB	2 x 4 GB	2 x 8 GB	2 x 16 GB
Memory type		DDR4 Non-ECC			
Package memory format		SO-DIMM			
Serial Presence Detect (SPD)	Speed grade [2]	2400 MT/s			
	CAS Latency	CL17			

*1. The applicable type of memory is determined by the CPU type.
Refer to *4-1-5 CPU Specifications* on page 4-6 for CPU details.
Refer to *1-4 Product Configuration* on page 1-5 for product configuration details.
*2. The actual speed depends on the CPU type.

4-1-7   Storage Device Specifications

This section provides the specifications of the storage devices.

Hard Disk Drive Specifications

Specifications for the Hard Disk Drive (HDD) are provided in the table below.

Item	Model Specifications		
	320 GB [1]	**500 GB** [1]	**1 TB** [1]
Model [2]	NY000-AH00	NY000-AH01	NY000-AH02
Power consumption	2 W max.		
S.M.A.R.T. support	Yes		
Rotation speed	5,400 r/min		
Interface	Serial ATA 3.0		
Operating temperature	5 to 55°C [3]		0 to 60°C [3]
Operating humidity (with no condensation)	• 8 to 90% RH • 29°C wet-bulb temperature max.		
Storage temperature	-40 to 65°C		
Storage humidity (with no condensation)	• 8 to 90% RH • 40°C wet-bulb temperature max.		• 5 to 95% RH • 40°C wet-bulb temperature max.
Endurance	Approximately 5 years or 20,000 powered-ON hours (whichever comes first) under the following conditions: • 25°C at 101.3 kPa • Less than 333 powered-ON hours/month[4] • Less than 20% operation while powered-ON[5] • Less than 1.30×10^6 seeks/month		Average Annualized Failure Rate (AFR): 0.50% under the following conditions: • Case Temperature 40°C • Power on Hours (POH) ≤ 3120

*1.   Refer to *1-4 Product Configuration* on page 1-5 for product configuration details.

*2.   Refer to *2-9-4 HDD and SSD Storage Devices* on page 2-20 for brand details.

*3.   Refer to *4-4-1 Operation Environment Specifications* on page 4-23 for the temperature specifications of the complete IPC

*4.   Powered-ON hours include sleep and standby modes.

*5.   Operation includes seeking, writing, and reading functions.

Solid State Drive Specifications

Specifications for the Solid State Drive (SSD) are provided in the table below.

Item	Model Specifications					
	32 GB *1	64 GB *1		128 GB *1		500 GB *1
Model *2	NY000-AS00	NY000-AS01	NY000-AS03	NY000-AS06	NY000-AS04	NY000-AS05
Type	SLC			pSLC	iMLC	
Max. power consumption	1.4 W	1.4 W	2.5 W	0.8W	0.8 W	2.7 W
S.M.A.R.T. support	Yes					
Interface	Serial ATA 3.1					
Max. sequential read speed	160 MB/s	160 MB/s	500 MB/s	530 MB/s	530 MB/s	415 MB/s
Max. sequential write speed	145 MB/s	150 MB/s	370 MB/s	380 MB/s	190 MB/s	200 MB/s
Operating temperature	0 to 70°C *3					
Max. operating humidity (with no condensation)	10 to 95% RH	10 to 95% RH	10 to 85% RH	10 to 95% RH	10 to 95% RH	10 to 95% RH
Storage temperature	-40 to 100°C	-40 to 100°C	-45 to 90°C	-55 to 95°C	-55 to 95°C	-55 to 95°C
Max. storage humidity (with no condensation)	10 to 95% RH					
Endurance	749 TBW	1497 TBW	1900 TBW	1389 TBW	208 TBW	154 TBW

*1.   Refer to *1-4 Product Configuration* on page 1-5 for product configuration details.

*2.   Refer to *2-9-4 HDD and SSD Storage Devices* on page 2-20 for brand details.

*3.   Refer to *4-4-1 Operation Environment Specifications* on page 4-23 for the temperature specifications of the complete IPC.

4-1-8   Bracket Specifications

The metal mounting brackets mount your IPC and they are the connection for the functional ground. Refer to *5-3-2 Product Orientation* on page 5-10 for allowed book mount and allowed wall mount product orientations.

Book mount brackets

Dimensions
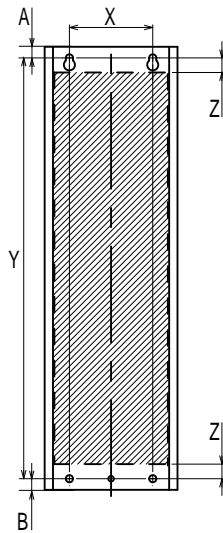
Examples of book mount brackets
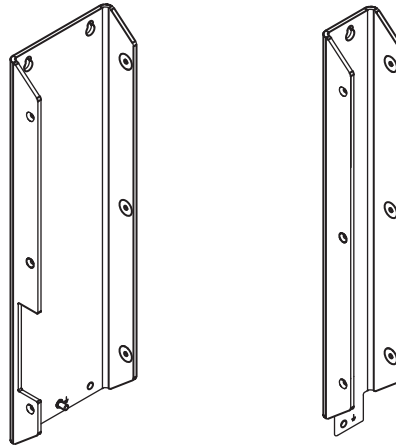
📒 **Additional Information**

*   Refer to *2-9-1 Mounting Brackets* on page 2-18 for bracket IDs.
*   Refer to *5-3-8 Book Mount Procedure* on page 5-19 for book mount details.

Bracket Details	Drill Specifications			Product Dimensions			
Bracket ID	Hole Distance X	Hole Distance Y	Distance Z	Bracket Width	Bracket Height	Top to hole A	Hole to bottom B
NY000-AB00	60 mm	303 mm	11 mm	96 mm	319 mm	8 mm	8 mm

Wall mount brackets
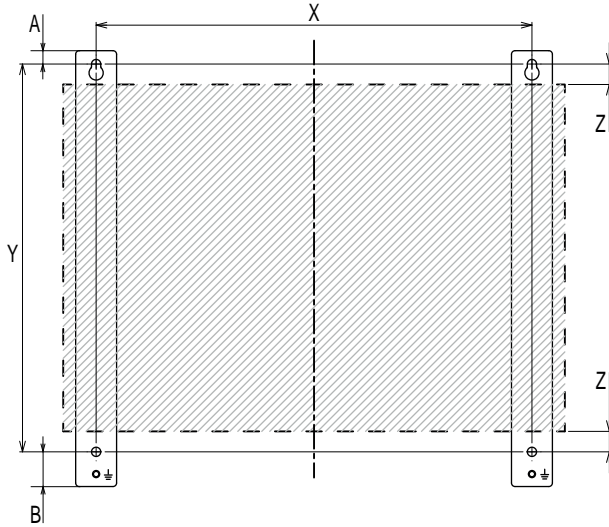
Dimensions   Appearance of wall mount brackets
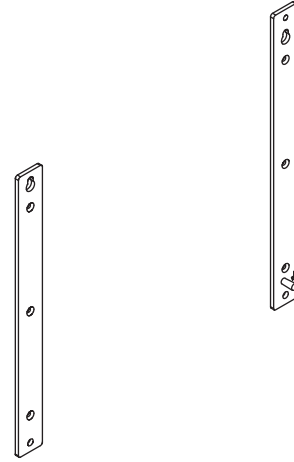
📝 **Additional Information**

- Refer to *2-9-1 Mounting Brackets* on page 2-18 for bracket IDs.
- Refer to *5-3-9 Wall Mount Procedure* on page 5-20 for wall mount details.

Bracket Details	Drill Specifications			Product Dimensions			
Bracket ID	Hole Distance X	Hole Distance Y	Distance Z	Bracket Width	Bracket Height	Top to hole A	Hole to bottom B
NY000-AB01	245 mm	218 mm	12 mm	23 mm	245 mm	7.5 mm	19.5 mm

4-2 Connector Specifications

This section provides the Connector Specifications of the IPC Application Controller.

4-2-1 Power Connector Specifications

The power supply connector is locked when inserted to prevent unintentional disconnection.
The connector can only be inserted the correct way.
The connector is a Phoenix Contact type SPC5/2-STCL-7.62 BK (1711708).
The IPC provides protection against reverse polarity.
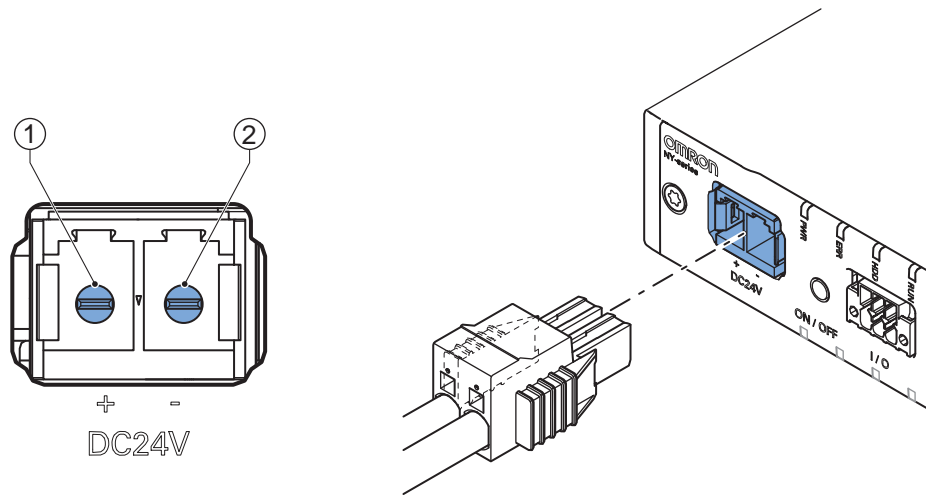
The pin layout represents the power connector on the IPC.

Pin	Description
1	24 VDC
2	0 VDC

Item	Specifications
Conductor isolation rating	90°C
Termination rating	90°C

> **Additional Information**
>
> • Refer to *5-4-3 Wire the Power Connector* on page 5-28 for wiring details.
> • Refer to *5-4-2 Ground* on page 5-21 for grounding details.

Locking and Removing the Power Connector

The power connector automatically locks into place when the black part of the connector is held and pushed in.
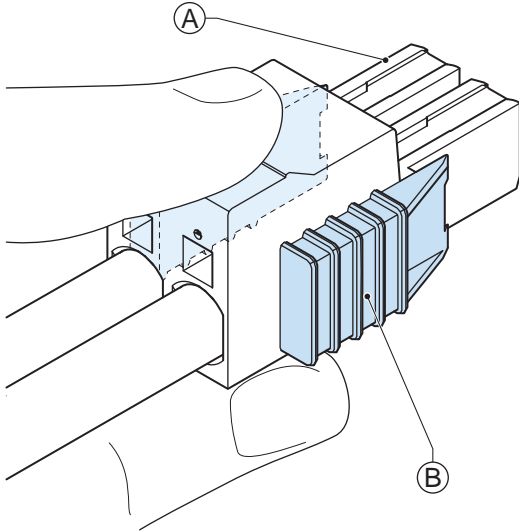
Pushing both orange sliders Ⓑ towards the end of the connector Ⓐ will release the lock when removing the connector.

4-2-2 I/O Connector Specifications

Details of the I/O connector are provided below.
The I/O connector is locked when inserted to prevent unintentional disconnection.
The connector can only be inserted in the correct way.
The Lock-and-Release Latch connector is a Phoenix Contact type DFMC 1,5/ 3-ST-3,5-LR BK (1711658).
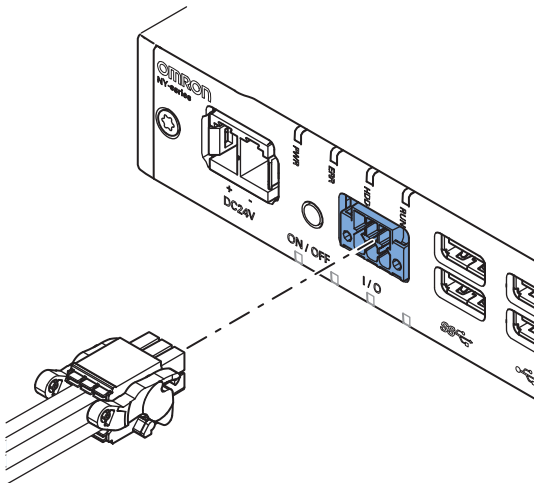
Item	Specifications
Conductor isolation rating	90°C
Termination rating	90°C

I/O Connector Pin Details

The pin details of the I/O connector.
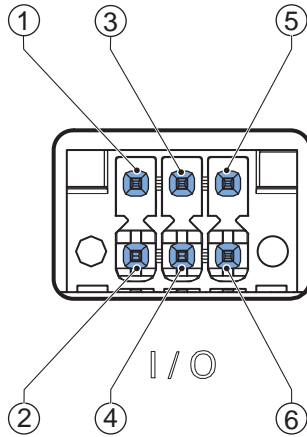
The pin layout represents the I/O connector on the IPC.

The I/O signals connected must be powered from a power supply which conforms to the SELV standards.

Pin details of the I/O Connector:

Pin	Description	Type	Electrical Specifications	Details
1 2	Power Status Output *1	Contact output	• SPST-NO contact configuration • 24 VDC at 2A switching capacity (resistive load) • Operation lifetime 150,000 cycles at 2A max. • Connect to SELV	• Open: The Power Status Output is OFF when the IPC is OFF or has been disconnected from the power supply. • Closed: The Power Status Output is ON when the IPC has shutdown successfully and is connected to the power supply and has not been disconnected from that power supply since power OFF. Refer to *I/O Connector Power Status Output Details* on page 4-14 for details.
3 4	Power ON/OFF Input *2	Isolated transistor input (sinking or sourcing)	• ON: 8.8 VDC min./5 mA min. • OFF: 1.1 VDC max./0.5 mA max. • Connect to SELV	If the signal changes from inactive to active, the IPC will perform one of the following operations. • When powered ON, the IPC will shut down and power OFF. • When powered OFF, the IPC will power ON.
5 6	UPS Mode Input			This input is provided to allow monitoring the state of an external UPS unit that provides a compatible power state output signal.

*1. Refer to *I/O Connector Power Status Output Details* on page 4-14 for Power Status Output details.

*2. Refer to *6-1 Power ON* on page 6-2 and *6-2 Power OFF* on page 6-3 for Power ON/OFF Input details.

Additional Information

Refer to *5-4-4 Wire the I/O Connector* on page 5-31 for I/O connector wiring details.

I/O Connector Power Status Output Details

This section provides details of the Power Status Output relay.
The Power Status Output is a relay between pin 1 and 2 of the I/O Connector.

● Power ON Power Status Output Operation

This section provides power ON details of the Power Status Output operation.
The Power Status Output turns ON to indicate that the system has been shut down and the power supply to the IPC can be turned OFF.
If power is not turned OFF, the Power Status output will turn OFF when the IPC is turned ON.

The Power Status Output is ON Ⓐ when the IPC has been used and has not been disconnected from the power supply.

The Power Status Output is OFF Ⓑ when the IPC has been disconnected from the power supply.
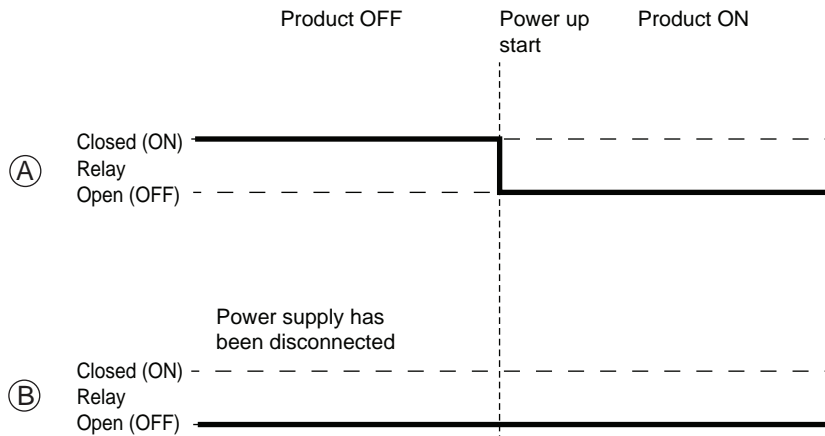
Additional Information

Refer to *5-4-4 Wire the I/O Connector* on page 5-31 for I/O connector wiring details.

● Power OFF Power Status Output Operation

This section provides power OFF details of the Power Status Output operation.
The Power Status Output turns ON to indicate that the system has been shut down and the power supply to the IPC can be turned OFF.

If power is not turned OFF, the Power Status output will stay ON Ⓐ. It will turn OFF when the IPC is turned ON.

If power is turned OFF, the Power Status Output will turn OFF Ⓑ.
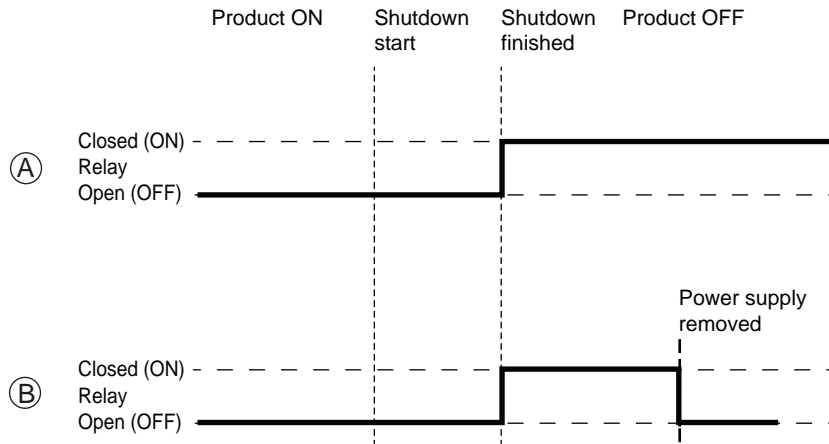
Product ON   Shutdown   Shutdown   Product OFF
              start   finished

(A)   Closed (ON)
      Relay
      Open (OFF)

      Power supply
      removed

(B)   Closed (ON)
      Relay
      Open (OFF)

📓 **Additional Information**

Refer to *5-4-4 Wire the I/O Connector* on page 5-31 for I/O connector wiring details.

Lock and Remove the I/O Connector

The I/O connector locks into place when the black part of the connector is held and pushed in.
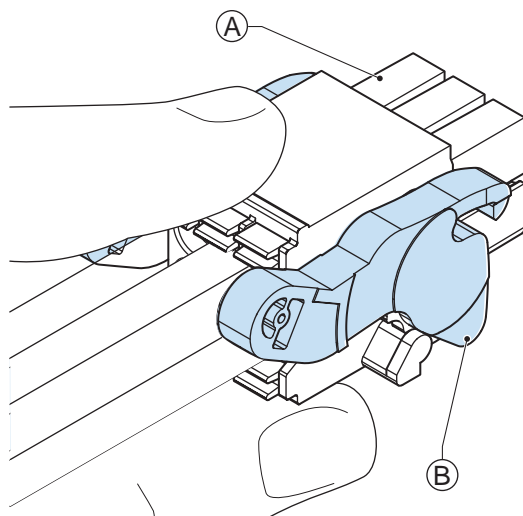
Tilting both levers Ⓑ will release the I/O connector Ⓐ from the IPC.

4-2-3   USB Connector Specifications

The IPC Application Controller includes four USB connectors. Two connectors provide version 2.0 performance and two connectors provide version 3.0 performance. Details of the USB interface connectors are provided below.
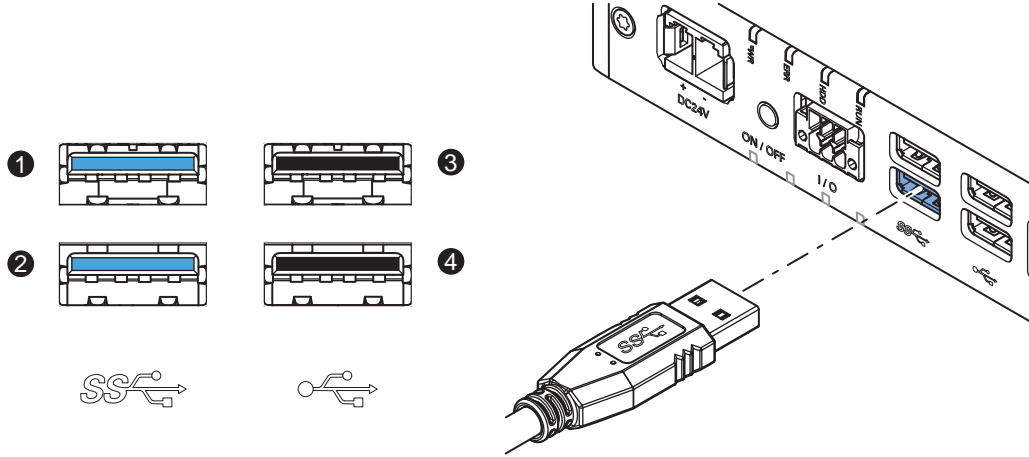
The connector layout represents the USB connectors on the IPC.

Interface Connector	Details per Connector
1 2	• USB 3.0 • 900 mA maximum current at 5 VDC equals 4.5 W maximum power consumption [1] • 3 m maximum cable length • Blue color
3 4	• USB 2.0 • 500 mA maximum current at 5 VDC equals 2.5 W maximum power consumption [1] • 5 m maximum cable length • Black color

*1.   The total power consumption for the USB Connectors is 14 W max. (2 x 4.5 + 2 x 2.5)

Additional Information

• Refer to *5-4-2 Ground* on page 5-21 for grounding details.
• Note that the read/write speed of the connected USB device determines the actual data transfer speed. Use a fast USB device to reduce data transfer durations.

4-2-4   Ethernet Connector Specifications

Details of the RJ45 Ethernet connectors are provided below.
The Ethernet connector locks automatically to prevent unintentional disconnection.
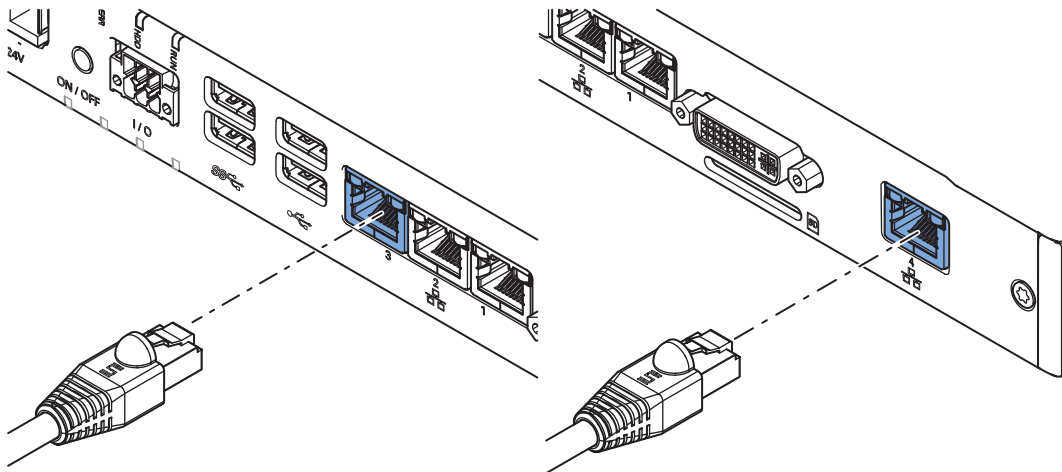
The set of 3 RJ45 Ethernet connectors is available on all models, the single connector is optional.

Ethernet Connector Specification Details

Details of the RJ45 Ethernet connectors are provided below.

Item	Specifications
Number of available ports	3 1 extra port is optional
Physical layer	10BASE-T, 100BASE-TX or 1000BASE-T
Frame length	1,514 bytes max.
Media access method	CSMA/CD
Modulation	Baseband
Topology	Star
Transmission media	STP (shielded, twisted pair) cable of Ethernet category 5,5e or higher
Maximum transmission distance between Ethernet switch and node	100 m
Maximum number of cascade connections	There are no restrictions if an Ethernet switch is used

Ethernet Connector LED Indicators

Details of the RJ45 Ethernet connectors are provided below.

Each connector has LED indicators for speed, link and activity.
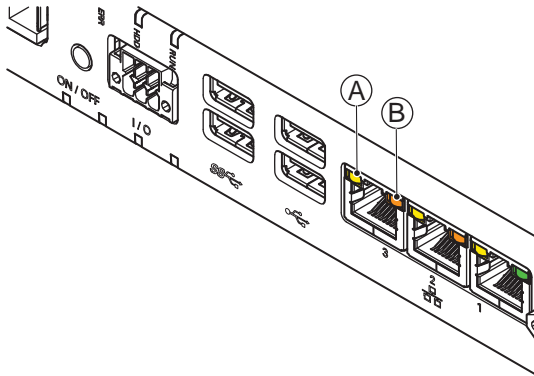
Item	Indicator	Color		Status	Description
A	Link/Act	Yellow	□	Not lit	No link
			▨	Lit	Link
			▨	Flashing	Link and activity
B	Speed	Not lit	□	Not lit	10 Mbps or no link
		Green	■	Lit	100 Mbps link
		Orange	■	Lit	1 Gbps link

4-2-5 DVI Connector Specifications

DVI is the standard video interface for the IPC.
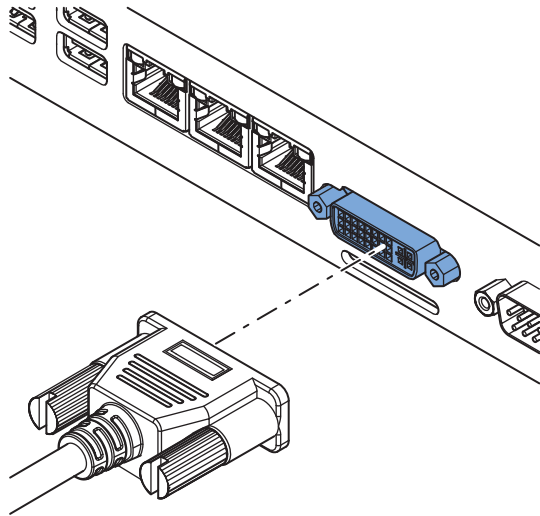
📝 **Additional Information**

- Refer to *4-1-5 CPU Specifications* on page 4-6 for graphics controller details.
- Refer to *5-4-2 Ground* on page 5-21 for grounding details.
- Refer to *A-4 DVI Connector Pin Details* on page A-9 for pin details.

