



Industrial PC Platform

NY-series

NYB Industrial Box PC

Hardware User's Manual

NYB□□

Industrial Box PC




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Introduction

Thank you for purchasing the Industrial Box PC.

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

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

Intended Audience

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

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

Applicable Products

This manual covers following Industrial Box PC products:

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



Additional Information

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

Sections in this Manual

1	Overview	1
2	System Configurations	2
3	Hardware	3
4	Specifications	4
5	Installation	5
6	Operating Procedures	6
7	Maintenance	7
A	Appendices	A

CONTENTS

Introduction	1
Intended Audience	1
Applicable Products	1
Sections in this Manual	3
Manual Information	9
Page Structure	9
Special Information	10
Terms and Conditions Agreement.....	11
Warranty, Limitations of Liability	11
Application Considerations	12
Disclaimers	13
Safety Precautions.....	14
Definition of Precautionary Information.....	14
Symbols	14
Warnings.....	15
Cautions.....	18
Precautions for Safe Use	19
Disassembly, Dropping, Mounting, Installation and Storage	19
Wiring.....	19
Power Supply Design and Turning ON/OFF the Power Supply.....	20
Actual Operation	20
Operation	20
General Communications	21
Battery and Fan Replacement	21
Cleaning, Maintenance and Disposal	21
Precautions for Correct Use	22
Storage, Installation and Mounting	22
Wiring.....	22
Actual Operation and Operation	23
Battery Replacement	23
SD Memory Cards	23
Regulations and Standards	24
Conformance to EU Directives	24
Conformance to KC Certification	25
Conformance to UL and CSA Standards.....	25
Software Licenses and Copyrights	25
Related Manuals.....	26
Related Box PC Manual	26
Related Products Manuals.....	26
Industrial Monitor Manual	27
Terminology and Abbreviations	28
Industrial PC Platform	28
Hardware	28
Software.....	29
Revision History.....	30

Section 1 Overview

1-1	Intended Use	1-2
1-2	Hardware Features.....	1-3
1-3	ID Information Label	1-4
1-4	Product Configuration Box PC	1-5
1-5	Overall Setup Procedure	1-7
1-6	Industrial PC Platform Overview	1-8
1-6-1	Industrial Monitor	1-8
1-6-2	Industrial Box PC	1-9
1-6-3	Industrial Panel PC	1-9

Section 2 System Configurations

2-1	Configuration for NYB and NYP	2-2
------------	--	------------

Section 3 Hardware

3-1	Layers and Components	3-3
3-1-1	Cooling Layer	3-4
3-1-2	Base Layer	3-5
3-1-3	Expansion Layer (Optional).....	3-6
3-2	LED Indicators	3-7
3-2-1	PWR LED Indicator	3-7
3-2-2	ERR LED Indicator.....	3-8
3-2-3	HDD LED Indicator.....	3-8
3-2-4	RUN LED Indicator.....	3-8
3-3	Power Button.....	3-9
3-4	Connectors	3-10
3-4-1	Power Connector	3-10
3-4-2	I/O Connector	3-10
3-4-3	USB Connectors	3-11
3-4-4	Ethernet Connectors	3-12
3-4-5	DisplayPort Connector (Optional)	3-12
3-4-6	DVI Connector (Optional).....	3-13
3-4-7	RS-232C Connector (Optional)	3-13
3-4-8	DVI-D Connector (Optional)	3-14
3-4-9	NY Monitor Link Connector (Optional)	3-14
3-4-10	Ethernet Connector (Optional)	3-15
3-5	SD Memory Card Slot (Optional)	3-16
3-6	CFast Card, Battery Slot (Optional).....	3-17
3-6-1	CFast Card Slot (Optional).....	3-18
3-6-2	Battery Slot (Optional).....	3-18
3-7	Drive Bays	3-19
3-8	PCIe Card Slot.....	3-20
3-9	Spare Parts	3-21
3-9-1	Battery.....	3-21
3-9-2	Fan Unit.....	3-21
3-9-3	Accessory Kit	3-22
3-9-4	Connectors	3-22
3-10	Optional Hardware	3-23
3-10-1	Mounting Brackets	3-23

3-10-2	SD Memory Cards.....	3-25
3-10-3	CFast Cards	3-25
3-10-4	HDD and SSD Storage Devices.....	3-26
3-10-5	DVI Cables	3-27
3-10-6	USB Type-A to USB Type-B Cables	3-28
3-10-7	NY Monitor Link Cables	3-29
3-10-8	Industrial Monitor	3-32
3-10-9	Power Supply	3-32
3-10-10	UPS	3-33
3-10-11	UPS Communication Cable	3-34

Section 4 Specifications

4-1	General Specifications	4-2
4-1-1	Dimensions and Weight	4-2
4-1-2	General Electrical Specifications.....	4-4
4-1-3	Power Consumption Specifications.....	4-5
4-1-4	Power Supply Specifications.....	4-6
4-1-5	CPU Specifications	4-7
4-1-6	Memory Specifications	4-12
4-1-7	Storage Device Specifications	4-14
4-1-8	PCIe Card Specifications	4-18
4-1-9	Bracket Specifications	4-21
4-2	Connector Specifications	4-23
4-2-1	Power Connector Specifications	4-23
4-2-2	I/O Connector Specifications.....	4-24
4-2-3	USB Connector Specifications	4-28
4-2-4	Ethernet Connector Specifications	4-29
4-2-5	DVI Connector Specifications	4-31
4-2-6	DisplayPort Connector Specifications	4-32
4-2-7	DVI-D Connector Specifications.....	4-33
4-2-8	RS-232C Connector Specifications.....	4-34
4-2-9	NY Monitor Link Connector Specifications	4-34
4-3	Environmental Specifications.....	4-36
4-3-1	Operation Environment Specifications	4-36
4-3-2	Temperature and Humidity Specifications	4-37
4-3-3	Recycling Specifications	4-42

Section 5 Installation

5-1	Unpack.....	5-2
5-1-1	Unpack Procedure	5-2
5-1-2	Items Supplied	5-2
5-2	Install Options	5-5
5-2-1	Install RAID 1	5-5
5-2-2	Install a Drive	5-6
5-2-3	Install the PCIe Card	5-10
5-3	Mount	5-16
5-3-1	Installation Method in Control Panels.....	5-16
5-3-2	Product Orientation	5-17
5-3-3	Temperature	5-17
5-3-4	Humidity	5-20
5-3-5	Vibration and Shock	5-20
5-3-6	Atmosphere.....	5-21
5-3-7	Electrical Environment	5-21
5-3-8	Book Mount Procedure	5-26
5-3-9	Wall Mount Procedure	5-27
5-4	Wire	5-28

5-4-1	Wiring Warnings and Cautions	5-28
5-4-2	Ground	5-29
5-4-3	Wire the Power Connector	5-36
5-4-4	Wire the I/O Connector	5-39
5-5	Connect.....	5-42
5-5-1	Connector Identification	5-42
5-5-2	Connection Procedure	5-43
5-6	Initial Power ON	5-45
5-6-1	Initial Power ON Procedure	5-45
5-6-2	Windows Startup First Time	5-47
5-7	Install Software	5-49
5-8	Connect UPS	5-50
5-8-1	Connect UPS Using the USB Connector	5-51
5-8-2	Connect UPS Using the I/O Connector	5-53
5-9	Create Backup and Repair Data	5-57

Section 6 Operating Procedures

6-1	Power ON.....	6-2
6-1-1	Power ON Using the Power Button	6-2
6-1-2	Power ON Using the Power ON/OFF Input.....	6-2
6-1-3	Auto Power ON	6-2
6-2	Power OFF	6-3
6-2-1	Power OFF Using the Power Button	6-3
6-2-2	Power OFF Using Windows Shut Down	6-3
6-2-3	Power OFF Using the Power ON/OFF Input	6-4
6-2-4	Forced Power OFF Using the Power Button	6-4
6-3	React to Product Messages	6-5
6-4	React to Windows Messages.....	6-6

Section 7 Maintenance

7-1	Preventive Maintenance	7-2
7-1-1	Preventive Maintenance Schedule.....	7-2
7-1-2	Clean the Box PC.....	7-3
7-2	Corrective Maintenance	7-4
7-2-1	Warning and Error Messages.....	7-4
7-2-2	Remove the Cover	7-6
7-2-3	Replace the Fan Unit	7-7
7-2-4	Replace the CJ1W Battery.....	7-9
7-2-5	Replace a Drive.....	7-14
7-2-6	Replace the PCIe Card	7-19
7-2-7	Replace the CFast Card.....	7-24

Appendices

A-1	BIOS	A-2
A-1-1	BIOS Overview.....	A-2
A-1-2	BIOS for 4 th generation CPUs.....	A-6
A-1-3	BIOS for 6 th generation CPUs.....	A-14
A-1-4	BIOS for 7 th generation CPUs.....	A-32
A-1-5	BIOS for 11 th generation CPU - CVWNA111 CVWNR111 CVWGR111	A-62
A-1-6	BIOS for 11 th generation CPU - CQWGA111	A-71

A-1-7	BIOS for Atom CPU - 1AWGR113	A-79
A-1-8	BIOS for Atom CPU - 3AWNR113.....	A-85
A-2	DVI Connector Pin Details.....	A-94
A-2-1	DVI-I Connector Pin Details	A-94
A-2-2	DVI-D Connector Pin Details.....	A-95
A-3	RS-232C Connector Pin Details.....	A-97

