OMRON

Industrial PC Platform

NY-series

IPC Without Operating System Industrial Box PC

User's Manual

NYB□□-□□0

Industrial Box PC

SYSMAC always in control

W586-E2-05

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Introduction

Thank you for purchasing the Box PC Without Operating System.
This manual contains information that is necessary to use the Box PC Without Operating System (hereafter also named as 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 without Operating System products:

Product	Model
Industrial Box PC	• NYB□□-□□0

Additional Information

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

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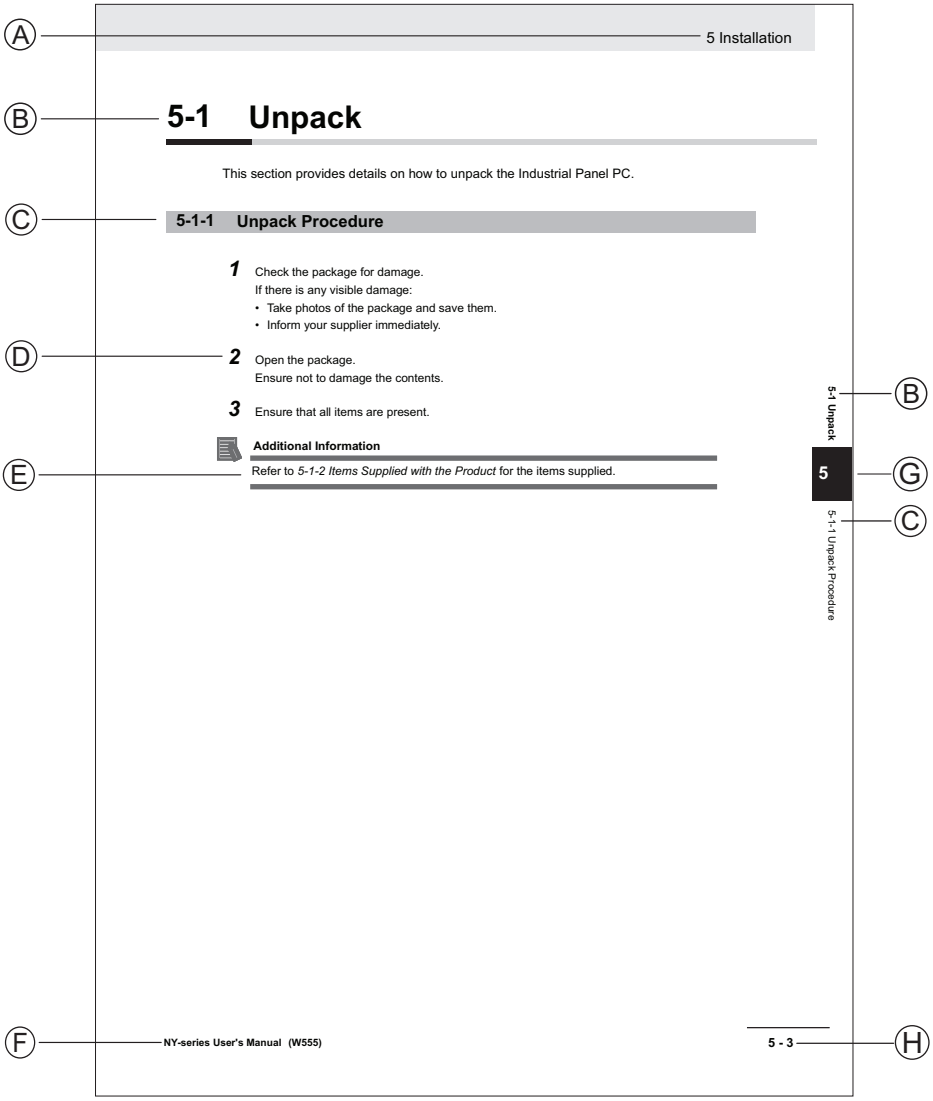
Manual Information

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, Limitations of Liability

Warranties

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Change in Specifications

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

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Safety Precautions

Definition of Precautionary Information

The following notation is used in this manual to provide precautions required to ensure safe usage of the Box PC Without Operating System. The safety precautions that are provided are extremely important to safety.
Always read and heed the information provided in all safety precautions.
The following notation is used.

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

Symbols

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

Warnings

⚠ WARNING

Disassembly and Dropping

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

Installation

Always connect to a ground of 100 Ω or less when installing the product.	
Ensure that installation and post-installation checks of the product are performed by personnel in charge who possess a thorough understanding of the machinery to be installed.	

Fail-safe Measures

Provide safety measures in external circuits to ensure safety in the system if an abnormality occurs due to malfunction of the product or due to other external factors affecting operation. Not doing so may result in serious accidents due to incorrect operation.	
Emergency stop circuits, interlock circuit, limit circuits, and similar safety measures must be provided in external control circuits.	
Unintended behavior may occur when an error occurs in internal memory of the product. As a countermeasure for such problems, external safety measures must be provided to ensure safe operation of the system.	
The use of an uninterruptible power supply (UPS) allows normal operation to continue even if a momentary power failure occurs, possibly resulting in the reception of an erroneous signal from an external device affected by the momentary power failure. Take external fail-safe measures. Where necessary, monitor the power supply voltage on the system for external devices and use it as an interlock condition.	

Actual Operation

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

Cautions

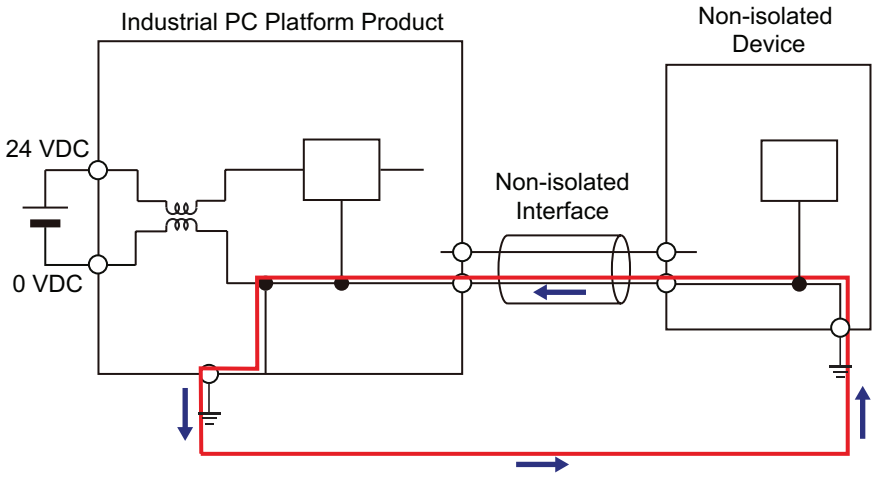
⚠ Caution

Installation

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

Wiring

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



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

Precautions for Safe Use

Disassembly, Dropping, Mounting, Installation and Storage

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

Wiring

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

Power Supply Design and Turning ON/OFF the Power Supply

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

Actual Operation

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

Operation

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

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

General Communications

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

Battery Replacement

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

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

Cleaning, Maintenance and Disposal

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

廃電池請回収

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

  Perchlorate Material - special handling may apply.

  See http://www.dtsc.ca.gov/hazardouswaste/perchlorate.
- The product contains a lithium battery with a perchlorate content of 6ppb or higher. When exporting an end product containing the product to or shipping through California, USA, label all packing and shipping containers appropriately.

Precautions for Correct Use

Storage, Installation and Mounting

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

Wiring

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

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

Actual Operation and Operation

- After an OS update or a peripheral device driver update for the product is executed, the product behavior might be different. Confirm that operation is correct before you start actual operation.
- 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.
- Diagnostic information is not available when the Industrial PC Support Utility is not installed.

Battery Replacement

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

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

SD Memory Cards

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

Regulations and Standards

Conformance to EU Directives

The Box PC Without Operating System complies with EU Directives. To ensure that the machine or device in which the Box PC Without Operating System is used complies with EU Directives, the following precautions must be observed:

- The Box PC Without Operating System must be installed within a control panel.
- The Box PC Without Operating System 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 Box PC Without Operating System is used complies with EU Directives.
- This is a Class A product (for industrial environments). In a residential environment, it may cause radio interference. If radio interference occurs, the user may be required to take appropriate measures.

Applicable Directive

EMC Directive

EMC Directive

OMRON devices that comply with EU Directives also conform to the related EMC standards so that they can be more easily built into other devices or the overall machine. The actual products have been checked for conformity to EMC standards.
Applicable EMC (Electromagnetic Compatibility) standards are as follows:

- EMS (Electromagnetic Susceptibility): EN 61131-2
- EMI (Electromagnetic Interference): EN 61131-2 (Radiated emission: 10-m regulations)

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

Conformance to KC Standards

Observe the following precaution if you use Industrial PC Platform products in Korea.

A 급 기기 (업무용 방송통신기자재)
이 기기는 업무용(A 급) 전자파적합기기로서 판매자
또는 사용자는 이 점을 주의하시기 바라며, 가정외의
지역에서 사용하는 것을 목적으로 합니다.

Class A Device (Broadcasting Communications Device for Office Use).
This device obtained EMC registration for office use (Class A), and it is intended to be used in places other than homes.
Sellers and/or users need to take note of this.

Conformance to UL and CSA Standards

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

Software Licenses and Copyrights

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

Related Manuals

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

Related Products Manuals

Manual name	Cat. No.	Model numbers	Application	Description
UPS S8BA User's Manual	U702	S8BA	Learning the information that is necessary to use the Uninterruptible Power Supply (UPS) Unit.	An introduction to the UPS is provided along with the following information: • Overview • Preparation • Installation and Connection • Check and Start Operation • Maintenance and Inspection • Shutdown Processing • I/O Signal Functions • Troubleshooting
UPS Setting Utility Instruction Manual	---	• SB8A • BU-2RWL	Learning the information that is necessary to connect the UPS and to configure all settings.	An introduction to the UPS Setting Utility is provided along with the following information: • Overview • Operating Environment • Software License Agreement • Connect • Use the UPS Setting Utility • Setting Details
UPS Power Attendant Lite for Windows User's Manual	---	S8BA	Learning the information that is necessary to use the software to monitor, test and control the UPS and to configure all settings.	An introduction to the software is provided along with the following information: • Overviews • Connection and Installation • The Simple Usage and Operation Test • Settings

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□ NYM15W-C106□ NYM12W-C100□ NYM12W-C106□	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

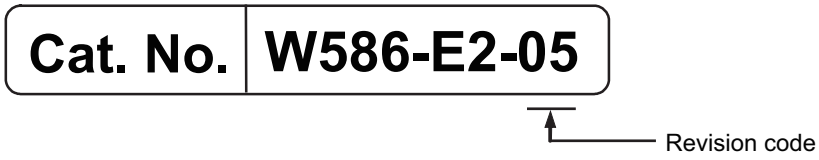
Term / Abbreviation	Description
BMC	Board Management Controller
CFast	An SSD CFast storage device
CPU	A Central Processing Unit is the hardware within a computer that executes the instructions of a computer program
DVI	Digital Visual Interface
DVI-D	A Digital Visual Interface with only Digital signals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

Software

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

Revision History

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



Revision code	Date	Revised content
05	May 2018	• Added Intel® Xeon® E3-1515M v5 CPU • Added main memory DDR4 32 GB • Added main memory DDR4 ECC 8 GB and 16 GB • Added SSD 500 GB NY000-AS05 • Added CFast 64 GB NY000-AT00, 128 GB NY000-AT01, 256 GB NY000-AT02 • Added RJ45 Gb Ethernet option • Minor modifications
04	April 2018	• Added layer information • Added thin cooling layer • Added Intel® Core™ i5-7300U CPU • Added Intel® Celeron® 3965U CPU • Added SSD 64 GB NY000-AS03 • Added SSD 128 GB NY000-AS04 • Added main memory DDR4 4 GB and 8 GB • Updated Power Consumption Specifications • Implemented new location for the product code of an operating system
03	January 2018	• Added option for 16 GB main memory • Added options for 500 GB and 1 TB HDD • Added support of RAID • Minor modifications
02	June 2017	Added NY Monitor Link option
01	April 2017	First release

Sections in this Manual

1

Overview

This section provides general information about the Box PC Without Operating System.

1-1 Intended Use

The Box PC Without Operating System (also indicated as Box PC) is an industrial-grade PC intended for use within factory automation environments. This Box PC can be configured with Windows, Linux or a realtime operating system (RTOS). It can be used with third party software to serve as a powerful PC platform.
The Box PC can easily be integrated in manufacturing innovations like big data, NUI and IIoT.
The Box PC Without Operating System has a compact design that offers flexibility, expandability and easy maintenance for applications in factory automation environments.

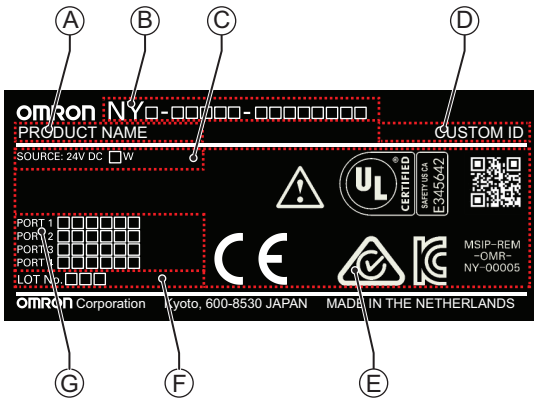
1-2 Hardware Features

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.
- RAID support
  RAID 0 and RAID 1 are supported. For 4th generation CPUs starting with Main BIOS version A□27R110. Hot-swap of storage devices is not supported.
- LED indicators
  LED indicators provide a clear indication of the operational status of the 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.
- NY Monitor Link interface
  The interface combines video signals and USB signals for a connection to an OMRON Industrial Monitor using a single NY Monitor Link cable up to 100 meter.
- 3 Ethernet ports 1Gb/s
  Interface with multiple networks. An extra (optional) 4th 1Gb/s Ethernet port can be added.
- 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.
- Built-in CFast Card slot
  An optional CFast Card slot is provided as a removable storage device.

1-3 ID Information Label

The ID information label contains relevant information about the Box PC Without Operating System. The following example will be different from your product label.



Item	Name	Description
A	Product name	The name of your product
B	Model *1	Model and configuration details
C	Power rating	Power rating details
D	Custom ID (Optional)	A custom ID [NYC□□□-□□□□□□□□] Only for Industrial Monitors and Industrial Panel PCs with a custom logo *1.
E	Standards and QR code	The applicable standards and a QR code for OMRON internal use
F	LOT number and serial number	Production details, consisting of: • The lot number of the Box PC Without Operating System in the format DDMYY□. DDMYY with Month number 1 to 9 for January to September, X for October, Y for November, and Z for December. □: For use by OMRON • Serial number (4 digits)
G	MAC ADDRESS *2	• PORT 1: the MAC address of Ethernet port 1 • PORT 2: the MAC address of Ethernet port 2 • PORT 3: the MAC address of Ethernet port 3 • PORT 4: the MAC address of Ethernet port 4 (Optional)

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

*2. Refer to *4-2-4 Ethernet Connector Specifications* on page 4 - 24 for Ethernet specifications.

Additional Information

Refer to *2-1-2 Base Layer* on page 2 - 5 for the ID label location.

1-4 Product Configuration

This section provides an overview of the product configurations available for the Box PC Without Operating System.
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.

NYB□□-□□□□□
1 2 3 4 5 6 7

Item	Description	Option / Description
1	Series name	NYB: NY-series Industrial Box PC
2	Processor	17: Intel® Core™ i7-4700EQ, 4th generation CPU with active cooling 1C: Intel® Celeron® 2980U, 4th generation CPU 1E: Intel® Xeon® E3-1515M v5 6th generation CPU with active cooling 25: Intel® Core™ i5-4300U, 4th generation CPU 2C: Intel® Celeron® 3965U, 7th generation CPU 35: Intel® Core™ i5-7300U, 7th generation CPU
3	Main memory	1: 2 GB, non-ECC 2: 4 GB, non-ECC 3: 8 GB, non-ECC 4: 16 GB, non-ECC 5: 32 GB, non-ECC C: 8 GB, ECC D: 16 GB, ECC
4	Expansion slots	0: None 1: 1 PCIe slot
5	Operating system	0: No Operating System
6	Storage	0: No Drive
7	Interface	0: None 1: RS-232C 2: DVI-D 6: NY Monitor Link 9: Gb Ethernet

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 operating system 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.

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.

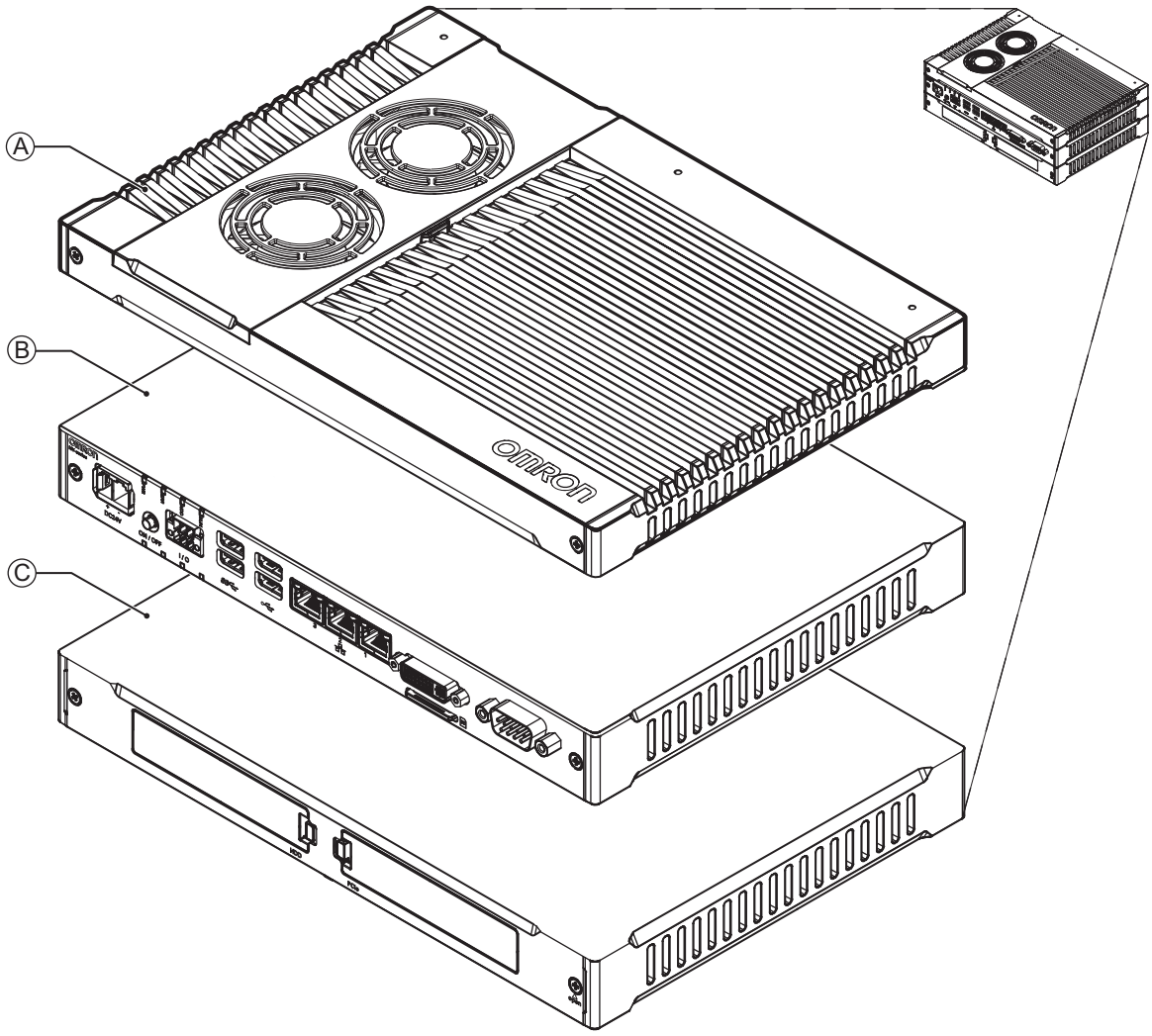
2

Hardware

This section provides an overview of the hardware of the Box PC Without Operating System.

2-1 Layers and Components of the Industrial Box PC

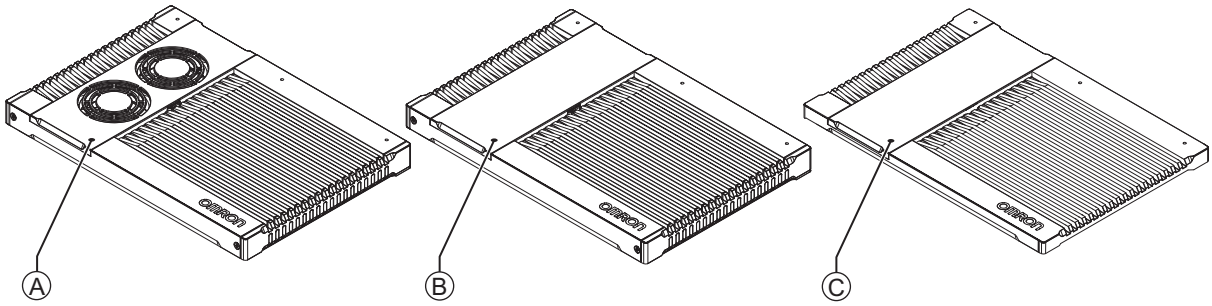
This section shows the layers of the Industrial Box PC.



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

2-1-1 Cooling Layer

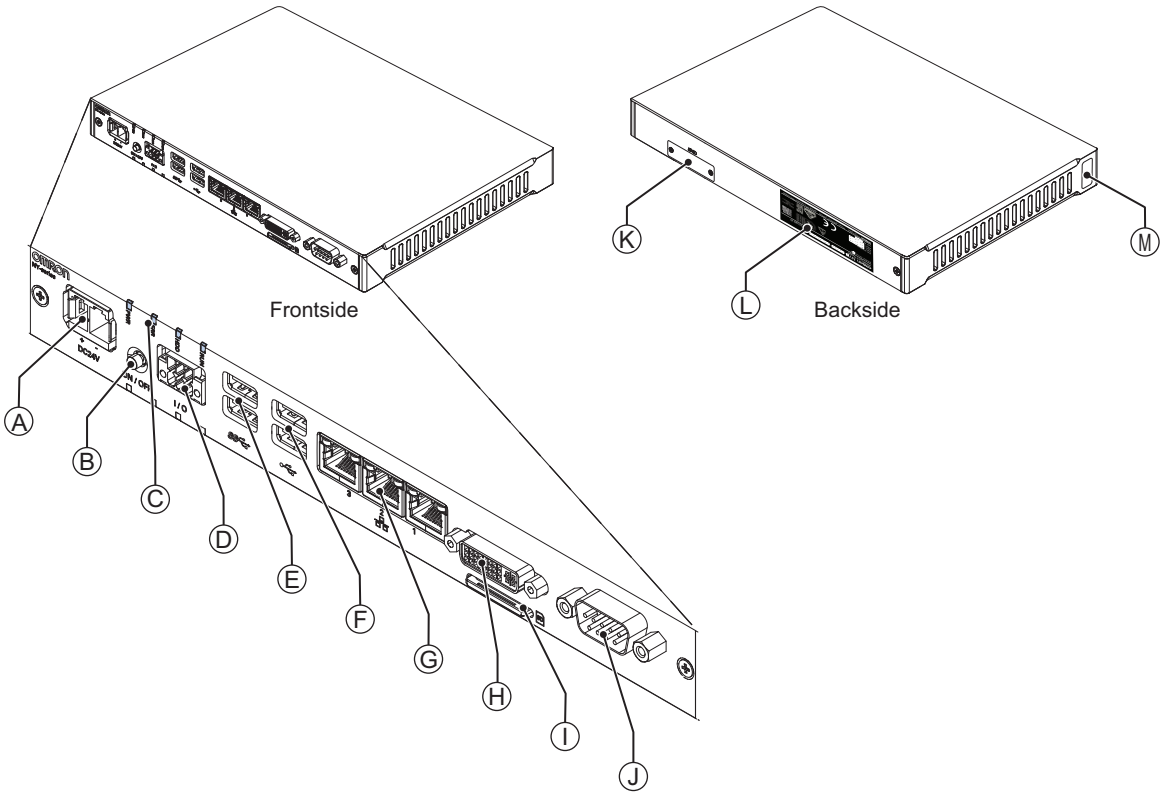
This section gives details on the cooling layer.
The cooling layer will dissipate excessive heat from the Box PC.
Thickness and design details of the cooling layer can vary, depending on the product configuration.



Item	Name	Description
A	Cooling layer with removable cover and active cooling	The cover provides access to: • The battery • The battery replacement date • The fans, only for Box PCs that have active cooling
B	Cooling layer with removable cover	
C	Cooling layer without removable cover	A thin cooling layer for passive cooling

2-1-2 Base Layer

This section shows the component names and functions for the base layer.
The base layer houses most of the functionality of the Box PC.



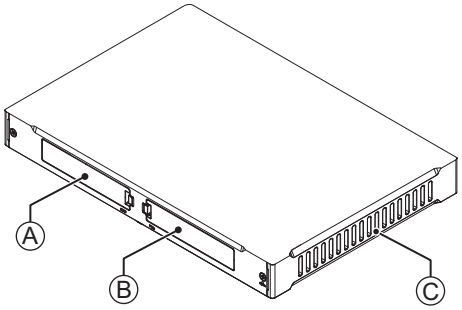
The connector layout and the available components can differ depending on the product configuration. Refer to *1-4 Product Configuration* on page 1 - 5 for configuration details.

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

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

2-1-3 Expansion Layer (Optional)

This section shows the component names and functions for the expansion layer.
The expansion layer adds additional functionality to the base layer.



The Expansion Layer is installed for models NY□□□-□1.
Refer to *1-4 Product Configuration* on page 1 - 5 for configuration details.

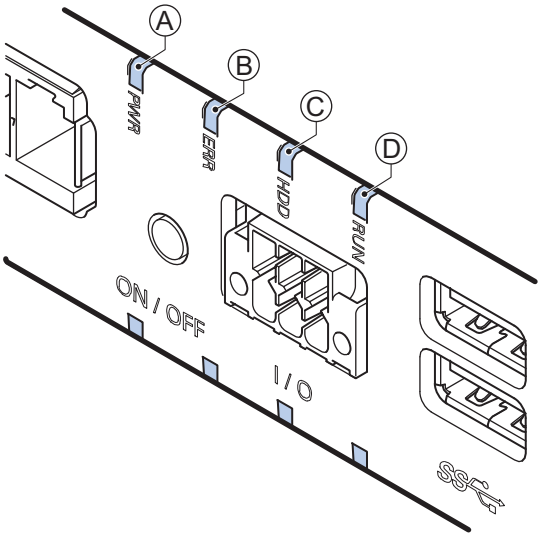
Item	Name	Description
A	Drive bays *1	Two 2.5 inch drive bays for HDD/SSD storage devices: • Drive bay A = Bay for an optional drive *2 for the operating system and main storage. Drive bay A is the bay at the side of the base layer. • Drive bay B = Bay for an optional drive *2 for additional storage. Drive bay B is the bay at the opposite side of the base layer.
B	PCIe bay	PCI Express mounting slot
C	PCIe drawer	Mounting location for the PCIe Card

*1. Depending on the model one or two drives are supported.
Refer to *4-1-5 CPU Specifications* on page 4 - 7 for the number of supported drives.

*2. Installed storage and the operating system are depending on the configuration.
Refer to *1-4 Product Configuration* on page 1 - 5 for:
- installed drive (storage) details
- operating system details

2-2 LED Indicators

The Industrial Box PC has LED indicators located at the base layer. These LED indicators provide the current operating status of the Box PC.
Models with an Expansion layer have a second row with four LED indicators that have the same function.
The following LED indicators are available:



Item	LED Indicator	Name	Description
A	PWR	Power	Indicates the operating mode of the 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. *1

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

2-2-1 PWR LED Indicator

The Power LED (PWR) indicates the operating mode of the 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 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 undervoltage error • Power Supply overvoltage error • Power supply defective

Additional Information

- Refer to *7-2 Corrective Maintenance* on page 7 - 4 for actions to solve errors.
- For a Box PC with a Windows operating system the status of this LED can be defined by users using the Industrial PC System API.
  Refer to NY-series Industrial Box PC User's Manual (Cat. No. W553) for Industrial PC System API details.

2-2-3 HDD LED Indicator

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

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

2-2-4 RUN LED Indicator

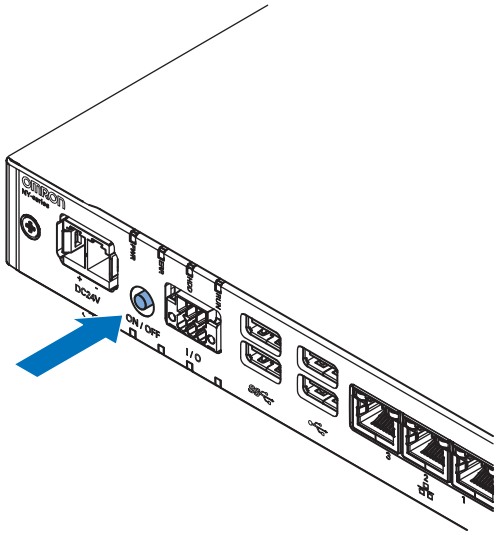
The RUN LED has no functionality and will not be lit.

Additional Information

For a Box PC with a Windows operating system the status of this LED can be defined using the Industrial PC System API.
Refer to NY-series Industrial Box PC User's Manual (Cat. No. W553) for Industrial PC System API details.

2-3 Power Button

The power button is located at the base layer.
The power button is used to manually switch the Box PC ON and OFF.



Additional Information

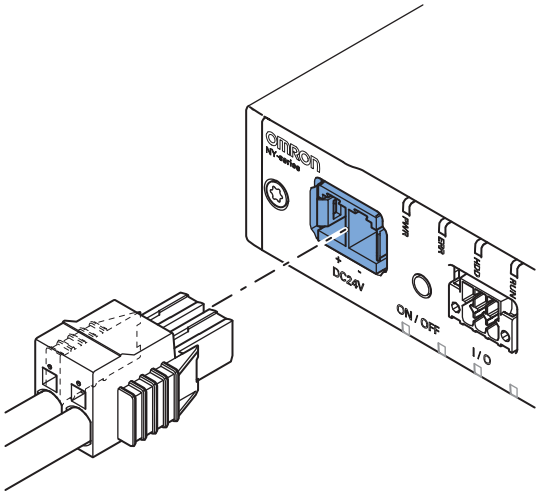
- Refer to *6-1 Power ON* on page 6 - 2 for ON details.
- Refer to *6-2 Power OFF* on page 6 - 3 for OFF details.

2-4 Connectors

This section gives an overview of the connectors located at the base layer of the Box PC Without Operating System.

2-4-1 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

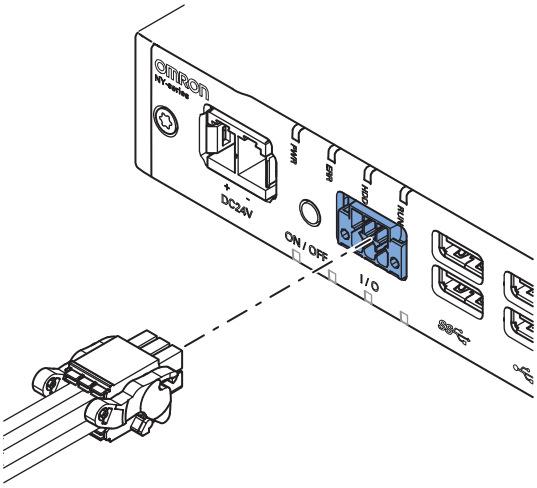
- Refer to *4-2-1 Power Connector Specifications* on page 4 - 18 for specifications.
- Refer to *5-4-3 Wire the Power Connector* on page 5 - 36 for wiring details.
- Refer to *5-5 Connect* on page 5 - 42 for connection details.

2-4-2 I/O Connector

The I/O connector on the Box PC Without Operating System 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.

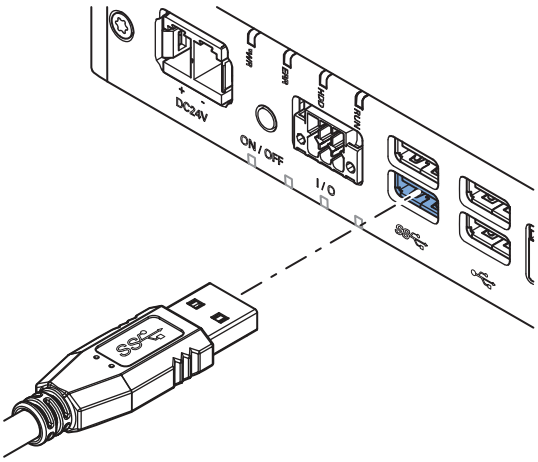


Additional Information

- Refer to *4-2-2 I/O Connector Specifications* on page 4 - 19 for specifications.
- Refer to *5-4-4 Wire the I/O Connector* on page 5 - 39 for wiring details.
- Refer to *5-5 Connect* on page 5 - 42 for connection details.

2-4-3 USB Connectors

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

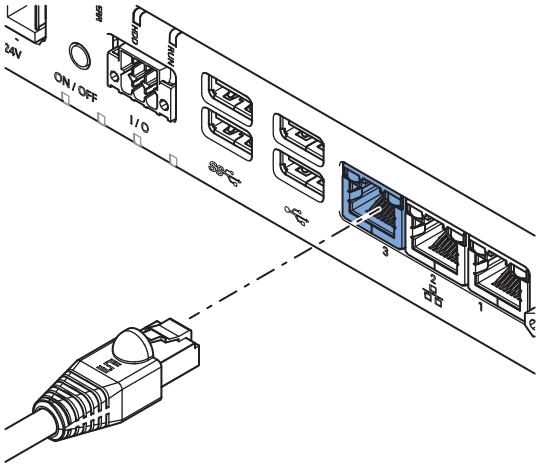


Additional Information

- Refer to *4-2-3 USB Connector Specifications* on page 4 - 23 for specifications.
- Refer to *5-5 Connect* on page 5 - 42 for connection details.

