OMRON

Industrial PC Platform

NY-series

Industrial Box PC

User's Manual

NYB17-□11□□
NYB17-□12□□
NYB25-□11□□
NYB25-□12□□
NYB1C-□11□□
NYB1C-□12□□

Industrial Box PC

SYSMAC
always in control

W553-E2-01

Introduction

Thank you for purchasing the Industrial Box PC.
This manual contains information that is necessary to use the Industrial Box PC. Please read this manual and make sure you understand the functionality and performance of the Box PC 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 Industrial Box PC products:

- NYB17-□11□□
- NYB17-□12□□
- NYB25-□11□□
- NYB25-□12□□
- NYB1C-□11□□
- NYB1C-□12□□

Additional Information

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

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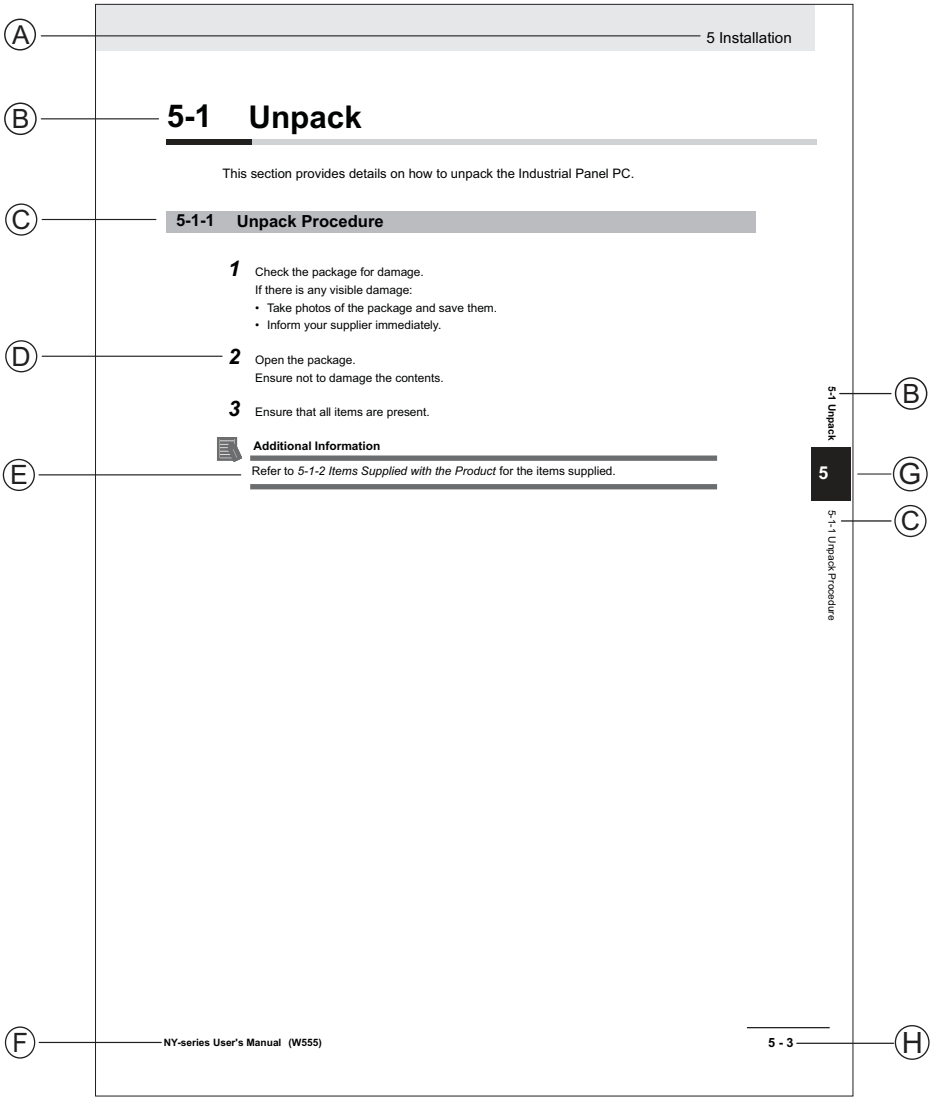
Manual Information

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
D	Step in a procedure	H	Page number

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 and Limitations of Liability

Warranty

- **Exclusive Warranty**
  Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, expressed or implied.
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  Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

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Limitations of Liability

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY. Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Application Considerations

Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products

- Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.
- Omron Companies shall not be responsible for the operation of the user accessible operating system (e.g. Windows, Linux), or any consequence thereof.

Disclaimers

Performance Data

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

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 Industrial Box PC. 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

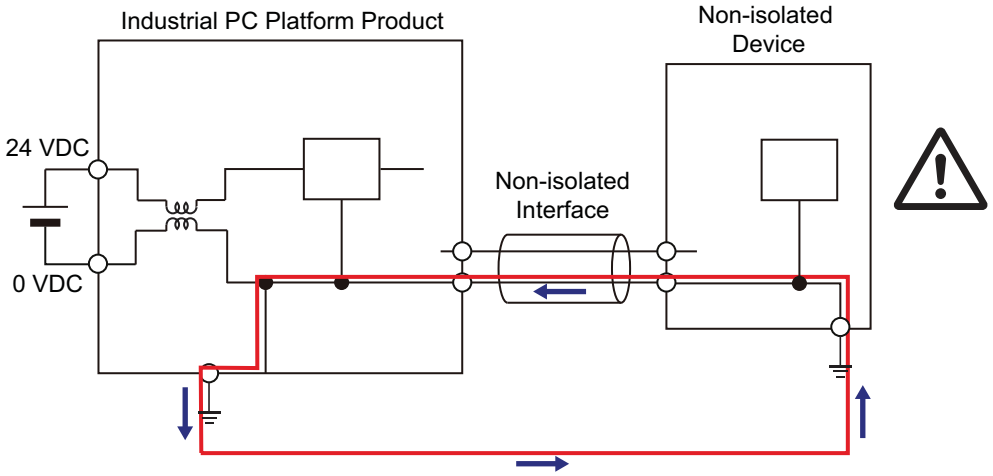
Security setting adjustments should only be performed by the engineer in charge that possesses a thorough understanding of the security settings. Selecting non-recommended security settings can put your system at risk.	
Changing BIOS information is only allowed for the engineer in charge that possesses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

Cautions

⚠ Caution

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.
- In the case of an extended storage period, 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.

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.

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 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.

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

- 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.

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.
- Always create a Windows System Repair Disk using Windows Backup and Restore to recover the HDD/SSD configuration if necessary.
- 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.
- 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.

Battery Replacement

- 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 Industrial Box PC complies with EU Directives. To ensure that the machine or device in which the Industrial Box PC is used complies with EU Directives, the following precautions must be observed:

- The Industrial Box PC must be installed within a control panel.
- The Industrial Box PC 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 Industrial Box PC 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.

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
Simple-Shutdown Windows Instruction Manual	K1L-D	---	Learning the installation instructions, methods of use, and precautions for use for the Simple Shutdown Software (Windows Version).	An introduction to the Simple Shutdown Software is provided along with the following information: • Connection Method • Installation • Shutdown Parameter Settings • Startup and Shutdown of the Agent • Shutdown Sequence • Uninstallation

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	• NYM15W-C100□ • NYM12W-C100□	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
Sysmac	OMRON's brand name of the product family for the industrial automation equipment

Hardware

Term / Abbreviation	Description
BMC	Board Management Controller
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
iMLC	Industrial Multi-Level Cell type of SSD storage device
PCIe	The PCI Express is a high-speed computer bus standard called Peripheral Component Interconnect Express
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

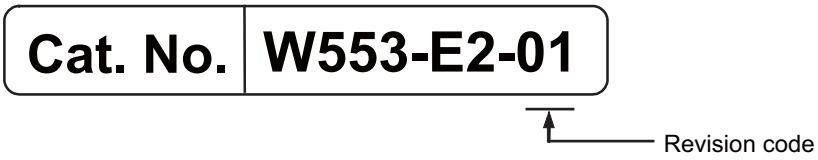
Software

Term / Abbreviation	Description
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

Term / Abbreviation	Description
IIoT	Industrial Internet of Things
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
SDK	Software Development Kit
TCP/IP	Transmission Control Protocol / Internet Protocol, a core member of the Internet protocol suite
TPM	Trusted Platform Module
Windows	An Operating System designed by Microsoft

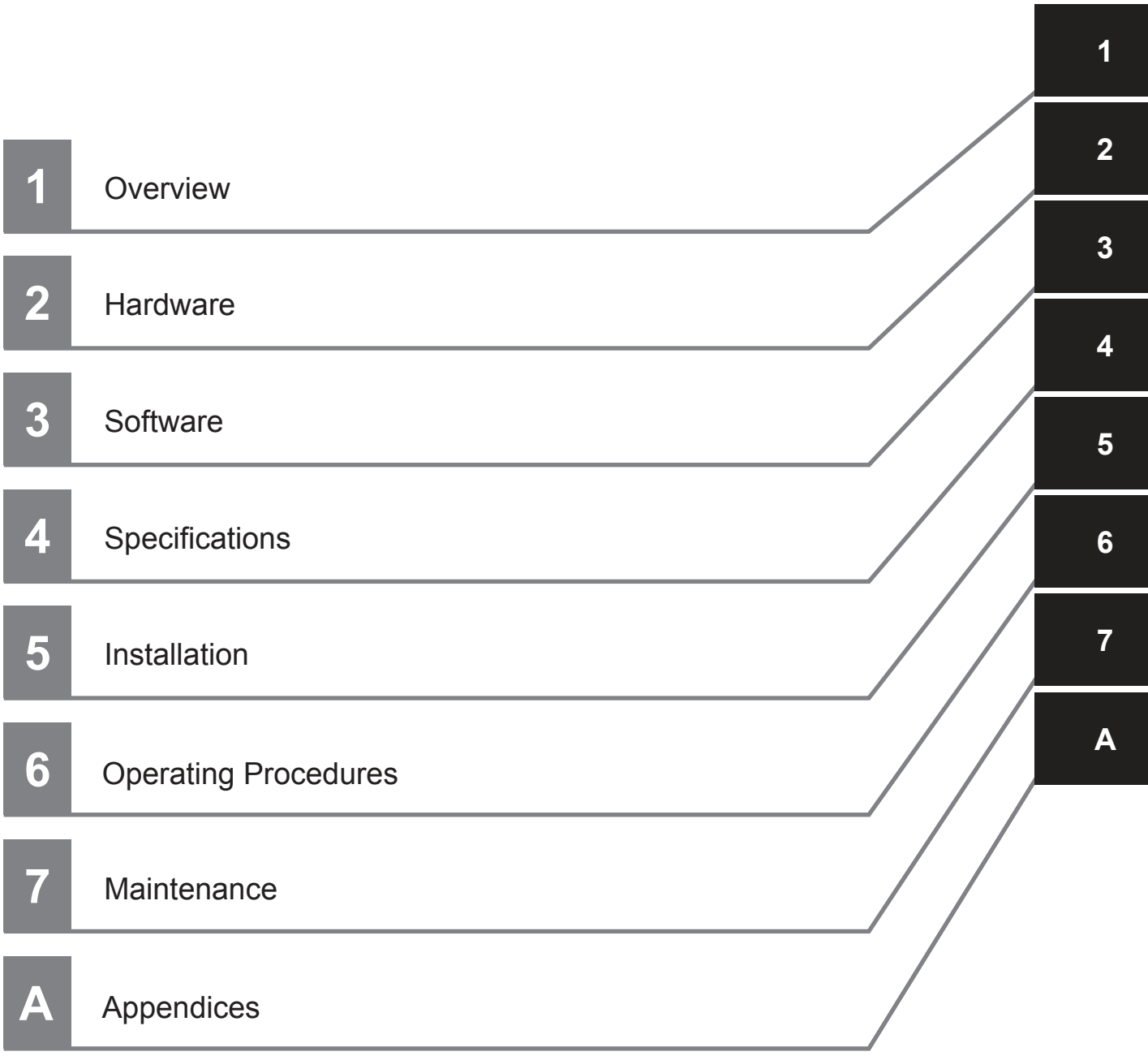
Revision History

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



Revision code	Date	Revised content
01	August 2016	First release

Sections in this Manual



1

Overview

This section provides general information of the Industrial Box PC.

1-1 Intended Use

The Industrial Box PC is an industrial-grade PC intended for use within factory automation environments. This Industrial Box PC simultaneously uses the standard Windows operating system and programs as well as third-party software to serve as a powerful PC platform.
The Industrial Box PC can easily be integrated in manufacturing innovations like big data, NUI and IIoT.
The Industrial Box PC has a compact design that offers flexibility, expandability and easy maintenance for applications in factory automation environments.

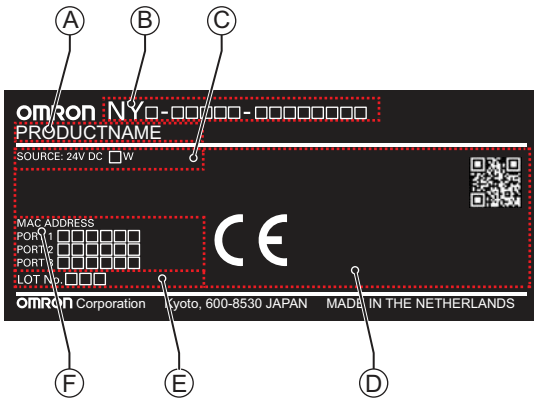
1-2 Hardware Features

The Industrial Box PC provides the following hardware features:

- Compact design with two mounting orientation options
  The Box PC 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.
- Fanless cooling for multiple CPU types
  The Box PC has passive cooling for multiple CPU types which means no moving parts and less maintenance effort.
- Easy access to storage devices and the PCI Express Card
  Adding or changing storage devices (HDD, SSD) and PCI Express Card is fast and simple.
- LED indicators
  LED indicators provide a clear indication of the operational status of the Box PC.
- DVI visual interface
  The video interface for the Box PC 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.
- Built-in I/O
  Built-in I/O for UPS status and Box PC 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

The ID information label contains relevant information about the Industrial Box PC.
The following example will be different from your product label.



Item	Name	Description
A	Product name	Industrial PC
B	Model *1	Model and configuration details
C	Power rating	Power rating details
D	Standards and QR code	The applicable standards and the QR code for the website
E	LOT No.	Production details The lot number of the Industrial Box PC 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.
F	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

*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 - 19 for Ethernet specifications.

Additional Information

Refer to *2-1-2 Back of the Industrial Box PC* on page 2 - 4 for the ID label location.

1-4 Product Configuration

This section provides an overview of the product configurations available for the Industrial Box PC.
The product configuration is visible in the model-type that is mentioned on the ID information label of the product.
The structure of the model-type is: NYB□□-□□□□□.
Each item in the model-type has a specific meaning.

N Y B□□-□□□□□
1 2 3 4 5 6 7

Item	Description	Option / Description
1	Series name	NY: NY- series Industrial Box PC
2	Processor	17: Intel® Core™ i7-4700EQ 4th generation CPU with Fan Unit for active cooling 25: Intel® Core™ i5-4300U 4th generation CPU with fanless cooling 1C: Intel® Celeron® 2980U 4th generation CPU with fanless cooling
3	Main memory	1: 2 GB, non-ECC 2: 4 GB, non-ECC 3: 8 GB, non-ECC
4	Expansion slots	1: 1 PCIe slot
5	Operating system	1: Windows Embedded Standard 7 - 32 bit 2: Windows Embedded Standard 7 - 64 bit
6	Storage	8: 32 GB, SSD SLC 9: 64 GB, SSD SLC C: 320 GB, HDD K: 128 GB, SSD iMLC
7	Optional interface	1: RS-232C 2: DVI-D

1-5 Industrial PC Platform Overview

The Industrial PC Platform is an integrated range of products designed for use in a variety of industrial applications that will benefit from advanced PC technology. The range is scalable, robust and reliable, and is suitable for use with both standard PC/Windows software and proprietary programs for machine control and automation.
In line with OMRON's established quality standards, each element in the Industrial PC Platform, ranging from the standalone Industrial Box PC to the touchscreen Industrial Monitor, is engineered with long-life components and built to the most advanced design standards.

The following sections introduce Industrial PC Platform products.

1-5-1 Industrial Monitor

The Industrial Monitor is of key importance at the interface between operator and system. The Industrial Monitor is efficient, effective and highly visible with an attractive design.
Using smart algorithms, the touch controller determines the exact location of each touch for precise control as well as detecting abnormal or illegal actions to protect misuse or false touches.

1-5-2 Industrial Box PC

The Industrial Box PC is designed to meet the specific needs of the industrial environment. Design simplification and future-proof architecture minimize the risk of failure. In addition, new PC features can be seamlessly incorporated, without the need for wholesale redesign.
The Industrial Box PC can simultaneously use the standard Windows operating system and programs, alongside other third-party software.

1-5-3 Industrial Panel PC

The Industrial Panel PC intelligently combines the functionality of the Industrial Box PC and Industrial Monitor. No cables are used between the two components, which ensures optimal signal distribution and reliable operation in industrial environments.

2

Hardware

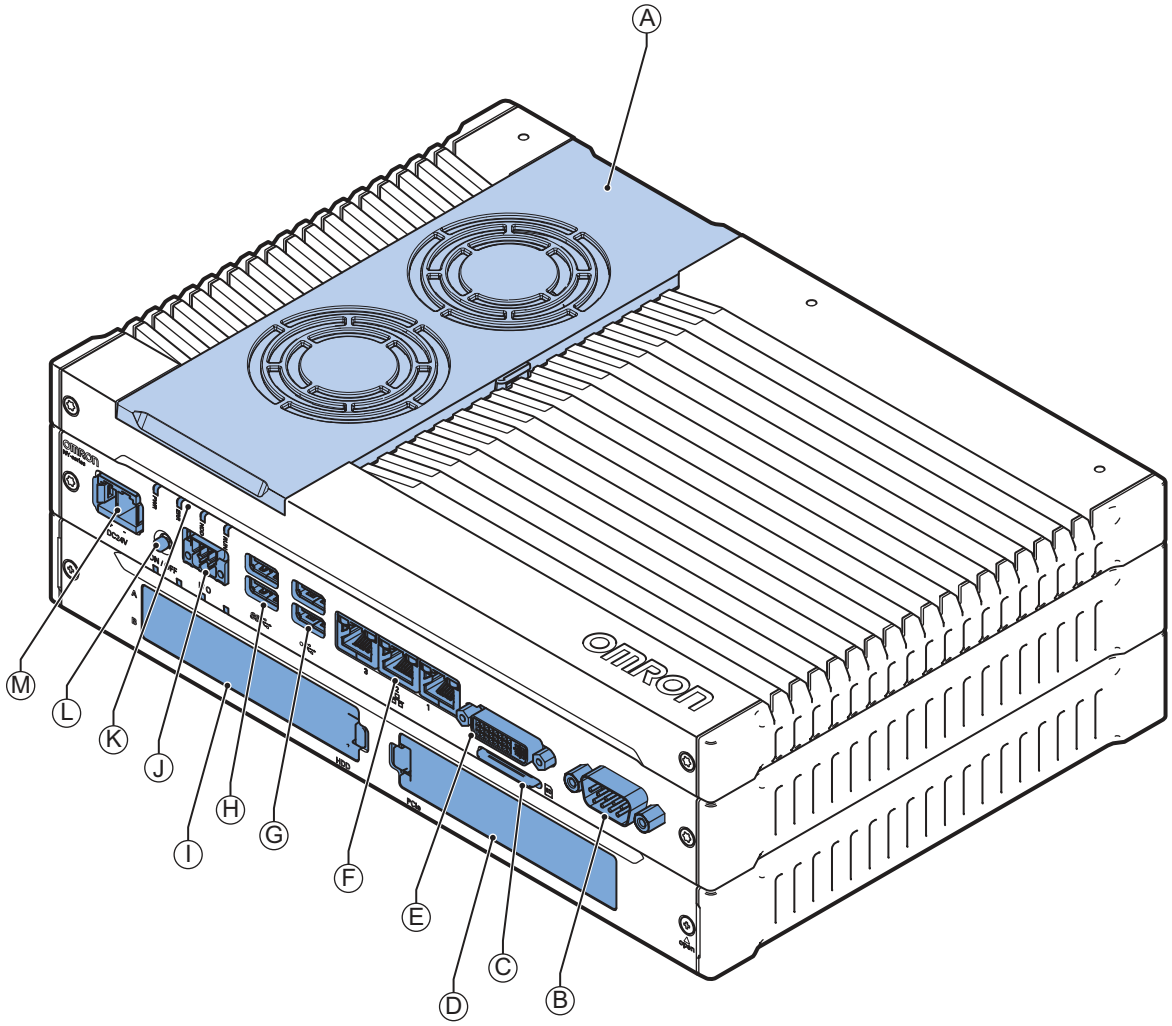
This section provides an overview of the hardware of the Industrial Box PC.

2-1 Component Names and Functions

This section shows views of the Industrial Box PC with information about all items.

2-1-1 Front and Top of the Industrial Box PC

This section shows the component names and functions for the front and top of the Box PC.



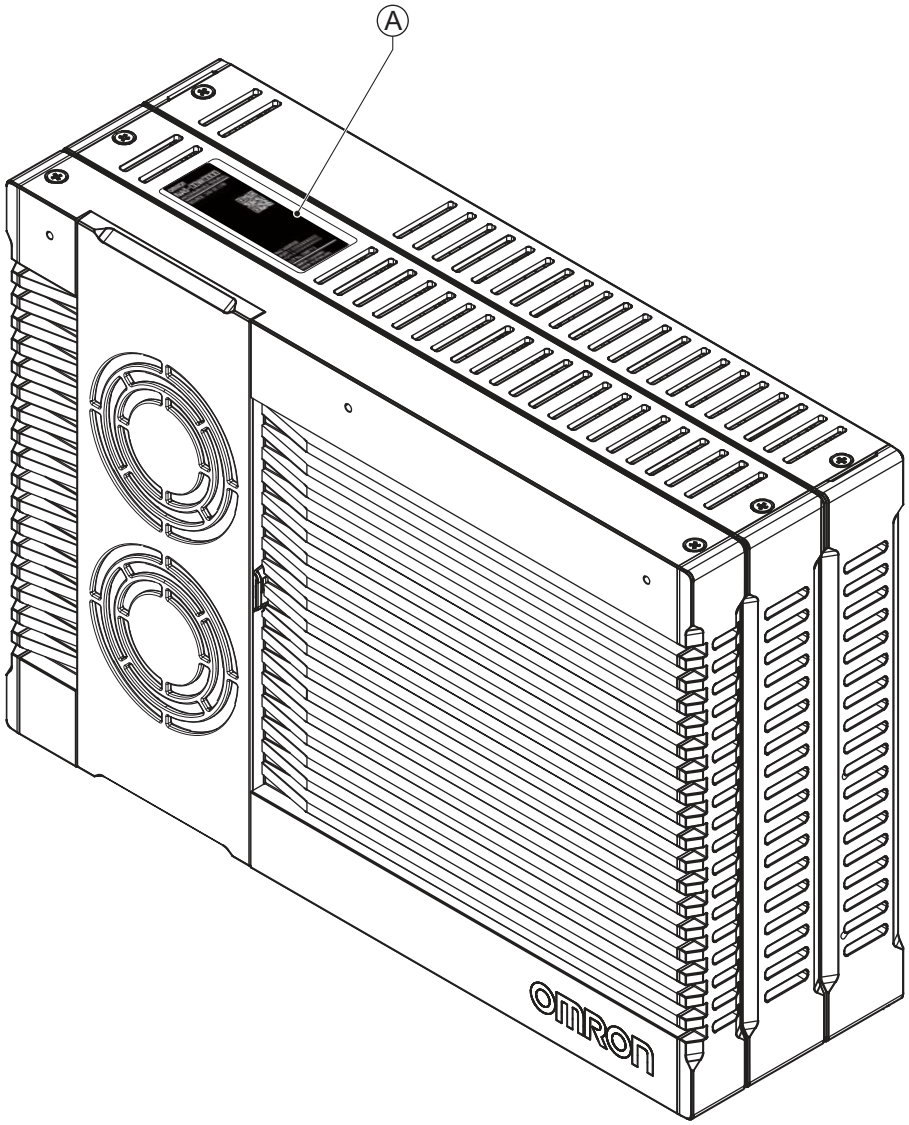
Item	Name	Description
A	Cover	Provides access to the backup battery and to the fans for Box PCs that have active cooling.
B	Option port	Interface connection options: • RS-232 connector (default) or • DVI-D connector for additional monitor connection
C	SD Memory Card slot	SD Memory Card slot
D	PCIe bay	PCI Express mounting slot

Item	Name	Description
E	DVI connector	Digital Visual Interface connector
F	10BASE-T/100BASE-TX/1000BASE-T Ethernet connectors	3 RJ45 Gb Ethernet interface connectors
G	USB 2.0 connectors	2 USB 2.0 interface connectors
H	USB 3.0 connectors	2 USB 3.0 interface connectors
I	Drive bay *1	Two 2.5 inch drive bays for HDD/SSD storage devices: • Slot A= Pre-installed Windows OS and main storage Slot A is the slot at the side of the connectors • Slot B= Optional drive for additional storage Slot B is the slot at the outside of the Box PC
J	I/O connector	2 inputs (Power ON/OFF Input and UPS Mode Input) and 1 output (Power Status Output)
K	LED indicators	Visual indicators for the operating state of the Industrial Box PC
L	Power button	Pushbutton to manually power ON/OFF the Box PC
M	Power connector	Lockable power connector

*1 Depending on the model one or two drives are supported.
Refer to *4-1-4 CPU Specifications* on page 4 - 6 for the number of supported drives.

2-1-2 Back of the Industrial Box PC

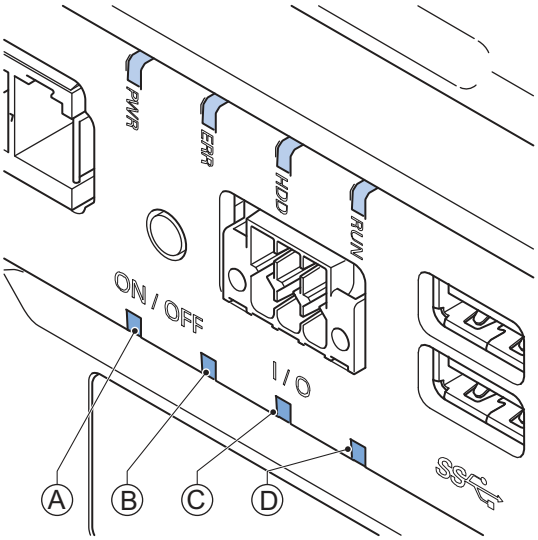
This section shows the component names and functions for the back of the Industrial Box PC.



Item	Name	Description
A	ID information label	Label containing Model ID., LOT No. and other product specific information. Refer to *1-3 ID Information Label* on page 1 - 4 for label details.

2-2 LED Indicators

The Industrial Box PC has two rows of four LED indicators that show the operating status of the product. Both rows have the same function.
The following LED indicators are available:



Item	LED Indicator	Name	Description
A	PWR	Power	Indicates the operating mode of the Industrial Box PC.
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.

2-2-1 PWR LED Indicator

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

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

2-2-2 ERR LED Indicator

The Error LED (ERR) indicates the presence and type of an error within the Industrial Box PC.

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 under-voltage 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 *3-3-2 Industrial PC System API* on page 3 - 17 for Industrial PC System API details.
- Refer to *7-2 Corrective Maintenance* on page 7 - 11 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 is active.

2-2-4 RUN LED Indicator

The RUN LED is available for user applications.

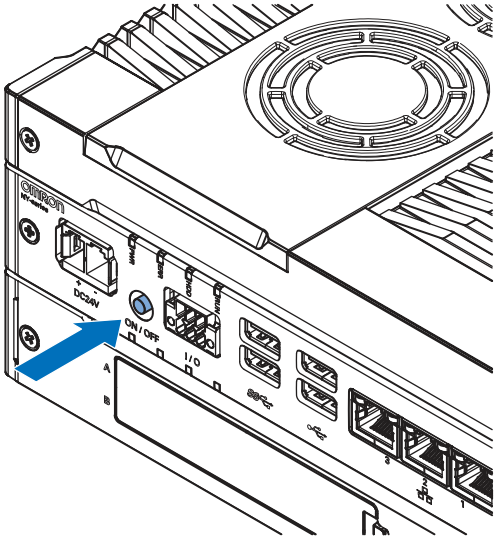
Color	Status		Meaning
Green		Not lit	User-defined. The status can be defined in a user program using the Industrial PC System API.
		Blinking	
		Lit	

Additional Information

Refer to *3-3-2 Industrial PC System API* on page 3 - 17 for Industrial PC System API details.

2-3 Power Button

The power button is used to manually switch the Box PC ON and OFF.

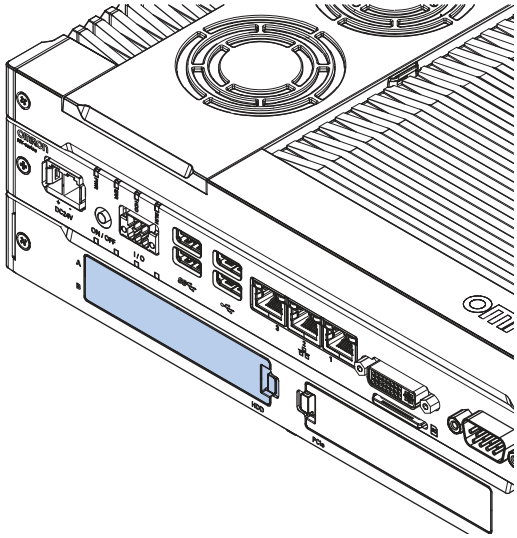


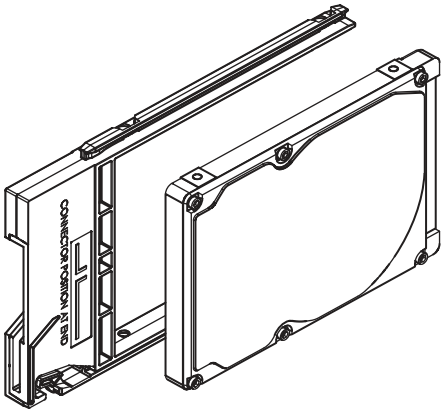
Additional Information

- 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 Drive Bays

The drive bays in the Industrial Box PC accept 2.5 inch Hard Disk Drives (HDD) or Solid State Drives (SSD). Depending on the model one or two drives are supported.





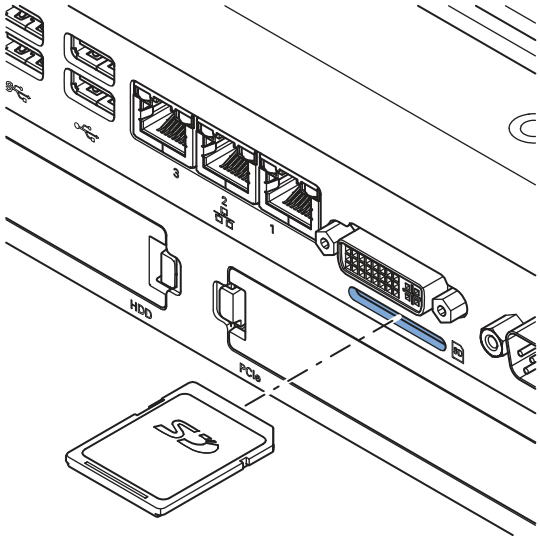
Additional Information

- Refer to *4-1-4 CPU Specifications* on page 4 - 6 for the number of supported drives.
- Refer to *Hard Disk Drive Specifications* on page 4 - 8 for HDD specifications.
- Refer to *Solid State Drive Specifications* on page 4 - 8 for SSD specifications.
- Refer to *5-2-1 Install an Additional Drive* on page 5 - 6 for install information.
- Refer to *7-2-5 Replace a Drive* on page 7 - 18 for maintenance information.

2-5 SD Memory Card Slot

The SD Memory Card slot on the Industrial Box PC accept SD Memory Cards with the following specifications.

- SDHC type (SD 2.0 specification)
- Up to 32 GB capacity



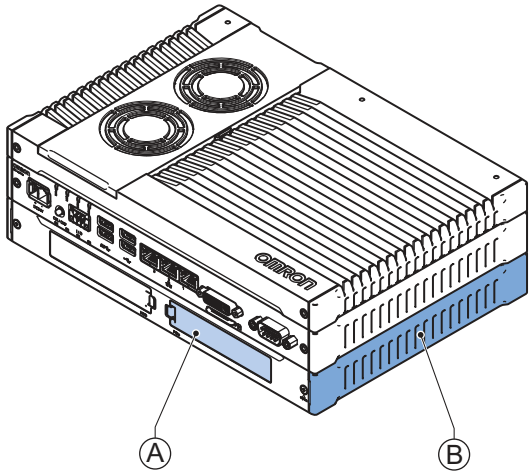
Additional Information

Refer to *2-9-2 SD Memory Cards* on page 2 - 17 for SD Memory Card details.

2-6 PCIe Card Slot

The PCI Express (PCIe) Card slot of the Industrial Box PC accepts various PCIe Cards for specific hardware needs.

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



Additional Information

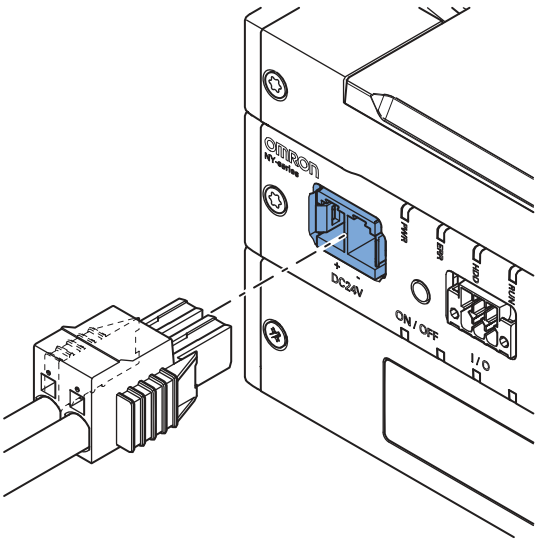
- Refer to *4-1-7 PCIe Card Slot Specifications* on page 4 - 10 for specifications.
- Refer to *5-2-2 Install the PCIe Card* on page 5 - 10 for install information.
- Refer to *7-2-6 Replace the PCIe Card* on page 7 - 23 for maintenance information.

2-7 Connectors

This section gives an overview of the available connectors for the Industrial Box PC.

2-7-1 Power Connector

The power connector on the Box PC is used to supply 24 VDC power to the Box PC.
The power connector is supplied with the Box PC.