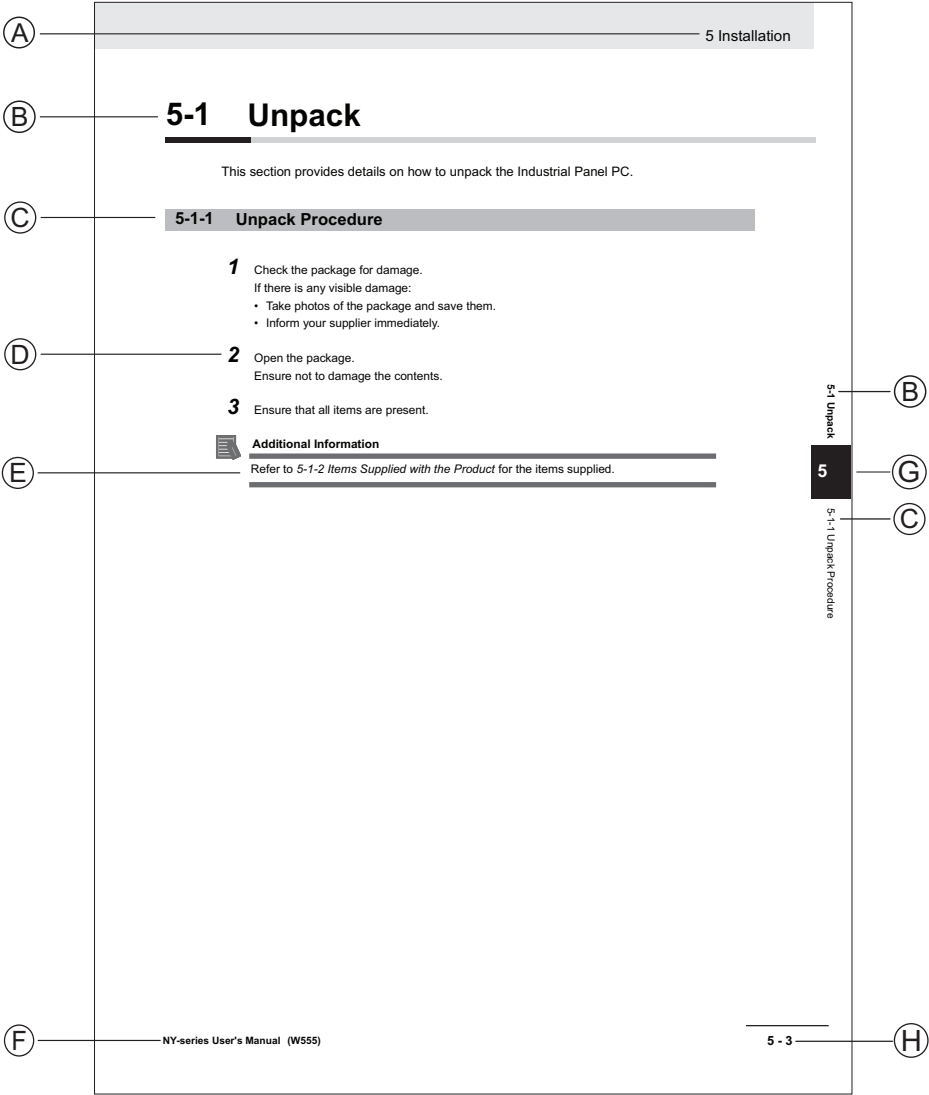
Index

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.

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Warranty, Limitations of Liability

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

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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 Industrial Box PC. The safety precautions that are provided are extremely important to safety. Always read and heed the information provided in all safety precautions. The following notation is used.

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

Symbols

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

Warnings

WARNING

Disassembly and Dropping

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



Installation

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



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



Fail-safe Measures

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



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



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



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



Actual Operation

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



Changing BIOS information is only allowed for the engineer in charge that possesses a thorough understanding of the BIOS settings because it can change the behavior of the product.



Cybersecurity

To maintain the security and reliability of the system, a robust cybersecurity defense program should be implemented, which may include some or all of the following:

Anti-virus protection

- Install the latest commercial-quality anti-virus software on the computer connected to the control system and keep the software and virus definitions up-to-date.
- Scan USB drives or other external storage devices before connecting them to control systems and equipment.

Security measures to prevent unauthorized network access

- Install physical controls so that only authorized personnel can access control systems and equipment.
- Reduce connections to control systems and equipment via networks to prevent access from untrusted devices.
- Install firewalls to block unused communications ports and limit communication between systems. Limit access between control systems and systems from the IT network.
- Control remote access and adopt multifactor authentication to devices with remote access to control systems and equipment.
- Set strong password policies and monitor for compliance frequently.

Data input and output protection

- Backup data and keep the data up-to-date periodically to prepare for data loss.
- Validate backups and retention policies to cope with unintentional modification of input/output data to control systems and equipment.
- Validate the scope of data protection regularly to accommodate changes.
- Check validity of backups by scheduling test restores to ensure successful recovery from incidents.
- Safety design, such as emergency shutdown and fail-soft operations in case of data tampering and incidents.

Additional recommendations

- When using an external network environment to connect to an unauthorized terminal such as a SCADA, HMI or to an unauthorized server may result in network security issues such as spoofing and tampering.
- You must take sufficient measures such as restricting access to the terminal, using a terminal equipped with a secure function, and locking the installation area by yourself.
- When constructing network infrastructure, communication failure may occur due to cable disconnection or the influence of unauthorized network equipment.
- Take adequate measures, such as restricting physical access to network devices, by means such as locking the installation area.
- When using devices equipped with an SD Memory Card, there is a security risk that a third party may acquire, alter, or replace the files and data in the removable media by removing or unmounting the media.
- Please take sufficient measures, such as restricting physical access to the Controller or taking appropriate management measures for removable media, by means of locking and controlling access to the installation area.
- Educate employees to help them identify phishing scams received via email on systems that will connect to the control network.



Cautions

⚠ CAUTION

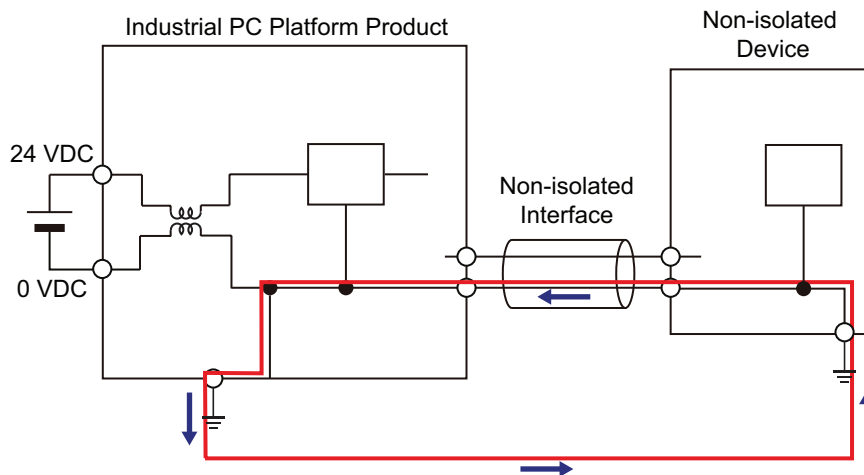
Installation

When installing or removing a PCIe card, avoid touching 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 in the manual.
- 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 connecting 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 storage device
 - 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.
- Install all updates and ensure virus definitions stay up-to-date.
- Make sure that your OS environment is protected against malicious software and viruses.
- 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 an 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 and Fan 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.
- If the storage period exceeds 6 months, check the performance of the fan unit before production starts.

Cleaning, Maintenance and Disposal

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



廢電池請回收

- Dispose in accordance with applicable regulations.



- 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.
- 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.
- Do not reset or power OFF the product while the password is being changed. If you fail to save the password there is a possibility that the project will not work.
- 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 Industrial Box PC complies with EU Directives. To ensure that the machine or device in which the Box PC is used complies with EU Directives, the following precautions must be observed:

- The Box PC must be installed within a control panel.
- The Box PC that complies with EU Directives also conforms to the Common Emission Standard. Radiated emission characteristics 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 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

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

Conformance to KC Certification

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

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

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

Conformance to UL and CSA Standards

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

Software Licenses and Copyrights

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

Related Manuals

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

Related Box PC Manual

Manual name	Cat. No.	Model-ID	Application	Description
NY-series Operating Systems and Software Utilities Manual	W616	NYB NYP	Learning all software related information about the Industrial Box PC. This includes introductory information, installation, operating procedures and maintenance. Mainly software information is provided.	An introduction to the Box PC is provided along with the following information: <ul style="list-style-type: none"> • Overview • Software • Specifications • Installation • Operating Procedures • Maintenance

Related Products Manuals

Manual name	Cat. No.	Model-ID	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: <ul style="list-style-type: none"> • Overview • Preparation • Installation and Connection • Check and Start Operation • Maintenance and Inspection • Shutdown Processing • I/O Signal Functions • Troubleshooting
UPS Setting Utility Instruction Manual	---	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Overview • Operating Environment • Software License Agreement • Connect • Use the UPS Setting Utility • Setting Details

Industrial Monitor Manual

This table contains the related manual of the Industrial Monitor.