2-4-4 Ethernet Connectors

The Ethernet connectors provide 3 individual Ethernet ports on the Box PC Without Operating System. Each port offers 10BASE-T/100BASE-TX/1000BASE-T Ethernet speeds.

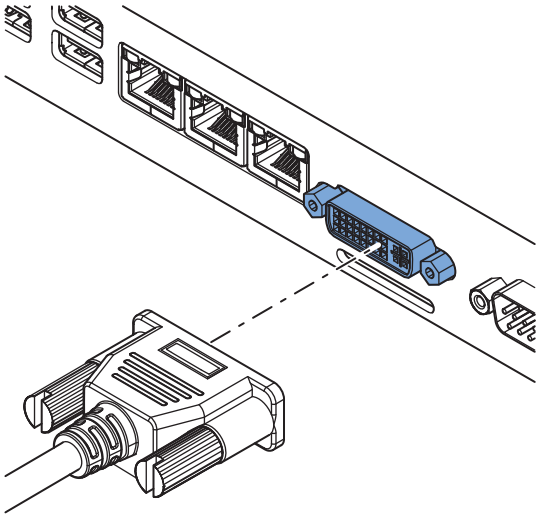


Additional Information

- Refer to *4-2-4 Ethernet Connector Specifications* on page 4 - 24 for specifications.
- Refer to *5-5 Connect* on page 5 - 42 for connection details.

2-4-5 DVI Connector

The DVI interfaces supported on this connector are dependent on the configuration of the Box PC Without Operating System.

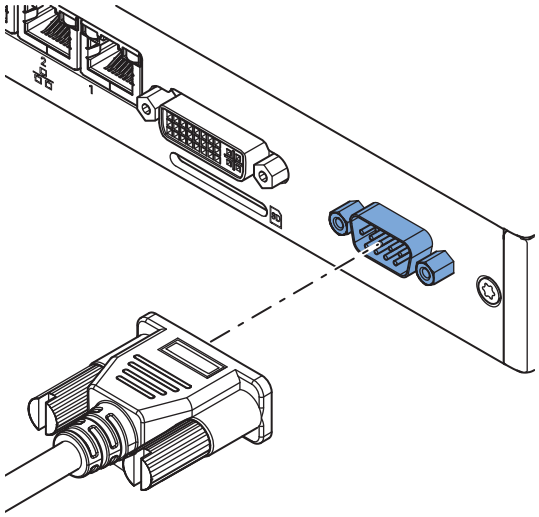


Additional Information

- Refer to *1-4 Product Configuration* on page 1 - 5 for configuration details.
- Refer to *4-2-5 DVI Connector Specifications* on page 4 - 26 for specifications.
- Refer to *5-5 Connect* on page 5 - 42 for connection details.

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

Depending on the product configuration an optional RS-232C connector is available.

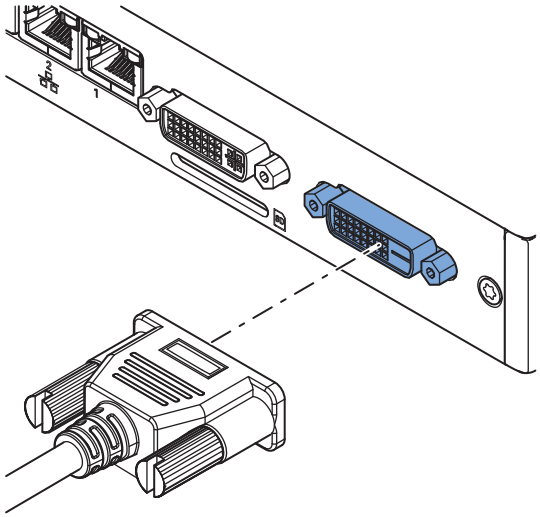


Additional Information

- Refer to *1-4 Product Configuration* on page 1 - 5 for configuration details.
- Refer to *4-2-7 RS-232C Connector Specifications* on page 4 - 28 for specifications.
- Refer to *5-5 Connect* on page 5 - 42 for connection details.

2-4-7 DVI-D Connector (Optional)

Depending on the product configuration an optional DVI-D connector is available. This interface only supports digital video signals.

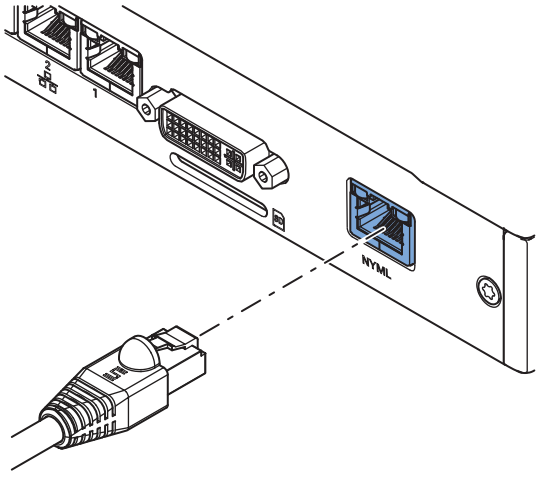


Additional Information

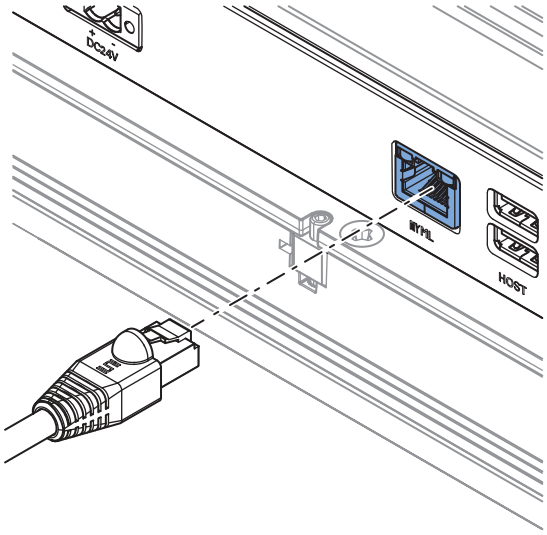
- Refer to *1-4 Product Configuration* on page 1 - 5 for configuration details.
- Refer to *4-2-6 DVI-D Connector Specifications* on page 4 - 27 for specifications.
- Refer to *5-5 Connect* on page 5 - 42 for connection details.

2-4-8 NY Monitor Link Connector (Optional)

Depending on the product configuration an optional NY Monitor Link connector is available.
The NY Monitor Link interface connector connects an OMRON Industrial PC to the OMRON Industrial Monitor.



Industrial PC



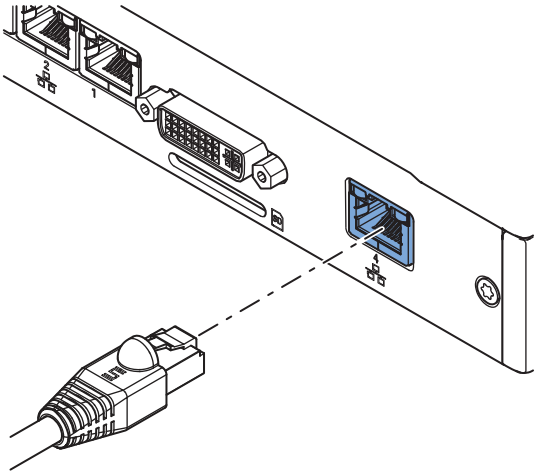
Industrial Monitor

Additional Information

- Refer to *1-4 Product Configuration* on page 1 - 5 for configuration details.
- Refer to *4-2-8 NY Monitor Link Connector Specifications* on page 4 - 28 for specifications.
- Refer to *5-5 Connect* on page 5 - 42 for connection details.

2-4-9 Ethernet Connector (Optional)

Depending on the product configuration an optional Ethernet connector is available.
The port offers 10BASE-T/100BASE-TX/1000BASE-T Ethernet speeds.



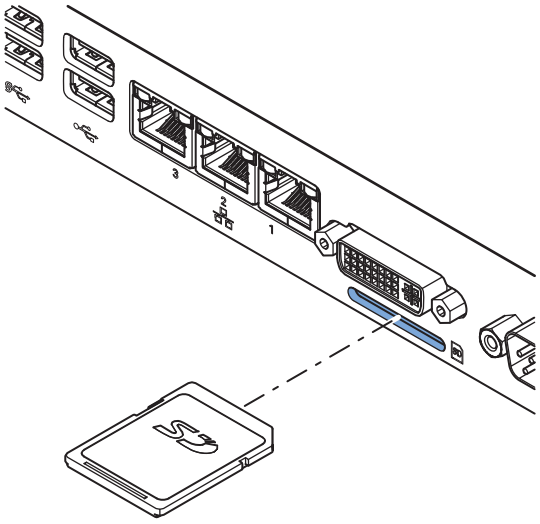
Additional Information

- Refer to *1-4 Product Configuration* on page 1 - 5 for configuration details.
- Refer to *4-2-9 Ethernet Connector Specifications* on page 4 - 30 for specifications.
- Refer to *5-5 Connect* on page 5 - 42 for connection details.

2-5 SD Memory Card Slot

The SD Memory Card slot is located at the base layer.
The SD Memory Card slot on the Box PC Without Operating System accepts SD Memory Cards with the following specifications.

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

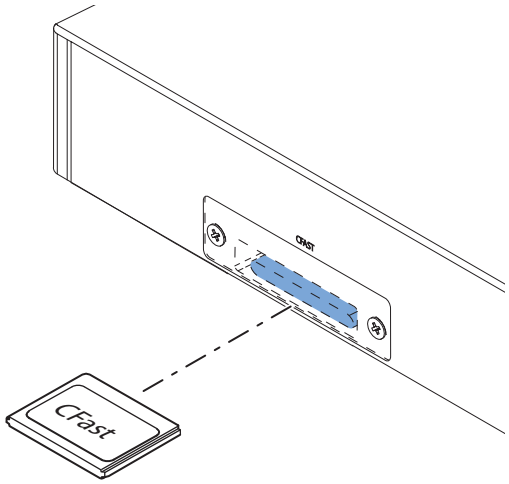


Additional Information

Refer to *2-10-2 SD Memory Cards* on page 2 - 23 for SD Memory Card details.

2-6 CFast Card Slot (Optional)

Depending on the product configuration an optional CFast Card slot is located at the rear side of the base layer.
The CFast Card slot accepts CFast Cards that comply with the CFast 2.0 specification.

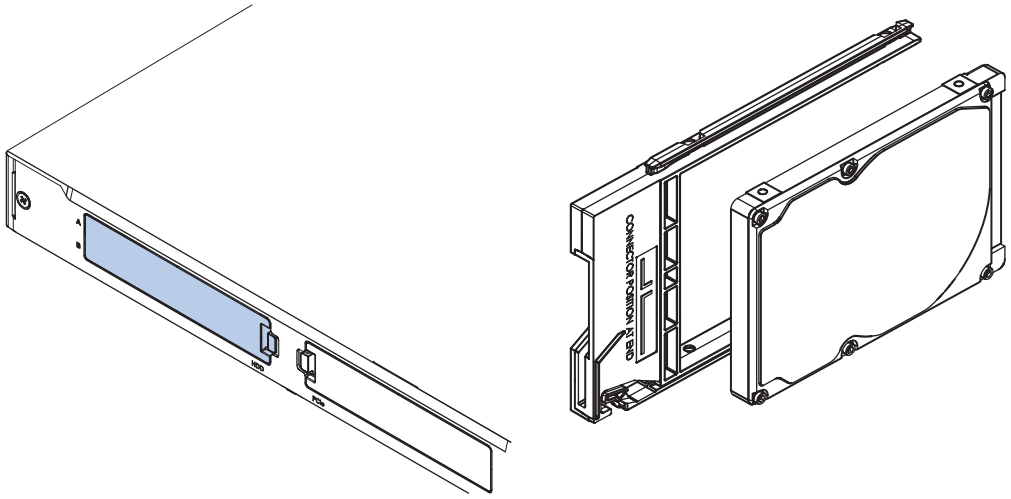


Additional Information

Refer to *2-10-4 CFast Cards* on page 2 - 24 for details.

2-7 Drive Bays

The drive bays are located in the expansion layer.
The drive bays in the Box PC Without Operating System accept 2.5 inch Hard Disk Drives (HDD) or Solid State Drives (SSD). Depending on the model one or two drives are supported.



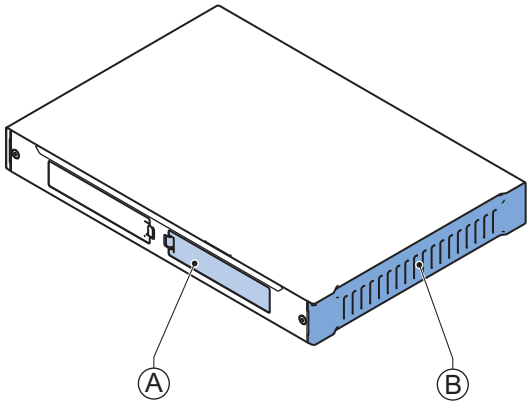
Additional Information

- Refer to *4-1-5 CPU Specifications* on page 4 - 7 for the number of supported drives.
- Refer to *4-1-7 Storage Device Specifications* on page 4 - 11 for storage device specifications.
- Refer to *5-2-1 Install a Drive* on page 5 - 5 for install information.
- Refer to *7-2-5 Replace a Drive* on page 7 - 10 for maintenance information.

2-8 PCIe Card Slot

The PCI Express (PCIe) Card slot is located in the expansion layer.
The PCI Express (PCIe) Card slot of the Box PC Without Operating System 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 *4-1-8 PCIe Card Specifications* on page 4 - 14 for specifications.
- Refer to *5-2-2 Install the PCIe Card* on page 5 - 9 for install information.
- Refer to *7-2-6 Replace the PCIe Card* on page 7 - 15 for maintenance information.

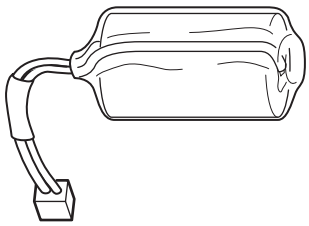
2-9 Spare Parts

The following spare parts for the Box PC Without Operating System are available.

2-9-1 Battery

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

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

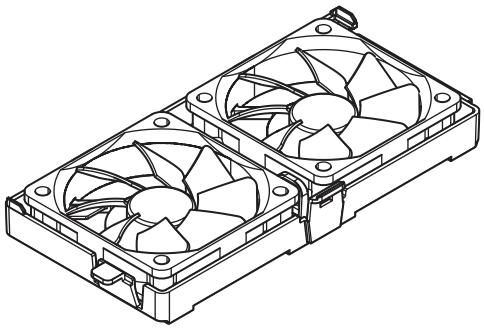
Model	Appearance	Specifications
CJ1W-BAT01		Service life: 5 years at 25°C

Additional Information

Refer to *7-2-4 Replace the Battery* on page 7 - 8 for the replacement procedure.

2-9-2 Fan Unit

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

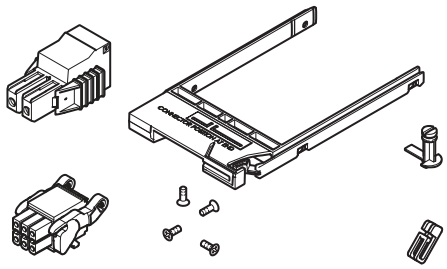
Model	Appearance	Specifications
NY000-AF00		• Service life: 70,000 hours of continuous operation at 40°C with 15% to 65% relative humidity • Shelf life: 6 months This is the storage limitation with no power supplied. We highly recommend performance testing if the Fan Unit has been stored over 6 months.

Additional Information

Refer to *7-2-3 Replace the Fan Unit* on page 7 - 6 for the replacement procedure.

2-9-3 Accessory Kit

The accessory kit for the Box PC.

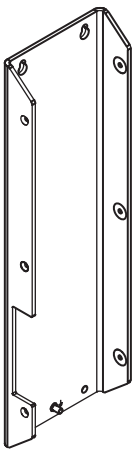
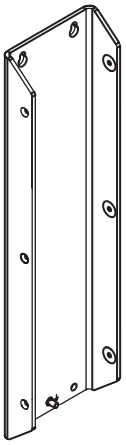
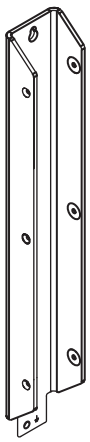
Model	Appearance	Specifications
NY000-AK00		Accessory Kit containing all accessories supplied with the Box PC. • Power connector • I/O connector • Drive bracket for drive installation • 4 mounting screws for drive installation • PCIe Card support for PCIe Card installation • PCIe Card clip for PCIe Card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

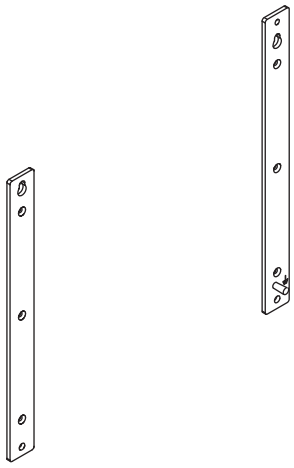
2-10 Optional Hardware

The following optional hardware is available for the Box PC Without Operating System.

2-10-1 Mounting Brackets

Mounting brackets details are provided below.

Model	Appearance	Bracket type
NY000-AB00		Book mount For Model ID: • NY51□-□□□□-1 • NYB25-□1 • NYB17-□1 • NYB1E-□1 • NYB1C-□1 Model description: • with an expansion layer • with a cooling layer with a re-movable cover
NY000-AB02		Book mount For Model ID: • NYB35-□1 • NYB2C-□1 Model description: • with an expansion layer • with a cooling layer with a non-removable cover
NY000-AB04		Book mount For Model ID: • NYB35-□0 • NYB2C-□0 Model description: • without an expansion layer • with a cooling layer with a non-removable cover

Model	Appearance	Bracket type
NY000-AB01		Wall mount For all Industrial Box PCs

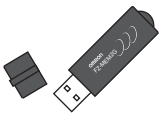
2-10-2 SD Memory Cards

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

2-10-3 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

2-10-4 CFast Cards

CFast Card details are provided below.

OMRON is not responsible for the operation, performance, or write life of any other CFast Card.

Model	Appearance	Storage type	Capacity	Details
NY000-AT00		CFast Card	64 GB	Innodisk DECFA-64GM41BW1DC
NY000-AT01			128 GB	Innodisk DECFA-A28M41BW1DC
NY000-AT02			256 GB	Innodisk DECFA-B56M41BW1DC

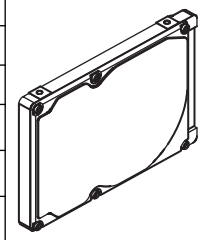
Additional Information

Refer to *CFast Card Specifications* on page 4 - 13 for CFast Card specifications.

2-10-5 HDD and SSD Storage Devices

HDD and SSD storage devices can only be installed in models with an Expansion Layer. The model ID is NY□□□-□1

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

Model	Appearance	Storage type	Capacity	Details
NY000-AH00		HDD	320 GB	Toshiba MQ01ABF032
NY000-AH01			500 GB	Toshiba MQ01ABF050
NY000-AH02			1 TB	HGST HTS541010B7E610
NY000-AS00		SSD SLC	32 GB	Apacer APS25AB7032G-AT
NY000-AS01 *1			64 GB	Apacer APS25AB7064G-AT
NY000-AS03 *2				Hagiwara HFD25S-064GD(A23AE)-HC
NY000-AS02 *1		SSD iMLC	128 GB	Apacer APS25H12128G-GTM1
NY000-AS04 *2				Innodisk DES25-A28M41BC1DC
NY000-AS05			500 GB	Innodisk DES25-C12D08BC1QC

*1. Default for Box PC models: NY□25-□1, NY□17-□1 and NY□1C-□1
*2. Default for Box PC models: NY□35-□1, NY□2C-□1 and NY□1E-□1

Additional Information

Refer to *4-1-7 Storage Device Specifications* on page 4 - 11 for storage device specifications.

Storage Device Considerations

For a storage device that is not an OMRON NY000-A□□□ consider the following:

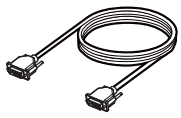
- OMRON is not responsible for the operation, performance or write life of any storage device other than those supplied by OMRON.
- Test and measure the environmental performance of the intended storage device before actual operation, using the SMART monitoring feature of the selected storage device.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

Additional Information

- Refer to *4-1-7 Storage Device Specifications* on page 4 - 11 for storage device specifications.
- Refer to *4-3-1 Operation Environment Specifications* on page 4 - 31 for environment specifications, specifically temperature and vibration specifications.

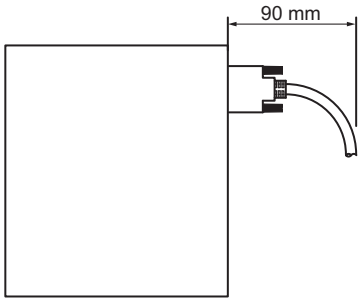
2-10-6 DVI Cables

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.



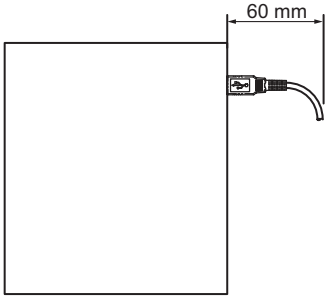
2-10-7 USB Type-A to USB Type-B Cables

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.



2-10-8 NY Monitor Link Cables

The following table lists the recommended cables and connectors for the NY Monitor Link cable applications.

Item		Intra cabinet or light industrial environment	Inter cabinet	Inter cabinet and harsh industrial environment
Maximum length		25 m	100 m	100 m
Manufacturer		Lapp	Lapp	Lapp
Cable type		2170196	2170614	2170466
Category type		Cat 6A	Cat 7	Cat 6A
Cable sheath		Halogen free	Halogen free	Halogen free
Conductor pairs/size/type		4 x 2 x AWG23/1	4 x 2 x AWG23/1	4 x 2 x AWG22/1
Overall shielding		Aluminum foil	Copper braid	Copper braid
Pair shielding		Aluminum foil	Aluminum foil	Aluminum foil
Maximum outer diameter		7.6 mm	7.7 mm	9.0 mm
Maximum bending radius of cable in a fixed position		31 mm	31 mm	90 mm
Maximum temperature for a cable in a fixed position		60°C	60°C	80°C
RJ45 connectors	Manufacturer	Stewart Connector	Stewart Connector	Lapp
	Partnumber	SS39200-027 or SS39200-030	SS39200-027 or SS39200-030	21700600 (T568A) or 21700601 (T568B)
	Connector length	30 mm	30 mm	50 mm

Additional Information

When making cables, connect the shield to the connectors at both ends.

NY Monitor Link Cable Clearance

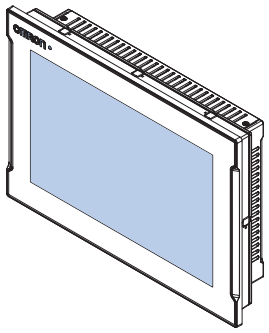
The NY Monitor Link cable requires a minimum clearance from the connector entry to prevent excessive strain on the connector and cable assembly.

The minimum clearance consists of the sum of:

- Connector length
- Maximum bending radius of cable in a fixed position

2-10-9 Industrial Monitor

Details for the recommended monitor are provided below.
OMRON is not responsible for the operation or performance of any other monitor.

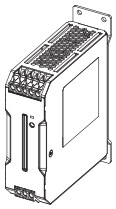
Model	Appearance	Specifications
NYM15W-C100□ NYM15W-C106□ NYM12W-C100□ NYM12W-C106□		• LCD touchscreen • Multi-touch functionality • Supply voltage: 24 VDC • Up to 1,280 x 800 pixels at 60 Hz • 2 USB Type-A Connectors • Programmable brightness control

Additional Information

Refer to the OMRON website for specifications and manuals.

2-10-10 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.

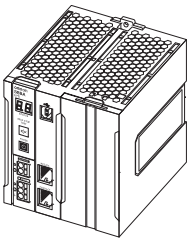
Model	Appearance	Specifications
S8VK-G□□□24		Output voltage: 24 VDC

Additional Information

- Refer to *4-1-3 Power Consumption Specifications* on page 4 - 5 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.

2-10-11 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

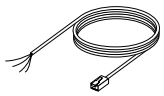
Use an Omron S8BA UPS with the correct revision number to prevent improper system shutdown.

Additional Information

- Refer to *2-10-10 Power Supply* on page 2 - 28 for power supply details.
- Refer to *4-1-3 Power Consumption Specifications* on page 4 - 5 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.

2-10-12 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 Box PC Without Operating System.

3-1 Compatible Operating Systems

The operating system installed on the Box PC must be:

- compatible with the Advanced Configuration and Power Interface (ACPI) protocol
- installed on the storage device in drive bay A

Compatible operating systems for the Box PC are:

- Windows 7, only for 4th generation CPUs
- Windows 10
- Wind River Linux 7 (64bit)
- Wind River VxWorks 7 (64bit)
- Linux Ubuntu LTS 14.04 (64Bit)

Additional Information

Install applicable hardware drivers and support software to access all features of the Box PC.

- Refer to *5-7-1 Drivers and Custom Software* on page 5 - 47 for driver details.
- Refer to *3-2 Support Software* on page 3 - 3 for software details.

3-2 Support Software

This section provides an overview of the support software available for your Box PC Without Operating System.

3-2-1 Overview IPC Support Software for Windows

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

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

*1. Included in the Industrial Monitor Utility installer
*2. Included in the Industrial PC Support Utility installer

Select and download the utilities required from the OMRON website.

Additional Information

- An internet connection is required to install support software.
- Refer to the User Manual of the product for software utility details.

3-2-2 Overview IPC Developer Software for Windows

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

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 SDK software from the OMRON website.

4

Specifications

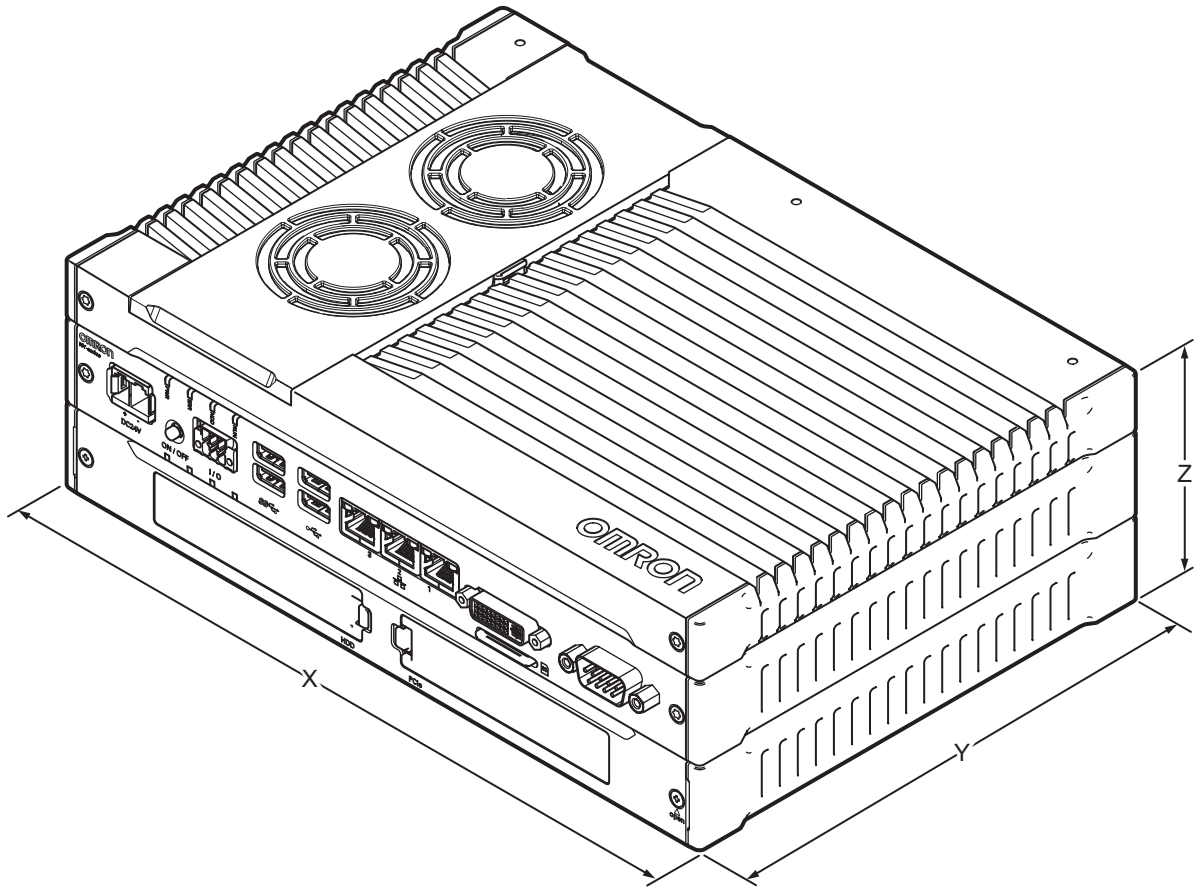
This section provides specifications of the Box PC Without Operating System.

4-1 General Specifications

This section provides general specifications of the Box PC Without Operating System.

4-1-1 Dimensions and Weight

The following table provides specification details on dimensions and weights.



Model			Specifications			
Model ID *1 *2	Model details	Mount details	Width X	Depth Y *3	Height Z	Weight
• NY512 -□□□□-1 • NYB25-□1 • NYB17-□1 • NYB1E-□1 • NYB1C-□1	• With Expansion layer • With Cooling layer with re-movable cover	Not mounted	282 mm	200 mm	89 mm	3.8 kg
		Book mount	319 mm *4	211 mm	96 mm *4	4.2 kg
		Wall mount	282 mm	245 mm *4	92 mm	3.9 kg
• NYB35-□1 • NYB2C-□1	• With Expansion layer • With Cooling layer with non-removable cover	Not mounted	282 mm	200 mm	73 mm	3.0 kg
		Book mount	319 mm *4	211 mm	80 mm *4	3.3 kg
		Wall mount	282 mm	245 mm *4	76 mm	3.1 kg

Model			Specifications			
Model ID *1 *2	Model details	Mount details	Width X	Depth Y *3	Height Z	Weight
• NYB35-□0 • NYB2C-□0	• Without Expansion layer • With Cooling layer with non-removable cover	Not mounted	282 mm	200 mm	41 mm	2.1 kg
		Book mount	319 mm *4	211 mm	47 mm *4	2.3 kg
		Wall mount	282 mm	245 mm *4	44 mm	2.2 kg

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

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

*3. This includes the 5 mm of the protruding DVI connector.

*4. This is the mounting bracket dimension.

4-1-2 General Electrical Specifications

The following table provides the general electrical specifications.

Item	Specifications
Rated power supply voltage	24 VDC
Allowable power supply voltage range	20.4 to 28.8 VDC
Power supply standard	SELV
Grounding method	Ground to less than 100 Ω
Inrush current	At 24 VDC: 12 A / 6 ms max. for cold start at room temperature
Overvoltage category	JIS B3502 and IEC 61131-2: Category II
EMC immunity level	IEC 61131-2: Zone B
RTC accuracy	At ambient temperature of 55°C: −3.5 to +0.5 min error per month At ambient temperature of 25°C: −1.5 to +1.5 min error per month At ambient temperature of 0°C: −3 to +1 min error per month
Power button life	100,000 operations
Fan life	Only for models with active cooling: 8 years of continuous operation at 40°C. Refer to *1-4 Product Configuration* on page 1 - 5 for details.
Battery life	Refer to *2-9-1 Battery* on page 2 - 20 for details.

4-1-3 Power Consumption Specifications

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

An overview of the components and their power consumption.

Item		Power consumption
Box PC Without Operating System *1	NY512-□□□□-1	81 W
	NYB35-□1	46 W
	NYB35-□0	46 W
	NYB25-□1	52 W
	NYB2C-□1	27 W
	NYB2C-□0	27 W
	NYB17-□1	81 W
	NYB1E-□1	86 W
	NYB1C-□1	45 W
Drive *1	Bay A	Refer to *4-1-7 Storage Device Specifications* on page 4 - 11 for Omron drive details. For other drives refer to the applicable specifications for maximum power consumption details.
	Bay B	
	CFast	
Expansions	USB	Refer to the power consumption specifications of your connected USB devices. Refer to *4-2-3 USB Connector Specifications* on page 4 - 23 for maximum power consumption details.
	PCIe	Refer to the power consumption specifications of the installed PCIe Card. Refer to *4-1-8 PCIe Card Specifications* on page 4 - 14 for maximum power consumption details.

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

Calculation for the total power consumption of the Box PC:

Box PC Without Operating System with my specific CPU ….....….. W

Depending on the configuration:

- Drive in bay A ….....….. W
- Drive in bay B ….....….. W
- Drive in CFast slot ….....….. W
- Expansion USB ….....….. W
- Expansion PCIe ….....….. W +

Total power consumption ….....….. W

Additional Information

Ensure to use a power supply with sufficient capacity.
Refer to *4-1-4 Power Supply Specifications* on page 4 - 6 for details.

4-1-4 Power Supply Specifications

The minimum power supply requirements depend on the maximum power consumption of the Box PC. Refer to *4-1-3 Power Consumption Specifications* on page 4 - 5 for details.

With a UPS installed the minimum power requirements are:

Model	Minimum power requirements	
	Power supply *1	UPS *2
• NY□35 • NY□25 • NY□2C • NY□1C	120 W	120 W
• NY5□2 • NY□1E • NY□17	240 W	240 W

*1. Refer to *2-10-10 Power Supply* on page 2 - 28 for power supply products.

*2. Refer to *2-10-11 UPS* on page 2 - 29 for UPS products.

4-1-5 CPU Specifications

This section gives the specifications of the CPUs that are available for the Box PC Without Operating System.
Refer to *1-4 Product Configuration* on page 1 - 5 for product configuration details.

Intel® Core™ i5-7300U CPU Specifications

CPU specifications for an Intel® Core™ i5-7300U CPU.

Item	Specifications
Cores / Threads	2 / 4
CPU base frequency	2.6 GHz
Maximum turbo frequency	3.5 GHz
Cache	3 MB
Cooling details	Passive cooling (fanless)
Drive bays (HDD/SSD)	2
Graphics controller	Intel ® HD Graphics 620. Up to two independent screens.