Additional Information

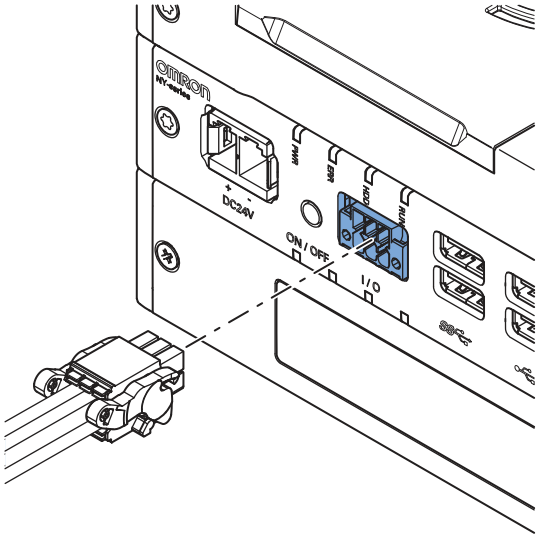
- Refer to *4-2-1 Power Connector Specifications* on page 4 - 13 for specifications.
- Refer to *5-4-3 Wire the Power Connector* on page 5 - 35 for wiring details.
- Refer to *5-5-1 Connector Identification* on page 5 - 42 for connection details.

2-7-2 I/O Connector

The I/O connector on the Industrial Box PC provides discrete signals with the following functions.

- Input signal to the Box PC when a connected UPS switches to battery power.
- Input signal to the Box PC to perform a shutdown or power ON when the signal turns ON.
- Output signal from the Box PC to indicate the power status of the Box PC.

The I/O connector is supplied with the Box PC.



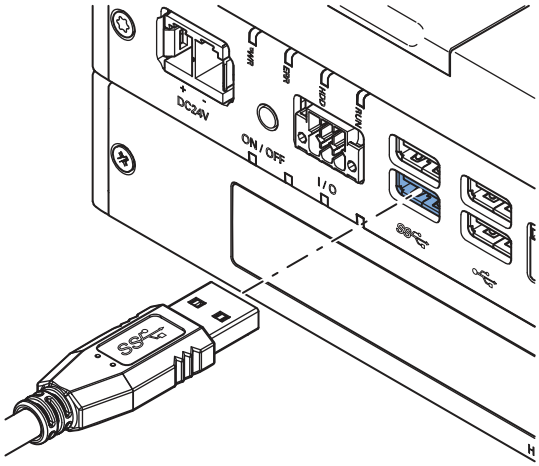
Additional Information

- Refer to *4-2-2 I/O Connector Specifications* on page 4 - 14 for specifications.
- Refer to *5-4-4 Wire the I/O Connector* on page 5 - 38 for wiring details.
- Refer to *5-5-1 Connector Identification* on page 5 - 42 for connection details.

2-7-3 USB Connectors

The USB connectors support USB 2.0 and USB 3.0 specifications.

All USB interfaces are protected against overcurrent and all ports support Wake-on-USB.

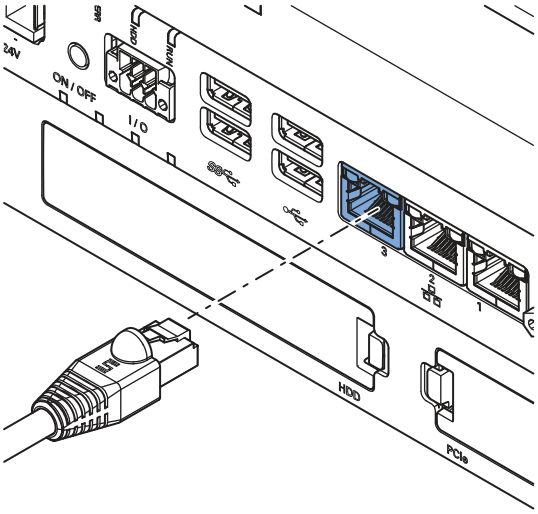


Additional Information

- Refer to *4-2-3 USB Connector Specifications* on page 4 - 18 for specifications.
- Refer to *5-5-1 Connector Identification* on page 5 - 42 for connection details.

2-7-4 Ethernet Connectors

The Ethernet connectors provide 3 individual Ethernet ports on the Industrial Box PC.
Each port offers 10BASE-T/100BASE-TX/1000BASE-T Ethernet speeds.

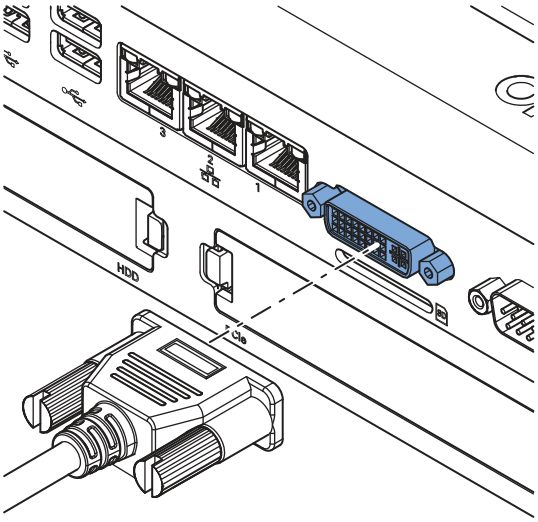


Additional Information

- Refer to *4-2-4 Ethernet Connector Specifications* on page 4 - 19 for specifications.
- Refer to *5-5-1 Connector Identification* on page 5 - 42 for connection details.

2-7-5 DVI Connector

The DVI interfaces supported on this connector are dependent on the configuration of the Industrial Box PC.

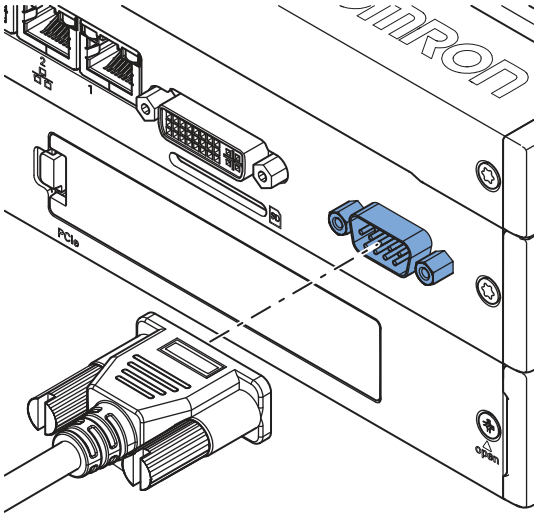


Additional Information

- Refer to *1-4 Product Configuration* on page 1 - 5 for configuration details.
- Refer to *4-2-5 DVI Connector Specifications* on page 4 - 21 for specifications.
- Refer to *5-5-1 Connector Identification* on page 5 - 42 for connection details.

2-7-6 Optional RS-232 Connector

An optional RS-232 connector is available.

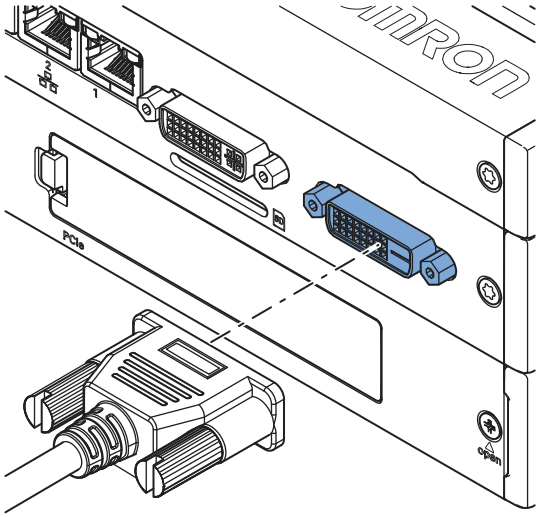


Additional Information

- Refer to *4-2-7 Optional RS-232 Connector Specifications* on page 4 - 24 for specifications.
- Refer to *5-5-1 Connector Identification* on page 5 - 42 for connection details.

2-7-7 Optional DVI-D Connector

An optional DVI-D connector is available. This interface only supports digital video signals.



Additional Information

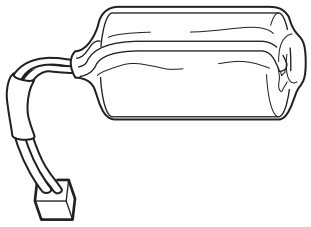
- Refer to *4-2-6 Optional DVI-D Connector Specifications* on page 4 - 23 for specifications.
- Refer to *5-5-1 Connector Identification* on page 5 - 42 for connection details.

2-8 Spare Parts

The following spare parts for the Industrial Box PC are available.

2-8-1 Battery

One battery is supplied with the Box PC. The battery supplies power to the real-time clock.
The battery is located inside the Box PC.

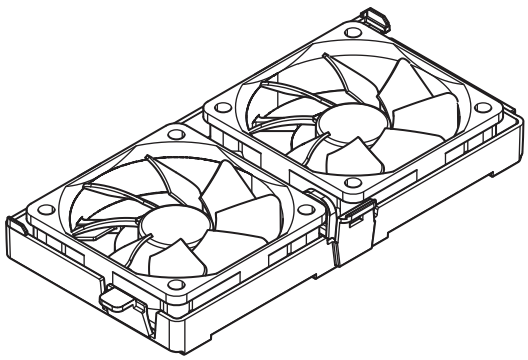
Model	Appearance	Specifications
CJ1W-BAT01		Service life: 5 years at 25°C

Additional Information

Refer to *7-2-4 Replace the Battery* on page 7 - 16 for the replacement procedure.

2-8-2 Fan Unit

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

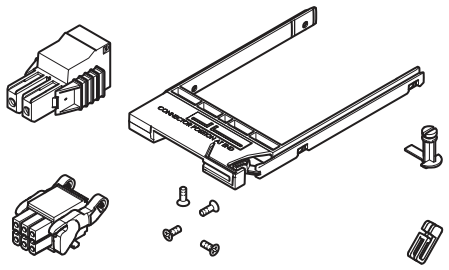
Model	Appearance	Specifications
NY000-AF00		• Service life: 70,000 hours of continuous operation at 40°C with 15% to 65% relative humidity • Shelf life: 6 months This is the storage limitation with no power supplied.

Additional Information

Refer to *7-2-3 Replace the Fan Unit* on page 7 - 14 for the replacement procedure.

2-8-3 Accessory Kit

The accessory kit for the Box PC.

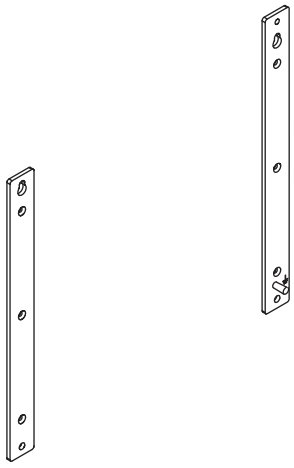
Model	Appearance	Specifications
NY000-AK00		Accessory Kit containing all accessories supplied with the Box PC. • Power connector • I/O connector • Drive bracket for drive installation • 4 mounting screws for drive installation • PCIe Card support for PCIe Card installation • PCIe Card clip for PCIe Card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

2-9 Optional Hardware

The following optional hardware is available for the Industrial Box PC.

2-9-1 Mounting Brackets

Mounting brackets details are provided below.

Model	Appearance	Bracket type
NY000-AB00		Book mount
NY000-AB01		Wall mount

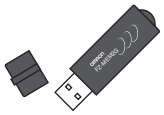
2-9-2 SD Memory Cards

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

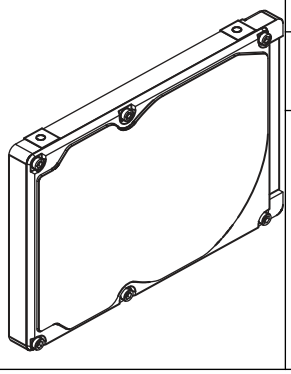
2-9-3 USB Flash Drives

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 Storage Devices

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

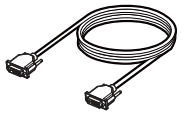
Model	Appearance	Storage type	Capacity
NY000-AH00		HDD	320 GB
NY000-AS00		SSD SLC	32 GB
NY000-AS01			64 GB
NY000-AS02		SSD iMLC	128 GB

Additional Information

Refer to *4-1-6 Storage Devices* on page 4 - 8 for storage device specifications.

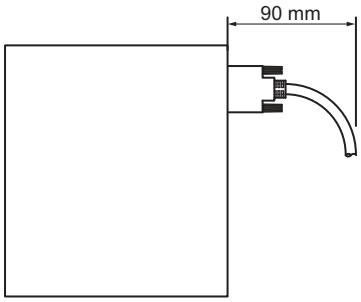
2-9-5 DVI Cables

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 • Minimum bend radius: 36 mm
NY000-AC00 5M		5 m	

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.



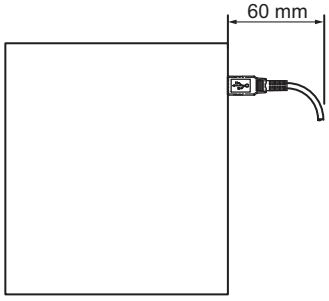
2-9-6 USB Type-A to USB Type-B Cables

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 • Minimum bend radius: 25 mm
FH-VUAB 5M		5 m	

USB Type-A to USB Type-B Cable Clearance

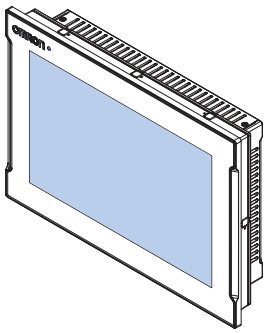
The USB Type-A to USB Type-B cable requires a minimum clearance of 60 mm from the connector entry to prevent excessive strain on the connector and cable assembly.



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
NYM15W-C100☐ NYM12W-C100☐		• LCD touchscreen • Multi-touch functionality • Supply voltage: 24 VDC • Up to 1,280 x 800 pixels at 60 Hz • 2 USB Type-A Connectors • Programmable brightness control

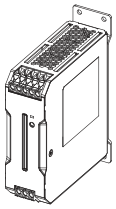
Additional Information

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.

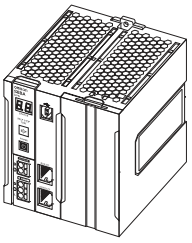
Model	Appearance	Specifications
S8VK-G☐☐☐24		Output voltage: 24 VDC

Additional Information

- Refer to *4-1-3 Power Consumption Specifications* on page 4 - 3 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 Box PC 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 - 20 for power supply details.
- Refer to *4-1-3 Power Consumption Specifications* on page 4 - 3 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 Industrial Box PC.

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 Embedded Standard 7

To determine your version of the Windows Operating System:

1. Select the **Start** 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.

3-1-2 Determine Your Ethernet Ports

This section provides information to determine the relation between the physical Ethernet ports on your Industrial Box PC and the ports in Windows.

Available Ethernet Ports

The Ethernet ports available are:

- Port 1 - Local Area Connection - I281 (Intel® Ethernet Connection I218-LM)
- Port 2 - Local Area Connection 3 - I210 #2 (Intel® I210 Gigabit Ethernet Network Connection #2)
- Port 3 - Local Area Connection 2 - I210 (Intel® I210 Gigabit Ethernet Network Connection)

The following procedure provides information to determine the Ethernet ports on your Industrial Box PC.

Determine Ethernet Ports using Network Connections

To determine the Ethernet ports using computer management:

1 Select the **Start** Button.

2 Enter *Network* in the search box.

3 Select **Network and Sharing Center** in the pop-up that appears.
An overview of your basic network information and set up connections will appear, including a series of options in the left bar.

4 Select **Change adapter settings** in the left bar.
An overview of your adapters will appear.

5 Determine the specific connector with the information in *Available Ethernet Ports* on page 3 - 3.

The adapter name and the connector ID are known.

3-2 Support Software

This section provides an overview of the support software available for your Industrial Box PC.

3-2-1 Available Support Software

This section gives an overview of the software utilities available for all Industrial PC Platform products.

Product	Software utility
Industrial Monitor	Industrial Monitor Utility Industrial Monitor Brightness Utility Industrial PC Tray Utility
Industrial Box PC	Industrial PC Support Utility Industrial PC Tray Utility
Industrial Panel PC	Industrial Monitor Utility Industrial Monitor Brightness Utility Industrial PC Support Utility Industrial PC Tray Utility

Select and download the utilities required from the OMRON download website.

3-2-2 Installed Support Software

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

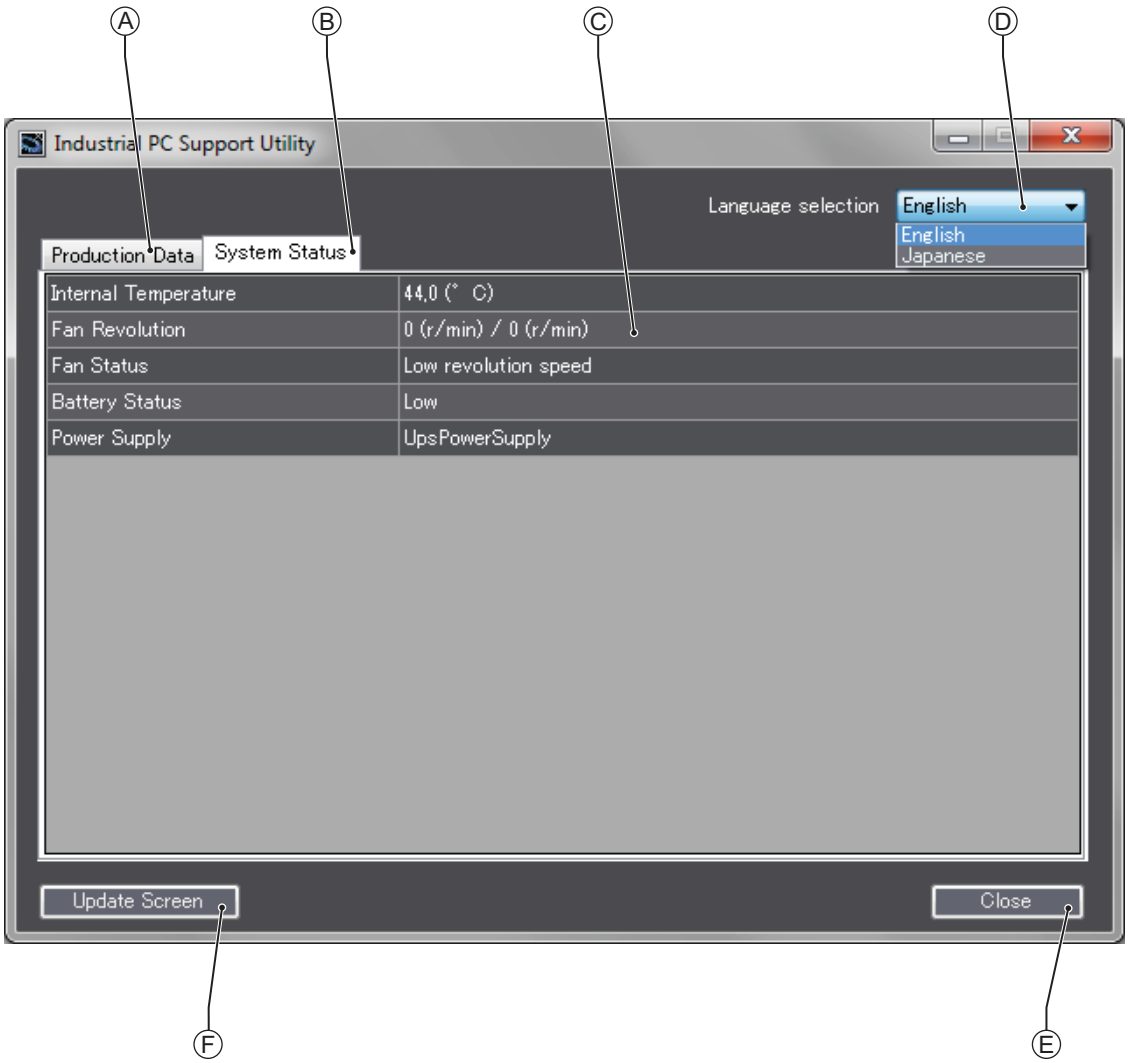
Product	Specifications
Industrial PC Support Utility	Refer to *3-2-3 Industrial PC Support Utility* on page 3 - 5 for details.
Industrial PC Tray Utility	Refer to *3-2-5 Industrial PC Tray Utility* on page 3 - 14 for details.
Industrial PC System API	For the Industrial PC Support Utility.
Industrial Monitor API	For the optional OMRON Industrial Monitor.
congatec CGOS API	For the Industrial PC System API.
Microsoft .NET Framework 4.6	For the Industrial PC Tray Utility.
Industrial Monitor Brightness Utility	For the optional OMRON Industrial Monitor. Refer to *3-3-2 Industrial PC System API* on page 3 - 17 and *2-9-7 Industrial Monitor* on page 2 - 20 for details.
Industrial Monitor Utility	For the optional OMRON Industrial Monitor. Refer to *3-3-2 Industrial PC System API* on page 3 - 17 and *2-9-7 Industrial Monitor* on page 2 - 20 for details.

3-2-3 Industrial PC Support Utility

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

Industrial PC Support Utility Overview

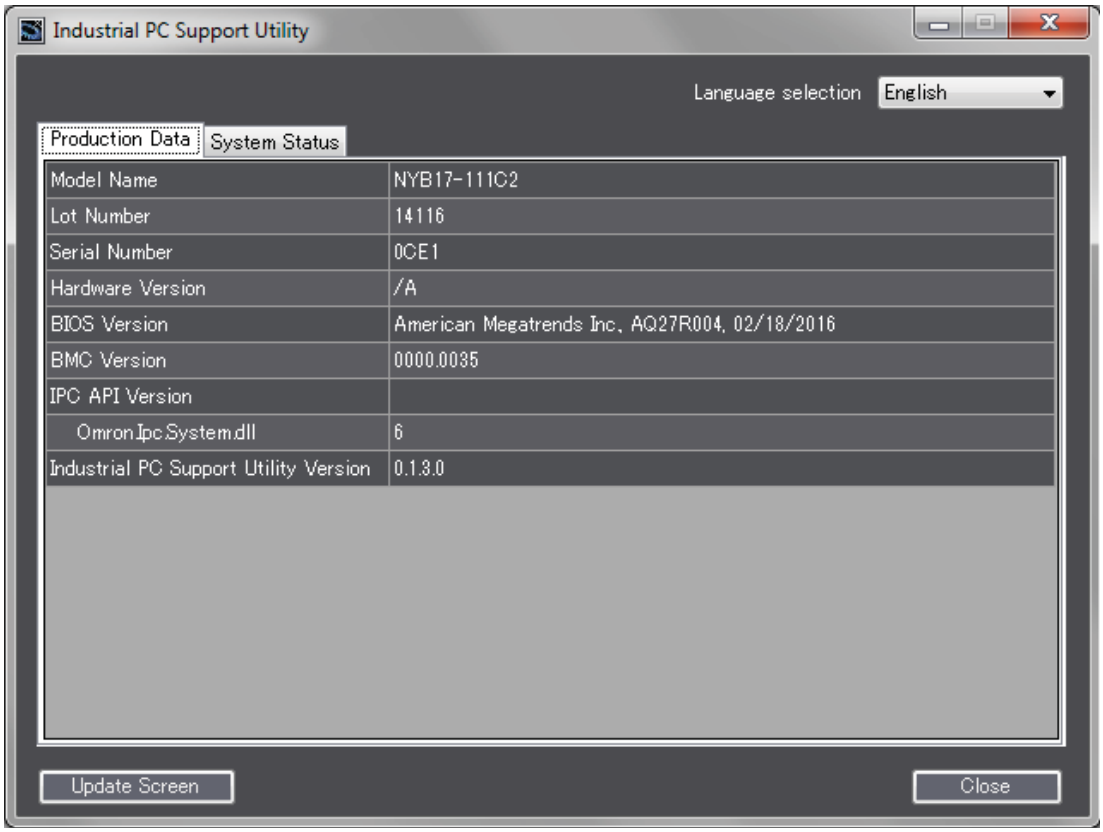
The Industrial PC Support Utility is a software utility to assist in diagnosing and resolving problems of the Industrial Box PC.



Item	Description	Details
A	Production Data Tab	Select to display Production Data details in the Tab details area Ⓒ. Refer to *Production Data Tab* on page 3 - 6 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 - 7 for details.
C	Tab details	Details of the selected Tab page.
D	Language Selector	Select to display and choose the UI language of the Industrial PC Support Utility.
E	Close Button	Close the Industrial PC Support Utility.
F	Update Screen Button	Use this button to retrieve updated values from the Industrial Box PC.

Production Data Tab

The Production Data tab displays generic Industrial Box PC 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).

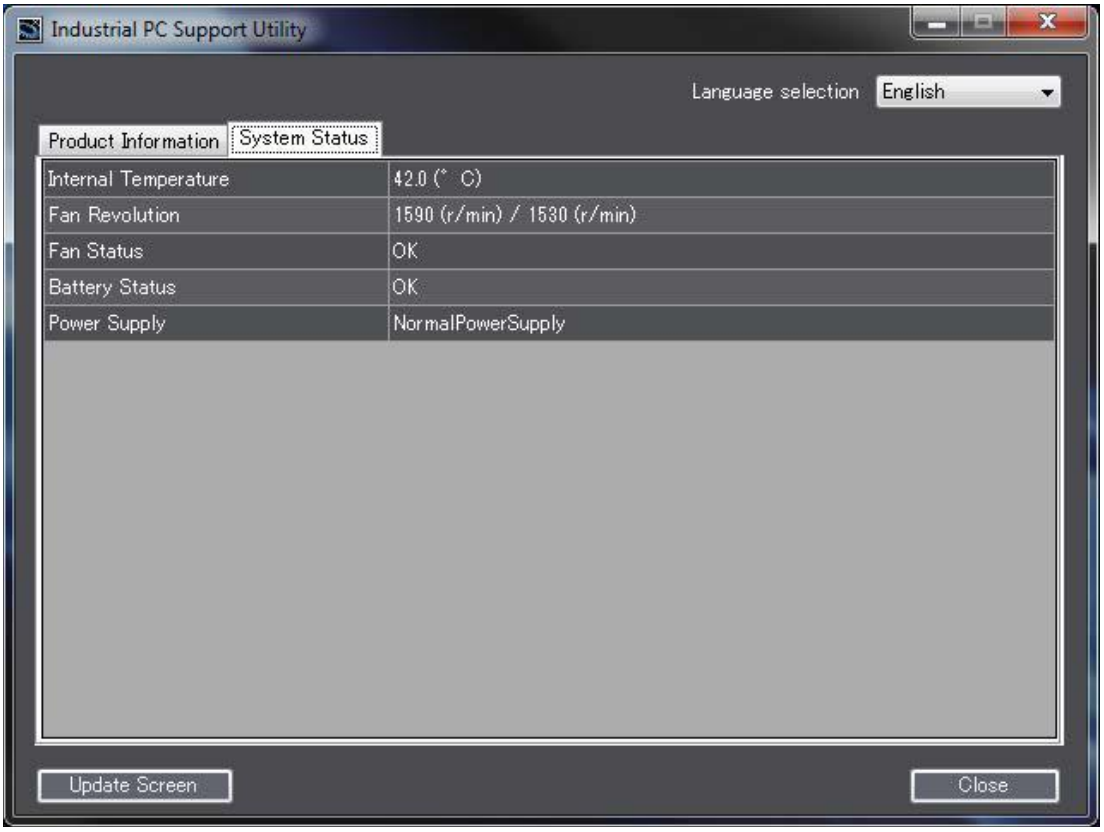


- Model Name is the configuration code of this model.
  Refer to *1-4 Product Configuration* on page 1 - 5 for details.
- BMC Version is the firmware version of the Board Management Controller.

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. Refer to *7-2-3 Replace the Fan Unit* on page 7 - 14 for replacement details.
Battery Status	The battery status • **OK** indicates the battery is full • **Low** indicates the battery voltage is low. Replace the battery. Refer to *7-2-4 Replace the Battery* on page 7 - 16 for replacement details.
Power Supply	The power supply status is determined by the UPS and reported to the Box PC via the I/O connector. • **NormalPowerSupply** indicates the Box PC is powered by the 24V power supply. • **UPS Power Supply** indicates that there is no power from the 24V power supply and the Box PC 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

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

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

Installation

The Industrial PC Support Utility is pre-installed on the Industrial Box PC and Industrial Panel PC. Download the Industrial PC Support Utility from the OMRON download website if reinstallation is required.

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

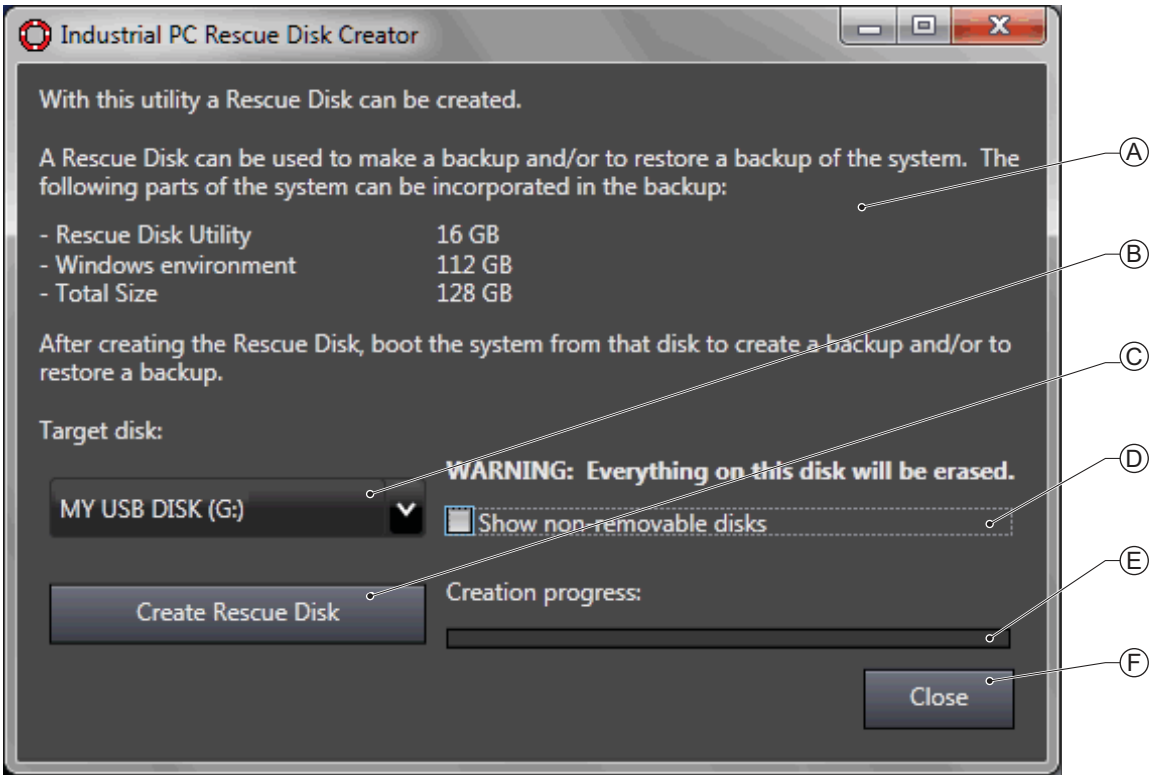
The Industrial Monitor Utility and the Industrial PC Support Utility record the operation history in the Windows event log.
Refer to *7-2-9 Windows Event Viewer* on page 7 - 36 for the logged messages.

3-2-4 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 - 6 for system backup details.
- Refer to *Create a System Backup with the Rescue Disk* on page 7 - 6 for system restore details.

Startup

The Rescue Disk Creator can be started from the Windows Start Menu.
In the Windows Start Menu select **OMRON** and then **Industrial PC** and then right-click **Rescue Disk Creator**.
Select **Run as administrator** to start the Rescue Disk Creator.

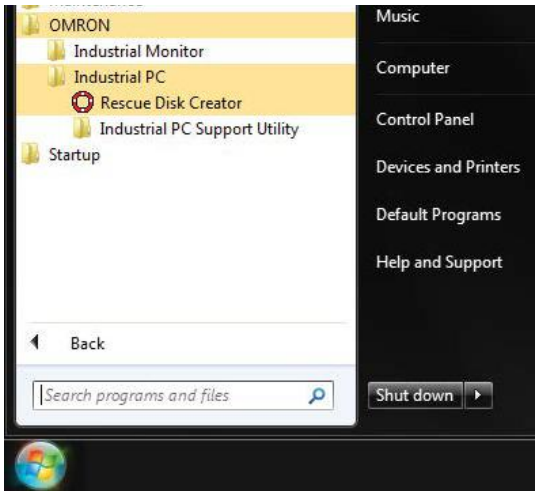
Installation

The Rescue Disk Creator needs to be installed before a Rescue Disk can be created.

Use the following procedure to install the Rescue Disk Creator.

1. Use Windows Explorer to examine the contents of the user data partition mapped as drive letter D:.
2. Open the Installer folder (D:\OMRON-NY\Installers) and locate the Rescue Disk installer file **setup.exe**.
3. Right-click the installer file and select **Run as administrator**.
   A progress bar will visualize the extraction process and then a language selection window opens.
4. Select your language and then select **OK**.
   The installer window opens.
5. Follow the installer steps to complete the Rescue Disk Creator installation.

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



Messages

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 this 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.

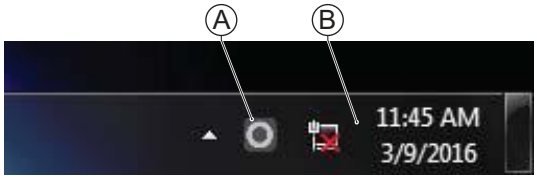
3-2-5 Industrial PC Tray Utility

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.



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.

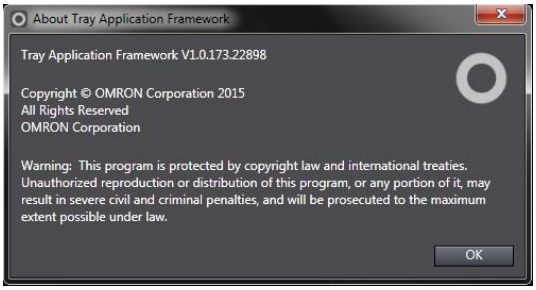
- The application displays the available utilities.
  - Select an entry to launch the associated utility, if applicable.
  - The icons of menu items in the Industrial PC Tray Utility menu will have a warning or error symbol when applicable.

- 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 - 15 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 an Industrial Box PC and an Industrial Panel PC.
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

The Industrial PC Tray Utility can be used on PCs with Windows 7.

Startup

By default the Industrial PC Tray Utility is configured to start automatically at Windows startup.
To manually (re)start the Industrial PC Tray Utility, open the software from the Windows start menu, select **OMRON**, and then **Omron Tray Application Framework**.

3-3 Software for Developers

This section provides information on the software that is available for developers.

3-3-1 Overview Developer Software

This section gives an overview of the software available for developers for all Industrial PC Platform products.

Product	Developer software
Industrial Monitor	Industrial Monitor SDK Industrial Monitor API
Industrial Box PC	Industrial PC System SDK Industrial PC System API
Industrial Panel PC	Industrial Monitor SDK Industrial Monitor API Industrial PC System SDK Industrial PC System API

Select and download the software required from the OMRON download website.