Manual name	Cat. No.	Model-ID	Application	Description
Industrial Monitor User's Manual	W554	NYM12W-C1□□□ NYM15W-C1□□□ NYM19W-C1□□□	Learning all basic information about the Industrial Monitor. This includes introductory information with features, hardware overview, specifications, mounting, wiring, connecting, operating and maintaining the Industrial Monitor.	An introduction to the Industrial Monitor is provided along with the following information: <ul style="list-style-type: none"> • 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
3D TLC	3D Triple-Level Cell flash memory
BMC	Board Management Controller
CFast	An SSD CFast storage device
CPU	A Central Processing Unit is the hardware within a computer that executes the instructions of a computer program
DVI	Digital Visual Interface
DVI-D	A Digital Visual Interface with only Digital signals
DVI-I	A Digital Visual Interface with Analog and Digital signals
Ethernet	A network communication protocol used in TCP/IP network
HDD	A Hard Disk Drive storage device
HMI	A Human Machine Interface that facilitates machine operation and control
MLC	Multi-Level Cell type of SSD storage device
NYML	NY Monitor Link interface with video signals and USB signals
PCIe	The PCI Express is a high-speed computer bus standard called Peripheral Component Interconnect Express
PoE	Power over Ethernet
pSLC	Pseudo Single Level Cell type of SSD storage device
SATA	The Serial AT Attachment is a serial bus interface primarily used with mass storage devices such as hard disk drives
SLC	Single-Level Cell type of SSD storage device
SO-DIMM	Small Outline Dual Inline Memory Module
SSD	A Solid State Drive storage device
USB	Universal Serial Bus

Software

Term / Abbreviation	Description
ACPI	Advanced Configuration and Power Interface protocol for operating systems
API	Application Programming Interface
BIOS	Basic Input Output System. The first software run by a PC when powered on.
Developer	Any person involved with the development of software
DST	Daylight Saving Time
EFW	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
Windows	An Operating System designed by Microsoft

Revision History

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

Cat. No. W553-E2-16

↑
Revision code

Revision code	Date	Revised content
16	July 2024	<ul style="list-style-type: none"> Improved NY Monitor Link Cable details Minor modifications
15	September 2023	Minor modifications
14	June 2023	<ul style="list-style-type: none"> Added CPU types <ul style="list-style-type: none"> Intel® Core™ i7-1185GRE Intel® Core™ i5-1145GRE Intel® Xeon® W-11865MRE Intel® Core™ i3-1115GRE Intel® Atom® x6425RE Added SSDs <ul style="list-style-type: none"> 128, 256, 512 GB 3D TLC 1TB 3D TLC SSD 128, 256, 512 GB CFAST Added/Replaced DDR4 Memory <ul style="list-style-type: none"> 4, 8, 16, 32, 64, 96 GB Non-ECC 32, 64, 96 GB ECC Added DisplayPort Restructured temperature specifications Minor modifications
13	September 2021	<ul style="list-style-type: none"> Added hardware RAID 1 configuration Minor modifications
12	April 2021	Updated BIOS details for <ul style="list-style-type: none"> Intel® Core™ i5-7300U Intel® Celeron® 3965U
11	November 2020	<ul style="list-style-type: none"> Added Intel® Core™ i7-7820EQ CPU Minor modifications
10	July 2020	<ul style="list-style-type: none"> Added SSD 256 GB NY000-AS08 Updated bracket details Added Overall Setup Procedure Minor modifications
09	July 2019	Updated Conformance to KC certification
08	May 2019	<ul style="list-style-type: none"> Separated software information to a new manual NY-series Operating Systems and Software Utilities Manual (Cat. No. W616) Added Intel® Atom® x5-E3930 CPU Added 19" monitor Minor modifications

Revision code	Date	Revised content
07	May 2018	<ul style="list-style-type: none"> 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
06	April 2018	<ul style="list-style-type: none"> 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
05	January 2018	<ul style="list-style-type: none"> Added option for 16 GB main memory Added options for 500 GB and 1 TB HDD Added support of software RAID Minor modifications
04	June 2017	Added NY Monitor Link option
03	May 2017	<ul style="list-style-type: none"> Added operating system Windows 10 IoT Enterprise LTSC Added Storage Device Considerations Modified UPS configuration procedure Minor modifications
02	December 2016	<ul style="list-style-type: none"> UL implementation KC Standard implementation Minor modifications
01	August 2016	Original production

Overview

This section provides general information about the Industrial Box PC.

1-1	Intended Use	1-2
1-2	Hardware Features	1-3
1-3	ID Information Label.....	1-4
1-4	Product Configuration Box PC	1-5
1-5	Overall Setup Procedure	1-7
1-6	Industrial PC Platform Overview	1-8
1-6-1	Industrial Monitor	1-8
1-6-2	Industrial Box PC	1-9
1-6-3	Industrial Panel PC	1-9

1-1 Intended Use

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

The Industrial Box PC can easily be integrated in manufacturing innovations like big data, NUI and IIoT.

The Industrial Box PC has a compact design that offers flexibility, expandability and easy maintenance for applications in factory automation environments.

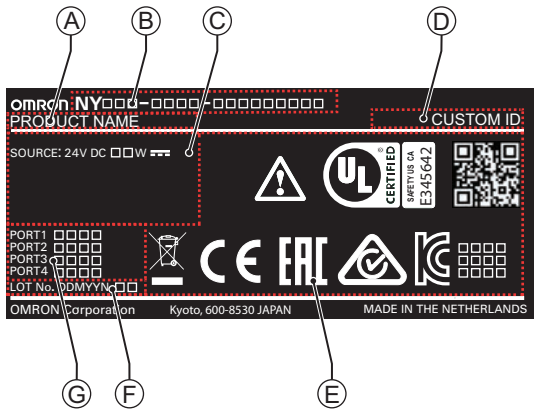
1-2 Hardware Features

The Industrial Box PC provides the following hardware features:

- Compact design with two mounting orientation options
The Box PC has a compact design to minimize panel space while allowing for two mounting orientations.
- Powerful CPU options
Powerful CPU options provide high performance for various applications.
- Fanless cooling for multiple CPU types
The Box PC has passive cooling for multiple CPU types which means no moving parts and less maintenance effort.
- Easy access to storage devices and the PCI Express Card
Adding or changing storage devices (HDD, SSD) and PCI Express Card is fast and simple.
- RAID support
- LED indicators
LED indicators provide a clear indication of the operational status of the Box PC.
- Video interfaces
The video interface for the Box PC is provided with a DisplayPort or DVI connector for connection to a monitor.
An extra (optional) video 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
Interface with multiple networks. An optional 4th 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
4 USB-A ports are provided for connection to external USB devices such as keyboards, memory sticks, or other peripheral hardware.
- SD Memory Card slot
An SD Memory Card slot can be provided for removable memory.
- CFast Card slot
A CFast Card slot can be provided as a removable storage device.

1-3 ID Information Label

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



Item	Name	Description
A	Product name	The name of your product
B	Model *1	Model and configuration details
C	Power rating	Power rating details and optional UL related information
D	Custom ID (Optional)	A custom ID [NYC□□□-□□□□□□□□] Only applicable for customized IPC platform products.
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: <ul style="list-style-type: none"> The lot number of the Industrial Box PC in the format DDMYY□. DDMYY with Month number 1 to 9 for January to September, X for October, Y for November, and Z for December. □: For use by OMRON Serial number (4 digits)
G	MAC ADDRESS *2	<ul style="list-style-type: none"> 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 Box PC on page 1-5 for model details.

*2. Refer to 4-2-4 Ethernet Connector Specifications on page 4-29 for Ethernet specifications.



Additional Information

Refer to 3-1-2 Base Layer on page 3-5 for the ID label location.

1-4 Product Configuration Box PC

This section provides an overview of the product configurations available for the Industrial Box PC.

The product configuration is visible in the model-ID that is mentioned on the ID information label of the product.

The structure of the model-ID is: NYB□□-□□□□□.

Each item in the model-ID has a specific meaning.

N	Y	B	□	□	-	□	□	□	□	□
1	2		3	4	5	6	7			

Item	Description	Option / Description
1	Series name	NYB: NY- series Industrial Box PC
2	Processor	Intel Atom CPUs 2A: Intel® Atom® x5-E3940 3A: Intel® Atom® x6425RE 4 th generation CPUs 17: Intel® Core™ i7-4700EQ, active cooling 1C: Intel® Celeron® 2980U 25: Intel® Core™ i5-4300U 6 th generation CPUs 1E: Intel® Xeon® E3-1515M v5, active cooling 7 th generation CPUs 2C: Intel® Celeron® 3965U 27: Intel® Core™ i7-7820EQ, active cooling 35: Intel® Core™ i5-7300U 11 th generation CPUs 13: Intel® Core™ i3-1115GRE 2E: Intel® Xeon® W-11865MRE, active cooling 37: Intel® Core™ i7-1185GRE, active cooling 55: Intel® Core™ i5-1145GRE, active cooling 65: Intel® Core™ i5-1145GRE
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 6: 64 GB, non-ECC 7: 96 GB, non-ECC C: 8 GB, ECC D: 16 GB, ECC E: 32 GB, ECC F: 64 GB, ECC G: 96 GB, ECC

Item	Description	Option / Description
4	Expansion slots	0: None 1: 1 PCIe slot 2: 1 PCIe slot + Storage hardware RAID 1
5	Operating system	0: No Operating System 1: Windows Embedded Standard 7 - 32 bit 2: Windows Embedded Standard 7 - 64 bit 3: Windows 10 IoT Enterprise 2016 LTSC - 64 bit 4: Windows 10 IoT Enterprise 2019 LTSC - 64 bit 5: Windows 10 IoT Enterprise 2021 LTSC - 64 bit
6	Storage	0: None 1: 128 GB, CFast 3D TLC 2: 256 GB, CFast 3D TLC 3: 512 GB, CFast 3D TLC 5: 64 GB, CFast MLC 6: 128 GB, CFast MLC 7: 256 GB, CFast MLC 8: 32 GB, SSD SLC 9: 64 GB, SSD SLC C: 320 GB, HDD D: 500 GB, HDD E: 1 TB, HDD F: 128 GB, SSD 3D TLC G: 256 GB, SSD 3D TLC H: 512 GB, SSD 3D TLC K: 128 GB, SSD MLC L: 256 GB, SSD MLC M: 500 GB, SSD MLC P: 1 TB, SSD 3DTLC
7	Optional interface	0: None 1: RS-232C 2: DVI-D 4: DisplayPort 6: NY Monitor Link 9: Gb Ethernet

1-5 Overall Setup Procedure

This section gives the overall setup procedure for the Industrial PC.