Intel® Core™ i5-4300U CPU Specifications

CPU specifications for 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 bays (HDD/SSD)	2
Graphics controller	Intel ® HD Graphics 4400. Up to two independent screens.

Intel® Celeron® 3965U CPU Specifications

CPU specifications for an Intel® Celeron® 3965U CPU.

Item	Specifications
Cores / Threads	2 / 2
CPU base frequency	2.2 GHz
Maximum turbo frequency	---
Cache	2 MB
Cooling details	Passive cooling (fanless)
Drive bays (HDD/SSD)	2
Graphics controller	Intel ® HD Graphics 610. Up to two independent screens.

Intel® Core™ i7-4700EQ CPU Specifications

CPU specifications for 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 bays (HDD/SSD)	2
Graphics controller	Intel ® HD Graphics 4600. Up to two independent screens.

Intel® Xeon® E3-1515M v5 CPU Specifications

CPU specifications for an Intel® Xeon® E3-1515M v5 CPU.

Item	Specifications
Cores / Threads	4 / 8
CPU base frequency	2.8 GHz
Maximum turbo frequency	3.7 GHz
Cache	8 MB
Cooling details	Requires active cooling (fan)
Drive bays (HDD/SSD)	2
Graphics controller	Intel® Iris™ Pro Graphics P580. Up to two independent screens.

Intel® Celeron® 2980U CPU Specifications

CPU specifications for 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 bays (HDD/SSD)	1. Drive bay A.
Graphics controller	Intel ® HD Graphics. Up to two independent screens.

4-1-6 Memory Specifications

The type of memory depends on the product configuration.

Model	Memory type
NY□1E	DDR4 • Refer to *DDR4 ECC* on page 4 - 9 for details. • Refer to *DDR4 Non-ECC* on page 4 - 9 for details.
• NY□35 • NY□2C	DDR4 Refer to *DDR4 Non-ECC* on page 4 - 9 for details.
• NY□17 • NY□25 • NY□1C	DDR3L Refer to *DDR3L Non-ECC* on page 4 - 10 for details.

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.

DDR4 ECC

The following table provides specification details of the DDR4 memory.

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

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

*2. Actual speed depends on the CPU type.

DDR4 Non-ECC

The following table provides specification details of the DDR4 memory.

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

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

*2. Actual speed depends on the CPU type.

DDR3L Non-ECC

The following table provides specification details of the DDR3L memory.

Item		Model Specifications *1			
		2 GB	4 GB	8 GB	16 GB
Memory configuration		1 x 2 GB	1 x 4 GB	2 x 4 GB	2 x 8 GB
Memory type		DDR3L Non-ECC			
Package memory format		SO-DIMM			
Serial Presence Detect (SPD)	Speed grade	1600 MT/s			
	CAS Latency	CL11			

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

4-1-7 Storage Device Specifications

This section provides the specifications of the storage devices.

Hard Disk Drive Specifications

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

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

*1. Refer to *1-4 Product Configuration* on page 1 - 5 for product configuration details.
*2. Refer to *2-10-5 HDD and SSD Storage Devices* on page 2 - 25 for brand details.
*3. Refer to *4-3-1 Operation Environment Specifications* on page 4 - 31 for the temperature specifications of the complete Box PC
*4. Powered-ON hours include sleep and standby modes.
*5. Operation includes seeking, writing, and reading functions.

Solid State Drive Specifications

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

Item	Model Specifications					
	32 GB *1	64 GB *1		128 GB *1		500 GB *1
Model *2	NY000-AS00	NY000-AS01	NY000-AS03	NY000-AS02	NY000-AS04	NY000-AS05
Type	SLC			iMLC		
Max. power consumption	1.4 W	1.4 W	2.5 W	1.6 W	0.8 W	2.7 W
S.M.A.R.T. support	Yes					
Interface	Serial ATA 3.1					
Max. sequential read speed	160 MB/s	160 MB/s	500 MB/s	430 MB/s	530 MB/s	415 MB/s
Max. sequential write speed	145 MB/s	150 MB/s	370 MB/s	170 MB/s	190 MB/s	200 MB/s
Operating temperature	0 to 70°C *3					
Max. operating humidity (with no condensation)	10% to 95%	10% to 95%	10% to 85%	10% to 95%	10% to 95%	10% to 95%
Storage temperature	-40 to 100°C	-40 to 100°C	-45 to 90°C	-40 to 85°C	-55 to 95°C	-55 to 95°C
Max. storage humidity (with no condensation)	10% to 95%					
Endurance	749 TBW	1497 TBW	1900 TBW	114 TBW	208 TBW	154 TBW

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

*2. Refer to *2-10-5 HDD and SSD Storage Devices* on page 2 - 25 for brand details.

*3. Refer to *4-3-1 Operation Environment Specifications* on page 4 - 31 for the temperature specifications of the complete Box PC.

CFast Card Specifications

Specifications for the CFast Drive are provided in the table below.

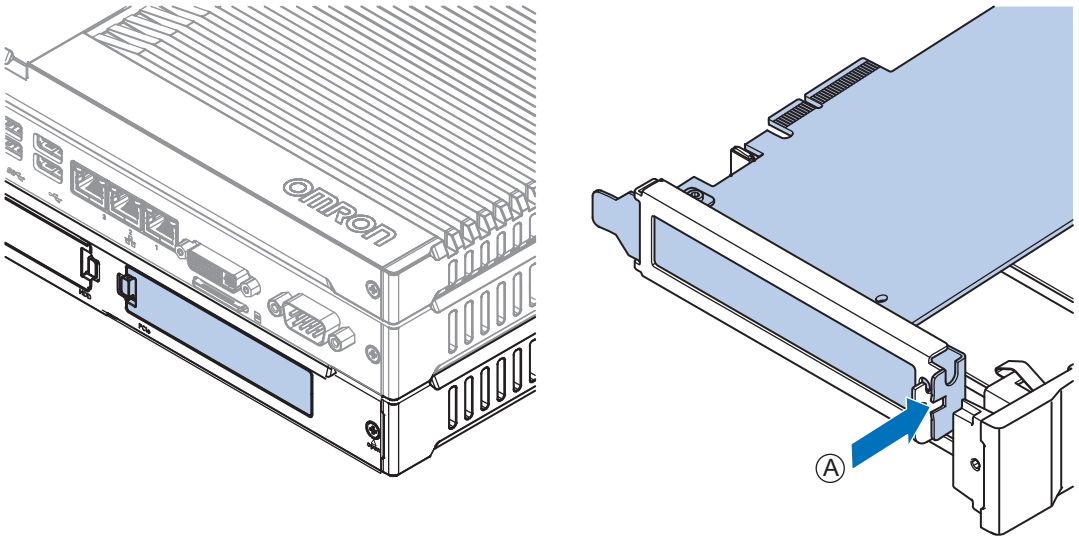
Item	Model Specifications		
	64 GB *1	128 GB *1	256 GB *1
Model *2	NY000-AT00	NY000-AT01	NY000-AT02
User capacity	61 GB	122 GB	244 GB
Type	iMLC		
Max. power consumption	0.9 W		
Max. sequential read speed	530 MB/s		
Max. sequential write speed	100 MB/s	190 MB/s	210 MB/s
Operating temperature	-40 to 85°C *3		
Max. operating humidity (with no condensation)	10% to 95%		
Storage temperature	-55 to 95°C		
Max. storage humidity (with no condensation)	10% to 95%		
Endurance	125 TBW	208 TBW	417 TBW

*1. Refer to *1-4 Product Configuration* on page 1 - 5 for product configuration details.
*2. Refer to *2-10-4 CFast Cards* on page 2 - 24 for brand details.
*3. Refer to *4-3-1 Operation Environment Specifications* on page 4 - 31 for the temperature specifications of the complete Box PC.

4-1-8 PCIe Card Specifications

The PCI Express (PCIe) Card slot of the Box PC Without Operating System accepts various cards for specific hardware needs.

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



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

Additional Information

- Refer to *1-4 Product Configuration* on page 1 - 5 for product configuration details.
- Refer to *PCIe Card Slot Specifications for NY□35-□1* on page 4 - 14 for details.
- Refer to *PCIe Card Slot Specifications for NY□25-□1* on page 4 - 15 for details.
- Refer to *PCIe Card Slot Specifications for NY□2C-□1* on page 4 - 15 for details.
- Refer to *PCIe Card Slot Specifications for NY□17-□1* on page 4 - 15 for details.
- Refer to *PCIe Card Slot Specifications for NY□1E-□1* on page 4 - 16 for details.
- Refer to *PCIe Card Slot Specifications for NY□1C-□1* on page 4 - 16 for details.

PCIe Card Slot Specifications for NY□35-□1

The table below provides PCIe Card slot details for Box PC Without Operating Systems with an Intel® Core™ i5-7300U CPU.

Item	Specifications
Configuration	X2 (2 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	5 W max.
Maximum current	1.5 A with 3.3 VDC, 0.5 A with 12 VDC

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

PCIe Card Slot Specifications for NY□25-□1

The table below provides PCIe Card slot details for Box PC Without Operating Systems 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	5 W max.
Maximum current	1.5 A with 3.3 VDC, 0.5 A with 12 VDC

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

PCIe Card Slot Specifications for NY□2C-□1

The table below provides PCIe Card slot details for Box PC Without Operating Systems with an Intel® Celeron® 3965U CPU.

Item	Specifications
Configuration	X2 (2 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	5 W max.
Maximum current	1.5 A with 3.3 VDC, 0.5 A with 12 VDC

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

PCIe Card Slot Specifications for NY□17-□1

The table below provides PCIe Card slot details for Box PC Without Operating Systems 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	15 W max.
Maximum current	3 A with 3.3 VDC, 1.25 A with 12 VDC

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

PCIe Card Slot Specifications for NY□1E-□1

The table below provides PCIe Card slot details for Box PC Without Operating Systems with an Intel® Xeon® E3-1515M v5 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	15 W max.
Maximum current	3 A with 3.3 VC, 1.25 A with 12 VDC

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

PCIe Card Slot Specifications for NY□1C-□1

The table below provides PCIe Card slot details for Box PC Without Operating Systems 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	5 W max.
Maximum current	1.5 A with 3.3 VDC, 0.5 A with 12 VDC

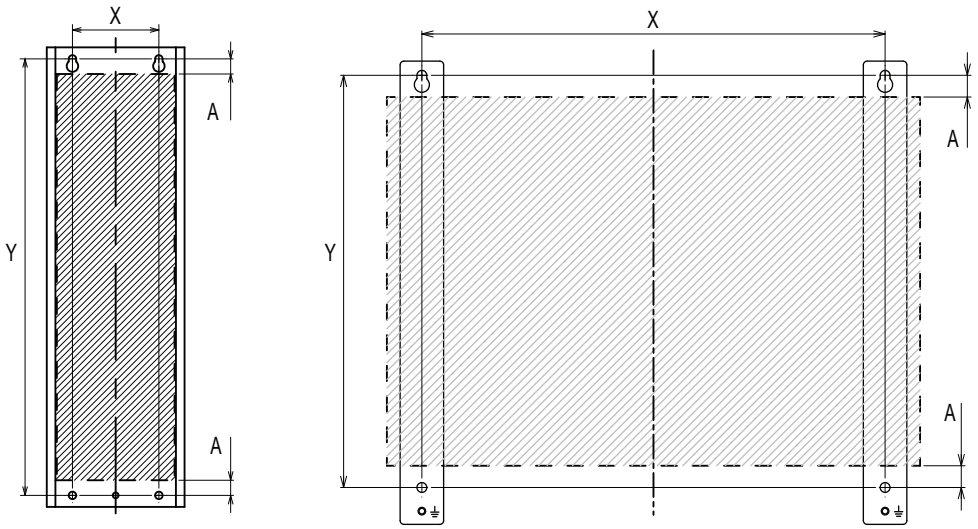
*1. Low profile cards, 2.536 inches (64.4 mm) are not supported.

4-1-9 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:



Model			Drill Specifications			Product Dimensions	
Model ID *1 *2	Model details	Mount details	Hole Distance X	Hole Distance Y	Distance A	Bracket Width	Bracket Height
• NY512 -□□□□-1 • NYB25-□1 • NYB17-□1 • NYB1E-□1 • NYB1C-□1	• With Expansion layer • With Cooling layer with removable cover	Book mount NY000-AB00	60 mm	303 mm	11 mm	96 mm	319 mm
		Wall mount NY000-AB01	245 mm	218 mm	12 mm	23 mm	245 mm
• NYB35-□1 • NYB2C-□1	• With Expansion layer • With Cooling layer with non-removable cover	Book mount NY000-AB02	50 mm	303 mm	11 mm	80 mm	319 mm
		Wall mount NY000-AB01	245 mm	218 mm	12 mm	23 mm	245 mm
• NYB35-□0 • NYB2C-□0	• Without Expansion layer • With Cooling layer with non-removable cover	Book mount NY000-AB04	n.a.	298 mm	11 mm	47 mm	319 mm
		Wall mount NY000-AB01	245 mm	218 mm	12 mm	23 mm	245 mm

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

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

Additional Information

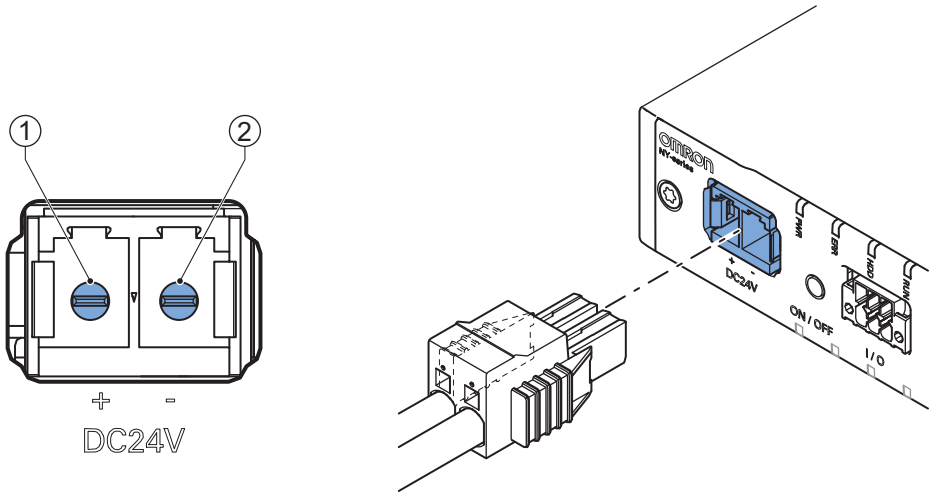
- Refer to *5-3-8 Book Mount Procedure* on page 5 - 26 for book mount details.
- Refer to *5-3-9 Wall Mount Procedure* on page 5 - 27 for wall mount details.

4-2 Connector Specifications

This section provides the Connector Specifications of the Box PC Without Operating System.

4-2-1 Power Connector Specifications

The power supply connector is locked when inserted to prevent unintentional disconnection.
The connector can only be inserted the correct way.
The connector is a Phoenix Contact type SPC5/2-STCL-7.62 BK (1711708).
The 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

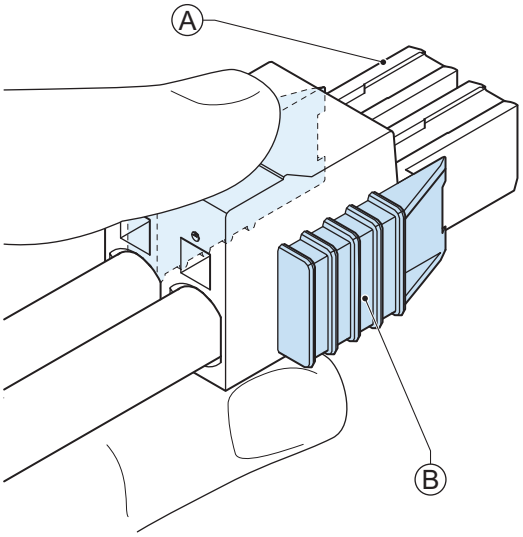
Item	Specifications
Conductor isolation rating	90°C
Termination rating	90°C

Additional Information

- Refer to *5-4-3 Wire the Power Connector* on page 5 - 36 for wiring details.
- Refer to *5-4-2 Ground* on page 5 - 29 for grounding details.

Locking and Removing the Power Connector

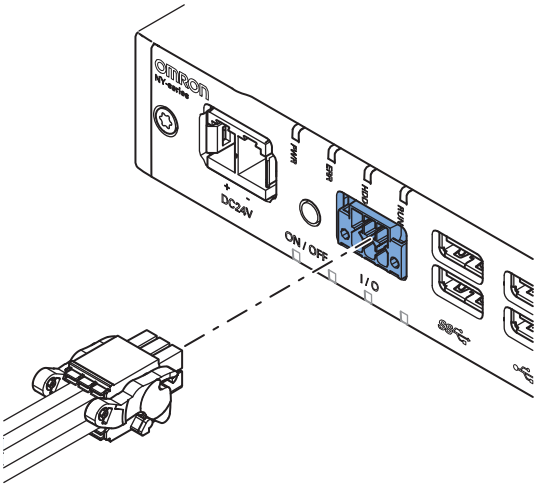
The power connector automatically locks into place when the black part of the connector is held and pushed in.



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

4-2-2 I/O Connector Specifications

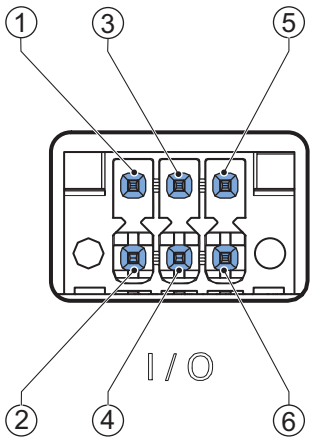
Details of the I/O connector are provided below.
The I/O connector is locked when inserted to prevent unintentional disconnection.
The connector can only be inserted in the correct way.
The Lock-and-Release Latch connector is a Phoenix Contact type DFMC 1,5/ 3-ST-3,5-LR BK (1711658).



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

I/O Connector Pin Details

The pin details of the I/O connector.



The pin layout represents the I/O connector on the Box PC.
The I/O signals connected must be powered from a power supply which conforms to the SELV standards.
Pin details of the I/O Connector:

Pin	Description	Type	Electrical Specifications	Details
1 2	Power Status Output *1	Contact output	• SPST-NO contact configuration • 24 VDC at 2A switching capacity (resistive load) • Operation lifetime 150,000 cycles at 2A max. • Connect to SELV	• Open: The Power Status Output is OFF when the 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 - 21 for details.
3 4	Power ON/OFF Input *2	Isolated transistor input (sinking or sourcing)	• ON: 8.8 VDC min./5 mA min. • OFF: 1.1 VDC max./0.5 mA max. • Connect to SELV	If the signal changes from inactive to active, the 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 - 21 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 - 39 for I/O connector wiring details.

I/O Connector Power Status Output Details

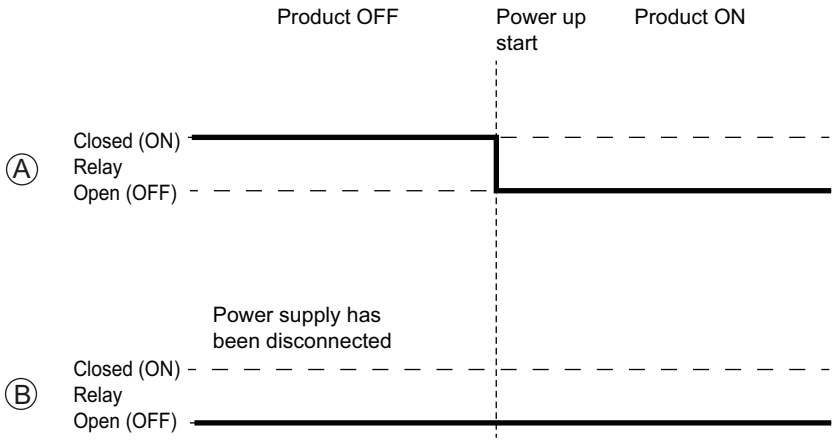
This section provides details of the Power Status Output relay.
The Power Status Output is a relay between pin 1 and 2 of the I/O Connector.

● 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

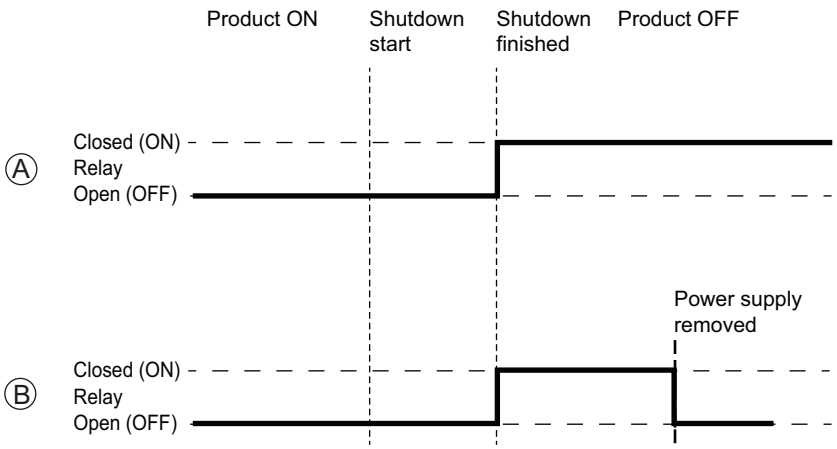
Refer to *5-4-4 Wire the I/O Connector* on page 5 - 39 for I/O connector wiring details.

● 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 Ⓑ.

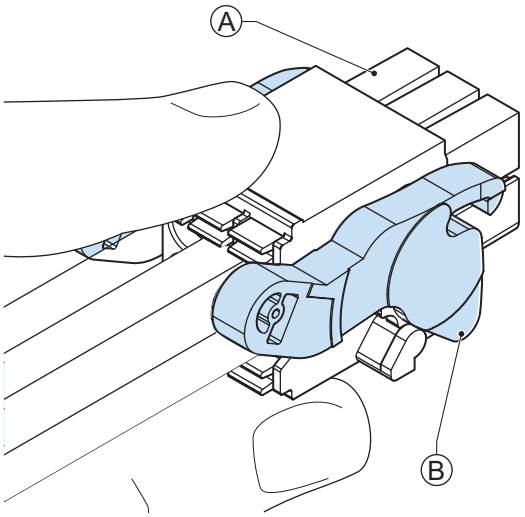


Additional Information

Refer to *5-4-4 Wire the I/O Connector* on page 5 - 39 for I/O connector wiring details.

Lock and Remove the I/O Connector

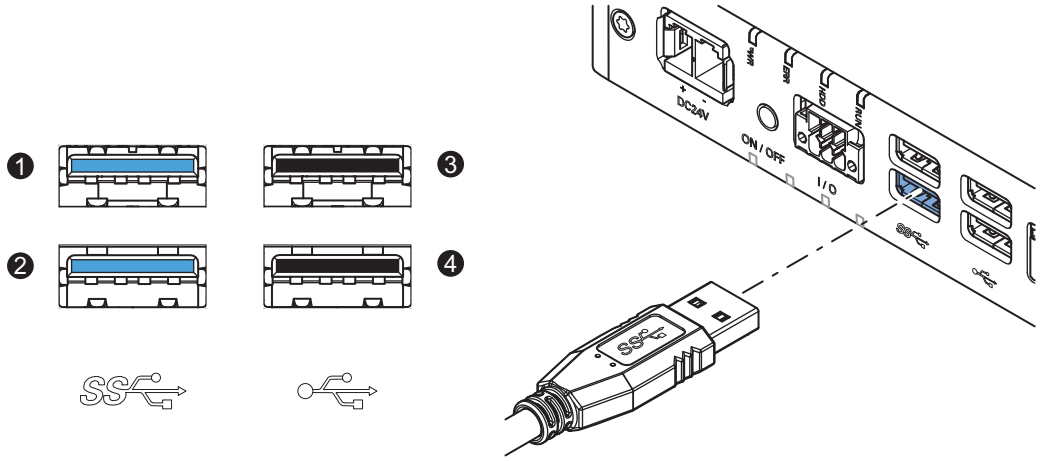
The I/O connector locks into place when the black part of the connector is held and pushed in.



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

4-2-3 USB Connector Specifications

The Box PC Without Operating System 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 per Connector
1	• USB 3.0 • 900 mA maximum current at 5 VDC equals 4.5 W maximum power consumption *1 • 3 m maximum cable length • Blue color
2	
3	• USB 2.0 • 500 mA maximum current at 5 VDC equals 2.5 W maximum power consumption *1 • 5 m maximum cable length • Black color
4	

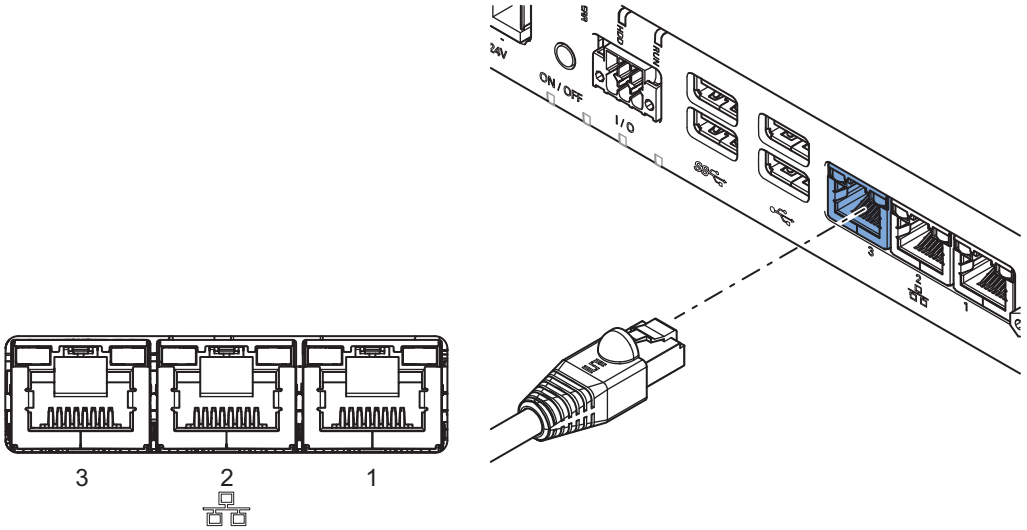
*1. The total power consumption for the USB Connectors is 14 W max. (2 x 4.5 + 2 x 2.5)

Additional Information

Refer to *5-4-2 Ground* on page 5 - 29 for grounding details.

4-2-4 Ethernet Connector Specifications

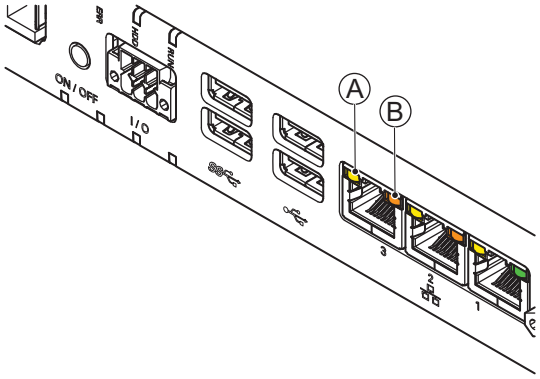
Details of the RJ45 Ethernet connectors are provided below.
The Ethernet connector locks automatically to prevent unintentional disconnection.



The view represents the Ethernet connector on the Box PC Without Operating System.

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

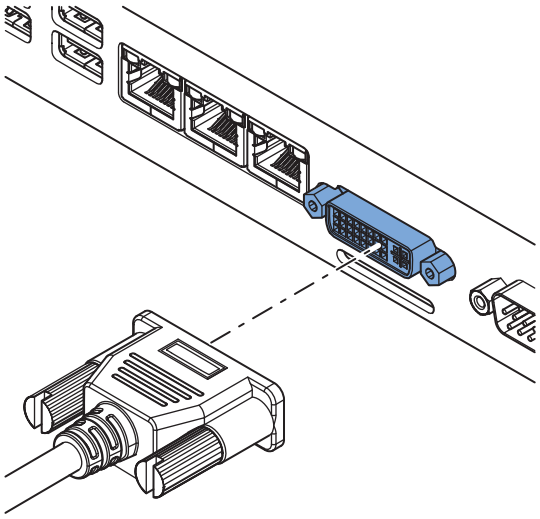
Item	Indicator	Color	Status		Description
B	Speed	Not lit		Not lit	10 Mbps or no link
		Green		Lit	100 Mbps link
		Orange		Lit	1 Gbps link

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.



Additional Information

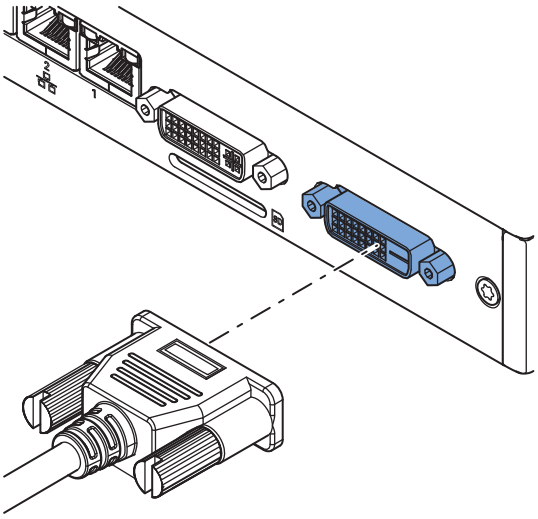
- Refer to *4-1-5 CPU Specifications* on page 4 - 7 for graphics controller details.
- Refer to *5-4-2 Ground* on page 5 - 29 for grounding details.
- Refer to *A-2-2 DVI-D Connector Pin Details* on page A - 45 for pin details.

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

Item	Model	Specifications
Video interface	NY5□2	Digital or Analog
	NY□17	
	NY□1E	
	NY□35	Digital only
	NY□25	
	NY□2C	
	NY□1C	
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 DVI-D Connector Specifications

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



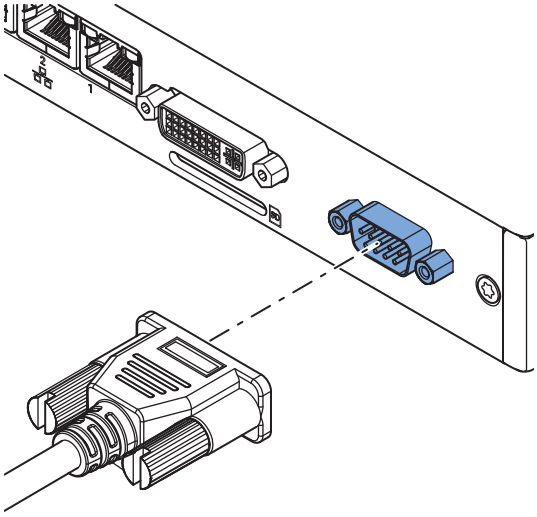
Item	Specification
Video interface	Digital only
Resolution	Up to 1920 x 1200 pixels at 60 Hz
Type	Dual link
Maximum DVI cable length	Dependent upon connected monitor type and resolution

Additional Information

- Refer to *4-1-5 CPU Specifications* on page 4 - 7 for graphics controller details.
- Refer to *5-4-2 Ground* on page 5 - 29 for grounding details.
- Refer to *A-2-2 DVI-D Connector Pin Details* on page A - 45 for pin details.

4-2-7 RS-232C Connector Specifications

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



Additional Information

- Refer to *5-4-2 Ground* on page 5 - 29 for grounding details.
- Refer to *A-3 RS-232C Connector Pin Details* on page A - 47 for pin details.

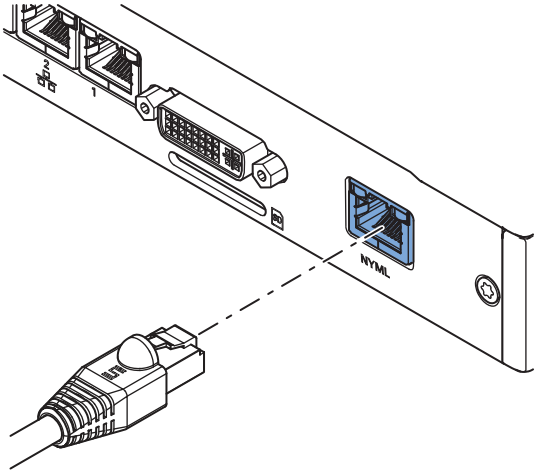
4-2-8 NY Monitor Link Connector Specifications

The optional NY Monitor Link connector connects an OMRON Industrial Monitor with an OMRON Industrial PC that has an NY monitor link connector.
The NY Monitor Link communication is a combination of video and USB information.

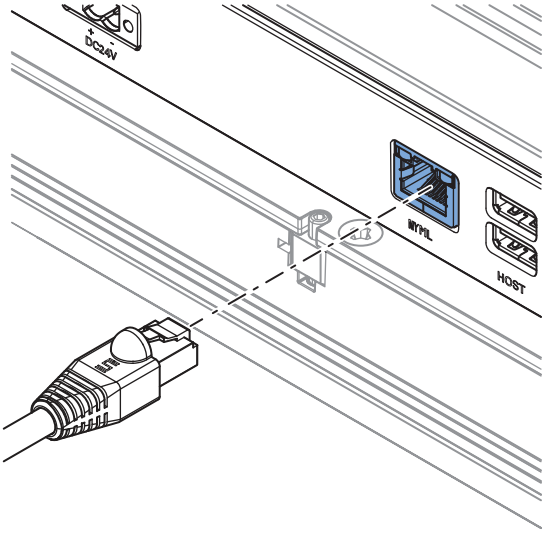
Item	Specifications
Connector type	RJ45
Transmission media	Twisted pair cable of category 6A or higher (double-shielded straight cable with copper braiding and aluminum foil)
Maximum cable length between Industrial PC and Industrial Monitor	100 m
Topology	Line (direct) connection only *1
Video resolution	1280 x 800 pixels at 60 Hz
Data throughput rate	280 Mbps max.

*1. Use a direct connection between the OMRON Industrial PC and the OMRON Industrial Monitor.
Do not use:
- Ethernet switches
- Ethernet hubs
- Daisy chain connections

The NY Monitor Link connector locks automatically to prevent unintentional disconnection.



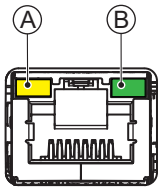
Industrial PC



Industrial Monitor

NY Monitor Link Connector LED Indicators

The connector has LED indicators Connected Ⓐ and Video Ⓑ.