3-3-2 Industrial PC System API

This section describes the Industrial PC System API.
The Industrial PC System API allows programmers to create programs that can retrieve information or set an indicator status of the Industrial Box PC.
The API makes use of the included IPC System Service to manage the hardware.

Features

The Industrial PC System API can retrieve information such as:

- System information
- System flags
- Maintenance information
- Configuring and programming the Watchdog Error

The Industrial PC System API can also set the status of the Run LED Indicator and the ERR LED Indicator.

Installation

The Industrial PC System API is part of the SDK download.
The Industrial PC System API is pre-installed on the Industrial Panel PC and the Industrial Box PC.
Install the Industrial PC System SDK to use the Industrial PC System API on development PCs.
Use the Merge Module to include the Industrial PC System API in the installer for custom applications.
To use the Industrial PC System API the API needs to be referenced in your development project.

3-3-3 Industrial Monitor API

This section describes the Industrial Monitor API.
The Industrial Monitor API allows programmers to create applications that can control the hardware features and retrieve information from connected Industrial Monitors.
The main function of the Industrial Monitor API is to enable the brightness of the backlight and the LEDs of the monitor to be increased or decreased according to the working environment.

Features

For all connected Industrial Monitors, the Industrial Monitor API can:

- Retrieve product information
- Retrieve Status LED indicator information
- Set brightness of the Status LED indicator
- Set brightness of the backlight
- Set brightness of the Logo LED

The API makes use of the included Industrial Monitor Service to manage all Industrial Monitors connected via USB.

Installation

The Industrial Monitor API is part of the SDK download.
The Industrial Monitor API is pre-installed on the Industrial Panel PC and Industrial Box PC.
Install the Industrial Monitor SDK to use the Industrial Monitor API on development PCs.
Use the Merge Module to include the Industrial Monitor API in the installer for custom applications.
To use the Industrial Monitor API the API needs to be referenced in your development project.

4

Specifications

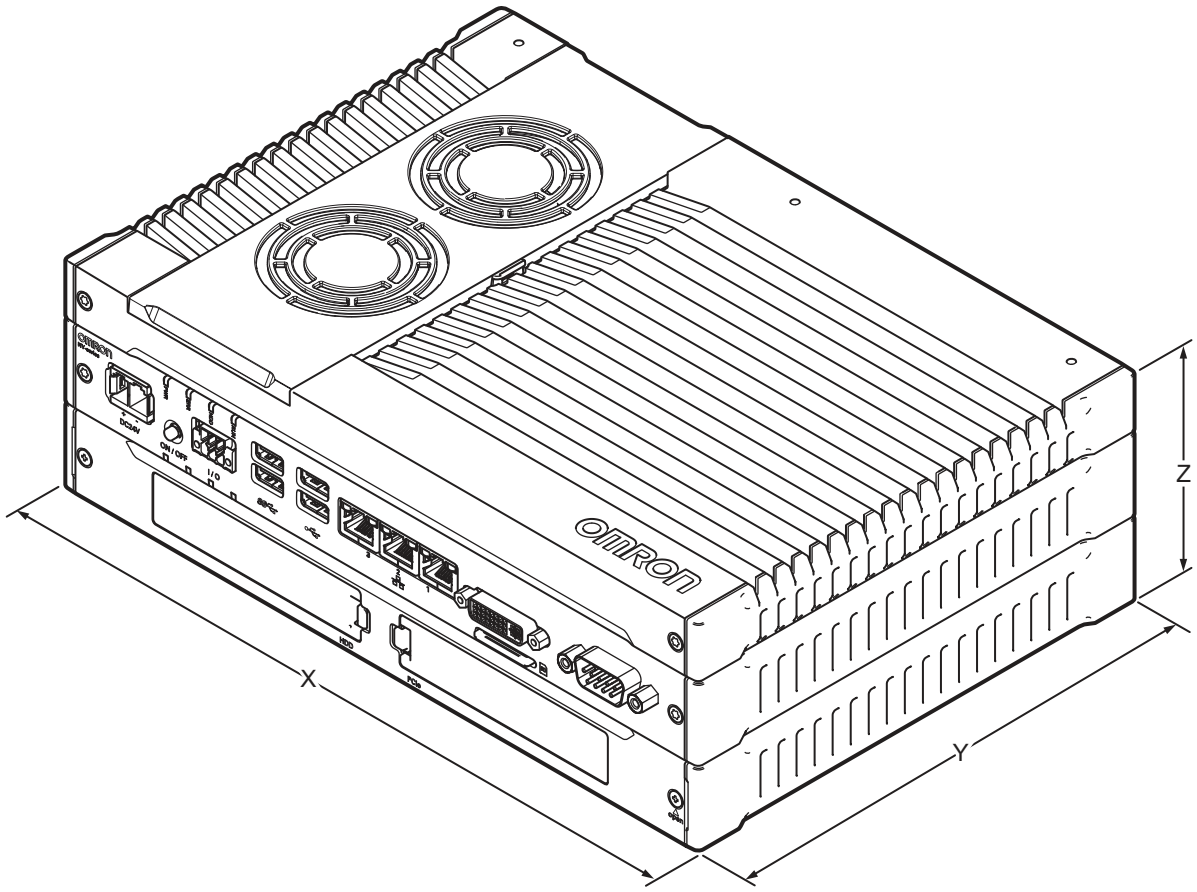
This section provides specifications of the Industrial Box PC.

4-1 General Specifications

This section provides general specifications of the Industrial Box PC.

4-1-1 Dimensions and Weight

The following table provides specification details on dimensions and weights.



Item	Specifications
Dimensions	Width X = 282 mm Depth Y = 195 mm, Y = 200 mm including the DVI connectors Height Z = 88.75 mm
Weight	3.9 kg

4-1-2 General Electrical Specifications

The following table provides the general electrical specifications.

Item	Specifications
Rated power supply voltage	24 VDC, non-isolated
Allowable power supply voltage range	20.4 to 28.8 VDC
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	Category II: Conforms to IEC 61131-2
EMC immunity level	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	8 years of continuous operation at 40°C
Battery life	5 years at 25°C (for battery CJ1W-BAT01)

4-1-3 Power Consumption Specifications

The following tables provide details on the power consumption of the Industrial Box PC.
The total power consumption is the sum of the power consumption of all items that are installed in your Box PC.
Refer to *1-4 Product Configuration* on page 1 - 5 for details.

Power Consumption with an Intel® Core™ i7-4700EQ CPU

Power consumption specifications for Industrial Box PCs with an Intel® Core™ i7-4700EQ CPU.

Item		Power consumption
Industrial Box PC with Intel® Core™ i7-4700EQ excluding Drives and Expansions		81 W
Drives *1	HDD 320 GB	2 W
	SSD SLC 32 GB	
	SSD SLC 64 GB	
	SSD iMLC 128 GB	
Expansions *2	USB	14 W max. ((2 x 500 mA at 5 V) + (2 x 900 mA at 5 V))
	PCIe	15 W max.

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

*2 Refer to the documentation of your expansions for their power consumption details.

The total power consumption is the sum of the power consumption of all items that are installed in your Industrial Box PC.

The required supply specifications for an Industrial Box PC with an Intel® Core™ i7-4700EQ CPU.

Item	Minimum power requirements
Power supply Refer to *2-9-8 Power Supply* on page 2 - 20 for power supply products.	240 W
UPS Refer to *2-9-9 UPS* on page 2 - 21 for UPS products.	120 W

Power Consumption with an Intel® Core™ i5-4300U CPU

Power consumption specifications for Industrial Box PCs with an Intel® Core™ i5-4300U CPU.

Item		Power consumption
Industrial Box PC with Intel® Core™ i5-4300U excluding Drives and Expansions		52 W
Drives *1	HDD 320 GB	2 W
	SSD SLC 32 GB	
	SSD SLC 64 GB	
	SSD iMLC 128 GB	
Expansions *2	USB	14 W max. ((2 x 500 mA at 5 V) + (2 x 900 mA at 5 V))
	PCIe	5 W max.

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

*2 Refer to the documentation of your expansions for their power consumption details.

The total power consumption is the sum of the power consumption of all items that are installed in your Industrial Box PC.

The required supply specifications for an Industrial Box PC with an Intel® Core™ i5-4300U CPU.

Item	Minimum power requirements
Power supply Refer to *2-9-8 Power Supply* on page 2 - 20 for power supply products.	120 W
UPS Refer to *2-9-9 UPS* on page 2 - 21 for UPS products.	120 W

Power Consumption with an Intel® Celeron® 2980U CPU

Power consumption specifications for Industrial Box PCs with an Intel® Celeron® 2980U CPU.

Item		Power consumption
Industrial Box PC with Intel® Celeron® 2980U excluding Drives and Expansions		45 W
Drives *1	HDD 320 GB	2 W
	SSD SLC 32 GB	
	SSD SLC 64 GB	
	SSD iMLC 128 GB	
Expansions *2	USB	14 W max. ((2 x 500 mA at 5 V) + (2 x 900 mA at 5 V))
	PCIe	5 W max.

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

*2 Refer to the documentation of your expansions for their power consumption details.

The total power consumption is the sum of the power consumption of all items that are installed in your Industrial Box PC.

The required supply specifications for an Industrial Box PC with an Intel® Celeron® 2980U CPU.

Item	Minimum power requirements
Power supply Refer to *2-9-8 Power Supply* on page 2 - 20 for power supply products.	120 W
UPS Refer to *2-9-9 UPS* on page 2 - 21 for UPS products.	120 W

4-1-4 CPU Specifications

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

Intel® Core™ i7-4700EQ CPU Specifications

CPU specifications for Industrial Box PCs with an Intel® Core™ i7-4700EQ CPU.

Item	Specifications
Cores / Threads	4 / 8
CPU base frequency	2.4 GHz
Maximum turbo frequency	3.4 GHz
Cache	6 MB
Cooling details	Requires active cooling (fan)
Drive slots (HDD/SSD)	2
Graphics controller	Intel ® HD Graphics. Up to two independent screens. Intel ® HD Graphics 4600

Additional Information

Refer to *A-1-3 BIOS - Advanced* on page A - 4 for turbo frequency details.

Intel® Core™ i5-4300U CPU Specifications

CPU specifications for Industrial Box PCs with an Intel® Core™ i5-4300U CPU.

Item	Specifications
Cores / Threads	2 / 4
CPU base frequency	1.9 GHz
Maximum turbo frequency	2.9 GHz
Cache	3 MB
Cooling details	Passive cooling (fanless)
Drive slots (HDD/SSD)	2
Graphics controller	Intel ® HD Graphics. Up to two independent screens. Intel ® HD Graphics 4400

Additional Information

Refer to *A-1-3 BIOS - Advanced* on page A - 4 for turbo frequency details.

Intel® Celeron® 2980U CPU Specifications

CPU specifications for Industrial Box PCs with an Intel® Celeron® 2980U CPU.

Item	Specifications
Cores / Threads	2 / 2
CPU base frequency	1.6 GHz
Maximum turbo frequency	---
Cache	2 MB
Cooling details	Passive cooling (fanless)
Drive slots (HDD/SSD)	1. Drive slot A.
Graphics controller	Intel ® HD Graphics. Up to two independent screens. Intel ® HD Graphics

4-1-5 Memory Specifications

The following table provides specification details of the memory.

Item		Model Specifications		
		2 GB *1	4 GB *1	8 GB *1
Memory type		DDR3L		
Package memory format		SO-DIMM		
Serial Presence Detect (SPD)	Speed grade	1600 Mbps		
	CAS Latency	CL11		

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

Additional Information

The small outline dual in-line memory modules (SO-DIMM) cannot be added or replaced by users.

4-1-6 Storage Devices

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
Model	NY000-AH00
S.M.A.R.T. support	Yes
Rotation speed	5,400 r/min
Interface	Serial ATA 3.0
Operating temperature	5 to 55°C *2
Operating humidity	• 10% to 95% (with no condensation) • 29°C wet-bulb temperature max.
Storage temperature	-40 to 65°C
Storage humidity	• 8% to 90% (with no condensation) • 40°C wet-bulb temperature max.
Life	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*3 • Less than 20% operation while powered-ON*4 • Less than 1.30 x 10^6 seeks/month

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

*2 Refer to *4-4-2 Temperature and Humidity Specifications* on page 4 - 27 for the temperature specifications of the complete Box PC

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

*4 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
Model	NY000-AS00	NY000-AS01	NY000-AS02
Type	SLC	SLC	iMLC
S.M.A.R.T. support	Yes		
Interface	Serial ATA 3.1		
Sustained read speed	Up to 160 MB/s		Up to 430 MB/s
Sustained write speed	Up to 150 MB/s		Up to 190 MB/s
Operating temperature	0 to 70°C *2		
Operating humidity	10% to 95% (with no condensation)		
Storage temperature	-40 to 100°C		
Storage humidity	10% to 95% (with no condensation)		

Item	Model Specifications		
	32 GB *1	64 GB *1	128 GB *1
Life	1500 TB/11 years at a daily workload of 350 GB	3000 TB/23 years at a daily workload of 350 GB	114 TB/3 years at a daily workload of 100 GB

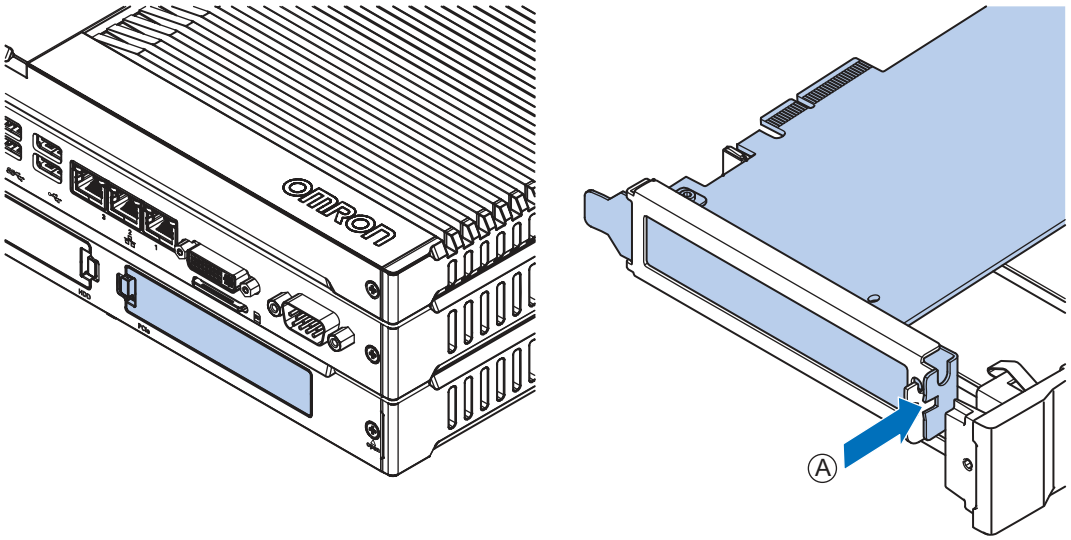
*1 Refer to *1-4 Product Configuration* on page 1 - 5 for product configuration details.

*2 Refer to *4-4-1 General Environmental Specifications* on page 4 - 26 for the temperature specifications of the complete Box PC

4-1-7 PCIe Card Slot Specifications

The PCI Express (PCIe) Card slot of the Industrial Box PC accepts various cards for specific hardware needs.

Ensure that, according to the PCIe hardware specifications, the indent Ⓐ is present.



The following tables provide PCIe Card Slot details per CPU type.

PCIe Card Slot Specifications with an Intel® Core™ i7-4700EQ CPU

The table below provides PCIe Card slot details for Industrial Box PCs with an Intel® Core™ i7-4700EQ CPU.

Item	Specifications
Configuration	X4 (4 lanes) up to Gen 3
Card height	Standard height cards, 4.20 inches (106.7 mm)*1
Card length	Half-length cards, 6.6 inches (167.65 mm)
Power consumption	Refer to *Power Consumption with an Intel® Core™ i7-4700EQ CPU* on page 4 - 4 for the maximum power consumption

*1 Low profile cards, 2.536 inches (64.4 mm) are not supported.

PCIe Card Slot Specifications with an Intel® Core™ i5-4300U CPU

The table below provides PCIe Card slot details for Industrial Box PCs with an Intel® Core™ i5-4300U CPU.

Item	Specifications
Configuration	X1 (1 lane) up to Gen 2
Card height	Standard height cards, 4.20 inches (106.7 mm)*1
Card length	Half-length cards, 6.6 inches (167.65 mm)
Power consumption	Refer to *Power Consumption with an Intel® Core™ i5-4300U CPU* on page 4 - 4 for the maximum power consumption

*1 Low profile cards, 2.536 inches (64.4 mm) are not supported.

PCIe Card Slot Specifications with an Intel® Celeron® 2980U CPU

The table below provides PCIe Card slot details for Industrial Box PCs with an Intel® Celeron® 2980U CPU.

Item	Specifications
Configuration	X1 (1 lane) up to Gen 2
Card height	Standard height cards, 4.20 inches (106.7 mm)*1
Card length	Half-length cards, 6.6 inches (167.65 mm)
Power consumption	Refer to *Power Consumption with an Intel® Celeron® 2980U CPU* on page 4 - 5 for the maximum power consumption

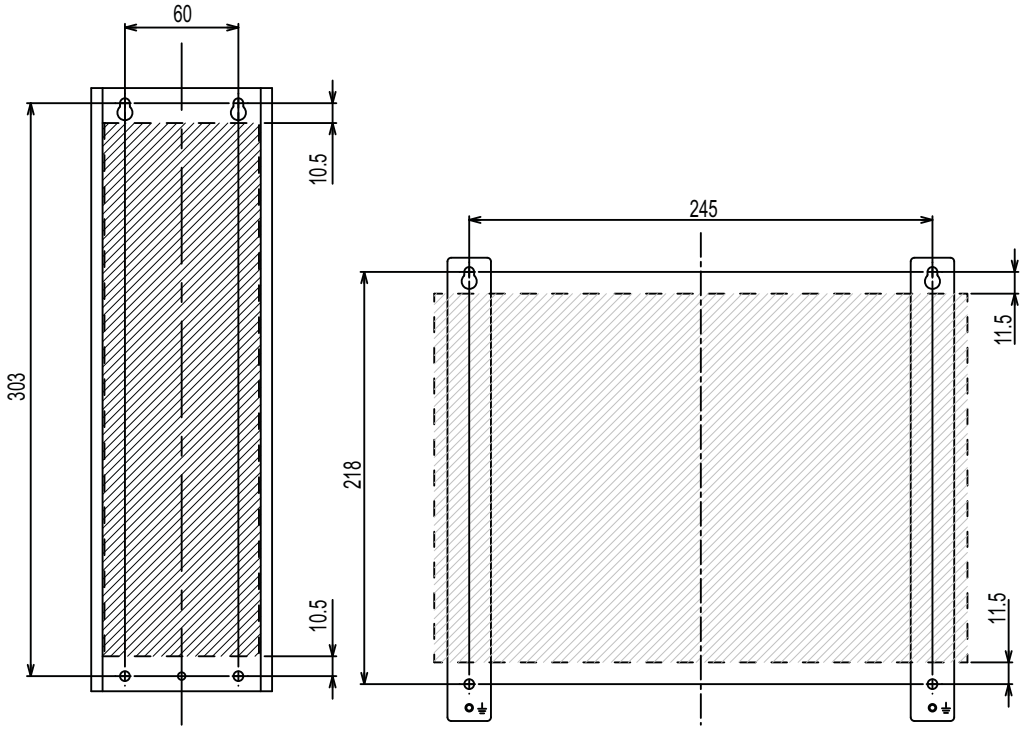
*1 Low profile cards, 2.536 inches (64.4 mm) are not supported.

4-1-8 Bracket Specifications

The metal mounting brackets mount your Box PC and they are the connection for the functional ground.

Use metal screws with a diameter of 4 mm or 5 mm to mount the brackets.

Mounting screw locations for book mount and wall mount orientation:



Additional Information

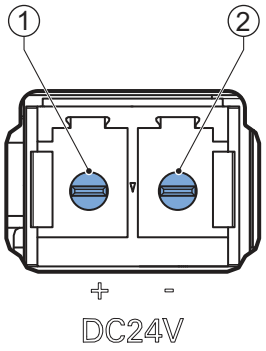
Refer to *5-3-8 Book Mount Procedure* on page 5 - 25 for book mount details.
Refer to *5-3-9 Wall Mount Procedure* on page 5 - 26 for wall mount details.

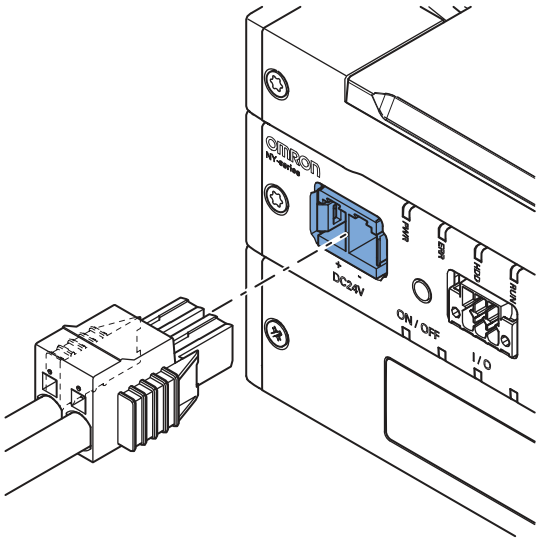
4-2 Connector Specifications

This section provides the Connector Specifications of the Industrial Box PC.

4-2-1 Power Connector Specifications

The power supply connector can be locked 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 Box PC provides protection against reverse polarity.





The pin layout represents the power connector on the Box PC.

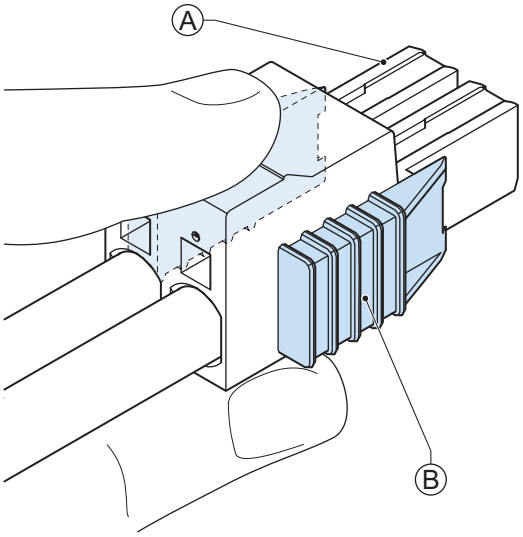
Pin	Description
1	24 VDC
2	0 VDC

Additional Information

- Refer to *5-4-3 Wire the Power Connector* on page 5 - 35 for wiring details.
- Refer to *5-4-2 Ground* on page 5 - 27 for grounding details.

Locking and Removing the Power Connector

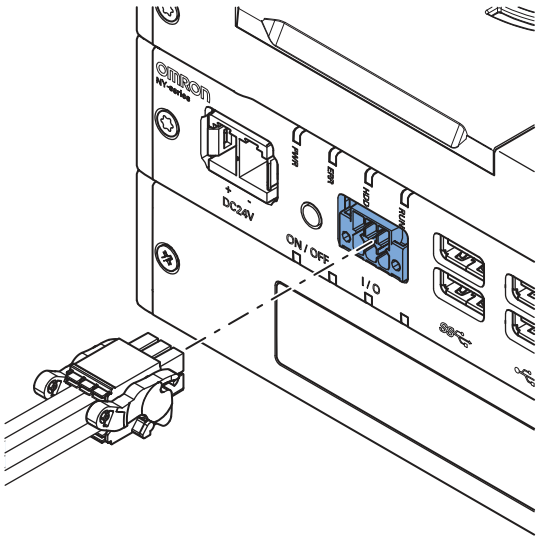
The power connector automatically locks into place when the black part of the connector is held and pushed in.



Pushing both orange sliders Ⓑ towards the end of the connector Ⓐ will release the lock when removing the connector.

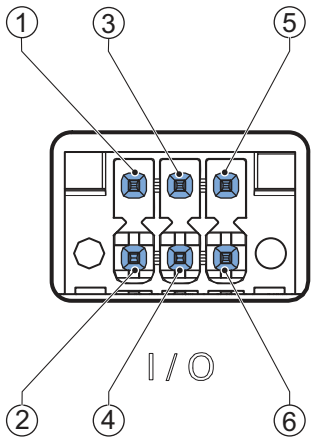
4-2-2 I/O Connector Specifications

Details of the I/O connector are provided below.
The I/O connector can be locked 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).



I/O Connector Pin Details

The pin details of the I/O connector.



The pin layout represents the I/O connector on the Box PC.
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.	• Open: The Power Status Output is OFF when the Box PC is OFF or has been disconnected from the power supply. • Closed: The Power Status Output is ON when the Box PC 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 - 16 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.	If the signal changes from inactive to active, the Box PC will perform one of the following operations. • When powered ON, the Box PC will shut down and power OFF. • When powered OFF, the Box PC 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 - 16 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 - 38 for I/O connector wiring details.

I/O Connector Power Status Output Details

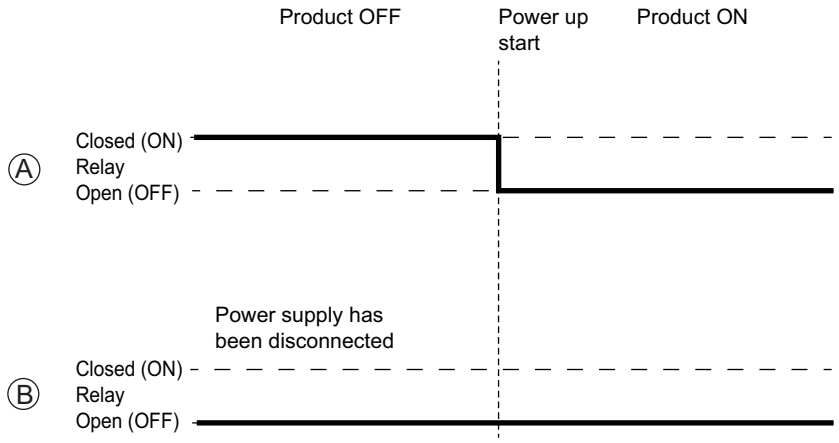
This section provides details of the Power Status Output relay.
The Power Status Output is a relay between pin 1 and 2 of the I/O Connector.

● 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 Box PC can be turned OFF.
If power is not turned OFF, the Power Status output will turn OFF when the Box PC is turned ON.

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

The Power Status Output is OFF Ⓑ when the Box PC has been disconnected from the power supply.



Additional Information

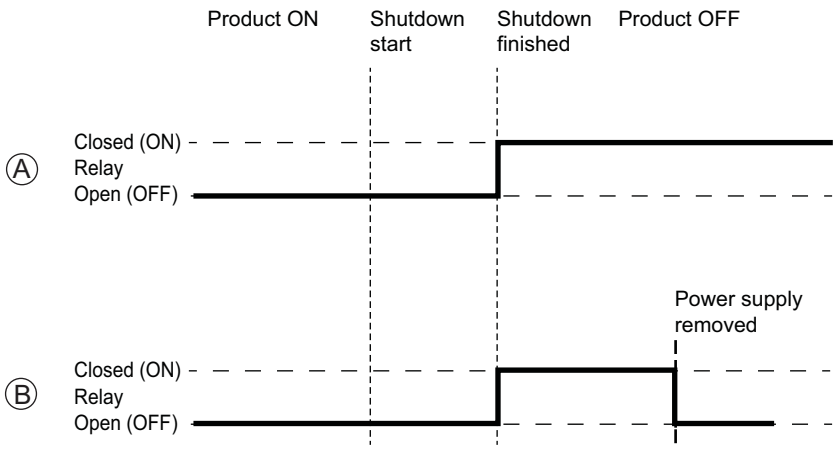
Refer to *5-4-4 Wire the I/O Connector* on page 5 - 38 for I/O connector wiring details.

● 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 Box PC can be turned OFF.

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

If power is turned OFF, the Power Status Output will turn OFF Ⓑ.

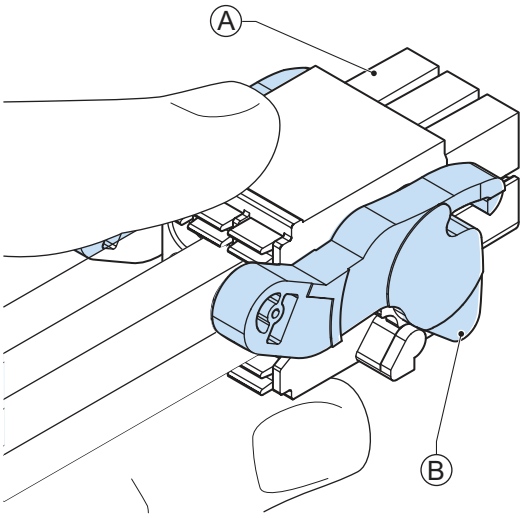


Additional Information

Refer to *5-4-4 Wire the I/O Connector* on page 5 - 38 for I/O connector wiring details.

Lock and Remove the I/O Connector

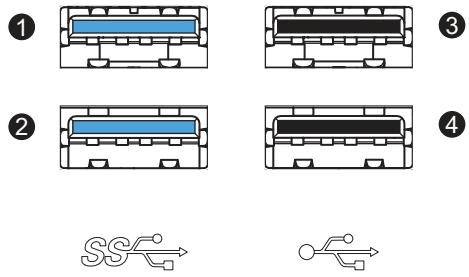
The I/O connector locks into place when the black part of the connector is held and pushed in.

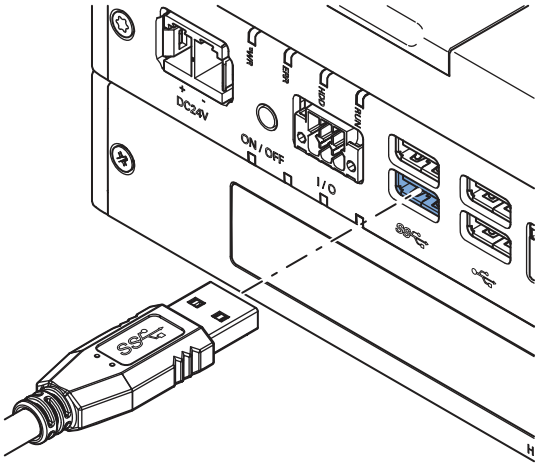


Tilting both levers Ⓑ will release the I/O connector Ⓐ from the Box PC.

4-2-3 USB Connector Specifications

The Industrial Box PC 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 Box PC.

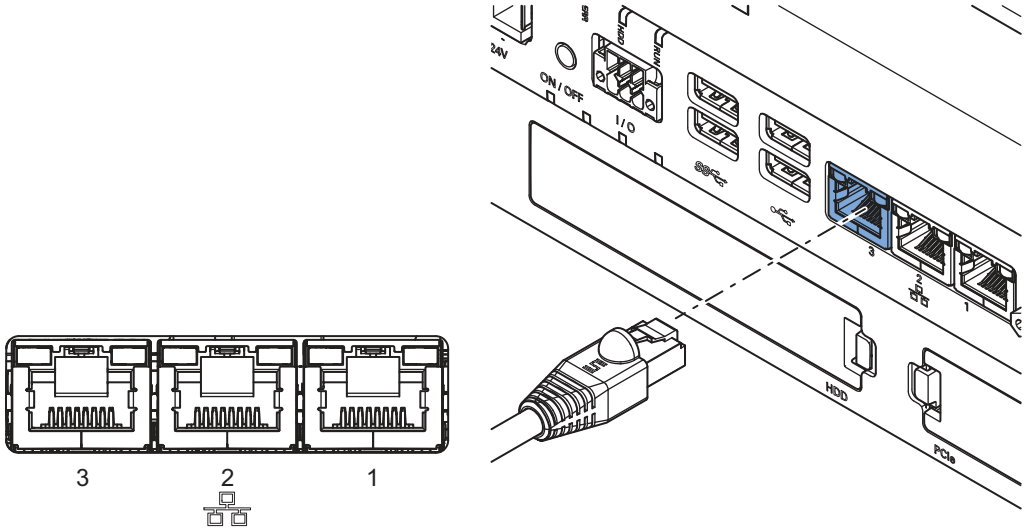
Interface Connector	Details
1	• USB 3.0 • 900 mA maximum current • 3 m maximum cable length • Blue color
2	
3	• USB 2.0 • 500 mA maximum current • 5 m maximum cable length • Black color
4	

Additional Information

Refer to *5-4-2 Ground* on page 5 - 27 for grounding details.

4-2-4 Ethernet Connector Specifications

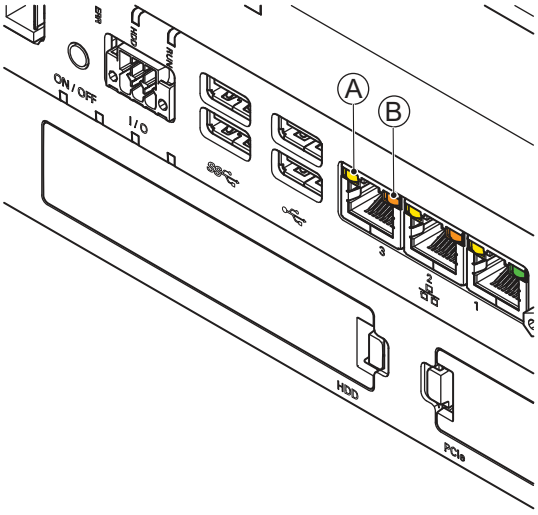
Details of the RJ45 Ethernet connectors are provided below.
The Ethernet connector locks automatically to prevent unintentional disconnection.



The view represents the Ethernet connector on the Industrial Box PC.

Ethernet Connector LED Indicators

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

Item	Indicator	Color	Status		Description
B	Speed	Not lit		Not lit	10 Mbps or no link
		Green		Lit	100 Mbps link
		Orange		Lit	1 Gbps link

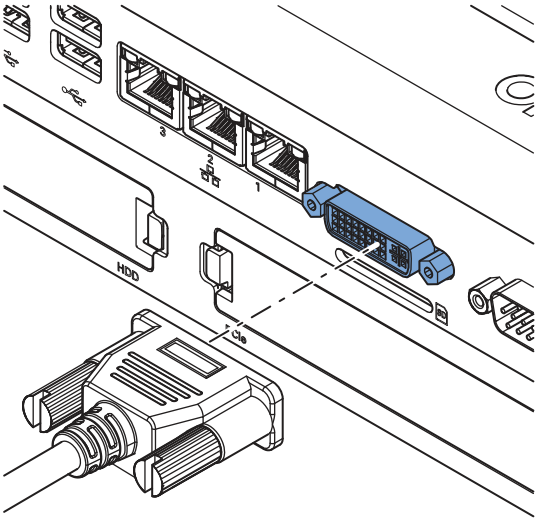
Ethernet Connector Specifications

Item	Specifications
Number of available ports	3
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

4-2-5 DVI Connector Specifications

DVI is the standard video interface for the Box PC.