The DVI Card specifications depend on the CPU and thus on the product configuration.

Item	Specifications
Video interface NY☐45	Digital or Analog
Resolution	Up to 1920 x 1200 pixels at 60 Hz
Type	Dual link
Maximum DVI cable length	Dependent upon connected monitor type and resolution

4-2-6   RS-232C Connector Specifications

The optional RS-232C interface on the IPC uses a standard SUBD9 connector.

The RS-232C interface is not isolated from the internal IPC's components.
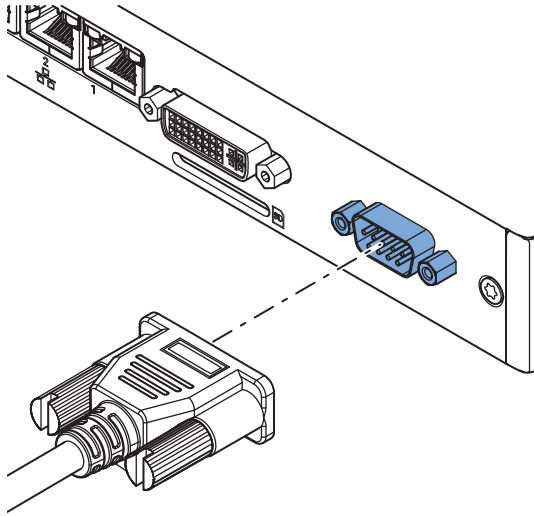
> 📑 **Additional Information**
>
> • Refer to *5-4-2 Ground* on page 5-21 for grounding details.
> • Refer to *A-3 RS-232C Connector Pin Details* on page A-8 for pin details.

4-2-7 PCIe PoE Connectors Specifications

The PCI Express (PCIe) Card slot contains a pre-installed PCIe PoE Card with 4 connectors.
The ports offers 10BASE-T/100BASE-TX/1000BASE-T Ethernet speeds.
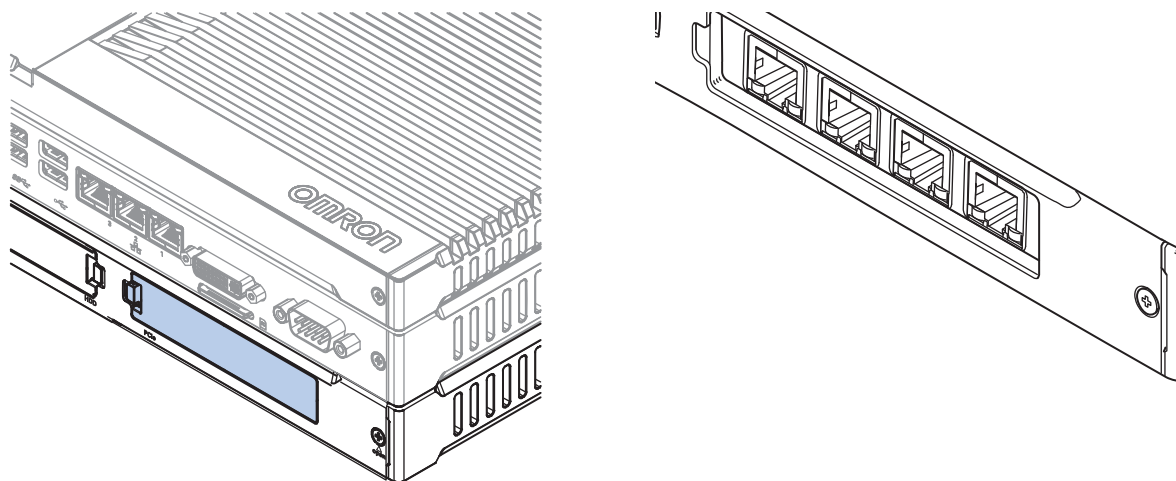
> 📑 **Additional Information**
>
> • The PCIe PoE card is pre-installed, for replacement contact your local OMRON representative.
> • Refer to *Ethernet Connector LED Indicators* on page 4-18 for LED details.
> • Refer to *5-5 Connect* on page 5-34 for connection details.

PCIe Card Specifications for AC1-152000

The table below provides PCIe PoE Card slot details for IPC Application Controllers with an Intel Core i5-7440EQ CPU.

Item		Specifications
Number of available ports		4
Physical layer		10BASE-T, 100BASE-TX or 1000BASE-T
PoE Standard		• IEEE 802.3af
		• IEEE 802.3at [*2]
Configuration		X4 (4 lanes) up to Gen 2
Power consumption	PCIe PoE Card	11 W max. [*1]
	Per PoE port	3 W max. [*1][*2]

*1.   The total power consumption for the PCIe Connectors is 23 W max. (11 W + 4 x 3 W)

*2.   The output power specification is limited to 3 W and does not comply with IEEE standard 802.3a f/t.

4-3 Software Specifications

This section provides the Software Specifications of the IPC Application Controller.

4-3-1 Available Windows Operating Systems

The CPU type determines what Windows Operating Systems are available.
The CPU type is part of the model-ID.
Refer to *1-4 Product Configuration* on page 1-5 for model-ID details.

Model	Windows Operating System	Edition	Remark
• NY□2A	Windows 10	Windows 10 IoT Enterprise 2019 LTSC - 64 bit	The Long-term Servicing Channel of Windows is primarily for specialized devices. The LTSC of Windows excludes most of the bundled applications, including Microsoft Edge. Note: In the software the name LTSB might still be displayed.
• NY□45	Windows 10	Windows 10 IoT Enterprise 2016 LTSB - 64 bit	The Long-term Service Branch of Windows is primarily for specialized devices. The LTSB of Windows excludes most of the bundled applications, including Microsoft Edge.

4-3-2 Supported Languages

Languages default supported by the operating system are:

Operating System	Languages							
	EN	CN[1]	DE	ES	FR	IT	JA	KO
Windows 10	✓	✓	✓	✓	✓	✓	✓	✓

*1. CN Simplified (ZH-CN) and CN Traditional (ZH-TW)

> **Additional Information**
>
> Refer to the Microsoft support information for details on available language packs.

4-4 Environmental Specifications

This section provides environmental specifications of the IPC Application Controller.

4-4-1 Operation Environment Specifications

The following table provides the general environmental specifications for the IPC Application Controller.

Item	Specifications
Ambient operating temperature	0 to 55°C [1]
Ambient storage temperature	-20 to 70°C [1]
Ambient operating humidity	10% to 90% with no condensation
Ambient storage humidity	10% to 90% with no condensation
Operating atmosphere	No corrosive gases
Altitude	2,000 m max.
Noise resistance (during operation)	Conforms to IEC61000-4-4, 2kV (power lines)
Vibration resistance (during operation)	Conforms to IEC 60068-2-6. For a IPC with an SSD: 5 to 8.4 Hz with 3.5 mm single amplitude and 8.4 to 150 Hz with 9.8 m/s² for 10 times each in X, Y and Z directions. For a IPC with a HDD the vibration resistance depends on the mounting orientation[2].
Shock resistance (during operation)	Conforms to IEC 60068-2-27. 147 m/s², 3 times in each X, Y and Z directions
Pollution degree	JIS B3502 and IEC 61131-2: 2 or less
RTC accuracy	At ambient temperature of 55°C: −3.5 to +0.5 min error per month At ambient temperature of 25°C: −1.5 to +1.5 min error per month At ambient temperature of 0°C: −3 to +1 min error per month

[1]. Refer to *4-4-2 Temperature and Humidity Specifications* on page 4-24 for ambient operating temperature details per CPU type.

[2]. Vibration resistance depends on the IPC's mounting orientation and storage device type:

Mounting Orientation	SSD or CFast Card	HDD
Book	9.8 m/s²	2.5 m/s²
Wall		4.9 m/s²

4-4-2   Temperature and Humidity Specifications

The allowed ambient operating temperature and ambient humidity depend on the model, mounting orientation, and storage device type.
The following sections provide temperature and humidity details and temperature specifications per model.

Temperature and Humidity Graphs

The maximum ambient operating temperature and ambient humidity are specified per storage device type.
The following graphs provide ambient temperature and humidity details per storage device type and the conditions for storage.

- Operate the IPC with a SSD within the general environmental specifications.

- Operate the IPC with a HDD within the ambient temperature and humidity ranges as shown in following graph.
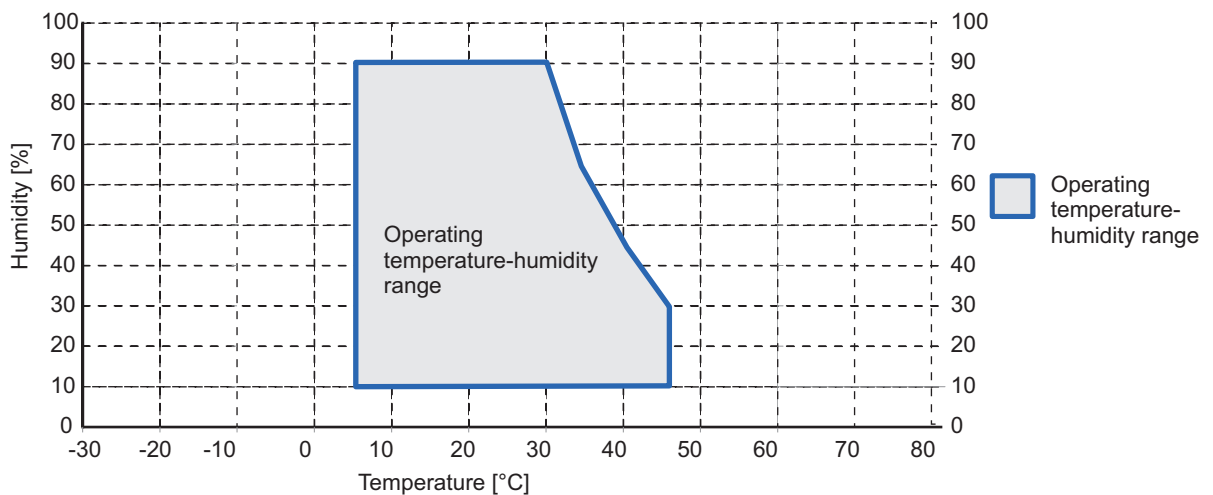
> 📑 **Additional Information**
>
> Refer to the ambient temperature specifications per CPU type for specific limitations.

- Store the IPC with a SSD within the general environmental specifications.

- Store the IPC with a HDD within the ambient temperature and humidity ranges as shown in following graph.

Temperature Specifications for model AC1-152000

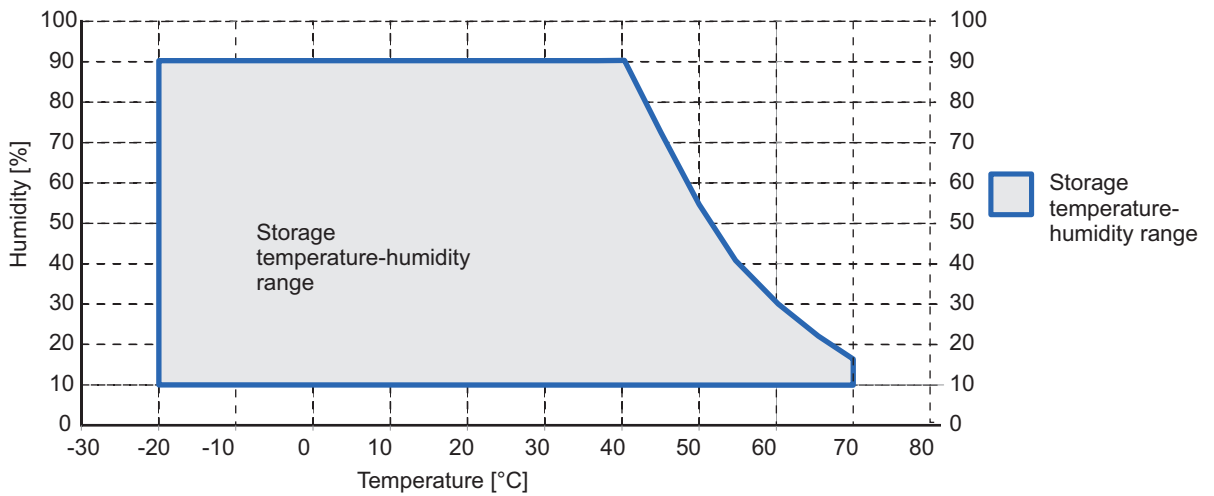Ambient operating temperature specifications for model AC1-152000.
This IPC has an Intel Core i5-7440EQ CPU.

📝 **Additional Information**

Refer to *1-4 Product Configuration* on page 1-5 for model details.

Mounting Orientation	Storage device type *1		
	1 x SSD	**2 x SSD**	**1 x SSD 1 x HDD**[2]
Book	0 to 55°C		5 to 45°C
Wall	0 to 55°C		5 to 45°C

*1.   Refer to *1-4 Product Configuration* on page 1-5 for model details.
*2.   Ambient operating temperature specifications when using a 1 TB HDD:

Mounting Orientation	Storage device type
	1 x SSD 1 x HDD
Book	0 to 35°C
Wall	0 to 35°C

4-4-3 Recycling Specifications

The following table provides recycling information for the IPC Application Controller.

Part	Recycle specifications
Battery	Chemical waste
PCIe Card and other electrical components	Electrical waste

Precautions for Safe Use

Dispose of the product and batteries according to local ordinances as they apply.

廢電池請回收

5

Installation

This section provides all installation details for the IPC Application Controller.

5-1 Unpack

This section provides details on how to unpack the IPC Application Controller.

5-1-1 Unpack Procedure

1 Check the package for damage.
If there is any visible damage:
- Take photos of the package and save them.
- Inform your supplier immediately.

2 Open the package.
Ensure not to damage the contents.

3 Ensure that all items are present.

> **Additional Information**
>
> Refer to *5-1-2 Items Supplied* on page 5-2 for the items supplied.

5-1-2 Items Supplied

The IPC Application Controller is supplied with several items.

> **Additional Information**
>
> - Refer to *Items Supplied with the IPC Application Controller* on page 5-3 for more details.
> - Refer to *Items Supplied with the Brackets* on page 5-4 for more details.

Items Supplied with the IPC Application Controller

This section describes the items supplied with your IPC Application Controller.

- Industrial Box PC
- Documentation:
  - Safety Precautions sheets (English and Japanese)
  - EU Compliance sheet
  - Standards and Certifications sheet
- Bag with:
  - Power connector
  - I/O connector
- Models with an Expansion Layer will have inside the bag also:
  - Drive bracket for drive installation
  - 4 Mounting screws for drive installation

Model AC1-152000.
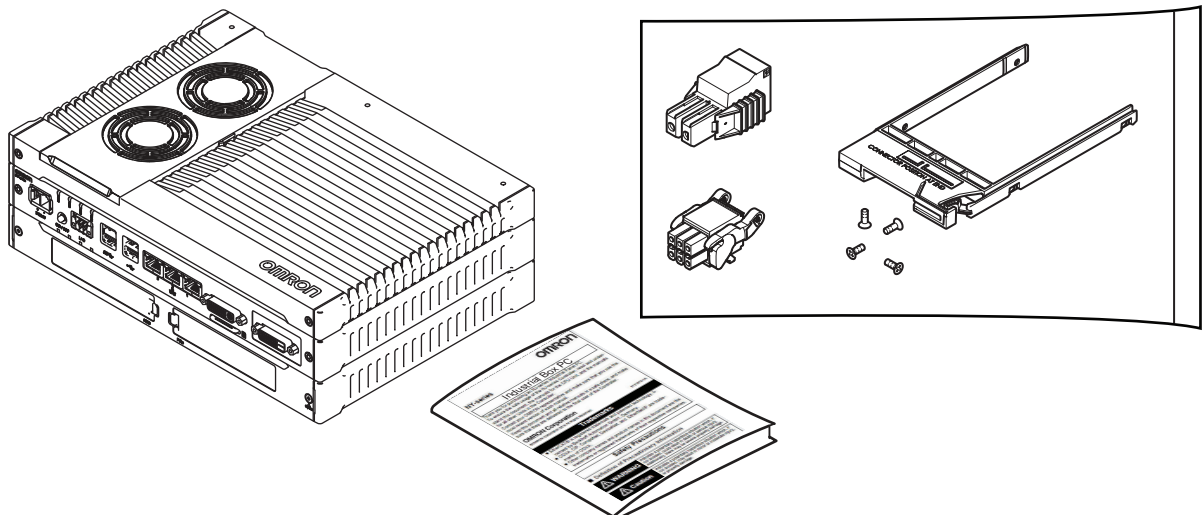
Items Supplied with the Brackets

This section describes the items supplied with the brackets for your IPC Application Controller.

Additional Information

- Refer to *2-9-1 Mounting Brackets* on page 2-18 for bracket details.
- Refer to *5-3-8 Book Mount Procedure* on page 5-19 for book mount installation.
- Refer to *5-3-9 Wall Mount Procedure* on page 5-20 for wall mount installation.

● Book Mount

Check if the content is complete.

Supplied items:

- 1 Book mount bracket
- 6 Mounting screws
- 1 Nut for the functional ground terminal connection
- 2 Washers for the functional ground terminal connection

● Wall Mount

Check if the content is complete.

Supplied items:

- 2 Wall mount brackets
- 6 Mounting screws
- 1 Nut for the functional ground terminal connection
- 2 Washers for the functional ground terminal connection

5-2 Install Options

This section describes the installable options for the IPC Application Controller.

5-2-1 Install a Drive

A drive is a storage device for the IPC Application Controller.

> **Additional Information**
>
> • Depending on the product configuration 0, 1 or 2 drives can be pre-installed.
>   Refer to *1-4 Product Configuration* on page 1-5 for details.
> • Depending on the CPU type one or two drives are supported.
>   Refer to *4-1-5 CPU Specifications* on page 4-6 for the number of supported drives.
> • Refer to *2-9-4 HDD and SSD Storage Devices* on page 2-20 for the recommended drive models.
> • Refer to *4-1-7 Storage Device Specifications* on page 4-7 for drive specifications.

Prepare the following items:
• The drive
  A drive is not supplied with the IPC.
• The drive bracket with mounting screws
  These are supplied with the IPC.

To install a drive:

1 Ensure the IPC is OFF.

2 Remove the drive cover.
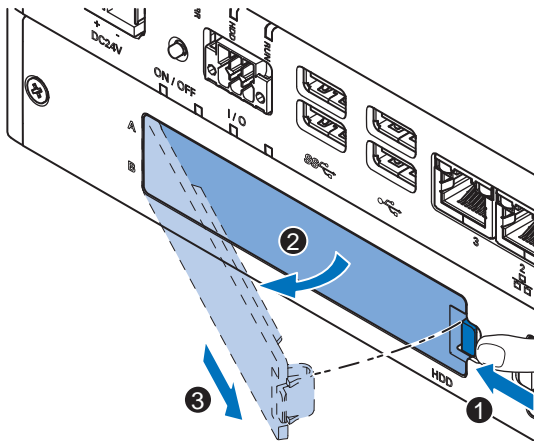
  1) Push the lock lever ❶.

  2) Tilt the drive cover ❷.

  3) Remove the drive cover ❸.

3 Pull the metal shielding cover out of the IPC.
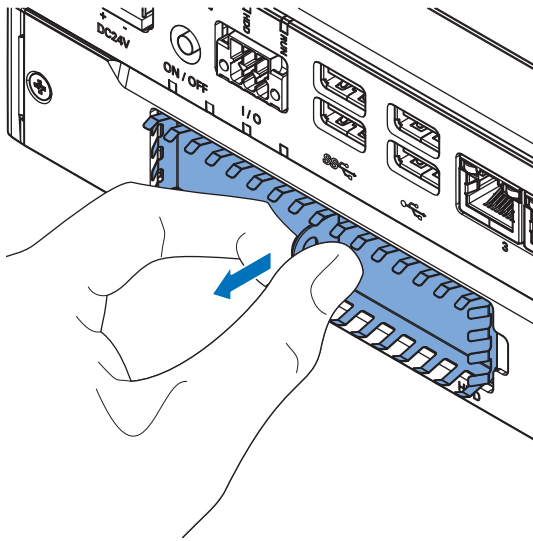
4 Rotate ❶ and then remove ❷ the break out part from the drive bracket.
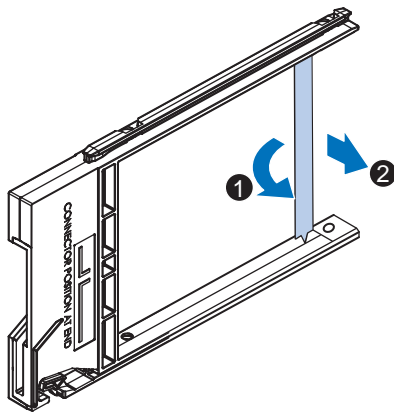
5 Align the connectors of the drive as shown Ⓐ on the bracket. Then insert the replacement drive❶ in the bracket and insert the 4 mounting screws ❷. Tighten these screws with a torque of 0.35 N·m.
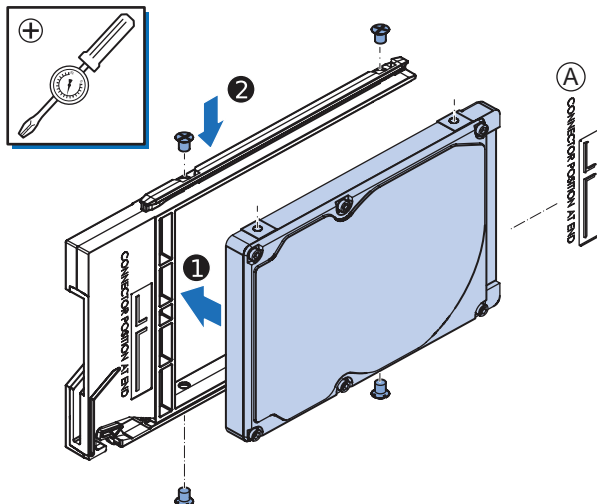
6 Insert the bracket with the drive in the correct bay.

Refer to *2-1-3 Expansion Layer (Optional)* on page 2-5 for bay details.

Ensure the bracket is completely in the IPC with an extra push.
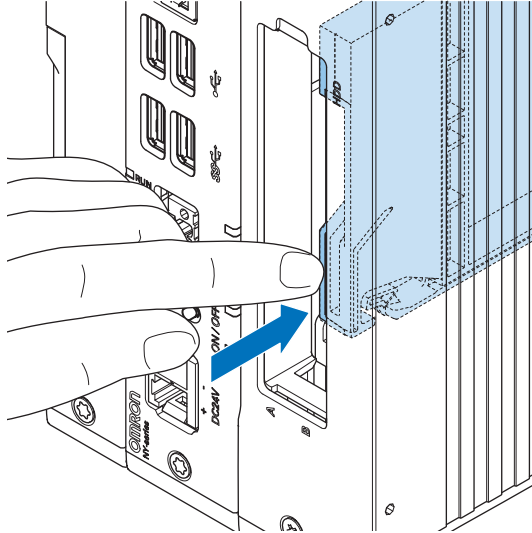
The drive bracket will lock into place when it is fully inserted.

7 Insert the metal shielding cover.
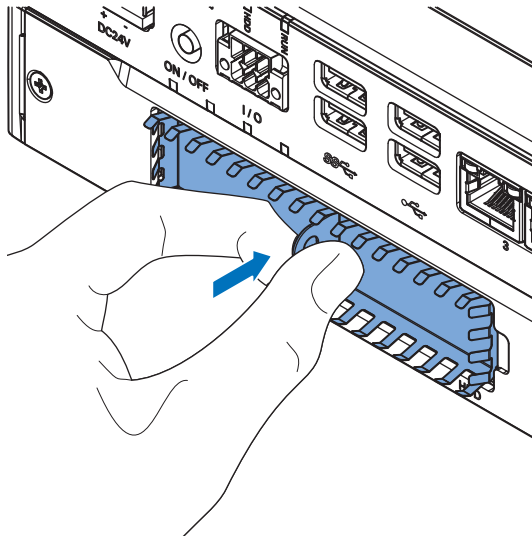
8 Mount the drive cover.

The lock lever will click when closed correctly.
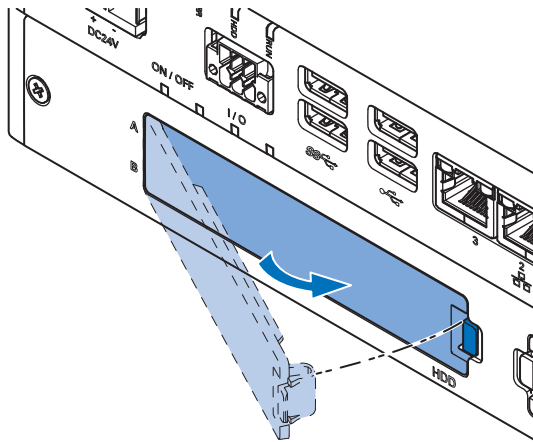
9 Finalize the drive installation when the IPC installation is completed.

- For storage drives:

  1) Ensure the drive is functional and confirm normal operation.

  2) For a IPC with a Windows operating system:

     If the storage drive should be visible in Windows but it is not visible then that drive needs to be allocated.

     Refer to *2-1-3 Expansion Layer (Optional)* on page 2-5 for details on the visiblity per storage drive.

The drive is installed and functional.

5-3 Mount

This section describes how to mount the IPC in either a book or wall orientation inside a control panel.

> ⚠ **WARNING**
>
> Ensure that installation and post-installation checks of the product are performed by personnel in charge who possess a thorough understanding of the machinery to be installed.

5-3-1 Installation Method in Control Panels

The IPC Application Controller must be mounted in a cabinet or a control panel.

Consider the orientation, cooling distance, noise resistance, ducts and IPC replacement when determining the space between the IPC and other devices.

Precautions for Safe Use

Install the product in the correct orientation and temperature according to the specifications in the manual to prevent overheating. Not doing so may result in malfunction.