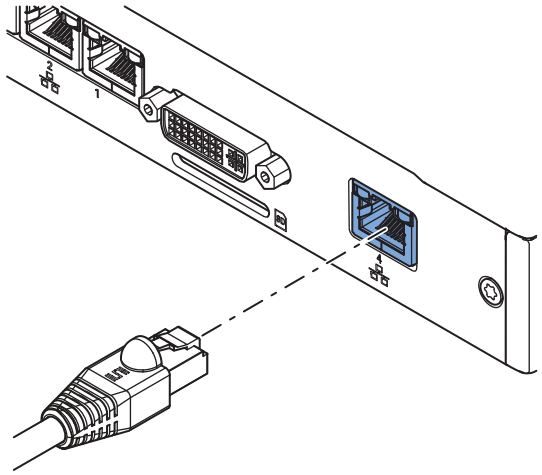
NYML

Item	Indicator	Color	Status		Description
A	Connected	Yellow		Not lit	Not connected
				Lit	Connected USB communication active
B	Video	Green		Not lit	No video signal
				Blinking	Video signal present
				Lit	Encrypted video signal present Video output is not supported for encrypted video.

4-2-9 Ethernet Connector Specifications

The optional RJ45 Gb Ethernet connector connects an Industrial PC to a network.

The RJ45 Gb Ethernet connector locks automatically to prevent unintentional disconnection.



Additional Information

Refer to *4-2-4 Ethernet Connector Specifications* on page 4 - 24 for LED and connector details.

4-3 Environmental Specifications

This section provides environmental specifications of the Box PC Without Operating System.

4-3-1 Operation Environment 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 60068-2-27. 147 m/s², 3 times in each X, Y and Z directions
Pollution degree	JIS B3502 and IEC 61131-2: 2 or less
RTC accuracy	At ambient temperature of 55°C: −3.5 to +0.5 min error per month At ambient temperature of 25°C: −1.5 to +1.5 min error per month At ambient temperature of 0°C: −3 to +1 min error per month

*1. Refer to *4-3-2 Temperature and Humidity Specifications* on page 4 - 32 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 or CFast Card	HDD
Book	9.8 m/s²	2.5 m/s²
Wall		4.9 m/s²

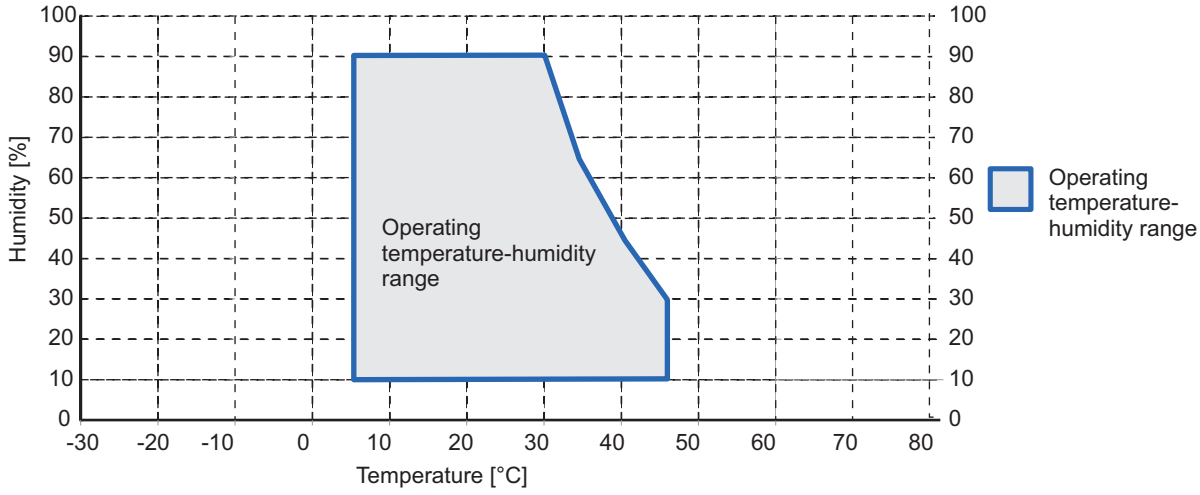
4-3-2 Temperature and Humidity Specifications

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

Temperature and Humidity Graphs

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

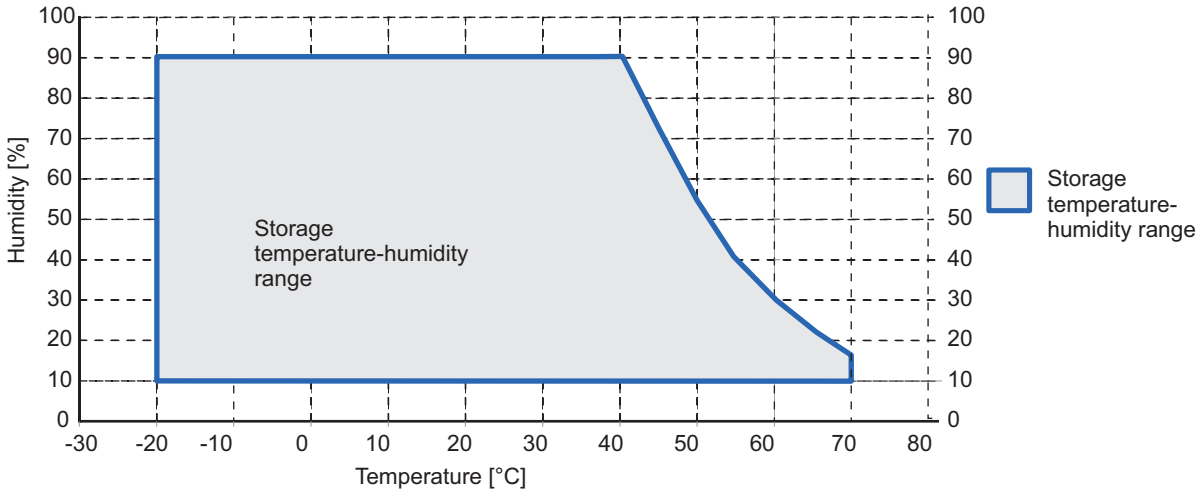
- Operate the Box PC with a SSD within the general environmental specifications.
- Operate the Box PC with a HDD within the ambient temperature and humidity ranges as shown in following graph.



Additional Information

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

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



Temperature Specifications for model NYB17-□1

Ambient operating temperature specifications for model NYB17-□1.

This Box PC has an Intel® Core™ i7-4700EQ CPU.

Additional Information

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

Mounting Orientation	Storage device type *1				
	1 x SSD	2 x SSD	1 x HDD*2	2 x HDD*2	1 x SSD 1 x HDD*2
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.

*2. Ambient operating temperature specifications when using a 1 TB HDD:

Mounting Orientation	Storage device type		
	1 x HDD	2 x HDD	1 x SSD 1 x HDD
Book	0 to 40°C	5 to 30°C	0 to 35°C
Wall	0 to 40°C	5 to 30°C	0 to 35°C

Temperature Specifications for model NYB1C-□1

Ambient operating temperature specifications for model NYB1C-□1.

This Box PC has an Intel® Celeron® 2980U CPU.

Additional Information

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

Mounting Orientation	Storage device type *1		
	SSD	HDD 320 GB / 500 GB	HDD 1 TB
Book	0 to 55°C	5 to 45°C	0 to 40°C
Wall	0 to 50°C	5 to 40°C	0 to 35°C

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

Temperature Specifications for model NYB1E-□1

Ambient operating temperature specifications for model NYB1E-□1.

This Box PC has an Intel® Xeon® E3-1515M v5 CPU.

Additional Information

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

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

*2. Ambient operating temperature specifications when using a 1 TB HDD:

Mounting Orientation	Storage device type		
	1 x HDD	2 x HDD	1 x SSD 1 x HDD
Book	0 to 40°C	5 to 30°C	0 to 35°C
Wall	0 to 40°C	5 to 30°C	0 to 35°C

Temperature Specifications for model NYB25-□1

Ambient operating temperature specifications for model NYB25-□1.

This Box PC has an Intel® Core™ i5-4300U CPU.

Additional Information

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

Mounting Orientation	Storage device type *1				
	1 x SSD	2 x SSD	1 x HDD*2	2 x HDD*2	1 x SSD 1 x HDD*2
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.

*2. Ambient operating temperature specifications when using a 1 TB HDD:

Mounting Orientation	Storage device type		
	1 x HDD	2 x HDD	1 x SSD 1 x HDD
Book	0 to 40°C	Not supported	0 to 40°C
Wall	0 to 35°C	Not supported	0 to 35°C

Temperature Specifications for model NYB2C-□0

Ambient operating temperature specifications for model NYB2C-□0.

This Box PC has an Intel® Celeron® 3965U CPU.

Additional Information

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

Mounting Orientation	Storage device type *1
	CFast Card
Book	0 to 55°C
Wall	0 to 50°C

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

Temperature Specifications for model NYB2C-□1

Ambient operating temperature specifications for model NYB2C-□1.

This Box PC has an Intel® Celeron® 3965U CPU.

Additional Information

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

Mounting Orientation	Storage device type *1				
	1 x SSD	2 x SSD	1 x HDD*2	2 x HDD*2	1 x SSD 1 x HDD*2
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.

*2. Ambient operating temperature specifications when using a 1 TB HDD:

Mounting Orientation	Storage device type		
	1 x HDD	2 x HDD	1 x SSD 1 x HDD
Book	0 to 40°C	Not supported	0 to 40°C
Wall	0 to 35°C	Not supported	0 to 35°C

Temperature Specifications for model NYB35-□0

Ambient operating temperature specifications for model NYB35-□0.

This Box PC has an Intel® Core™ i5-7300U CPU.

Additional Information

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

Mounting Orientation	Storage device type *1
	CFast Card
Book	0 to 55°C
Wall	0 to 50°C

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

Temperature Specifications for model NYB35-□1

Ambient operating temperature specifications for model NYB35-□1.

This Box PC has an Intel® Core™ i5-7300U CPU.

Additional Information

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

Mounting Orientation	Storage device type *1				
	1 x SSD	2 x SSD	1 x HDD*2	2 x HDD*2	1 x SSD 1 x HDD*2
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.

*2. Ambient operating temperature specifications when using a 1 TB HDD:

Mounting Orientation	Storage device type		
	1 x HDD	2 x HDD	1 x SSD 1 x HDD
Book	0 to 40°C	Not supported	0 to 40°C
Wall	0 to 35°C	Not supported	0 to 35°C

4-3-3 Recycling Specifications

The following table provides recycling information for the Box PC Without Operating System.

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 Box PC Without Operating System.

5-1 Unpack

This section provides details on how to unpack the Box PC Without Operating System.

5-1-1 Unpack Procedure

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

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

3 Ensure that all items are present.

Additional Information

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

5-1-2 Items Supplied

The Industrial Box PC is supplied with several items.

Additional Information

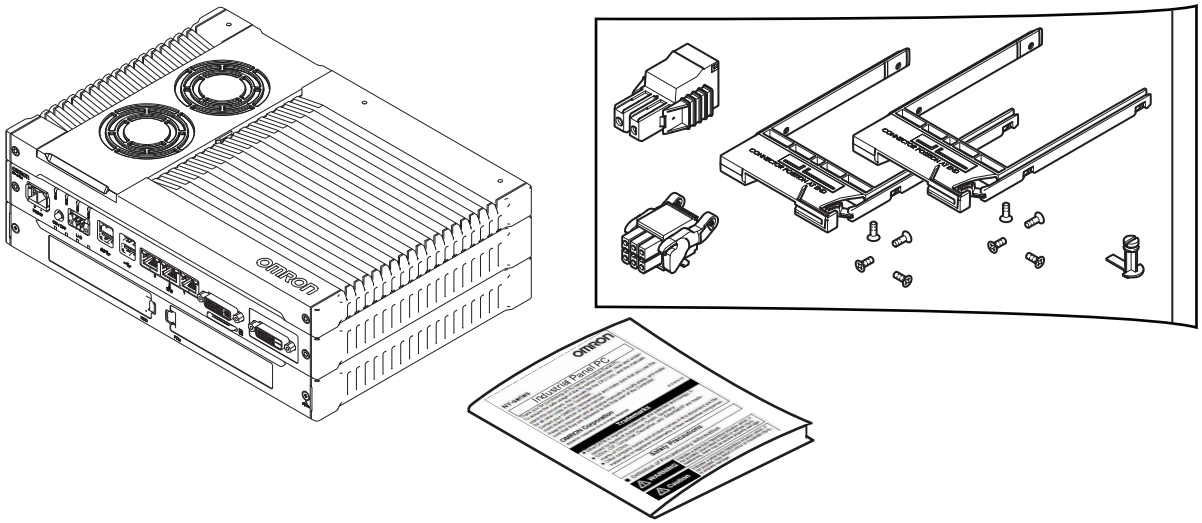
- Refer to *Items Supplied with the Industrial Box PC* on page 5 - 3 for more details.
- Refer to *Items Supplied with the Brackets* on page 5 - 4 for more details.

Items Supplied with the Industrial Box PC

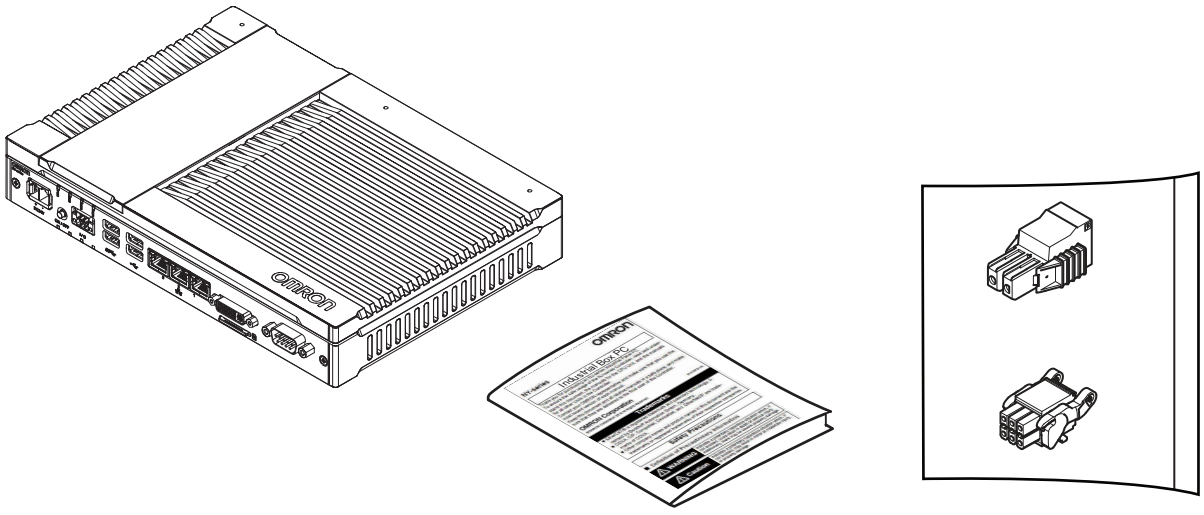
This section describes the items supplied with your Industrial Box PC.

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

Models NYB□□-□1 and NY512-□□□□-1.



Models NYB□□-□0 and NY512-□□□□-0.



Items Supplied with the Brackets

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

Additional Information

- Refer to *2-10-1 Mounting Brackets* on page 2 - 22 for bracket details.
- Refer to *5-3-8 Book Mount Procedure* on page 5 - 26 for book mount installation.
- Refer to *5-3-9 Wall Mount Procedure* on page 5 - 27 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 Box PC Without Operating System.

5-2-1 Install a Drive

A drive is a storage device for the Box PC Without Operating System.

Additional Information

- Depending on the product configuration a drive is already installed.
  Refer to *1-4 Product Configuration* on page 1 - 5 for storage details.
- Depending on the CPU type one or two drives are supported.
  Refer to *4-1-5 CPU Specifications* on page 4 - 7 for the number of supported drives.
- Refer to *2-10-5 HDD and SSD Storage Devices* on page 2 - 25 for the recommended drive models.
- Refer to *4-1-7 Storage Device Specifications* on page 4 - 11 for drive specifications.

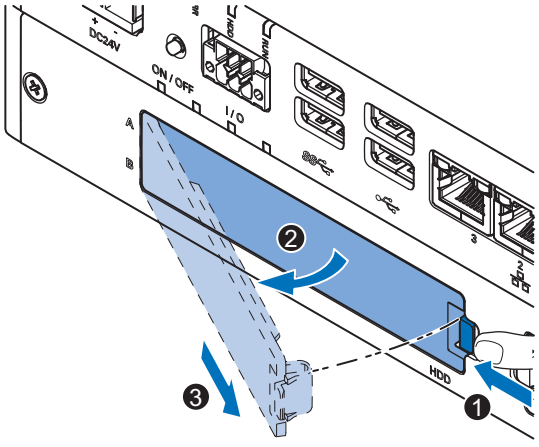
Prepare the following items:

- The drive
  A drive is not supplied with the Box PC.
- 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.

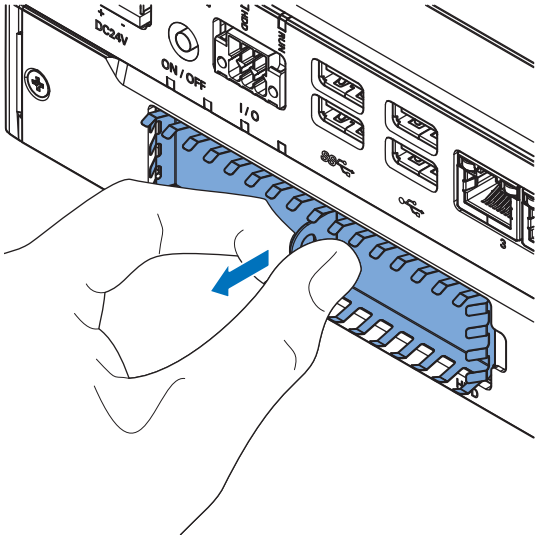


(1) Push the lock lever ❶.

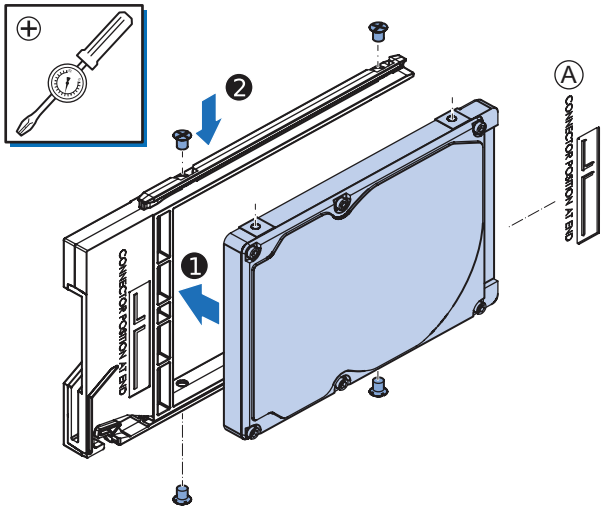
(2) Tilt the drive cover ❷.

(3) Remove the drive cover ❸.

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



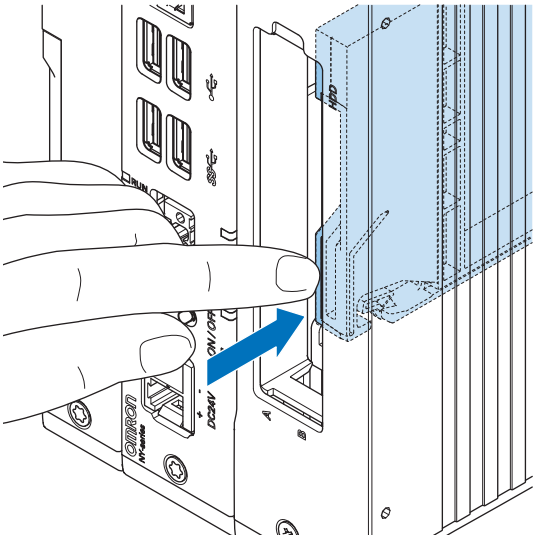
4 Align the connectors of the drive as shown Ⓐ on the bracket. Then insert the replacement drive ❶ in the bracket and insert the 4 mounting screws ❷. Tighten these screws with a torque of 0.35 N·m.



5 Insert the bracket with the drive in the correct bay.

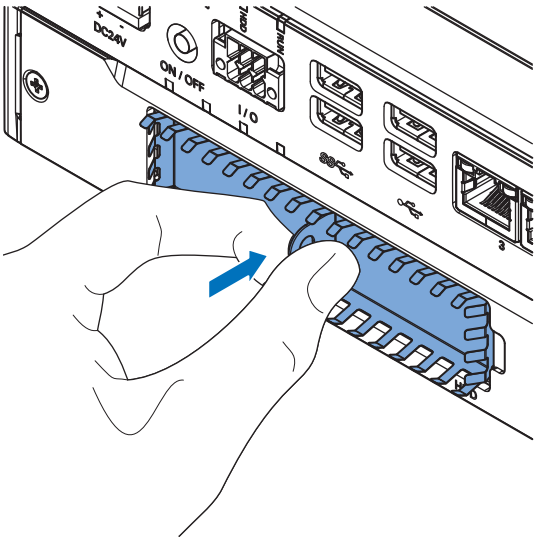
- A drive for the operating system has to be inserted in bay A
- The drive for additional storage can be inserted in bay B

Ensure the bracket is completely in the Box PC with an extra push.

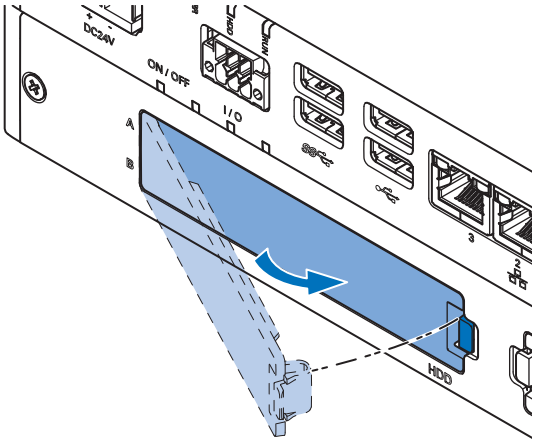


The drive bracket will lock into place when it is fully inserted.

6 Insert the metal shielding cover.



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



8 Finalize the drive installation when the Box PC installation is completed.

- If the drive is inserted in bay A:
  (1) Install an operating system
  (2) Power OFF and then Power ON
  (3) Ensure the drive is functional and confirm normal operation.
  If required set the drive as boot disk in the BIOS settings.
  Refer to *A-1 BIOS* on page A - 2 for boot priority settings.
- If the drive is inserted in bay B:
  (1) Ensure the drive is functional and confirm normal operation.
  If the Box PC has a Windows operating system and the storage drive is not visible in Windows then the drive needs to be allocated.

The drive is installed and functional.

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

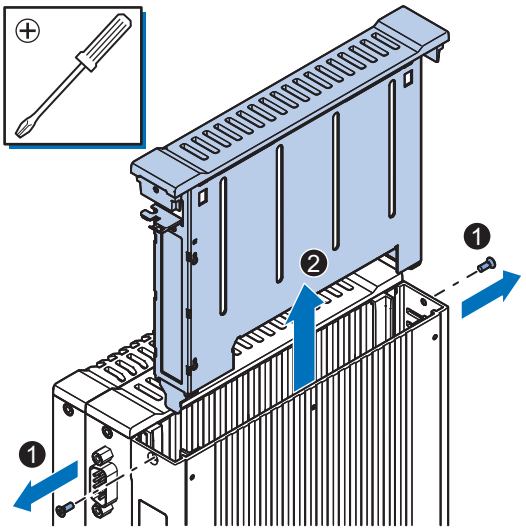
Refer to *4-1-8 PCIe Card Specifications* on page 4 - 14 for PCIe specifications.

- 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.

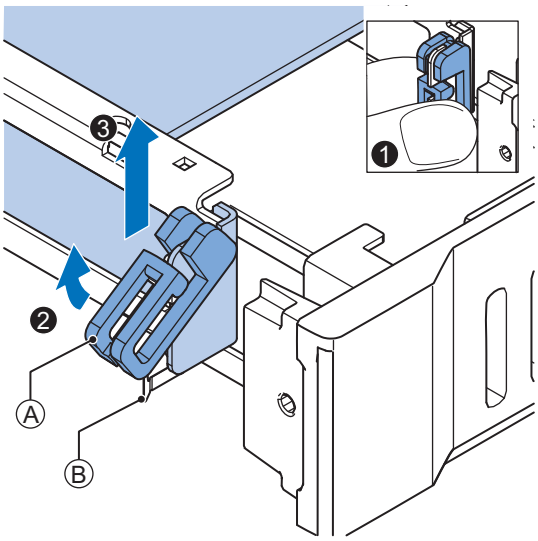
2 Remove the two crosshead screws ❶ indicated with "open" and then pull up ❷ the PCIe Drawer.
The indent at the side of the drawer will help you to pull the drawer from the Box PC.



3 Grip the Card Clip Ⓐ on the sides ❶. Pull the middle of the Card Clip to unlock it ❷ and remove it ❸ from the PCIe Drawer.

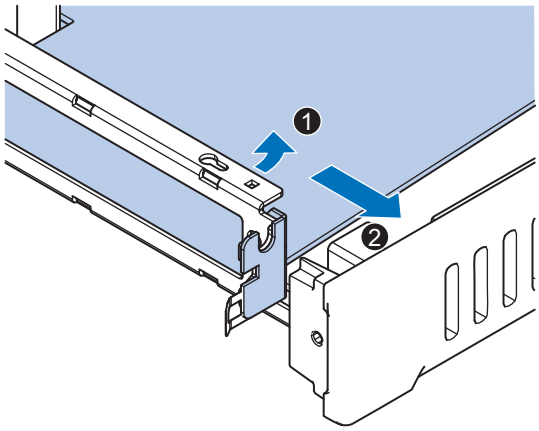
⚠ Caution

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



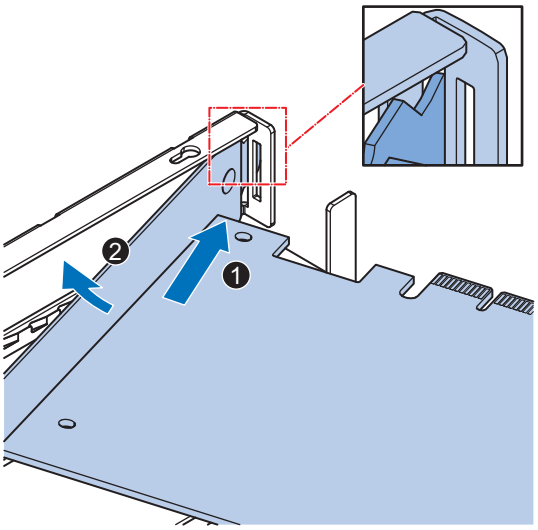
Ⓐ Card Clip
Ⓑ Sheet metal frame tab

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.

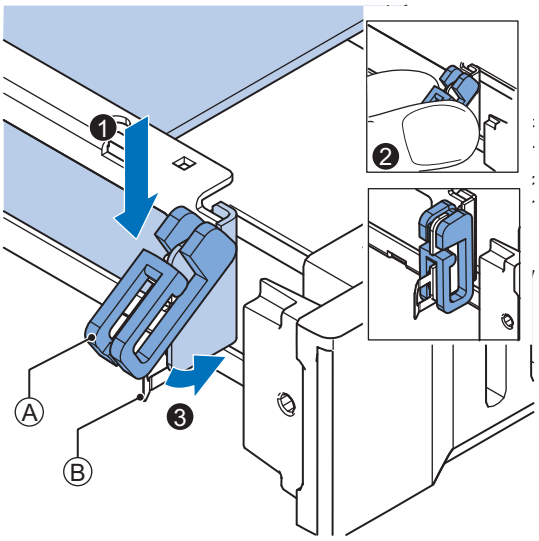


Ensure to insert the PCIe Card in the correct opening.
Ensure the thin sheet metal frame is positioned between the PCIe Card and the PCIe Drawer to ensure a good conductive contact.

6 Place the Card Clip Ⓐ in the PCIe Card and PCIe Drawer ❶, grip the Card Clip on the sides ❷ and then rotate the Clip ❸ to lock it in place.

⚠ Caution

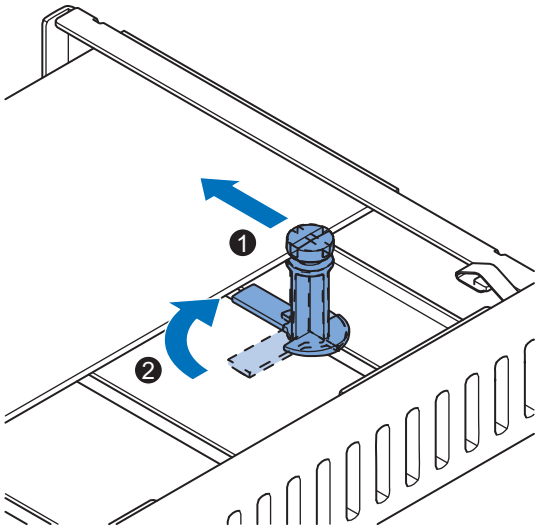
When installing or removing a PCIe card, ensure to grip the Card Clip on the sides to prevent contact with the sharp edges of the sheet metal frame tab. Injury may result.



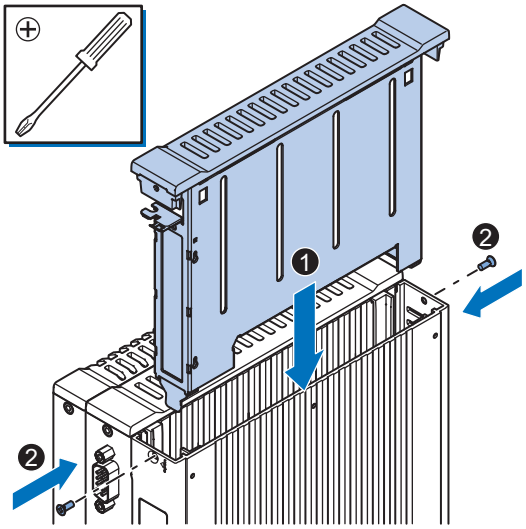
Ⓐ Card Clip
Ⓑ Sheet metal frame tab

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.

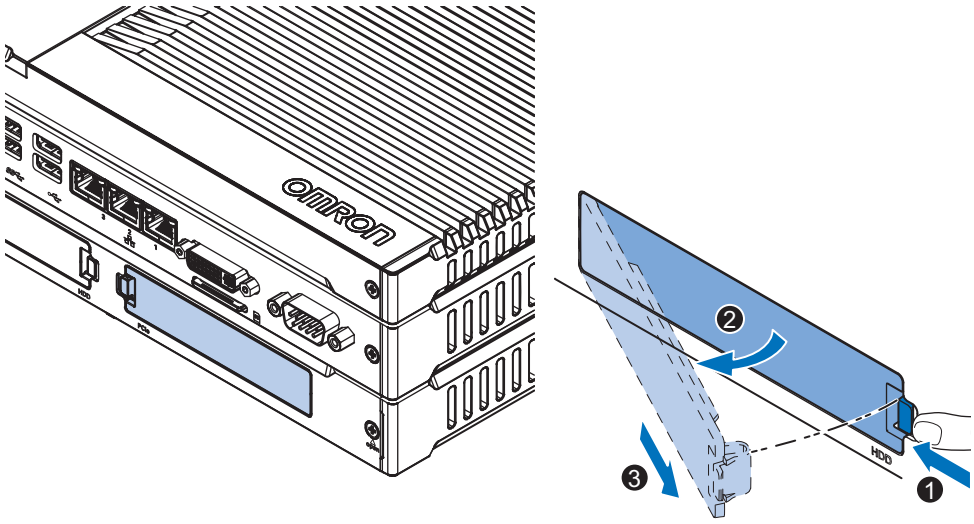
Rotate the Card Support ❷ to lock it in place.



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 Box PC Without Operating System must be mounted in a cabinet or a control panel.
Consider the 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

Additional Information

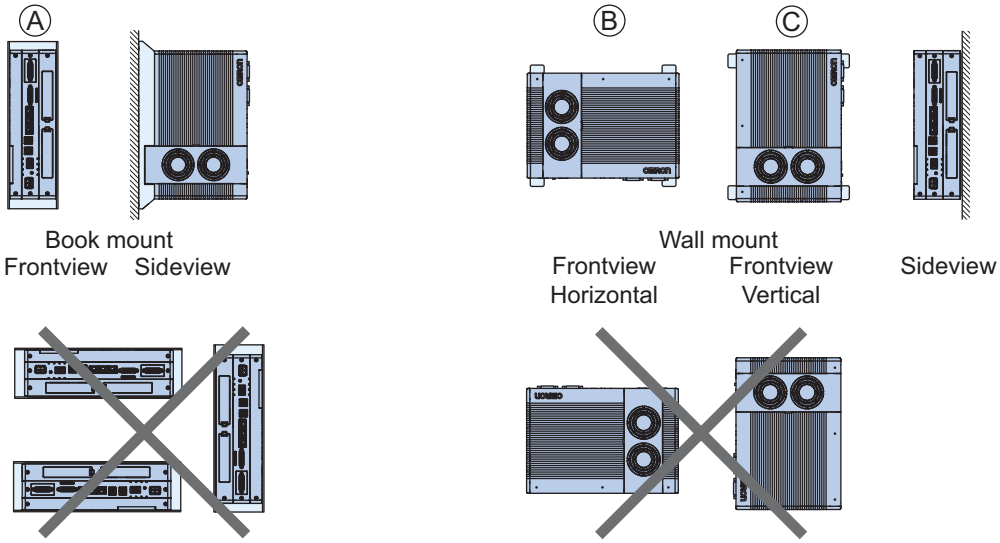
- Ensure you have installed the options before you mount the product.
  Refer to *5-2 Install Options* on page 5 - 5 for option details.
- Refer to *5-3-8 Book Mount Procedure* on page 5 - 26
  or *5-3-9 Wall Mount Procedure* on page 5 - 27 for orientation details.
- Refer to *5-3-3 Temperature* on page 5 - 15 for temperature details.
- Refer to *5-3-4 Humidity* on page 5 - 18 for humidity details.
- Refer to *5-4 Wire* on page 5 - 28 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

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

Distance for Cooling

Adequate airflow around the Industrial Box PC is required.