The video interface depends on the model of the Box PC as specified below:



Additional Information

- Refer to *4-1-4 CPU Specifications* on page 4 - 6 for graphics controller details.
- Refer to *5-4-2 Ground* on page 5 - 27 for grounding details.
- Refer to *A-3 DVI Connector Pin Details* on page A - 15 for pin details.

The following tables provide DVI details per CPU type.

DVI-I Connector Specifications with an Intel® Core™ i7-4700EQ CPU

DVI-I connector specifications for Industrial Box PCs with an Intel® Core™ i7-4700EQ CPU.

Item	Specifications
Video interface	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

DVI-D Connector Specifications with an Intel® Core™ i5-4300U CPU

DVI-D connector specifications for Industrial Box PCs with an Intel® Core™ i5-4300U CPU.

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

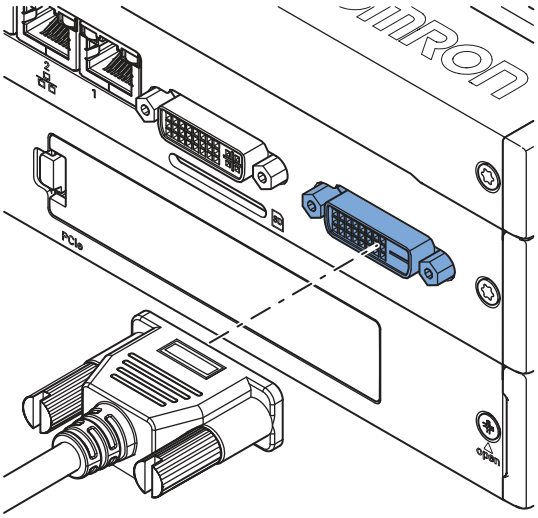
DVI-D Connector Specifications with an Intel® Celeron® 2980U CPU

DVI-D connector specifications for Industrial Box PC with an Intel® Celeron® 2980U CPU.

Item	Specifications
Video interface	Digital only
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 Optional DVI-D Connector Specifications

The optional video interface on the Box PC uses a DVI dual link connector.



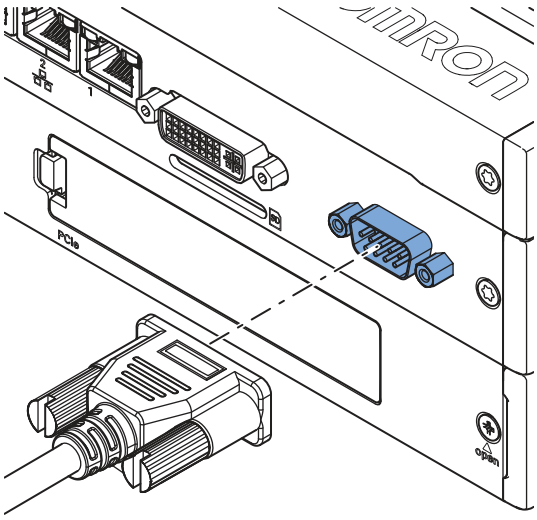
Item	Specification
Video interface	Digital only
Resolution	Up to 1920 x 1200 pixels at 60 Hz
Type	Dual link
Maximum DVI cable length	Dependent upon connected monitor type and resolution

Additional Information

- Refer to *4-1-4 CPU Specifications* on page 4 - 6 for graphics controller details.
- Refer to *5-4-2 Ground* on page 5 - 27 for grounding details.
- Refer to *A-3-2 DVI-D Connector Pin Details* on page A - 16 for pin details.

4-2-7 Optional RS-232 Connector Specifications

The optional RS-232 interface on the Box PC uses a standard SUBD9 connector.
The RS-232 interface is not isolated from the internal Box PC's components.



Additional Information

- Refer to *5-4-2 Ground* on page 5 - 27 for grounding details.
- Refer to *A-4 RS-232 Connector Pin Details* on page A - 18 for pin details.

4-3 Software Specifications

This section provides the Software Specifications of the Industrial Box PC.

4-3-1 Available Windows Operating Systems

The available Windows Operating Systems are:

- Windows Embedded Standard 7 SP1 - 32 bit
- Windows Embedded Standard 7 SP1 - 64 bit

4-3-2 Supported Languages

Languages supported by the Windows Operating System are:

- EN
- CN Simplified (zh-cn)
- CN Traditional (zh-tw)
- DE
- ES
- FR
- IT
- JA

4-4 Environmental Specifications

This section provides environmental specifications of the Industrial Box PC.

4-4-1 General Environmental Specifications

The following table provides the general environmental specifications for the Industrial Box PC.

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 Box PC 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 Box PC with a HDD the vibration resistance depends on the mounting orientation*2.
Shock resistance (during operation)	Conforms to IEC 60028-2-27. 147 m/s², 3 times in each X, Y and Z directions
Pollution degree	2 or less: IEC 61131-2
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 - 27 for ambient operating temperature details per CPU type.

*2 Vibration resistance depends on the Box PC's mounting orientation and storage device type:

Mounting Orientation	SSD	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 product type, CPU type, mounting orientation, and storage device type.
The following sections provide temperature and humidity details per CPU type.

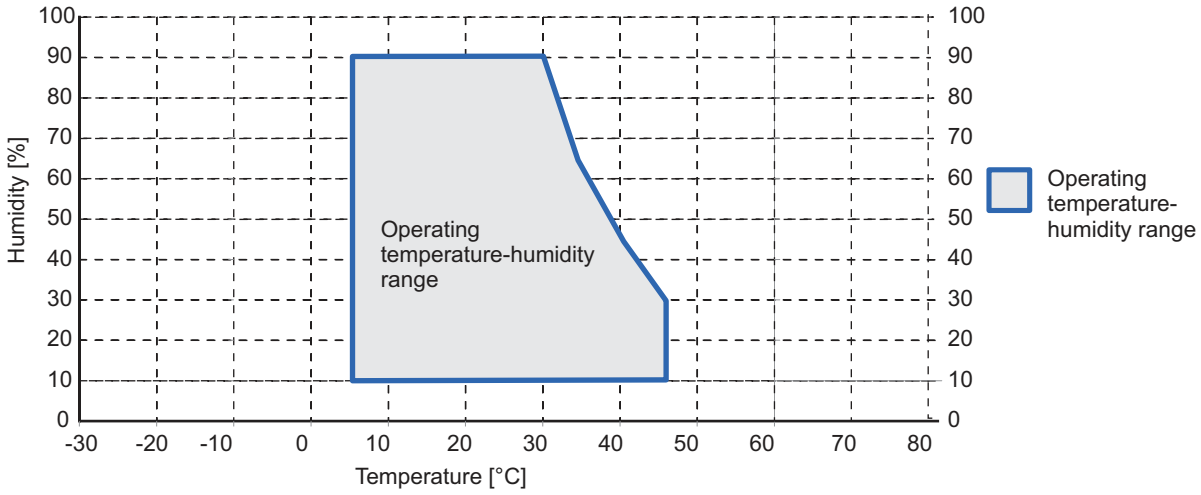
Temperature and Humidity Graphs

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

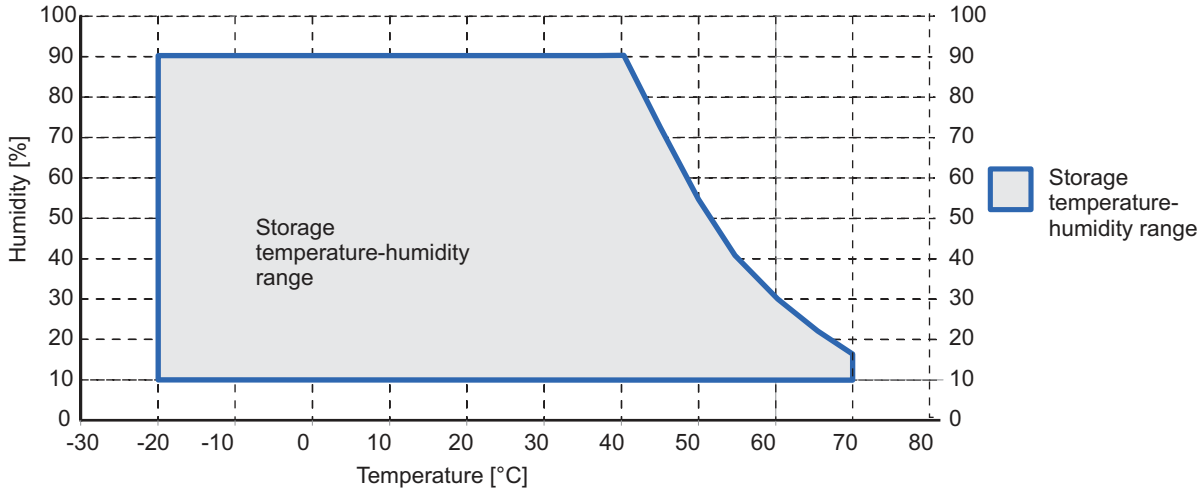
- Operate the Box PC with a SSD within the general environmental specifications.
- Operate the Box PC with a HDD within the following ambient temperature and humidity ranges.

Additional Information

Refer to the ambient temperature and humidity specifications per CPU type for specific limitations.



- Store the Box PC with a SSD within the general environmental specifications.
- Store the Box PC with a HDD within the following ambient temperature and humidity ranges.



Temperature Specifications with an Intel® Core™ i7-4700EQ CPU

Ambient operating temperature specifications for a Box PC with an Intel® Core™ i7-4700EQ CPU.

Mounting Orientation	Storage device type *1				
	1 x SSD	2 x SSD	1 x HDD	2 x HDD	1 x SSD 1 x HDD
Book	0 to 55°C		5 to 45°C	5 to 35°C	5 to 45°C
Wall	0 to 55°C		5 to 45°C	5 to 35°C	5 to 45°C

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

Additional Information

Refer to *Temperature and Humidity Graphs* on page 4 - 27 for graph details.

Temperature Specifications with an Intel® Core™ i5-4300U CPU

Ambient operating temperature specifications for a Box PC with an Intel® Core™ i5-4300U CPU.

Mounting Orientation	Storage device type *1				
	1 x SSD	2 x SSD	1 x HDD	2 x HDD	1 x SSD 1 x HDD
Book	0 to 55°C		5 to 45°C	5 to 30°C	5 to 45°C
Wall	0 to 50°C		5 to 40°C	5 to 30°C	5 to 40°C

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

Additional Information

Refer to *Temperature and Humidity Graphs* on page 4 - 27 for graph details.

Temperature Specifications with an Intel® Celeron® 2980U CPU

Ambient operating temperature specifications for a Box PC with an Intel® Celeron® 2980U CPU.

Mounting Orientation	Storage device type *1	
	SSD	HDD
Book	0 to 55°C	5 to 45°C
Wall	0 to 50°C	5 to 40°C

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

Additional Information

Refer to *Temperature and Humidity Graphs* on page 4 - 27 for graph details.

4-4-3 Applicable Environmental Standards

The following table provides the applicable standards for the Industrial Box PC.

Item	Specifications
Applicable environmental standards	RoHS Directive (2002/95/EC)

Additional Information

- Refer to the OMRON website (www.ia.omron.com) or contact your OMRON representative for the most recent applicable standards for each model.
- Refer to *Regulations and Standards* on page 21 for other applicable standards.

4-4-4 Recycling Specifications

The following table provides recycling information for the Industrial Box PC.

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 Industrial Box PC.

5-1 Unpack

This section provides details on how to unpack the Industrial Box PC.

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 - 3 for the items supplied.

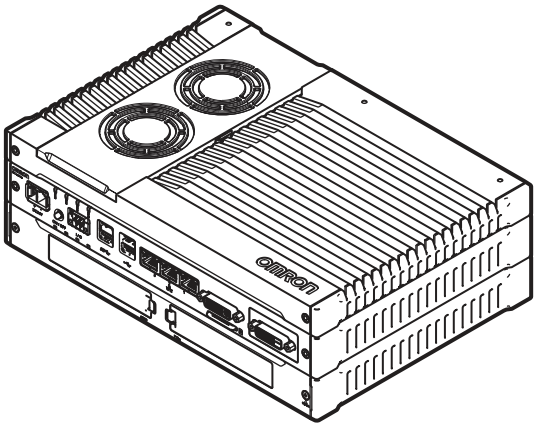
5-1-2 Items Supplied

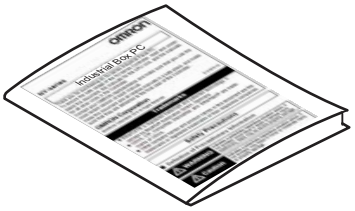
The Industrial Box PC is supplied with several items.
Refer to *Items Supplied with the Industrial Box PC* on page 5 - 4
and to *Items Supplied with the Brackets* on page 5 - 5 for more information.

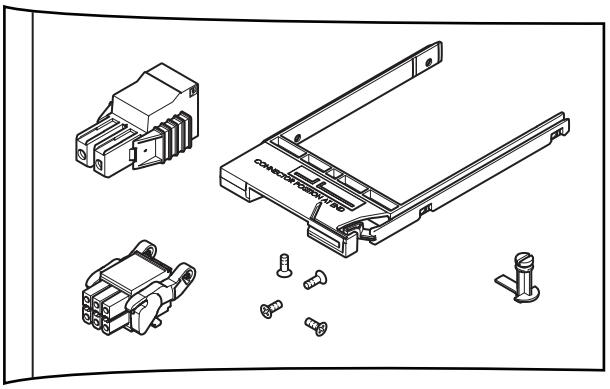
Items Supplied with the Industrial Box PC

This section describes the items supplied with your Industrial Box PC.

- Industrial Box PC
- Instruction sheet
- Bag with:
  - Power connector
  - I/O connector
  - Drive bracket for drive installation
  - 4 Mounting screws for drive installation
  - PCIe Card support for PCIe Card installation







Items Supplied with the Brackets

This section describes the items supplied with the brackets for your Industrial Box PC.

Additional Information

- Refer to *2-9-1 Mounting Brackets* on page 2 - 17 for bracket details.
- Refer to *5-3-8 Book Mount Procedure* on page 5 - 25 for book mount installation.
- Refer to *5-3-9 Wall Mount Procedure* on page 5 - 26 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 Industrial Box PC.

5-2-1 Install an Additional Drive

A drive is a storage device for the Industrial Box PC.
Depending on the model one or two drives are supported.
Refer to *4-1-4 CPU Specifications* on page 4 - 6 for the number of supported drives.

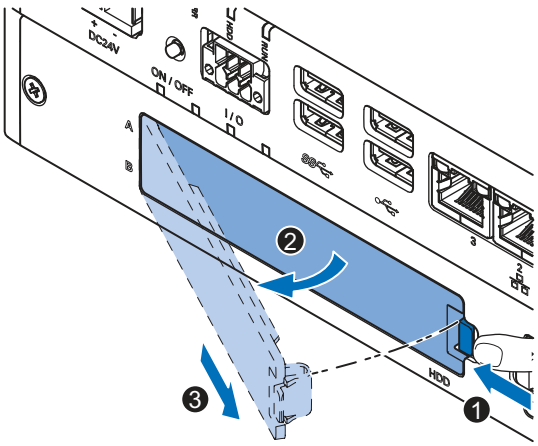
Prepare the following items:

- The additional drive
  An additional drive is not supplied with the Box PC.
  Refer to *2-9-4 Storage Devices* on page 2 - 18 for the model.
  Refer to *4-1-6 Storage Devices* on page 4 - 8 for drive specifications.
- The drive bracket with mounting screws
  These are supplied with the Box PC.

To install a drive:

1 Ensure the Box PC is OFF.

2 Remove the drive cover.

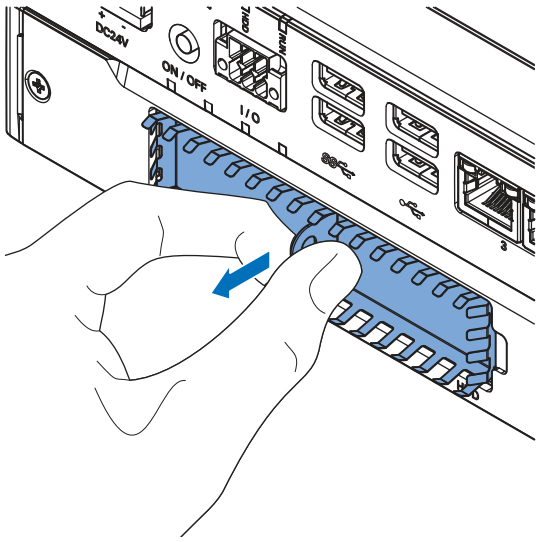


(1) Push the lock lever ❶.

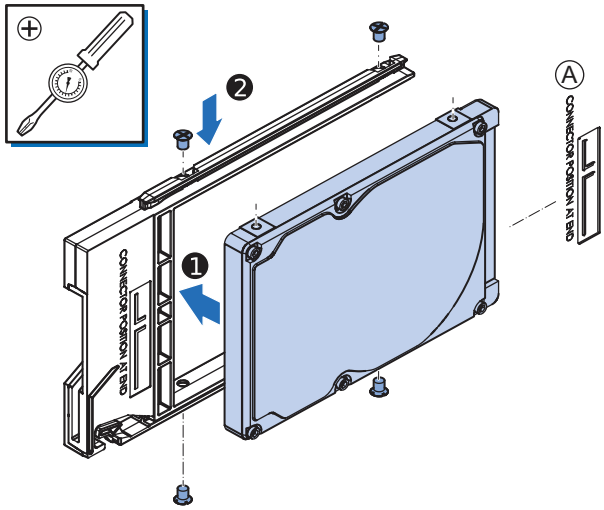
(2) Tilt the drive cover ❷.

(3) Remove the drive cover ❸.

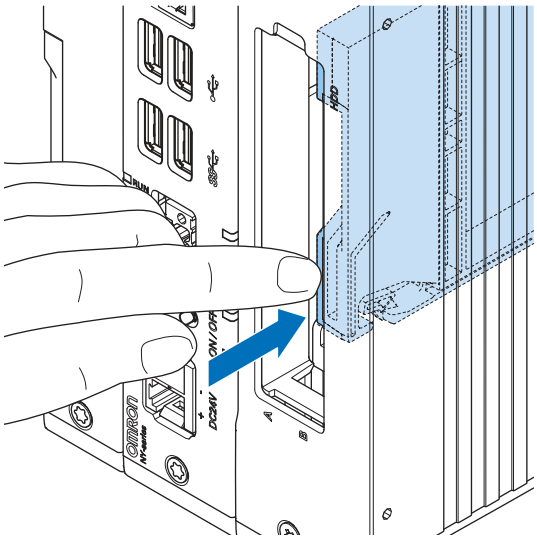
3 Pull the metal shielding cover out of the Box PC.



4 Align the connectors of the 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.

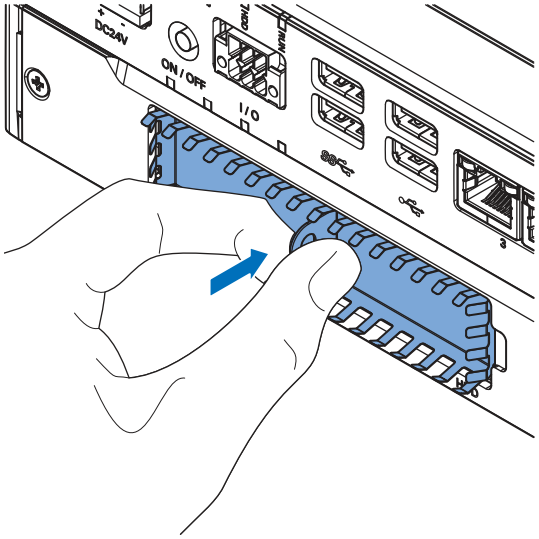


5 Insert the bracket with the drive into slot B of the Box PC.
Ensure the bracket is completely in the Box PC with an extra push.

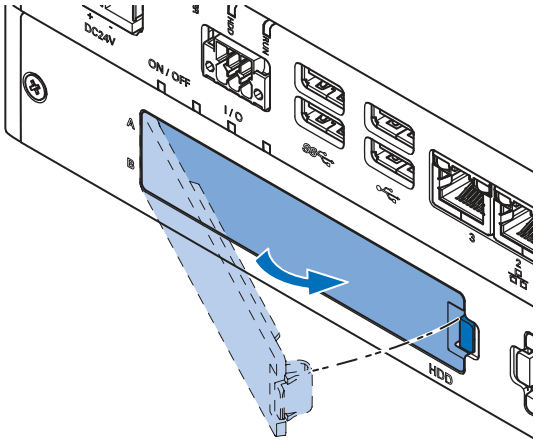


The drive bracket will lock into place when it is fully inserted.

6 Insert the metal shielding cover.



7 Mount the drive cover.
The lock lever will click when closed correctly.



8 When the Box PC is powered ON then allocate the drive to have it visible in Windows.
Refer to *7-2-8 Allocate a Drive in Windows* on page 7 - 35 for the allocation procedure.

The drive is installed.

5-2-2 Install the PCIe Card

Prepare the following items:

- The PCIe Card.
  A PCIe Card is not supplied with the Box PC.

Additional Information

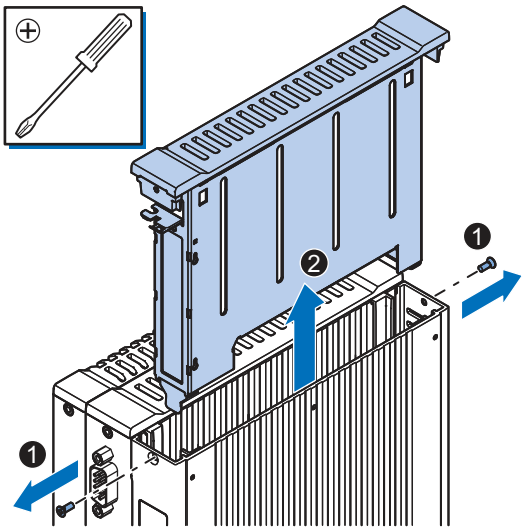
Refer to *4-1-7 PCIe Card Slot Specifications* on page 4 - 10 for PCIe specifications.

- The PCIe Card mounting material: Card Support.
  This item is supplied with the Box PC.

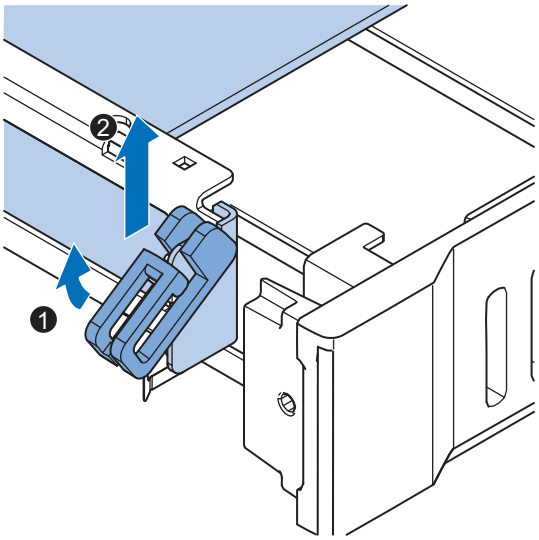
To install the PCIe Card:

1 Ensure the Box PC is OFF.

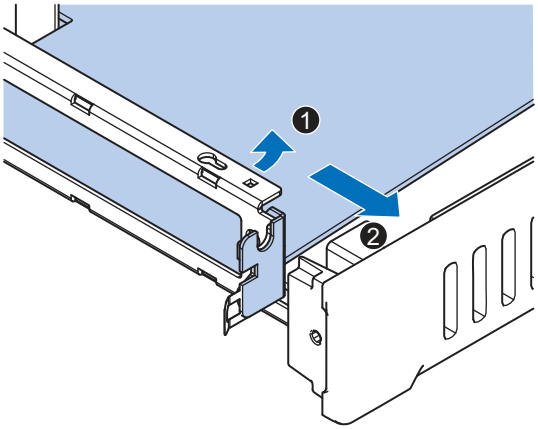
2 Remove the two crosshead screws ❶ indicated with "open" and then pull up ❷ the PCIe Drawer.
The indent at the side of the drawer will help you to pull the drawer from the Box PC.



3 Pull the middle of the Card Clip to unlock it and remove it from the PCIe Drawer.

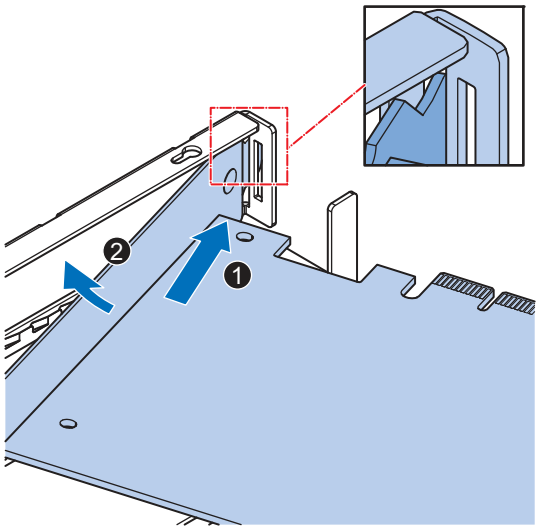


4 Remove the slot cover from the PCIe Drawer.
The thin sheet metal frame should stay in the PCIe Drawer.



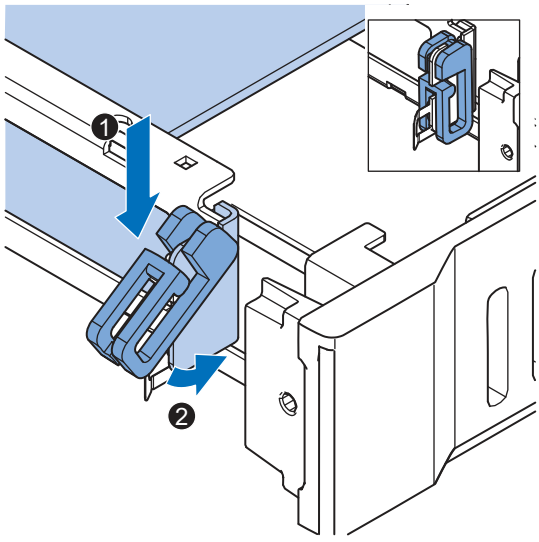
The slot cover is now removed.

5 Place the PCIe Card in the PCIe Drawer.

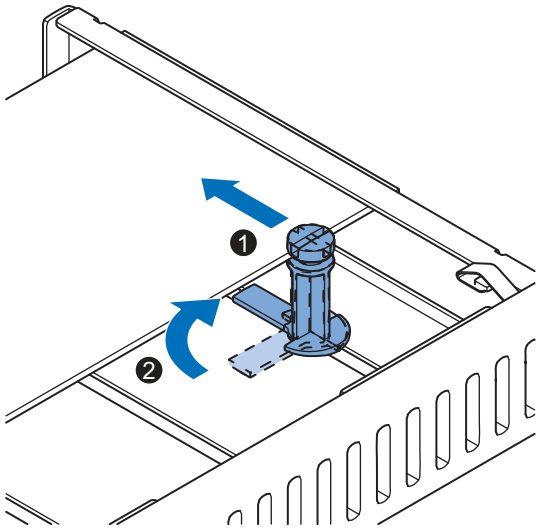


Ensure to insert the PCIe Card in the correct opening.
Ensure the thin sheet metal frame is positioned between the PCIe Card and the PCIe Drawer to ensure a good conductive contact.

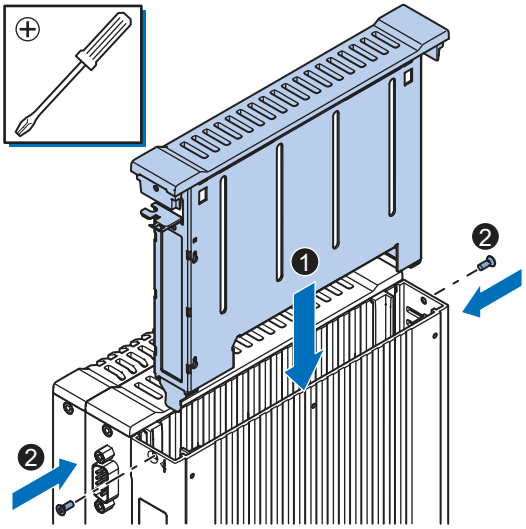
6 Place the Card Clip in the PCIe Card and PCIe Drawer ❶ and then rotate the Clip ❷ to lock it in place.



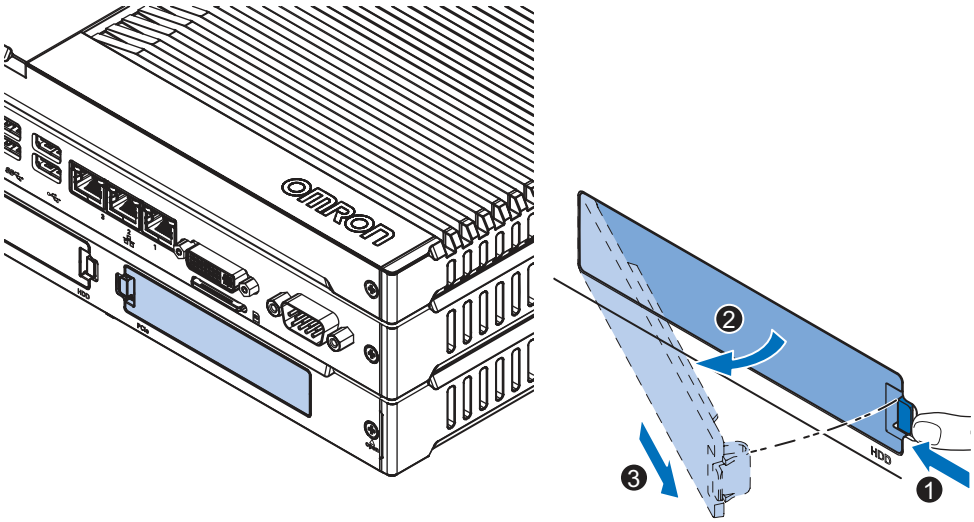
7 Slide the Card Support ❶ so that it supports the side of the PCIe Card.
The card should be in small groove so there is support below and above the card.
Rotate the Card Support ❷ to lock it in place.



8 Insert the PCIe Drawer in the Box PC and then insert the two crosshead screws that hold the PCIe Drawer in place.



9 Remove the PCIe cover if the PCIe Card has external connectors.



(1) Push the lock lever ❶

(2) Tilt the PCIe cover ❷

(3) Remove the PCIe cover ❸

The PCIe Card is installed.

5-3 Mount

This section describes how to mount the Box PC 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 Industrial Box PC must be mounted in a cabinet or a control panel.
Consider Box PC orientation, cooling distance, noise resistance, ducts and Box PC replacement when determining the space between the Box PC 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
- Locations outdoors subject to direct wind and rain
- Locations subject to strong ultraviolet light

Additional Information

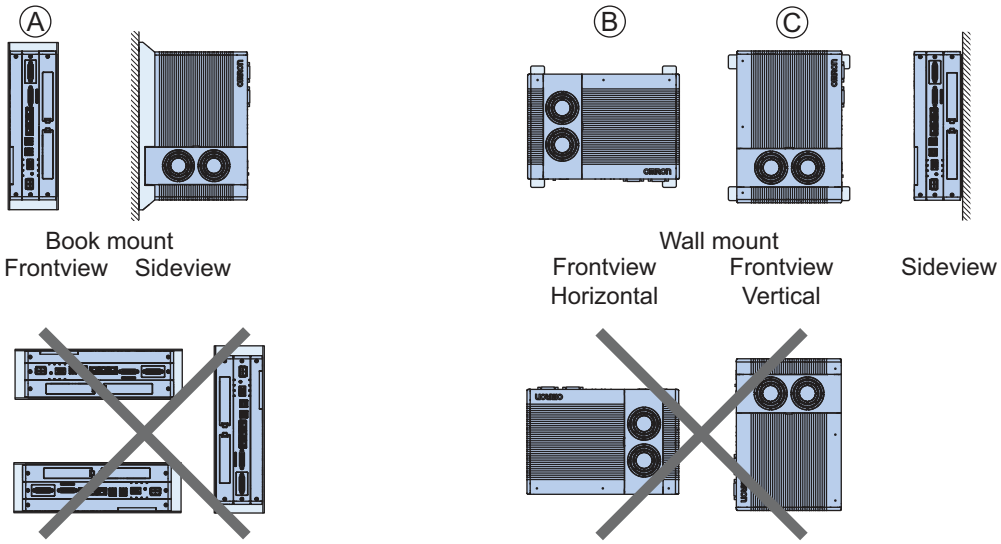
- Ensure you have installed the options before you mount the product.
  Refer to *5-2 Install Options* on page 5 - 6 for option details.
- Refer to *5-3-8 Book Mount Procedure* on page 5 - 25
  or *5-3-9 Wall Mount Procedure* on page 5 - 26 for orientation details.
- Refer to *4-4 Environmental Specifications* on page 4 - 26 for temperature details.
- Refer to *5-3-4 Humidity* on page 5 - 19 for humidity details.
- Refer to *5-4 Wire* on page 5 - 27 for wiring details.

5-3-2 Product Orientation

The Box PC 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 Box PC in other orientations.



5-3-3 Temperature

Panels have been reduced in size due to space-saving and miniaturization in devices and systems, and the temperature inside the 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 panel, and allow a sufficient margin for the temperature.

Distance for Cooling

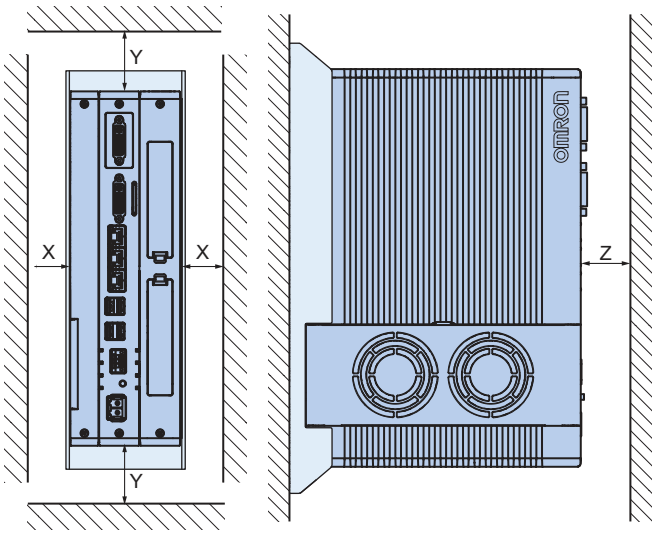
Adequate airflow around the Industrial Box PC is required.