This manual presents this information in the same order as the following setup procedure.

To setup the Industrial PC:

- 1** Familiarize yourself with the Industrial PC
 - Refer to the information in this manual.
Specifically refer to following sections of this manual:
 - *Section 2 System Configurations* on page 2-1
 - *Section 3 Hardware* on page 3-1
 - *Section 4 Specifications* on page 4-1
 - Refer to the information in related manual *NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)*.
- 2** Install the IPC Hardware

Perform the procedures that are required to use the Industrial PC such as installation, and connection with peripheral devices including a UPS.
Refer to *Section 5 Installation* on page 5-1.
- 3** Setup the IPC

Install and configure the operating system, the software support utilities and the UPS software.
Refer to the information in related manual *NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)*.
- 4** Operate the IPC

Use the operating procedures to operate the Industrial PC.
Refer to:
 - *Section 6 Operating Procedures* on page 6-1
 - "Section Operating Procedures" in related manual *NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)*

The setup of the Industrial PC is finished.

The section 'Maintenance' contains preventive and corrective maintenance information.

Refer to:

- *Section 7 Maintenance* on page 7-1
- "Section Maintenance" in related manual *NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)*

1-6 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.

1-6-1 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.



Industrial Monitor



Industrial Hygienic Monitor

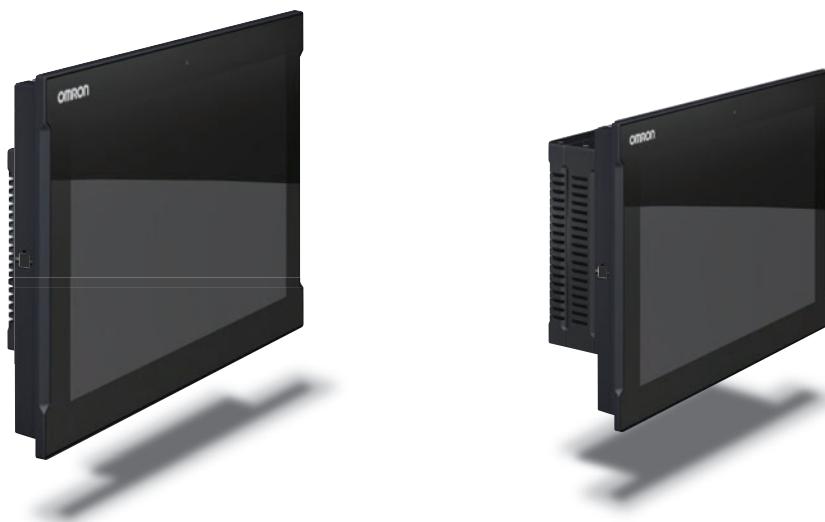
1-6-2 Industrial Box PC

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. Examples are IPCs with a Machine Controller or IPCs designed specifically for an Autonomous Mobile Robot (AMR).



1-6-3 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.



System Configurations

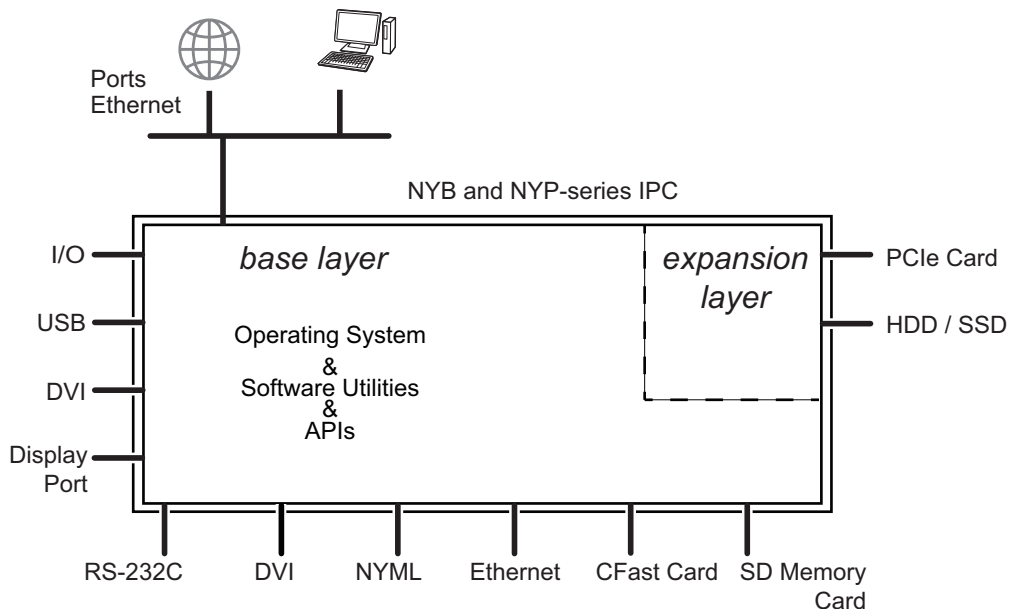
This section provides an overview of the system configurations for the Industrial Box PC.

2-1	Configuration for NYB and NYP.....	2-2
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2-1 Configuration for NYB and NYP

The Industrial PC supports many different hardware configurations.

Refer to *1-4 Product Configuration Box PC* on page 1-5 for more information.



The major parts for configurations are layers.

- All configurations have the base layer and a cooling layer.
The base layer contains the CPU, the software and most of the connectors and functionality.
- The optional expansion layer supports PCIe cards and storage devices.
- A display layer is always present for an Industrial Panel PC.



Additional Information

- Refer to *3-1 Layers and Components* on page 3-3 for details.
- Refer to *NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)* for details on the operating system, the support software and the APIs.

Hardware

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

3-1	Layers and Components	3-3
3-1-1	Cooling Layer	3-4
3-1-2	Base Layer	3-5
3-1-3	Expansion Layer (Optional)	3-6
3-2	LED Indicators	3-7
3-2-1	PWR LED Indicator	3-7
3-2-2	ERR LED Indicator	3-8
3-2-3	HDD LED Indicator	3-8
3-2-4	RUN LED Indicator	3-8
3-3	Power Button	3-9
3-4	Connectors	3-10
3-4-1	Power Connector	3-10
3-4-2	I/O Connector	3-10
3-4-3	USB Connectors	3-11
3-4-4	Ethernet Connectors	3-12
3-4-5	DisplayPort Connector (Optional)	3-12
3-4-6	DVI Connector (Optional)	3-13
3-4-7	RS-232C Connector (Optional)	3-13
3-4-8	DVI-D Connector (Optional)	3-14
3-4-9	NY Monitor Link Connector (Optional)	3-14
3-4-10	Ethernet Connector (Optional)	3-15
3-5	SD Memory Card Slot (Optional)	3-16
3-6	CFast Card, Battery Slot (Optional)	3-17
3-6-1	CFast Card Slot (Optional)	3-18
3-6-2	Battery Slot (Optional)	3-18
3-7	Drive Bays	3-19
3-8	PCIe Card Slot	3-20
3-9	Spare Parts	3-21
3-9-1	Battery	3-21
3-9-2	Fan Unit	3-21
3-9-3	Accessory Kit	3-22
3-9-4	Connectors	3-22
3-10	Optional Hardware	3-23
3-10-1	Mounting Brackets	3-23
3-10-2	SD Memory Cards	3-25