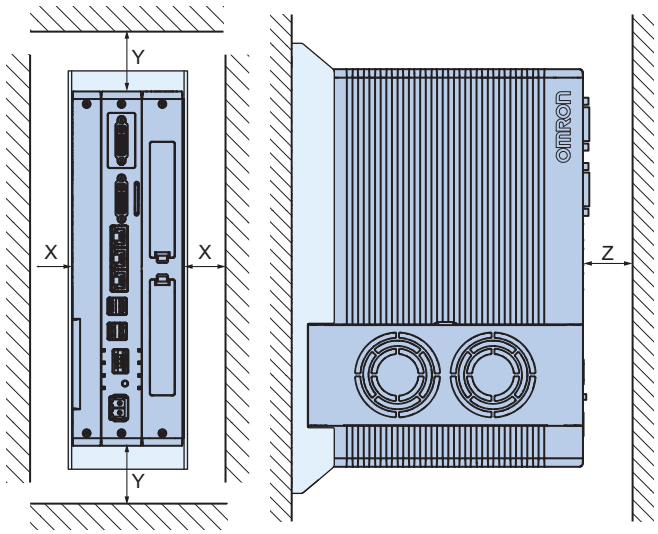
Additional Information

- The ambient temperature must be within the operating range.
  Refer to *4-3-1 Operation Environment Specifications* on page 4 - 31 for temperature specifications.
- Allow space to accommodate for the bending radius of the cables.
  Refer to:
  - *2-10-6 DVI Cables* on page 2 - 26
  - *2-10-7 USB Type-A to USB Type-B Cables* on page 2 - 26
  - *2-10-8 NY Monitor Link Cables* on page 2 - 27

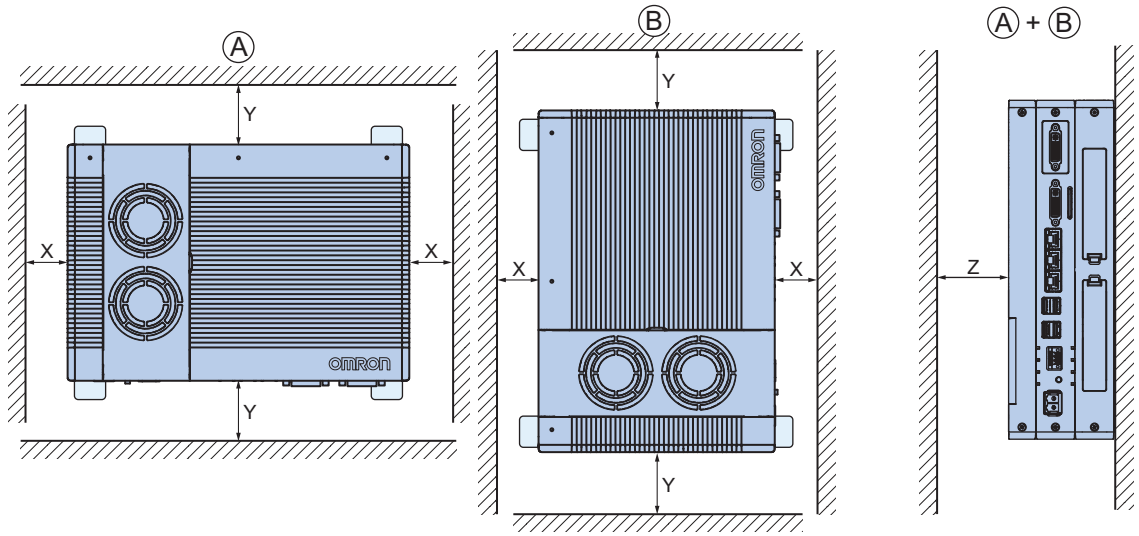
  for cable bending requirements.

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.

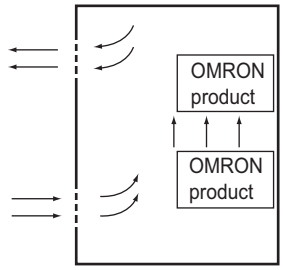
High Temperatures

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.

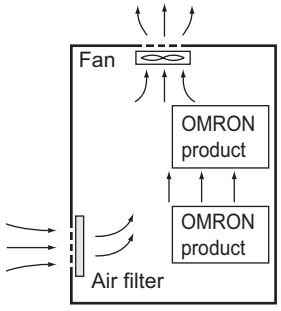
- Do not install the Box PC at the top of the panel, where hot air tends to stagnate.
- To provide ventilation space above and below the Box PC, leave sufficient distance from other devices, wiring ducts, etc.
- Do not mount the Box PC in the wrong direction (e.g., vertically or upside down). Doing so 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

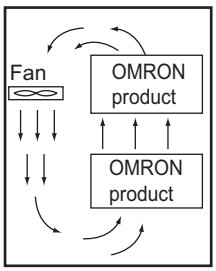
Forced ventilation with a fan in the top of the control cabinet.



Forced Ventilation Method

● Forced Air Circulation

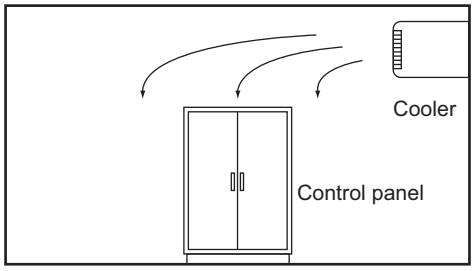
Forced circulation with a fan inside the closed control cabinet.



Forced Air Circulation

- **Room Cooling**

Cool the entire room where the control panel is located.



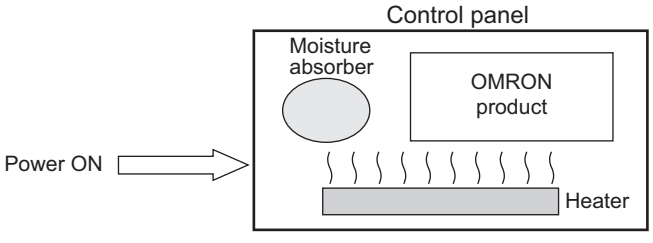
Room Cooling

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.
- Prevent shocks 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

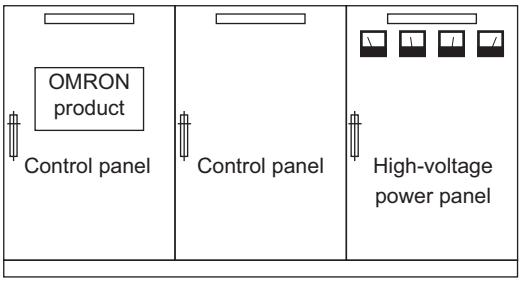
When installing or wiring devices, make sure that there will be no danger to people and that noise will not interfere with electrical signals.

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.

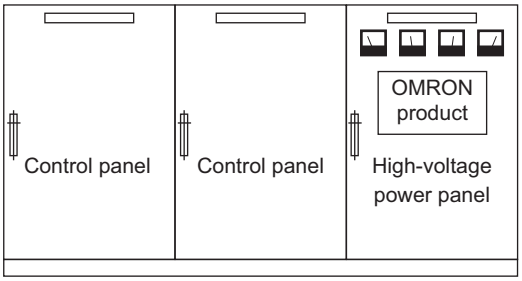
Example of Recommended Equipment Arrangement

OK



Example of Poor Equipment Arrangement

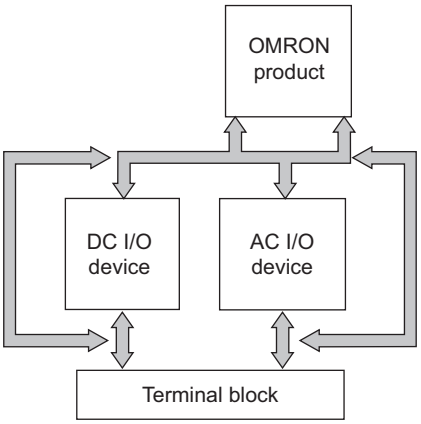
NG



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.

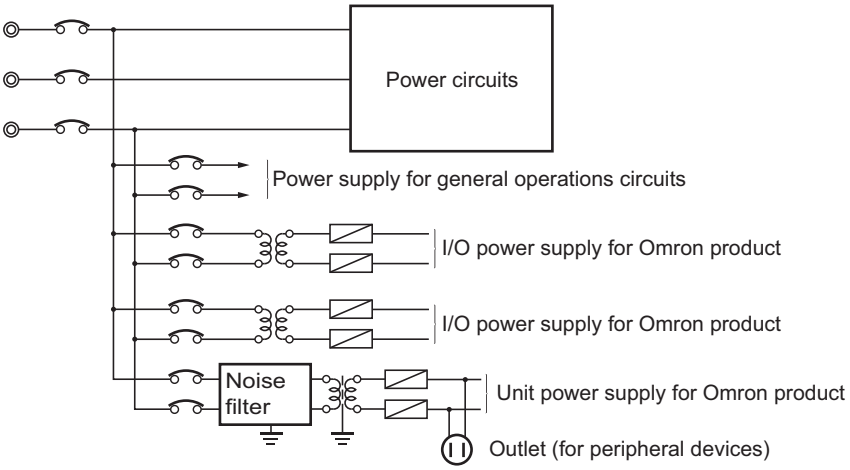


Example of Arrangement in Panel

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.

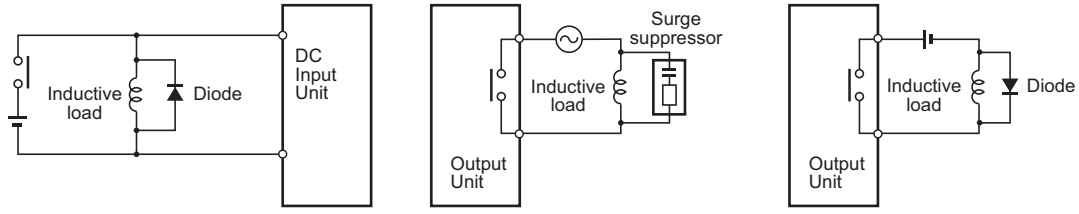


Power Supply System Diagram

Wire External I/O Signal Lines

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

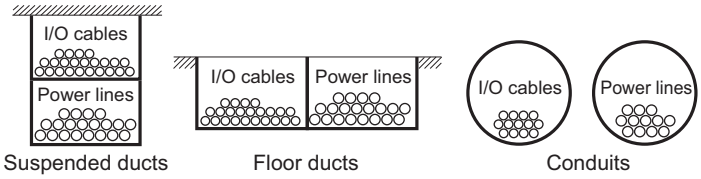
- To absorb reverse electromotive force when an inductive load is connected to an output signal, connect a surge suppressor near the inductive load in an AC circuit, or connect a diode near the inductive load in a DC circuit.



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

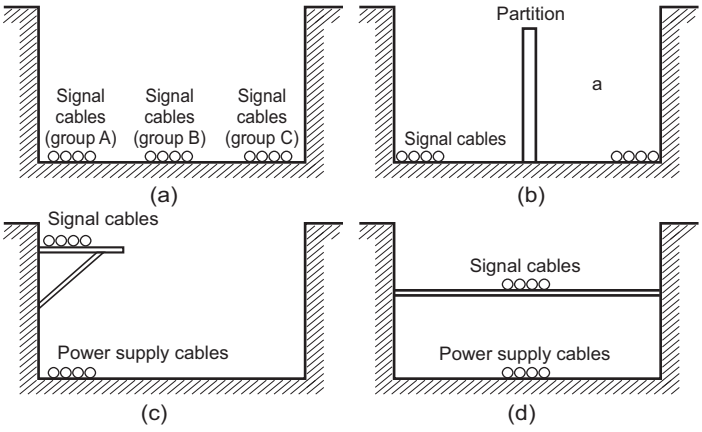
Each of the following combinations includes different signal types, properties, or levels. They will cause the signal-to-noise ratio to drop due to factors such as electrical induction. As a general rule when wiring, either use separate cables or separate wiring routes for these items. Future maintenance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

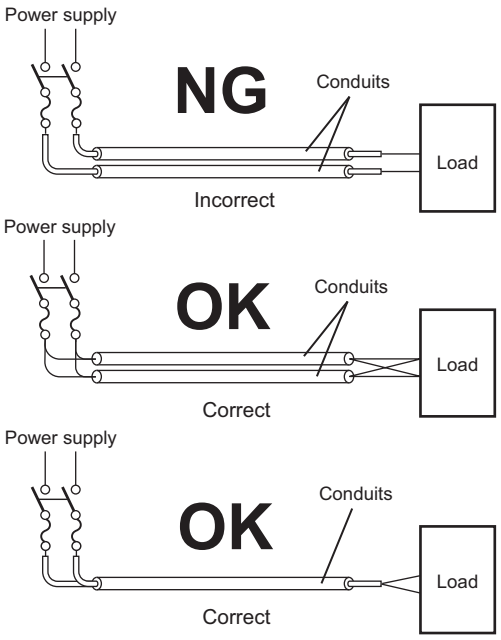
Observe the following points when wiring power supply and signal cables.

- 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.



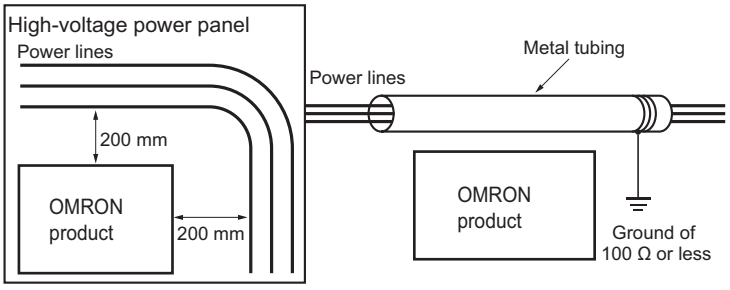
Partitioning Methods for Signal and Power Supply Cables

- 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 Box PC Without Operating System directly into the duct.

Additional Information

Refer to *Distance for Cooling* on page 5 - 15 for the minimum required distances.

It is convenient to use wiring ducts that have the same depth as the Box PC Without Operating System.

5-3-8 Book Mount Procedure

Use the following procedure to mount the Box PC Without Operating System in the book orientation.

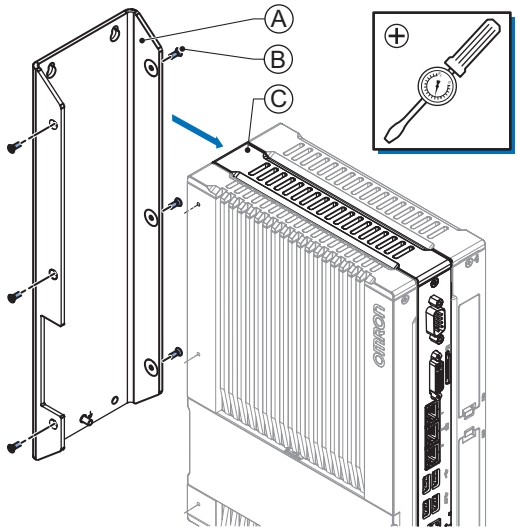
Additional Information

- Refer to *5-4-2 Ground* on page 5 - 29 for grounding details.
- Refer to *2-10-1 Mounting Brackets* on page 2 - 22 for the bracket model.

To mount the Box PC:

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

2 Mount the bracket Ⓐ to the Industrial Box PC Ⓒ with the 6 Phillips screws Ⓑ supplied with the bracket.
First tighten the 3 screws at the side of the contact areas with a torque of 0.5 N·m.
Then tighten the 3 screws at the opposite side, also with a torque of 0.5 N·m.



The bracket and the Industrial Box PC can differ depending on the product configuration.

3 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 *4-1-9 Bracket Specifications* on page 4 - 17 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

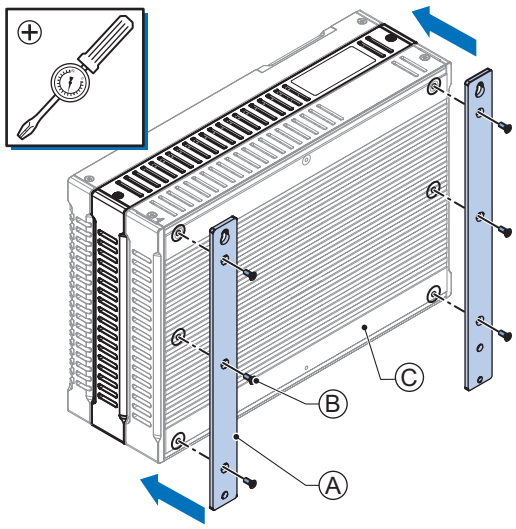
Use the following procedure to mount the Box PC in the wall orientation.

Additional Information

- Refer to *5-4-2 Ground* on page 5 - 29 for grounding details.
- Refer to *2-10-1 Mounting Brackets* on page 2 - 22 for the bracket model.

To mount the Box PC:

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.



The Industrial Box PC can differ depending on the product configuration.

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 *4-1-9 Bracket Specifications* on page 4 - 17 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 Box PC Without Operating System.

5-4-1 Wiring Warnings and Cautions

This section describes the Warnings and Cautions when wiring the Box PC Without Operating System.

⚠ 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

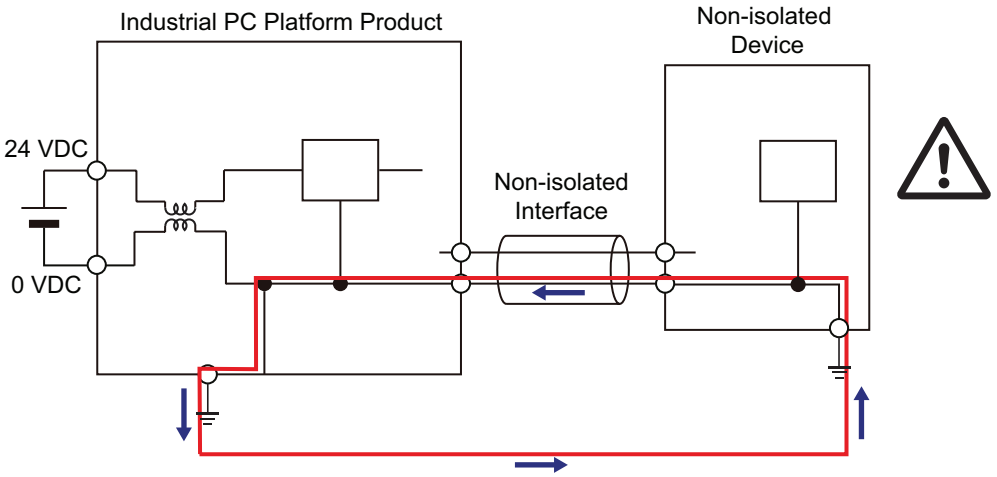
This section describes how to ground the Box PC Without Operating System.

⚠ 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.

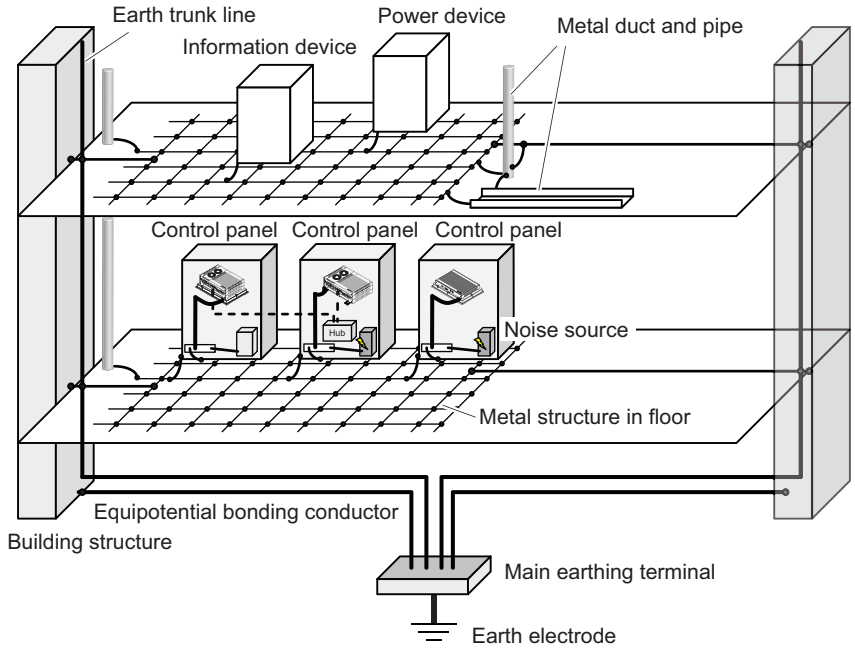
Equipotential Bonding System

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

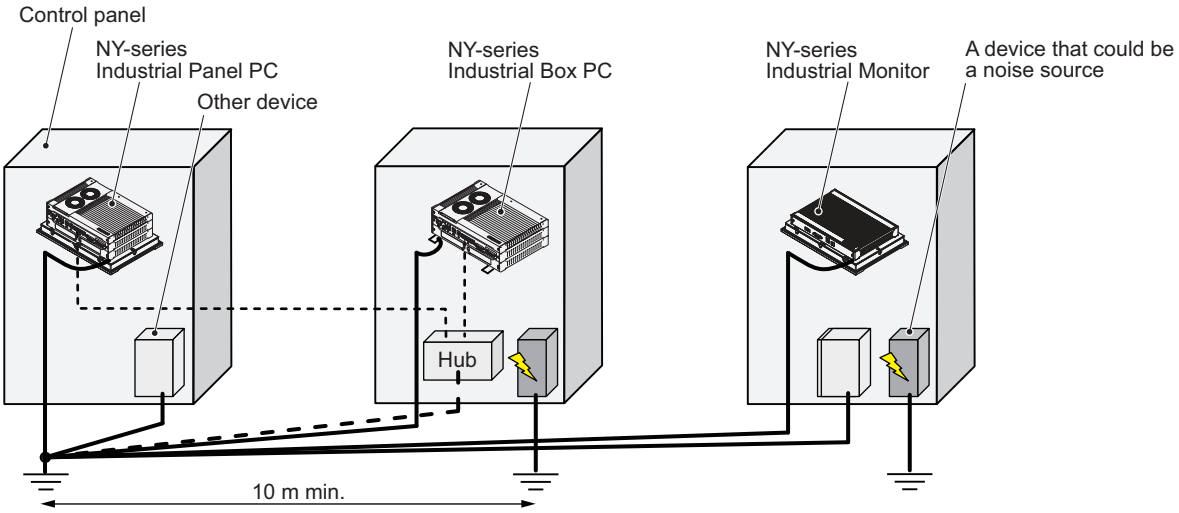
If the earthing method used for the building is not equipotential bonding or the earthing system is unknown, choose (a) from among the earthing methods given below.

(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.

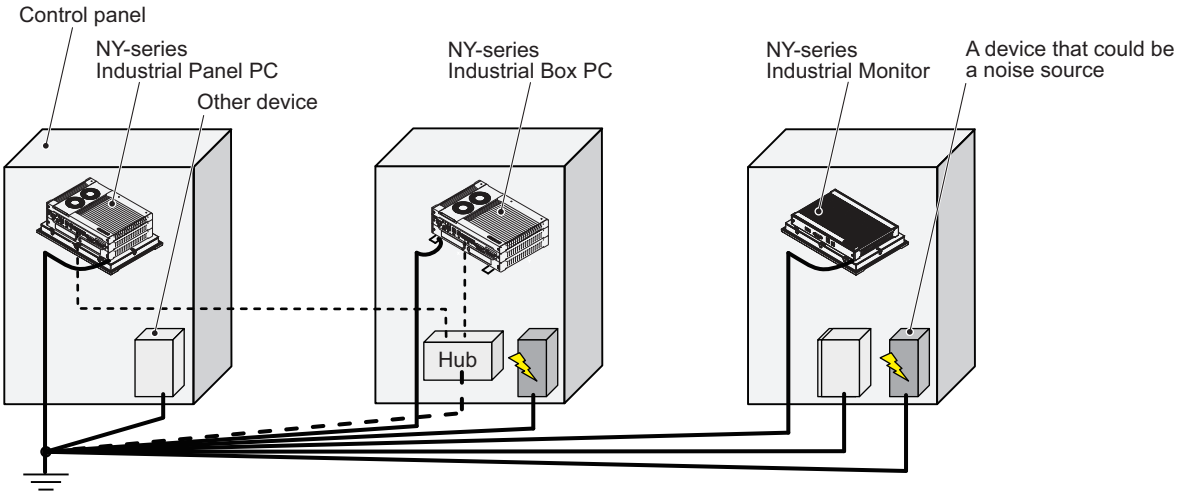
Connect the ground lines of the device that is connected with a communications cable and other devices as a bundle to a single earth electrode. Be sure that the earth electrode is separated by a minimum of 10 m from any other earth electrode of a device that could be a noise source.



(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.

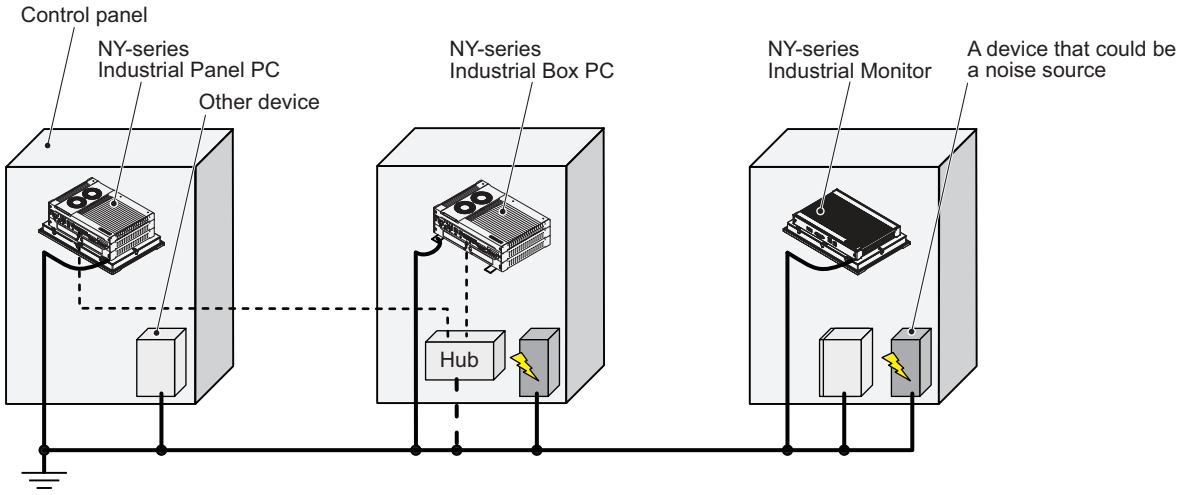
This earthing method is not recommended because the device that could be a noise source may interfere electromagnetically with other devices.



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.

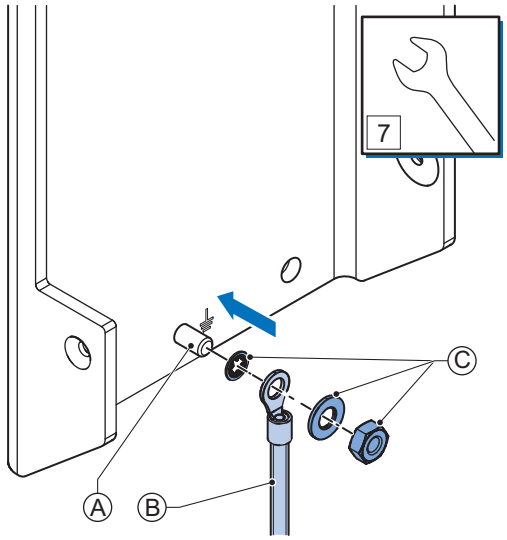


Ground Connection Details

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

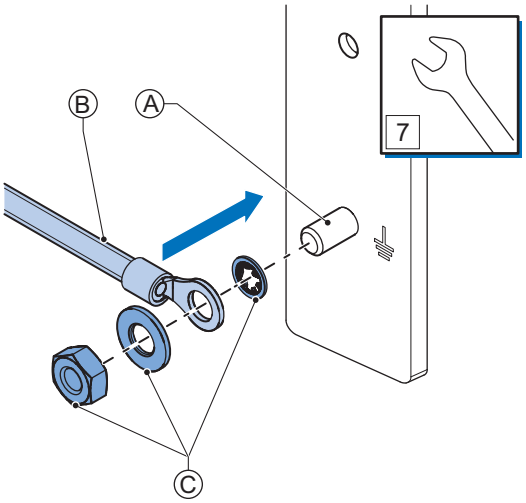
The washers and nut Ⓒ are supplied with the bracket(s).
Refer to *Items Supplied with the Brackets* on page 5 - 4 for details.

Book Mount



Mount the ground connection wire Ⓑ to the functional ground terminal Ⓐ using the washers and nut Ⓒ. Tighten the nut with a torque of 1.2 N·m max.
Refer to *5-3-8 Book Mount Procedure* on page 5 - 26 for book mounting details.

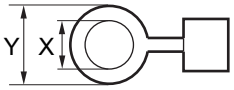
Wall Mount



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 - 27 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.
- Always use the recommended uninterruptible power supply (UPS) to prevent data loss and other system file integrity issues caused by unexpected power interruption. Back up the system files in the planned way to prevent data loss and other system file integrity issues caused by incorrect operation.

Additional Information

- The selected conductor size must match with the used maximum power supply capacity or an overcurrent protection device must be used.
- The used wires and the overcurrent protection device must meet the applicable national standards.
  Standards are:
  - NEC (National Electric Code)
  - CEC (Canadian Electrical Code)
  - international applicable standards
- Refer to *4-1-2 General Electrical Specifications* on page 4 - 4 for electrical specifications.
- Refer to *4-1-3 Power Consumption Specifications* on page 4 - 5 for power consumption specifications.
- Refer to *2-10-11 UPS* on page 2 - 29 for UPS information.

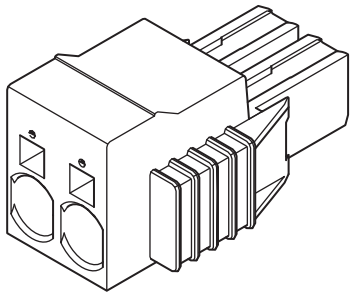
Power Connector Wiring Materials

Use the power supply connector that was supplied to connect the power supply to the Box PC Without Operating System.

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

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

- Power Supply Connector



DC Power Supply

The OMRON S8VK-series power supply is recommended for use with the Box PC Without Operating System.

Additional Information

- Refer to *2-10-10 Power Supply* on page 2 - 28 for more information.
- Refer to *4-1-3 Power Consumption Specifications* on page 4 - 5 for power consumption details.

Power Connector Wiring Procedure

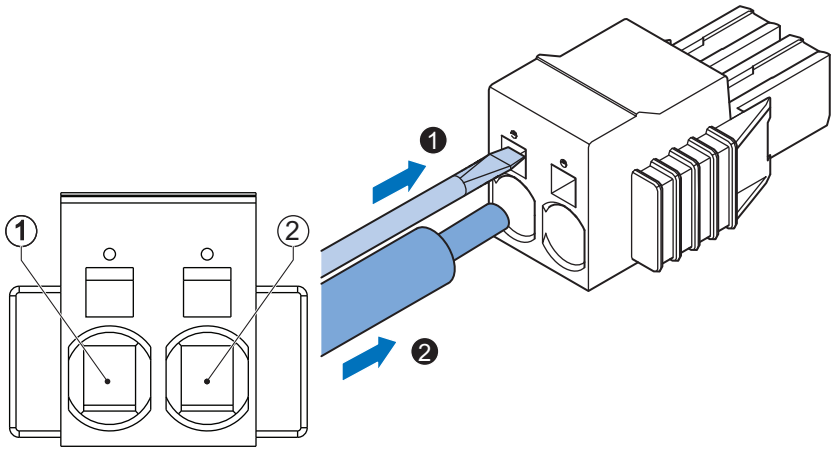
Use the following procedure to wire the power connector.

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.

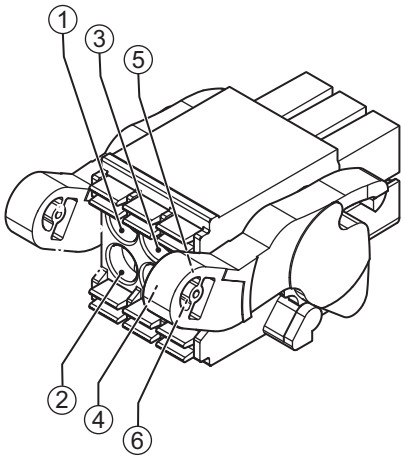
I/O Connector Wiring Materials

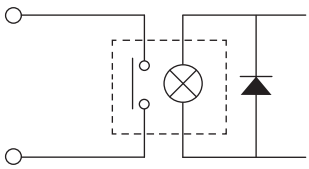
Use the supplied I/O connector to connect the inputs and outputs to the Box PC Without Operating System.
Recommended I/O conductor sizes for the connector are provided in the table.

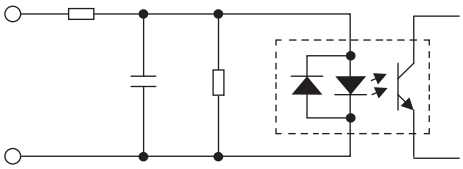
Wire type	Conductor cross-section
Solid conductor	0.2 to 1.5 mm^2
Flexible conductor	
Flexible conductor, with ferrule and no plastic sleeve	0.25 to 1.5 mm^2
Flexible conductor, with ferrule and plastic sleeve	0.25 to 0.75 mm^2
Minimum AWG according to UL/cUL	24
Maximum AWG according to UL/cUL	16

I/O Connections

This section describes I/O connection details.



Pin	Description	Internal Circuit Details
1	Power Status Output	The Power Status Output has an internal relay. Wire this according to the input device connected to the Power Status Output. 
2		

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

Additional Information

- Refer to *4-2-2 I/O Connector Specifications* on page 4 - 19 for I/O connector specifications.
- Refer to *I/O Connector Power Status Output Details* on page 4 - 21 for power status output details.
- Refer to *2-10-11 UPS* on page 2 - 29 for UPS information.