Additional Information

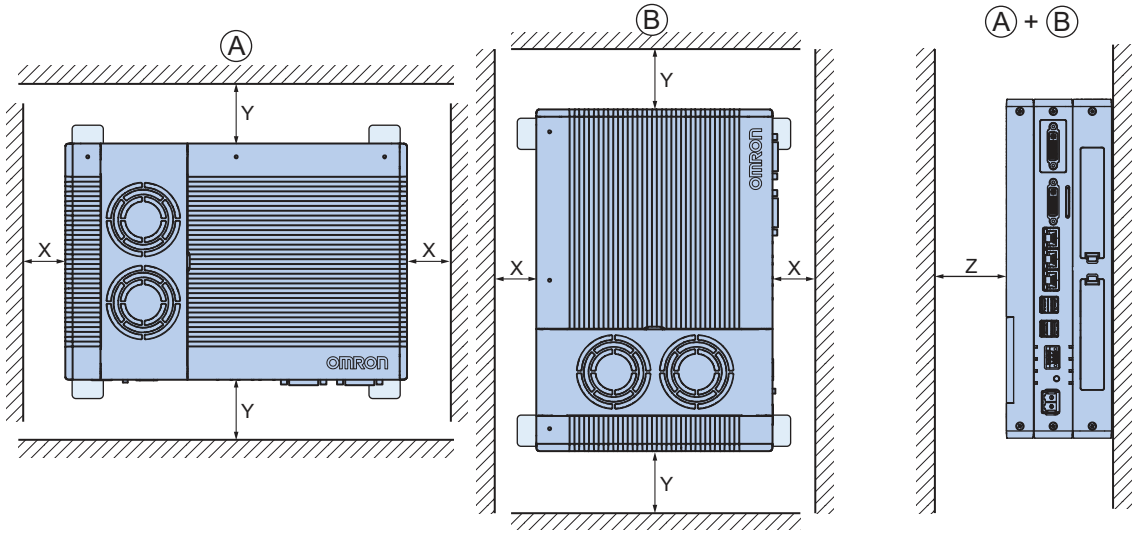
- The ambient temperature must be within the operating range.
  Refer to *4-4-1 General Environmental Specifications* on page 4 - 26 for temperature specifications.
- Allow space to accommodate for the bending radius of the cables.
  Refer to *2-9-5 DVI Cables* on page 2 - 19 and
  2-9-6 USB Type-A to USB Type-B Cables on page 2 - 19 for cable bending radius information.

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

- **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 Box PC.

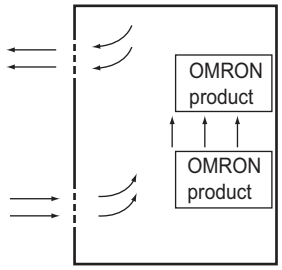
High Temperatures

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.

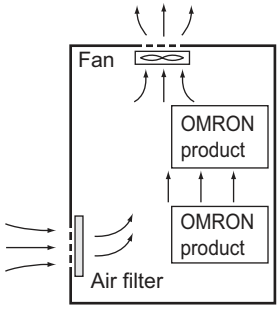
- Do not install the Box PC at the top of the panel, where hot air tends to stagnate.
- To provide ventilation space above and below the Box PC, leave sufficient distance from other devices, wiring ducts, etc.
- Do not mount the Box PC in the wrong direction (e.g., vertically or upside down). Doing so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



Natural Cooling

● Forced Ventilation

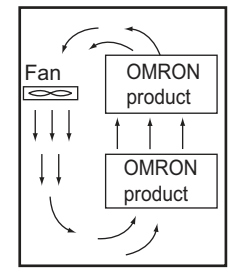
Forced ventilation with a fan in the top of the control cabinet.



Forced Ventilation Method

● Forced Air Circulation

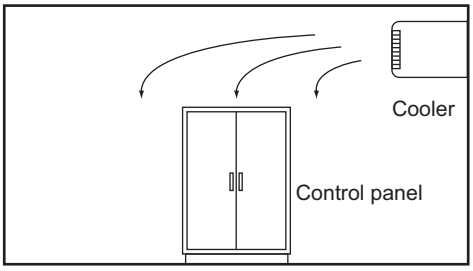
Forced circulation with a fan inside the closed control cabinet.



Forced Air Circulation

● Room Cooling

Cool the entire room where the control panel is located.



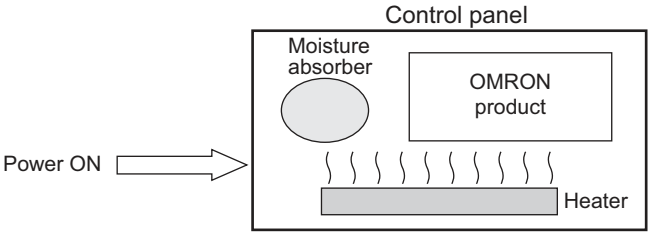
Room Cooling

Low Temperatures

The Box PC 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 Box PC power ON to keep the Box PC 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 Box PC 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 Box PC 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, however, the Box PC 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 Box PC control panel from the source of the vibration or shock. Or secure the Box PC and the control panel with rubber padding to prevent vibration.
- Make the building or the floor vibration-resistant.
- To prevent shock when other devices in the panel such as electromagnetic contactors operate, secure either the source of the shock or the Box PC with rubber padding.

5-3-6 Atmosphere

Using the Box PC in any of the following locations can cause defective contact with connectors and corrosion 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 pressurize 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 Box PC.

5-3-7 Electrical Environment

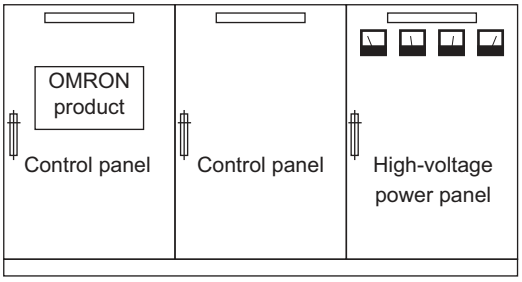
When installing or wiring devices, make sure that there will be no danger to people and that noise will not interfere with electrical signals.

Installation Location

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

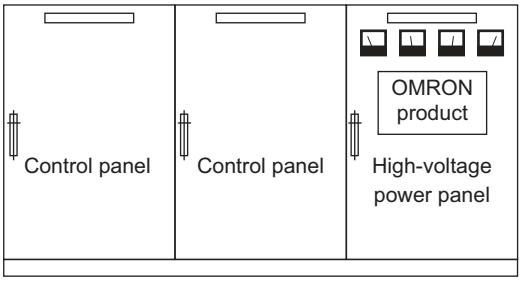
Example of Recommended Equipment Arrangement

OK



Example of Poor Equipment Arrangement

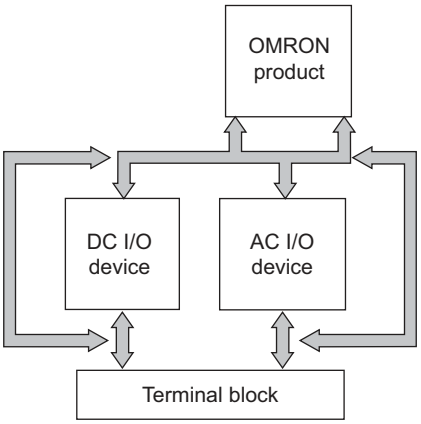
NG



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 Box PC. Locate them at least 100 mm away from the Box PC.

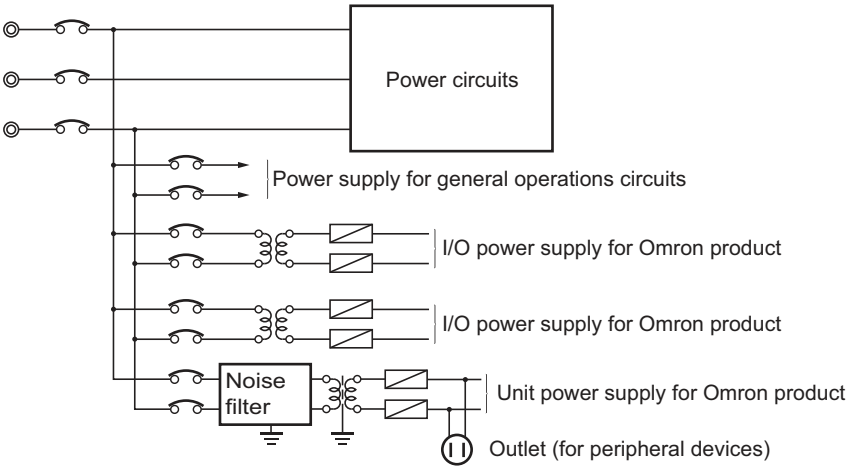


Example of Arrangement in Panel

Wire Layout for the Power Supply

Observe the following points when wiring the power supply system.

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

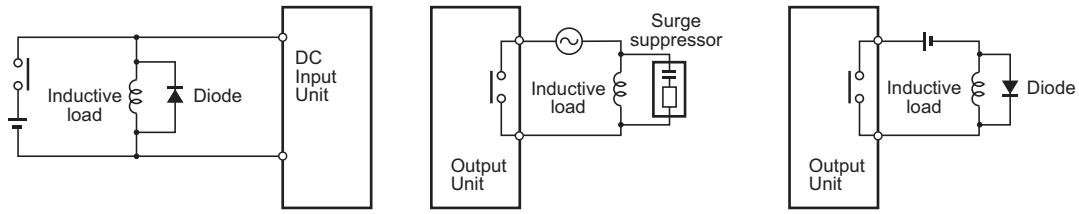


Power Supply System Diagram

Wire External I/O Signal Lines

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

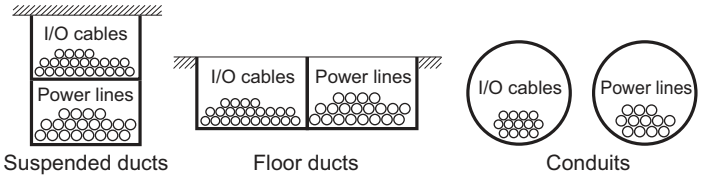
- To absorb reverse electromotive force when an inductive load is connected to an output signal, connect a surge suppressor near the inductive load in an AC circuit, or connect a diode near the inductive load in a DC circuit.



Connect a diode in a DC circuit. Connect a surge suppressor in an AC circuit. Connect a diode 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 Box PC, 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

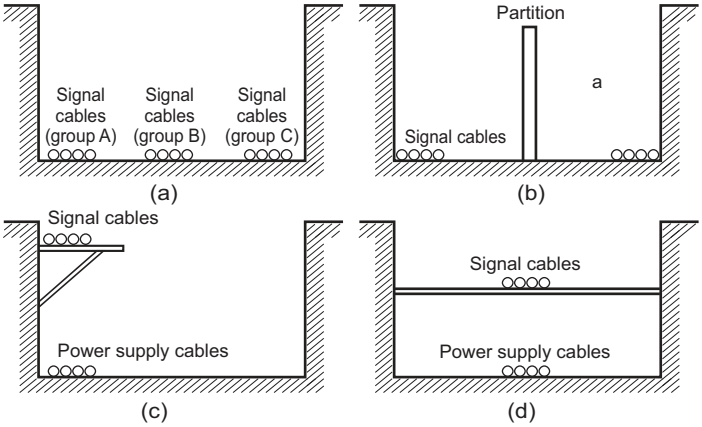
Each of the following combinations includes different signal types, properties, or levels. They will cause the signal-to-noise ratio to drop due to factors such as electrical induction. As a general rule when wiring, either use separate cables or separate wiring routes for these items. Future maintenance 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

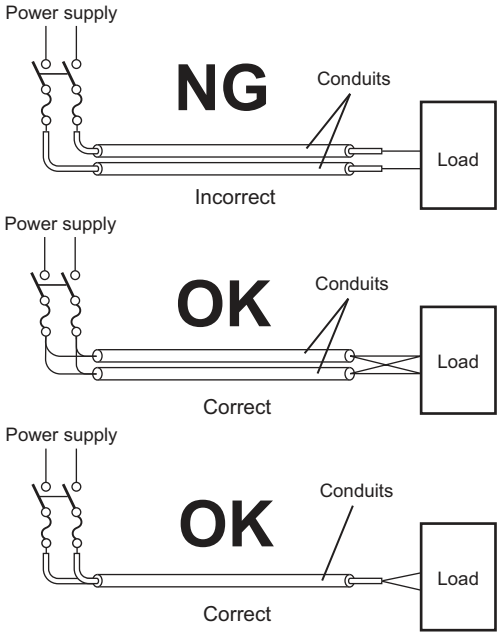
Observe the following points when wiring power supply and signal cables.

- 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.



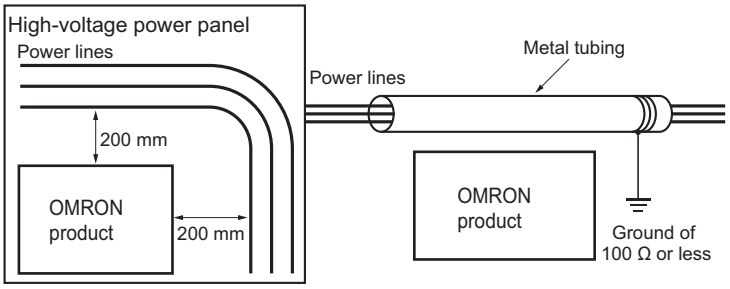
Partitioning Methods for Signal and Power Supply Cables

- 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 Box PC is installed in a panel that includes high-voltage devices. Wire and install them as far apart as possible.
- Either install the Box PC 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 Industrial Box PC directly into the duct.

Additional Information

Refer to *Distance for Cooling* on page 5 - 16 for the minimum required distances.

It is convenient to use wiring ducts that have the same depth as the Industrial Box PC.

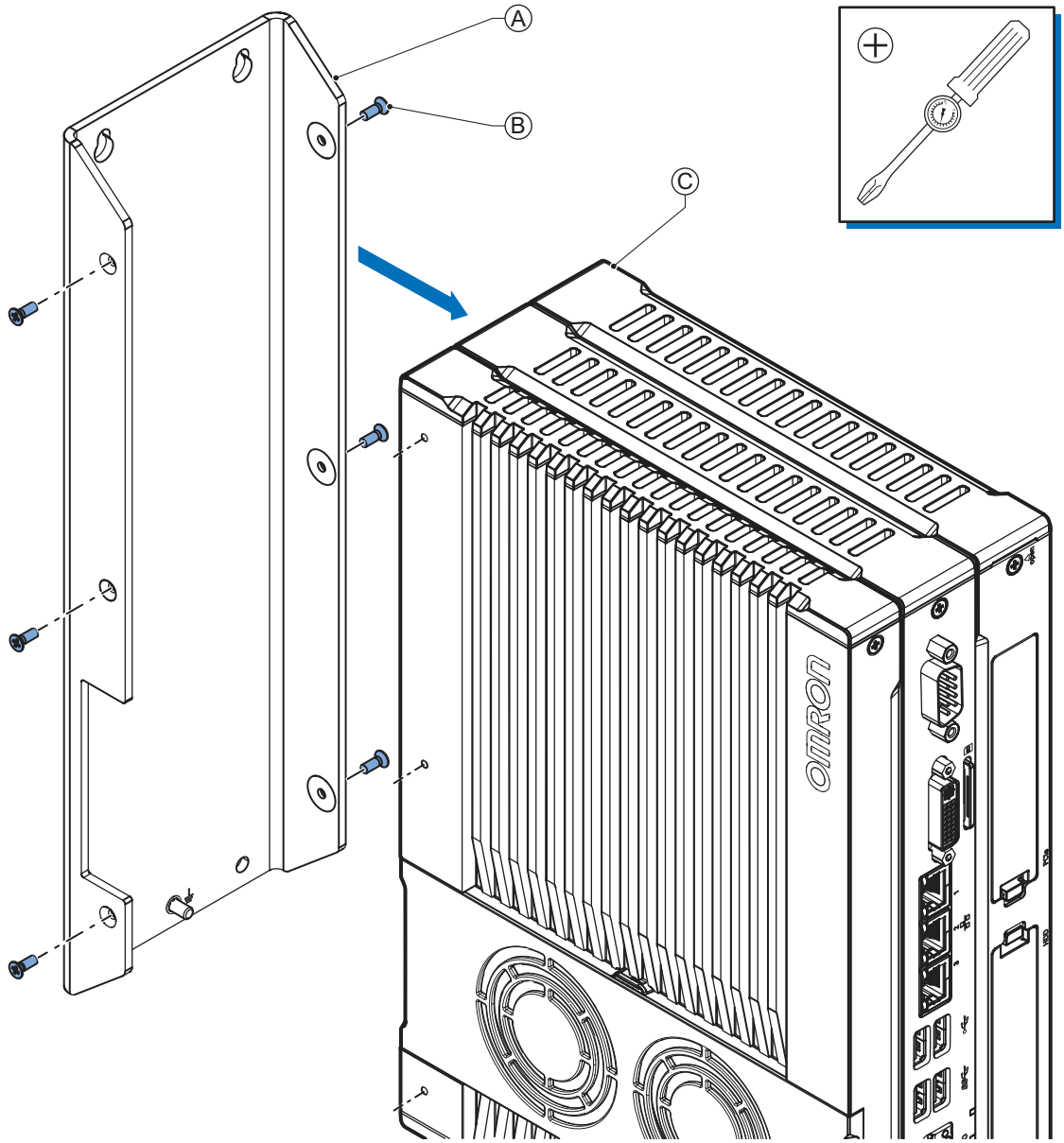
● Other Precautions

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 Industrial Box PC in the book orientation.
Refer to *Ground Connection Details* on page 5 - 33 for grounding methods.
Refer to *2-9-1 Mounting Brackets* on page 2 - 17 for the bracket model.

1 Mount the Bracket Ⓐ to the Industrial Box PC Ⓒ with the 6 Phillips screws Ⓑ supplied with the brackets. Tighten these screws with a torque of 0.5 N·m.



2 Mount the Box PC with the bracket in position.

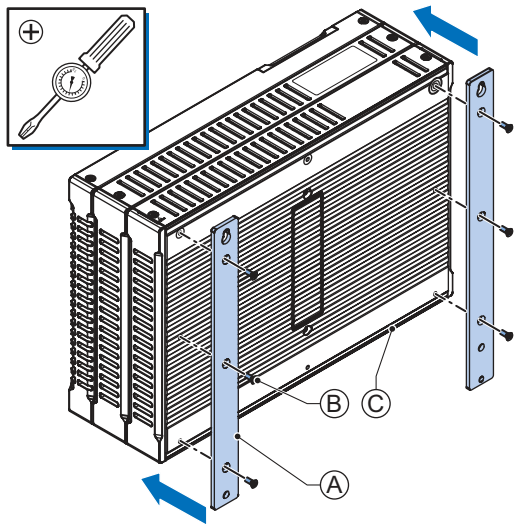
- Drill the four holes at the location where the Box PC with bracket will be mounted.
  Refer to *4-1-8 Bracket Specifications* on page 4 - 12 for details.
- Position the Industrial Box PC with bracket in the mounting location.
- Insert screws through the bracket into the mounting surface.
  Note that these screws are not in the scope of delivery.
- Tighten all four screws with a torque of 0.5 N·m.

The Box PC is mounted.

5-3-9 Wall Mount Procedure

Use the following procedure to mount the Box PC in the wall orientation.
Refer to *Ground Connection Details* on page 5 - 33 for grounding methods.
Refer to *2-9-1 Mounting Brackets* on page 2 - 17 for the bracket model.

1 Mount the Brackets Ⓐ to the Industrial Box PC Ⓒ with the 6 Phillips screws Ⓑ supplied with the brackets.
Tighten these screws with a torque of 0.5 N·m.



2 Mount the Industrial Box PC with the brackets in position.

- Drill the four holes at the location where the Box PC with brackets will be mounted.
  Refer to *4-1-8 Bracket Specifications* on page 4 - 12 for details.
- Position the Industrial Box PC with bracket in the mounting location.
- Insert screws through the bracket into the mounting surface.
  Note that these screws are not in the scope of delivery.
- Tighten all four screws with a torque of 0.5 N·m.

The Box PC is mounted.

5-4 Wire

This section describes how to wire the Industrial Box PC.

5-4-1 Wiring Warnings and Cautions

This section describes the Warnings and Cautions when wiring the Industrial Box PC.

⚠ 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

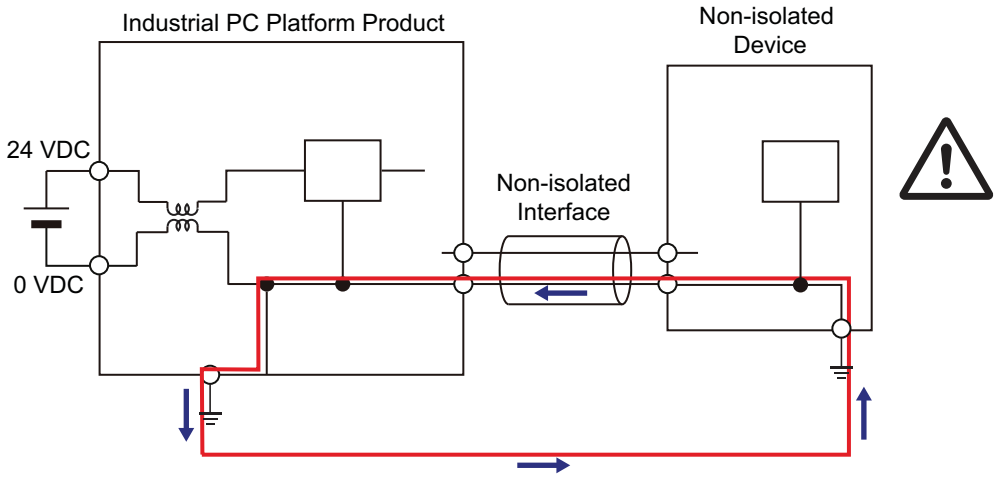
This section describes how to ground the Industrial Box PC.

⚠ 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 Box PC.

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.

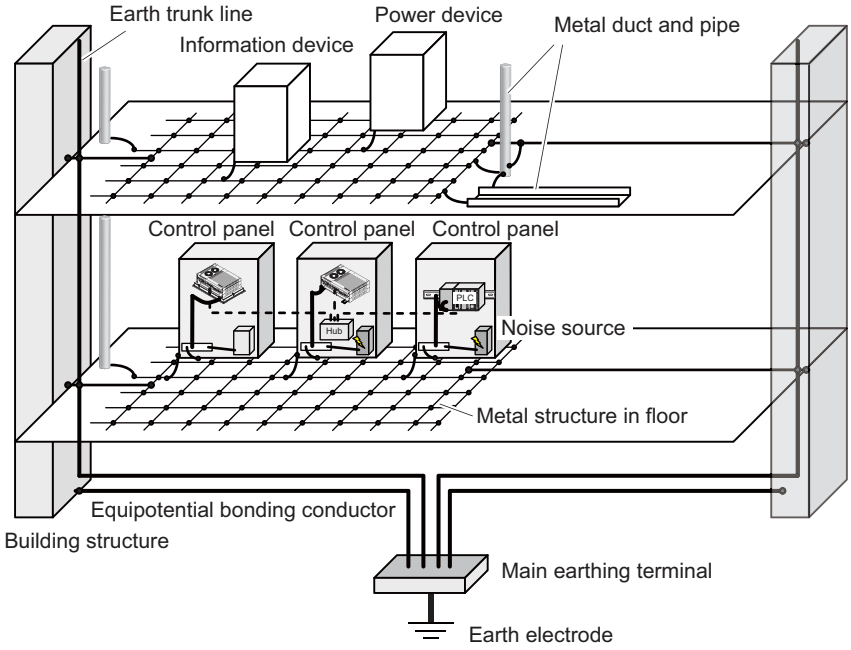
Equipotential Bonding System

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

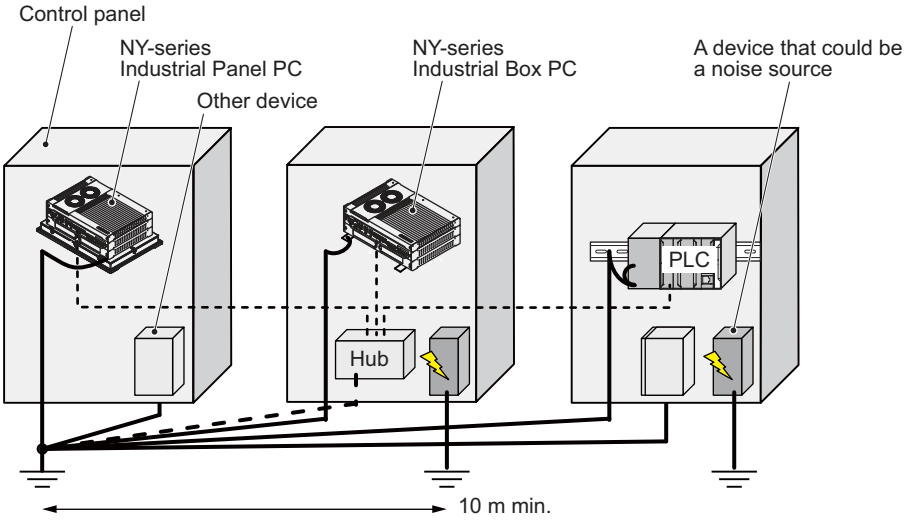
If the earthing method used for the building is not equipotential bonding or the earthing system is unknown, choose (a) from among the earthing methods given below.

(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.

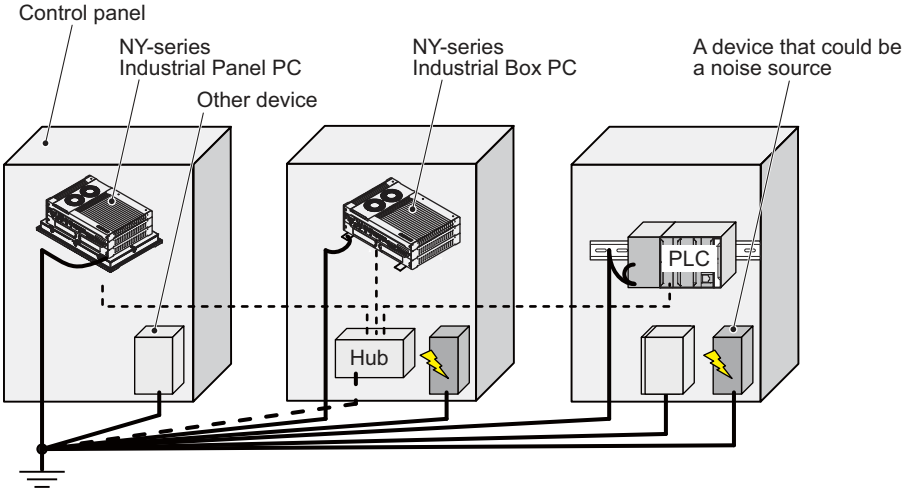
Connect the ground lines of the device that is connected with a communications cable and other devices as a bundle to a single earth electrode. Be sure that the earth electrode is separated by a minimum of 10 m from any other earth electrode of a device that could be a noise source.



(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.

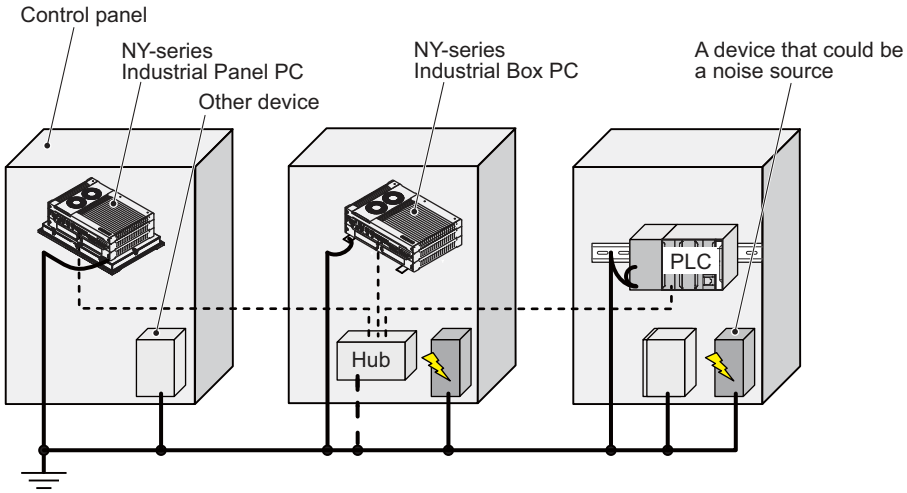
This earthing method is not recommended because the device that could be a noise source may interfere electromagnetically with other devices.



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.

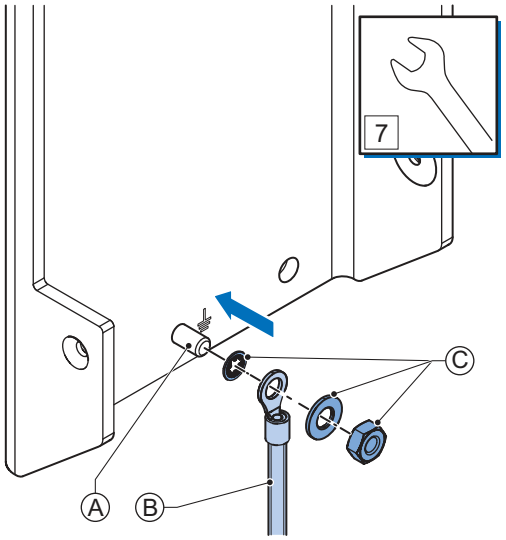


Ground Connection Details

This section provides details about the ground connection.
Use the functional ground terminal on the mounting bracket(s) to ground your Industrial Box PC.

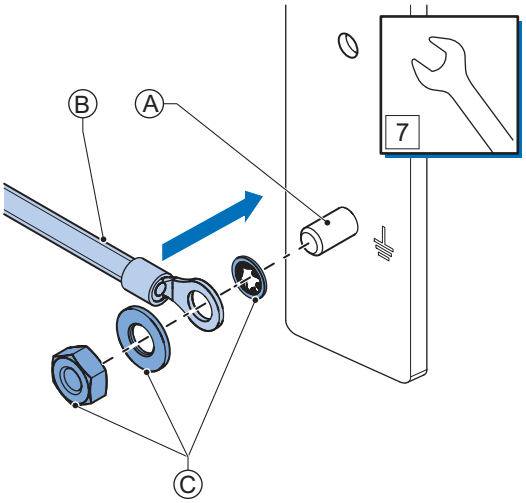
The washers and nut Ⓒ are supplied with the bracket(s).
Refer to *Items Supplied with the Brackets* on page 5 - 5 for details.

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 - 25 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 - 26 for wall mounting details.

● 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.
- Use crimp terminals for wiring.
- 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

- 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 - 3 for power consumption specifications.
- Refer to *2-9-9 UPS* on page 2 - 21 for UPS information.

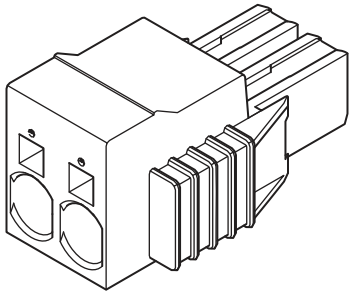
Power Connector Wiring Materials

Use the power supply connector that was supplied to connect the power supply to the Industrial Box PC.

- 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

- Power Supply Connector



DC Power Supply

The OMRON S8VK-series power supply is recommended for use with the Industrial Box PC.

Additional Information

- Refer to *2-9-8 Power Supply* on page 2 - 20 for more information.
- Refer to *4-1-3 Power Consumption Specifications* on page 4 - 3 for power consumption details.

Power Connector Wiring Procedure

Use the following procedure to wire the power connector.

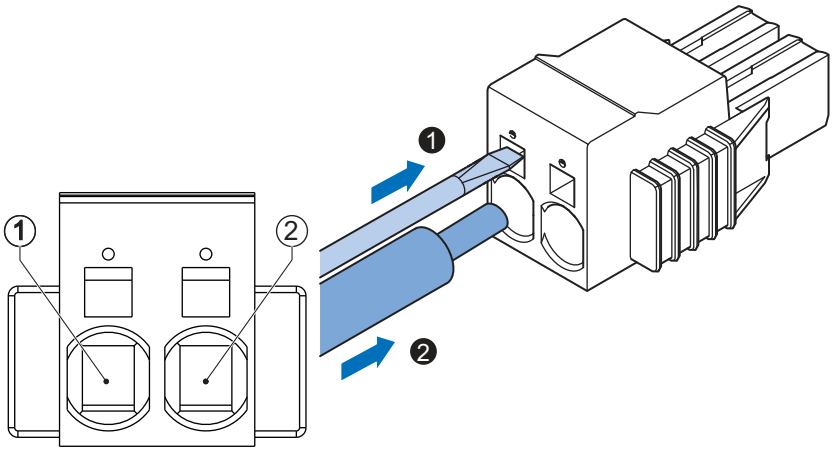
1 Remove the sheath from the power supply wires.

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.

2 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

3 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

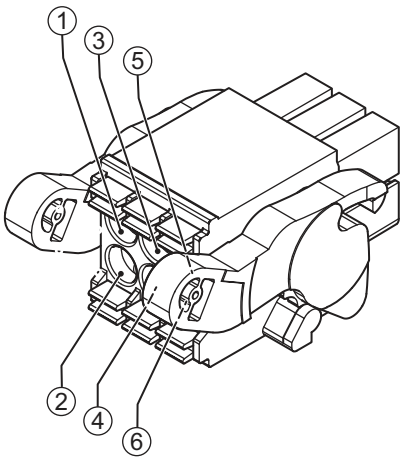
Use the supplied I/O connector to connect the inputs and outputs to the Industrial Box PC.

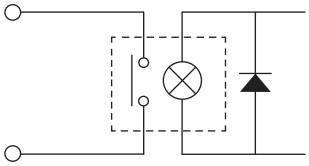
- Use a conductor from AWG 24 to 16.
- Recommended I/O conductor sizes for the connector are provided in the table.

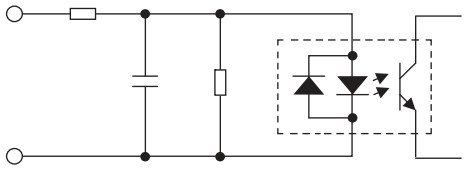
Wire type	Conductor cross-section
Solid conductor	0.2 to 1.5 mm^2
Flexible conductor	
Flexible conductor, with ferrule and no plastic sleeve	0.25 to 1.5 mm^2
Flexible conductor, with ferrule and plastic sleeve	0.25 to 0.75 mm^2

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 Battery 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	Battery Mode Input	
6		

Additional Information

- Refer to *4-2-2 I/O Connector Specifications* on page 4 - 14 for I/O connector specifications.
- Refer to *I/O Connector Power Status Output Details* on page 4 - 16 for power status output details.
- Refer to *2-9-9 UPS* on page 2 - 21 for UPS connection details.

I/O Connector Wiring Procedure

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

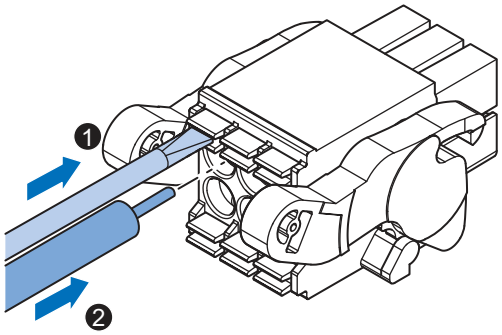
1 Remove the sheath from the wires.