3-10-3 CFast Cards 3-25

3-10-4 HDD and SSD Storage Devices 3-26

3-10-5 DVI Cables 3-27

3-10-6 USB Type-A to USB Type-B Cables..... 3-28

3-10-7 NY Monitor Link Cables..... 3-29

3-10-8 Industrial Monitor 3-32

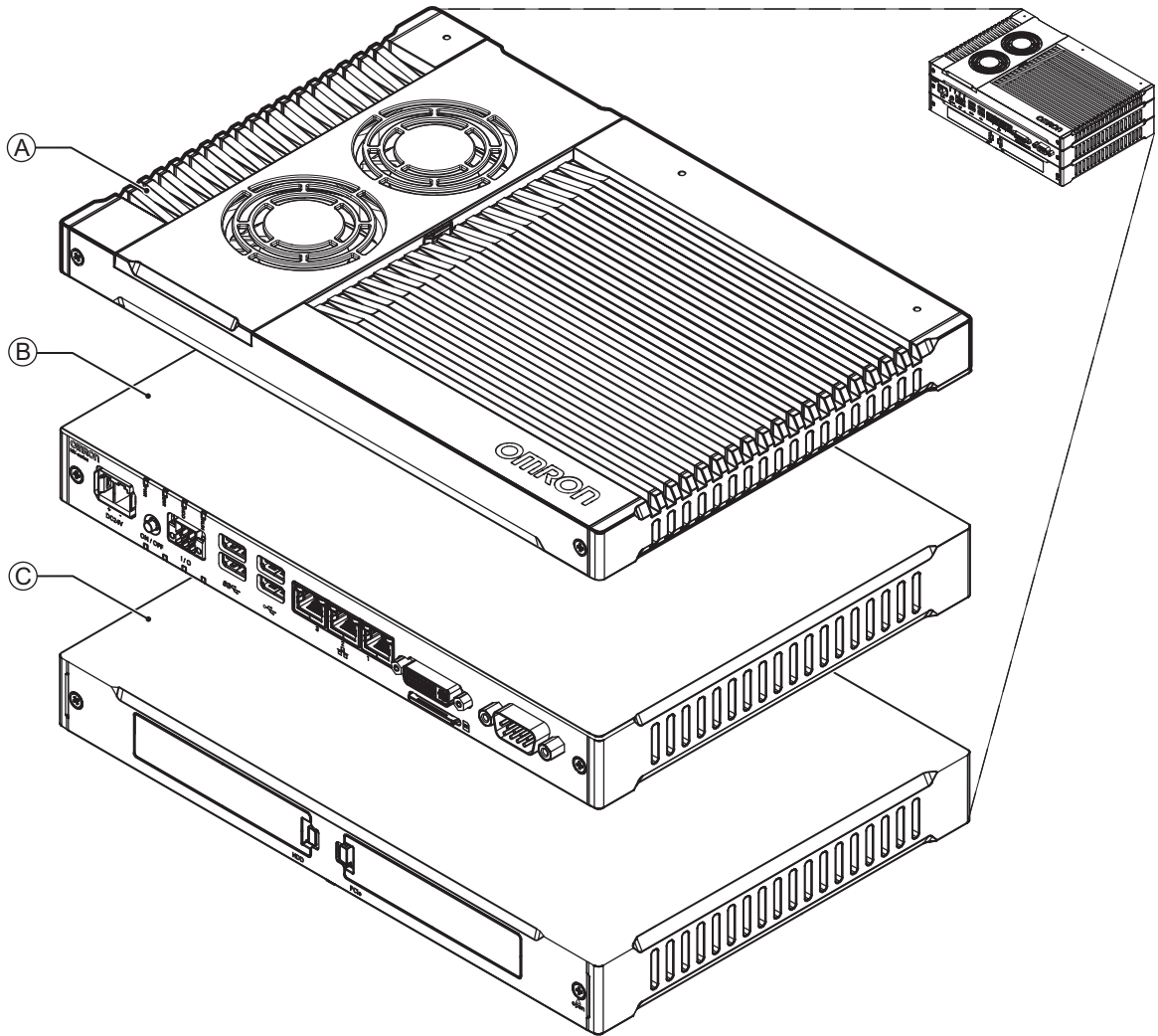
3-10-9 Power Supply 3-32

3-10-10 UPS 3-33

3-10-11 UPS Communication Cable..... 3-34

3-1 Layers and Components

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.

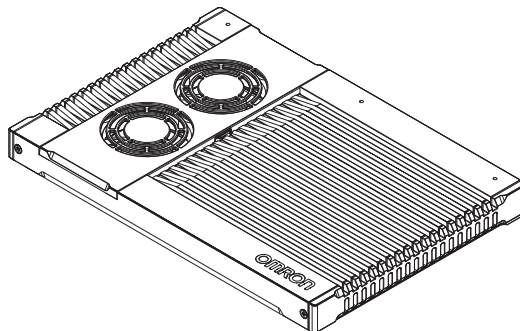
3-1-1 Cooling Layer

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.

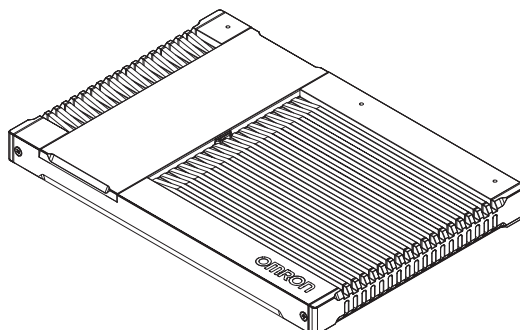
Cooling layer with removable cover and active cooling



The cover provides access to:

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

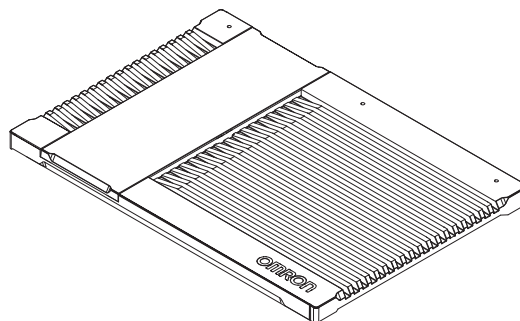
Cooling layer with removable cover and passive cooling



The cover provides access to:

- The battery
- The battery replacement date

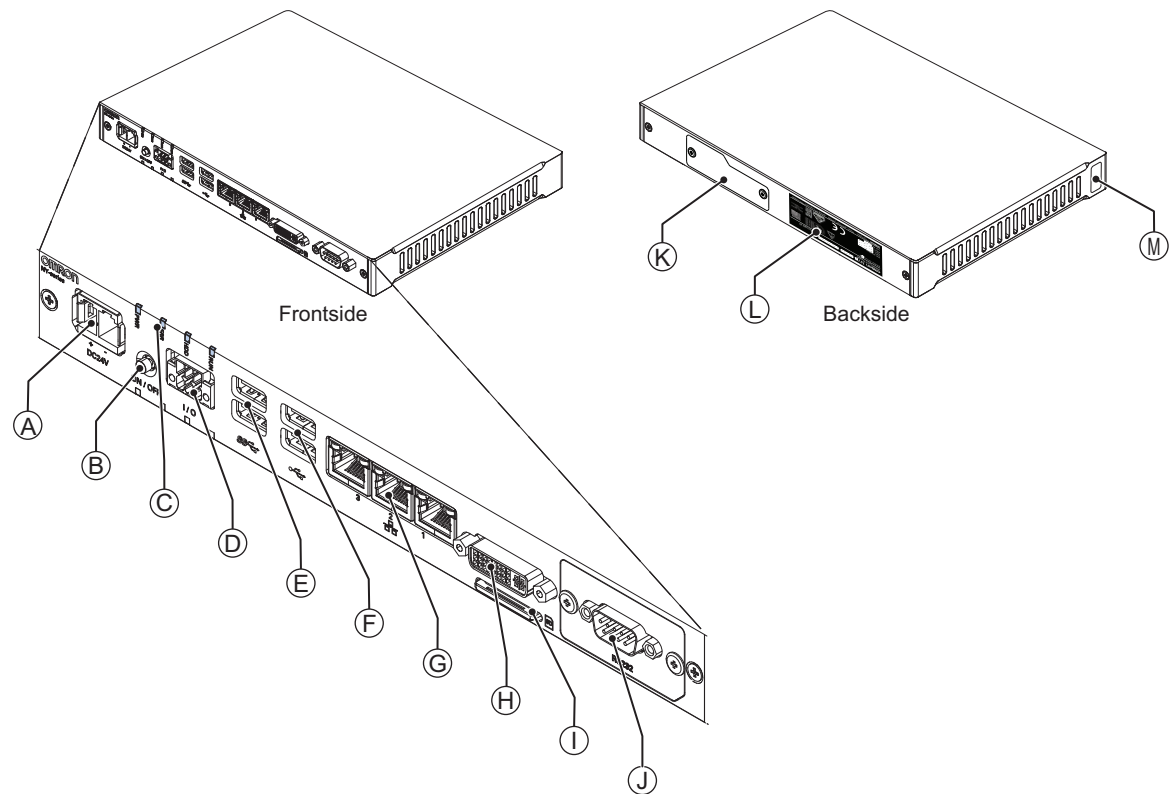
Cooling layer with passive cooling and a non-removable cover



A thin cooling layer for passive cooling

3-1-2 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 Box PC 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 and 1 Output
E	USB connectors	2 USB interface connectors
F	USB connectors	2 USB interface connectors
G	Ethernet connectors	3 RJ45 Gb Ethernet interface connectors
H	Video connector	Video options are: <ul style="list-style-type: none">• DisplayPort (video and audio)• Digital Visual Interface connector (video)
I	SD Memory Card slot	Optional SD Memory Card slot
J	Option port	Interface connection options for peripheral devices or an additional monitor. Possible option ports are: <ul style="list-style-type: none">• RS-232C connector• DVI-D connector• DisplayPort (video and audio) connector• NYML connector• RJ45 Gb Ethernet connector
K	Storage slot	Optional CFAST Card slot and optional Battery slot

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

3-1-3 Expansion Layer (Optional)

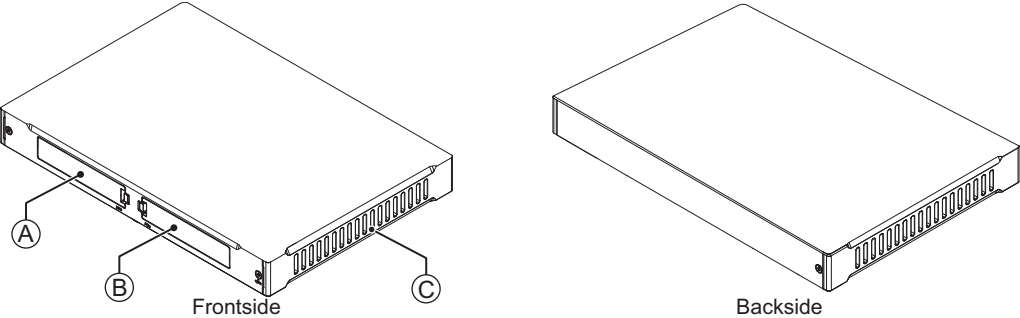
This section shows the component names and functions for the expansion layer.