I/O Connector Wiring Procedure

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

1 Remove the sheath from the wires.

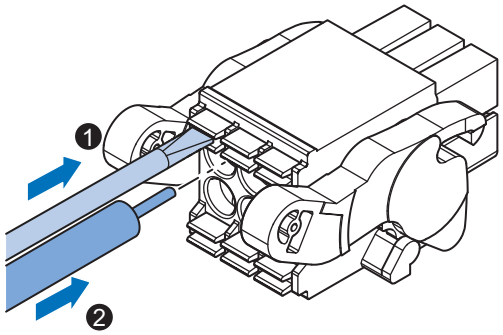
Precautions for Safe Use

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.

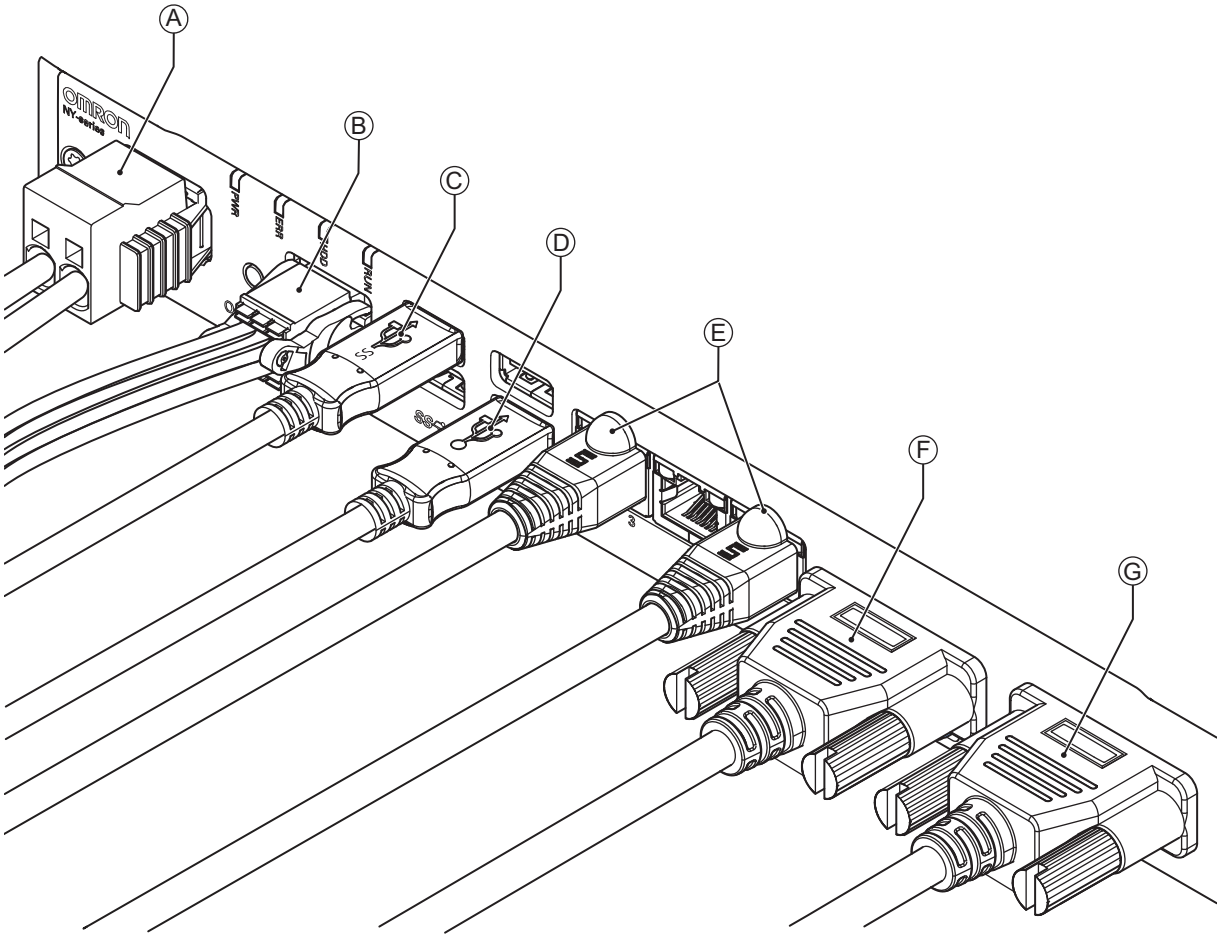
Do not apply stress to the cable after you have connected the wires.

5-5 Connect

This section describes how to connect the Box PC Without Operating System.

5-5-1 Connector Identification

An overview of the connectors of the base layer.



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

5-5-2 Connection Procedure

Use the following procedure to connect the Box PC Without Operating System.
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

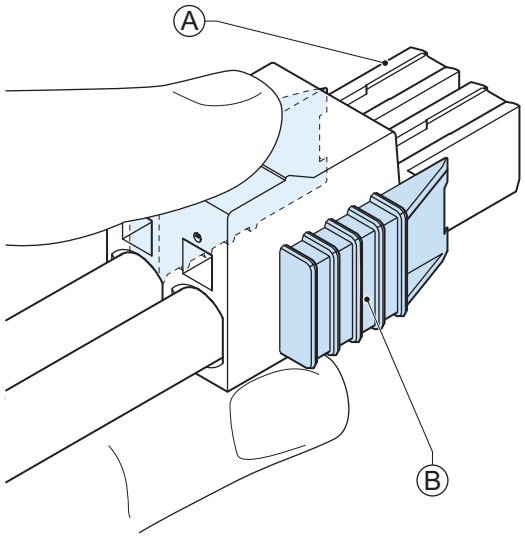
- Refer to *5-3 Mount* on page 5 - 14 for mounting details.
- Refer to:
  - *2-10-6 DVI Cables* on page 2 - 26
  - *2-10-7 USB Type-A to USB Type-B Cables* on page 2 - 26
  - individual cable specifications

  for cable bending requirements and connector clearance.

Use the following procedure to connect the Box PC:

1 Ensure the ground terminal is connected.
Refer to *5-4-2 Ground* on page 5 - 29 for grounding details.

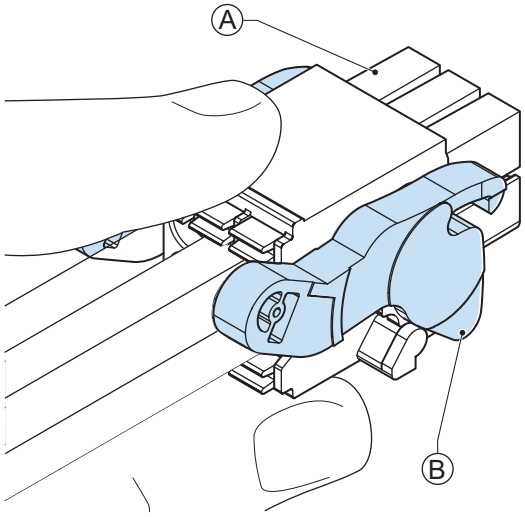
2 Connect the power connector Ⓐ.
Hold the black part to enable the auto-locking mechanism.



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

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

6 Connect the USB ports to peripheral devices .

7 Connect the Box PC to the required Ethernet interface connector(s).
Refer to *4-2-4 Ethernet Connector Specifications* on page 4 - 24 for Ethernet port details.

The Box PC is connected.

5-6 Initial Power ON

This section describes how to Power ON the Box PC Without Operating System 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 Box PC Without Operating System 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.

Additional Information

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

4 Ensure the power supply is ON.

Precautions for Safe Use

Always check the power supply and power connections before applying power.
Incorrect power connections can damage the product or cause burning.

Additional Information

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

5 Press the power button and release within 1 second.
Refer to *2-3 Power Button* on page 2 - 9 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.
- If a Windows operating system is preinstalled:
  - the Windows configuration will automatically start
  - refer to *Windows Startup First Time* for details

6 Verify the ERR LED is OFF.

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

Precautions for Safe Use

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

Additional Information

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

5-7 Install Software

This section describes how to install the software for the Box PC Without Operating System.

5-7-1 Drivers and Custom Software

Use the following procedure to install drivers and custom software on your Box PC Without Operating System.

- For an Industrial PC without Operating System download the drivers from the OMRON website.
- For an Industrial PC with a Windows operating system the drivers for most OMRON devices and common third party devices are already available on the product. They will be installed automatically after the initial Windows configuration or upon connection of a device to the Box PC. Download the drivers from the OMRON website if reinstallation is required.

1 Install drivers that are required for the application.

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

Precautions for Safe Use

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

5-8 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 will shutdown normally without data loss. The Box PC can automatically start up again when the power is restored.

⚠ WARNING

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

Precautions for Safe Use

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

Additional Information

- The minimum power requirements of the UPS are dependent on the power consumption. Refer to *4-1-3 Power Consumption Specifications* on page 4 - 5 for power consumption details.
- Refer to the OMRON website for S8BA specifications and for the *UPS S8BA User's Manual (Cat. No. U702)*.
  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 Box PC Without Operating System when needed.

UPS Drivers and the required software can be downloaded:

- Drivers for the S8BA UPS from this OMRON website.
- Installation files for the Simple Shutdown Software from this OMRON website.
- Installation files for the UPS Setting Utility (Windows only) from this OMRON website.

Precautions for Safe Use

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

Follow the steps below to connect the S8BA UPS with a USB cable and to configure it correctly.

1 Ensure the revision number of the UPS is correct.
Refer to *2-10-11 UPS* on page 2 - 29 for more information.

2 Download the above mentioned software.

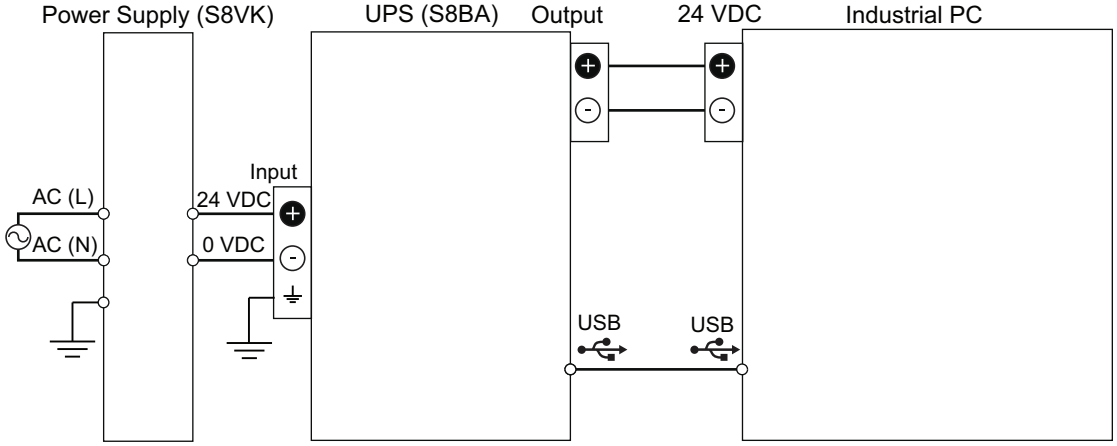
3 Wire the S8BA UPS.

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

(2) Wire the output of the UPS to the power connector of the Box PC.

(3) Ground the UPS.

(4) Connect the USB port of the S8BA UPS to the USB port of the Box PC using the USB cable provided with the S8BA UPS.



Refer to the *UPS S8BA User's Manual (Cat. No. U702)* for details.
Refer to *5-4-3 Wire the Power Connector* on page 5 - 36 for Power Connector details.

4 Supply power to the Power Supply.

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

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

7 Configure the UPS using the UPS Settings Utility.

8 Install the Simple Shutdown Utility.

9 Configure the Simple Shutdown Utility.

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

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

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

The UPS is connected and configured.
The Box PC will shut down properly in case of a power supply interruption and restart automatically when the power is restored.

Additional Information

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

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

The I/O connector of the Box PC Without Operating System:

- receives the power status of the UPS with the UPS Mode Input when the Box PC has a Windows operating system. For other operating systems this input is not functional.
- indicates the power status of the Box PC to the UPS with the Power Status Output.

Additional Information

- A UPS connection using the I/O connector is only possible for a Box PC with a Windows operating system. For all other operating systems use the USB connector to connect the UPS. Refer to *5-8-1 Connect UPS Using the USB Connector* on page 5 - 49 for details.
- The Box PC does not react automatically to the UPS Mode Input. A custom software program is required to shut down the Box PC when needed.

UPS Drivers and the required software can be downloaded:

- Drivers for the S8BA UPS from this OMRON website.
- Installation files for the UPS Setting Utility (Windows only) from this OMRON website.

Precautions for Safe Use

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

Follow the steps below to connect the S8BA UPS to the I/O connector of the Box PC and to configure it correctly.

1 Ensure the revision number of the UPS is correct.
Refer to *2-10-11 UPS* on page 2 - 29 for more information.

2 Download the above mentioned software.

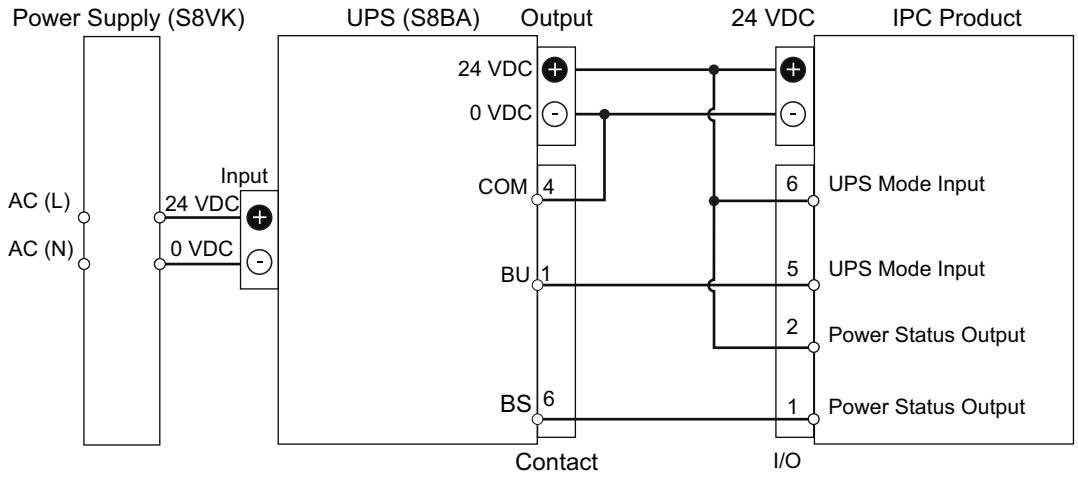
3 Wire the S8BA UPS.

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

(2) Wire the output of the UPS to the power connector of the Box PC.

(3) Ground the UPS.

(4) Connect the Contact port of the S8BA UPS to the I/O port of the Box PC with the connection cable S8BW-02.



Refer to the *UPS S8BA User's Manual (Cat. No. U702)* for details.
Refer to *5-4-3 Wire the Power Connector* on page 5 - 36 for Power Connector details.
Refer to *5-4-4 Wire the I/O Connector* on page 5 - 39 for I/O Connector details.

4 Power ON the Box PC.

5 Configure the UPS.

(1) Connect the USB cable supplied with the UPS to the USB connector of the UPS and to the USB connector of the Box PC.

(2) Configure the UPS using the UPS Settings Utility.

(3) Remove the USB cable between the UPS and the Box PC.

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

7 Create a software program that monitors the UPS Mode Input and initiates Power OFF of the Box PC when the UPS Mode Input becomes active.
Use the Industrial PC System API to obtain the UPS Mode Input status.
Refer to NY-series Software Development Kit User's Manual for Industrial PC System API details.

8 Install the created software program.

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

10 Simulate a power interruption and confirm a correct shutdown of the Box PC.

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

The UPS is connected and configured.
The Box PC will shut down properly in case of a power supply interruption and restart automatically when the power is restored.

Additional Information

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

6

Operating Procedures

This section provides the operating procedures for the Box PC Without Operating System.

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 *2-3 Power Button* on page 2 - 9 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 Box PC is ON and the Operating System, if installed, starts.

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

Start condition: Power is supplied to the 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 Box PC is ON and the Operating System, if installed, starts.

Additional Information

- Refer to *4-2-2 I/O Connector Specifications* on page 4 - 19 for connector specifications.
- Refer to *5-4-4 Wire the I/O Connector* on page 5 - 39 for wiring details.

6-1-3 Auto Power ON

The 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 BIOS* on page A - 2 for BIOS details.

6-2 Power OFF

This section provides Power OFF details.
Before following power OFF procedures below, check that the Box PC Without Operating System is ON by examining the LED indicators on the Box PC.

6-2-1 Power OFF Using the Operating System Shut Down

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

2 Select **Shut down** of the Operating System.
The Box PC will shut down.

3 Wait until the PWR LED is OFF.

The Box PC is powered OFF.

6-2-2 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 Box PC Without Operating System within 1 second.
The Box PC Without Operating System will shutdown.
Note that this behaviour of can be reconfigured with the Power Options settings.
Refer to *2-3 Power Button* on page 2 - 9 for power button location information.

3 Wait until the PWR LED is OFF.

The Box PC is powered OFF.

Additional Information

The Box PC will restart automatically if a UPS is connected to the I/O connector of the Box PC. Use the Power button of the UPS or remove the input power from the UPS for a normal shut-down of the Box PC.

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

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

2 Supply a 24 VDC signal to the Power ON/OFF Input (pins 3 and 4) of the I/O connector.
The input signal must remain ON for a minimum of 60 ms and a maximum of 750 ms to be correctly detected by the Box PC Without Operating System.
The Box PC Without Operating System will shutdown.
Note that this behaviour can be reconfigured with the Power Options settings.

3 Wait until the PWR LED is OFF.

The Box PC is powered OFF.

Additional Information

- Refer to *4-2-2 I/O Connector Specifications* on page 4 - 19 for connector specifications.
- Refer to *5-4-4 Wire the I/O Connector* on page 5 - 39 for wiring details.

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

Precautions for Safe Use

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

1 Ensure all programs are closed.
If required, close all active programs to prevent losing unsaved data.

2 Press and hold the power button on the Box PC for 5 to 10 seconds.
Refer to *2-3 Power Button* on page 2 - 9 for power button location information.
The Box PC Without Operating System will power OFF.
Any optional operating system settings related to power OFF will be disregarded.

3 Wait until the PWR LED is OFF.

The Box PC is powered OFF.

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

7

Maintenance

This section provides an overview of all maintenance tasks for the Box PC Without Operating System.

7-1 Preventive Maintenance

Preventive Maintenance covers all actions that prevent downtime.

7-1-1 Preventive Maintenance Schedule

Prevent unscheduled downtime with the following preventive maintenance schedule.

Daily	Reference
Check Box PC Without Operating System status	• Refer to *7-2-1 Warning and Error Messages* on page 7 - 4 for Box PC Messages. • Refer to *2-2 LED Indicators* on page 2 - 7 for LED details.
Monitor storage devices that do not comply to the Omron specifications	Refer to *Storage Device Considerations* on page 2 - 25 for 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 Box PC Without Operating System	---

Periodically but at least every 6 months	Reference
Check the ambient environment: • Temperature and humidity within specifications • Noise sources not close to the Box PC Without Operating System	Refer to *4-3 Environmental Specifications* on page 4 - 31 for environmental specifications.
Check installation: Box PC Without Operating System mounted securely	Refer to *5-3 Mount* on page 5 - 14 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 - 28 for wiring details. Refer to *5-5 Connect* on page 5 - 42 for connection details.
For a cooling layer with removable cover: • 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 - 5 to check the label. • Refer to *7-2-4 Replace the Battery* on page 7 - 8 to replace the battery.

Periodically but at least every 6 months	Reference
Check that the backup of the Box PC Without Operating System is available and operational.	---

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

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:

- Internet browser
- Operating system 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.

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 Box PC Without Operating System 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 Box PC Without Operating System.
Error messages inform you about what caused the downtime of the Box PC Without Operating System.

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 - 8 for ERR details.

7-2-2 Remove the Cover

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

The Cover of the cooling layer provides access to the following items.

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

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

No tools are required to open the Cover.

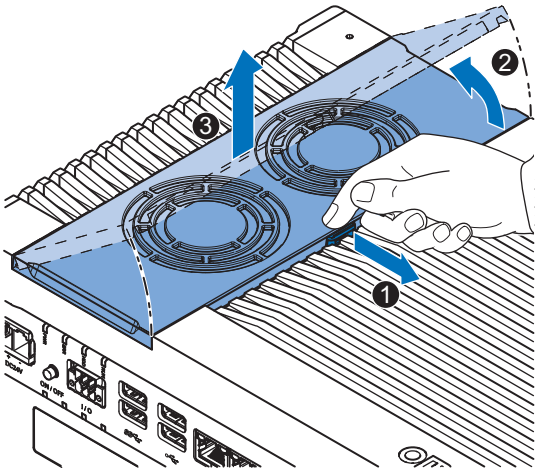
Use the following procedure to remove the Cover of the Box PC.

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

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

Additional Information

Refer to *2-9-2 Fan Unit* on page 2 - 20 for the model.

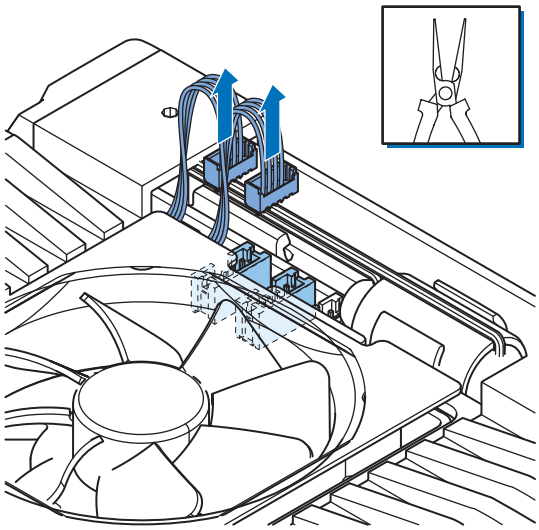
1 Power OFF the Box PC.

2 Remove the Cover of the Box PC.

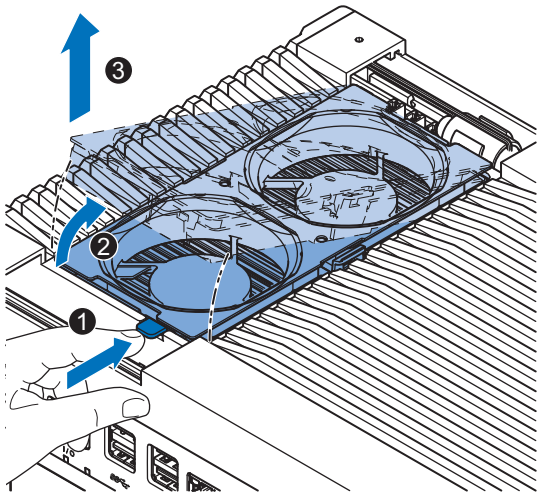
Additional Information

Refer to *7-2-2 Remove the Cover* on page 7 - 5 for the cover removal procedure.

3 Disconnect the Fan Connectors from the board.



4 Replace the complete Fan Unit.



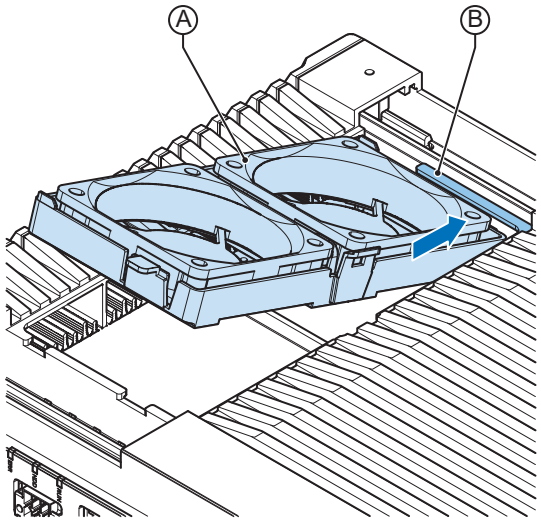
(1) Push the lever ❶ to unlock the Fan Unit.

(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

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

Precautions for Safe Use

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

Precautions for Correct Use

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

Additional Information

- Refer to *2-9-1 Battery* on page 2 - 20 for the battery model.

Use the following procedure to replace the battery:

1 Power OFF the Box PC.

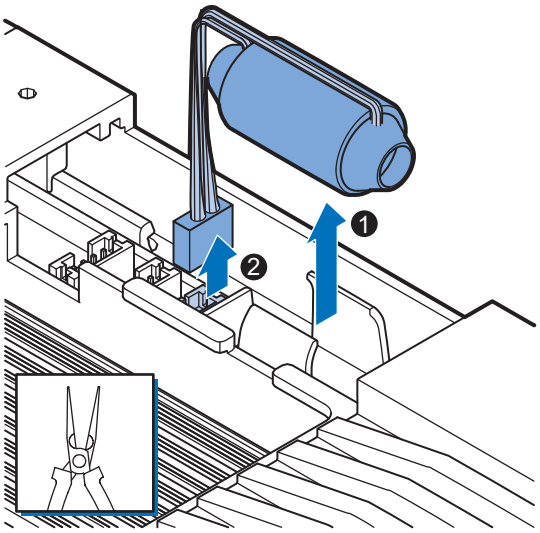
2 Remove the cover.

Additional Information

Refer to *7-2-2 Remove the Cover* on page 7 - 5 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.
Ensure the wires are at the side of the battery and not on top of the battery. If the wires are on top of the battery this might make closing and opening the cover more difficult.

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

Additional Information

Refer to *2-9-1 Battery* on page 2 - 20 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 the operating system.
Correct the Date and Time if this is required.

The battery is replaced and the alarm is reset.

7-2-5 Replace a Drive

Use the following procedure to replace a drive.

Prepare the new drive.

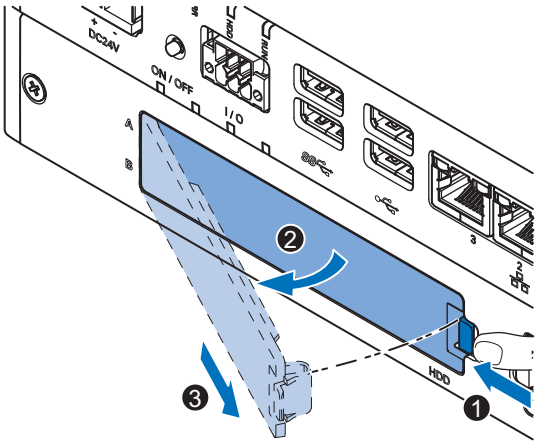
Additional Information

- Refer to *1-4 Product Configuration* on page 1 - 5 for the installed drive model.
- Refer to *2-10-5 HDD and SSD Storage Devices* on page 2 - 25 for the available drive models.
- Refer to *4-1-7 Storage Device Specifications* on page 4 - 11 for drive specifications.

To replace a drive:

1 Power OFF the Box PC.

2 Remove the drive cover.



(1) Push the lock lever ❶.

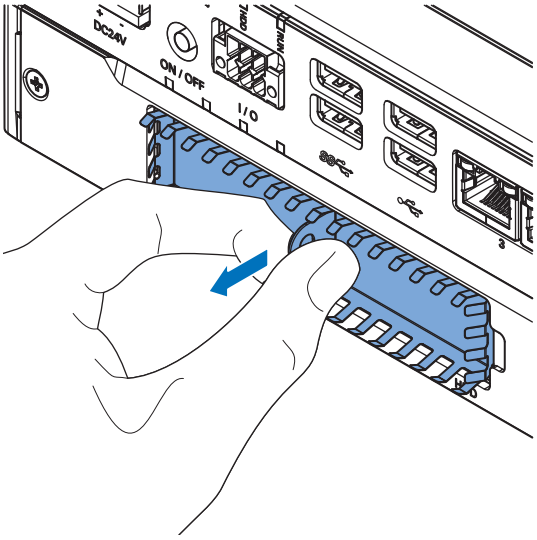
(2) Tilt the cover ❷.

(3) Remove the drive cover ❸.

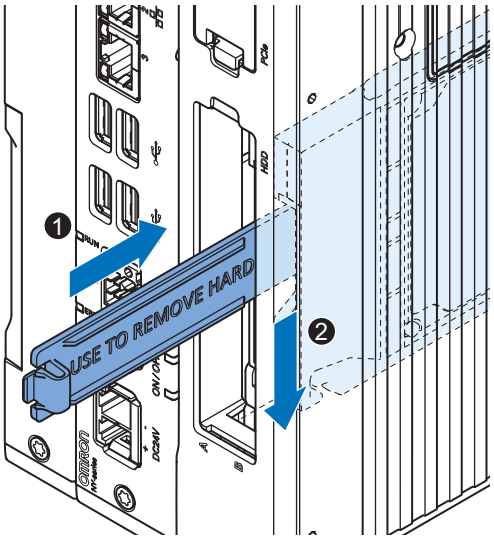
Additional Information

- Refer to *2-7 Drive Bays* on page 2 - 18 for the location of the drive cover.
- The Box PC has 2 drive bays, marked with "A" and "B" at the left side of the drive cover. Take note of the bay position for the drive that is being removed and do not place a drive in the incorrect bay.

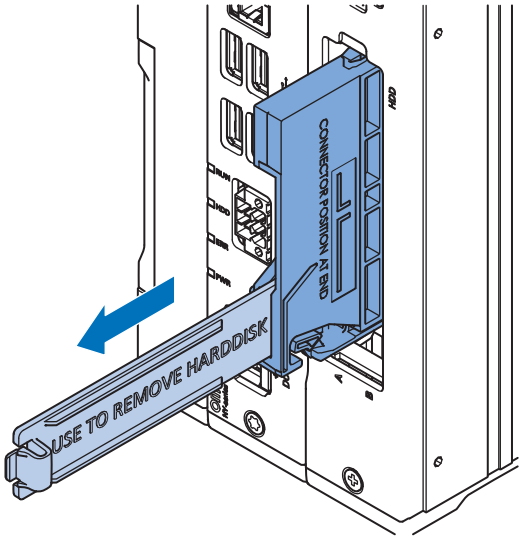
3 Pull the metal shielding cover out of the Box PC.



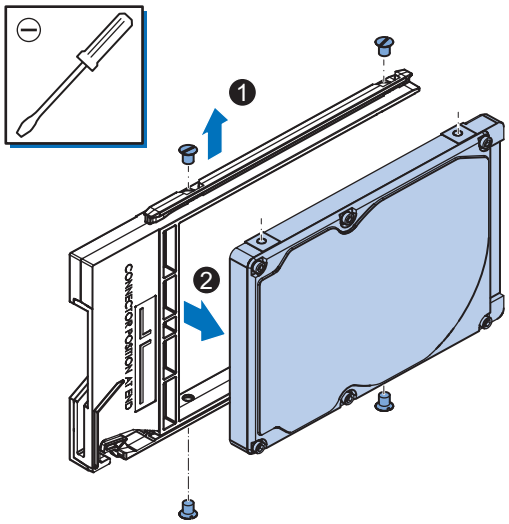
4 Insert the drive cover in the drive bracket bay ❶ and move it down ❷ so that it locks in the drive bracket.



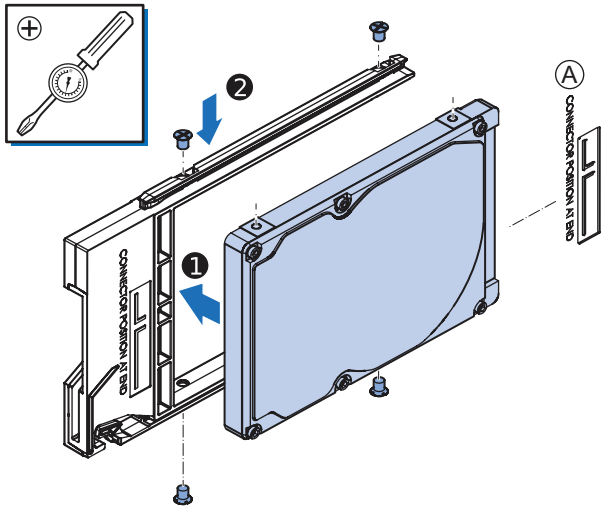
5 Remove the drive bracket from the Box PC using the drive cover.



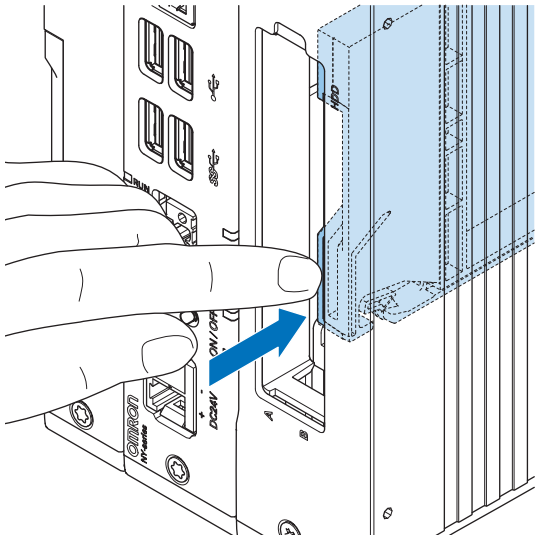
6 Remove the 4 mounting screws ❶ and then remove the drive ❷ from the drive bracket.



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.

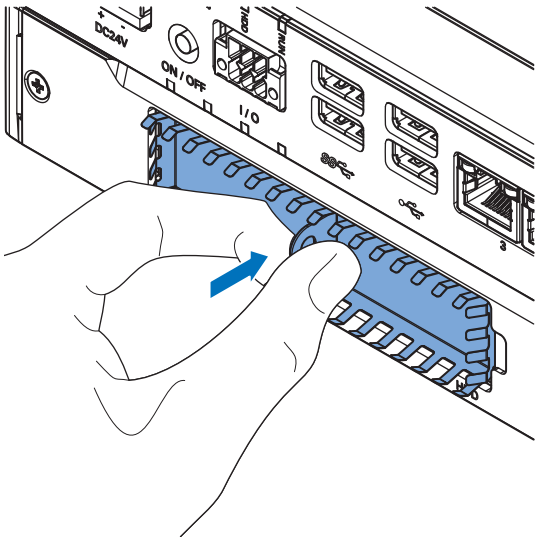


8 Insert the bracket with the replacement drive into the correct bay of the Box PC. Ensure the bracket is completely in the Box PC with an extra push.