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.

2 Remove the I/O connector from the Box PC.

3 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.



4 Remove the screwdriver.

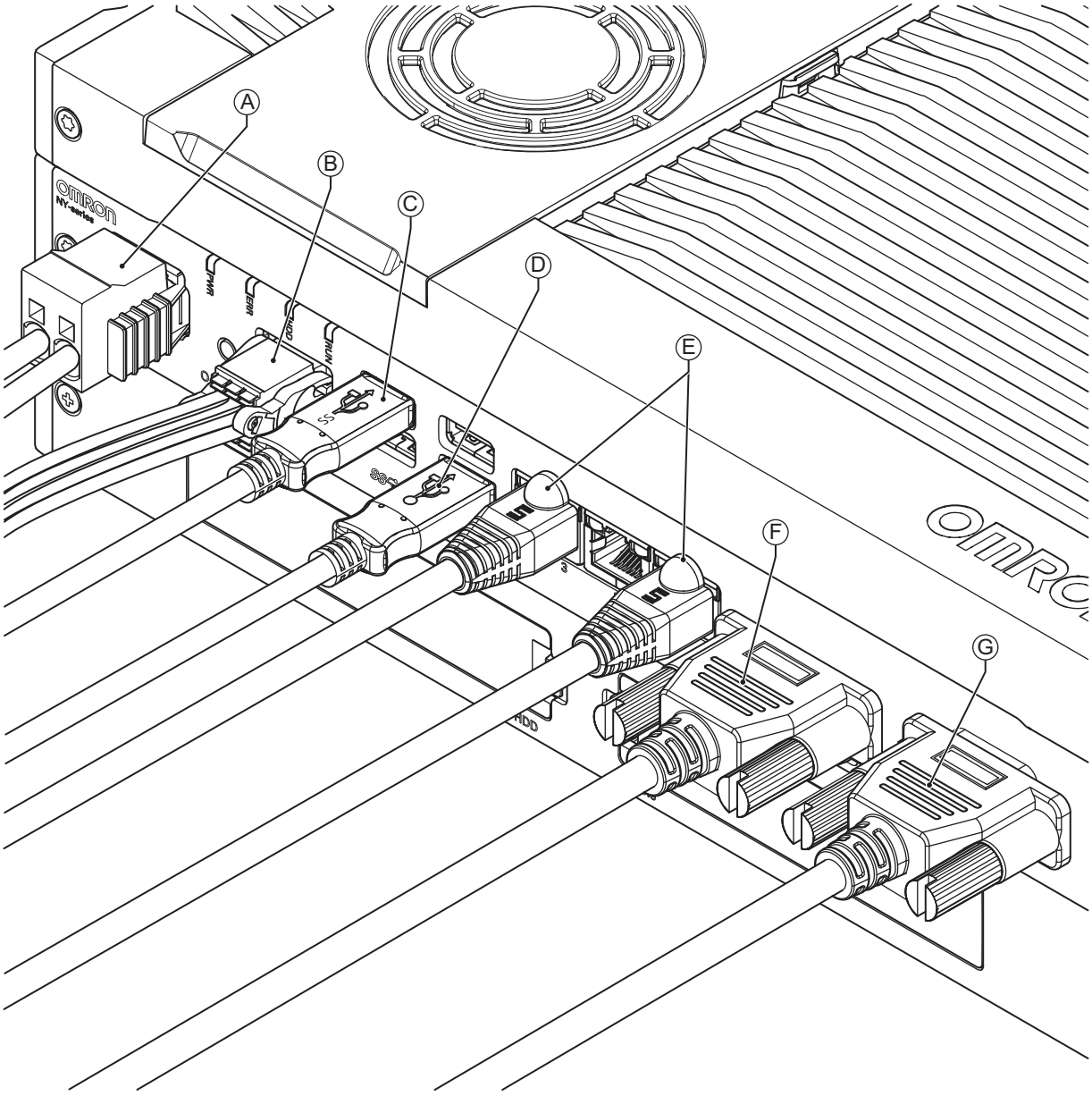
Do not apply stress to the cable after you have connected the wires.

5-5 Connect

This section describes how to connect the Industrial Box PC.

5-5-1 Connector Identification

The Industrial Box PC connectors are shown below.



Item	Name	Description
A	Power connector	Lockable power connector
B	I/O connector	2 inputs (UPS signal and power OFF control) and 1 output (Industrial Box PC 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: • RS-232 connector (default) • DVI-D connector for additional monitor connection

5-5-2 Connection Procedure

Use the following procedure to connect the Industrial Box PC.
Ensure the Box PC is securely fastened to the mounting surface.
Ensure the mounted Box PC can be connected to power and peripheral devices. Remove dust covers where applicable and store them in a safe place.

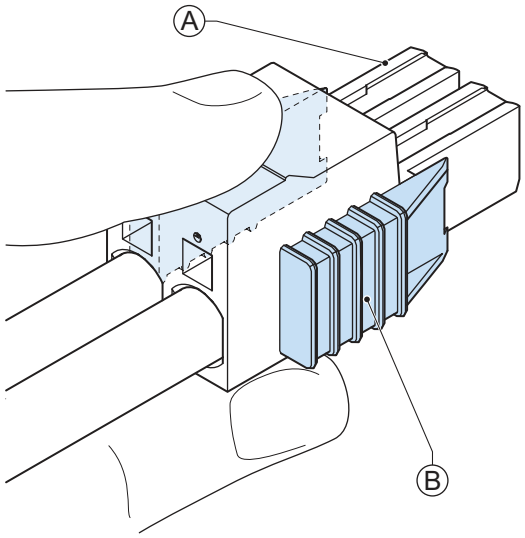
Additional Information

- Refer to *5-3 Mount* on page 5 - 15 for mounting details.
- Refer to *2-9-5 DVI Cables* on page 2 - 19 for the DVI cable bending radius.
- Refer to *2-9-6 USB Type-A to USB Type-B Cables* on page 2 - 19 for the USB cable bending radius.
- Refer to individual cable specifications for acceptable bending radius and connector clearance.

Use the following procedure to connect the Box PC:

1 Ensure the functional ground terminal is connected.
Refer to *5-4-2 Ground* on page 5 - 27 for grounding details.

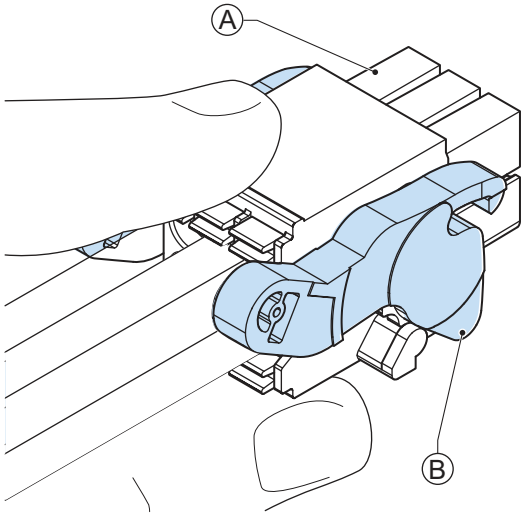
2 Connect the power connector Ⓐ.
Hold the black part to enable the auto-locking mechanism.



Do not push the orange sliders Ⓑ in the direction of the Box PC 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 the DVI connector to an external monitor such as the Industrial Monitor and tighten the fastening screws.
For an Industrial Panel PC this is optional because a monitor is integrated.
Do not remove the dust cap from the Box PC's DVI connector unless connecting to an external monitor is required.

5 Connect a device to the optional interface (DVI or RS-232) if applicable and tighten the fastening screws.
Do not remove the dust cap from the Box PC's optional interface connector(s) unless connections to external devices are required.

6 Connect the USB ports to peripheral devices .
Do not remove the dust cap from the Box PC's USB ports unless connections to peripheral devices are required.

7 Connect the Box PC to the required Ethernet interface connector(s).
Refer to *4-2-4 Ethernet Connector Specifications* on page 4 - 19 for Ethernet port details.

The Box PC is connected.

5-6 Initial Power ON

This section describes how to Power ON the Industrial Box PC 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 Industrial Box PC for the first time.

1 Ensure the following conditions are present before applying power for the first time:
- The Box PC is securely fastened to the mounting surface.
- The Box PC 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.
If using an OMRON Industrial Monitor this may not be required because it has touch functionality.

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.

5 Press the power button and release within 1 second.
Refer to *2-1-1 Front and Top of the Industrial Box PC* on page 2 - 2 for the power button location.
The Box PC 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 Box PC.

6 Verify the ERR LED is OFF.

The Box PC is ON and the Operating System starts.
The first time initialization will prepare the system and automatically reboot the Box PC when required.

5-6-2 Windows Startup First Time

Use the following procedure for the first time startup of Windows on your Box PC when the Language Selection Window is displayed.

1 Ensure the following conditions are present before starting up windows for the first time:
- Do not power OFF the Box PC during this procedure.
- Ensure a keyboard and mouse are connected.
- Select the language carefully, the selected language can not be changed.

2 Select the preferred language in the Language Selection Window.
Refer to *4-3-2 Supported Languages* on page 4 - 25 for supported languages.
Select **Next** to continue.

3 Set the preferred Local settings:

(1) Country or Region

(2) Time and Currency

(3) Keyboard layout

Select **Next** to continue.

4 Set name of computer and of main user:

(1) the name for the main user account

(2) the computer name

Select **Next** to continue.

5 Input a password and password hint for the main user account.

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.

6 Read the Microsoft Windows License information.
Select the checkbox to accept the content and continue.

7 Read the License information for the OMRON Utilities.
Select the checkbox to accept the content and continue.
Select **I accept** to accept the content and continue.
Contact your OMRON representative or OMRON support when disagreeing with the License information.

8 Select **Use recommended settings** for security settings.

⚠ 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.

9 Adjust time zone, date and time settings.
Select **Next** to continue.
The Box PC will restart.

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

Additional Information

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

11 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 Industrial Box PC.

5-7-1 Install Internet Browser

The Industrial Box PC does not have an internet browser pre-installed for security reasons. An executable file for browser installation is provided in the user data partition of the drive supplied with the Industrial Box PC.
Use the following procedure to perform the browser installation.

Additional Information

Check the IT policy of your company for available software and for details on the software environment the Industrial Box PC will operate in.

1. Use Windows Explorer to examine the contents of the user data partition mapped as drive letter D:.
2. Open the Installer folder (D:\OMRON-NY\Installers) and locate the Internet Explorer installer files.
3. Select the installer suitable for your system (32/64 bits) and language (English/Japanese).
4. Ensure there is a connection to the Internet.
5. Launch the installer to begin the installation process.
6. Follow the installer steps to complete the browser installation.
7. Download and install the latest updates via Windows Update.

Precautions for Safe Use

Install all updates and ensure the browser stays up-to-date.

5-7-2 Install Firewall

An industrial network should be separated from an office network.

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 Industrial Box PC will operate in.

5-7-3 Install Anti-virus Software

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

Precautions for Safe Use

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

Additional Information

Check the IT policy of your company for available software and for details on the software environment the Industrial Box PC will operate in.

5-7-4 Install Drivers and Custom Software

Use the following procedure to install drivers and custom software on your Industrial Box PC.
Drivers for most OMRON devices and common third party devices are already available on the system and will be installed automatically after the initial Windows configuration or upon connection of a device to the Industrial Box PC.

1 Install drivers that are required for the application.

2 Install third-party software that is required for 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.

5-7-5 Customize Windows

Windows provides customization tools.
Using these tools is only allowed for experienced software engineers.

Additional Information

- Refer to *A-2-1 Enhanced Write Filter* on page A - 11 for EWF details.
- Refer to *A-2-2 File-Based Write Filter* on page A - 12 for FBWF details.
- Refer to *A-2-3 Trusted Platform Module* on page A - 14 for TPM details.

5-8 Connect UPS

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

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

- The USB connector and Simple Shutdown Software
  Refer to *5-8-1 Connect UPS Using the USB Connector* on page 5 - 52 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 - 54 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

- Use an Omron S8BA UPS with the correct revision number to prevent improper system shutdown.
- 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.
- 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 - 3 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

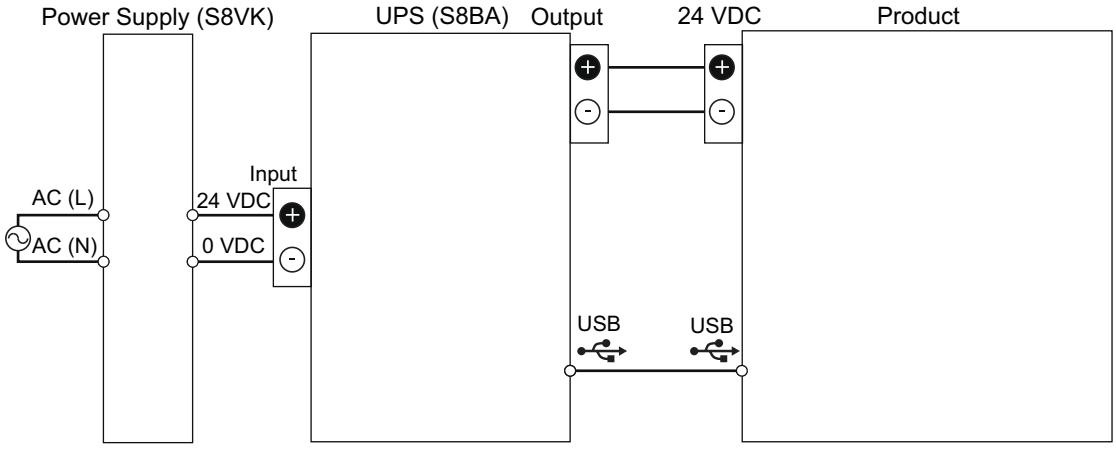
The Simple Shutdown Software monitors the UPS status via the USB interface and shuts down the Industrial Box PC when needed.
The drivers for the S8BA UPS are pre-installed on the Industrial Box PC. The installation files for the Simple Shutdown Software are available on the OMRON website.

Precautions for Safe Use

- 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.
- 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.

Follow the steps below to connect the S8BA UPS with a USB cable and to configure it correctly. Before proceeding with the steps below, check if the revision number of the UPS is correct. Refer to *2-9-9 UPS* on page 2 - 21 for more information.

1 Install and connect the S8BA UPS.
Refer to the *UPS S8BA User's Manual (Cat. No. U702)* for details.
Connect the USB port of the S8BA UPS to the USB port of the Industrial Box PC using the USB cable provided with the S8BA UPS.



2 Power ON the Industrial Box PC and Proceed to the next step after the device drivers are successfully installed.

3 Install the Simple Shutdown Software.

4 Configure the Simple Shutdown Software.
Refer to the *Simple Shutdown Software (Windows Version) Instruction Manual (Cat. No. K1LD)* for more information.

5 Configure the Industrial Box PC to auto-start after power loss within the BIOS settings.

- Refer to *A-1-1 BIOS Overview* on page A - 2 for details on BIOS changes.
- Refer to *A-1-5 BIOS - Boot* on page A - 9 for power loss BIOS details.

The UPS is connected.

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.

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

The I/O connector of the Industrial Box PC

- receives the power status of the UPS with the UPS power input.
- indicates the power status of the Box PC with the Power status output.

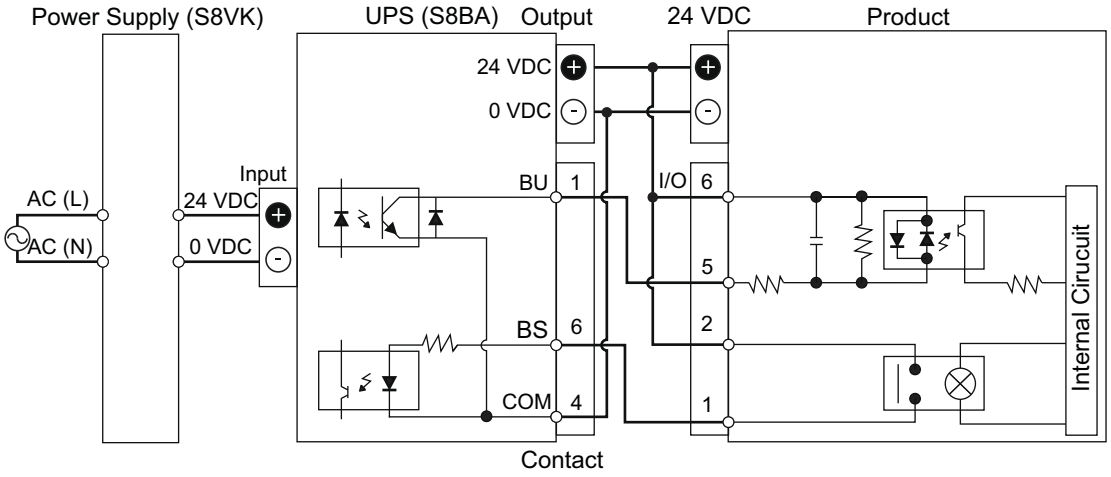
The Box PC does not react automatically to the UPS power input. A custom software program is required to shut down the Box PC when needed.

Precautions for Safe Use

- 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.
- 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.

Follow the steps below to connect the S8BA UPS to the I/O connector of the Box PC and to configure it correctly. Before proceeding with the steps below, check if the revision number of the UPS is correct. Refer to *2-9-9 UPS* on page 2 - 21 for more information.

1 Connect and install the S8BA UPS.
Refer to the *UPS S8BA User's Manual (Cat. No. U702)* for details.
Connect the Contact port of the S8BA UPS to the I/O port of the Box PC with the connection cable S8BW-02.



2 Power ON the Box PC.

3 Configure the Box PC to auto-start after power loss within the BIOS settings.

- Refer to *A-1-1 BIOS Overview* on page A - 2 for details on BIOS changes.
- Refer to *A-1-5 BIOS - Boot* on page A - 9 for power loss BIOS details.

4 Create a software program that monitors the UPS Mode Input and initiates Power OFF of the Box PC when the UPS Mode Input becomes active.
Use the Industrial PC System API to create the software program.

Refer to *3-3-2 Industrial PC System API* on page 3 - 17 for System API details.

5 Install the created software program.

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

The UPS is connected.

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 Data

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

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.

Recommended software to create a backup is the Rescue Disk Utility. This software creates a system backup on a USB storage device. A system backup contains the Windows partition, the boot partition and the MBR. A system restore action will restore the Windows partition, the boot partition and the MBR of the Box PC. A partial backup/restore or a backup/restore from another storage device is not possible.
The Rescue Disk Utility allows:

- Create Backup
  The creation of a system backup.
- Restore Backup
  A system restore to bring the system back to the condition it was in when the Rescue Disk backup was created.

Additional Information

- Refer to *3-2-4 Rescue Disk Creator* on page 3 - 9 for Rescue Disk Creator details.
- Refer to *5-9-1 Create a New Rescue Disk with the Rescue Disk Creator* on page 5 - 57 for Rescue Disk creation details.
- Refer to *Create a System Backup with the Rescue Disk* on page 7 - 6 for system backup details.

The standard Windows Backup and Restore features can be used. The Windows software can create and restore full backups and partial backups. These backups can be created automatically at predefined intervals.
The Windows Backup and Restore allows:

- Creation of a Windows Backup
  Creates a backup of a user's selection of folders and the option to create a system image of a drive.
  This backup:
  - Can not include the MBR and the Windows partition.
  - Can include data from another partition than the Windows partition.
  - Can include data from another storage device than the device with the Windows partition.

  .
- Creation of a Windows System Repair Disk.
  Creates a Windows System Repair Disk that will also include the MBR and the Windows partition.
  This procedure requires a separate PC with Windows 7 and a DVD writer and also an external DVD reader.
  The Repair Disk gives following options:
  - Startup Repair

Examines Windows 7's most integral files and repairs any missing or damaged files that may be keeping Windows 7 from starting.

- System Restore
  Restores your Windows system files to an earlier point in time. It does not affect your personal files.
- System Image Recovery
  Returns your PC to the condition it was in when you created the selected System Image backup.

Additional Information

- Refer to *Create a Custom Backup with Windows Backup* on page 7 - 8 for Windows Back-up details.
- Refer to *Create a Windows System Repair Disk* on page 5 - 59 for Windows Repair Disk details.

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

5-9-1 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 - 11 for installation details.
- A USB storage device that has sufficient capacity to backup the content of the Box PC. Note that all content on this USB storage device will be erased during the Rescue Disk creation.

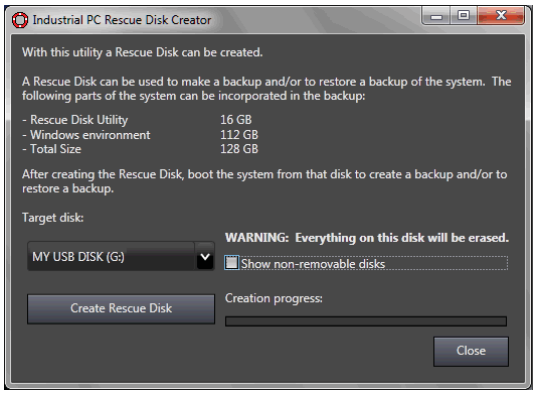
Use the following procedure to create a new Rescue Disk:

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

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 - 12 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 - 12 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 - 6 for system backup details.
- Refer to *Installation* on page 3 - 11 for installation details of the Rescue Disk Creator.
- Refer to *Create a System Backup with the Rescue Disk* on page 7 - 6 for system restore details.

5-9-2 Create a Windows System Repair Disk and a Windows Backup

A Windows Repair Disk is a disk that enables users to restore the Windows operating system.
A Windows Backup is a backup that enables users to restore a user-defined content set.
Use the following procedures to ensure you can always go back to this situation.

1. Create a Windows System Repair Disk.
   Refer to *Create a Windows System Repair Disk* on page 5 - 59 for details.

2. Create a Windows Backup.
   Refer to *Create a Custom Backup with Windows Backup* on page 7 - 8 for details.

Create a Windows System Repair Disk

A Windows System Repair Disk can repair Windows if a serious error occurs.

Additional Information

To create a Windows System Repair Disk, a separate Windows PC with a DVD writer is required that has the same Windows edition and System type as the Industrial Box PC. The Windows System Repair Disk can not be created with the Industrial Box PC.

Prepare:

- A PC with a DVD writer that has the same Windows edition and System type as your Box PC.
  - An example of the Windows edition is "Windows 7" with "Service Pack 1".
  - An example of the System type is "64-bit Operating System".
- An empty DVD

Use the Windows Backup and Restore mechanisms on the PC with a DVD writer to create a system repair disk.

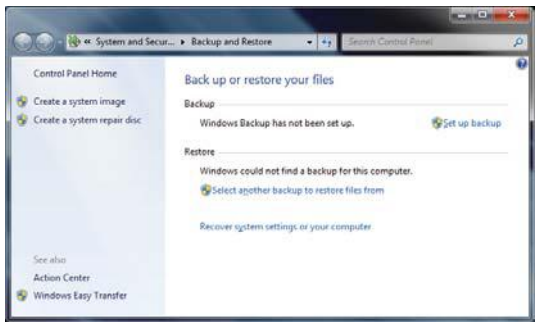
To create a Windows System Repair Disk:

1. Start the PC that has a DVD writer and login.

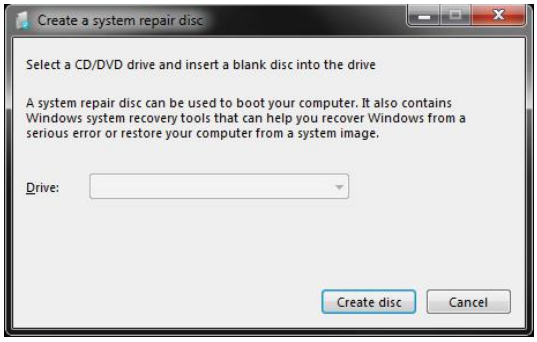
2. Select the Windows **Start** Button.

3. In the search field, input *Backup*.

4. Select **Backup and Restore**.
   The Backup and Restore window opens.



5 Select **Create a system repair disk**.
The Create a system repair disk window opens.



6 Select the applicable drive letter of the DVD writer and then select **Create disk**.

7 Wait until the disk is created and the remove it and store it in a safe place.

Additional Information

Refer to http://windows.microsoft.com/ for Backup and Restore details.

6

Operating Procedures

This section provides the operating procedures for the Industrial Box PC.

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 Box PC and the Box PC is OFF.

1. Press the power button and release within 1 second.
   Refer to *2-1-1 Front and Top of the Industrial Box PC* on page 2 - 2 for the power button location.
   The Box PC 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 Industrial Box PC is ON and the Operating System starts.

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

Start condition: Power is supplied to the Box PC and the Box PC 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 Box PC.
   The Box PC 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 Industrial Box PC is ON and the Operating System starts.

Additional Information

- Refer to *4-2-2 I/O Connector Specifications* on page 4 - 14 for connector specifications.
- Refer to *5-4-4 Wire the I/O Connector* on page 5 - 38 for wiring details.

6-1-3 Auto Power ON

The Industrial Box PC 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-1-5 BIOS - Boot* on page A - 9 for BIOS details.

6-2 Power OFF

This section provides Power OFF details.
Before following power OFF procedures below, check that the Industrial Box PC is ON by examining the LED indicators on the Box PC.

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 Industrial Box PC within 1 second.
Refer to *2-1-1 Front and Top of the Industrial Box PC* on page 2 - 2 for power button location information.
Depending on the Windows configuration, the Industrial Box PC will:
- Shutdown (default)
- Restart
- go to Sleep
- not react

3 Wait until the PWR LED is OFF.

The Industrial Box PC is powered OFF.

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 **Start** Button.

3 Select the **Shut down** Button.
The Industrial Box PC will shut down.

4 Wait until the PWR LED is OFF.

The Industrial Box PC is powered OFF.

6-2-3 Power OFF Using an Input Signal

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 Industrial Box PC.
Depending on the Windows configuration, the Industrial Box PC will:
- Shutdown (default)
- Restart
- go to Sleep
- not react

3 Wait until the PWR LED is OFF.

The Industrial Box PC is powered OFF.

Additional Information

- Refer to *4-2-2 I/O Connector Specifications* on page 4 - 14 for connector specifications.
- Refer to *5-4-4 Wire the I/O Connector* on page 5 - 38 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.

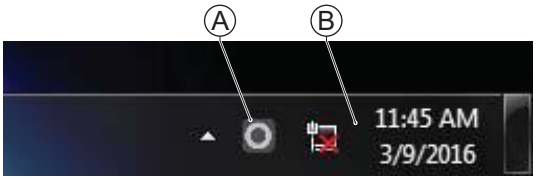
2 Press and hold the power button on the Box PC for 5 to 10 seconds.
Refer to *2-1-1 Front and Top of the Industrial Box PC* on page 2 - 2 for power button location information.
The Industrial Box PC will disregard the Windows settings and power OFF.

3 Wait until the PWR LED is OFF.

The Industrial Box PC is powered OFF.

6-3 React to Product Messages

The Industrial Box PC uses the Industrial PC Tray Utility icon Ⓐ in the system tray area Ⓑ of Windows to present Warnings and Errors.



Additional Information

Refer to *3-2-5 Industrial PC Tray Utility* on page 3 - 14 for Industrial PC Tray Utility details.

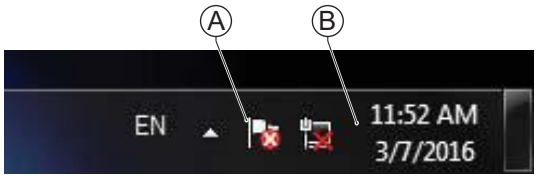
Check the Industrial PC Tray Utility icon for a Warning or Error symbol.
A Warning or Error symbol displayed on the Industrial PC Tray Utility icon indicates a product message.
To react to a product message:

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 - 11 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 Industrial Box PC are resolved.

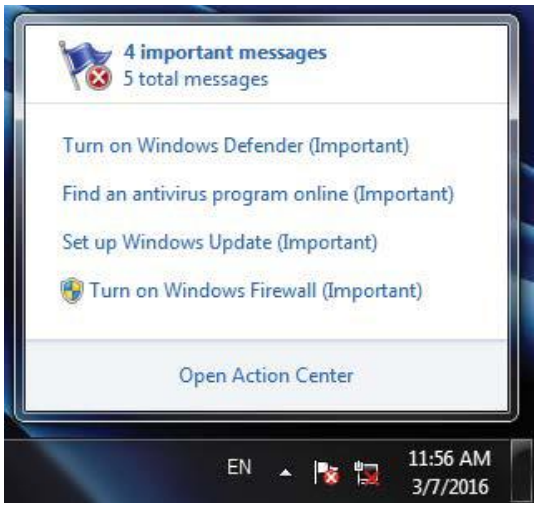
6-4 React to Windows Messages

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

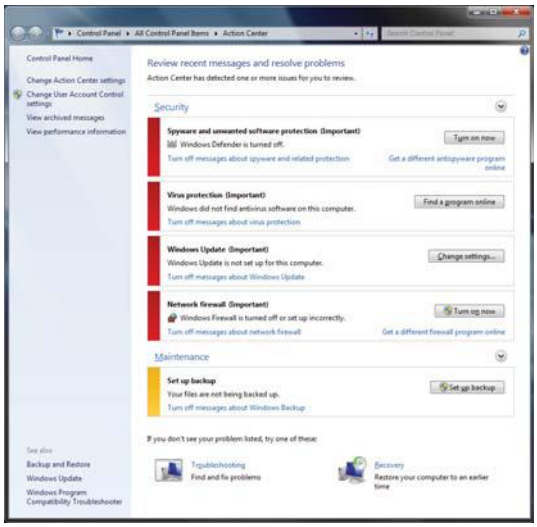


Check the Windows Action Center icon for a Warning or Error symbol.
A Warning or Error symbol displayed on the Windows Action Center icon indicates a Windows message.
To react to a Windows message:

1 Select the Windows Action Center icon.
A pop-up window will appear.



2 Select **Open Action Center**.
A new window will appear.



3 Read the message available in the window.

4 Perform the actions until each Warning or Error is resolved.

The Windows messages for the Industrial Box PC are resolved.

7

Maintenance

This section provides an overview of all maintenance tasks for the Industrial Box PC.

7-1 Preventive Maintenance

Preventive Maintenance covers all actions that prevent downtime.

7-1-1 Preventive Maintenance Schedule

Prevent unscheduled downtime with the following preventative maintenance schedule.

Daily	Reference
Check Industrial Box PC status	• Refer to *7-2-1 Warning and Error Messages* on page 7 - 11 for Box PC Messages. • Refer to *6-4 React to Windows Messages* on page 6 - 6 for Windows Messages. • Refer to *2-2 LED Indicators* on page 2 - 5 for LED details.

Weekly	Reference
Clean the Box PC	Refer to *7-1-2 Clean the Box PC* 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 update details.

When changing applications or configurations	Reference
Create a backup of the Industrial Box PC	Refer to *7-1-4 Create Backup and Repair Data* on page 7 - 4 for back-up details.

Periodically but at least every 6 months	Reference
Check the ambient environment: • Temperature and humidity within specifications • Noise sources not close to the Industrial Box PC	Refer to *4-4 Environmental Specifications* on page 4 - 26 for environmental specifications.
Check installation: Industrial Box PC mounted securely	Refer to *5-3 Mount* on page 5 - 15 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 - 27 for wiring details. Refer to *5-5 Connect* on page 5 - 41 for connection details.
Check the battery replacement date on the label at the inside of the cover. Replace the battery before the replacement date.	• Refer to *7-2-2 Remove the Cover* on page 7 - 13 to check the label. • Refer to *7-2-4 Replace the Battery* on page 7 - 16 to replace the battery.
Check that the Rescue Disk or the Repair Disk is available and operational	• Refer to *5-9-1 Create a New Rescue Disk with the Rescue Disk Creator* on page 5 - 57 for Rescue Disk details. • Refer to *5-9-2 Create a Windows System Repair Disk and a Windows Backup* on page 5 - 59 for Repair Disk details.

7-1-2 Clean the Box PC

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

Wipe the Box PC 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 Install Internet Browser* on page 5 - 48 for Browser details.
- Refer to *5-7-2 Install Firewall* on page 5 - 49 for Firewall details.
- Refer to *5-7-3 Install Anti-virus Software* on page 5 - 49 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.

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.

Recommended software to create a backup is the Rescue Disk Utility. This software creates a system backup on a USB storage device. A system backup contains the Windows partition, the boot partition and the MBR. A system restore action will restore the Windows partition, the boot partition and the MBR of the Box PC. A partial backup/restore or a backup/restore from another storage device is not possible.
The Rescue Disk Utility allows:

- Create Backup
  The creation of a system backup.
- Restore Backup
  A system restore to bring the system back to the condition it was in when the Rescue Disk backup was created.

Additional Information

- Refer to *3-2-4 Rescue Disk Creator* on page 3 - 9 for Rescue Disk Creator details.
- Refer to *5-9-1 Create a New Rescue Disk with the Rescue Disk Creator* on page 5 - 57 for Rescue Disk creation details.
- Refer to *Create a System Backup with the Rescue Disk* on page 7 - 6 for system backup details.

The standard Windows Backup and Restore features can be used. The Windows software can create and restore full backups and partial backups. These backups can be created automatically at predefined intervals.
The Windows Backup and Restore allows:

- Creation of a Windows Backup
  Creates a backup of a user's selection of folders and the option to create a system image of a drive.
  This backup:
  - Can not include the MBR and the Windows partition.
  - Can include data from another partition than the Windows partition.
  - Can include data from another storage device than the device with the Windows partition.

  .
- Creation of a Windows System Repair Disk.
  Creates a Windows System Repair Disk that will also include the MBR and the Windows partition.
  This procedure requires a separate PC with Windows 7 and a DVD writer and also an external DVD reader.
  The Repair Disk gives following options:
  - Startup Repair
    Examines Windows 7's most integral files and repairs any missing or damaged files that may be keeping Windows 7 from starting.

- System Restore
  Restores your Windows system files to an earlier point in time. It does not affect your personal files.
- System Image Recovery
  Returns your PC to the condition it was in when you created the selected System Image backup.

Additional Information

- Refer to *Create a Custom Backup with Windows Backup* on page 7 - 8 for Windows Backup details.
- Refer to *Create a Windows System Repair Disk* on page 5 - 59 for Windows Repair Disk details.

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

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 Box PC.
A system backup contains the Windows partition, the boot partition and the MBR.

Precautions for Correct Use

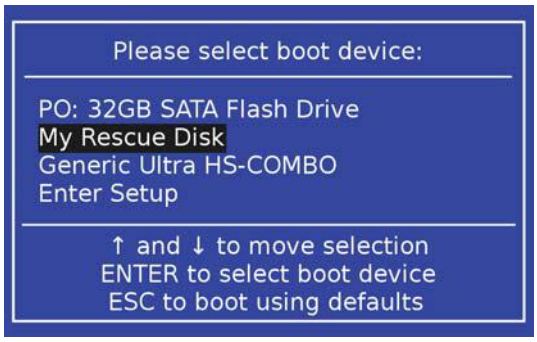
The backup data of the Rescue Disk can only be used to recover the data of the Box PC that created that backup. You can not use the backup to recover another Box PC.