Precautions for Correct Use

Do not operate or store the product in the following locations. Operation may stop or malfunctions may occur.
- Locations subject to direct sunlight
- Locations subject to temperatures or humidity outside the range specified in the specifications
- Locations subject to condensation as the result of severe changes in temperature
- Locations subject to corrosive or flammable gases
- Locations subject to dust (especially iron dust) or salts
- Locations subject to exposure to water, oil or chemicals
- Locations subject to shock or vibration

Additional Information

- Ensure you have installed the options before you mount the product.
  Refer to *5-2 Install Options* on page 5-5 for option details.
- Refer to *5-3-8 Book Mount Procedure* on page 5-19
  or *5-3-9 Wall Mount Procedure* on page 5-20 for orientation details.
- Refer to *5-3-3 Temperature* on page 5-10 for temperature details.
- Refer to *5-3-4 Humidity* on page 5-13 for humidity details.
- Refer to *5-4 Wire* on page 5-21 for wiring details.

5-3-2   Product Orientation

The IPC can be mounted in a book $Ⓐ$ or wall $Ⓑ$ $Ⓒ$ orientation.

- For book mount there is one allowed orientation $Ⓐ$.

- For wall mount there are two allowed orientations, horizontally mounted $Ⓑ$ and vertically mounted $Ⓒ$.

Do not install the IPC in other orientations.

Book mount
Frontview   Sideview

Wall mount
Frontview   Frontview   Sideview
Horizontal   Vertical
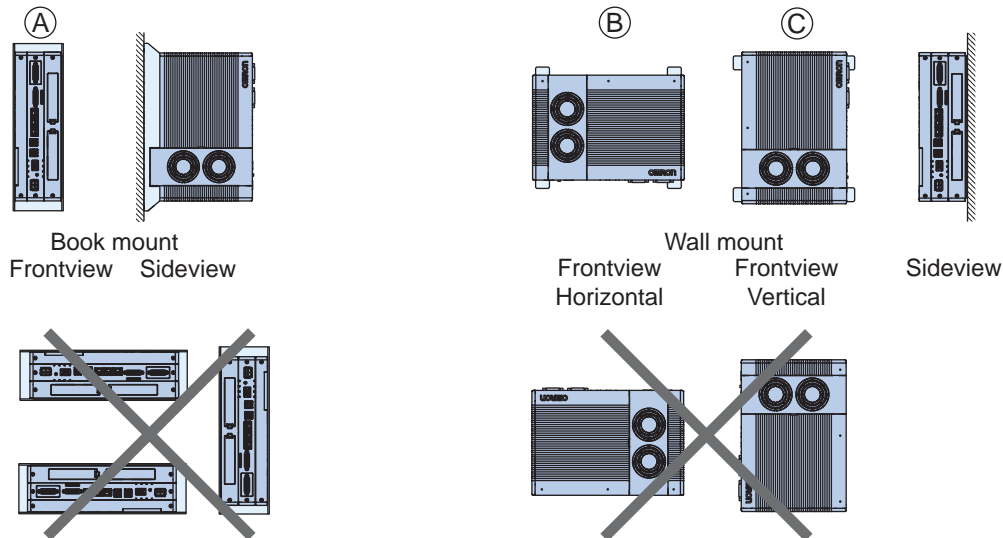
5-3-3   Temperature

The temperature inside a control panel may be at least 10 to 15°C higher than outside the panel. Implement the following measures against overheating at the installation site and in the control panel, and allow a sufficient margin for the temperature.

Distance for Cooling

Adequate airflow around the IPC Application Controller is required.

> **Additional Information**
>
> - The ambient temperature must be within the operating range.
>   Refer to *4-4-1 Operation Environment Specifications* on page 4-23 for temperature specifications.
> - Allow space to accommodate for the bending radius of the cables.
>   Refer to:
>   - *2-9-5 DVI Cables* on page 2-21
>   - *2-9-6 USB Type-A to USB Type-B Cables* on page 2-21
>   for cable bending requirements.

Provide enough space for good air flow and ensure the following minimum distances are observed around the sides of the IPC.

- **Book Mount**
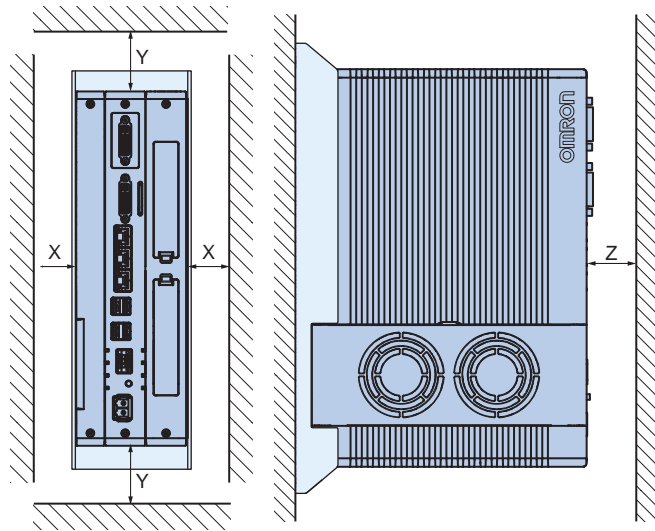
- **Wall Mount** in landscape Ⓐ or portrait Ⓑ orientation
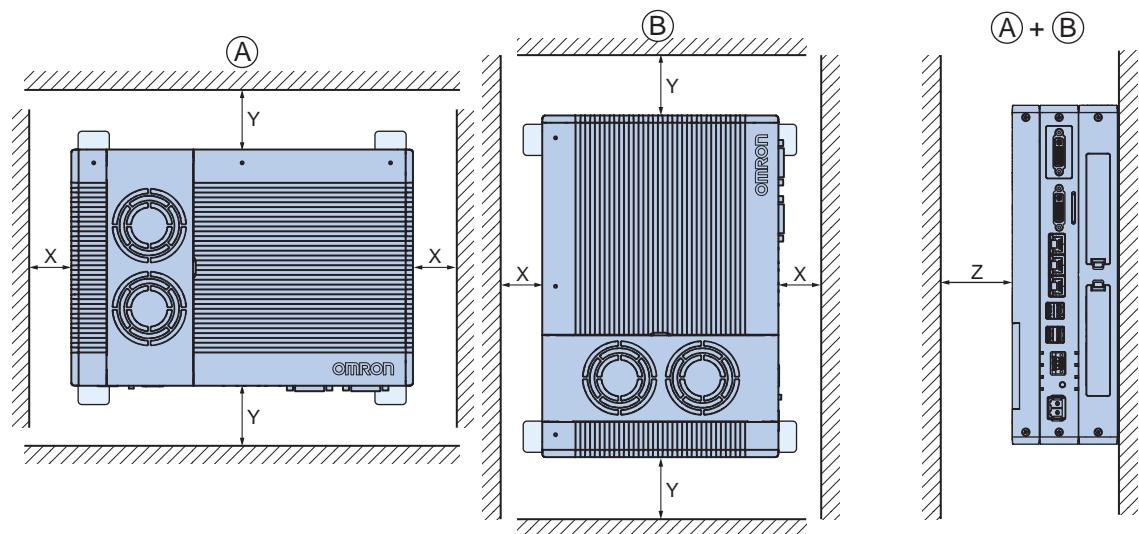
Item	Minimum distance *1
X	50 mm
Y	100 mm
Z	50 mm

*1.   Measure the minimum distances X and Y at the air openings in the sides of the IPC.
       Check the required bending radius of all wires for the actual required minimum distance.

High Temperatures

Use the following cooling methods as required, taking into account the ambient temperature and the amount of heating inside the panel.

● Natural Cooling

Natural cooling relies on natural ventilation through slits in the panel, rather than using cooling devices such as fans or coolers. When using this method, observe the following points.

- Do not install the IPC at the top of the panel, where hot air tends to stagnate.
- To provide ventilation space above and below the IPC, leave sufficient distance from other devices, wiring ducts, etc.
- Do not mount the IPC in the wrong direction (e.g., vertically or upside down). Doing so may cause abnormal heating in the IPC.
- Do not install the IPC directly above any heat-generating equipment, such as heaters or transformers.
- Do not install the IPC in a location exposed to direct sunlight.
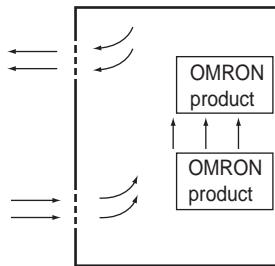
Natural Cooling

● Forced Ventilation

Forced ventilation with a fan in the top of the control cabinet.
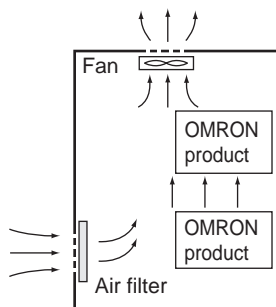
Forced Ventilation Method

● Forced Air Circulation

Forced circulation with a fan inside the closed control cabinet.
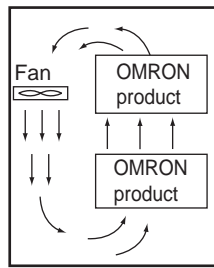
Forced Air Circulation

● **Room Cooling**

Cool the entire room where the control panel is located.

Cooler

Control panel
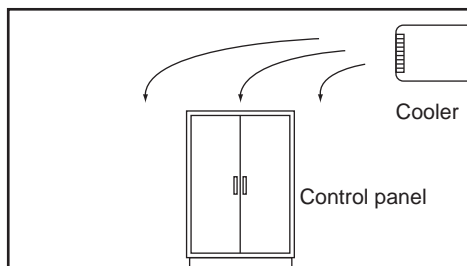
Room Cooling

Low Temperatures

The IPC may not start normally if the temperature is below 0°C when the power is turned ON. Maintain an air temperature of at least 5°C inside the panel, by implementing measures such as installing a low-capacity space heater in the panel.
Alternatively, leave the IPC power ON to keep the IPC warm.

5-3-4 Humidity

Rapid temperature changes can cause condensation to occur, resulting in malfunctioning due to short-circuiting.
When there is a possibility of this occurring, take measures against condensation, such as leaving the IPC power ON at night or installing a heater in the control panel to keep it warmer.
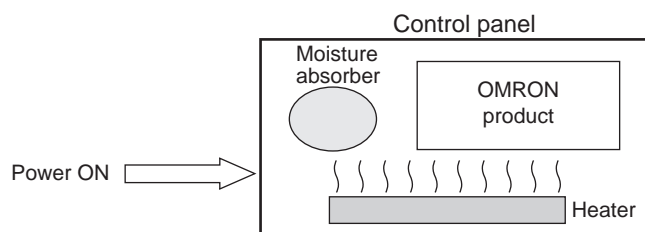
Examples of Measures against Condensation

5-3-5 Vibration and Shock

The IPC is tested for conformity with the sine wave vibration test method (IEC 60068-2-6) and the shock test method (IEC 60068-2-27) of the Environmental Testing for Electrotechnical Products. It is

designed so that malfunctioning will not occur within the specifications for vibration and shock. If, how-
ever, the IPC is to be used in a location in which it will be directly subjected to regular vibration or
shock, then implement the following countermeasures:
- Separate the IPC control panel from the source of the vibration or shock. Or secure the IPC and the
  control panel with rubber padding to prevent vibration.
- Make the building or the floor vibration-resistant.
- Prevent shocks when other devices in the panel, such as electromagnetic contactors, operate. Se-
  cure either the source of the shock or the IPC with rubber padding.

5-3-6   Atmosphere

Using the IPC in any of the following locations can cause defective contact with connectors and corro-
sion of components. Implement countermeasures such as purging the air as required.
- In locations exposed to dust, dirt, salt, metal powder, soot, or organic solvents, use a panel with an
  airtight structure. Be careful of temperature increases inside the panel.
- In locations exposed to corrosive gas, purge the air inside the panel to clear the gas and then pres-
  surize the inside of the panel to prevent gas from entering from outside.
- In locations where flammable gas is present, either use an explosion-protected construction or do
  not use the IPC.

5-3-7   Electrical Environment

When installing or wiring devices, make sure that there will be no danger to people and that noise will
not interfere with electrical signals.

Installation Location

Install the IPC as far away as possible from high-voltage (600 V or higher) and power devices to en-
sure safe operation and maintenance.

Examples of Equipment Arrangement in Panel with High-voltage Devices

Hardware Arrangement

The coils and contacts in electromagnetic contacts and relays in an external circuit are sources of noise. Do not install them close to the IPC. Locate them at least 100 mm away from the IPC.
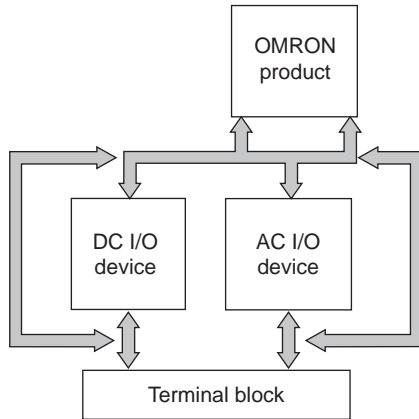
Example of Arrangement in Panel

Wire Layout for the Power Supply

Observe the following points when wiring the power supply system.

- Separate the IPC power supply from the I/O device power supply and install a noise filter near the IPC power supply feed section.
- Use an isolating transformer to significantly reduce noise between the IPC and the ground. Install the isolating transformer between the IPC power supply and the noise filter, and do not ground the secondary coil of the transformer.
- Keep the wiring between the transformer and the IPC as short as possible, twist the wires well, and keep the wiring separate from high-voltage and power lines.
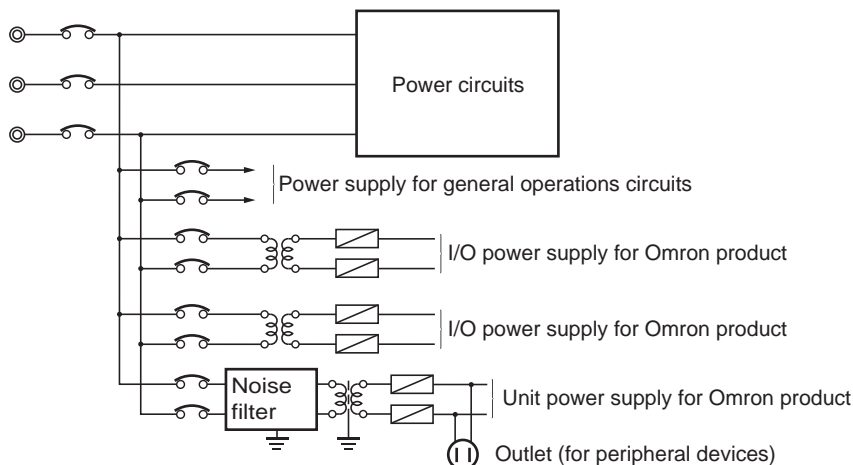
Power Supply System Diagram

Wire External I/O Signal Lines

Observe the following points when wiring the external I/O signal lines.

- To absorb reverse electromotive force when an inductive load is connected to an output signal, connect a surge suppressor near the inductive load in an AC circuit, or connect a diode near the inductive load in a DC circuit.

Connect a diode in a DC circuit.   Connect a surge   Connect a diode
                                          suppressor in an AC circuit.   in a DC circuit.

Input Signal Noise Countermeasures   Output Signal Noise Countermeasures

- Never bundle output signal lines with high-voltage or power lines, and do not route them in close proximity or parallel to such lines.
  If output signal lines must be routed in close proximity to such lines, place them in separate ducts or conduits. Be sure to ground the ducts or conduits.

Suspended ducts   Floor ducts   Conduits
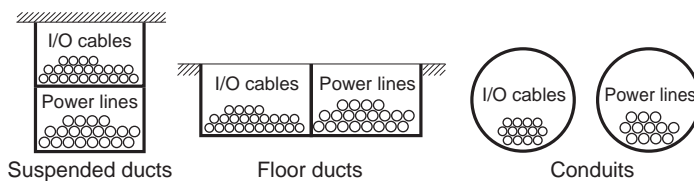
I/O Cable Arrangement

- If the signal lines and power lines cannot be routed in separate ducts, use shielded cable. Connect the shield to the ground terminal at the IPC, and leave it unconnected at the input device.
- Wire the lines so that common impedance does not occur. Such wiring will increase the number of wires, so use common return circuits. Use thick wires with sufficient allowance for the return circuits, and bundle them with lines of the same signal level.
- For long I/O lines, wire the input and output signal lines separately.
- Use twisted-pair wires for pilot lamps (and particularly lamps with filaments).
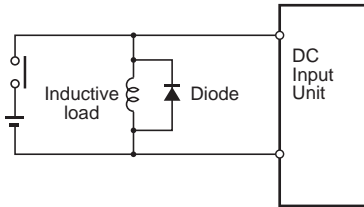- Use countermeasures, such as CR surge absorbers and diodes, for input device and output load device noise sources, as required.

External Wiring

Wiring, and noise countermeasures in particular, are based on experience, and it is necessary to closely manage wiring based on experience and information in the manuals.

● Wiring Routes

Each of the following combinations includes different signal types, properties, or levels. They will cause the signal-to-noise ratio to drop due to factors such as electrical induction. As a general rule when wiring, either use separate cables or separate wiring routes for these items. Future maintenance operations and changes to the system will also be made easier by carefully organizing the wiring from the start.

- Power lines and signal lines
- Input signals and output signals
- Analog signals and digital signals
- High-level signals and low-level signals
- Communications lines and power lines
- DC signals and AC signals
- High-frequency devices (such as Inverters) and signal lines (communications)

● **(Routing of) Wiring**

Observe the following points when wiring power supply and signal cables.
- When routing signal cables with differing characteristics through the same duct, always keep them separated.
- As much as possible, avoid routing multiple power supply lines through the same duct. If it cannot be avoided, then construct a partition between them in the duct and ground the partition.
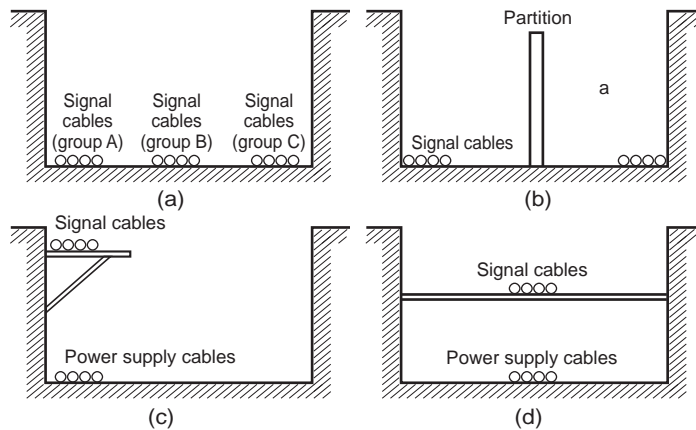
Partitioning Methods for Signal and Power Supply Cables

- To avoid overheating the conduits when using conduits for wiring, do not place wires for a single circuit in separate conduits.
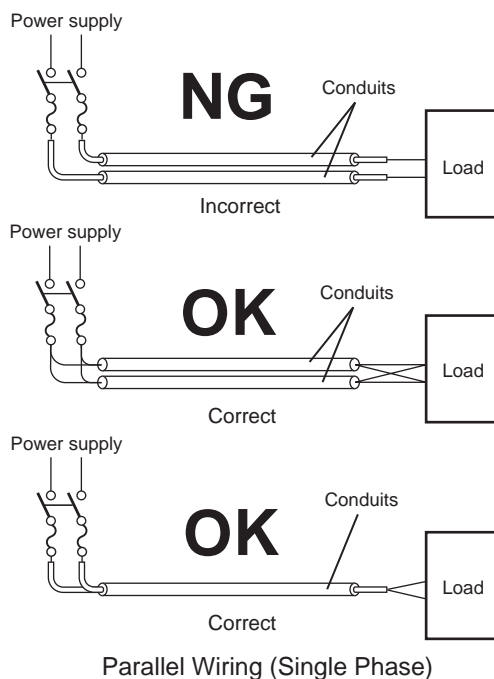
Parallel Wiring (Single Phase)

- Power cables and signal cables adversely affect each other. Do not wire them in parallel.

- Noise induction may occur if the IPC is installed in a panel that includes high-voltage devices. Wire and install them as far apart as possible.
- Either install the IPC a minimum of 200 mm away from high-voltage lines or power lines, or place the high-voltage lines or power lines in metal tubing and completely ground the metal tubing to 100 Ω or less.
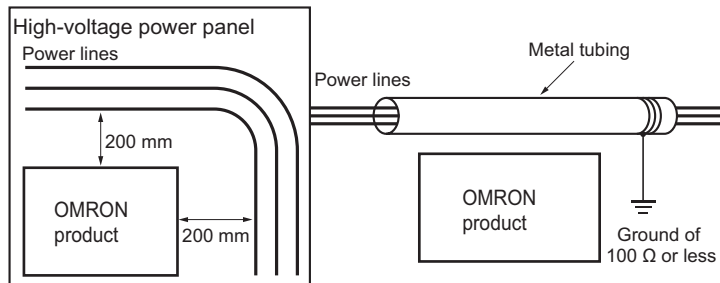
Example: Separating an OMRON product from Power Lines

● Wiring Ducts

Whenever possible, route the cables and wires through wiring ducts.
Install the wiring ducts so that it is easy to route the wires from the IPC Application Controller directly into the duct.

> **Additional Information**
>
> Refer to *Distance for Cooling* on page 5-10 for the minimum required distances.

It is convenient to use wiring ducts that have the same depth as the IPC Application Controller.

● Other Precautions

Basic I/O Units have both plus and minus commons, so pay attention to the polarity when wiring.

5-3-8   Book Mount Procedure

Use the following procedure to mount the IPC Application Controller in the book orientation.

> **Additional Information**
>
> • Refer to *5-4-2 Ground* on page 5-21 for grounding details.
> • Refer to *2-9-1 Mounting Brackets* on page 2-18 for the bracket model.

To mount the IPC:

1   The IPC has on one side light grey circles around the threaded mounting holes. The book-mount bracket has on the inside on one side also the light grey circles around the mounting holes.
The light grey circles are contact areas that ensure a good electrical conductivity.
Position the IPC inside the bracket so the light grey circles of the bookmount bracket contact the light grey circles of the IPC.

2   Mount the bracket Ⓐ to the IPC Ⓒ with the 6 Phillips screws Ⓑ supplied with the bracket.
First tighten the 3 screws at the side of the contact areas with a torque of 0.6 N·m.
Then tighten the 3 screws at the opposite side, also with a torque of 0.6 N·m.
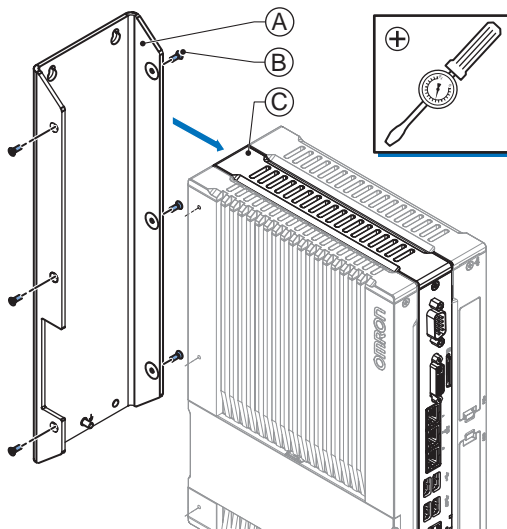
The bracket and the IPC can differ depending on the product configuration.

3   Mount the IPC with the bracket in position.
• Arrange the two or four holes at the location where the IPC with bracket will be mounted.
    Refer to *4-1-8 Bracket Specifications* on page 4-9 for details.
• Position the IPC with bracket in the mounting location.
• Insert screws through the bracket and into or through the mounting surface.
    Note that these screws are not in the scope of delivery.
• Tighten the screws with a torque matching the screw size and the mounting materials.

The IPC is mounted.

5-3-9 Wall Mount Procedure

Use the following procedure to mount the IPC in the wall orientation.

> 📝 **Additional Information**
>
> • Refer to *5-4-2 Ground* on page 5-21 for grounding details.
> • Refer to *2-9-1 Mounting Brackets* on page 2-18 for the bracket model.

To mount the IPC:

1 Mount the Brackets Ⓐ to the IPC Ⓒ with the 6 Phillips screws Ⓑ supplied with the brackets. Tighten these screws with a torque of 0.6 N·m.
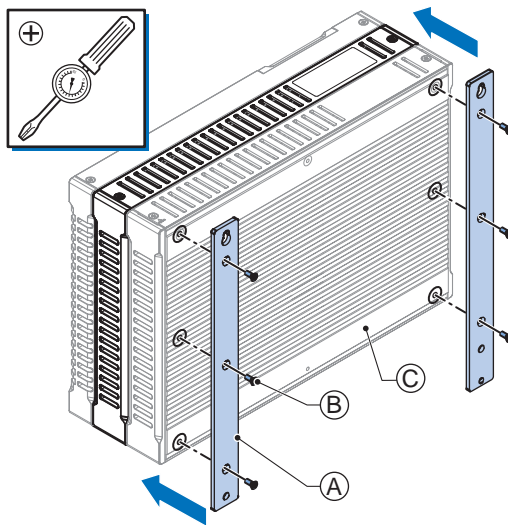
The IPC can differ depending on the product configuration.

2 Mount the IPC with the brackets in position.
  • Arrange four holes at the location where the IPC with brackets will be mounted.
    Refer to *4-1-8 Bracket Specifications* on page 4-9 for details.
  • Position the IPC with bracket in the mounting location.
  • Insert screws through the bracket and into or through the mounting surface.
    Note that these screws are not in the scope of delivery.
  • Tighten all four screws with a torque matching the screw size and the mounting materials.

The IPC is mounted.

5-4　Wire

This section describes how to wire the IPC Application Controller.

5-4-1　Wiring Warnings and Cautions

This section describes the Warnings and Cautions when wiring the IPC Application Controller.

⚠ **WARNING**

Provide safety measures in external circuits to ensure safety in the system if an abnormality occurs due to malfunction of the product or due to other external factors affecting operation. Not doing so may result in serious accidents due to incorrect operation.

⚠ **WARNING**

Emergency stop circuits, interlock circuit, limit circuits, and similar safety measures must be provided in external control circuits.

⚠ **WARNING**

Unintended behavior may occur when an error occurs in internal memory of the product. As a countermeasure for such problems, external safety measures must be provided to ensure safe operation of the system.