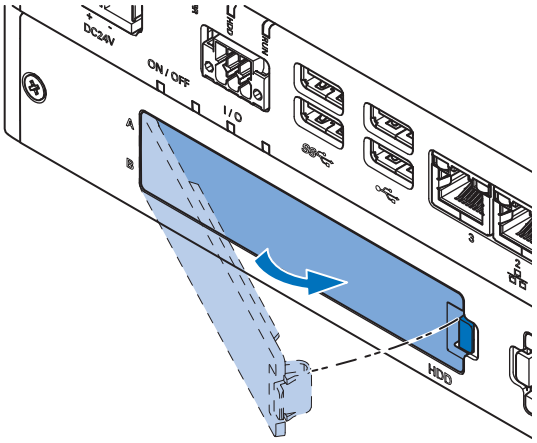
The drive bracket will lock into place when it is fully inserted.

9 Insert the metal shielding cover.



10 Mount the drive cover.

The lock lever will click when closed correctly.



11 Restore the drive data.

- For products *NYB*□□ and *NYP*□□:
  - For an Industrial PC with RTOS Controller restore the drive data from a backup.
  - For an Industrial PC without Operating System restore the drive data from a backup.
  - For an Industrial PC with a Windows operating system refer to the restore procedure in the section *Corrective Maintenance* to restore data.
- For products *NY5*□2 refer to the *NY-series IPC Machine Controller Industrial Panel PC / Industrial Box PC Setup User's Manual (Cat. No. W568)* to restore data from a backup.

12 Finalize the drive replacement.

If the Box PC has a Windows operating system and the storage drive is not visible in Windows then the drive needs to be allocated.

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 *4-1-8 PCIe Card Specifications* on page 4 - 14 for PCIe specifications.

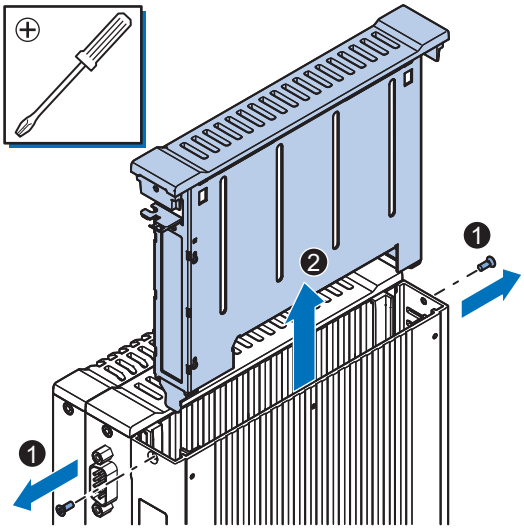
- The PCIe Card mounting materials: Card Clip and Card Support
  These are supplied with the Box PC Without Operating System.

To replace the PCIe Card:

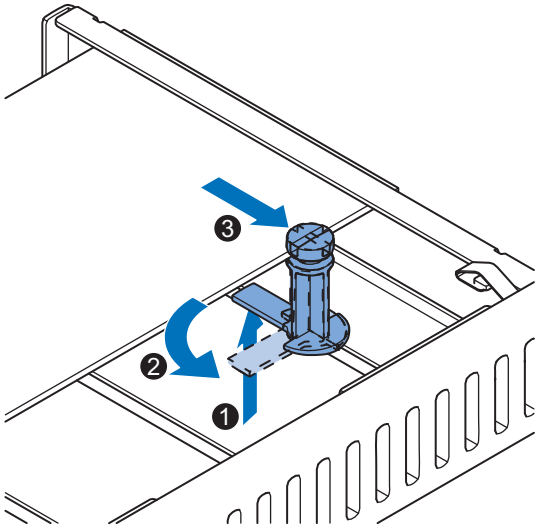
1 Power OFF the system.

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.



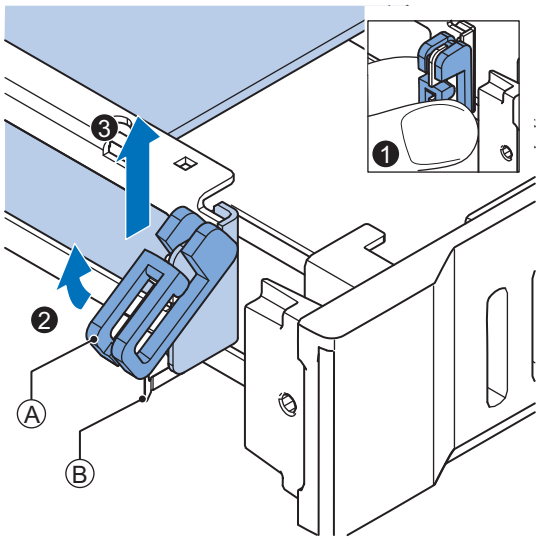
4 Push the notch ❶ at the bottom of the Card Support up and rotate ❷ the Card Support. Slide the Card Support ❸ away from the card to create space and to remove it.



5 Grip the Card Clip Ⓐ on the sides ❶. Pull the middle of the Card Clip to unlock it ❷ and remove it ❸ from the PCIe Drawer.

⚠ Caution

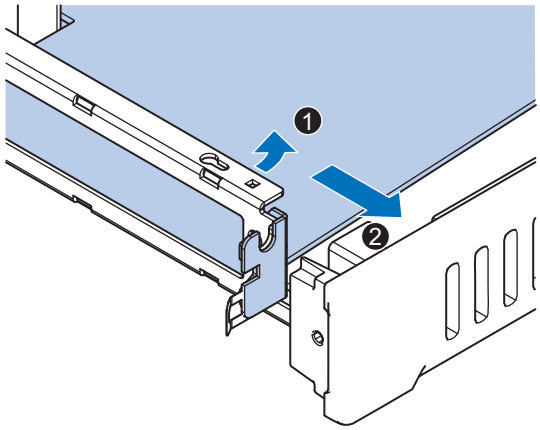
When installing or removing a PCIe card, ensure to grip the Card Clip on the sides to prevent contact with the sharp edges of the sheet metal frame tab. Injury may result.



Ⓐ Card Clip

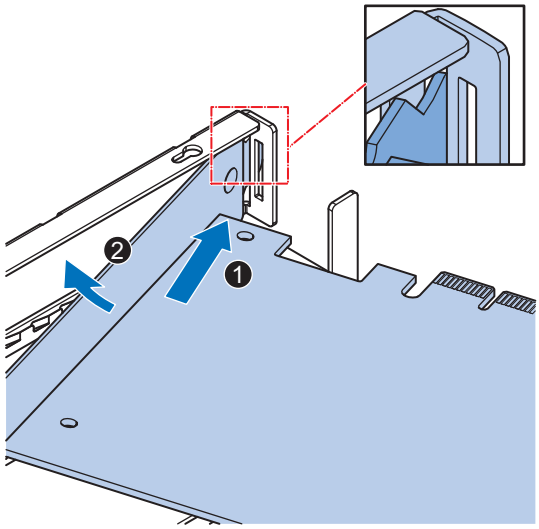
Ⓑ Sheet metal frame tab

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.

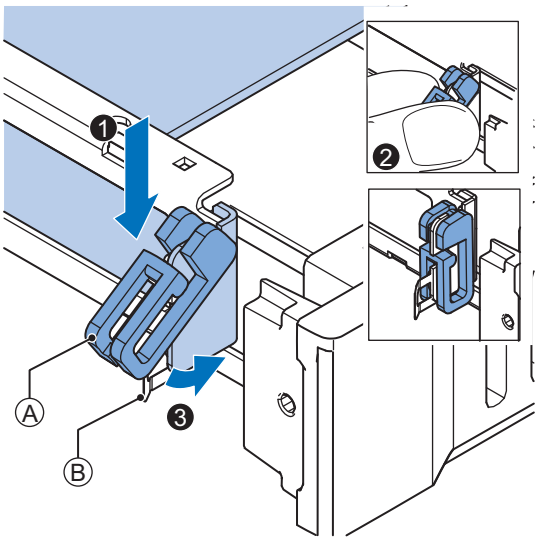


Ensure the PCIe Card is inserted into the correct opening.

8 Place the Card Clip Ⓐ in the PCIe Card and PCIe Drawer ❶, grip the Card Clip on the sides ❷ and then rotate the Clip ❸ to lock it in place.

⚠ Caution

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

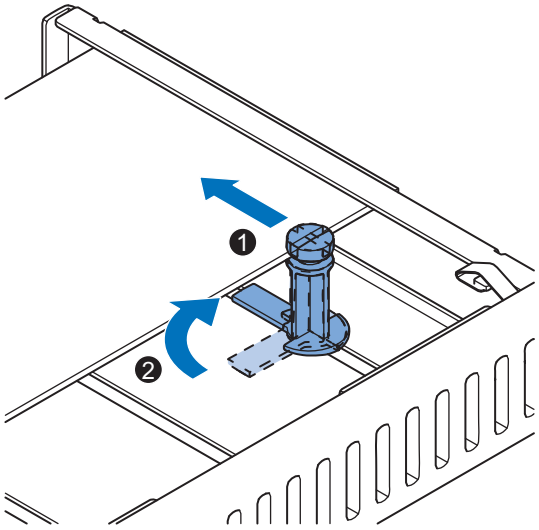


Ⓐ Card Clip

Ⓑ Sheet metal frame tab

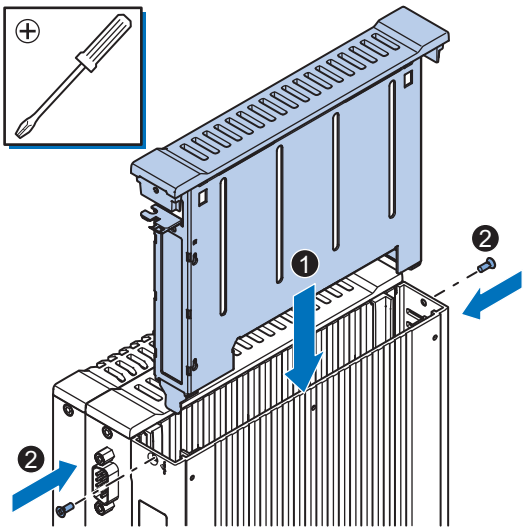
9 Slide the Card Support ❶ so that it supports the side of the PCIe Card.

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 Replace the CFast Card

Use the following procedure to replace the CFast Card.

Prepare the new CFast Card.

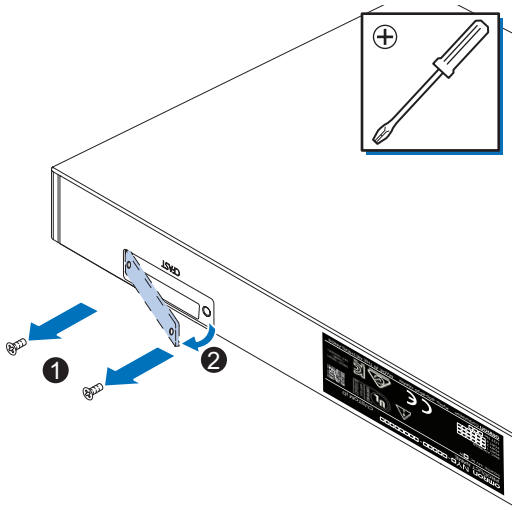
Additional Information

- Refer to *1-4 Product Configuration* on page 1 - 5 for the installed CFast Card model.
- Refer to *2-10-4 CFast Cards* on page 2 - 24 for the available CFast Card models.
- Refer to *CFast Card Specifications* on page 4 - 13 for specification details.

To replace the CFast Card:

1 Power OFF the Box PC.

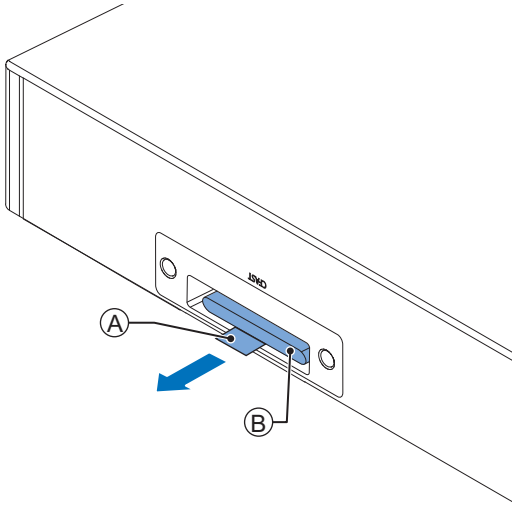
2 Remove the CFast Card slot cover.



(1) Remove the two screws ❶.

(2) Remove the cover ❷.

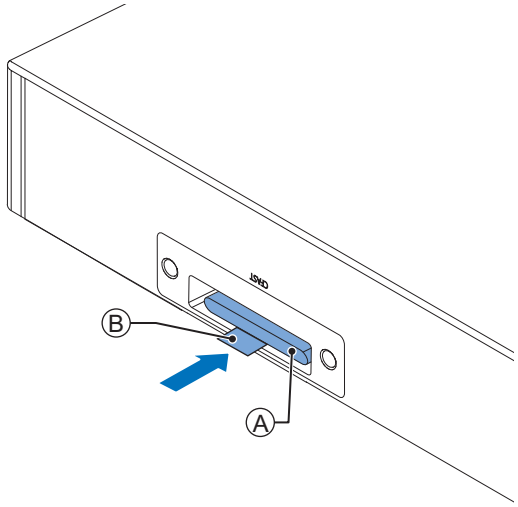
3 Pull the plastic Pull Tab Ⓐ to remove the CFast Card Ⓑ from the Box PC.



4 Insert the replacement CFast Card Ⓐ into the slot of the Box PC.

Ensure the CFast Card Ⓐ is completely in the Box PC with an extra push using the CFast Card slot cover.

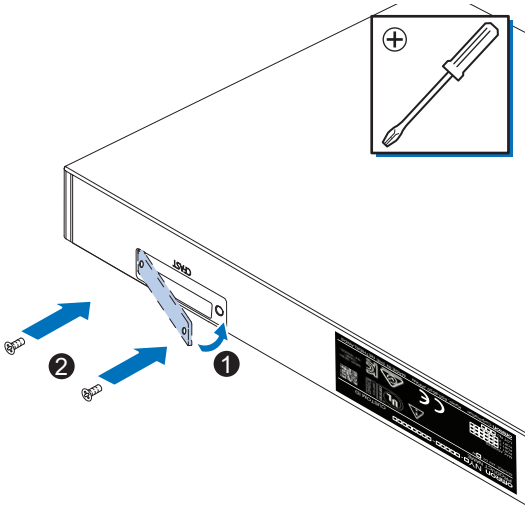
If the CFast Card can not go in completely then the CFast Card orientation is incorrect. Remove the CFast Card, turn it upside down and reinsert it. Ensure the CFast Card Ⓐ is completely in the Box PC with an extra push using the CFast Card slot cover.



Fold the plastic Pull Tab Ⓑ up so it stays inside the slot area.

5 Mount the CFast Card slot cover.

Place the slot cover ❶ and then mount the screws ❷.



6 Restore the drive data.

For products *NYB*□□ and *NYP*□□:

- For an Industrial PC without Operating System restore the drive data from a backup.
- For an Industrial PC with a Windows operating system refer to the restore procedure in the section *Corrective Maintenance* to restore data.

7 Finalize the drive replacement.
If the Box PC has a Windows operating system and the storage drive is not visible in Windows then the drive needs to be allocated.

The CFast Card is replaced.

A

Appendices

A-1 BIOS

This section provides the BIOS information of the Box PC Without Operating System.

⚠ 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 Box PC Without Operating System.
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:

- **Main**
- **Advanced**
- **Chipset**
- **Security**
- **Boot**
- **Save & Exit**

BIOS Navigation and Function Keys

The right part of the BIOS screens is divided in two parts.

Top part.
Provides additional information on selected screens or parameters.
Bottom part.
Provides information on Keys.

- →← : Select Screen
  Changed between different BIOS pages.
- ↑↓ : Select Item
  Changed between different parameters.
- **Enter: Select**
  Selects the parameter that has the focus and displays a submenu or the possibility to change the parameter.
- **+ / - : Change Option**
  Change settings. A numerical value will be increased or decreased. A boolean value will toggle.
- **F1: General Help**
  Displays help information.
- **F2: Previous Values**
  Changes all parameters to the values they had when entering the BIOS.
- **F9: Optimized Defaults**
  Changes all settings to the default values.
- **F10: Save & Exit**
  Saves all changes and exits the BIOS.
- **ESC: Exit**
  Go one level up. For parameters this is the previous level. For the main pages this exits the BIOS.

BIOS Password & Write Protection

A BIOS password protects the BIOS setup program from unauthorized access. This ensures that users cannot change the system configuration without authorization. With an assigned BIOS password, the BIOS prompts the user for a password on a setup entry. If the password entered is wrong, the BIOS setup program will not launch.
The BIOS uses encryption for the password.
The BIOS password is case sensitive with a minimum of 3 characters and a maximum of 20 characters. Once a BIOS password has been assigned, the BIOS activates the grayed out **BIOS Update and Write Protection** option. If this option is set to **enabled**, only authorized users (users with the correct password) can update the BIOS. With the BIOS password protection and the BIOS update and write protection, the system configuration is completely secured. If the BIOS is password protected, you cannot change the configuration of an end application without the correct password.

A-1-2 BIOS for 4th generation CPUs

The BIOS settings for 4th generation CPUs.

The BIOS is divided in the pages Main, Advanced, Chipset, Security, Boot and Save&Exit.

BIOS - Main

The main setup screen gives platform information about the BIOS, Board Information, Firmware Revision, MAC Addresses and information about the number of Boots and the Running Time.

Changeable BIOS Main parameters and their factory default values:

- **System Date**
  Use the **Enter** key to the next Date field.
- **System Time**
  Use the **Enter** key to the next Time field.

BIOS - Advanced

This section provides Advanced BIOS information for 4th generation CPUs.

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		Disabled
	ACPI Sleep State		Suspend Disabled
	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		Smart 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.

BIOS - Chipset

This section provides Chipset information for 4th generation CPUs.

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.

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 Box PC Without Operating System will stay OFF when power is supplied to the power connector
Turn ON: The Box PC Without Operating System will automatically start up when power is supplied to the power connector.
Last State: The Box PC Without Operating System will start up or remain OFF when power is supplied based on the Box PC Without Operating System 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

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

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-1-3 BIOS for 6th generation CPUs

The BIOS settings for 6th generation CPUs.

The BIOS is divided in the pages Main, Advanced, Chipset, Security, Boot and Save&Exit.

BIOS - Main

The main setup screen gives platform information about the BIOS, Board Information, Firmware Revision, MAC Addresses and information about the number of Boots and the Running Time. Platform Information gives CPU and platform details.

Changeable BIOS Main parameters and their factory default values:

- **System Date**
  Use the **Enter** key to the next Date field.
- **System Time**
  Use the **Enter** key to the next Time field.

BIOS - Advanced

This section provides Advanced BIOS information for 6th generation CPUs.

Changeable BIOS Advanced parameters and their factory default values:

Item			Default / Remark
Intel RC ACPI Settings	PTID Support		Disabled
	PECI Access Method		Direct I/O
	Native PCI Express Support		Enabled
	Native ASPM		Disabled
	BDAT ACPI Table Support		Disabled
	Wake system from S5		Disabled
	ACPI Debug		Disabled
	Low Power S0 Idle Capability		Disabled
	Lpit Recidency Counter		SLP S0
	PCI Delay Optimization		Disabled
	ZpODD Support		Disabled
CPU	SW Guard Extensions (SGX)		Software Controlled
	Select Owner EPOCH input type		No Change in Owner EPOCHs
	CPU Flex Ratio Override		Disabled
	Hardware Prefetcher		Enabled
	Adjacent Cache Line Prefetch		Enabled
	Intel (VMX) Virtualization Technology		Enabled
	PECI		Enabled
	Active Processor Cores		All
	Hyper-Threading		Enabled
	BIST		Disabled
	JTAG C10 Power		Disabled
	AP threads Idle Manner		MWAIT Loop
	AP threads Handoff Manner		MWAIT Loop
	AES		Enabled
	MachineCheck		Enabled
	MonitorMWait		Enabled
	Intel Trusted Execution Technology		Disabled
	Reset AUX Content		No
	Flash Wear Out Protection		Disabled
	Debug Interface		Disabled
	Debug Interface Lock		Enabled
	Processor trace memory allocation		Disabled
	CPU SMM Enhance-ment	SMM Code Access Check	Enabled
		SMM Use Delay Indication	Enabled
		SMM Use Block Indication	Enabled
	FCLK Frequency for Early Power On		1 GHz
	Three Strike Counter		Enabled
	Voltage Optimization		Auto

Item			Default / Remark
Power & Performance	CPU - Power Management Control	Boot performance mode	Max Non-Turbo Performance
		Intel ® SpeedStep ™	Enabled
		Race To Halt (RTH)	Enabled
		Intel ® Speed Shift Technology	Enabled
		HDC Control	Enabled
		Turbo Mode	Enabled
	CPU - Power Management Control /View/Configure Turbo Options		
		Package Power Limit MSR Lock	Disabled
		1-Core Ratio Limit Override	37
		2-Core Ratio Limit Override	36
		3-Core Ratio Limit Override	35
		4-Core Ratio Limit Override	33
		Energy Efficient Turbo	Enabled
	CPU - Power Management Control /Config TDP Configurations		
		Configurable TDP Boot Mode	Nominal
		Configurable TDP Lock	Disabled
		CTDP BIOS control	Disabled
		Power Limit 1	0
		Power Limit 2	0
		Power Limit 1 Time Window	0
		ConfigTDP Turbo Activation Ratio	0
		Power Limit 1	0
		Power Limit 2	0
		Power Limit 1 Time Window	0
		ConfigTDP Turbo Activation Ratio	0
	CPU - Power Management Control / CPU VR Settings		
		PSYS Slope	0
		PSYS Offset	0
		PSYS PMax Power	0
		Acoustic Noise Settings	Acoustic Noise Mitigation = Disabled

Item			Default / Remark
Power & Performance	CPU - Power Management Control / CPU VR Settings / System Agent VR Settings and CPU - Power Management Control / CPU VR Settings / Core/IA VR Settings and CPU - Power Management Control / CPU VR Settings / GT-UnSliced VR Settings and CPU - Power Management Control / CPU VR Settings / GT-Sliced VR Settings		
		VR Config Enable	Enabled
		AC Loadline	0
		DC Loadline	0
		PS Current Threshold1	80
		PS Current Threshold2	20
		PS Current Threshold3	4
		PS3 Enable	Enabled
		PS4 Enable	Enabled
		IMON Slope	0
		IMON Offset	0
		IMON Prefix	+
		VR Current Limit	0
		VR Voltage Limit	0
		TDC Enable	Enabled
		TDC Current Limit	0
		TDC Time Window	1 ms
		TDC Lock	Disabled
	CPU - Power Management Control / CPU VR Settings		
		VR Mailbox Command options	0
		Intersil VR Command	Send for IA/GT/SA rails
	CPU - Power Management Control	Platform PL1 Enable	Disabled
		Platform PL2 Enable	Disabled
		Power Limit 4 Override	Disabled
		C states	Disabled
		Thermal Monitor	Enabled
		Interrupt Redirection Mode Selection	PAIR with Fixed Priority
		Timed MWAIT	Disabled
		Custom P-state Table	Number of P states = 0
		Energy Performance Gain	Disabled
		Power Limit 3 Settings	Power Limit 3 Override = Disabled
		CPU Lock Configuration	CFG Lock = Enabled Overclocking Lock =Disabled
	GT - Power Management Control	Maximum GT frequency	Default Max Frequency

Item			Default / Remark
PCH-FW Configuration	Comms Hub Support		Disabled
	JHI Support		Disabled
	Core Bios Done Message		Enabled
	Firmware Update Configuration	Me FW Image Re-Flash	Disabled
	PTT Configuration	TPM Device Selection	dTPM
	ME Debug Configuration	HECI Timeouts	Enabled
		Force ME DID Init Status	Disabled
		CPU Replaced Polling Disable	Disabled
		ME DID Message	Enabled
		HECI Retry Disable	Disabled
		HECI Message check Disable	Disabled
		MBP HOB Skip	Disabled
		HECI2 Interface Communication	Disabled
		KT Device	Enabled
		IDER Device	Enabled
		End Of Post Message	Send in DXE
		DOI3 Setting for HECI Disable	Disabled
Thermal Configuration	CPU Thermal Configuration	DTS SMM	Disabled
		Tcc Activation Offset	0
		Tcc Offset Time Window	Disabled
		Tcc Offset Clamp Enable	Disabled
		Tcc Offset Lock Enable	Disabled
		Bi-directional PROCHOT#	Enabled
		Disable PROCHOT# Output	Enabled
		Disable VR Thermal Alert	Disabled
		PROCHOT Response	Disabled
		PROCHOT Lock	Disabled
		ACPI T-States	Disabled
		PECI Reset	Disabled
		PECI C10 Reset	Disabled
	Platform Thermal Configuration	PCH Thermal Device	Enabled in PCI mode
		PCH Temp Read	Enabled
		CPU Energy Read	Enabled
		CPU Temp Read	Enabled
		Alert Enable Lock	Disabled
	DPTF Configuration	DPTF	Disabled
Intel ICC	ICC/OC Watchdog Timer		Disabled
Watchdog	POST Watchdog		Disabled
	Runtime Watchdog		Disabled

Item			Default / Remark
Hardware Health Monitoring	Fan PWM Frequency Mode		High Frequency
	Fan PWM Frequency (kHz)		31
	Pulses Per Revolution		2
	Default Fan Speed		60%
	Automatic Fan Speed Control		Enabled
	Fan Control Temperature		CPU Temperature
	Lower Temperature Limit		50 C
	Upper Temperature Limit		80 C
	Minimum Fan Speed		40%
	Mid Range Bottom Fan Speed		60%
	Mid Range Top Fan Speed		80%
	Maximum Fan Speed		100%
Trusted Computing	Security Device Support		Enable
	SHA-1 PCR Bank		Enabled
	SHA256 PCR Bank		Enabled
	Pending operation		None
	Platform Hierarchy		Enabled
	Storage Hierarchy		Enabled
	Endorsement Hierarchy		Enabled
	TPM2.0 UEFI Spec Version		TCG_2
	Physical Presence Spec Version		1.3
	Device Select		Auto
ACPI	Enable ACPI Auto Configuration		Disabled
	Hibernation Support		Disabled
	ACPI Sleep State		Suspend Disabled
	Lock Legacy Resources		Disabled
	S3 Video Repost		Disabled
	Automatic Critical Trip Point		Enabled
	Lid Button Support		Disabled
	Sleep Button Support		Disabled
SMART Settings	SMART Self Test		Disabled
Acoustic Management	Acoustic Management Configuration		Disabled
PCI Configuration	PCI Latency Timer		32 PCI Bus Clocks
	PCI-X Latency Timer		64 PCI Bus Clocks
	VGA Palette Snoop		Disabled
	PERR# Generation		Disabled
	SERR# Generation		Disabled
	Above 4G Decoding		Disabled
	PCI Hot-Plug Settings	BIOS Hot-Plug Support	Enabled
		PCI Buses Padding	1
		I/O Resoruces Padding	4 K
		MMIO 32 bit Resources Padding	16 M
		PFMMIO 32 bit Resources Padding	16 M
UEFI Network Stack	UEFI Network Stack		Disabled

Item		Default / Remark
CSM & Option ROM Control	CSM Support	Enabled
	Gate A20 Active	Upon Request
	Option ROM Messages	Force BIOS
	INT19 Trap Response	Immediate
	Boot Option Filter	UEFI and Legacy
	PXE Option ROM Launch Policy	UEFI ROM Only
	Storage Option ROM Launch Policy	UEFI ROM Only
	Video Option ROM Launch Policy	Legacy ROM Only
	Other Option ROM Launch Policy	UEFI ROM Only
SDIO Configuration	SDIO Access Mode	Auto
USB	Overcurrent Protection	Disabled
	Legacy USB Support	Enabled
	xHCI Hand-off	Enabled
	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
Diagnostic Settings	Relay Interface	Disabled
	BC Diagnostic Console Interface	Disabled

BIOS - Chipset

Provides BIOS Chipset settings for 6th generation CPUs.

Changeable BIOS Chipset parameters and their factory default values:

Item			Default / Remark
Processor (Integrated Components)	Memory Configuration / Memory Thermal Configuration		Refer to *Memory Thermal Configuration* on page A - 42 for details.
	Memory Configuration / Memory Training Algorithms		
		Early Command Training	Disabled
		SenseAmp Offset Training	Enabled
		Early ReadMPR Timing Centering 2D	Enabled
		Read MPR Training	Enabled
		Receive Enable Training	Enabled
		Jedec Write Leveling	Enabled
		Early Write Time Centering 2D	Enabled
		Early Write Drive Strength / Equalization	Enabled
		Early Read Time Centering 2D	Enabled
		Write Timing Centering 1D	Enabled
		Write Voltage Centering 1D	Enabled
		Read Timing Centering 1D	Enabled
		Dimm ODT Training*	Enabled
		Max RTT_WR	ODT Off
		DIMM RON Training*	Enabled
		Write Drive Strength/Equalization 2D*	Disabled
		Write Slew Rate Training*	Enabled
		Read ODT Training*	Enabled
		Read Equalization Training*	Enabled
		Read Amplifier Training*	Enabled
		Write Timing Centering 2D	Enabled
		Read Timing Centering 2D	Enabled
		Command Voltage Centering	Enabled

Item			Default / Remark
Processor (Integrated Components)	Memory Configuration / Memory Training Algorithms		
		Write Voltage Centering 2D	Enabled
		Read Voltage Centering 2D	Enabled
		Late Command Training	Enabled
		Round Trip Latency	Enabled
		Turn Around Timing Training	Enabled
		Rank Margin Tool	Disabled
		Memory test	Disabled
		DIMM SPD Alias Test	Enabled
		Receive Enable Centering 1D	Enabled
		Retrain Margin Check	Enabled
		Write Drive Strength Up/Dn independently	Disabled
		CMD Slew Rate Training	Enabled
		CMD Drive Strength / Tx Equalization	Enabled
		CMD Normalization	Enabled
	Memory Configuration	MRC ULT Safe Config	Disabled
		Maximum Memory Frequency	Auto
		HOB Buffer Size	Auto
		ECC Support	Enabled
		Max TOLUD	Dynamic
		SA GV	Fixed High
		Retrain on Fast Fail	Enabled
		Command Tristate	Enabled
		Enable RH Prevention	Enabled
		Row Hammer Solution	Hardware RHP
		RH Activation Probability	1/2^11
		Exit On Failure (MRC)	Enabled
		MC Lock	Enabled
		Probeless Trace	Disabled
		Enable/Disable IED (Intel Enhanced Debug)	Disabled
		Ch Hash Support	Enabled
		Ch Hash Mask	0
		Ch Hash Interleaved Bit	BIT8
		VC1 Read Metering	Enabled
		VC1 RdMeter Time Window	800
		VC1 RdMeter Threshold	280
		Strong Weak Leaker	7
		Memory Scramble	Enabled
		Force ColdReset	Disabled
		Channel A DIMM Control	Enable both DIMMs
		Channel B DIMM Control	Enable both DIMMs

Item			Default / Remark
Processor (Integrated Components)	Memory Configuration	Force Single Rank	Disabled
		Memory Remap	Enabled
		Time Measure	Disabled
		DLL Weak Lock Support	Enabled
		Pwr Down Idle Timer	0
		Mrc Fast Boot	Enabled
		Lpddr Mem WL Set	Set B
		EV Loader	Disabled
		EV Loader Delay	Enabled
	Graphics Configuration	Primary Display	Auto
		External Gfx Card Primary Display Configuration	Primary PEG = Auto Primary PCIE = Auto
		Internal Graphics Device	Auto
		GTT Size	8MB
		Aperture Size	256MB
		IGD Pre-Allocated Graphics Memory	32M
		IGD Total Graphics Memory	256M
		PM support	Disabled
		PAVP Enable	Enabled
		Cdynmax Clamping Enable	Enabled
		Cd Clock Frequency	675 Mhz
		GOP Config Driver	Enabled
		IUER Button Enable	Disabled
	DMI/OPI Configuration	DMI Max Link Speed	Auto
		DMI Gen3 Eq Phase 2	Auto
		DMI Gen3 Eq Phase 3 Method	Auto
		DMI Vc1 Control	Disabled
		DMI Vcm Control	Enabled
		Program Static Phase1 Eq	Enabled
		Gen3 Root Port Preset value for each Lane	All values = 4
		Gen3 Endpoint Preset value for each Lane	All values = 7
		Gen3 Endpoint Hint value for each Lane	All values = 2
		Gen3 RxCTLE Control	All values = 3
		DMI Link ASPM Processor Side	Disabled
		DMI Extended Sync Control	Disabled
		DMI De-emphasis Control	-3.5 dB
		DMI IOT	Disabled

Item			Default / Remark
Processor (Integrated Components)	Stop Grant Configuration		Auto
	VT-d		Enabled
	CHAP Device		Disabled
	Thermal Device		Disabled
	GMM Device		Enabled
	CRID Support		Disabled
	Above 4GB MMI BIOS assignment		Disabled
	X2APIC Opt Out		Disabled
	eDRAM Mode		eDRAM HW Mode
Platform Controller Hub (PCH)	Isolate SMBus Segments		Always
	PCI Express Configuration	PCI Express Clock Gating	Disabled
		Legacy IO Low Latency	Disabled
		DMI Link ASPM PCH Side	Disabled
		Port8xh Decode	Disabled
		Peer Memory Write Enable	Disabled
		Compliance Test Mode	Disabled
		PCIe-USB Glitch W/A	Disabled
		PCIe function swap	Disabled
		PCI Express Gen3 Eq Lanes	Every Cm = 6 Every Cp = 2 Override SW EQ Settings = Disabled
		PCI Express Port 0	Refer to *PCI Express Port* on page A - 43 for details.
		PCI Express Port 1	
		PCI Express Port 2	
		PCI Express Port 3	
		PCI Express Port 4	
		PCI Express Port 5	
		PCI Express Port 6	
		PCI Express Port 7	
	SATA And RST Configuration	SATA Controller(s)	Enabled
		SATA Mode Selection	AHCI
		SATA Test Mode	Disabled
		Software Feature Mask Configuration	HDD Unlock = Enabled LED Locate = Enabled
		Aggressive LPM Support	Disabled
		SATA Controller Speed	Default
		Serial ATA Port 0	
		SATA Port	Enabled
		Hot Plug	Disabled
		Spin Up Device	Disabled
		SATA Device Type	Hard Disk Drive
		Topology	Unknown
		SATA Port 0 DevSlp	Disabled
		DITO Configuration	Disabled

Item			Default / Remark
Platform Controller Hub (PCH)	SATA And RST Configuration	Serial ATA Port 1	
		SATA Port	Enabled
		Hot Plug	Disabled
		Spin Up Device	Disabled
		SATA Device Type	Hard Disk Drive
		Topology	Unknown
		SATA Port 1 DevSlp	Disabled
		DITO Configuration	Disabled
		Serial ATA Port 2	
		SATA Port	Enabled
		Hot Plug	Disabled
		Spin Up Device	Disabled
		SATA Device Type	Hard Disk Drive
		Topology	Unknown
		SATA Port 2 DevSlp	Disabled
		DITO Configuration	Disabled
		Serial ATA Port 3	
		SATA Port	Enabled
		Hot Plug	Disabled
		Spin Up Device	Disabled
		SATA Device Type	Hard Disk Drive
		Topology	Unknown
		SATA Port 3 DevSlp	Disabled
		DITO Configuration	Disabled
	USB Configuration	XHCI Disable Compliance Mode	False
		xDCI Support	Disabled
		USB Port Disable Override	Disabled
	TraceHub Configuration menu	TraceHub Enable Mode	Disable
		MemRegion 0 Buffer Size	1MB
		MemRegion 1 Buffer Size	1MB
	DCI enable (HDCIEN)		Disabled
	PCH LAN Controller		Enabled
	DeepSx Power Policies		Disabled
	LAN Wake From DeepSx		Enabled
	Wake on LAN Enable		Enabled
	SLP_LAN# Low on DC Power		Enabled
	K1 off		Enabled
	Wake on WLAN and BT Enable		Disabled
	Disable DSX ACPRESENT Pulldown		Disabled
	Serial IRQ Mode		Continuous
	Port 61h Bit-4 Emulation		Enabled
	Port 80h Redirection		LPC Bus
	Enhance Port 80h LPC Decoding		Disabled
	Compatible Revision ID		Disabled
	PCH Cross Throttling		Enabled
	Disable Energy Reporting		FALSE

Item		Default / Remark
Platform Controller Hub (PCH)	Enable TCO Timer	Disabled
	Pcie P11 SSC	Auto
	IOAPIC 24-119 Entries	Enabled
	Unlock PCH P2SB	Disabled
	Flash Protection Range Registers (FPRR)	Disabled
	SPD Write Disable	TRUE
	ChipsetInit HECI Message	Enabled
	Bypass ChipsetInit sync reset	Disabled

BIOS - Security

Provides security information like BIOS Password and HDD information.