The expansion layer adds additional functionality to the base layer.

The Expansion Layer is available for models:

- NYB□□-□1, NYB□□-□2
- NYP□□-□1, NYP□□-□2

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



Item	Name	Description
A	Drive bays *1	Two 2.5 inch drive bays for HDD/SSD storage devices: <ul style="list-style-type: none">• Drive bay A is the bay at the side of the base layer.• Drive bay B is the bay at the opposite side of the base layer.
B	PCIe bay	PCI Express mounting slot
C	PCIe drawer	Mounting location for the PCIe Card

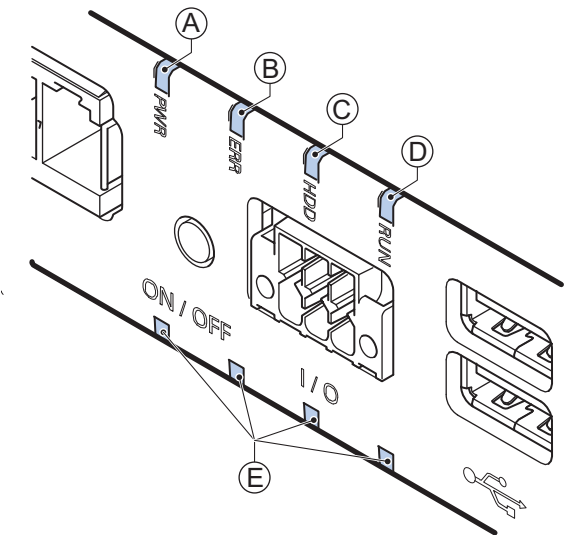
*1. Depending on the model one or two drives are supported.

Refer to 4-1-7 *Storage Device Specifications* on page 4-14 for the number of supported drives and for bay details.

3-2 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.

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 activity of the storage device..
D	RUN	Run	Indicates the status of a user-defined function.
E	-	-	Depending on the model a second row of LED indicators can be present. The four LED indicators of the second row have the same function (A, B, C, D).




3-2-1 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.

3-2-2 ERR LED Indicator

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

Color	Status		Meaning
Red		Not lit	<ul style="list-style-type: none"> The 24 VDC power is not supplied No error is present
		Blinking	<ul style="list-style-type: none"> Fan Error Battery low^{*1}
		Lit	<ul style="list-style-type: none"> Thermal shutdown Watchdog Error Power Supply undervoltage error Power Supply overvoltage error Power supply defective

*1. It can take up to one minute after battery replacement before the Battery low error is resolved.




Additional Information

- The status of this LED can also be defined by users using the Industrial PC System API. Refer to *NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)* for Industrial PC System API for API details.
- Refer to 7-2 *Corrective Maintenance* on page 7-4 for actions to solve errors.




3-2-3 HDD LED Indicator

The Hard Disk Drive LED (HDD) indicates activity of the storage device.

Color	Status		Meaning
Yellow		Flickering	The storage device is active.

3-2-4 RUN LED Indicator

The RUN LED is available for user applications.

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



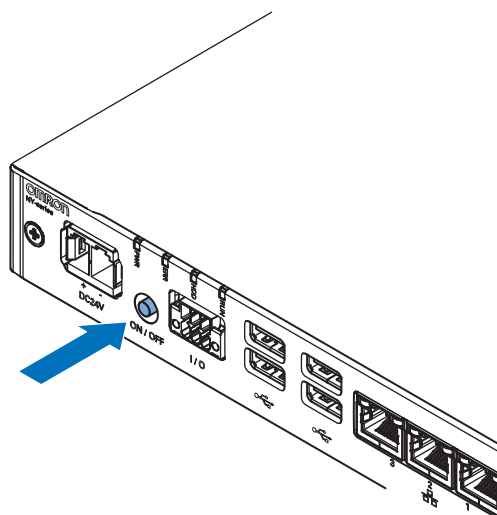
Additional Information

Refer to *NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)* for Industrial PC System API for API details.

3-3 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

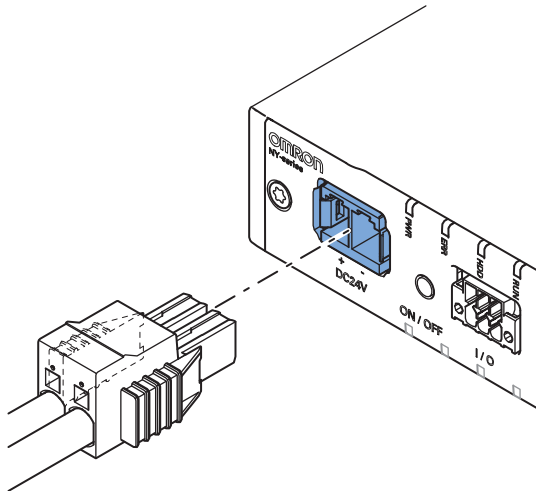
- Refer to 6-1 *Power ON* on page 6-2 for ON details.
- Refer to 6-2 *Power OFF* on page 6-3 for OFF details.

3-4 Connectors

This section gives an overview of the connectors located at the base layer of the Industrial Box PC.

3-4-1 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 4-23 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.

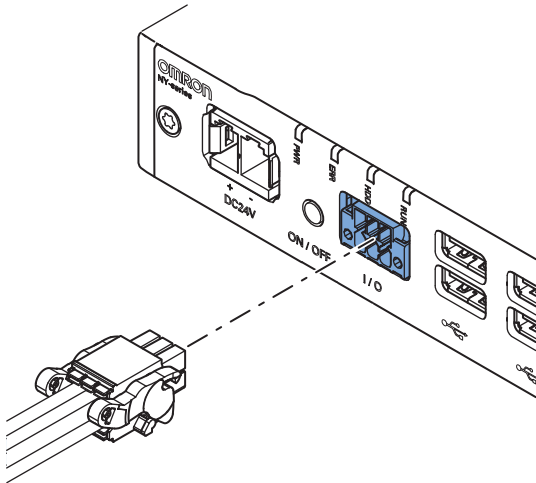
3-4-2 I/O Connector

The I/O connector on the Industrial Box PC provides 2 discrete Input signals and 1 discrete Output signal.

An example to use these I/O signals:

- Input 1.
E.g. to signal to the Box PC when a connected UPS switches to battery power.
- Input 2.
E.g. to signal to the Box PC to perform a shutdown or power ON when the signal turns ON.
- Output 1 to indicate the power status of the Box PC.

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

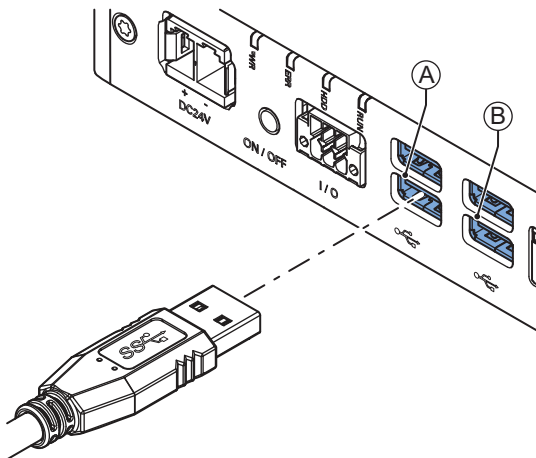


Additional Information

- Refer to 4-2-2 *I/O Connector Specifications* on page 4-24 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.

3-4-3 USB Connectors

USB connectors support USB 2.x or USB 3.x specifications.
All USB interfaces are protected against overcurrent.

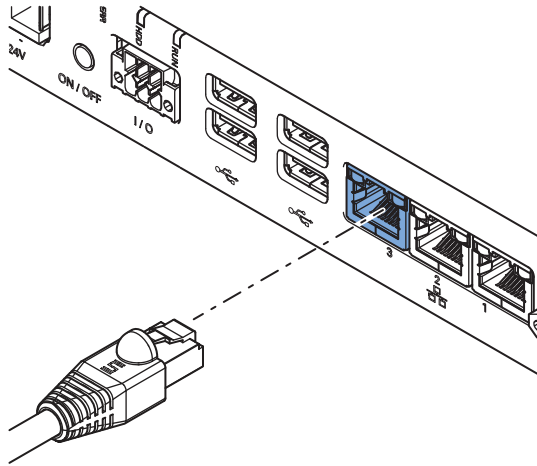


Additional Information

- Refer to 4-2-3 *USB Connector Specifications* on page 4-28 for specifications.
- Refer to 5-5 *Connect* on page 5-42 for connection details.