🔊 **Precautions for Safe Use**

Do not let metal particles enter the product when preparing the panel. Do not allow wire clippings, shavings, or other foreign material to enter any product. Otherwise, the product burning, failure, or malfunction may occur. Cover the product or take other suitable countermeasures, especially during wiring work.

5-4-2　Ground

This section describes how to ground the IPC Application Controller.

⚠ **WARNING**

Always connect to a ground of 100 Ω or less when installing the product.

> ## ⚠ Caution
>
> The product has an internal non-isolated DC power supply. Circuit ground (0 VDC) and frame ground are connected together. When connecting a non-isolated device or a non-isolated interface to the product, take appropriate actions to avoid communication failures or damage to the mentioned ports.
>
>
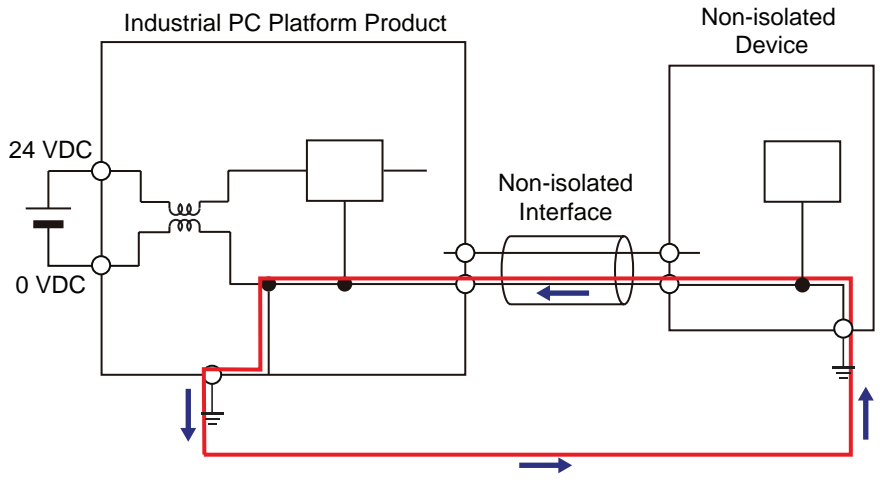
> ## ⚠ Caution
>
> Never ground the 24 VDC side of the power supply. This may cause a short circuit.

The shielding of the communication connectors are directly bonded to the case and to the functional ground of the IPC.

The shield of a communication cable should be terminated to ground at both ends of the cable with a low impedance connection. A large surface area surrounding the entire cable shield ensures a low impedance connection, avoid the use of pigtails.

Potential differences between the two connected communicating devices might cause an equipotential current to flow through the shielding connected at both ends.

To avoid equipotential currents on the cable shields, an additional equipotential bonding conductor must be installed.

Refer to IEC 61918 for guidelines regarding conductor sizing and length to prevent a voltage offset between two communicating devices exceeding 1 V.

Make sure to run the bonding conductor in close proximity to the communication cable.

Considerations for Earthing Methods

Local potential fluctuations due to lightning or noise occurred by power devices will cause potential fluctuations between ground terminals of devices. This potential fluctuation may result in device malfunction or damage. To prevent this, it is necessary to suppress the occurrence of a difference in electrical potential between ground terminals of devices. You need to consider the earthing methods to achieve this objective.

The recommended earthing methods for each usage condition are given in the following table.

Specification of communications cables	Earthing methods		
	Equipotential bonding system	Star earthing	Daisy chain
The cable shield connected to the connector hood at both ends of the communications cable	Recommended	Not recommended	Not recommended

> **Additional Information**
>
> - In a country or region where the earthing method is regulated, you must comply with the regulations. Refer to the applicable local and national ordinances of the place where you install the system, or other international laws and regulations.
> - Ethernet switches are used with the EtherNet/IP. For information on the environmental resistance of the Ethernet switch to use, the grounding between Ethernet switches, or the specifications of cables, ask the Ethernet switch manufacturer.

Each of these earthing methods is given below.

Equipotential Bonding System

Equipotential bonding is an earthing method in which steel frames and building structures, metal ducts and pipes, and metal structures in floors are connected together and make connections to the earth trunk line to achieve a uniform potential everywhere across the entire building. We recommend this earthing method.

The following figure shows an example of an equipotential bonding system.

Connect the main earthing terminal and building structures together with equipotential bonding conductors and embed the mesh ground line in each floor.

Connect the ground line of each control panel to the equipotential bonding system.
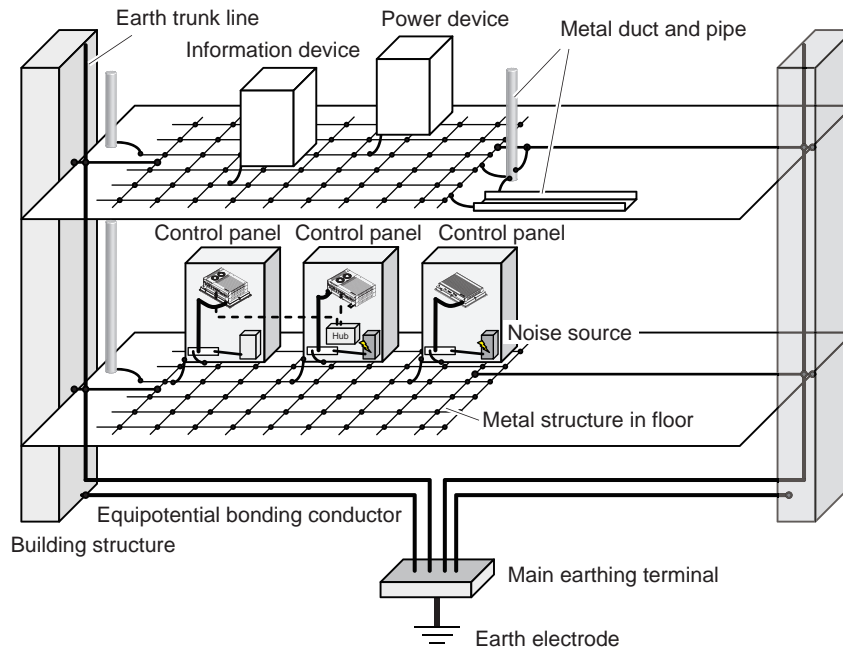
Star Earthing

If the earthing method used for the building is not equipotential bonding or the earthing system is unknown, choose (a) from among the earthing methods given below.

a. Connecting devices and noise sources to separate earth electrodes
    This is an earthing method to separately ground an earth electrode of the device that is connected with a communications cable or other devices and an earth electrode of a high-power device that could be a noise source, such as a motor or inverter.
    Each earth electrode must be ground to 100 Ω or less.
    Connect the ground lines of the device that is connected with a communications cable and other devices as a bundle to a single earth electrode. Be sure that the earth electrode is separated by a minimum of 10 m from any other earth electrode of a device that could be a noise source.
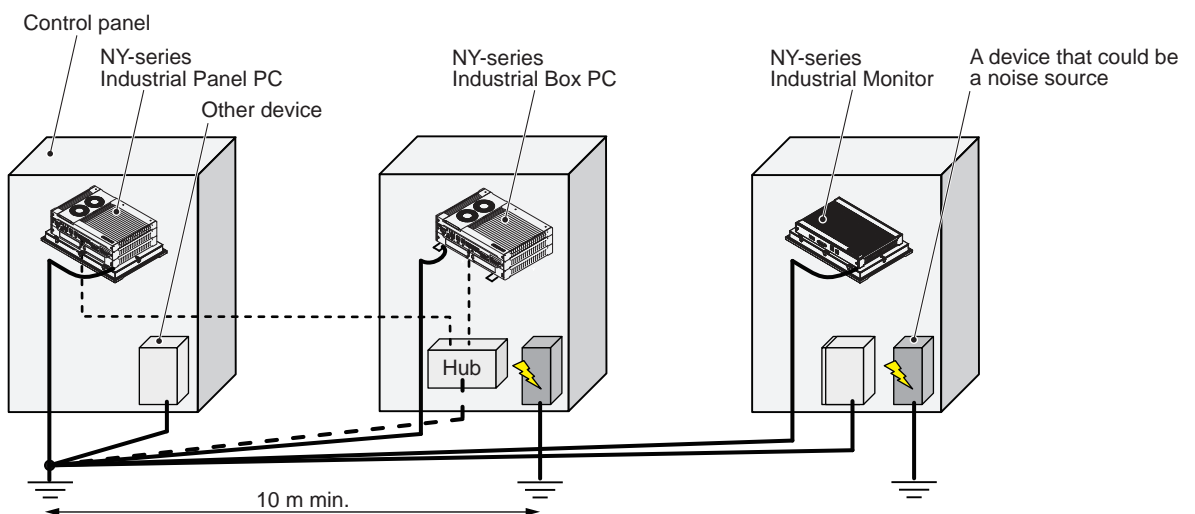
b. Connecting devices and noise sources to a common earth electrode
    This is an earthing method to connect the device that is connected with a communications cable, other devices, and a device that could be a noise source, to a common earth electrode.
    This earthing method is not recommended because the device that could be a noise source may interfere electromagnetically with other devices.
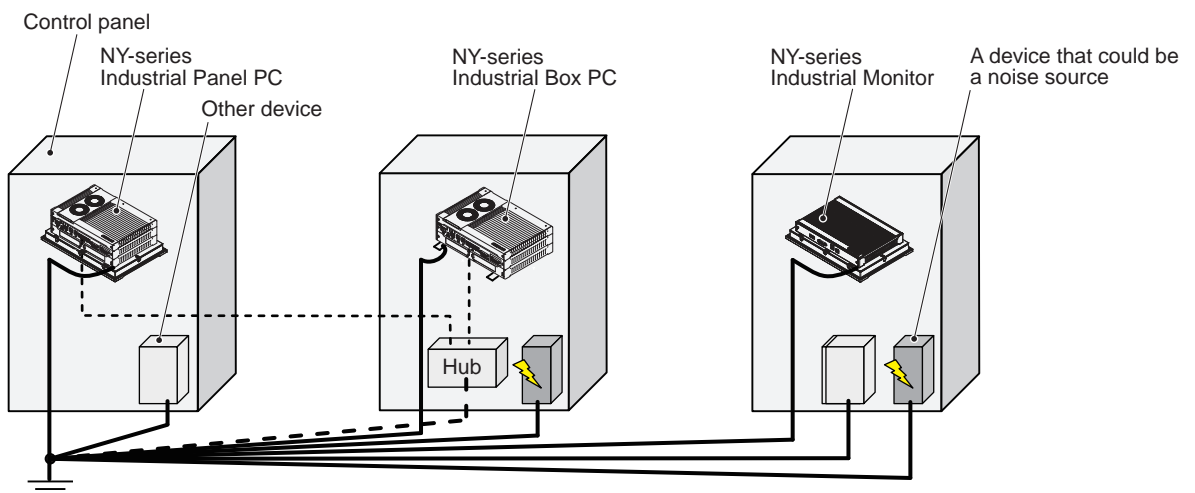
Daisy Chain

This is an earthing method to connect the device that is connected with a communications cable, other devices, and a device that could be a noise source using a daisy-chain topology to a common earth electrode.

This earthing method is not recommended because the device that could be a noise source may interfere electromagnetically with other devices.
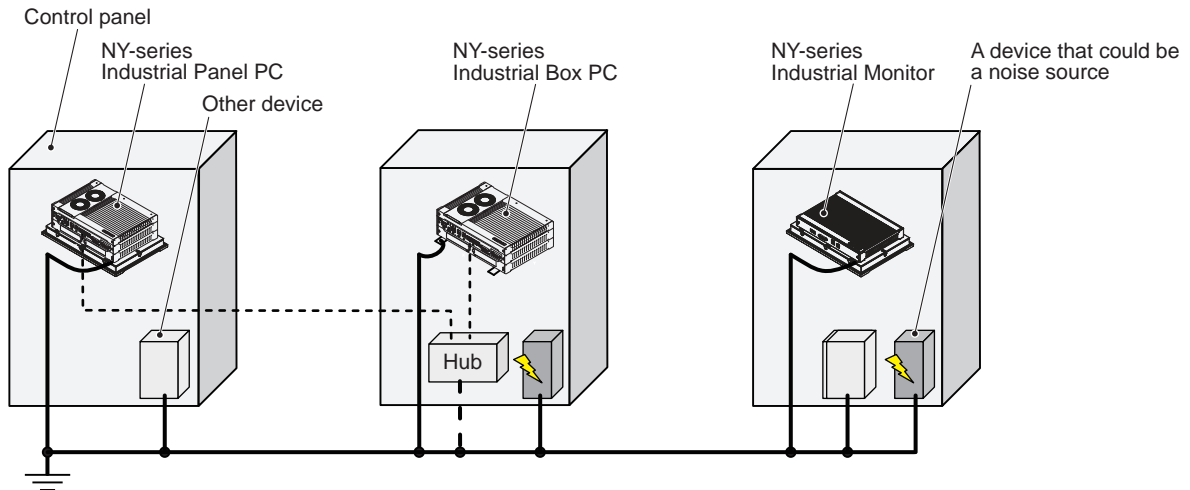
Ground Connection Details

This section provides details about the ground connection.

Use the functional ground terminal on the mounting bracket(s) to ground your IPC Application Controller.

The washers and nut Ⓒ are supplied with the bracket(s).

Refer to *Items Supplied with the Brackets* on page 5-4 for details.

Book Mount
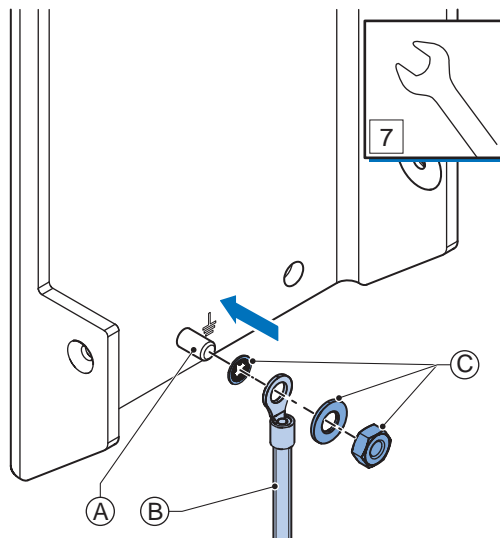
Mount the ground connection wire Ⓑ to the functional ground terminal Ⓐ using the washers and nut Ⓒ. Tighten the nut with a torque of 1.2 N·m max.

Refer to *5-3-8 Book Mount Procedure* on page 5-19 for book mounting details.

Wall Mount
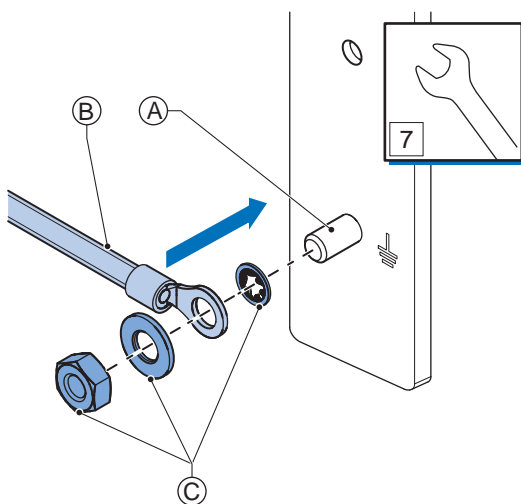
Mount the ground connection wire Ⓑ to the functional ground terminal Ⓐ using the washers and nut Ⓒ. Tighten the nut with a torque of 1.2 N·m max.

Refer to *5-3-9 Wall Mount Procedure* on page 5-20 for wall mounting details.

5-4 Wire

5

5-4-2 Ground

● **Crimp terminals**

Use crimp terminals with dimensions X = M4 and Y = 8 mm max.
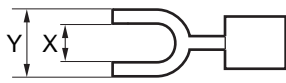
5-4-3   Wire the Power Connector

This section describes how to wire the power connector.

Precautions for Safe Use

- Do not perform a dielectric strength test.
- Always use the recommended uninterruptible power supply (UPS) to prevent data loss and other system file integrity issues caused by unexpected power interruption. Back up the system files in the planned way to prevent data loss and other system file integrity issues caused by incorrect operation.

Additional Information

- The selected conductor size must match with the used maximum power supply capacity or an overcurrent protection device must be used.
- The used wires and the overcurrent protection device must meet the applicable national standards.
  Standards are:
  - NEC (National Electric Code)
  - CEC (Canadian Electrical Code)
  - international applicable standards
- Refer to *4-1-2 General Electrical Specifications* on page 4-3 for electrical specifications.
- Refer to *4-1-3 Power Consumption Specifications* on page 4-4 for power consumption specifications.
- Refer to *2-9-9 UPS* on page 2-23 for UPS information.

Power Connector Wiring Materials

Use the power supply connector that was supplied to connect the power supply to the IPC Application Controller.

- Select power supply conductors with consideration to the voltage drop and heat generation for the cable length at the installation environment.
- Always use twisted wires to minimize the occurrence of electrical disturbance.
- Recommended power supply conductor sizes are provided in the table.

Wire type	Conductor cross-section
Solid conductor	0.5 to 10 mm^2
Flexible conductor	0.5 to 6 mm^2
Flexible conductor, with ferrule and no plastic sleeve	0.5 to 6 mm^2
Flexible conductor, with ferrule and plastic sleeve	0.5 to 4 mm^2
Minimum AWG according to UL/cUL	20
Maximum AWG according to UL/cUL	8

- Power Supply Connector
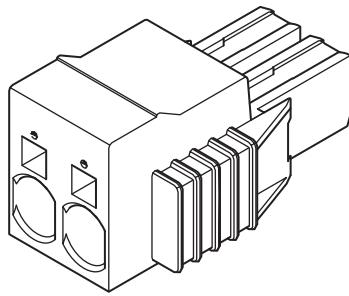
DC Power Supply

The OMRON S8VK-series power supply is recommended for use with the IPC Application Controller.

Additional Information

- Refer to *2-9-8 Power Supply* on page 2-22 for more information.
- Refer to *4-1-3 Power Consumption Specifications* on page 4-4 for power consumption details.

Power Connector Wiring Procedure

Use the following procedure to wire the power connector.

1 Ensure the power connector is not connected to the IPC.

2 Remove the sheath from the power supply wires. | 7 mm |

Precautions for Safe Use

Observe the following precautions to prevent broken wires.
- When you remove the sheath, be careful not to damage the conductor.
- Connect the conductor without twisting the wires.
- Do not weld the conductors. Doing so may cause the wires to break with vibration.

3 Insert a screwdriver in the small opening above the cable opening ❶ to unlock the cable entry

and then push the wire all the way to the back of the cable opening ❷.
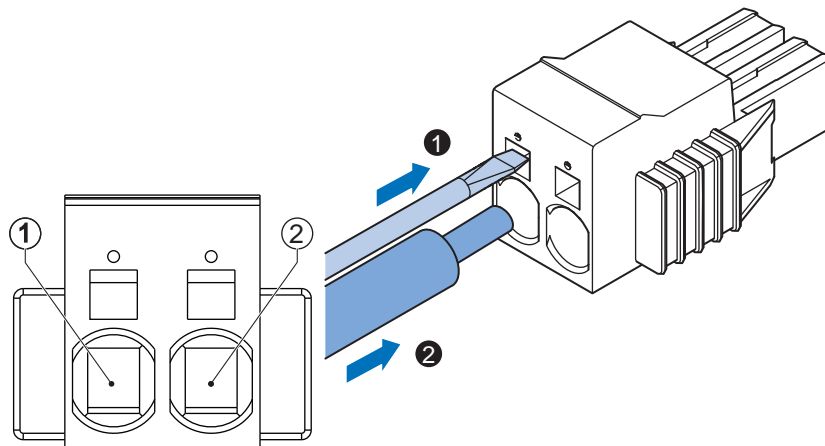
Pin	Description
1	24 VDC
2	0 VDC

4 Remove the screwdriver.

Do not apply stress to the cable after you have connected the wires.

5-4-4   Wire the I/O Connector

This section describes how to wire the I/O connector.

I/O Connector Wiring Materials

Use the supplied I/O connector to connect the inputs and outputs to the IPC Application Controller.
Recommended I/O conductor sizes for the connector are provided in the table.
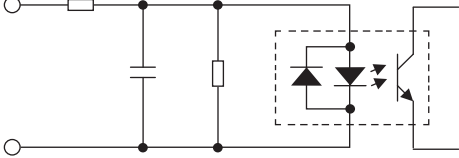
Wire type	Conductor cross-section
Solid conductor	0.2 to 1.5 mm^2
Flexible conductor	
Flexible conductor, with ferrule and no plastic sleeve	0.25 to 1.5 mm^2
Flexible conductor, with ferrule and plastic sleeve	0.25 to 0.75 mm^2
Minimum AWG according to UL/cUL	24
Maximum AWG according to UL/cUL	16

I/O Connections

This section describes I/O connection details.
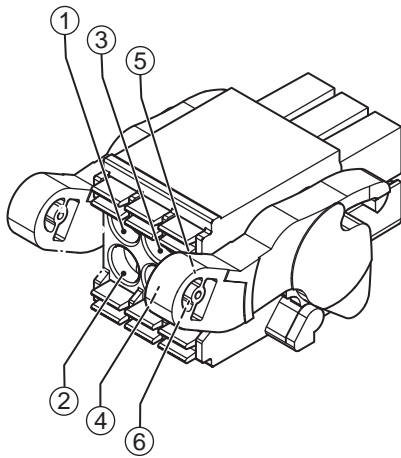
Pin	Description	Internal Circuit Details
1	Power Status Output	The Power Status Output has an internal relay. Wire this according to the input device connected to the Power Status Output.
2		

Pin	Description	Internal Circuit Details
3	Power ON Input	The Power ON Input and the UPS Mode Input are bi-directional and isolated. Each input can be wired as sinking (NPN) or sourcing (PNP). Wire these according to the output device connected to the inputs.
4		
5	UPS Mode Input	
6		

📋 **Additional Information**

- Refer to *4-2-2 I/O Connector Specifications* on page 4-12 for I/O connector specifications.
- Refer to *I/O Connector Power Status Output Details* on page 4-14 for power status output details.
- Refer to *2-9-9 UPS* on page 2-23 for UPS information.

I/O Connector Wiring Procedure

Use the following procedure to wire the I/O connector.

1 Ensure the I/O connector is not connected to the IPC.

7 mm

2 Remove the sheath from the wires.

Precautions for Safe Use

Observe the following precautions to prevent broken wires.
- When you remove the sheath, be careful not to damage the conductor.
- Connect the conductor without twisting the wires.
- Do not weld the conductors. Doing so may cause the wires to break with vibration.

3 Remove the I/O connector from the IPC.

4 Insert a screwdriver in the small groove above the cable entry ❶ to unlock the cable entry and then push the wire all the way to the back of the cable opening ❷.
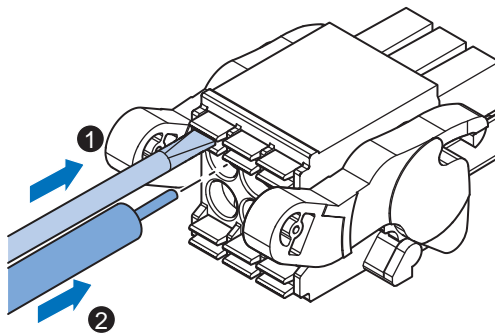
5 Remove the screwdriver.

Do not apply stress to the cable after you have connected the wires.

5-5   Connect

This section describes how to connect the IPC Application Controller.

5-5-1   Connector Identification

An overview of the connectors of the base layer.

Item	Name	Description
A	Power connector	Lockable power connector
B	I/O connector	2 inputs (UPS signal and power OFF control) and 1 output (power state)
C	USB 3.0 connector	2 USB 3.0 connectors
D	USB 2.0 connector	2 USB 2.0 connectors
E	10BASE-T/100BASE-TX/ 1000BASE-T Ethernet connectors	3 RJ45 Gb Ethernet connectors
F	DVI connector	Digital Visual Interface connector
G	Option port	Interface connection options for peripheral devices or an additional monitor: • RS-232C connector (default) • DVI-D connector • NY Monitor Link connector • RJ45 Gb Ethernet connector

5-5-2　Connection Procedure

Use the following procedure to connect the IPC Application Controller.

Ensure the IPC is securely fastened to the mounting surface.

Ensure the mounted IPC can be connected to power and peripheral devices. Remove dust covers where applicable and store them in a safe place.

Additional Information

- Refer to *5-3 Mount* on page 5-9 for mounting details.
- Refer to:
  - *2-9-5 DVI Cables* on page 2-21
  - *2-9-6 USB Type-A to USB Type-B Cables* on page 2-21
  - individual cable specifications

  for cable bending requirements and connector clearance.

Use the following procedure to connect the IPC:

1 Ensure the ground terminal is connected.

Refer to *5-4-2 Ground* on page 5-21 for grounding details.

2 Connect the power connector Ⓐ.

Hold the black part to enable the auto-locking mechanism.
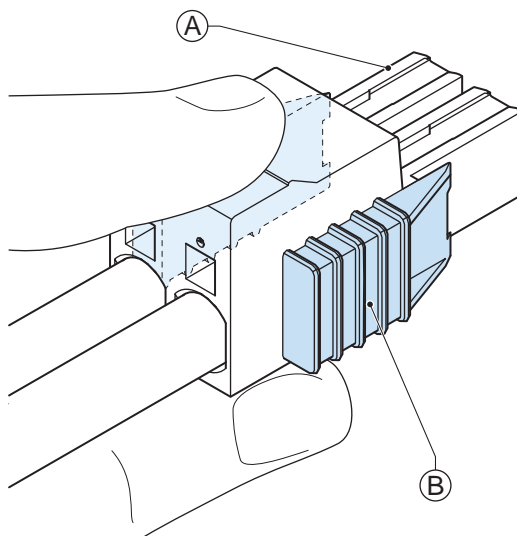
Do not push the orange sliders Ⓑ in the direction of the IPC because this will unlock the connector.