Additional Information

To create a system backup a Rescue Disk should be available.
Refer to *5-9-1 Create a New Rescue Disk with the Rescue Disk Creator* on page 5 - 57 for Rescue Disk creation.

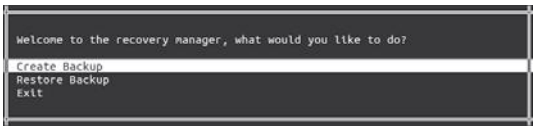
To create a system backup:

1. Ensure the Box PC is powered OFF.
2. Ensure a keyboard is connected to the Box PC.
3. Connect the Rescue Disk to a USB connector of the Box PC.
4. Power ON the Box PC while pressing the **F11** key twice per second.
   The option to select your boot device will appear.

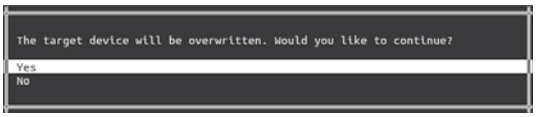


   Your Rescue Disk will be displayed in this boot menu with the manufacturer data of your USB device.
   If your boot device is not visible in this list:
   (1) Disconnect the USB connector of the Rescue Disk.
   (2) Re-insert the USB connector of the Rescue Disk.
   (3) Select **Ctrl**, **Alt** and **Delete** to reboot the Box PC.
   (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 Recovery Manager window opens.



6 Select **Create Backup**.
The confirmation window opens.



7 Select **Yes** to start the system backup process.
Wait until the message **Backup finished** appears.

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

9 Select **Exit** to close the Rescue Disk Utility.
The Box PC will power OFF.

10 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

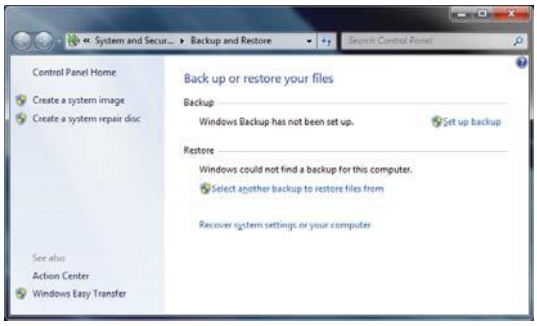
Refer to *Restore a System Backup with the Rescue Disk* on page 7 - 28 for system restore details.

Create a Custom Backup with Windows Backup

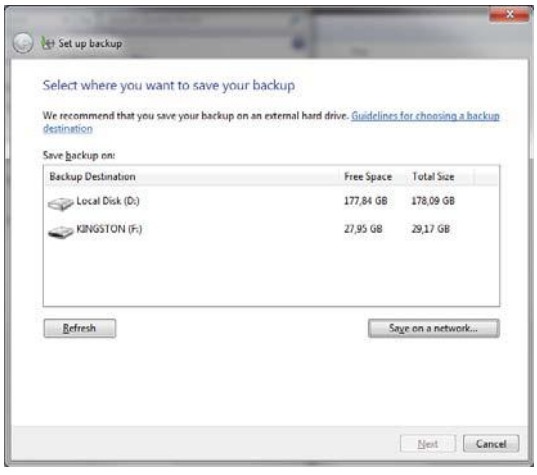
Use the following procedure to create a custom backup of the Industrial Box PC with the Windows Backup and Restore mechanism.

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.

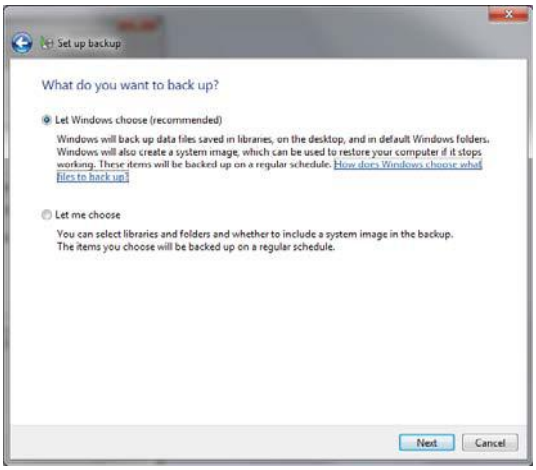


5. Select the backup destination.
   A network location can be added with **Save on a network**.

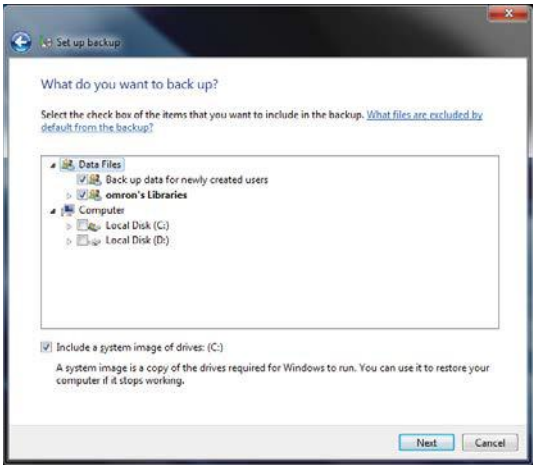
Additional Information

Preferred locations for an automatic backup are:
- A network drive
- The local drive in slot B
  Refer to *4-1-6 Storage Devices* on page 4 - 8 for specifications.

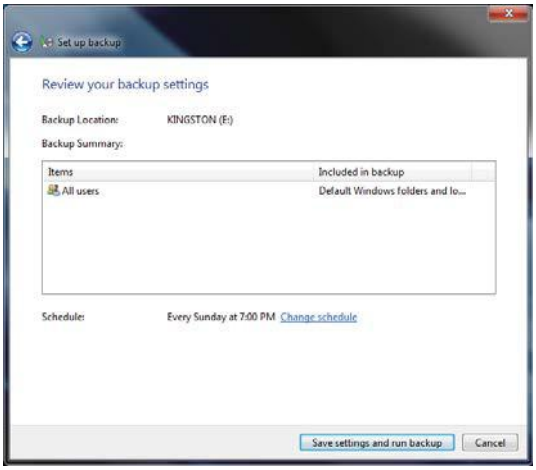
6 Select **Next**.
The following window will appear:



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 Industrial Box PC 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 - 31 for the Restore Procedure.

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 Industrial Box PC 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 Industrial Box PC.
Error messages inform you about what caused the downtime of the Industrial Box PC.

The following message channels are available.

LED Indicators

The ERR LED indicator provides information on warnings and errors.

Additional Information

Refer to *2-2-2 ERR LED Indicator* on page 2 - 6 for ERR details.

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.

Additional Information

- Refer to *4-4 Environmental Specifications* on page 4 - 26 for environmental details.
- Refer to *7-2-2 Remove the Cover* on page 7 - 13 for fan details.
- Refer to *7-2-3 Replace the Fan Unit* on page 7 - 14 for Fan Unit replacement details.
- Refer to *7-2-4 Replace the Battery* on page 7 - 16 for battery replacement details.

Windows Action Center

TheWindows 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 *6-4 React to Windows Messages* on page 6 - 6 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.

Additional Information

Refer to *7-2-10 Windows Low on Memory* on page 7 - 37 for details.

7-2-2 Remove the Cover

The Cover of the Industrial Box PC provides access to the following items.

- Battery
- Fan Unit (applies to products with active cooling).

No tools are required.

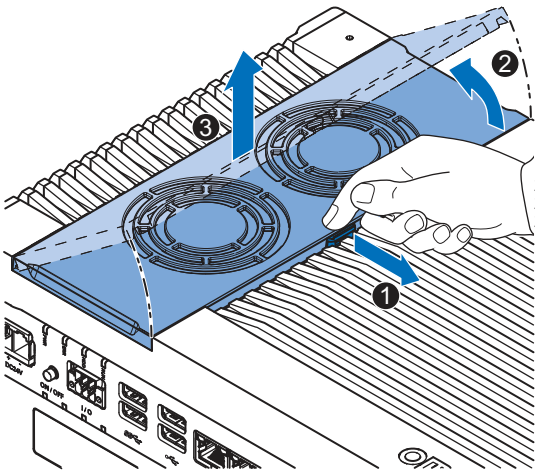
Use the following procedure to remove the Cover of the Box PC.:

1 Power OFF your Box PC 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 Box PC 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

In the case of an extended storage period, check the performance of the Fan Unit before production starts.

Additional Information

Refer to *2-8-2 Fan Unit* on page 2 - 15 for the model.

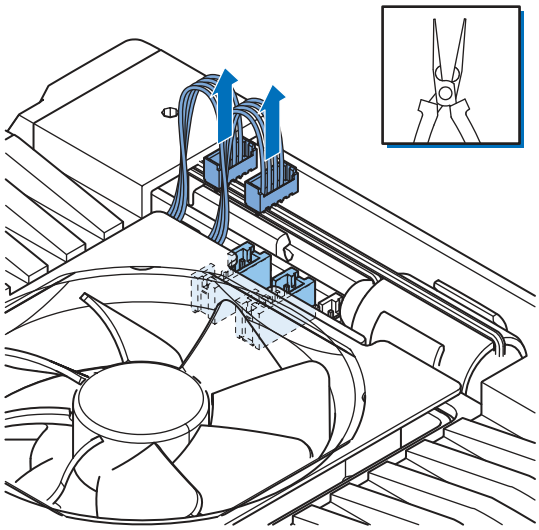
1 Power OFF the Box PC.

2 Remove the Cover of the Box PC.

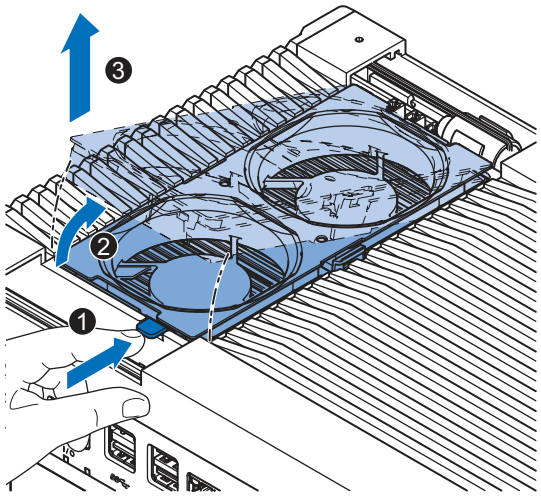
Additional Information

Refer to *7-2-2 Remove the Cover* on page 7 - 13 for the cover removal procedure.

3 Disconnect the Fan Connectors from the board.



4 Replace the complete Fan Unit.



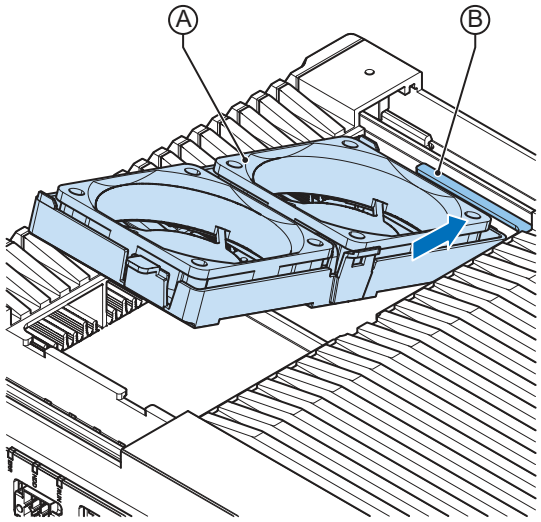
(1) Push the lever ❶ to unlock the Fan Unit

(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 Box PC.

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

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 - 15 for the battery model.
- UL standards require that batteries be replaced by experienced technicians. Always place an experienced technician in charge of battery replacement.

Use the following procedure to replace the battery:

1 Power OFF the Box PC.

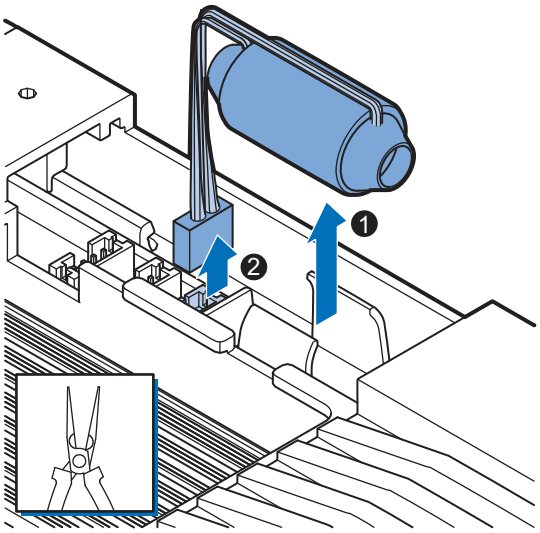
2 Remove the cover.

Additional Information

Refer to *7-2-2 Remove the Cover* on page 7 - 13 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 Box PC.

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 - 15 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 Box PC.

11 Check the Date and Time in Windows.
Correct the Date and Time in Windows 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.

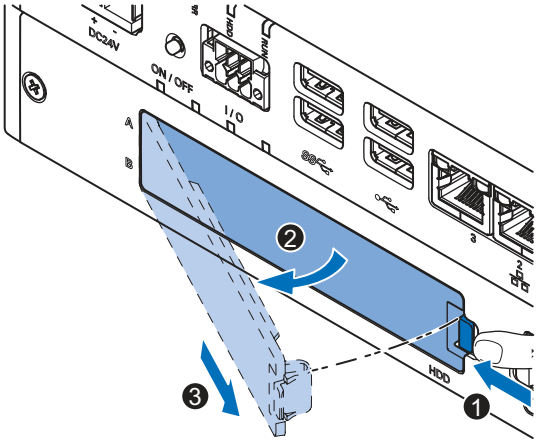
Prepare:

- The additional drive
  Refer to *2-9-4 Storage Devices* on page 2 - 18 for the drive model.
  Refer to *4-1-6 Storage Devices* on page 4 - 8 for drive specifications.
- The drive bracket with mounting screws
  These items are supplied with the Industrial Box PC.

To replace a drive:

1 Power OFF the Box PC.

2 Remove the drive cover.



(1) Push the lock lever ❶.

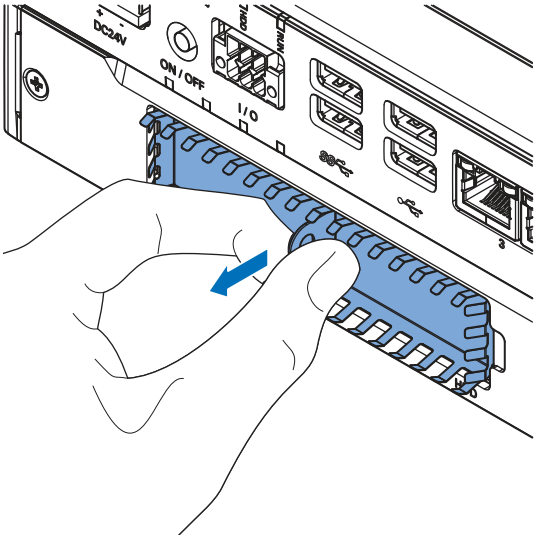
(2) Tilt the cover ❷.

(3) Remove the drive cover ❸.

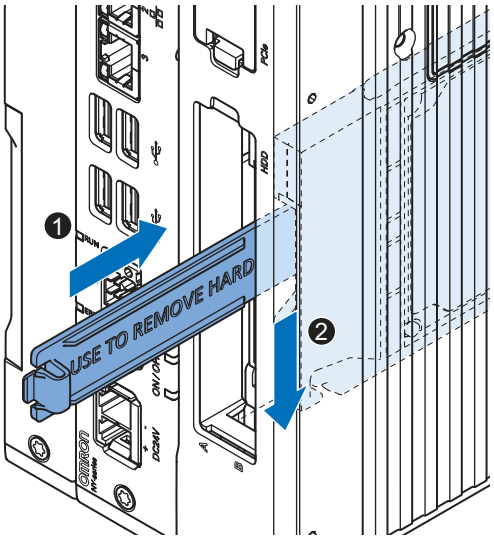
Additional Information

- Refer to *2-1-1 Front and Top of the Industrial Box PC* on page 2 - 2 for the location of the drive cover.
- The Box PC has 2 drive slots, marked with "A" and "B" at the left side of the drive cover. Take note of the slot position for the drive that is being removed and do not place a drive in the incorrect slot.

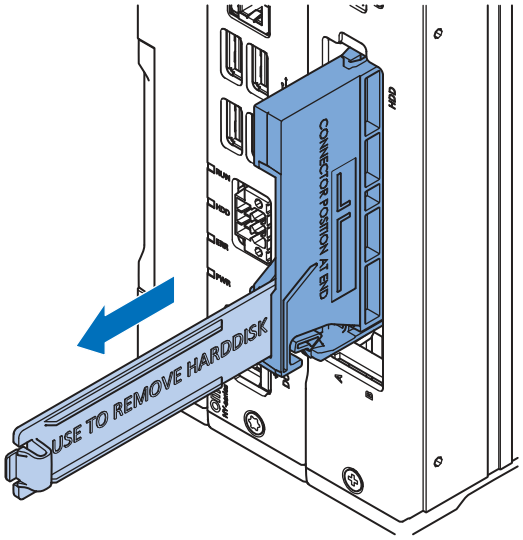
3 Pull the metal shielding cover out of the Box PC.



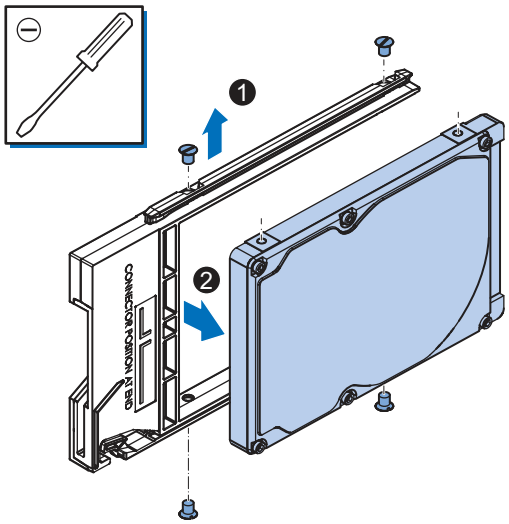
4 Insert the drive cover in the drive bracket slot ❶ and move it down ❷ so that it locks in the drive bracket.



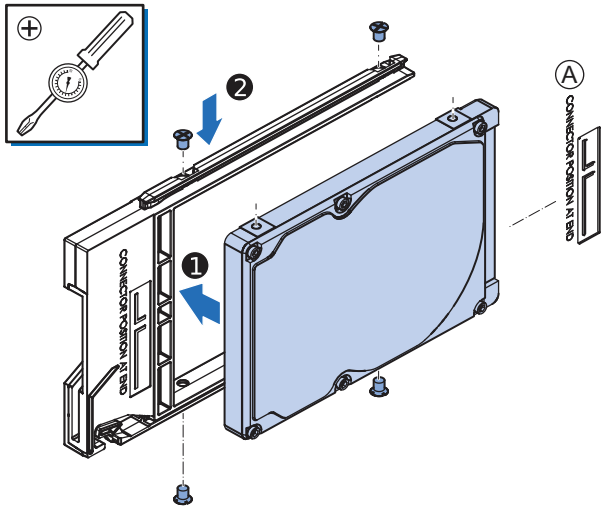
5 Remove the drive bracket from the Box PC using the drive cover.



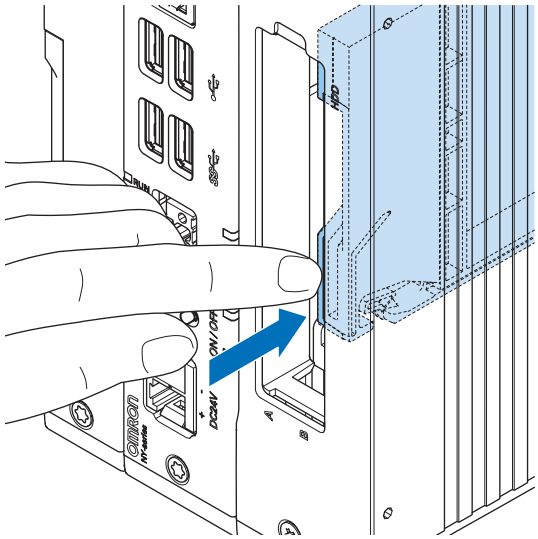
6 Remove the 4 mounting screws ❶ and then remove the drive ❷ from the drive bracket.



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.

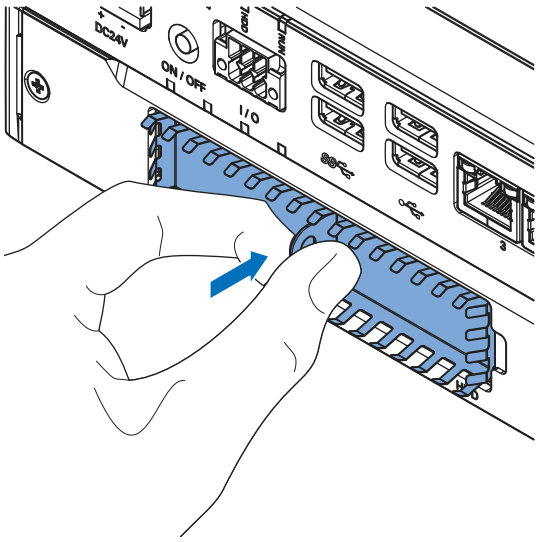


8 Insert the bracket with the replacement drive into the correct slot of the Box PC. Ensure the bracket is completely in the Box PC with an extra push.



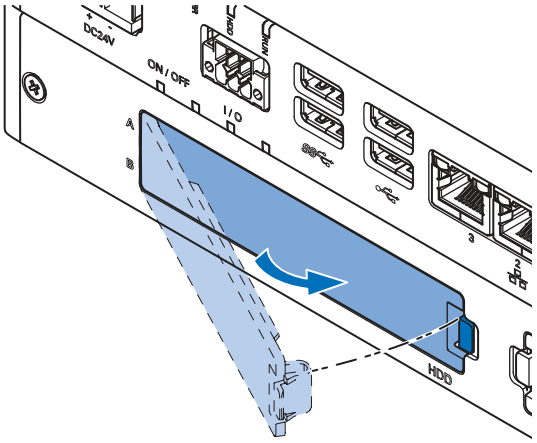
The drive bracket will lock into place when it is fully inserted.

9 Insert the metal shielding cover.



10 Mount the drive cover.

The lock lever will click when closed correctly.



11 Finalize the drive replacement.

(1) If the replaced drive is the Additional Storage drive then allocate the drive to have it visible in Windows.
Refer to *7-2-8 Allocate a Drive in Windows* on page 7 - 35 for the allocation procedure.

(2) If the replaced drive is the drive with the Operating System then restore the data from a backup.
Refer to the restore procedure for details. The restore procedure is available:
- For products *NYB*☐ in the section *Corrective Maintenance*.
- For products *NYP*☐ in the section *Corrective Maintenance*.
- For products *NY5*☐ refer to the *NY-series Industrial Panel PC / Industrial Box PC Setup User's Manual (Cat. No. W568)*

12 Ensure the drive is visible in Windows and confirm normal operation.

The drive is replaced.

7-2-6 Replace the PCIe Card

Use the following procedure to replace the PCIe Card.

Prepare:

- The PCIe Card

Additional Information

Refer to *4-1-7 PCIe Card Slot Specifications* on page 4 - 10 for PCIe specifications.

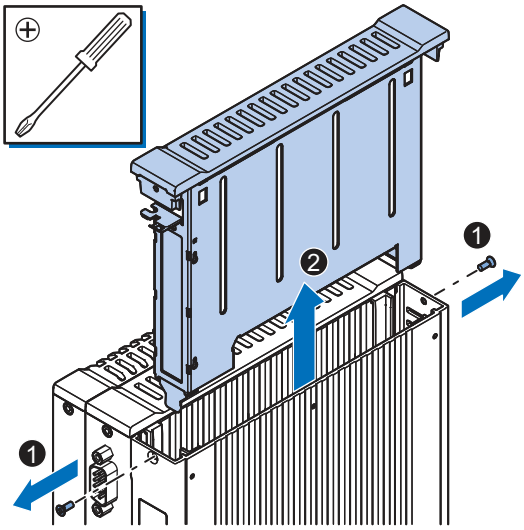
- The PCIe Card mounting materials: Card Clip and Card Support
  These are supplied with the Industrial Box PC.

To replace the PCIe Card:

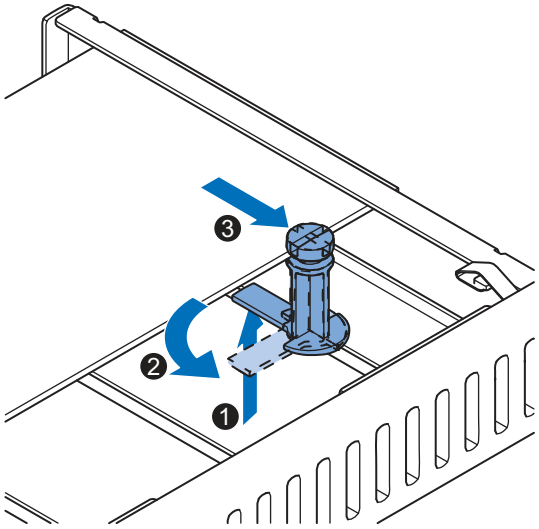
1 Power OFF the system.

2 Unmount the Box PC.

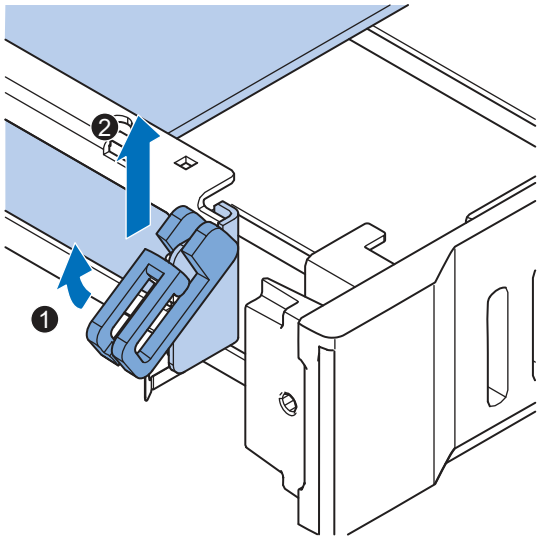
3 Remove the two crosshead screws ❶ indicated with "open" and then pull up ❷ the PCIe Drawer.
The indent at the side of the drawer will help you to pull the drawer from the Box PC.



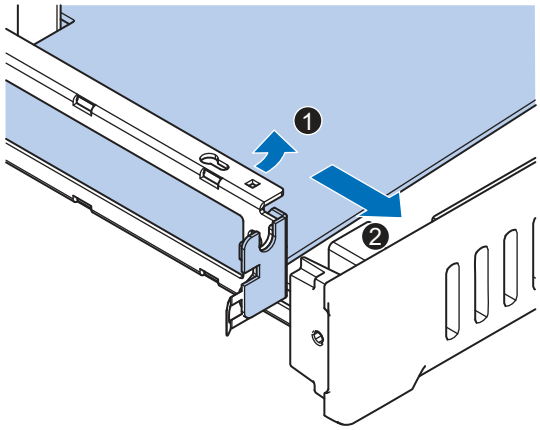
4 Push the notch ❶ at the bottom of the Card Support up and rotate ❷ the Card Support. Slide the Card Support ❸ away from the card to create space and to remove it.



5 Pull the middle of the Card Clip to unlock it and remove it from the PCIe Drawer.

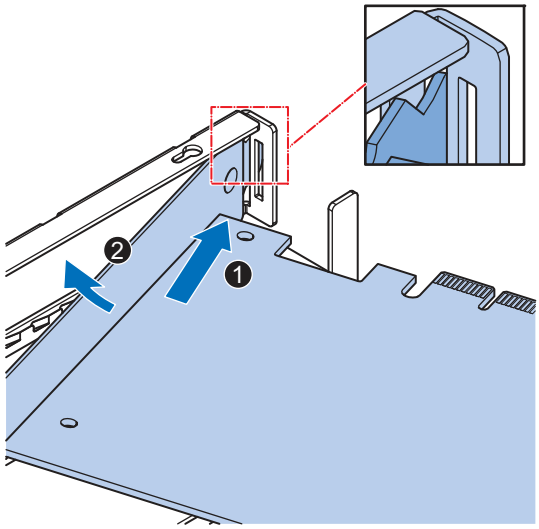


6 Remove the PCIe Card from the PCIe Drawer.



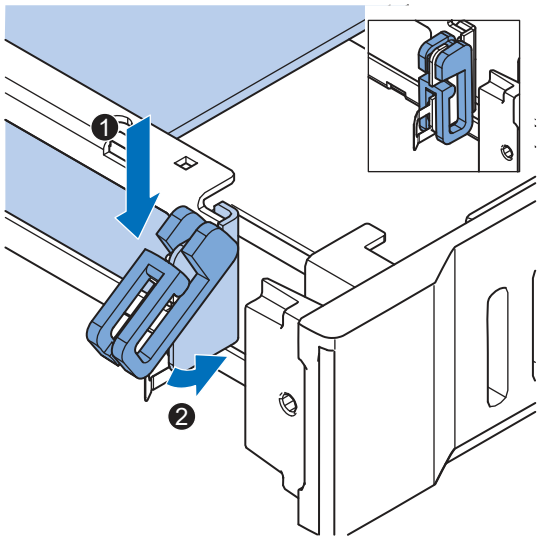
The PCIe Card is now removed.

7 Place the replacement PCIe Card in the PCIe Drawer.



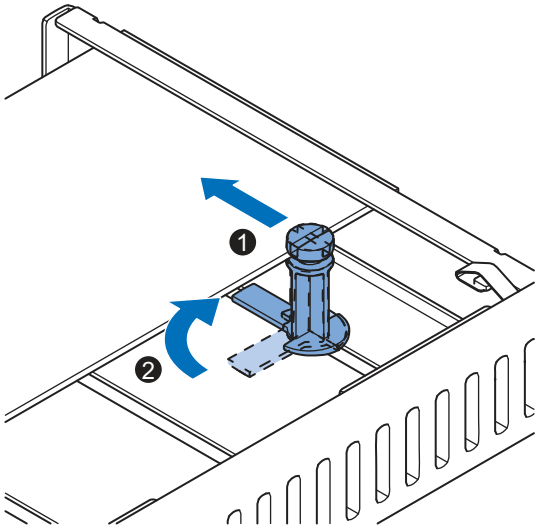
Ensure the PCIe Card is inserted into the correct opening.

8 Place the Card Clip in the PCIe Card and PCIe Drawer ❶ and then rotate the Clip ❷ to lock it in place.



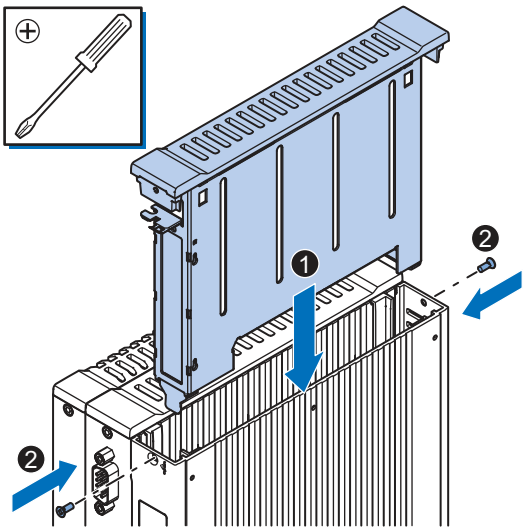
9 Slide the Card Support ❶ so that it supports the side of the PCIe Card.

Rotate the Card Support ❷ to lock it in place.



Ensure the Card Support contacts the PCIe Card with the small groove so that there is support below and above the PCIe Card.

10 Insert the PCIe Drawer in the Box PC and then insert the two crosshead screws that hold the PCIe Drawer in place.



11 Remount the Box PC.

12 Confirm normal operation.

The PCIe Card is replaced.

7-2-7 Restore and Repair Data

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

Use following actions to restore or repair your Box PC.

- Restore the Windows partition, the boot partition and the MBR to the moment the selected Rescue Disk was created.
  This is a system restore with the Rescue Disk.
  Refer to *Restore a System Backup with the Rescue Disk* on page 7 - 28 for system restore details.
- Restore a user's selection of folders to the moment the selected Windows backup was created.
  Refer to *Restore a Custom Backup with Windows* on page 7 - 31 for Windows restore details.
- Repair Windows.
  Refer to *Repair Windows with the System Repair Disk* on page 7 - 34 for Windows repair disk details.

Additional Information

Contact your OMRON representative when the Box PC needs to be restored and you do not have a system backup.

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 was created.

Precautions for Correct Use

The backup data of the Rescue Disk can only be used to recover the data of the Box PC that created that backup. You can not use the backup to recover another Box PC.

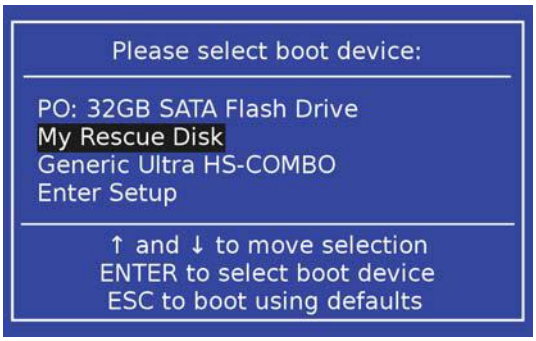
Additional Information

To restore a system backup, a Rescue Disk with a system backup should be available.
Refer to *5-9-1 Create a New Rescue Disk with the Rescue Disk Creator* on page 5 - 57 for Rescue Disk creation details.
Refer to *Create a System Backup with the Rescue Disk* on page 7 - 6 for system backup details.

To restore a system backup:

1. Ensure the Box PC is powered OFF.
2. Ensure a keyboard is connected to the Box PC.
3. Connect the Rescue Disk to a USB connector of the Box PC.
4. Power ON the Box PC while pressing the **F11** key twice per second.

The option to select your boot device will appear.



If your boot device is not visible in this list:

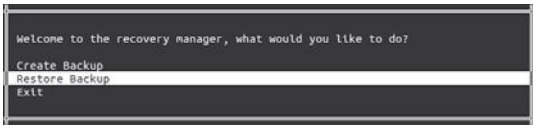
(1) Disconnect the USB connector of the Rescue Disk.

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

(3) Select **Ctrl**, **Alt** and **Delete** to reboot the Box PC.

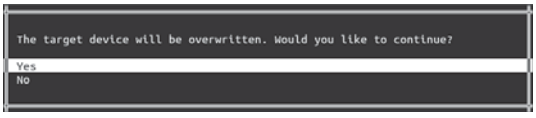
(4) Press the **F11** key twice per second.
The option to select your boot device will appear with your boot device in the list.