⚠ WARNING

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

Changeable BIOS Security parameters and their factory default values:

Item			Default / Remark
BIOS Password			Empty
BIOS Lock			Enabled
HDD Security Configuration	Diskname		Display disk parameters *1
Secure Boot Menu	Secure Boot		Disabled
	Secure Boot Customization		Custom
	Key Management	Factory Key Provision	Disabled
		Secure Boot variable	Display variable details

*1. Only when a storage device is installed.

BIOS - Boot

Provides Boot information and configuration settings.

Changeable BIOS Boot parameters and their factory default values:

Item		Default / Remark
Quiet Boot		Disabled
Setup Prompt Timeout		1
Bootup NumLock State		On
Power Loss Control *1		Remain Off
AT Shutdown Mode		Hot S5
Enter Setup If No Boot Device		No
Enable Popup Boot Menu		Yes
Boot Priority Selection		Type Based
Boot Option Sorting Method		UEFI First
Type Based Boot Priority	1st Boot Device	CPU specific *2
	2nd Boot Device	Disabled
	3rd Boot Device	Disabled
	4th Boot Device	Disabled
	5th Boot Device	Disabled
	6th Boot Device	Disabled
	7th Boot Device	Disabled
	8th Boot Device	Disabled
Battery Support		Auto (Battery Manager)
System Off Mode		G3/Mech Off
UEFI Fast Boot		Disabled
UEFI Screenshot Capability		Disabled

*1. Power Loss Control settings are :
Remain OFF: The Box PC Without Operating System will stay OFF when power is supplied to the power connector
Turn ON: The Box PC Without Operating System will automatically start up when power is supplied to the power connector.
Last State: The Box PC Without Operating System will start up or remain OFF when power is supplied based on the Box PC Without Operating System state at the moment power was removed from the power connector.

*2. For 7th generation CPUs: SATA 1 Drive.
For 6th generation CPUs: SATA 2 Drive.

BIOS - Save & Exit

Provides the possibility to leave the BIOS with or without saving changes and to create or restore a set of User Defaults.

Save & Exit Parameters: **Disabled**.

- **Save Changes and Exit**
  Changed settings are saved and the Operating System starts with the changed settings.
- **Discard Changes and Exit**
  Changed settings are not saved and the Operating System starts with the unchanged settings.
- **Save Changes and Reset**
  Changed settings are saved and the 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.
- **Save as User Defaults**
  Saves the BIOS values as a User Defaults set.
- **Restore User Defaults**
  Restores the User Defaults set to the BIOS.

A-1-4 BIOS for 7th generation CPUs

The BIOS settings for 7th generation CPUs.

The BIOS is divided in the pages Main, Advanced, Chipset, Security, Boot and Save&Exit.

BIOS - Main

The main setup screen gives platform information about the BIOS, Board Information, Firmware Revision, MAC Addresses and information about the number of Boots and the Running Time. Platform Information gives CPU and platform details.

Changeable BIOS Main parameters and their factory default values:

- **System Date**
  Use the **Enter** key to the next Date field.
- **System Time**
  Use the **Enter** key to the next Time field.

BIOS - Advanced

This section provides Advanced BIOS information for 7th generation CPUs.

Changeable BIOS Advanced parameters and their factory default values:

Item			Default / Remark
Intel RC ACPI Settings	PTID Support		Disabled
	PECI Access Method		Direct I/O
	Native PCI Express Support		Enabled
	Native ASPM		Disabled
	BDAT ACPI Table Support		Disabled
	Wake system from S5		Disabled
	ACPI Debug		Disabled
	Low Power S0 Idle Capability		Disabled
	Lpit Recidency Counter		SLP S0
	PCI Delay Optimization		Disabled
	ZpODD Support		Disabled
CPU	SW Guard Extensions (SGX)		Software Controlled
	Select Owner EPOCH input type		No Change in Owner EPOCHs
	CPU Flex Ratio Override		Disabled
	Hardware Prefetcher		Enabled
	Adjacent Cache Line Prefetch		Enabled
	Intel (VMX) Virtualization Technology		Enabled
	PECI		Enabled
	Active Processor Cores		All
	Hyper-Threading *1		Enabled
	BIST		Disabled
	JTAG C10 Power		Disabled
	AP threads Idle Manner		MWAIT Loop
	AP threads Handoff Manner		MWAIT Loop
	AES		Enabled
	MachineCheck		Enabled
	MonitorMWait		Enabled
	Intel Trusted Execution Technology *1		Disabled
	Reset AUX Content *1		No
	Flash Wear Out Protection		Disabled
	Debug Interface		Disabled
	Debug Interface Lock		Enabled
	Processor trace memory allocation		Disabled
	CPU SMM Enhance-ment	SMM Code Access Check	Enabled
		SMM Use Delay Indication	Enabled
		SMM Use Block Indication	Enabled
	FCLK Frequency for Early Power On		Normal (800 Mhz)
	Three Strike Counter		Enabled
	Voltage Optimization		Auto

Item			Default / Remark
Power & Performance	CPU - Power Management Control	Boot performance mode	Max Non-Turbo Performance
		Intel ® SpeedStep ™	Enabled
		Race To Halt (RTH)	Enabled
		Intel ® Speed Shift Technology	Enabled
		HDC Control	Enabled
		Turbo Mode *1	Enabled
	CPU - Power Management Control /View/Configure Turbo Options		
		Energy Efficient P-state	Enabled
		Package Power Limit MSR Lock	Disabled
		1-Core Ratio Limit Override	CPU specific *3
		2-Core Ratio Limit Override	CPU specific *3
		Energy Efficient Turbo	Enabled
	CPU - Power Management Control /Config TDP Configurations		
		Configurable TDP Boot Mode	Nominal
		Configurable TDP Lock	Enabled
	CPU - Power Management Control / CPU VR Settings *2		
		PSYS Slope	0
		PSYS Offset	0
		PSYS PMax Power	0
		Acoustic Noise Settings	Acoustic Noise Mitigation = Disabled
		System Agent VR Settings	VR Config Enable = Disabled
		Core/IA VR Settings	VR Config Enable = Disabled
		GT-Sliced VR Settings	VR Config Enable = Disabled
		VR Mailbox Command options	0
		Intersil VR Command	Disabled
	CPU - Power Management Control	Platform PL1 Enable	Disabled
		Platform PL2 Enable	Disabled
		Power Limit 4 Override	Disabled
		C states	Disabled
		Thermal Monitor	Enabled
		Interrupt Redirection Mode Selection	PAIR with Fixed Priority
		Timed MWAIT	Disabled
		Custom P-state Table	Number of P states = 0
		EC Turbo Control Mode	Disabled
		Energy Performance Gain	Disabled
		Power Limit 3 Settings	Power Limit 3 Override = Disabled
		CPU Lock Configuration	CFG Lock = Enabled
			Overclocking Lock = Enabled

Item			Default / Remark
Power & Performance	GT - Power Management Control	Maximum GT frequency	Default Max Frequency
PCH-FW Configuration	Comms Hub Support		Disabled
	JHI Support		Disabled
	Core Bios Done Message		Enabled
	Firmware Update Configuration	Me FW Image Re-Flash	Disabled
	PTT Configuration	TPM Device Selection	dTPM
	ME Debug Configuration	HECI Timeouts	Enabled
		Force ME DID Init Status	Disabled
		CPU Replaced Polling Disable	Disabled
		ME DID Message	Enabled
		HECI Retry Disable	Disabled
		HECI Message check Disable	Disabled
		MBP HOB Skip	Disabled
		HECI2 Interface Communication	Disabled
		KT Device	Enabled
		IDER Device	Enabled
		End Of Post Message	Send in DXE
		DOI3 Setting for HECI Disable	Disabled
Thermal Configuration	CPU Thermal Configuration	DTS SMM	Disabled
		Tcc Activation Offset	CPU specific *4
		Tcc Offset Time Window	Disabled
		Tcc Offset Clamp Enable	Disabled
		Tcc Offset Lock Enable	Disabled
		Bi-directional PROCHOT#	Disabled
		Disable VR Thermal Alert	Disabled
		PROCHOT Response	Disabled
		PROCHOT Lock	Enabled
		ACPI T-States	Disabled
		PECI Reset	Disabled
		PECI C10 Reset	Disabled
	Platform Thermal Configuration	PCH Thermal Device	Enabled in PCI mode
		PCH Temp Read	Enabled
		CPU Energy Read	Enabled
		CPU Temp Read	Enabled
		Alert Enable Lock	Disabled
	DPTF Configuration	DPTF	Disabled

Item			Default / Remark
Platform Settings	UCSI Retry Workaround		Disabled
	Firmware Configuration		Test
	PS2 Keyboard and Mouse		Enabled
	Pmic Vcc IO Level		Disabled
	Pmic Vddq Level		Disabled
	SLP_SO# VM		Disabled
	Power Sharing Manager		Disabled
	Wireless device		Disabled
	Enable Wireless Charge Support		Disabled
	Enable FFU support		Disabled
	HID Event Filter Driver		Disabled
	Alternate Mode Synch Delay		0
Intel ICC	ICC/OC Watchdog Timer		Disabled
	ICC PLL Shutdown		Enabled
Watchdog	POST Watchdog		Disabled
	Runtime Watchdog		Disabled
Trusted Computing	Security Device Support		Enable
	SHA-1 PCR Bank		Enabled
	SHA256 PCR Bank		Enabled
	Pending operation		None
	Platform Hierarchy		Enabled
	Storage Hierarchy		Enabled
	Endorsement Hierarchy		Enabled
	TPM2.0 UEFI Spec Version		TCG_2
	Physical Presence Spec Version		1.3
	Device Select		Auto
ACPI	Enable ACPI Auto Configuration		Disabled
	Hibernation Support		Disabled
	ACPI Sleep State		Suspend Disabled
	Lock Legacy Resources		Disabled
	S3 Video Repost		Disabled
	Automatic Critical Trip Point		Enabled
	Lid Button Support		Disabled
	Sleep Button Support		Disabled
SMART Settings	SMART Self Test		Disabled
Acoustic Management	Acoustic Management Configuration		Disabled
PCI Configuration	PCI Latency Timer		32 PCI Bus Clocks
	PCI-X Latency Timer		64 PCI Bus Clocks
	VGA Palette Snoop		Disabled
	PERR# Generation		Disabled
	SERR# Generation		Disabled
	Above 4G Decoding		Disabled
	PCI Hot-Plug Settings	BIOS Hot-Plug Support	Enabled
		PCI Buses Padding	1
		I/O Resoruces Padding	4 K
		MMIO 32 bit Resources Padding	16 M
		PFMMIO 32 bit Resources Padding	16 M

Item		Default / Remark
UEFI Network Stack	UEFI Network Stack	Disabled
CSM & Option ROM Control	CSM Support	Enabled
	Gate A20 Active	Upon Request
	Option ROM Messages	Force BIOS
	INT19 Trap Response	Immediate
	Boot Option Filter	UEFI and Legacy
	PXE Option ROM Launch Policy	UEFI ROM Only
	Storage Option ROM Launch Policy	UEFI ROM Only
	Video Option ROM Launch Policy	Legacy ROM Only
	Other Option ROM Launch Policy	UEFI ROM Only
SDIO Configuration	SD Card or COMx GPIO	COMx GPIO
	UARTO Controller	Disabled
	SDIO Access Mode	Auto
USB	Overcurrent Protection	Disabled
	Legacy USB Support	Enabled
	xHCI Hand-off	Enabled
	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
Diagnostic Settings	Relay Interface	Disabled
	BC Diagnostic Console Interface	Disabled

*1. Only for Box PCs with a CPU type Intel® Core™ i5-7300U.

*2. Only for Box PCs with a CPU type Intel® Celeron® 3965U.

*3. For CPU type Intel® Celeron® 3965U = 22
For CPU type Intel® Core™ i5-7300U = 35

*4. For CPU type Intel® Celeron® 3965U = 0
For CPU type Intel® Core™ i5-7300U = 5

BIOS - Chipset

This section provides Chipset information for 7th generation CPUs.

Changeable BIOS Chipset parameters and their factory default values:

Item			Default / Remark
Processor (Integrated Components)	Memory Configuration / Memory Thermal Configuration		Refer to *Memory Thermal Configuration* on page A - 42 for details.
	Memory Configuration / Memory Training Algorithms		
		Early Command Training	Disabled
		SenseAmp Offset Training	Enabled
		Early ReadMPR Timing Centering 2D	Enabled
		Read MPR Training	Enabled
		Receive Enable Training	Enabled
		Jedec Write Leveling	Enabled
		Early Write Time Centering 2D	Enabled
		Early Write Drive Strength / Equalization	Enabled
		Early Read Time Centering 2D	Enabled
		Write Timing Centering 1D	Enabled
		Write Voltage Centering 1D	Enabled
		Read Timing Centering 1D	Enabled
		Dimm ODT Training*	Enabled
		Max RTT_WR	ODT Off
		DIMM RON Training*	Enabled
		Write Drive Strength/Equalization 2D*	Disabled
		Write Slew Rate Training*	Enabled
		Read ODT Training*	Enabled
		Read Equalization Training*	Enabled
		Read Amplifier Training*	Enabled
		Write Timing Centering 2D	Enabled
		Read Timing Centering 2D	Enabled
		Command Voltage Centering	Enabled

Item			Default / Remark
Processor (Integrated Components)	Memory Configuration / Memory Training Algorithms		
		Write Voltage Centering 2D	Enabled
		Read Voltage Centering 2D	Enabled
		Late Command Training	Enabled
		Round Trip Latency	Enabled
		Turn Around Timing Training	Enabled
		Rank Margin Tool	Disabled
		Memory test	Disabled
		DIMM SPD Alias Test	Enabled
		Receive Enable Centering 1D	Enabled
		Retrain Margin Check	Enabled
		Write Drive Strength Up/Dn independently	Disabled
		CMD Slew Rate Training	Enabled
		CMD Drive Strength / Tx Equalization	Enabled
		CMD Normalization	Enabled
	Memory Configuration	MRC ULT Safe Config	Disabled
		Maximum Memory Frequency	2133
		HOB Buffer Size	Auto
		Max TOLUD	Dynamic
		SA GV	Fixed High
		Retrain on Fast Fail	Enabled
		Command Tristate	Enabled
		Enable RH Prevention	Enabled
		Row Hammer Solution	Hardware RHP
		RH Activation Probability	1/2^11
		Exit On Failure (MRC)	Enabled
		MC Lock	Enabled
		Probeless Trace	Disabled
		Enable/Disable IED (Intel Enhanced Debug)	Disabled
		Ch Hash Support	Enabled
		Ch Hash Mask	0
		Ch Hash Interleaved Bit	BIT8
		VC1 Read Metering	Enabled
		VC1 RdMeter Time Window	800
		VC1 RdMeter Threshold	280
		Strong Weak Leaker	7
		Memory Scrambler	Enabled
		Force ColdReset	Disabled
		Channel A DIMM Control	Enable both DIMMs
		Channel B DIMM Control	Enable both DIMMs

Item			Default / Remark
Processor (Integrated Components)	Memory Configuration	Force Single Rank	Disabled
		Memory Remap	Enabled
		Time Measure	Disabled
		DLL Weak Lock Support	Enabled
		Pwr Down Idle Timer	0
		Mrc Fast Boot	Enabled
		Lpddr Mem WL Set	Set B
		EV Loader	Disabled
		EV Loader Delay	Enabled
	Graphics Configuration	Graphics Turbo IMON Current	31
		Primary Display	Auto
		Select PCIE Card	Auto
		External Gfx Card Primary Display Configuration	Primary PEG = Auto Primary PCIE = Auto
		Internal Graphics Device	Auto
		GTT Size	8MB
		Aperture Size	256MB
		IGD Pre-Allocated Graphics Memory	32M
		IGD Total Graphics Memory	256M
		Gfx Low Power Mode	Disabled
		VDD Enable	Enabled
		PM support	Disabled
		PAVP Enable	Enabled
		Cdynmax Clamping Enable	Enabled
		Cd Clock Frequency	675 Mhz
		GOP Config Driver	Enabled
		IUER Button Enable	Disabled
		Intel ® Ultrabook Event Support	IUER Slate Enable = Disabled IUER Dock Enable = Disabled
	DMI/OPI Configuration	DMI Vc1 Control	Disabled
		DMI Vcm Control	Enabled
	Stop Grant Configuration		Auto
	VT-d		Enabled
	CHAP Device		Disabled
	Thermal Device		Disabled
	GMM Device		Enabled
	CRID Support		Disabled
	Above 4GB MMI BIOS assignment		Disabled
	X2APIC Opt Out		Disabled
	eDRAM Mode		eDRAM HW Mode

Item			Default / Remark
Platform Controller Hub (PCH)	Isolate SMBus Segments		Always
	PCI Express Configuration	PCI Express Clock Gating	Disabled
		Legacy IO Low Latency	Disabled
		DMI Link ASPM PCH Side	Disabled
		Port8xh Decode	Disabled
		Peer Memory Write Enable	Disabled
		Compliance Test Mode	Disabled
		PCIe-USB Glitch W/A	Disabled
		PCIe function swap	Disabled
		PCI Express Gen3 Eq Lanes	Every Cm = 6 Every Cp = 2 Override SW EQ Settings = Disabled
		PCI Express Port 0	Refer to *PCI Express Port* on page A - 43 for details.
		PCI Express Port 2	
		PCI Express Port 3	
		PCI Express Port 4	
		PCI Express Port 6	
	SATA And RST Configuration	SATA Controller(s)	Enabled
		SATA Mode Selection	AHCI
		SATA Test Mode	Disabled
		Software Feature Mask Configuration	HDD Unlock = Enabled LED Locate = Enabled
		Aggressive LPM Support	Disabled
		SATA Controller Speed	Default
		Serial ATA Port 0	
		SATA Port	Enabled *1
		Hot Plug	Disabled
		Spin Up Device	Disabled
		SATA Device Type	Hard Disk Drive
		Topology	Unknown
		SATA Port 0 DevSlp	Disabled
		DITO Configuration	Disabled
		Serial ATA Port 1	
		SATA Port	Enabled *1
		Hot Plug	Disabled
		Spin Up Device	Disabled
		SATA Device Type	Hard Disk Drive
		Topology	Unknown
		SATA Port 1 DevSlp	Disabled
		DITO Configuration	Disabled
		Serial ATA Port 2	
		SATA Port	Enabled *1

Item			Default / Remark
Platform Controller Hub (PCH)	SATA And RST Configuration	Hot Plug	Disabled
		Spin Up Device	Disabled
		SATA Device Type	Hard Disk Drive
		Topology	Unknown
		SATA Port 2 DevSlp	Disabled
		DITO Configuration	Disabled
	USB Configuration	XHCI Disable Compliance Mode	False
		xDCI Support	Disabled
		USB Port Disable Override	Disabled
	TraceHub Configuration menu	TraceHub Enable Mode	Disable
		MemRegion 0 Buffer Size	1MB
		MemRegion 1 Buffer Size	1MB
	DCI enable (HDCIEN)		Disabled
	PCH LAN Controller		Enabled
	DeepSx Power Policies		Disabled
	LAN Wake From DeepSx		Enabled
	Wake on LAN Enable		Enabled
	SLP_LAN# Low on DC Power		Enabled
	K1 off		Enabled
	Wake on WLAN and BT Enable		Disabled
	Disable DSX ACPRESENT Pulldown		Disabled
	Serial IRQ Mode		Continuous
	Port 61h Bit-4 Emulation		Enabled
	Port 80h Redirection		LPC Bus
	Enhance Port 80h LPC Decoding		Disabled
	Compatible Revision ID		Disabled
	PCH Cross Throttling		Enabled
	Disable Energy Reporting		FALSE
	Enable TCO Timer		Disabled
	Pcie P11 SSC		Auto
	IOAPIC 24-119 Entries		Enabled
	Unlock PCH P2SB		Disabled
	Flash Protection Range Registers (FPRR)		Disabled
	SPD Write Disable		TRUE
	ChipsetInit HECI Message		Enabled
	Bypass ChipsetInit sync reset		Disabled

*1. Disabled when a storage device is not present on SATA port.

BIOS - Security

Provides security information like BIOS Password and HDD information.

⚠ WARNING

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

Changeable BIOS Security parameters and their factory default values:

Item			Default / Remark
BIOS Password			Empty
BIOS Lock			Enabled
HDD Security Configuration	Diskname		Display disk parameters *1
Secure Boot Menu	Secure Boot		Disabled
	Secure Boot Customization		Custom
	Key Management	Factory Key Provision	Disabled
		Secure Boot variable	Display variable details

*1. Only when a storage device is installed.

BIOS - Boot

Provides Boot information and configuration settings.

Changeable BIOS Boot parameters and their factory default values:

Item		Default / Remark
Quiet Boot		Disabled
Setup Prompt Timeout		1
Bootup NumLock State		On
Power Loss Control *1		Remain Off
AT Shutdown Mode		Hot S5
Enter Setup If No Boot Device		No
Enable Popup Boot Menu		Yes
Boot Priority Selection		Type Based
Boot Option Sorting Method		UEFI First
Type Based Boot Priority	1st Boot Device	CPU specific *2
	2nd Boot Device	Disabled
	3rd Boot Device	Disabled
	4th Boot Device	Disabled
	5th Boot Device	Disabled
	6th Boot Device	Disabled
	7th Boot Device	Disabled
	8th Boot Device	Disabled
Battery Support		Auto (Battery Manager)
System Off Mode		G3/Mech Off
UEFI Fast Boot		Disabled
UEFI Screenshot Capability		Disabled

*1. Power Loss Control settings are :
Remain OFF: The Box PC Without Operating System will stay OFF when power is supplied to the power connector
Turn ON: The Box PC Without Operating System will automatically start up when power is supplied to the power connector.
Last State: The Box PC Without Operating System will start up or remain OFF when power is supplied based on the Box PC Without Operating System state at the moment power was removed from the power connector.

*2. For 7th generation CPUs: SATA 1 Drive.
For 6th generation CPUs: SATA 2 Drive.

BIOS - Save & Exit

Provides the possibility to leave the BIOS with or without saving changes and to create or restore a set of User Defaults.

Save & Exit Parameters: **Disabled**.

- **Save Changes and Exit**
  Changed settings are saved and the Operating System starts with the changed settings.
- **Discard Changes and Exit**
  Changed settings are not saved and the Operating System starts with the unchanged settings.
- **Save Changes and Reset**
  Changed settings are saved and the 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.
- **Save as User Defaults**
  Saves the BIOS values as a User Defaults set.
- **Restore User Defaults**
  Restores the User Defaults set to the BIOS.

A-1-5 BIOS Chipset Details

This section provides BIOS Chipset details for 6th generation and 7th generation CPUs.

Memory Thermal Configuration

Provides BIOS Chipset details for the submenu Processor / Memory Configuration / Memory Thermal Configuration /.

Changeable BIOS Memory Thermal Configuration parameters and their factory default values:

Item			Default / Remark
Memory Power and Thermal Throttling	DDR PowerDown and idle counter		BIOS
	For LPDDR Only: DDR PowerDown annd idle counter		BIOS
	REFRESH_2X_MODE		Disabled
	LPDDR Thermal Sensor		Enabled
	SelfRefresh Enable		Enabled
	SelfRefresh IdleTimer		512
	Throttler CKEMin Defeature		Disabled
	Throttler CKEMin Timer		48
	For LPDDR Only: Throttler CKEMin Defeature *1		Enabled
	For LPDDR Only: Throttler CKEMin Timer *1		64
	DRAM Power Meter	Use user provided power weights, scale factor, and channel power floor values	Disabled
	Memory Thermal Reporting	Lock Thermal Management Registers	Enabled
		Extern Therm Status	Disabled
		Closed Loop Therm Manage	Disabled
		Open Loop Therm Manage	Disabled
		Thermal Threshold Settings	All settings = 255
		Thermal Throttle Budget Settings	All settings = 255
	Memory RAPL	RAPL PL Lock	Disabled
		RAPL PL 1 enable	Disabled
		RAPL PL 1 Power	0
		RAPL PL 1 WindowX	0
		RAPL PL 1 WindowY	0
		RAPL PL 2 enable	Disabled
		RAPL PL 2 Power	222
		RAPL PL 2 WindowX	1
		RAPL PL 2 WindowY	10
Memory Thermal Management			Disabled

*1. Available for 7th generation CPUs.
Not available for 6th generation CPUs.

PCI Express Port

Provides BIOS Chipset details for the submenu Platform Controller Hub / PCI Express Configuration / PCI Express Port.

Changeable BIOS PCI Express Port parameters and their factory default values:

Item		Default / Remark
PCI Express Port		Enabled
Topology		CPU specific *1
ASPM		Disabled
Gen 3 Eq Phase3 Method		Software Search
UPTP		5
DPTP		7
ACS		Enabled
URR		Disabled
FER		Disabled
NFER		Disabled
CER		Disabled
CTO		Disabled
SEFE		Disabled
SENFE		Disabled
SECE		Disabled
PME SCI		Enabled
Hot Plug		Disabled
Advanced Error Reporting		Enabled
PCIe Speed		Auto
Transmitter Half Swing		Disabled
Detect Timeout		0
PCH PCIE□ LTR *2		Enabled
Snoop Latency Override		Auto
Non Snoop Latency Override		Auto
Force LTR Override		Disabled
PCIE□ LTR Lock *2		Disabled
Extra options	Detect Non-Compliance Device	Disabled
	Prefetchable Memory	10
	Reserved Memory Alignment	1
	Prefetchable Memory Alignment	1

*1. CPU specific:

- For 7th generation CPUs: Port 0, 4 = Unknown. Port 2, 3, 6 = x1.
- For 6th generation CPUs: Port 0, 1, 2, 5, 6, 7 = Unknown. Port 3, 4 = x1.

*2. The default does not change but the PCIE number is port specific.

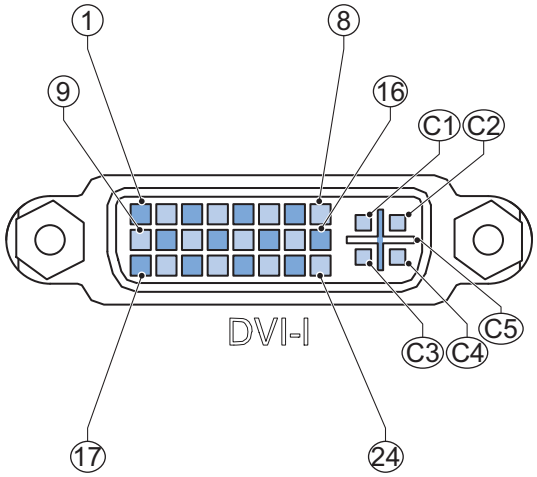
- For 7th generation CPUs:
  Port 0: PCIE1. Port 2: PCIE3. Port 3: PCIE4. Port 4: PCIE5. Port 6: PCIE9.
- For 6th generation CPUs:
  Port 0: PCIE5. Port 1: PCIE6. Port 2: PCIE7. Port 3: PCIE8. Port 4: PCIE9. Port 5: PCIE10. Port 6: PCIE11. Port 7: PCIE12.

A-2 DVI Connector Pin Details

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

A-2-1 DVI-I Connector Pin Details

Pin details of the DVI-I connector.



The pin layout represents the DVI-I connector on the Box PC Without Operating System.
Pin numbers increase from left to right for every row.

Pin	Signal Name	Function
1	TMDS data 2−	Digital red− (link 1)
2	TMDS data 2+	Digital red+ (link 1)
3	0 VDC	TMDS data 2/4 shield
4	Not connected	---
5	Not connected	---
6	DDC clock	DDC clock
7	DDC data	DDC data
8	Analog vertical sync	Depending on the product configuration *1
9	TMDS data 1−	Digital green− (link 1)
10	TMDS data 1+	Digital green+ (link 1)
11	0 VDC	TMDS data 1/3 shield
12	Not connected	---
13	Not connected	---
14	+5 V	Power for monitor DDC interface
15	0 V	Return for pin 14 and analog sync
16	HPD	Hot Plug Detect
17	TMDS data 0−	Digital blue− (link 1) and digital sync
18	TMDS data 0+	Digital blue+ (link 1) and digital sync
19	0 VDC	TMDS data 0/5 shield
20	Not connected	---
21	Not connected	---
22	0 VDC	TMDS clock shield

Pin	Signal Name	Function
23	TMDS clock+	Digital clock+
24	TMDS clock−	Digital clock−
C1	Analog red	Depending on the product configuration *1
C2	Analog green	Depending on the product configuration *1
C3	Analog blue	Depending on the product configuration *1
C4	Analog horizontal sync	Depending on the product configuration *1
C5	0 VDC	Depending on the product configuration *2

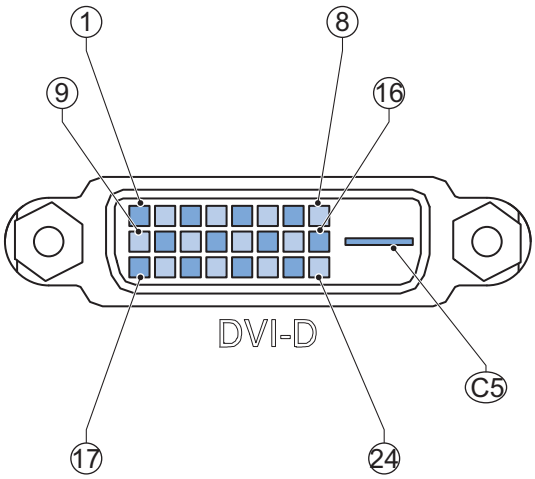
*1. For models NY□17 and NY□1E.

*2. Analog ground return, red and green and blue for models NY□17 and NY□1E.

Refer to Product Configuration for details.

A-2-2 DVI-D Connector Pin Details

Pin details of the DVI-D connector.

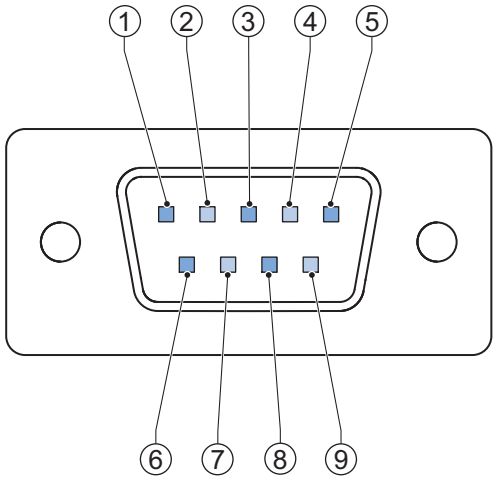


The pin layout represents the DVI connector on the Box PC Without Operating System.
Pin numbers increase from left to right for every row.

Pin	Signal Name	Function
1	TMDS data 2−	Digital red− (link 1)
2	TMDS data 2+	Digital red+ (link 1)
3	0 VDC	TMDS data 2/4 shield
4	Not connected	---
5	Not connected	---
6	DDC clock	DDC clock
7	DDC data	DDC data
8	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	---

Pin	Signal Name	Function
14	+5 V	Power for monitor DDC interface
15	0 V	Return for pin 14
16	HPD	Hot plug detect
17	TMDS data 0−	Digital blue− (link 1) and digital sync
18	TMDS data 0+	Digital blue+ (link 1) and digital sync
19	0 VDC	TMDS data 0/5 shield
20	Not connected	---
21	Not connected	---
22	0 VDC	TMDS clock shield
23	TMDS clock+	Digital clock+
24	TMDS clock−	Digital clock−
C5	Not connected	---

A-3 RS-232C Connector Pin Details



The pin layout represents the RS-232C 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 ground connection.

Additional Information

Refer to *5-4-2 Ground* on page 5 - 29 for grounding details.

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