3   Connect the I/O connector.

Hold the black part Ⓐ when inserting the connector, this enables the auto-locking mechanism.
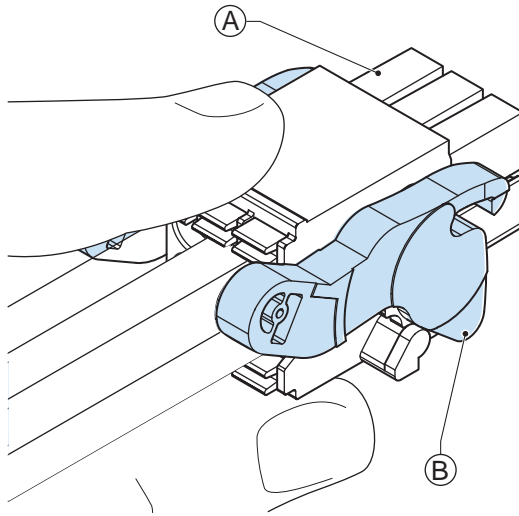
Do not tilt the orange levers Ⓑ because this will unlock the connector.

4   Connect an external monitor such as the Industrial Monitor.
Connect the monitor to the DVI connector and tighten the fastening screws or use the optional NYML connector.
For an Industrial Panel PC this is optional because a monitor is integrated.

5   Connect a device to the optional interface (DVI, RS-232C or NYML) if applicable and tighten the fastening screws when applicable.

6   Connect the USB ports to peripheral devices .

7   Connect the IPC to the Ethernet interface connector(s).

8   Connect the cameras to the PoE interface connector(s).

The IPC is connected.

5-6   Initial Power ON

This section describes how to Power ON the IPC Application Controller for the first time.

⚠ WARNING

Ensure that installation and post-installation checks of the product are performed by personnel in charge who possess a thorough understanding of the machinery to be installed.

5-6-1   Initial Power ON Procedure

Use the following procedure to power ON the IPC Application Controller for the first time.

1 Ensure the following conditions are present before applying power for the first time:
- The IPC is securely fastened to the mounting surface.
- The IPC is connected to ground.
- All connectors are securely fastened.

2 Ensure that the connected monitor(s) is powered ON.

3 Connect a keyboard and/or a mouse.

> **Additional Information**
>
> - If using an OMRON Industrial Monitor this may not be required because it has touch functionality.
> - Do not connect additional storage devices before the installation of the operating system completed. Adding storage devices like a USB flash drive, an SD memory card or a PCIe card might influence the default drive letter sequence.

4 Ensure the power supply is ON.

> **Precautions for Safe Use**
>
> Always check the power supply and power connections before applying power.
> Incorrect power connections can damage the product or cause burning.

> **Additional Information**
>
> If a drive with a windows operating system is installed a system backup of the factory state can be created. To create this system backup download and use the Rescue Disk Creator.
> Refer to the OMRON website for download details.

5 Press the power button and release within 1 second.
Refer to *2-3 Power Button* on page 2-8 for the power button location.
The IPC starts and the PWR LED will go ON.

> **Additional Information**
>
> - Do not connect or disconnect the DVI-D cable while power is supplied to the IPC.
> - If a Windows operating system is preinstalled:
>   - the Windows configuration will automatically start
>   - refer to *5-6-2 Windows Startup First Time* on page 5-39 for details

6 Verify the ERR LED is OFF.

The IPC is ON and if an operating system is installed it will start.

> **Precautions for Safe Use**
>
> Always use the SMART monitoring feature for storage devices that do not comply to the Omron Storage Device Specifications. Monitor the operating temperature and vibrations to ensure they stay within the environmental specifications of the storage device.

> **Additional Information**
>
> - The first time initialization will prepare the system and automatically reboot the IPC when required.
> - Install support software to fully utilize your IPC and optional connected hardware like the Industrial Monitor.

5-6-2 Windows Startup First Time

Use the following procedure for the first time startup of Windows on your IPC.

Additional Information

Do not power OFF the IPC during this procedure!
At the end of this procedure an automatic restart will result in the Windows home screen.

1 Ensure an input device is present.

- For an Industrial Box PC connect a keyboard and mouse or a touch monitor.
- For an Industrial Panel PC touch functionality is available. A keyboard and mouse are not required.

2 Follow the windows installation procedure.

Pay special attention to the following steps:

- Language
  Select the preferred language in the Language Selection Window
  Select the language carefully, the selected system language can not be changed.
- Legal stuff like license agreements
  - Windows 10: Select **Accept** to accept the combined Windows and OMRON license agreements.
  - Windows 7: Select **Accept** separately for Windows and for the OMRON utilities.
- Settings
  - Windows 10: Select **Customize** instead of **Use Express settings**.
    Set the settings according to your application environment.
  - Windows 7: Select **Use recommended settings**.
- Create a user account and password and enter the **password hint**

⚠ WARNING

Security setting adjustments should only be performed by the engineer in charge that possesses a thorough understanding of the security settings. Selecting non-recommended security settings can put your system at risk.

Precautions for Safe Use

- Choose an OS password that is not obvious to prevent unauthorized access.
- Remember the OS user name and password. The product is inaccessible without it.

The IPC will automatically restart.
A black screen will be visible for a few seconds and then the IPC will boot to the Windows start screen.

3 Login

4 Adjust the backlight, Logo LED, and Status LED brightness of the connected monitor(s) to your settings.

Additional Information

- Use the Industrial Monitor Utility to adjust the display and/or the connected OMRON Industrial Monitor.
- Verify that the IPC is responding to finger touches on the touchscreen of the product.

5 Install any third party software and drivers that may be required for your applications.

Precautions for Safe Use

Before operating the system, please make sure the appropriate software is installed and configured. Doing so may prevent unexpected operation.

5-7 Install Software

This section describes how to install the software for the IPC Application Controller.

5-7-1 Firewall

An industrial network should be separated from an office network.

Depending on the operating system a Firewall is preinstalled.

• For Windows 10 the standard firewall software is installed and enabled.

Precautions for Safe Use

• Separate the machine network segment from the office network to avoid communication failures.
• Install all updates and ensure the firewall stays up-to-date.

Additional Information

Check the IT policy of your company for available software and for details on the software environment the IPC Application Controller will operate in.

5-7-2 Anti-virus Software

The Windows operating system is vulnerable for viruses. Anti-virus software should be installed on the Windows operating system.

Depending on the operating system Anti-virus software is preinstalled.

• For Windows 10 the standard Anti-virus software is installed and enabled.

Additional Information

Check the IT policy of your company for available software and for details on the software environment the IPC Application Controller will operate in.

Precautions for Safe Use

• Make sure that your operating system environment is protected against malicious software and viruses.
• Install all updates and ensure virus definitions stay up-to-date.

5-7-3   Drivers and Custom Software

Use the following procedure to install drivers and custom software on your IPC Application Controller.
- For an download the drivers from the OMRON website.
- For an Industrial PC with a Windows operating system the drivers for most OMRON devices and common third party devices are already available on the product. They will be installed automatically after the initial Windows configuration or upon connection of a device to the IPC. Download the drivers from the OMRON website if reinstallation is required.

1 Install drivers that are required for the application.

2 Install third-party software that is required for the application.
Follow the installation instructions as supplied with the driver or software.

Precautions for Safe Use

Before operating the system, please make sure the appropriate software is installed and configured. Doing so may prevent unexpected operation.

5-7-4   Activate Windows

To activate Windows an internet connection is required.
If an internet connection is not available during the installation process then the Windows license will only be active after an internet connection has been established.
Activation is not required, a non-activated version of Windows is fully functional.
Refer to the Hardware Manual for the location of the Windows product key.

5-8 Connect UPS

The OMRON S8BA UPS protects the IPC from power failures, voltage variations and instantaneous voltage drops. Short power interruptions will be backed up by the UPS and the IPC will continue normal operation. The UPS signals the IPC when a power failure occurs and then the IPC can shutdown normally without data loss. The IPC can automatically start up again when the power is restored.

To connect the IPC to the OMRON S8BA UPS use one of the following two options:

• The USB connector and Power Attendant Lite Utility Software.
  Refer to *5-8-1 Connect UPS Using the USB Connector* on page 5-44 for details.
  This is the preferred connection method.
• The I/O connector and a custom software program
  Refer to *5-8-2 Connect UPS Using the I/O Connector* on page 5-46 for details.

⚠ WARNING

The use of an uninterruptible power supply (UPS) allows normal operation to continue even if a momentary power failure occurs, possibly resulting in the reception of an erroneous signal from an external device affected by the momentary power failure. Take external fail-safe measures. Where necessary, monitor the power supply voltage on the system for external devices and use it as an interlock condition.

Precautions for Safe Use

• Always use an uninterruptible power supply (UPS) to prevent data loss and other system file integrity issues caused by unexpected power interruption.
• Use an Omron S8BA UPS with the correct revision number to prevent improper system shutdown.
• Correctly perform wiring and setting, and ensure that the shutdown by the UPS can be executed.

Additional Information

• The minimum power requirements of the UPS are dependent on the power consumption.
  Refer to *4-1-3 Power Consumption Specifications* on page 4-4 for power consumption details.
• Refer to the OMRON website for S8BA specifications or to the *UPS S8BA User's Manual (Cat. No. U702)* for the UPS manual.
  Note that the power consumption details determine the output current/capacity of your UPS.

5-8-1   Connect UPS Using the USB Connector

The Power Attendant Lite Utility software monitors the UPS status via the USB interface and shuts down the IPC Application Controller when needed.

UPS Drivers and the required software is available.
- For IPCs with Windows 10 or Windows 7 preinstalled:
  - Drivers for the S8BA UPS are pre-installed
  - Installation files and manual for the Power Attendant Lite Utility are available in the directory *D:\OMRON-NY\Installers*Power Attendant Lite Utility
  - Installation files and manual for the UPS Settings Utility are available in the directory *D:\OMRON-NY\Installers*UPS Settings Utility
- For all other IPCs following software can be downloaded:
  - Drivers for the S8BA UPS from this OMRON website.
  - Installation files and manual for the Power Attendant Lite Utility from this OMRON website.
 - Installation files and manual for the UPS Settings Utility (Windows only) from this OMRON website.

> **Precautions for Safe Use**
>
> - Always use an uninterruptible power supply (UPS) to prevent data loss and other system file integrity issues caused by unexpected power interruption.
> - Use an Omron S8BA UPS with the correct revision number to prevent improper system shutdown.
> - Correctly perform wiring and setting, and ensure that the shutdown by the UPS can be executed.

Follow the steps below to connect the S8BA UPS with a USB cable and to configure it correctly.
Refer to *2-9-9 UPS* on page 2-23 for more information.

1   Ensure the revision number of the UPS is correct.
Refer to *2-9-9 UPS* on page 2-23 for more information.

2   For IPCs that do not have Windows pre-installed: Download the above mentioned software.

3   Wire the S8BA UPS.

1) Wire the input of the UPS to the output of the Power Supply.

2) Wire the output of the UPS to the power connector of the IPC.

3) Ground the UPS.

4) Connect the USB port of the S8BA UPS to the USB port of the IPC using the USB cable provided with the S8BA UPS.
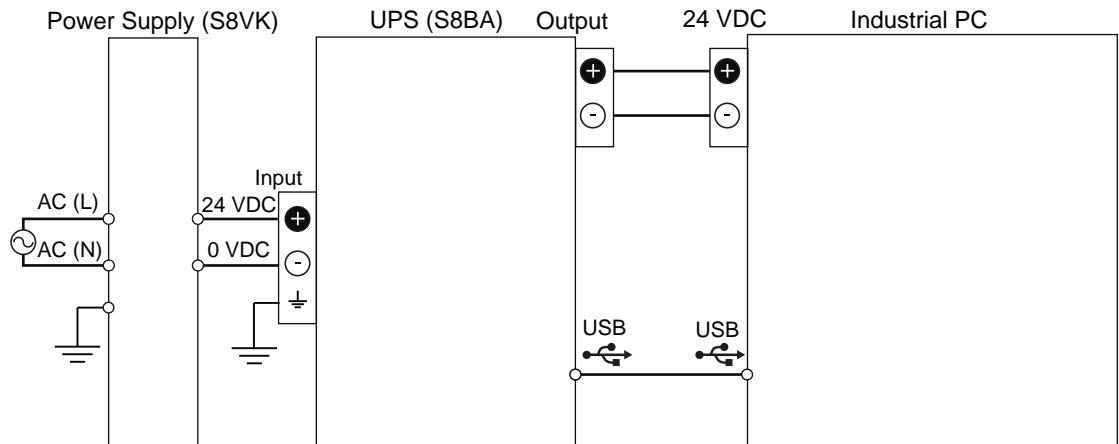
Refer to the *UPS S8BA User's Manual (Cat. No. U702)* for details.

Refer to *5-4-3 Wire the Power Connector* on page 5-28 for wiring details.

4 Supply power to the Power Supply.

5 Press and hold the UPS power button until **On** appears on the UPS display.

6 Power ON the IPC and then wait until the device drivers are successfully installed.

7 Configure the UPS using the UPS Settings Utility.

Refer to *UPS Setting Utility Instruction Manual for S8BA/BU-2RWL* for details.

8 Install the Power Attendant Lite Utility.

Refer to *3-3-6 Power Attendant Lite Utility* on page 3-21 for Power Attendant Lite Utility details.

9 Configure the UPS using the Power Attendant Lite Utility.

Refer to *3-3-6 Power Attendant Lite Utility* on page 3-21 for Power Attendant Lite Utility details.

10 Configure the IPC to auto-start after power loss within the BIOS settings.

Refer to *A-1 BIOS* on page A-2 for BIOS details.

11 Simulate a power interruption and confirm a correct shutdown of the IPC.

- Start the IPC
- Start applications
- Create a power interruption
- Monitor the shutdown sequence and confirm a correct shutdown sequence

The UPS is connected and configured.

The IPC will shut down properly in case of a power supply interruption and restart automatically when the power is restored.

> **Additional Information**
>
> - The default **Input sensitivity setting** is **Standard voltage sensitivity** and this is correct.
>   Do not set this parameter to **Low voltage sensitivity**. Doing so can cause a system malfunction when switching to battery mode.
> - The UPS Setting Utility can not be used when the Power Attendant Lite Utility is active.
>   To use the UPS Setting Utility:
>   1. Right-click the Power Attendant Lite Utility icon and select Agent Stop.
>   2. Use the UPS Setting Utility.
>   3. Right-click the Power Attendant Lite Utility icon and select Agent Start.

5-8-2 Connect UPS Using the I/O Connector

The I/O connector of the IPC Application Controller:
- receives the power status of the UPS with the UPS Mode Input when the IPC has a Windows operating system. For other operating systems this input is not functional.
- indicates the power status of the IPC to the UPS with the Power Status Output.

> **Additional Information**
>
> - A UPS connection using the I/O connector is only possible for a IPC with a Windows operating system. For all other operating systems use the USB connector to connect the UPS.
>   Refer to *5-8-1 Connect UPS Using the USB Connector* on page 5-44 for details.
> - The IPC does not react automatically to the UPS Mode Input.
>   **A custom software program is required** to shut down the IPC when needed.

UPS Drivers and the required software is available.
- For IPCs with Windows 10 or Windows 7 preinstalled:
  - Drivers for the S8BA UPS are pre-installed
  - Installation files and manual for the UPS Settings Utility are availabe in the installer directory
    D:\OMRON-NY\Installers\UPS Settings Utility
- For all other IPCs following software can be downloaded:
  - Drivers for the S8BA UPS from this OMRON website.
  - Installation files and manual for the UPS Settings Utility (Windows only) from this OMRON website.

> **Precautions for Safe Use**
>
> - Always use the recommended uninterruptible power supply (UPS) to prevent data loss and other system file integrity issues caused by unexpected power interruption.
> - Use an Omron S8BA UPS with the correct revision number to prevent improper system shutdown.
> - Correctly perform wiring and setting, and ensure that the shutdown by the UPS can be executed.

Follow the steps below to connect the S8BA UPS to the I/O connector of the IPC and to configure it correctly.
Refer to *5-4-4 Wire the I/O Connector* on page 5-31 for I/O Connector details.

1 Ensure the revision number of the UPS is correct.
Refer to *2-9-9 UPS* on page 2-23 for more information.

2 For IPCs that do not have Windows pre-installed: Download the above mentioned software.

3 Wire the S8BA UPS.

1) Wire the input of the UPS to the output of the Power Supply.

2) Wire the output of the UPS to the power connector of the IPC.

3) Ground the UPS.

4) Connect the Contact port of the S8BA UPS to the I/O port of the IPC with the connection cable S8BW-02.
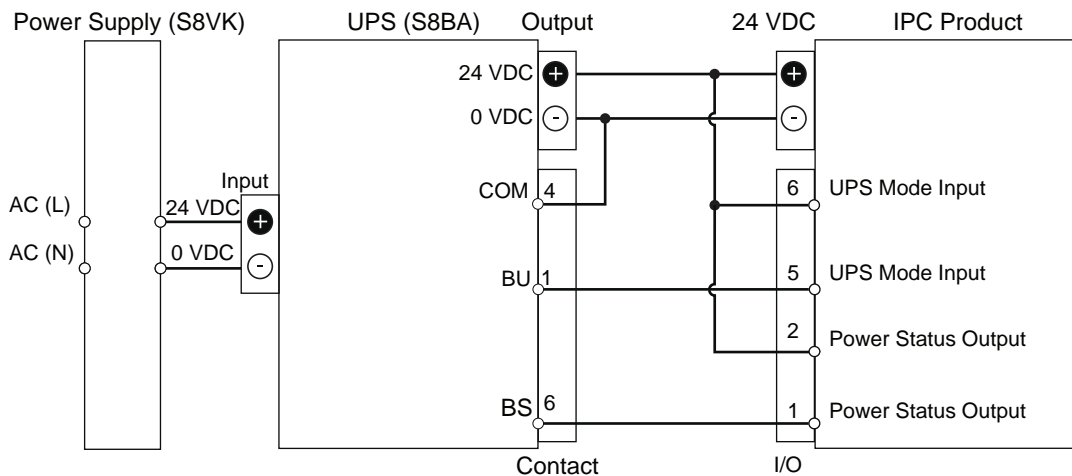
4 Power ON the IPC.

5 Configure the UPS.

1) Connect the USB cable supplied with the UPS to the USB connector of the UPS and to the USB connector of the IPC.

2) Configure the UPS using the UPS Settings Utility.
Refer to *UPS Setting Utility Instruction Manual for S8BA/BU-2RWL* for details.

3) Remove the USB cable between the UPS and the IPC

6 Configure the IPC to auto-start after power loss within the BIOS settings.
Refer to *A-1 BIOS* on page A-2 for BIOS details.

7 Create a software program that monitors the UPS Mode Input and initiates Power OFF of the IPC when the UPS Mode Input becomes active.
If the IPC has a Windows operating system then use the Industrial PC System API to create the software program.
Refer to *NY-series Software Development Kit User's Manual* for API details.

8 Install the created software program.

9 Test the created software program and ensure it functions correctly.

10 Simulate a power interruption and confirm a correct shutdown of the IPC.
• Start the IPC

- Start applications
- Create a power interruption
- Monitor the shutdown sequence and confirm a correct shutdown sequence

The UPS is connected and configured.

The IPC will shut down properly in case of a power supply interruption and restart automatically when the power is restored.

Additional Information

The default **Input sensitivity setting** is **Standard voltage sensitivity** and this is correct.
Do not set this parameter to **Low voltage sensitivity**. Doing so can cause a system malfunction when switching to battery mode.

5-9 Create Backup and Repair Media

Create the storage media to recover, restore or repair the operating system and other important files. There are several methods available, each with their own advantages and limitations.

> **Additional Information**
>
> Note that you can select more than one methods to create your recover, restore or repair media.

1 Refer to *Overview of Recover, Restore and Repair Methods* on page 7-4 and choose the best procedure for your situation.

2 Perform the procedures to create the desired storage media.

6

Operating Procedures

This section provides the operating procedures for the IPC Application Controller.

6

6-1   Power ON

This section provides Power ON details.

6-1-1   Power ON Using the Power Button

Start condition: Power is supplied to the IPC and the IPC is OFF.

1   Press the power button and release within 1 second.
Refer to *2-3 Power Button* on page 2-8 for the power button location.
The IPC starts and the PWR LED will turn ON.

2   Wait until the PWR LED is ON and verify that the ERR LED is OFF.
The IPC is ON and the Operating System, if installed, starts.

6-1-2   Power ON Using the Power ON/OFF Input

Start condition: Power is supplied to the IPC and the IPC is OFF.

1   Supply an input signal to pins 3 and 4 of the I/O connector.
The input signal must remain ON for a minimum of 60 ms and a maximum of 750 ms to be
correctly detected by the IPC.
The IPC starts and the PWR LED will turn ON.

2   Wait until the PWR LED is ON and verify that the ERR LED is OFF.
The IPC is ON and the Operating System, if installed, starts.

Additional Information

- Refer to *4-2-2 I/O Connector Specifications* on page 4-12 for connector specifications.
- Refer to *5-4-4 Wire the I/O Connector* on page 5-31 for wiring details.

6-1-3   Auto Power ON

The IPC can be configured to start up when power is supplied to the power connector.
The **Power Loss Control** BIOS setting controls this behavior.
Set the Power Loss Control setting to **Turn ON** to activate the Auto Power ON function.

Additional Information

Refer to *A-1 BIOS* on page A-2 for BIOS details.

6-2 Power OFF

This section provides Power OFF details.
Before following power OFF procedures below, check that the IPC Application Controller is ON by examining the LED indicators on the IPC.

6-2-1 Power OFF Using the Power Button

1 Ensure all programs are closed.
If required close all active programs.

2 Press and release the power button on the IPC Application Controller within 1 second.
The IPC Application Controller will shutdown.
Note that this behaviour of can be reconfigured with the Power Options settings.
Refer to *2-3 Power Button* on page 2-8 for power button location information.

3 Wait until the PWR LED is OFF.
The IPC is powered OFF.

> **Additional Information**
>
> The IPC will restart automatically if a UPS is connected to the I/O connector of the IPC. Use the Power button of the UPS or remove the input power from the UPS for a normal shutdown of the IPC.

6-2-2 Power OFF Using Windows Shut Down

1 Ensure all programs are closed.
If required close all active programs.

2 Select the Windows **Shutdown** button.
To display the **Shutdown** button:
• For Windows 10 select the **Windows** button and then the **Power** button.
• For Windows 7 select the **Windows** button.
The IPC Application Controller will shut down.

3 Wait until the PWR LED is OFF.
The IPC Application Controller is powered OFF.

6-2-3 Power OFF Using the Power ON/OFF Input

1 Ensure all programs are closed.

If required, close all active programs.

2 Supply a 24 VDC signal to the Power ON/OFF Input (pins 3 and 4) of the I/O connector.

The input signal must remain ON for a minimum of 60 ms and a maximum of 750 ms to be correctly detected by the IPC Application Controller.

The IPC Application Controller will shutdown.

Note that this behaviour can be reconfigured with the Power Options settings.

3 Wait until the PWR LED is OFF.

The IPC is powered OFF.

Additional Information

- Refer to *4-2-2 I/O Connector Specifications* on page 4-12 for connector specifications.
- Refer to *5-4-4 Wire the I/O Connector* on page 5-31 for wiring details.

6-2-4 Forced Power OFF Using the Power Button

Precautions for Safe Use

Press the power button for several seconds to force the product shutdown. Always back up files in the planned way to prevent data loss or system file corruption.

1 Ensure all programs are closed.

If required, close all active programs to prevent losing unsaved data.

2 Press and hold the power button on the IPC for 5 to 10 seconds.

Refer to *2-3 Power Button* on page 2-8 for power button location information.

The IPC Application Controller will power OFF.

Any optional operating system settings related to power OFF will be disregarded.

3 Wait until the PWR LED is OFF.

The IPC is powered OFF.

Confirm normal operation and check all product settings because unsaved data was lost.

6-3 Unified Write Filter

The IPC Application Controller is protected with a Unified Write Filter (UWF). The UWF intercepts disk changes and stores them into a memory overlay in RAM memory instead of applying them to disk. The UWF ensures the integrity of the disk at system startup.

All changes made to the system will be lost at the next reboot. This includes installation of new software, Windows updates and other software updates.

> **Additional Information**
>
> Refer to *6-4 Install and Update Software* on page 6-9 for the procedure to install and update software.

6-3-1   Enable Unified Write Filter

The Unified Write Filter (UWF) can be enabled to store changes into a memory overlay in RAM memory.

Additional Information

With the write filter enabled windows updates will not be applied to your IPC Application Controller. Windows updates should be installed regularly to prevent security risks. Refer to *6-4 Install and Update Software* on page 6-9 for details.

To enable the Unified Write Filter:

1   Right-click the icon **uwf-enable** located on the desktop and then select **Run as administrator**.
A command prompt window displays the message **File based write filter will be enabled on the next reboot. Press any key to continue ...**.
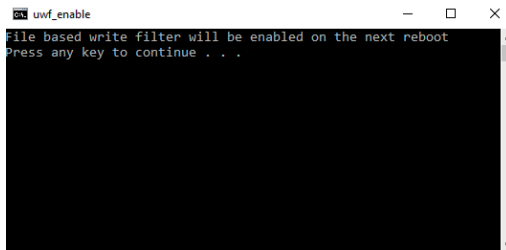
2   Press any key to close the command prompt window.

3   Reboot the IPC Application Controller.
During reboot the write filter is activated. After the reboot the desktop wallpaper will display **OMRON** without a subtitle.

The Unified Write Filter is enabled.

6-3-2   Disable Unified Write Filter

To disable the Unified Write Filter:

1 Right-click the icon **uwf-disable** and then select **Run as administrator**.
A command prompt window displays the message **File based write filter will be disabled on the next reboot. Press any key to continue ...**.
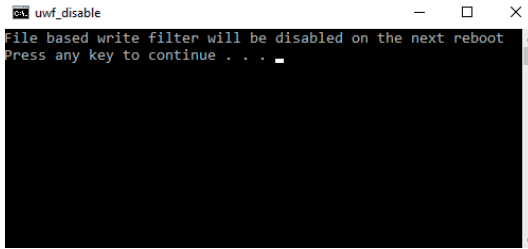
2 Press any key to close the command prompt window.

3 Reboot the IPC Application Controller.
During reboot the write filter is de-activated. After the reboot the desktop wallpaper will display **OMRON** with the subtitle **Write Filter Disabled**.

The Unified Write Filter is disabled.

6-3-3   Determine Status Unified Write Filter

The status of the Unified Write Filter can be determined from the windows desktop background.

With the write filter enabled the background has no subtitle under the white letters **OMRON**.

With the write filter disabled the background has the subtitle **Write Filter Disabled** under the white let-
ters **OMRON**.