5 Use the arrow keys to select the Rescue Disk and then select **Enter**.
The Recovery Manager window opens.



6 Select **Restore Backup**.
The restore selection window opens.

7 Select **MBR and Windows Partition** to restore the Windows partition, the boot partition and the MBR.
The overwrite confirmation window opens.



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 Box PC will power OFF.

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

The system backup of the Box PC is restored.

Additional Information

- Refer to *3-2-4 Rescue Disk Creator* on page 3 - 9 for Rescue Disk Creator details.
- Refer to *5-9-1 Create a New Rescue Disk with the Rescue Disk Creator* on page 5 - 57 for Rescue Disk creation details.
- Refer to *Create a System Backup with the Rescue Disk* on page 7 - 6 for system backup details.

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

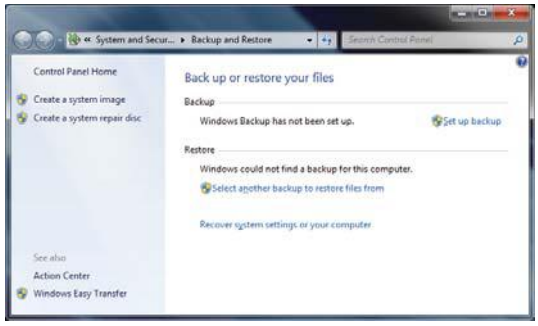
- With Windows Backup and Restore it is not possible to restore the complete boot disk or the operating system. Use the Windows Repair Disk to repair the Windows operating system.
  Refer to http://windows.microsoft.com/ for Backup and Restore details.
  Refer to *Repair Windows with the System Repair Disk* on page 7 - 34 for Repair Disk details.
- Refer to *Create a Custom Backup with Windows Backup* on page 7 - 8 for Custom Backup details.
- Use the Windows System Repair Disk to repair the Windows operating system when Windows can not be started.
  Refer to *Repair Windows with the System Repair Disk* on page 7 - 34 for repair details.

Ensure:

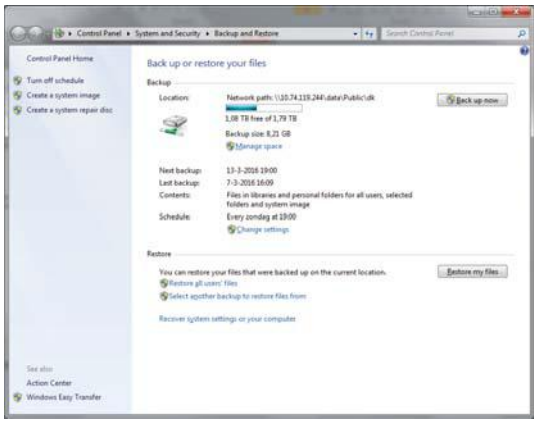
- The Industrial Box PC is ON
- You are logged in
- A backup is created earlier and it is available

To restore a backup:

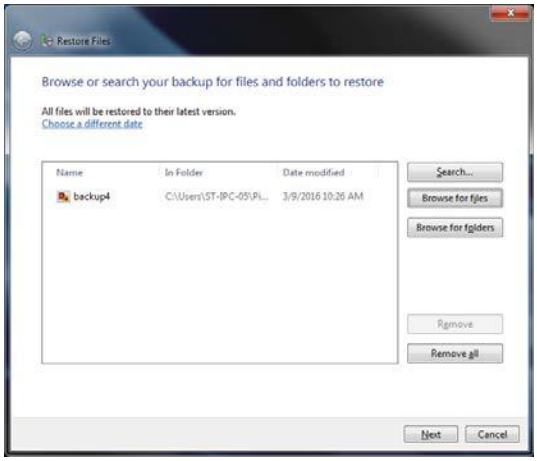
1. Select the Windows **Start** Button.
2. In the search field, input *Backup*.
3. Select **Backup and Restore**.
   The Backup and Restore window opens.



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.

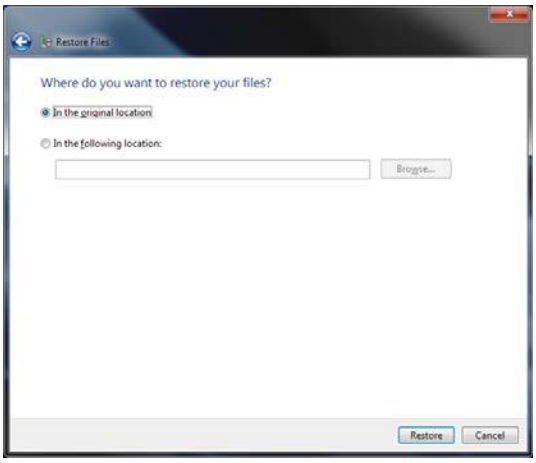


6 Add the files and folders to be restored and then select **Next**.

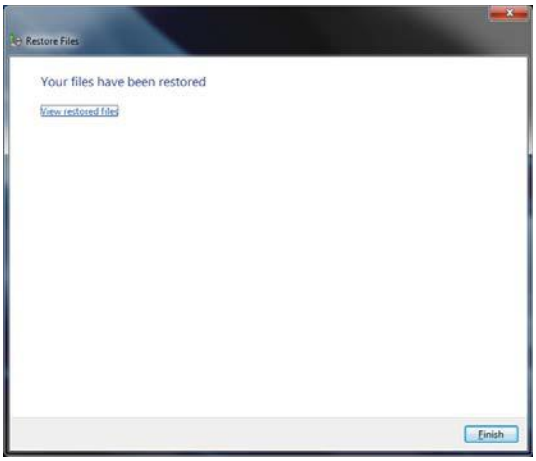
Additional Information

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.
Refer to *Repair Windows with the System Repair Disk* on page 7 - 34 for Windows Repair details.

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.

Repair Windows with the System Repair Disk

Use the following procedure to repair the Windows operating system with a System Repair Disk.

Ensure:
- The Industrial Box PC is powered OFF.
- A System Repair Disk is created earlier and it is available.

To perform a system repair:

1. Connect a USB keyboard, a USB mouse and a USB external DVD drive to the Industrial Box PC.
2. Power ON the Industrial Box PC and immediately press the **F11** key repeatedly.
3. Insert the System Repair Disk in the DVD drive.
4. Select **DVD Drive** as boot device and press **Enter**.
   The message *Windows is loading files ...* and a progress bar appear.
5. Press any key to start and wait until the recovery software started.
6. Select your keyboard language and then select **Next**.
   The System Recovery Options window appears.
7. Select **Restore your computer using a system image that you created earlier** and select **Next**.
8. Select **Use latest available system image** and then select **Next**.
   The Re-Image Your Computer window appears.
9. Do not change the setting to restore C: , select **Next**.
10. Review the settings and select **Finish**.
11. Wait until the repair process is finished, this can take several hours.
12. Restart the Industrial Box PC.

Windows is repaired.

Additional Information

- Refer to http://windows.microsoft.com/ for System repair details.
- Refer to *Create a Windows System Repair Disk* on page 5 - 59 for System Repair disk creation.
- Refer to *Create a Custom Backup with Windows Backup* on page 7 - 8 for Backup creation.

7-2-8 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 Box PC 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.

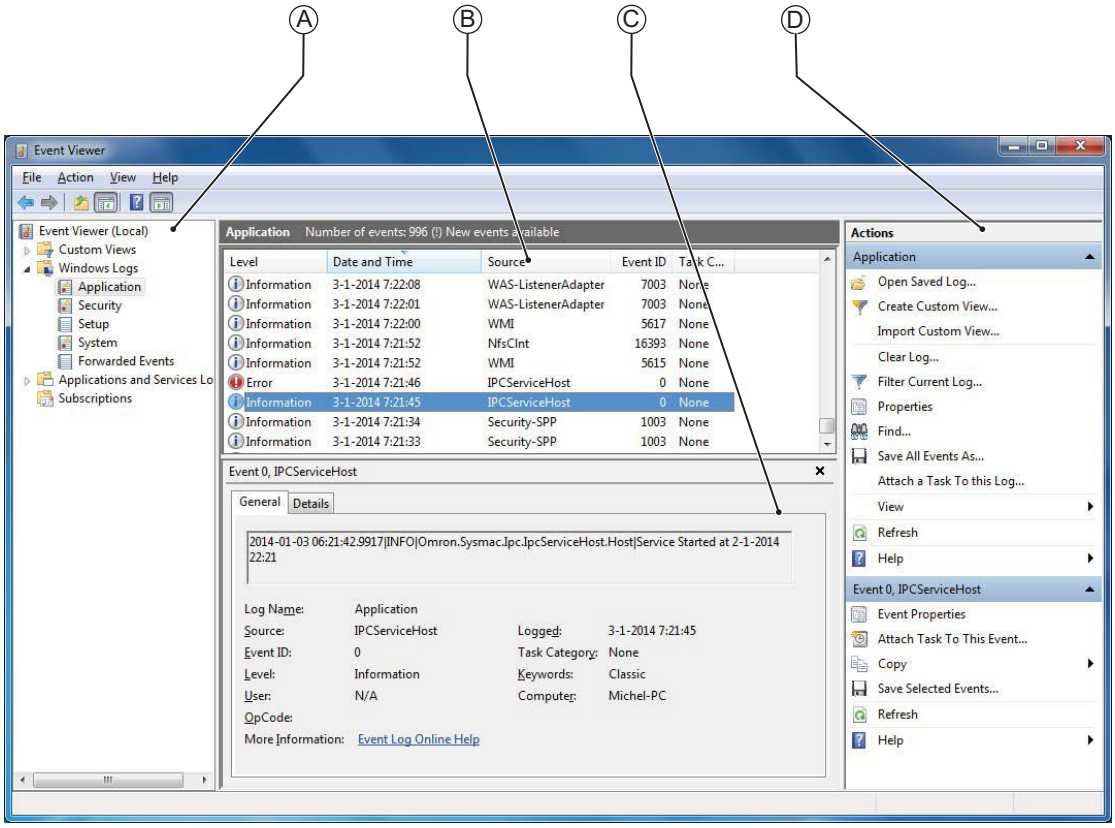
7-2-9 Windows Event Viewer

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.
The events of the Industrial Box PC start with *IPC*.

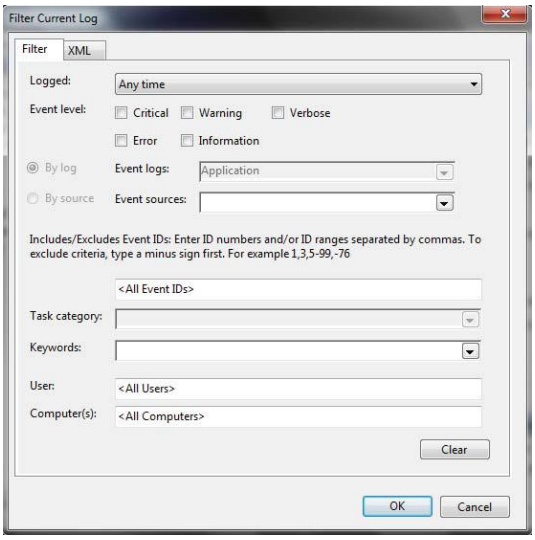
7 Select the event to display details in the Event details window or to take action in the Action overview window.

Filter Events and Event Details

This procedure explains how to filter events in the Windows event log.
To filter the events:

1 Open the Wiindows Event Viewer.
Refer to *7-2-9 Windows Event Viewer* on page 7 - 36 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.

7-2-10 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*.

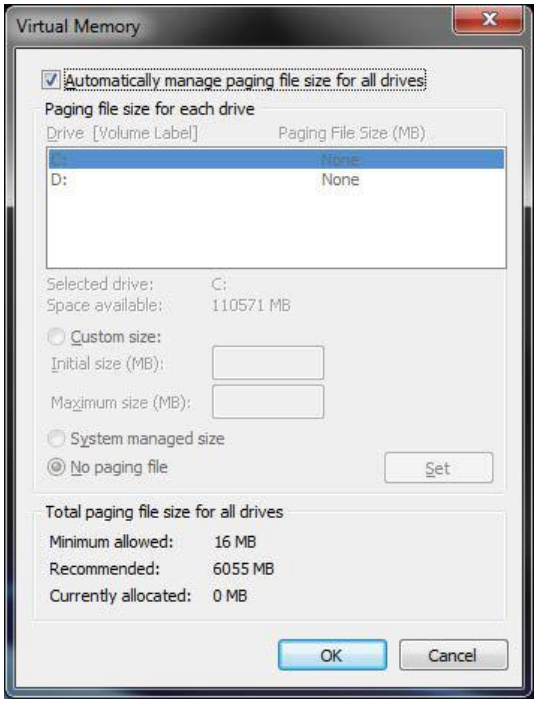
3 Select **View advanced system settings**.
The Advanced tab page in the Windows System properties will appear.

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.

7-2-11 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

Refer to http://windows.microsoft.com/en-us/windows7/resolving-stop-blue-screen-errors-in-windows-7 for details.

A

Appendices

A-1 BIOS

This section provides the BIOS information of the Industrial Box PC.

⚠ 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 Industrial Box PC.
The touchscreen functionality is not functional when working in BIOS.
Ensure a USB keyboard is connected.

BIOS Setup Program

Press the **DEL** or **F2** key repeatedly directly after Power ON to access the BIOS Setup Program.

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 with settings:

- **Main**
  Refer to *A-1-2 BIOS - Main* on page A - 4 for Main details.
- **Advanced**
  Refer to *A-1-3 BIOS - Advanced* on page A - 4 for Advanced details.
- **Chipset**
  Refer to *A-1-4 BIOS - Chipset* on page A - 8 for Chipset details.
- **Boot**

Refer to *A-1-5 BIOS - Boot* on page A - 9 for Boot details.

- **Security**
  Refer to *A-1-6 BIOS - Security* on page A - 10 for Security details.
- **Save & Exit**
  Refer to *A-1-7 BIOS - Save & Exit* on page A - 10 for Save and Exit details.

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 - 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.

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.

A-1-3 BIOS - Advanced

This section provides advanced BIOS information.

Changeable BIOS Advanced parameters and their factory default values:

Item			Default / Remark
Machine Control *1			Disabled
Graphics	Primary Graphics Device		Auto
	Internal Graphics Device		Auto
	IGD Pre-Allocated Graphics Memory		32M
	IGD Total Graphics Memory		256M
	Primary IGD Boot Display Device		Auto
	Active LFP Configuration		• eDP / for Industrial Panel PC • No Local Flat Panel / for Industrial Box PC
	Digital Display Interface 1		HDMI/DVI
	Digital Display Interface 2		HDMI/DVI
Hardware Health Monitoring *1	Start Temperature		50 C
	Temperature Range		30 C
	Minimum Fan Speed		30% / Fixed
	Maximum Fan Speed		100%
	Fan Always On At Minimum Speed		Disabled
PCI & PCI Express	PCI Latency Timer		32 PCI Bus Clocks
	PERR # Generation		Disabled
	SERR # Generation		Disabled
	PIRQ Routing & IRQ Reservation	PIRQA,B,C,D,E,F,G,H	Auto
	PCI Express Settings	Relaxed Ordering	Disabled
		Extended Tag	Disabled
		No Snoop	Enabled
		Maximum Payload	Auto
		Maximum Read Request	Auto
		ASPM	Disabled
		Extended Synch	Disabled
		Link Training Retry	5
		Link Training Timeout (us)	100
		Unpopulated Links	Disabled
		Restore PCIe Registers	Disabled

Item			Default / Remark
PCI & PCI Express	PCI Express Gen 2 Settings	Completion Timeout	Default
		ARI Forwarding	Disabled
		AtomicOp Requester Enable	Disabled
		AtomicOp Egress Blocking	Disabled
		IDO Request Enable	Disabled
		IDO Completion Enable	Disabled
		LTR Mechanism Enable	Disabled
		End-End TLP Prefix Blocking	Disabled
		Target Link Speed	Auto
		Clock Power Management	Disabled
		Compliance SOS	Disabled
		Hardware Autonomous Width	Enabled
		Hardware Autonomous Speed	Enabled
	PCI Express Gen3 Settings (for Port 0 and 1) *1	Run-time C7 Allowed	Disabled
		Detect Non-compliant Device	Disabled
		Program PCIe ASPM after OpROM	Disabled
		PEG Sampler Calibrate	Disabled
		Swing Control	Full
		Peg Gen3 Equalization	Enabled
		- Gen3 EQ Phase 2	Enabled
		- PEG Gen3 Root Port Preset Value for each Lane. Lane 0...15	8
		- PEG Gen3 Endpoint Preset Value for each Lane. Lane 0...15	7
		- PEG Gen3 Endpoint Hint Value for each Lane. Lane 0...15	2
		- Gen3 Eq Preset Search	Enabled
		– Always Re-search Gen3 Eq Preset	Disabled
		– Preset Search Dwell Time	1000
		– Error Target	1
		PEG RxCEM Loopback Mode	Disabled
		PCIe Gen3 RxCTLEp Setting. PCIe Gen3 RxCTLEp 0...7	8

Item			Default / Remark
PCI & PCI Express	GbE Channel 0	PCI Express Port 0	Enabled
		ASPM	Disabled
	GbE Channel 1	PCI Express Port 1	Enabled
		ASPM	Disabled
	PCI Express Port 0, 1 (x4 Gen3) *4	PEG1 Speed	Auto
		PEG1 ASPM	Disabled
		PEG1 De-emphasis Control	-3.5 dB
	PCI Express Port 2, 3, 4, 5 (x1 Gen2) *4	PCI Express Port x	Enabled
		ASPM	Disabled
		Hot Plug	Disabled
		PCIe Speed	Auto
		Detect Non-compliant Device	Disabled
ACPI	Hibernation Support		Enabled
	ACPI Sleep State		S3 (Suspend to RAM)
	Lock Legacy Resources		Disabled
	S3 Video Repost		Disabled
	ACPI Low Power S0 Idle *3*2		Disabled
	Native PCI Express Support		Enabled
	- Native ASPM		Disabled
	ACPI Debug		Disabled
	ACPI 5.0 CPPC Support		Disabled
	Active Trip Point *3*2		71 C
	Automatic Critical Trip Point		Enabled
RTC Wake	Make System At Fixed Time		Disabled
Trusted Computing	Security Device Support		Enable
	TPM State		Enabled
	Pending operation		None

Item			Default / Remark
CPU	CPU Information		Display of CPU parameters
	Set Boot Freq Ratio		255
	Hyper-Threading *2*1		Enabled
	Active Processor Cores		All
	Limit CPUID Maximum		Disabled
	Execute Disable Bit		Enabled
	Intel Vitalization Technology		Enabled
	Hardware Prefetcher		Enabled
	Adjacent Cache Line Prefetch		Enabled
	CPU AES *2*1		Enabled
	EIST		Enabled
	- Turbo Mode *2*1		Enabled
	- Energy Performance *2*1		Performance
	P-State Reduction *3		Disabled
	CPU C States		Disabled
	TCC Activation Offset		0
	Intel TXT(LT) Support *2*1		Disabled
SATA	SATA Controller(s)		Enabled
	SATA Mode Selection		AHCI
	SATA Test Mode		Disabled
	Aggressive LPM Support		Disabled
	SATA Controller Speed		Default
	Serial ATA Port 0, 1, 2, 3 *5	SATA Port	Enabled *5
		Hot Plug	Disabled
		External SATA	Disabled
		SATA Device Type	Hard Disk Drive
		Spin Up Device	Disabled
Memory Configuration			Display of memory parameters
Intel (R) Rapid Start Technology			Disabled
USB	XHCI Mode		Auto
	Overcurrent Protection		Disabled
	USB Ports Per-Port Disable Control	USB Ports Per-Port Disable Control	Enabled
		- USB Port 0...6	Enabled
		- USB 3.0 Port 0...1	Enabled
	Legacy USB Support		Enabled
	External USB Controllers Support		Enabled
	XHCI Hand-off		Enabled
	EHCI Hand-off		Disabled
	USB Mass Storage Driver Support		Enabled
	USB Transfer Timeout		20 sec
	Device Reset Timeout		20 sec
	Device Power-up Delay Selection		Auto
	Generic Ultra HS-COMBO		Auto

Item			Default / Remark
SMART Settings	Smart Self Test *6		Disabled
UEFI Network Stack	UEFI Network Stack		Disabled
NVMe Configuration			No NVME device found
Intel® Ethernet Connection I218-LM - Unique MAC Address	NIC Configuration	Link Speed	Auto Negotiated
		Wake On LAN	Enabled
	Blink LEDs		0

*1 Only for Box PCs with a CPU type Intel® Core™ i7-4700EQ.

*2 Only for Box PCs with a CPU type Intel® Core™ i5-4300U.

*3 Only for Box PCs with a CPU type Intel® Celeron® 2980U.

*4 The active PCI Express Port number is related to the CPU type

- Box PCs with an Intel® Core™ i7-4700EQ CPU type use Port 0..5
- Box PCs with an Intel® Core™ i5-4300U CPU type use Port 2 and 3
- Box PCs with an Intel® Celeron® 2980U CPU type use Port 2 and 3

*5
- Box PCs with an Intel® Celeron® 2980U CPU type only Port 0 and 1 are available
- Box PCs with an Intel® Core™ i5-4300U CPU type Port 1 is Disabled
- Box PCs with an Intel® Core™ i7-4700EQ CPU type Port 1 is Disabled. For Port 2: SATA Port = Enabled.

*6 Smart Self Test monitors the status of the HDD/SSD.
Enable only when Smart Monitoring software is used.

A-1-4 BIOS - Chipset

Provides Chipset settings.

Changeable BIOS Chipset parameters and their factory default values:

Item		Default / Remark
Platform Controller Hub (PCH)	PCI Express Clock Gating	Disabled
	DMI Link ASPM PCH Side	Disabled
	DMI Link Extended Synch Control	Disabled
	Isolate SMBus Segments	During POST
	PCIe-USB Glitch W/A	Disabled
	USB Precondition	Disabled
	BTCG	Enabled
	HDA Controller	Auto
	HDA PME	Disabled
	PCH LAN Controller	Enabled
	Wake on LAN	Enabled
	Serial IRQ Mode	Continuous
	SB CRID	Disabled
	Port 80h Redirection	LPC Bus
	Subtractive Decode	Disabled
Processor (Integrated Components	VT-d *1*2	Enabled
	Audio Device (B0:D3:F0)	Enabled
	NB CRID	Disabled
	BDAT ACPI Table Support	Disabled

*1 Only for Box PCs with a CPU type Intel® Core™ i5-4300U.

*2 Only for Box PCs with a CPU type Intel® Core™ i7-4700EQ.

A-1-5 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
Battery Support		Auto (Battery Manager)
Power Loss Control *1		Remain Off
CSM & Option ROM Control	Launch CSM	Enabled
	Boot Option Filter	UEFI and Legacy
	PXE Option ROM Launch Policy	UEFI ROM Only
	Storage Option ROM Launch Policy	Legacy ROM Only
	Video Option ROM Launch Policy	Legacy ROM Only
	Other Option ROM Launch Policy	UEFI ROM Only
	Gate A20 Active	Upon Request
	Option ROM Messages	Force BIOS
Enter Setup If No Boot Device		No
Enable Popup Boot Menu		Yes
Boot Priority Selection		Type Based
Boot Option Sorting Method		Legacy First
Type Based Boot Priority	1st Boot Device	SATA 2 Drive *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
UEFI Fast Boot		Disabled

*1 Power Loss Control settings are :
Remain OFF: The Industrial Box PC will stay OFF when power is supplied to the power connector
Turn ON: The Industrial Box PC will automatically start up when power is supplied to the power connector.
Last State: The Industrial Box PC will start up or remain OFF when power is supplied based on the Industrial Box PC state at the moment power was removed from the power connector.

*2 For Box PCs with a CPU type Intel® Celeron® 2980U: SATA 1 Drive

A-1-6 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
Secure Boot Menu	Secure Boot		Disabled
	Secure Boot Mode		Custom
	Key Management	Default Key Provision	Disabled
		Platform Key (PK)	NOT INSTALLED
		Key Exchange Key (KEK)	NOT INSTALLED
		Authorized Signatures	NOT INSTALLED
		Forbidden Signatures	NOT INSTALLED
		Authorized TimeStamps	NOT INSTALLED

A-1-7 BIOS - Save & Exit

Provides the possibility to leave the BIOS with or without saving changes.

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 Box PC restarts using the changed settings.
- **Discard Changes and Reset**
  Changed settings are not saved and the Box PC 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.

A-2 Customize Windows

This section provides an overview of the tools to customize Windows.

A-2-1 Enhanced Write Filter

Enhanced Write Filter (EWF) intercepts disk changes and stores them into a memory overlay in RAM memory instead of applying them to the original volume.

Additional Information

- File-Based Write Filter (FBWF) provides a similar function, but operates at the file level, while EWF operates at the sector level.
- Refer to the Microsoft Developer Network (MSDN) for detailed information.

Application

EWF and FBWF provide the following benefits:

- Write-protect one or more partitions on a system.
- Make it possible to revert changes and revert to the original disk content.
- Enable booting from read-only media.
  By redirecting all write requests to RAM, EWF and FBWF enable the run-time image to maintain the appearance of a writable run-time image.
- Improve the file system performance when using relatively slow storage.
- Minimize write actions to the disk.
  For example, minimize write access to flash memory. Write cycles on flash memory are limited for technical reasons.

Usage

EWF is included in the Windows Embedded Standard 7 image and disabled by default. The configuration of this component can be defined with the command line tool `EWFMGR.EXE`.

To run to EWF Manager, open the Command Prompt with Administrator rights.

Command	Function	Remarks
`ewfmgr`	Shows an overview with current status.	---
`ewfmgr c: -enable`	Enables the write filter for the drive C:.	The protection is not effective until the system is restarted.
`ewfmgr c: -commit`	Writes all the changes in the memory overlay to the physical disk during the next restart.	Committing the overlay can affect the speed of the boot process.
`ewfmgr c: -commitanddisable`	Writes all the changes in the memory overlay to the physical disk during the next restart, and disables the disk protection.	Committing the overlay can affect the speed of the boot process. The protection is not disabled until the system is restarted.

Command	Function	Remarks
`ewfmgr c: -commitanddisable -live`	Writes all the changes in the memory overlay to the physical disk immediately, and disables the disk protection.	Protection is also disabled immediately. No restart is required.
`ewfmgr c: -disable`	Disables the disk protection.	The protection is not disabled until the system is restarted.
`ewfmgr /h`	Displays a helpscreen that explains all commands and options available.	A complete reference can also be found at the Microsoft Developer Network (MSDN).

Considerations

- EWF and FBWF cannot be used simultaneously.
- To prevent data loss in the event of a power failure, the use of a UPS is recommended.
- When the EWF function is enabled and a large amount of data is written, the system memory space will be reduced and operation may become unstable. To prevent this problem, it is recommended that a large amount of data be written to a different location.
- Automatic Adjustment of daylight saving time (DST) is incompatible with the Enhanced Write Filter (EWF).

Additional Information

Refer to the Microsoft Developer Network (MSDN) for DST details.

A-2-2 File-Based Write Filter

File-Based Write Filter (FBWF) intercepts file changes and stores them into a memory overlay in RAM memory instead of applying them to the original volume.
When FBWF is enabled, all files and folders of a partition are protected unless they are included in an exception list.

Additional Information

- Enhanced Write Filter (EWF) provides a similar function, but operates at the sector level, while FBWF operates at the file level. FBWF is more flexible in its configuration than EWF and allows immediate writing without rebooting.
- Refer to the Microsoft Developer Network (MSDN) for detailed information.

Application

EWF and FBWF provide the following benefits:

- Write-protect one or more partitions on a system.
- Make it possible to revert changes and revert to the original disk content.
- Enable booting from read-only media.
  By redirecting all write requests to RAM, EWF and FBWF enable the run-time image to maintain the appearance of a writable run-time image.
- Improve the file system performance when using relatively slow storage.
- Minimize write actions to the disk.

For example, minimize write access to flash memory. Write cycles on flash memory are limited for technical reasons.

Usage

FBWF is included in the Windows Embedded Standard 7 image and disabled by default. The configuration of this component can be defined with the command line tool `FBWFMGR.EXE`.
To run to FBWF Manager, open the Command Prompt with Administrator rights.

Command	Function	Remarks
`fbwfmgr`	Shows an overview with current status.	---
`fbwfmgr /displayconfig`	Shows current configuration.	---
`fbwfmgr /enable`	Enables the write filter.	The protection is not effective until the system is restarted.
`fbwfmgr /addvolume c:`	Adds a volume to the protected volume list.	That volume will be protected after the next restart.
`fbwfmgr /commit c: \Test.txt`	Writes the changes to the protected file/folder.	---
`fbwfmgr /addexclusion C: \Test.txt`	Adds a write-through path to the exclusion list (file/folder).	The exclusion is active after the next restart.
`fbwfmgr /removeexclusion C: \Test.txt`	Removes the write-through path from the exclusion list (file/folder).	The exclusion is removed after the next restart.
`fbwfmgr /h`	Displays a helpscreen that explains all commands and options available.	A complete reference can also be found at the Microsoft Developer Network (MSDN).

Additional Information

When specifying a file name, notice the space between drive name (c:) and file path (\Test.txt).

Considerations

- EWF and FBWF cannot be used simultaneously.
- FBWF can only protect formatted volumes. Do not move files between protected and unprotected volumes.
- When the FBWF function is enabled and a large amount of data is written, the system memory space will be reduced and operation may become unstable. To prevent this problem, it is recommended that a large amount of data be written to a different location.
- FBWF supports only NTFS and FAT32 file systems.
- Automatic Adjustment of daylight saving time (DST) is incompatible with the File-Based Write Filter (FBWF).

Additional Information

Refer to the Microsoft Developer Network (MSDN) for DST details.

A-2-3 Trusted Platform Module

The Trusted Platform Module (TPM) integrates encryption keys into the Industrial Box PC 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.

Additional Information

Refer to *A-1 BIOS* on page A - 2 to enable TPM in the BIOS Settings.

Considerations

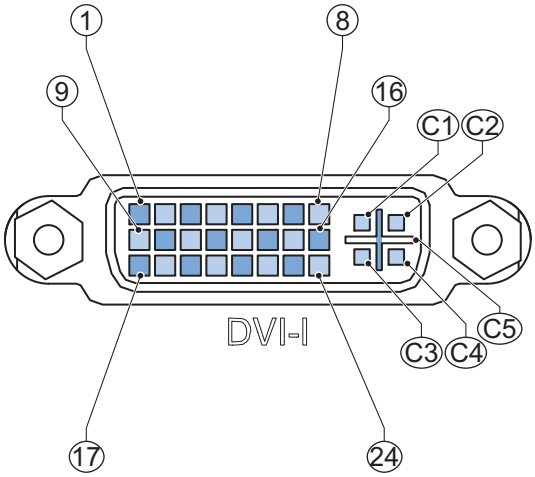
Risk of data loss: If you lose the password for the drive encryption, you will not be able to restore the data. You will then lose access to the encrypted drive. Please store the password carefully and make sure it is protected against unauthorized access.

A-3 DVI Connector Pin Details

This section provides the pin details for the DVI-I and the DVI-D connectors.

A-3-1 DVI-I Connector Pin Details

Pin details of the DVI-I connector.



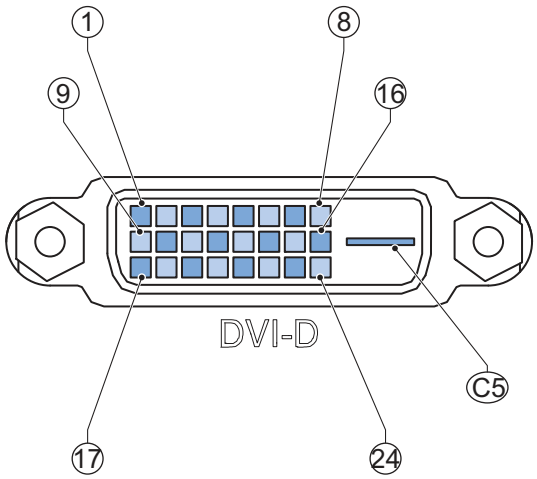
The pin layout represents the DVI-I connector on the Industrial Box PC.
Pin numbers increase from left to right for every row.

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	---
7	DDC data	---
8	Analog vertical sync (Intel® Core™ i7-4700EQ CPU type)	---
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	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	---

Pin	Signal Name	Function
22	0 VDC (TMDS clock shield)	---
23	TMDS clock+	Digital clock+
24	TMDS clock−	Digital clock−
C1	Analog red (Intel® Core™ i7-4700EQ CPU type)	---
C2	Analog green (Intel® Core™ i7-4700EQ CPU type)	---
C3	Analog blue (Intel® Core™ i7-4700EQ CPU type)	---
C4	Analog horizontal sync (Intel® Core™ i7-4700EQ CPU type)	---
C5	0 VDC (Analog ground return for red, green and blue (Intel® Core™ i7-4700EQ CPU type))	---

A-3-2 DVI-D Connector Pin Details

Pin details of the DVI-D connector.

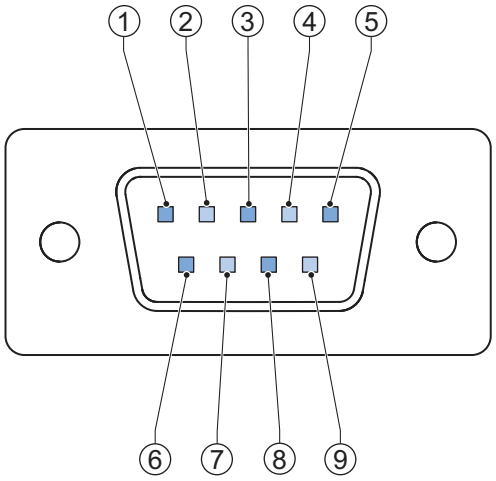


The pin layout represents the DVI connector on the Industrial Box PC.
Pin numbers increase from left to right for every row.

Pin	Signal Name	Function
1	TMNotDS 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	---
7	DDC data	---
8	Not connected	---
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)	---

Pin	Signal Name	Function
15	0 V return for pin 14	---
16	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)	---
23	TMDS clock+	Digital clock+
24	TMDS clock−	Digital clock−
C5	Not connected	---

A-4 RS-232 Connector Pin Details



The pin layout represents the RS-232 connector on the Box PC.

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 functional ground connection.

Additional Information

Refer to *5-4-2 Ground* on page 5 - 27 for grounding details.

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OMRON Corporation **Industrial Automation Company**
Kyoto, JAPAN

Contact: www.ia.omron.com

Regional Headquarters
OMRON EUROPE B.V.
Wegalaan 67-69, 2132 JD Hoofddorp
The Netherlands
Tel: (31)2356-81-300/Fax: (31)2356-81-388

OMRON ELECTRONICS LLC
2895 Greenspoint Parkway, Suite 200
Hoffman Estates, IL 60169 U.S.A.
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

OMRON ASIA PACIFIC PTE. LTD.
No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark,
Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON (CHINA) CO., LTD.
Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

Authorized Distributor:

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