3-4-4 Ethernet Connectors

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

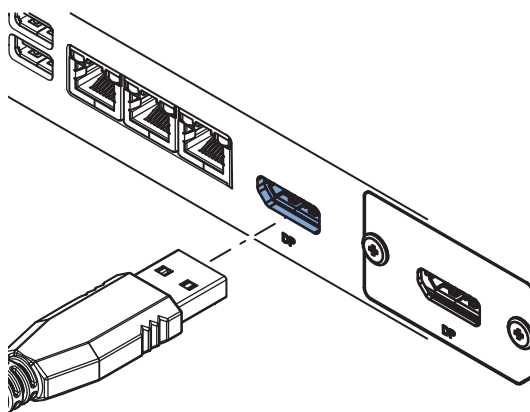


Additional Information

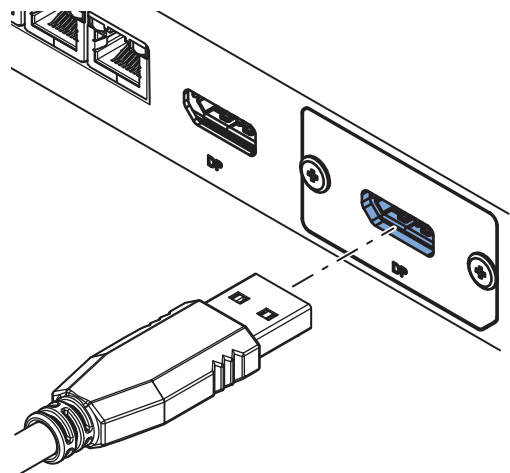
- Refer to 4-2-4 *Ethernet Connector Specifications* on page 4-29 for specifications.
- Refer to 5-5 *Connect* on page 5-42 for connection details.

3-4-5 DisplayPort Connector (Optional)

On the IPC the DisplayPort interface supported on the left connector is dependent on the configuration of the IPC. The DisplayPort on the right connector is the optional interface. On the Industrial Box PC.



IPC left DisplayPort Connector



IPC right DisplayPort Connector

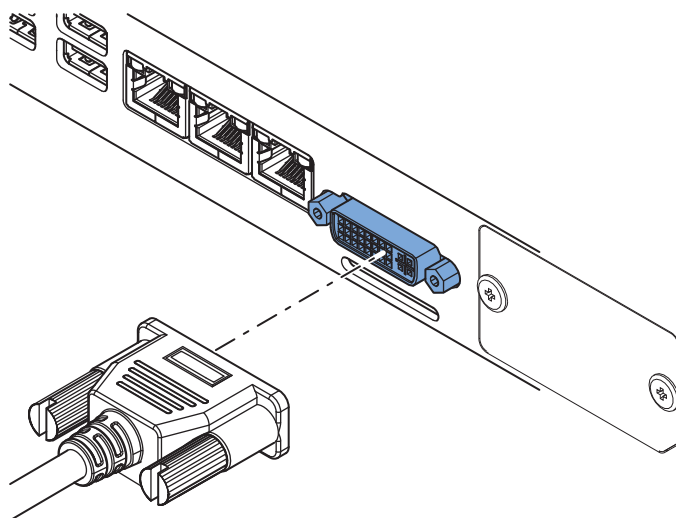


Additional Information

- Refer to *1-4 Product Configuration Box PC* on page 1-5 for configuration details.
- Refer to *4-2-6 DisplayPort Connector Specifications* on page 4-32 for specifications.
- Refer to *5-5 Connect* on page 5-42 for connection details.

3-4-6 DVI Connector (Optional)

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

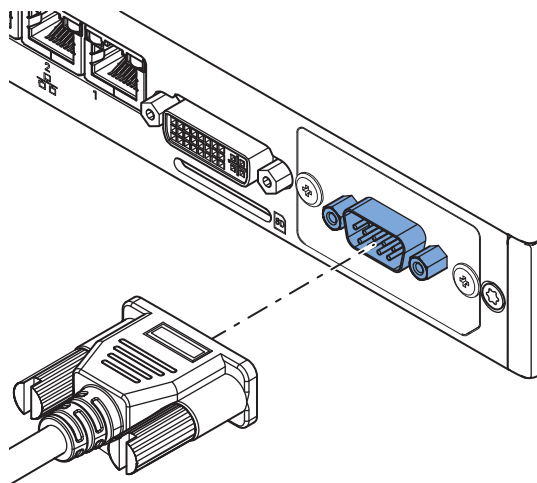


Additional Information

- Refer to *1-4 Product Configuration Box PC* on page 1-5 for configuration details.
- Refer to *4-2-5 DVI Connector Specifications* on page 4-31 for specifications.
- Refer to *5-5 Connect* on page 5-42 for connection details.

3-4-7 RS-232C Connector (Optional)

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



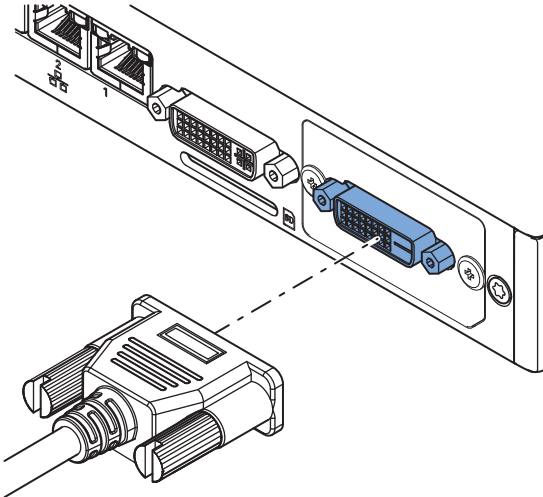


Additional Information

- Refer to *1-4 Product Configuration Box PC* on page 1-5 for configuration details.
- Refer to *4-2-8 RS-232C Connector Specifications* on page 4-34 for specifications.
- Refer to *5-5 Connect* on page 5-42 for connection details.

3-4-8 DVI-D Connector (Optional)

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



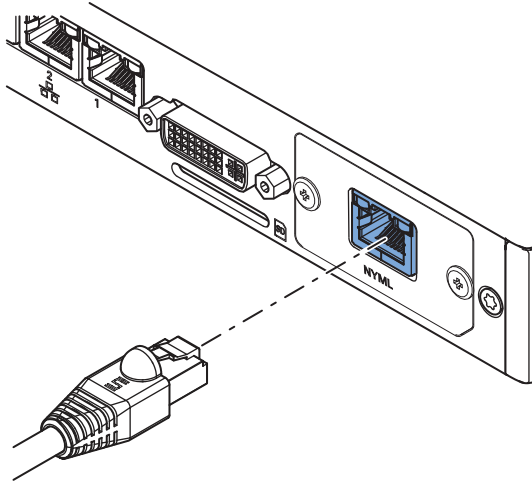
Additional Information

- Refer to *1-4 Product Configuration Box PC* on page 1-5 for configuration details.
- Refer to *4-2-7 DVI-D Connector Specifications* on page 4-33 for specifications.
- Refer to *5-5 Connect* on page 5-42 for connection details.

3-4-9 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

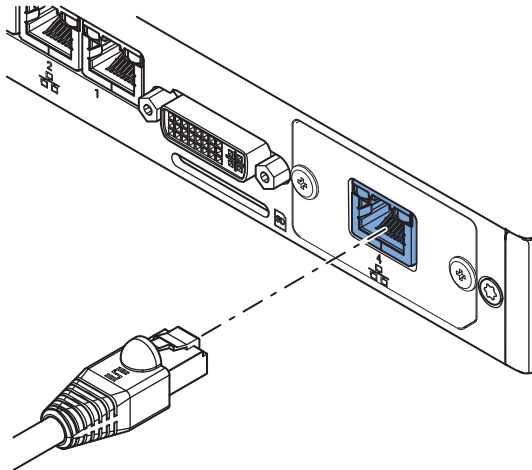


Additional Information

- Refer to *1-4 Product Configuration Box PC* on page 1-5 for configuration details.
- Refer to *4-2-9 NY Monitor Link Connector Specifications* on page 4-34 for specifications.
- Refer to *5-5 Connect* on page 5-42 for connection details.

3-4-10 Ethernet Connector (Optional)

Depending on the product configuration an optional Ethernet connector is available.



Additional Information

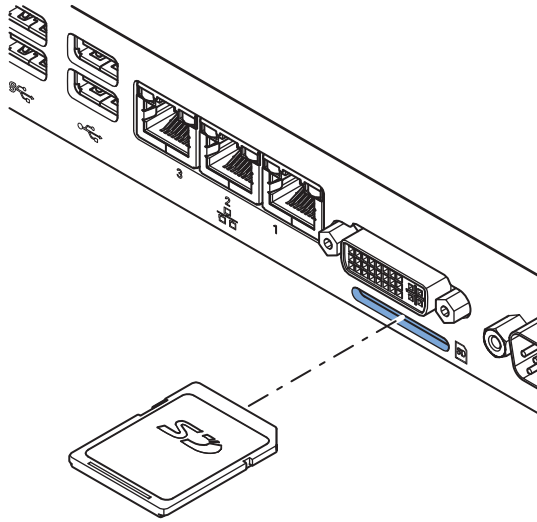
- Refer to *1-4 Product Configuration Box PC* on page 1-5 for configuration details.
- Refer to *4-2-4 Ethernet Connector Specifications* on page 4-29 for specifications.
- Refer to *5-5 Connect* on page 5-42 for connection details.

3-5 SD Memory Card Slot (Optional)

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

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

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

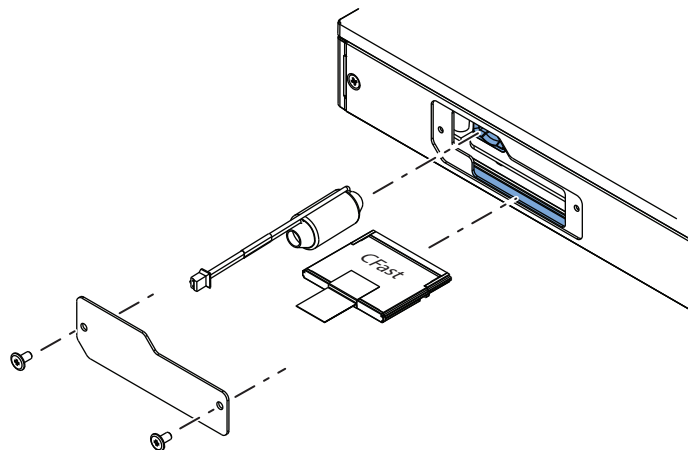


Additional Information

Refer to 3-10-2 *SD Memory Cards* on page 3-25 for SD Memory Card details.