To confirm the status of the write filter:

1   Right-click the icon **uwf-info** and then select **Run as administrator**.
A command prompt window displays the status with the line **Write filter is enabled** or **Write
filter is disabled**.
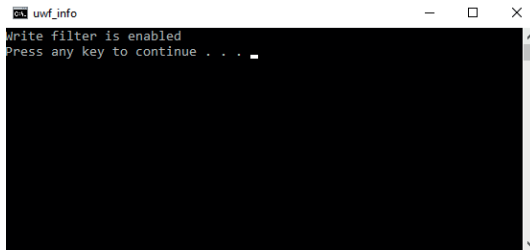
2   Press any key to close the command prompt window.
The status of the Unified Write Filter is known.

6-4   Install and Update Software

The IPC Application Controller is protected with a Unified Write Filter (UWF). Newly installed software and updates will be lost on the next system startup, when the UWF is enabled.

> **Additional Information**
>
> Refer to *6-3 Unified Write Filter* on page 6-5 for detailed information.

To install new software and updates use the following procedure:

1   Disable the write filter.
Refer to *6-3-2 Disable Unified Write Filter* on page 6-7 for details.

2   Manually install new software and (Windows) updates.

3   Reboot the IPC Application Controller to ensure the installation is finalized.
Recheck for new updates manually when installing Windows updates to ensure all updates are installed.

4   Enable the write filter.
Refer to *6-3-1 Enable Unified Write Filter* on page 6-6 for details.

5   Ensure the status of the Unified Write Filter is enabled.
Refer to *6-3-3 Determine Status Unified Write Filter* on page 6-8 for details.

The installed software and updates are preserved at the next system startup.

> **Additional Information**
>
> Windows updates can also be installed using the procedure as described by Microsoft.

6-5   React to Product Messages

The IPC Application Controller uses the Industrial PC Tray Utility icon Ⓐ in the system tray area Ⓑ of Windows to present Warnings and Errors.
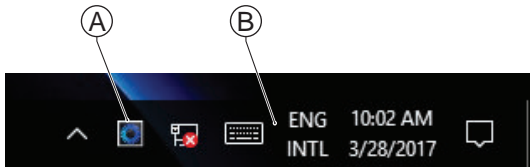
Check the Industrial PC Tray Utility icon for a Warning or Error symbol.
A Warning or Error symbol displayed on the Industrial PC Tray Utility icon indicates a product message.
To react to a product message:

1   Select the Industrial PC Tray Utility icon.
A pop-up window will appear.

2   Read the message available in the pop-up.

3   Refer to *7-2-1 Warning and Error Messages* on page 7-15 for all details on the message.
Perform the actions presented for the message until the Warning or Error is resolved.
The product messages for the IPC Application Controller are resolved.

6-6   React to Windows Messages

Windows uses the Windows Action Center icon Ⓐ in the system tray area Ⓑ of Windows to present Warnings and Errors.

Windows 10

Check the Windows Action Center icon for a Warning or Error symbol.
A Warning or Error symbol displayed on the Windows Action Center icon indicates a Windows message.
To react to a Windows message:

1 Open the Windows Action Center.
  • For Windows 10: Click the Windows Action Center icon.
  A pop-up window will appear.
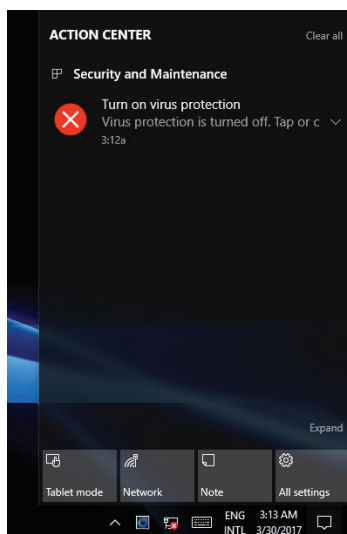
Windows 10

2 Read the message available in the window.

3 Perform the actions until each Warning or Error is resolved.
The Windows messages for the IPC Application Controller are resolved.

7

Maintenance

This section provides an overview of all maintenance tasks for the IPC Application Controller.

7

7-1   Preventive Maintenance

Preventive Maintenance covers all actions that prevent downtime.

7-1-1   Preventive Maintenance Schedule

Prevent unscheduled downtime with the following preventive maintenance schedule.

Daily	Reference
Check IPC Application Controller status	• Refer to *7-2-1 Warning and Error Messages* on page 7-15 for IPC Messages. • Refer to *6-6 React to Windows Messages* on page 6-11 for Windows Messages. • Refer to *2-2 LED Indicators* on page 2-6 for LED details.
Monitor storage devices that do not comply to the Omron specifications	Refer to *Storage Device Considerations* on page 2-20 for details.

Weekly	Reference
Clean the IPC	Refer to *7-1-2 Clean the IPC* on page 7-3 for cleaning details.
Ensure you have the latest software updates	Refer to *7-1-3 Keep Software Updated* on page 7-3 for details.

When changing applications or configurations	Reference
Create a backup of the IPC Application Controller	Refer to *7-1-4 Create Backup and Repair Data* on page 7-4 for backup details.

Periodically but at least every 6 months	Reference
Check the ambient environment: • Temperature and humidity within specifications • Noise sources not close to the IPC Application Controller	Refer to *4-4 Environmental Specifications* on page 4-23 for environmental specifications.
Check installation: IPC Application Controller mounted securely	Refer to *5-3 Mount* on page 5-9 for installation details.
Check wiring and connections: • Cable connectors fully inserted and locked • No damaged wiring or connectors	Refer to *5-4 Wire* on page 5-21 for wiring details. Refer to *5-5 Connect* on page 5-34 for connection details.
For a cooling layer with removable cover: • Check the battery replacement date. • Replace the battery before the replacement date.	• Refer to *7-2-2 Remove the Cover* on page 7-17 to check the label. • Refer to *7-2-4 Replace the Battery* on page 7-20 to replace the battery.
Check the backup and repair media.	Refer to *7-1-5 Check the Backup and Repair Media* on page 7-14 for details.

When the IPC Application Controller is not powered for 6 months	Reference
For a cooling layer with removable cover and active cooling: • Confirm both fans rotate immediately after Power ON. • Replace the Fan Unit when the fans do not rotate smoothly.	Refer to *7-2-3 Replace the Fan Unit* on page 7-18 to replace the Fan Unit.

7-1-2 Clean the IPC

Clean the IPC periodically in order to keep it in the best operating condition.

Wipe the IPC with a dry, soft cloth.

Precautions for Safe Use

Do not use corrosive substances to clean the product.
Doing so may result in the failure or malfunction.

7-1-3 Keep Software Updated

Always keep software at the latest released version to ensure stable operation.

This is specifically important for:

• Anti-virus software

• Firewall software

• Internet browser

• Windows security patches

• OMRON software

Precautions for Correct Use

After an OS update or a peripheral device driver update for the product is executed, the product behavior might be different. Confirm that operation is correct before you start actual operation.

Additional Information

• Refer to *5-7-1 Firewall* on page 5-41 for Firewall details.
• Refer to *5-7-2 Anti-virus Software* on page 5-41 for Anti-virus details.

7-1-4 Create Backup and Repair Data

Ensure the operating system, software and data can always be restored when required.

There are different software tools to create a backup and repair data.

Refer to *Overview of Recover, Restore and Repair Methods* on page 7-4 for an overview of the possibilities and their goals and requirements.

Precautions for Correct Use

Create backups according to the preventive maintenance schedule to prevent data loss and system integrity issues.
Refer to *7-1-1 Preventive Maintenance Schedule* on page 7-2 for intervals.

Select the Backup and Repair procedure or procedures that are most suitable for your situation.

Overview of Recover, Restore and Repair Methods

Depending on the goal and depending on the available backup and repair data an applicable backup and recover, restore or repair action can be selected.

An overview of the different methods to restore and repair Windows and custom files:

Tool	Goal	Preparation in advance	Restore details	Refer to
Omron Rescue Disk	Restore the • Windows partition • Boot partition • MBR = GPT	Create a Rescue Disk	• A partial recovery or recovery of user data is not possible • The IPC recovers to the state of the previously created Rescue Disk image • Uses a USB storage device	**Prepare**: *Create a New Rescue Disk with the Rescue Disk Creator* on page 7-5 **Create**: *Create a System Backup with the Rescue Disk* on page 7-7 **Check**: *Check the Backup Information on the Rescue Disk* on page 7-14 **Restore**: *Restore a System Backup with the Rescue Disk* on page 7-28
Windows Recovery disk	Restore Windows 10 to a previous state	Create a Windows Recovery disk	• A partial recovery or recovery of user data is not possible • Windows recovers to the state of the previously created Recovery image • Uses a USB storage device • The IPC can boot with this USB	**Create**: *Create a Windows 10 Recovery Drive* on page 7-9 **Restore**: *Recover Windows 10 with the Recovery Drive* on page 7-30

Tool	Goal	Preparation in advance	Restore details	Refer to
Windows WinRE	Restore Windows to the 'Out of the box' factory state	No actions required. A recovery partition is pre-installed	• A partial recovery or recovery of user data is not possible • Windows recovers to the 'Out of the box' situation • The IPC can boot from the partition	**Create**: Not applicable. **Restore**: *Recover Windows 10 Using WinRE* on page 7-31
Windows Backup and Restore	Restore a user's selection of folders	Create a Windows Backup	• The data is restored to the state of the previously created backup • Recovery of specific folders is possible. Backups can be created automatically at predefined intervals • No recovery of the Windows operating system • Uses any type of storage device	**Create**: *Create a Custom Backup with Windows Backup* on page 7-11 **Check**: *Check the Custom Backup Storage Device (Windows)* on page 7-14 **Restore**: *Restore a Custom Backup with Windows* on page 7-34

Additional Information

Contact your OMRON representative when the IPC needs to be restored and you do not have any restore or recover possibility.

Create a New Rescue Disk with the Rescue Disk Creator

A Rescue Disk is a disk with the Rescue Disk Utility that enables users to create a system backup and to do a system restore.
A system backup contains the Windows partition, the boot partition and the MBR.

Prepare:
• The Rescue Disk Creator
  Refer to *Installation* on page 3-12 for installation details.
  Refer to *Messages Creating the Rescue Disk* on page 3-14 for message details.
• A USB storage device that has sufficient capacity to backup the content of the IPC. The capacity should be at least the Windows partition size + 16 GB. The recommended minimum read/write speed is 190 MB/s.
  Note that all content on this USB storage device will be erased during the Rescue Disk creation.

Use the following procedure to create a new Rescue Disk:

1 Connect a USB storage device that has sufficient capacity to backup the content of the IPC.

2 Select the Windows **Start** Button.

3 In the search field, input *Rescue*.

4 Right-click **Rescue Disk Creator** and then select **Run as administrator**.

The Rescue Disk Creator Utility window opens.
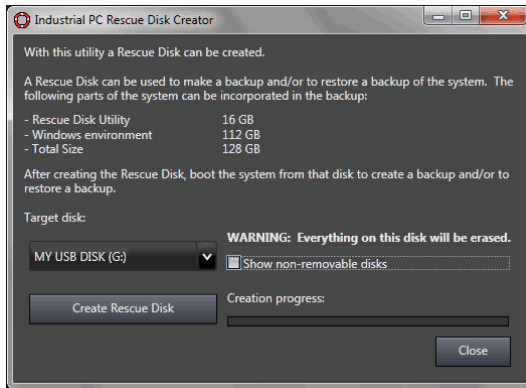
5 Select the connected USB storage device at **Target disk:**.

Refer to *Messages* on page 3-13 for message details if required.

The button **Create Rescue Disk** will be enabled as soon as a USB storage device is detected and accepted.

6 Select the **Create Rescue Disk** button to start the creation process.

Wait until the progress bar shows the Rescue Disk creation finished.

Refer to *Messages* on page 3-13 for message details if required.

7 Select **Close** to close the Rescue Disk Creator.

The Rescue Disk is **available but it is still empty**, there is no system backup on the Rescue Disk.

Next step is to create a system backup with this Rescue Disk.

> 📝 **Additional Information**
>
> • Refer to *Create a System Backup with the Rescue Disk* on page 7-7 for system backup details.
> • Refer to *Restore a System Backup with the Rescue Disk* on page 7-28 for system restore details.

Create a System Backup with the Rescue Disk

A Rescue Disk is a disk with the Rescue Disk Utility; this is the software that performs the system backup and system restore procedures of the IPC.
A system backup contains the Windows partition, the boot partition and the MBR.
A system backup can not include the User Data partition.

Precautions for Correct Use

The backup data of the Rescue Disk can be used to recover the data of the IPC that created that backup. It can also restore data to another IPC if the product configuration is identical to the IPC that created the backup.

Additional Information

To create a system backup a Rescue Disk should be available.
• Refer to *Create a New Rescue Disk with the Rescue Disk Creator* on page 7-5 for Rescue Disk creation.
• Refer to *Messages Using the Rescue Disk* on page 3-16 for Rescue Disk error messages.

To create a system backup:

1 Ensure the IPC is powered OFF.

2 Ensure a keyboard is connected to the IPC.

3 Connect the Rescue Disk to a USB connector of the IPC.

4 Power ON the IPC while pressing the **F11** key twice per second.
The option to select your boot device will appear.

Your Rescue Disk will be displayed in this boot menu with the manufacturer data of your USB device.
If your boot device is not visible in this list:

1) Disconnect the USB connector of the Rescue Disk.

2) Re-insert the USB connector of the Rescue Disk.

3) Select **Ctrl**, **Alt** and **Delete** to reboot the IPC.

4) Press the **F11** key twice per second.
The option to select your boot device will appear with your boot device in the list.

5   Use the arrow keys to select the Rescue Disk and then select **Enter**.

The menu window opens.

The mentioned number can be different from the number displayed on your screen.

```
Welcome to the Rescue Disk Utility □□ , what would you like to do?

Create Backup
Restore Backup
Backup information
Storage device information
Exit
```
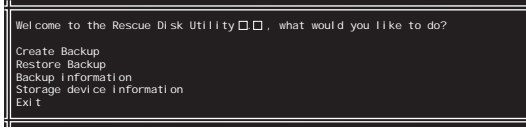
6   Select **Create Backup**.

The backup confirmation window opens.

```
MBR and Windows partition will be backed up.

Continue
Return
```
or
```
MBR, Boot and Windows partitions will be backed up.

Continue
Return
```
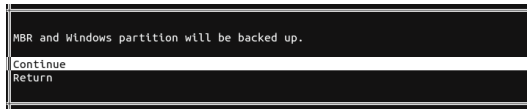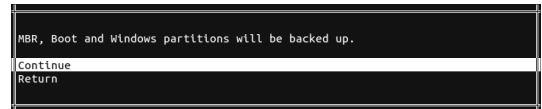
Windows 7   Windows 10

7   Select **Continue** to start the system backup process.

Wait until the message **Backup finished** appears.

8   The message **Would you like to enter an optional comment for the created backup?** gives the option to add an extra remark to the created backup.

Select **No** to exit without an optional comment.

Select **Yes** to add the optional comment. Add the comment and press [Enter] to finalize the backup creation.

9   Select **OK** to return to the main menu.

10 Select **Exit** to close the Rescue Disk Utility.

The IPC will power OFF.

11 Remove the Rescue Disk and store it in a safe place.

A system backup is created on the Rescue Disk.

Precautions for Correct Use

Create backups according to the preventive maintenance schedule to prevent data loss and system integrity issues.
Refer to *7-1-1 Preventive Maintenance Schedule* on page 7-2 for intervals.

Additional Information

Refer to *Restore a System Backup with the Rescue Disk* on page 7-28 for system restore details.

Create a Windows 10 Recovery Drive

A Windows recovery drive can repair Windows if a serious error occurs.

Prepare:

- A USB storage device that has sufficient capacity to backup the content of the IPC. The capacity should be at least the Windows partition size + 16 GB. The recommended minimum read/write speed is 190 MB/s.
  Note that all content on this USB storage device will be erased.

Use the following procedure to create a Windows recovery drive:

1 Insert the USB storage device in a USB 3.0 connector.

2 Select the Windows **Start** Button.

3 In the search field, input *recovery drive*.

4 Select **Create a recovery drive**.
The recovery drive window opens.
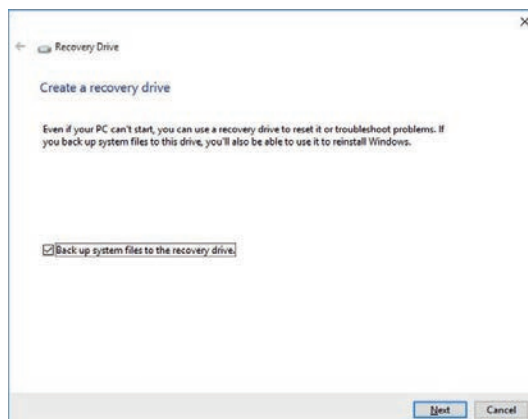
5 Check the checkbox **Back up system files to the recovery drive** and then select **Next**.
The drive selection window opens.
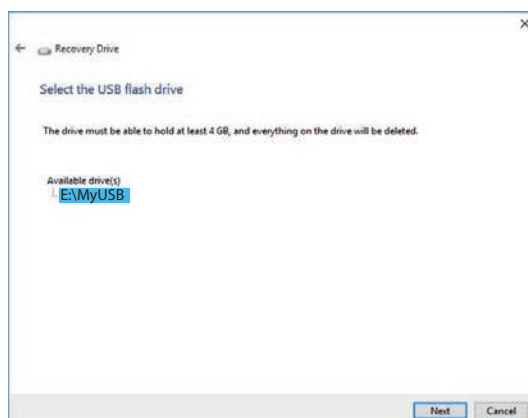
6 Select the applicable drive letter and then select **Next**.
The Create window will appear.
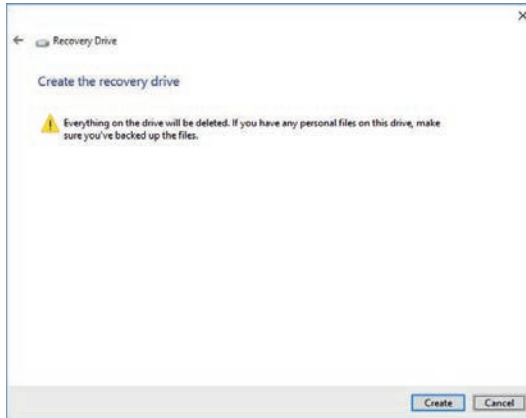
7 Read the warning and if your personal files are safe then select **Create**.

8 Wait until the progress bar is finished and the message **The recovery drive is ready** appears.
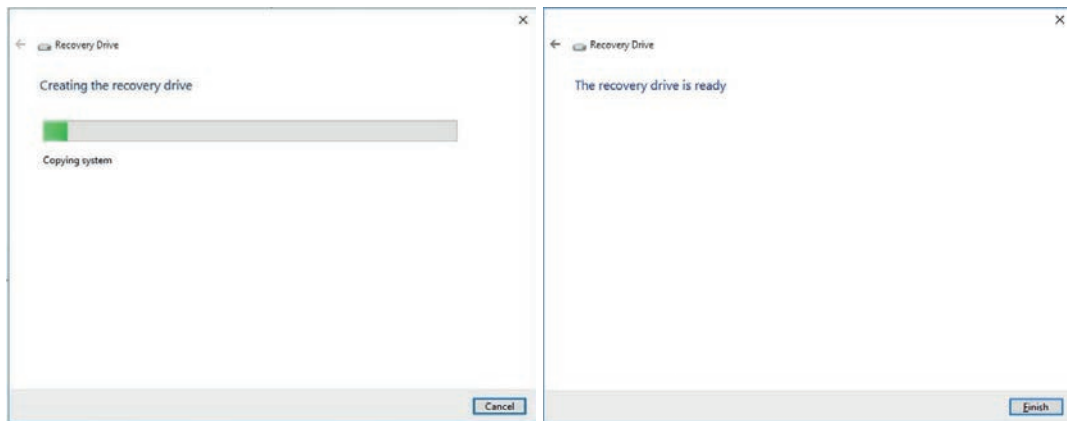
9 Remove the USB storage device and store it in a safe place.

The Windows recovery drive is ready.

📓 **Additional Information**

Refer to http://windows.microsoft.com/ for recovery drive details.

Create a Custom Backup with Windows Backup

Use the following procedure to create a custom backup of the IPC Application Controller with the Windows Backup and Restore mechanism.

To manually or automatically create a customized backup:

1 Select the Windows **Start** Button.

2 In search field, input *Backup*.

3 Select **Backup and Restore**.
The Backup and Restore window opens.
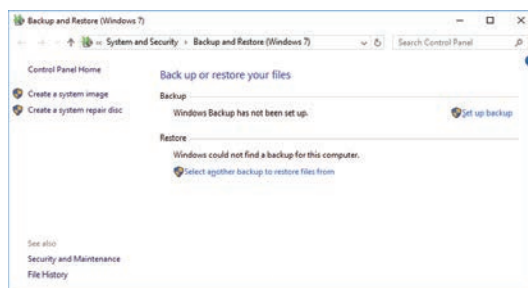
4 Select **Set up backup**.
The Set up backup window opens.
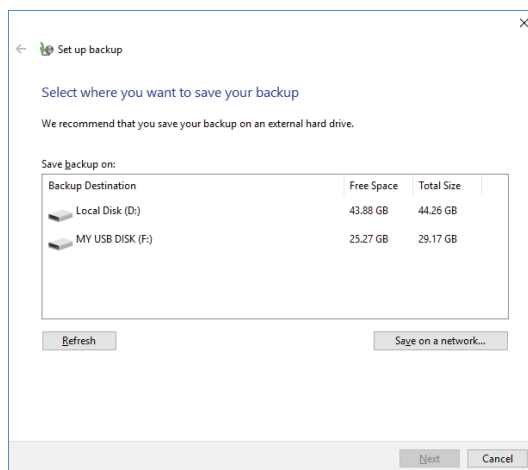
5 Select the backup destination.
A network location can be added with **Save on a network**.

 Additional Information

Preferred locations for an automatic backup are:
• A network drive
• The local drive in drive bay B, when installed.

6 Select **Next**.

The following window will appear:
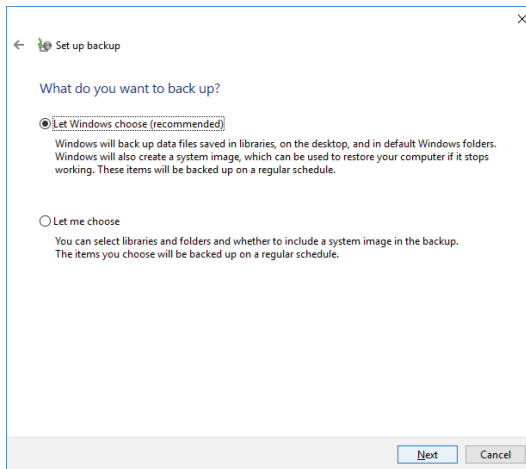
7 Select **Let me choose** and then select **Next**.

The following window will appear:
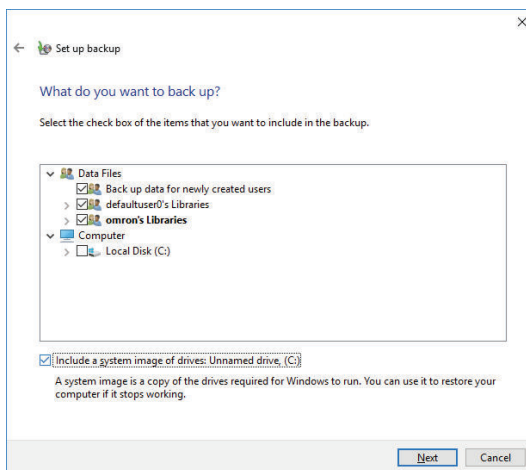
8 Select all directories you want to include in the backup.
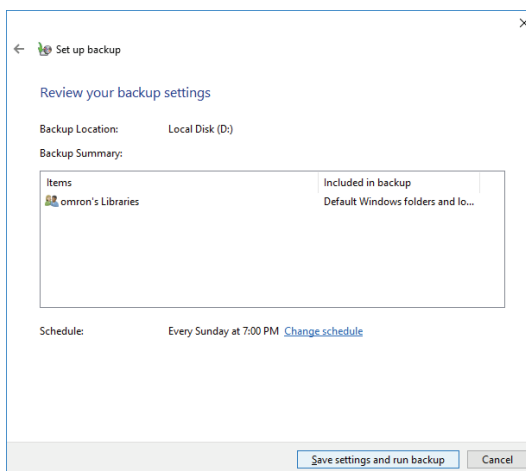
9 Select **Next**.

10 Select **Configure schedule** or **Change schedule** and change the backup schedule.
Ensure:
- The interval is short enough to minimize data loss when a restore is required
- The IPC Application Controller is powered ON during the backup periods
- The time the backup is scheduled does not interfere with normal operation

or uncheck **Run backup on a schedule** if an automatic backup is not possible.

11 Select **OK**.

12 Select **Save settings and run backup** to create the first backup.

Precautions for Correct Use

Create backups according to the preventive maintenance schedule to prevent data loss and system integrity issues.
Refer to *7-1-1 Preventive Maintenance Schedule* on page 7-2 for intervals.

Additional Information

- Check your backup to ensure it contains all data required for a restore.
- Refer to http://windows.microsoft.com/ for Backup and Restore details.
- Refer to *Restore a Custom Backup with Windows* on page 7-34 for the Restore Procedure.

7-1-5   Check the Backup and Repair Media

Use the following procedure to check the backup or repair media.

Check the Backup Information on the Rescue Disk

Use the following procedure to check the rescue disk for the system backup.

1   Use the rescue disk to boot the IPC.

Refer to *Restore a System Backup with the Rescue Disk* on page 7-28 for details.

Follow the first few steps of the procedure until following screen appears:

```
Welcome to the Rescue Disk Utility 0000.0xxx, what would you like to do?

Create Backup
Restore Backup
Backup information
Exit
```

2   Select **Backup Information** and then **Enter**.

Following screen will appear:

```
Backup created on Fri Dec  1  12:34:56

    Model name       : NY512-1300
    Serial number    : 0123
    Lot number       : 01234N
    Content          : MBR, Boot, Windows and Machine Control partitions
    Unit version     : V1.16.00
    OSB version      : 0000.0016
    Comment by user  : demo for manual - your content will be different

    Current System:

    Model name       : NY
    Serial number    : 0123
    Lot number       : 01234N
    Unit version     : V1.16.00
    OSB version      : 0000.0016

OK
```

3   Check the content. If there is no content then there is no usable backup on this Rescue Disk.

4   Select **Exit**.

The rescue disk information is checked.

Check the Custom Backup Storage Device (Windows)

Use the following procedure to check the custom backup storage device.

1   Insert the storage device with the backup in the IPC Application Controller that created the backup.

2   Follow the first few steps of the restore procedure to display the 'Restore files' screen.

Refer to *Restore a Custom Backup with Windows* on page 7-34 for details.

3   Browse the storage device and ensure at least one backup is displayed.

4   Select **Cancel** to cancel the restore procedure.

The storage device with the custom backup is approved.

7-2 Corrective Maintenance

Corrective maintenance covers all actions to correct problems that cause downtime.

> ## ⚠ WARNING
>
> Do not attempt to disassemble, repair, or modify the product in any way. Doing so may result in malfunction or fire.

Contact your local OMRON representative if the corrective maintenance actions did not solve the problem.

7-2-1 Warning and Error Messages

Warning and Error messages are provided by the IPC Application Controller when there is a potential problem that may cause downtime. This section provides details about these messages.
Warning messages inform you about a situation that will lead to downtime of the IPC Application Controller.
Error messages inform you about what caused the downtime of the IPC Application Controller.

The following message channels are available.

LED Indicators

The ERR LED indicator provides information on warnings and errors.

Industrial PC Support Utility

The Industrial PC Support Utility provides information on warnings and errors.

The Industrial PC Support Utility indicates:
• Internal temperature above setting
  Check the status of the Fan Unit and check the ambient conditions.
• Low revolution speed of the Fan Unit
  • Check for excessive dust on the fans and in the Fan Unit.
  • If required replace the Fan Unit.
• Low battery status
  Replace the battery.

Windows Action Center

The Windows Action Center provides information on Windows related warnings and errors.

The Windows Action Center indicates security and maintenance issues.
Some examples:
- Virus protection (Important)

  Windows did not find anti-virus software on this computer.
- Windows Update (Important)

  windows Update is not set up for this computer.
- Set up backup

  Your files are not being backed up.

> **Additional Information**
>
> Refer to *6-6 React to Windows Messages* on page 6-11 for details.

Windows Pop Up Window

Windows Pop Up windows provide information on Windows issues.

An example of a Windows Pop Up

- Close programs to prevent information loss.

  To solve this change the paging file size.

7-2-2 Remove the Cover

Applicable for products with a cooling layer that has a removable Cover.

The Cover of the cooling layer provides access to the following items.
- Battery
- Fan Unit (applies to products with active cooling)

The inside of the Cover contains a label with the battery replacement date.

No tools are required to open the Cover.

Use the following procedure to remove the Cover of the IPC.

1 Power OFF your IPC if it has active cooling.

▷ **Precautions for Safe Use**

Do not remove the fan cover while the power is ON. Contact with the rotating fan may result in injury.

2 Remove the Cover.
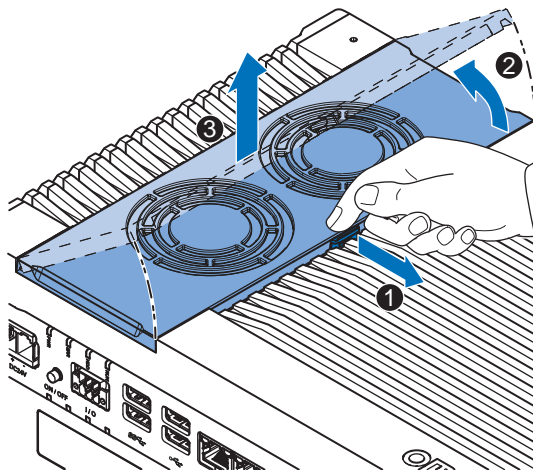
1) Pull the lever ❶ to unlock the Cover.

2) Lift the side ❷ to tilt the Cover.

3) Remove ❸ the complete Cover.

The Cover is removed.

To mount the Cover, position the side of the Cover in the IPC and push the cover in place.

The lever will lock in place.

7-2-3   Replace the Fan Unit

The fans are mounted in the Fan Unit.

Use the following procedure to replace the Fan Unit.

Precautions for Safe Use

If the replacement Fan Unit has been stored over 6 months then check the performance of the Fan Unit after replacement.

Additional Information

Refer to *2-8-2 Fan Unit* on page 2-16 for the model.

1   Power OFF the IPC.

2   Remove the Cover of the IPC.

Additional Information

Refer to *7-2-2 Remove the Cover* on page 7-17 for the cover removal procedure.

3   Disconnect the Fan Connectors from the board.
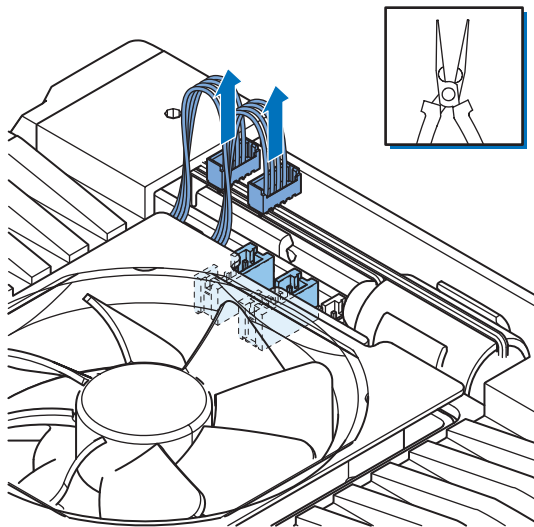
4 Replace the complete Fan Unit.
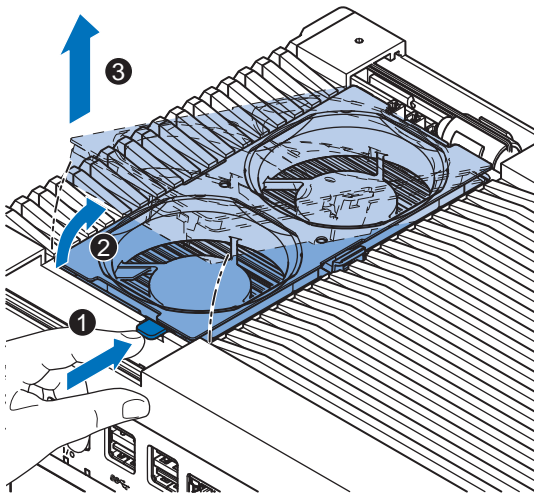
1) Push the lever ❶ to unlock the Fan Unit.

2) Lift the lever to tilt ❷ the Fan Unit.

3) Remove ❸ the complete Fan Unit.

5 Insert the new Fan Unit in the IPC.

Ensure the end of the Fan Unit Ⓐ is positioned under the fan guide Ⓑ.
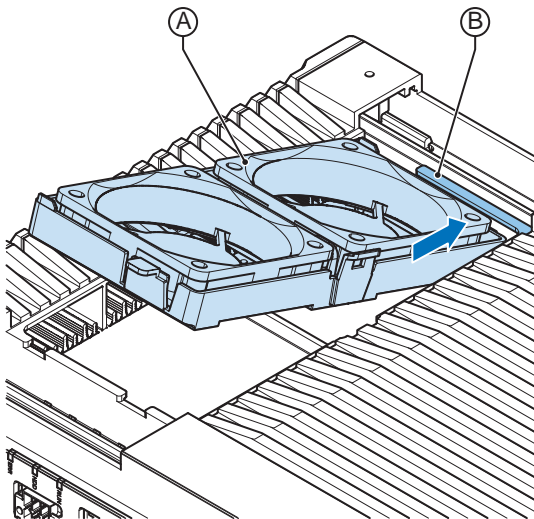
6 Connect the Fan Connectors to the board.

7 Mount the Cover.

8 Power ON the system.
Confirm both fans rotate immediately after Power ON.

The fans are replaced and the alarm is automatically reset.

7-2-4   Replace the Battery

Applicable for products with a cooling layer that has a removable cover.

Precautions for Safe Use

- The Battery may leak, rupture, heat, or ignite. Never short-circuit, charge, disassemble, heat, or incinerate the Battery or subject it to strong shock.
- Dispose of any Battery that has been dropped on the floor or otherwise subjected to excessive shock. Batteries that have been subjected to shock may leak if they are used.
- UL standards require that only an experienced engineer replace the Battery. Make sure that an experienced engineer is in charge of Battery replacement.

Precautions for Correct Use

- Always touch a grounded piece of metal to discharge static electricity from your body before starting an installation or maintenance procedure.
- Make sure to use a battery of the correct type and install the battery properly.
- Apply power for at least five minutes before changing the battery. Mount a new battery within five minutes after turning OFF the power supply. If power is not supplied for at least five minutes, the clock data may be lost. Check the clock data after changing the battery.
- Turn ON the power after replacing the battery for a product that has been unused for ax extended period of time. Leaving the product unused without turning ON the power even once after the battery is replaced may result in a shorter battery life.

Additional Information

- Refer to *2-8-1 Battery* on page 2-16 for the battery model.

Use the following procedure to replace the battery:

1 Power OFF the IPC.

2 Remove the cover.

Additional Information

Refer to *7-2-2 Remove the Cover* on page 7-17 for the cover removal procedure.

3 Lift the battery ❶ from the compartment.

4 Disconnect the battery from the battery connector ❷.
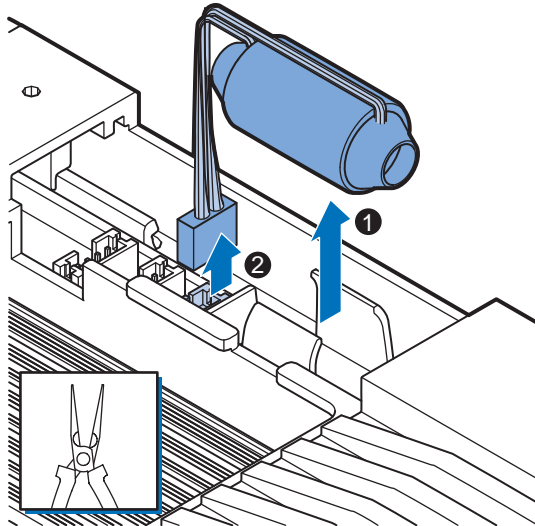
5 Connect the new battery to the battery connector.

6 Place the new battery in the IPC.
Ensure the wires are at the side of the battery and not on top of the battery. If the wires are on top of the battery this might make closing and opening the cover more difficult.

7 Write the next date of replacement on the label at the inside of the cover.

📓 **Additional Information**

Refer to *2-8-1 Battery* on page 2-16 for lifetime of the battery.

8 Mount the cover.

9 Remove the power connector for at least 3 seconds to reset the battery warning.

10 Power ON the IPC.

11 Check the Date and Time in the operating system.
Correct the Date and Time if this is required.
The battery is replaced and the alarm is reset.

7-2-5   Replace a Drive

Use the following procedure to replace a drive.

Prepare the new drive.

> 📑 **Additional Information**
>
> • Refer to *1-4 Product Configuration* on page 1-5 for the installed drive model.
> • Refer to *2-9-4 HDD and SSD Storage Devices* on page 2-20 for the available drive models.
> • Refer to *4-1-7 Storage Device Specifications* on page 4-7 for drive specifications.

To replace a drive:

1   Power OFF the IPC.

2   Remove the drive cover.
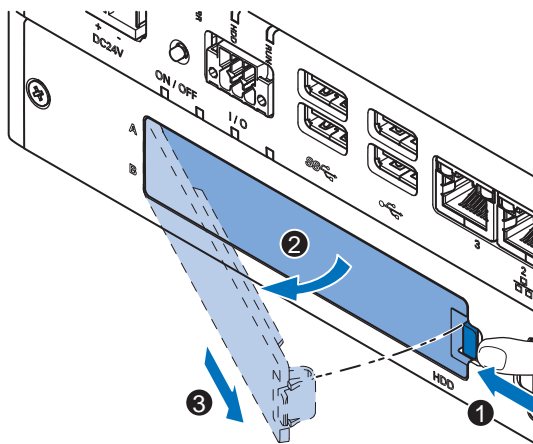
1) Push the lock lever ❶ .

2) Tilt the cover ❷ .

3) Remove the drive cover ❸ .

> 📑 **Additional Information**
>
> • Refer to *2-6 Drive Bays* on page 2-14 for the location of the drive cover.
> • The IPC has 2 drive bays, marked with "A" and "B" at the left side of the drive cover. Take note of the bay position for the drive that is being removed and do not place a drive in the incorrect bay.

3 Pull the metal shielding cover out of the IPC.

4 Insert the drive cover in the drive bracket bay ❶ and move it down ❷ so that it locks in the drive bracket.

5 Remove the drive bracket from the IPC using the drive cover.
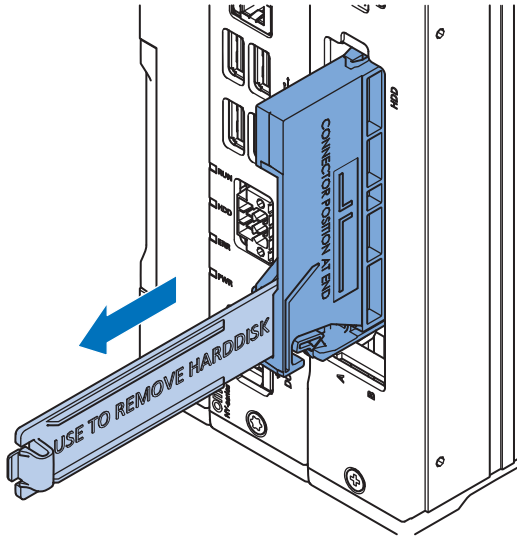
6 Remove the 4 mounting screws ❶ and then remove the drive ❷ from the drive bracket.
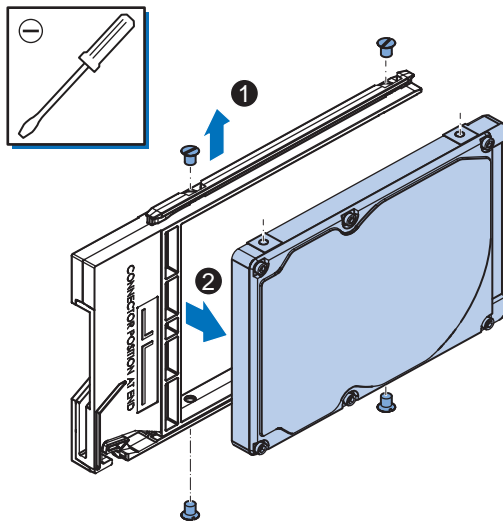
7 Align the connectors of the replacement drive as shown Ⓐ on the bracket. Then insert the replacement drive ❶ in the bracket and insert the 4 mounting screws ❷. Tighten these screws with a torque of 0.35 N·m.
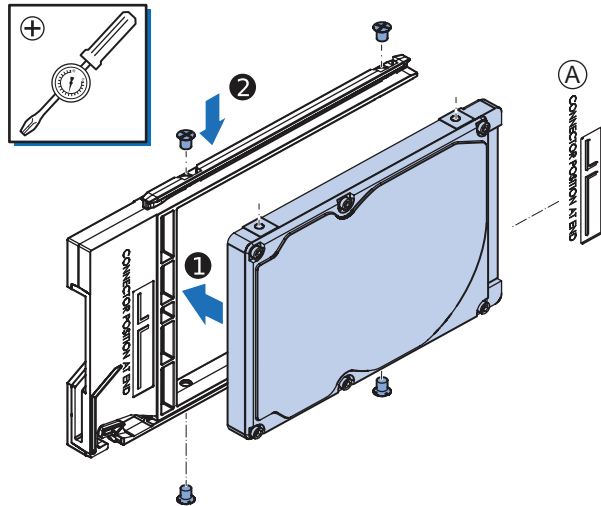
8 Insert the bracket with the replacement drive into the correct bay of the IPC.
Ensure the bracket is completely in the IPC with an extra push.
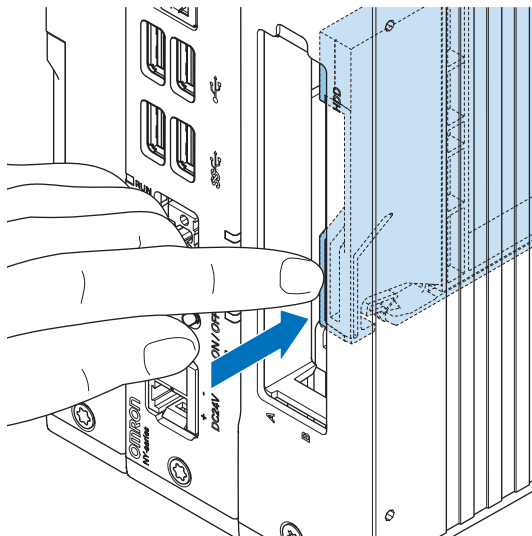
The drive bracket will lock into place when it is fully inserted.

9 Insert the metal shielding cover.
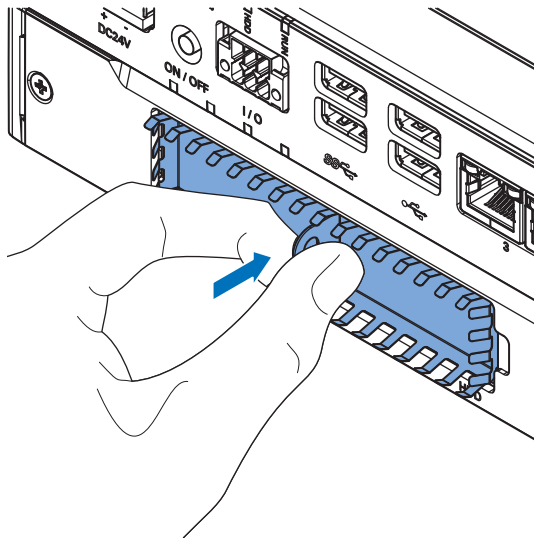
10 Mount the drive cover.

The lock lever will click when closed correctly.
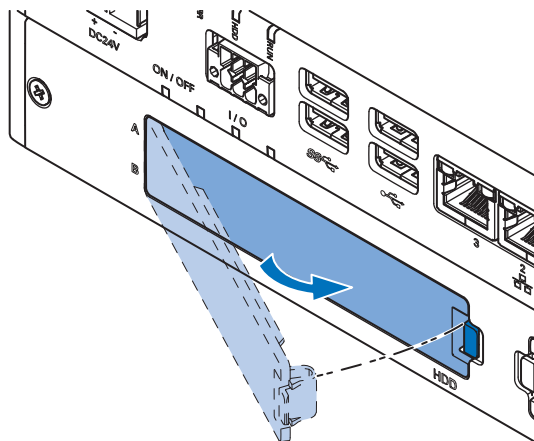
11 Restore the drive data.

The drive is replaced.

7-2-6   Restore and Repair Data

Depending on the goal and depending on the available backup and repair data an applicable restore or repair action can be selected.

Use the *Overview of Recover, Restore and Repair Methods* on page 7-4 to determine the method that is applicable to your situation.
Refer to the mentioned procedure to perform the restore or repair procedure.

Restore a System Backup with the Rescue Disk

A Rescue Disk is a disk with the Rescue Disk Utility; this is the software that performs the backup and restore procedures.

Use the Rescue Disk to restore the system backup. This will restore the Windows partition, the boot partition and the MBR to the moment the Rescue Disk backup was created.

Precautions for Correct Use

The backup data of the Rescue Disk can be used to recover the data of the IPC that created that backup. It can also restore data to another IPC if the product configuration is identical to the IPC that created the backup.

Additional Information

To restore a system backup, a Rescue Disk with a system backup should be available.
- Refer to *Create a New Rescue Disk with the Rescue Disk Creator* on page 7-5 for Rescue Disk creation details.
- Refer to *Create a System Backup with the Rescue Disk* on page 7-7 for system backup details.
- Refer to *Messages Using the Rescue Disk* on page 3-16 for Rescue Disk error messages.

To restore a system backup:

1 Ensure the IPC is powered OFF.

2 Ensure a keyboard is connected to the IPC.

3 Connect the Rescue Disk to a USB connector of the IPC.

4 Power ON the IPC while pressing the **F11** key twice per second.
The option to select your boot device will appear.


```
Please select boot device:

PO: 32GB SATA Flash Drive
My Rescue Disk
Generic Ultra HS-COMBO
Enter Setup

    ↑ and ↓ to move selection
    ENTER to select boot device
    ESC to boot using defaults
```

Your Rescue Disk will be displayed in this boot menu with the manufacturer data of your USB device.

If your boot device is not visible in this list:

1) Disconnect the USB connector of the Rescue Disk.

2) Re-insert the USB connector of the Rescue Disk.

3) Select **Ctrl**, **Alt** and **Delete** to reboot the IPC.

4) Press the **F11** key twice per second.

The option to select your boot device will appear with your boot device in the list.

5 Use the arrow keys to select the Rescue Disk and then select **Enter**.

The menu window opens.

```
Welcome to the Rescue Disk Utility □□, what would you like to do?

Create Backup
Restore Backup
Backup information
Storage device information
Exit
```

The mentioned number can be different from the number displayed on your screen.

6 Select **Restore Backup**.

The restore selection window opens.

```
Please select what to restore:

MBR
Windows Partition
Return
```
or
```
Select the restore option:

MBR
MBR, Boot and Windows Partitions
Return
```
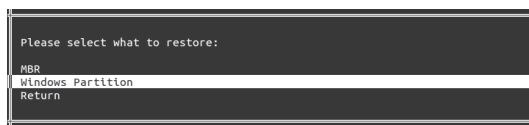
Windows 7   Windows 10

7 Select:
- **Windows Partition** for Windows 7
- **MBR, Boot and Windows Partitions** for Windows 10

to restore the system.

The overwrite confirmation window opens.

```
The target device will be overwritten. Would you like to continue?

Yes
No
```
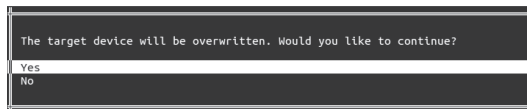
8 Select **Yes** to start the system restore process.

Wait until the message **Restore finished** appears.

9 Select **OK** to return to the main menu.

10 Select **Exit** to close the Rescue Disk Utility.

The IPC will power OFF.

11 Remove the Rescue Disk and store it in a safe place.

The system backup of the IPC is restored.

📝 **Additional Information**

- Refer to *3-3-4 Rescue Disk Creator* on page 3-11 for Rescue Disk Creator details.
- Refer to *Create a New Rescue Disk with the Rescue Disk Creator* on page 7-5 for Rescue Disk creation details.
- Refer to *Create a System Backup with the Rescue Disk* on page 7-7 for system backup details.

Recover Windows 10 with the Recovery Drive

Use the following procedure to recover Windows 10 to a previous state using a Recovery Drive.

Ensure a Windows Recovery Drive is created earlier and it is available:

To recover Windows 10:

1 Connect the USB storage device to the IPC.

2 Power ON the IPC and press **F11** repeatedly to display the Boot Selection Popup menu.

3 Select your boot device and then select **Enter**.
The IPC will reboot.

4 When requested choose your keyboard layout.
The window *Choose an option* will appear.
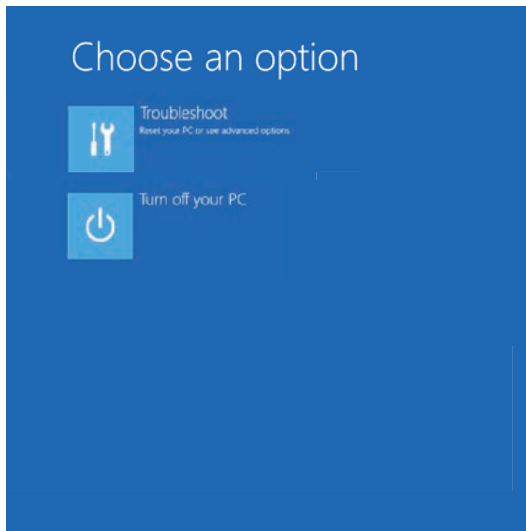
5 Select **Troubleshoot**
The window *Troubleshoot* will appear.

6 Select **Recover from a drive**.

📝 **Additional Information**

Windows will be restored to the state the recovery disk was created!

Follow the instruction and wait whire Windows 10 reinstalls.

Windows 10 is restored.

Recover Windows 10 Using WinRE

WinRE is the Windows 10 Recovery Environment. This environment supports you with the repair of common causes of unbootable operating systems.

In a Windows Recovery Environment the storage device contains a partition with Windows installation information. This partition is hidden from Windows.
To use WinRE a login for an account with Administrator priviliges is required.

Use the following procedure to recover Windows 10:

1 Select the Windows **Start** Button.

2 In the search field, input *Change advanced startup options* and then select it from the search results. The Settings page for Recovery opens.

Recovery

Reset this PC

If your PC isn't running well, resetting it might help. This lets you choose to keep your personal files or remove them, and then reinstalls Windows.

Get started

Advanced startup

Start up from a device or disc (such as a USB drive or DVD), change your PC's firmware settings, change Windows startup settings, or restore Windows from a system image. This will restart your PC.

Restart now

3 Select **Restart now**.

The PC will restart and then display several options.
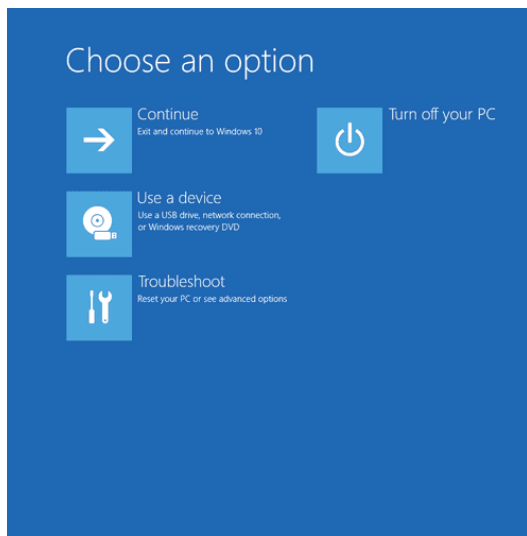
4 Select the option **Troubleshoot** to display the Troubleshoot options and then select **Advanced options**.
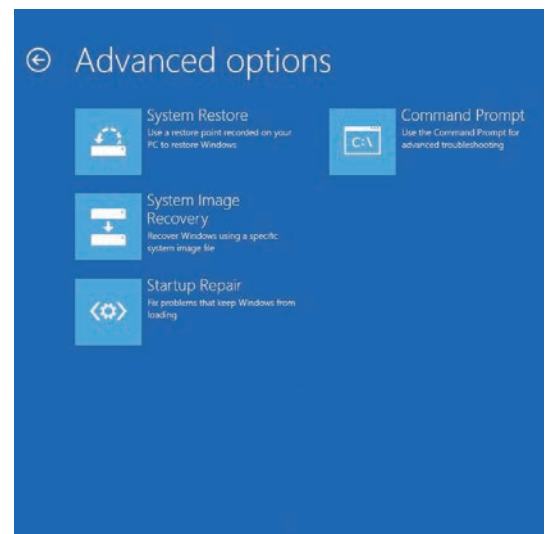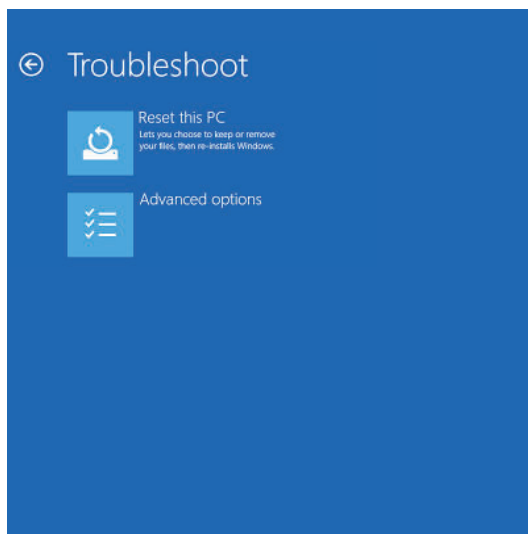
5 Select **Command prompt**.

The login window will appear.

6 Login with an administrator account.

7 In the command prompt console type *cd e:* and then **Enter** to change to hidden drive e:.

8 Type *dir* to display the content of drive e: and verify there is a file *restore.bat* .

9 Type *restore.bat* and then **Enter**.

The restore process will start and a progress bar will display the status.

When the restore process is finished the message **The operation completed succesfully.** appears in the command prompt console.

10 Close the command prompt console.

The window to choose an option will appear.
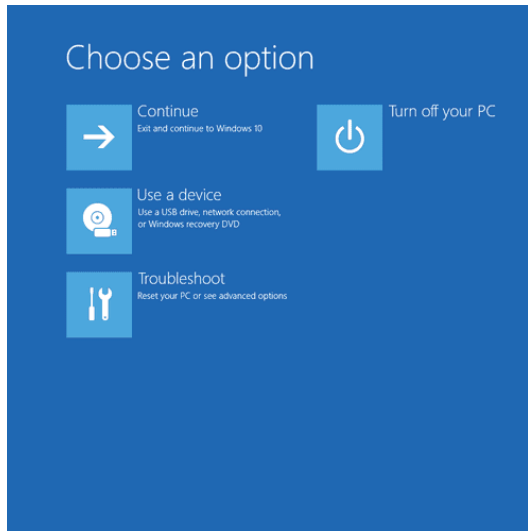
11 Select the option **Turn off your PC** to power down the IPC .

12 Power ON the IPC and follow the steps on the screen.

The Windows 10 operating system is recovered.

Restore a Custom Backup with Windows

Use the following procedure to restore a custom backup of user files with Windows Backup and Restore.

> **Additional Information**
>
> • Refer to *Create a Custom Backup with Windows Backup* on page 7-11 for Custom Backup details.

Ensure:
• The IPC Application Controller is ON
• You are logged in
• A backup is created earlier and it is available

To restore a backup:

1 Select the Windows **Start** Button.

2 In the search field, input *Backup*.

3 Select **Backup and Restore**.
The Backup and Restore window opens.
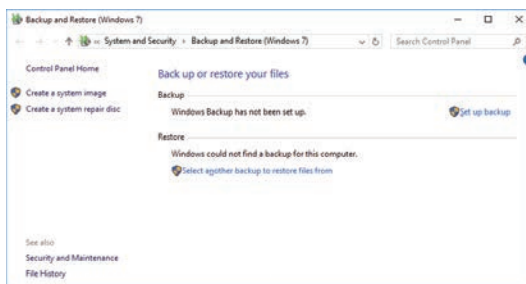
4 Select **Restore my files**.

The restore files window opens.
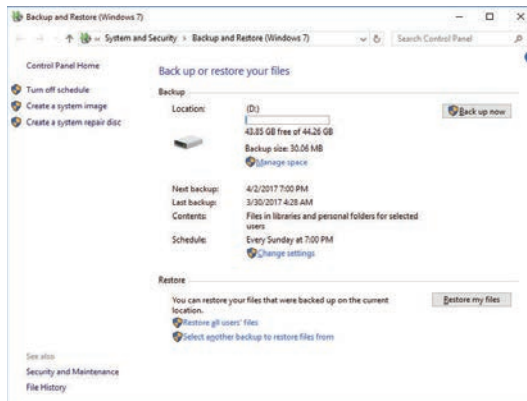
5 Use the buttons **Search** and **Browse for files** or **Browse for folders** to find the created back-up.
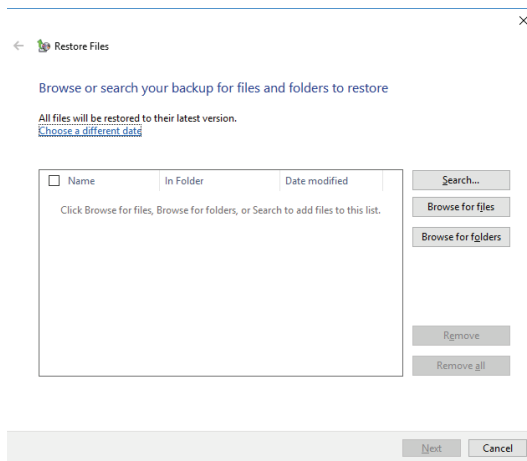
6 Add the files and folders to be restored and then select **Next**.

📋 **Additional Information**

With this Windows Restore procedure it is not possible to restore files that are in use. This means system files and files of the logged in user can not be restored with this procedure.

7 Select **In the original location** and then select **Next**.

The progress window will appear.
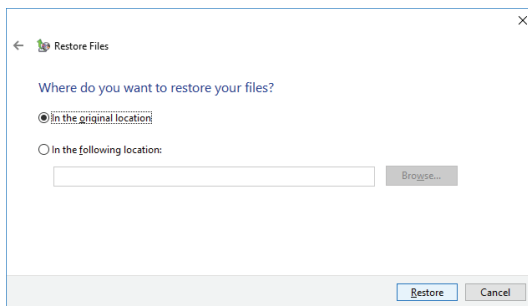
8 Wait until the message **Your files have been restored** appears and then select **Finish**.
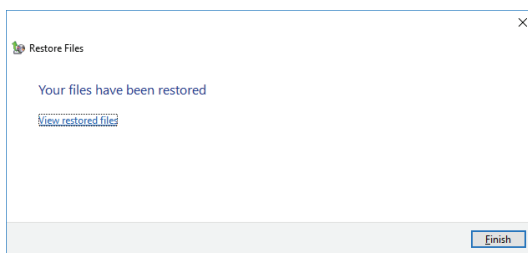
The files are restored.

7-2-7　Allocate a Drive in Windows

An added drive must be allocated before it becomes visible in Windows.
To allocate a drive in Windows:

1　Ensure the IPC is ON.

2　Select the Windows **Start** Button.

3　In the search field, input *partition*.

4　Select **Create and format hard disk partitions**.
The Disk Management window opens. The new disk is displayed with a storage space **Unallocated**.

5　Right click on the unallocated space and select **New Simple Volume**.
The New Simple Volume Wizard opens.

6　Follow the steps in the New Simple Volume Wizard.
The drive is installed and ready for use in Windows under the configured drive letter.

Additional Information

Do not format, resize or change settings for partition C:. Windows is installed on drive partition C: and any change to this partition can cause Windows to stop working.

7-2-8   Windows Event Viewer

The Windows Event Viewer displays logged events.
These logged events can support you in corrective maintenance.

1   Select the Windows **Start** Button.

2   In the search field, input *Event*.

3   Select **View event logs**.
The Event Viewer opens.
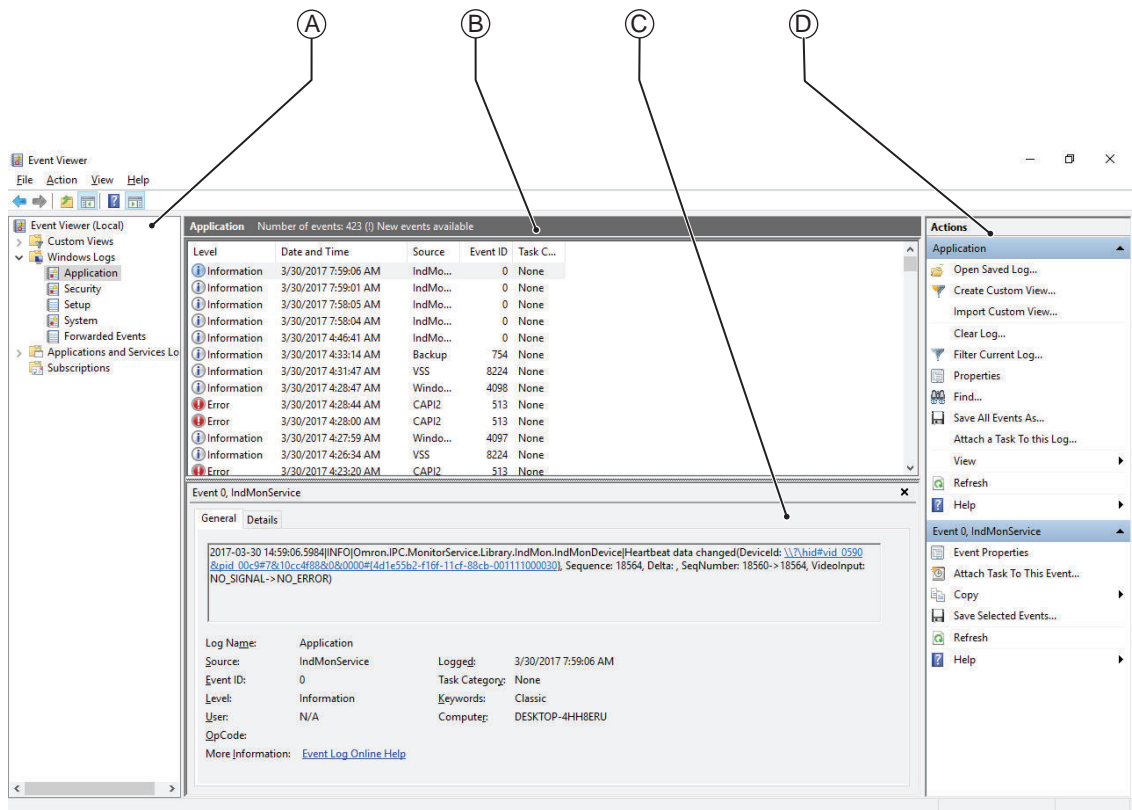
Item	
A	Selection tree
B	Event list
C	Event details
D	Action list

4   In the Selection tree expand **Windows Logs** and select **Application**.
The Event list will display the Events.

5   Select the heading **Source** to sort the event messages per application.

6   Scroll to the event you want to investigate.
Refer to the section 'Logging' of a specific utility for more details.

7   Select the event to display details in the Event details window or to take action in the Action overview window.

Filter Events and Event Details

This procedure explains how to filter events in the Windows event log.
To filter the events:

1 Open the Windows Event Viewer.
   Refer to *7-2-8 Windows Event Viewer* on page 7-38 for details.

2 In the *Actions list* select *Filter Current Log*.
   The Filter Current Log page opens.

3 Input the desired filters and select **OK**.

4 The filtered events will appear in Event list of the Event Viewer.
   Select an event in the Event list to display Event details in the Event details part of the Event Viewer.

The filtered events are available including the details per event.

7-2 Corrective Maintenance

7

7-2-8 Windows Event Viewer

7-2-9 Windows Low on Memory

The Windows memory can become low when adding applications and/or updates.

When the memory is low a new window with the message *Close programs to prevent information loss* will appear.

Increase the paging file size to solve this problem.

To increase the page file size:

1 Select the Windows **Start** Button.

2 In the search field, input *advanced system settings*.

3 Select **View advanced system settings**.
The Advanced tab page in the Windows System properties will appear.

4 In the group **Performance**, select the **Settings...** Button.
The Performance options window will appear.

5 Select the **Advanced** tab page.

6 In the group **Virtual memory**, select the **Change...** Button.

7 Select the checkbox **Automatically manage paging file size for all drives**.
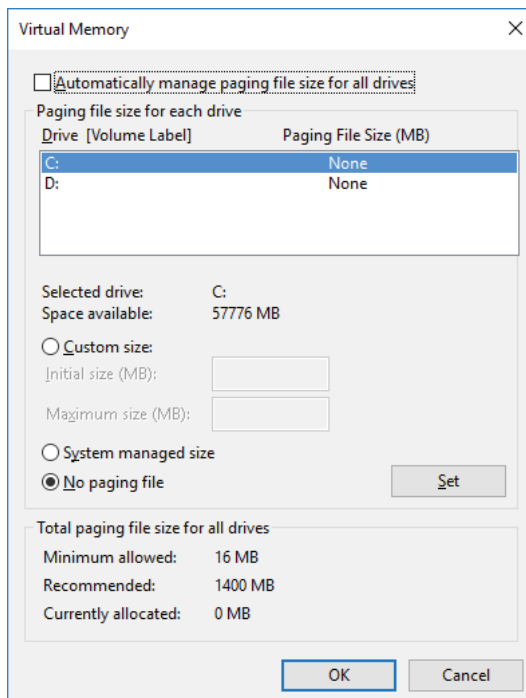
8 Select the **OK** Button to save this setting.

⊲)) **Precautions for Safe Use**

Virtual memory settings can affect the performance of the system. Disable the paging file after installation of applications or updates.

7-2-10   Windows Blue Screens

A blue screen will appear if Windows crashes.

Possible solutions for repetitive blue screens:

1 Install the latest updates of Windows.

2 Install the latest device drivers.

3 If changes to the system were made: Undo recent hardware changes, undo recent driver updates and then roll back system to latest working state.

> **Additional Information**
>
> • For troubleshooting an external boot device might be handy.
>   Refer to *Overview of Recover, Restore and Repair Methods* on page 7-4 for possible boot devices.

A

Appendices

A

A-1   BIOS

This section provides the BIOS information of the IPC Application Controller.

⚠ WARNING

Changing BIOS information is only allowed for the engineer in charge
that possesses a thorough understanding of the BIOS settings because
it can change the behavior of the product.

A-1-1   BIOS Overview

The BIOS contains settings that influence the behavior of the IPC Application Controller.
The touchscreen functionality is not functional when working in BIOS.
Ensure a USB keyboard is connected.

BIOS Setup Program

Press the **DEL** key repeatedly directly after Power ON to access the BIOS Setup Program.

> **Additional Information**
>
> For 4th, 6th and 7th generation CPUs also the **F2** key can be used.
> For Atom CPUs also the **Esc** key can be used.

Boot Selection Popup Menu

Press the **F11** key repeatedly directly after Power ON to display the Boot Selection Popup menu.
The popup menu allows selection of the boot device and the option to enter the BIOS setup program.

BIOS Structure

The BIOS contains a menu bar, a left frame and a right frame.
The left frame displays all the options that can be configured in the selected menu.
The left frame uses following colors:
• Blue = Configurable options
• Greyed-out = Not configurable
• Inverse white = Selected

The right frame displays the key legend. Above the key legend is an area reserved for text messages.
These text messages explain the options and the possible impacts when you change the selected option in the left frame.

Use the →← keys to navigate between pages.
The menu bar gives access to following pages:
• **Main**
• **Advanced**
• **Chipset**

- **Security**
- **Boot**
- **Save & Exit**

BIOS Navigation and Function Keys

The right part of the BIOS screens is divided in two parts.

Top part.
Provides additional information on selected screens or parameters.
Bottom part.
Provides information on Keys.

- → ← : Select Screen

  Changed between different BIOS pages.

- ↑ ↓ : Select Item

  Changed between different parameters.

- **Enter: Select**

  Selects the parameter that has the focus and displays a submenu or the possibility to change the parameter.

- **+ / - : Change Option**

  Change settings. A numerical value will be increased or decreased. A boolean value will toggle.

- **F1: General Help**

  Displays help information.

- **F2: Previous Values**

  Changes all parameters to the values they had when entering the BIOS.

- **F9: Optimized Defaults**

  Changes all settings to the default values.

- **F10: Save & Exit**

  Saves all changes and exits the BIOS.

- **ESC: Exit**

  Go one level up. For parameters this is the previous level. For the main pages this exits the BIOS.

BIOS Password & Write Protection

A BIOS password protects the BIOS setup program from unauthorized access. This ensures that users cannot change the system configuration without authorization. With an assigned BIOS password, the BIOS prompts the user for a password on a setup entry. If the password entered is wrong, the BIOS setup program will not launch.
The BIOS uses encryption for the password.
The BIOS password is case sensitive with a minimum of 3 characters and a maximum of 20 characters. Once a BIOS password has been assigned, the BIOS activates the grayed out **BIOS Update and Write Protection** option. If this option is set to **enabled**, only authorized users (users with the correct password) can update the BIOS. With the BIOS password protection and the BIOS update and write protection, the system configuration is completely secured. If the BIOS is password protected, you cannot change the configuration of an end application without the correct password.

A-1-2   BIOS for 7th generation CPUs

The BIOS settings for 7th generation CPUs.

The BIOS is divided in the pages Main, Advanced, Chipset, Security, Boot and Save&Exit.

BIOS - Main

The main setup screen gives platform information about the BIOS, Board Information, Firmware Revision, MAC Addresses and information about the number of Boots and the Running Time. Platform Information gives CPU and platform details.

Changeable BIOS Main parameters and their factory default values:

- **System Date**

  Use the **Enter** key to the next Date field.

- **System Time**

  Use the **Enter** key to the next Time field.

BIOS - Security

Provides security information like BIOS Password and HDD information.

⚠ **WARNING**

Security setting adjustments should only be performed by the engineer in charge that possesses a thorough understanding of the security settings. Selecting non-recommended security settings can put your system at risk.

Changeable BIOS Security parameters and their factory default values:

Item			Default / Remark
BIOS Password			Empty
BIOS Lock			Enabled
HDD Security Configuration	Diskname		Display disk parameters *1
Secure Boot Menu	Secure Boot		Disabled
	Secure Boot Customization		Custom
	Key Management	Factory Key Provision	Disabled
		Secure Boot variable	Display variable details

*1.   Only when a storage device is installed.

BIOS - Boot

Provides Boot information and configuration settings.

Changeable BIOS Boot parameters and their factory default values:

Item		Default / Remark
Quiet Boot		Disabled
Setup Prompt Timeout		1
Bootup NumLock State		On
Power Loss Control [1]		Remain Off
AT Shutdown Mode		Hot S5
Enter Setup If No Boot Device		No
Enable Popup Boot Menu		Yes
Boot Priority Selection		Type Based
Boot Option Sorting Method		UEFI First
Type Based Boot Priority	1st Boot Device	CPU specific [2]
	2nd Boot Device	Disabled
	3rd Boot Device	Disabled
	4th Boot Device	Disabled
	5th Boot Device	Disabled
	6th Boot Device	Disabled
	7th Boot Device	Disabled
	8th Boot Device	Disabled
Battery Support		Auto (Battery Manager)
System Off Mode		G3/Mech Off
UEFI Fast Boot		Disabled
UEFI Screenshot Capability		Disabled

[1]. Power Loss Control settings are :
Remain OFF: The IPC Application Controller will stay OFF when power is supplied to the power connector
Turn ON: The IPC Application Controller will automatically start up when power is supplied to the power connector.
Last State: The IPC Application Controller will start up or remain OFF when power is supplied based on the IPC Application Controller state at the moment power was removed from the power connector.

[2]. For 7th generation CPUs: SATA 1 Drive.
For 6th generation CPUs: SATA 2 Drive.

BIOS - Save & Exit

Provides the possibility to leave the BIOS with or without saving changes and to create or restore a set of User Defaults.

Save & Exit Parameters: **Disabled**.

- **Save Changes and Exit**

  Changed settings are saved and the Operating System starts with the changed settings.

- **Discard Changes and Exit**

  Changed settings are not saved and the Operating System starts with the unchanged settings.

- **Save Changes and Reset**

  Changed settings are saved and the IPC restarts using the changed settings.

- **Discard Changes and Reset**

  Changed settings are not saved and the IPC restarts with the unchanged settings.

- **Save Changes**

  Changed settings are saved and the BIOS setup stays open.

- **Discard Changes**

  Changed settings are reverted to their last saved values and the BIOS setup stays open.

- **Restore Defaults**

  Revert all BIOS settings to factory default.

- **Save as User Defaults**

  Saves the BIOS values as a User Defaults set.

- **Restore User Defaults**

  Restores the User Defaults set to the BIOS.

A-2   Customize Windows

This section provides an overview of the tools to customize Windows.

A-2-1   Trusted Platform Module

The Trusted Platform Module (TPM) integrates encryption keys into the IPC Application Controller in order to secure hardware and software. The TPM enables the following security functions:
* Ensure the integrity of the platform: The TPM can be used in the BIOS and other software to protect against unauthorized manipulation.
* Disk encryption: The TPM can be used with "BitLocker" drive encryption.
* Password protection and other uses of encryption: The TPM provides encryption key management.

> **Additional Information**
>
> Refer to the Microsoft Developer Network (MSDN) for best practice information.

Usage

To enable the TPM, see the relevant section in the BIOS Settings.
To use the TPM with "BitLocker" drive encryption, please follow the instructions in the operating system.

Considerations

Risk of data loss: If you lose the password for the drive encryption, you will not be able to restore the data. You will then lose access to the encrypted drive. Please store the password carefully and make sure it is protected against unauthorized access.

A-3   RS-232C Connector Pin Details
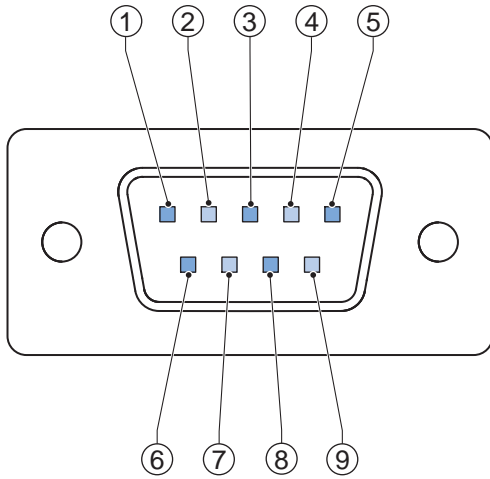
The pin layout represents the RS-232C connector on the IPC.

Pin	Signal Name
1	CD
2	RXD
3	TXD
4	DTR
5	0 VDC [1]
6	DSR
7	RTS
8	CTS
9	RI

*1.   The 0 VDC pin is internally connected to the ground connection.

Additional Information

Refer to *5-4-2 Ground* on page 5-21 for grounding details.

A-4 DVI Connector Pin Details

This section provides the pin details for the DVI-I connector and for the optional DVI-D connector.

A-4-1 DVI-I Connector Pin Details

Pin details of the DVI-I connector.
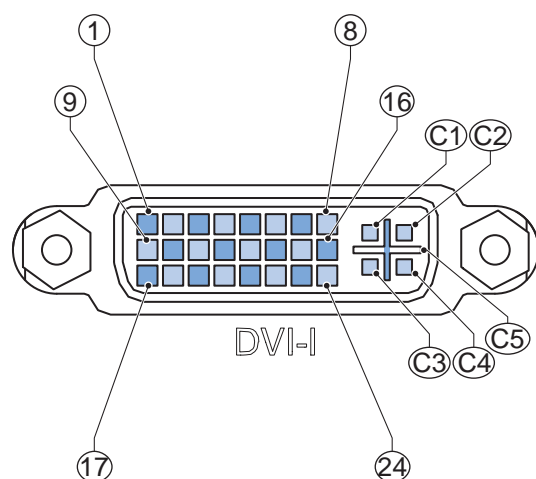
The pin layout represents the DVI-I connector on the IPC Application Controller.
Pin numbers increase from left to right for every row.

Pin	Signal Name	Function
1	TMDS data 2−	Digital red− (link 1)
2	TMDS data 2+	Digital red+ (link 1)
3	0 VDC	TMDS data 2/4 shield
4	Not connected	---
5	Not connected	---
6	DDC clock	DDC clock
7	DDC data	DDC data
8	Analog vertical sync	Depending on the product configuration [1]
9	TMDS data 1−	Digital green− (link 1)
10	TMDS data 1+	Digital green+ (link 1)
11	0 VDC	TMDS data 1/3 shield
12	Not connected	---
13	Not connected	---
14	+5 V	Power for monitor DDC interface
15	0 V	Return for pin 14 and analog sync
16	HPD	Hot Plug Detect
17	TMDS data 0−	Digital blue− (link 1) and digital sync
18	TMDS data 0+	Digital blue+ (link 1) and digital sync
19	0 VDC	TMDS data 0/5 shield
20	Not connected	---
21	Not connected	---
22	0 VDC	TMDS clock shield

Pin	Signal Name	Function
23	TMDS clock+	Digital clock+
24	TMDS clock−	Digital clock−
C1	Analog red	Depending on the product configuration [1]
C2	Analog green	Depending on the product configuration [1]
C3	Analog blue	Depending on the product configuration [1]
C4	Analog horizontal sync	Depending on the product configuration [1]
C5	0 VDC	Depending on the product configuration [2]

*1.   For models NY□17 and NY□1E.

*2.   Analog ground return, red and green and blue for models NY□17 and NY□1E.

Refer to *1-4 Product Configuration* on page 1-5 for details.

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