3-6 CFast Card, Battery Slot (Optional)

Depending on the product configuration an optional CFast Card slot and/or an optional Battery are located at the rear side of the base layer.

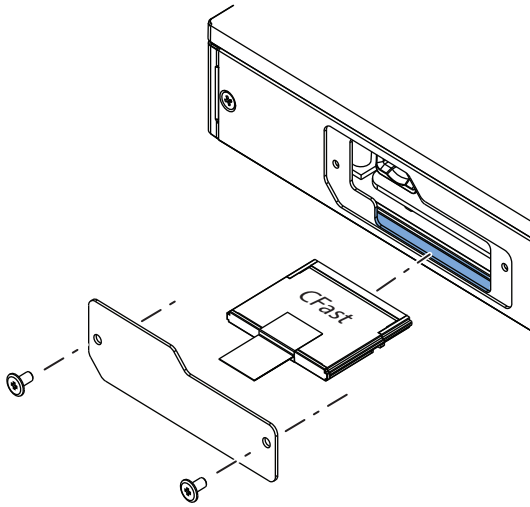


Additional Information

- Refer to 3-6-1 CFast Card Slot (Optional) on page 3-18 for more information.
- Refer to 3-6-2 Battery Slot (Optional) on page 3-18 for more information.

3-6-1 CFast Card Slot (Optional)

Depending on the product configuration an optional CFast Card slot is located at the rear side of the base layer.

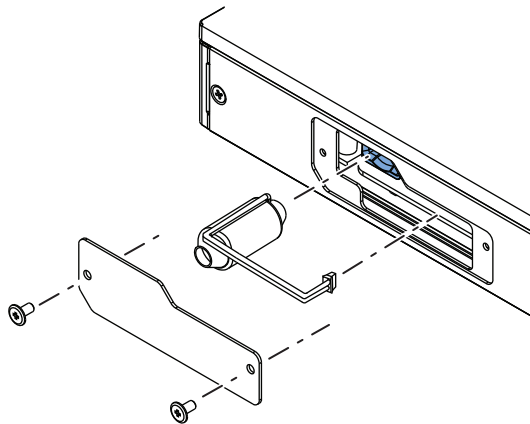


Additional Information

Refer to 3-10-3 *CFast Cards* on page 3-25 for details.

3-6-2 Battery Slot (Optional)

Depending on the product configuration a battery can be mounted behind the cover at the rear side of the base layer.



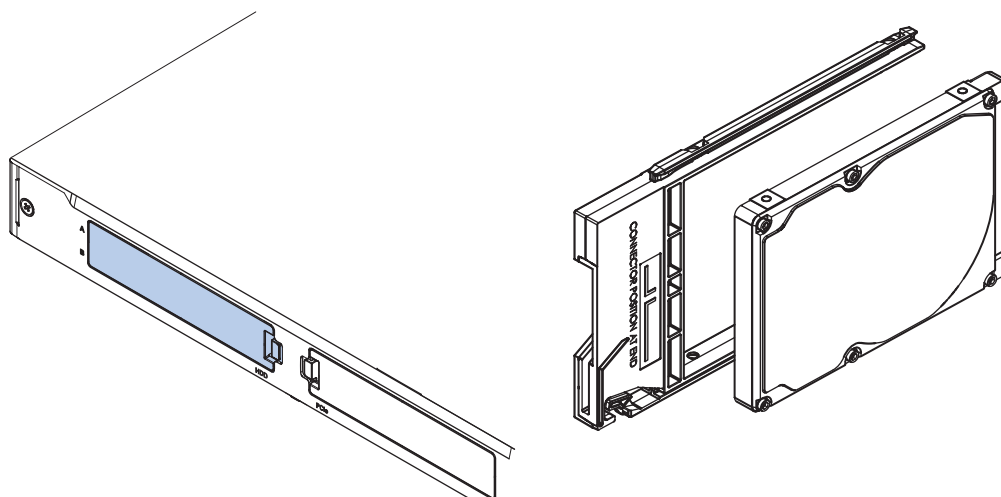
Additional Information

Refer to 3-9-1 *Battery* on page 3-21 for more information.

3-7 Drive Bays

The drive bays are located in the expansion layer.

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



Additional Information

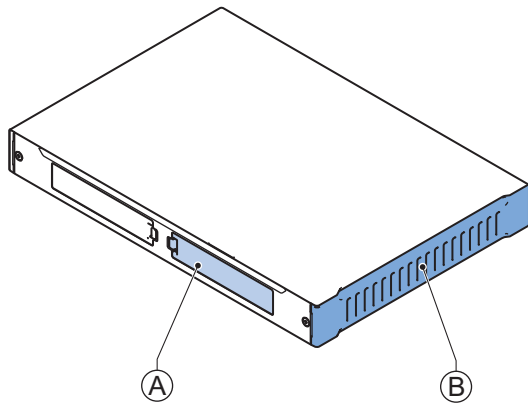
- Refer to *4-1-5 CPU Specifications* on page 4-7 for the number of supported drives.
- Refer to *4-1-7 Storage Device Specifications* on page 4-14 for storage device specifications.
- Refer to *5-2-2 Install a Drive* on page 5-6 for install information.
- Refer to *7-2-5 Replace a Drive* on page 7-14 for maintenance information.

3-8 PCIe Card Slot

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

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

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



Additional Information

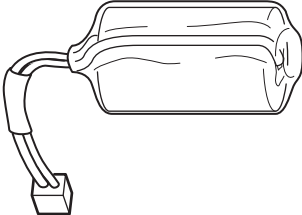
- Refer to 4-1-8 *PCIe Card Specifications* on page 4-18 for specifications.
- Refer to 5-2-3 *Install the PCIe Card* on page 5-10 for install information.
- Refer to 7-2-6 *Replace the PCIe Card* on page 7-19 for maintenance information.

3-9 Spare Parts

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

3-9-1 Battery

One battery is located inside the Box PC. The battery supplies power to the real-time clock. Refer to *7-2-4 Replace the CJ1W Battery* on page 7-9 for the more information. A non-replaceable battery has a lifetime for at least 10 years at 40°C.

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



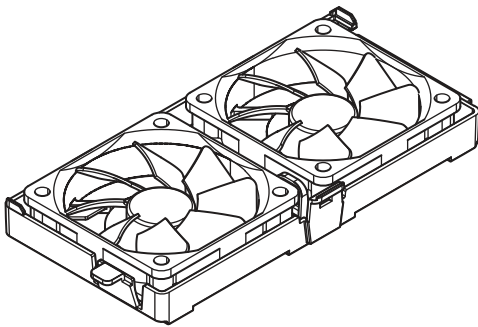
Additional Information

Refer to the label on the battery for the production date. The manufacturing date is mentioned with YY-MM.
Production Date



3-9-2 Fan Unit

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

Model	Appearance	Specifications
NY000-AF00		<ul style="list-style-type: none"> Service life: 70,000 hours of continuous operation at 40°C with 15% to 65% relative humidity Shelf life: 6 months <p>This is the storage limitation with no power supplied. We highly recommend performance testing if the Fan Unit has been stored over 6 months.</p>

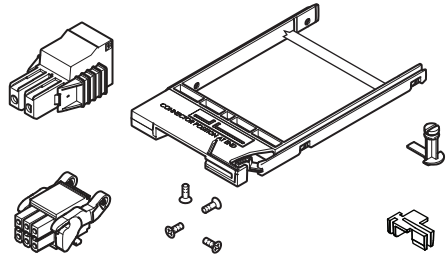


Additional Information

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

3-9-3 Accessory Kit

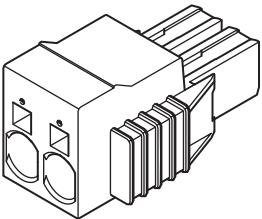
The accessory kit for the Box PC.

Model	Appearance	Specifications
NY000-AK00		<p>Accessory Kit containing all accessories supplied with the Box PC.</p> <ul style="list-style-type: none"> • Power connector • I/O connector • Drive bracket for drive installation ^{*1} • 4 mounting screws for drive installation ^{*1} • PCIe Card support for PCIe Card installation ^{*1} • PCIe Card clip for PCIe Card installation ^{*1}

^{*1}. The Accessory Kit can contain accessories that are not applicable to your model.
Refer to 1-4 Product Configuration Box PC on page 1-5 for details.

3-9-4 Connectors

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

Model	Appearance	Specifications
NY000-AK01		<p>Power Connectors for Omron Industrial PCs. 10 pieces.</p>

3-10 Optional Hardware


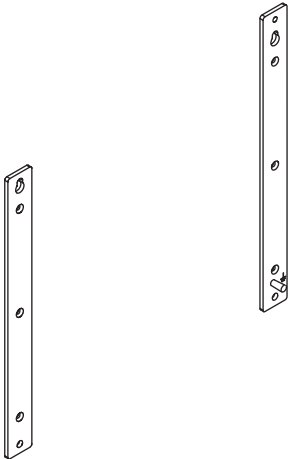
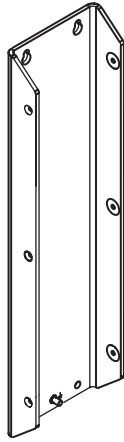
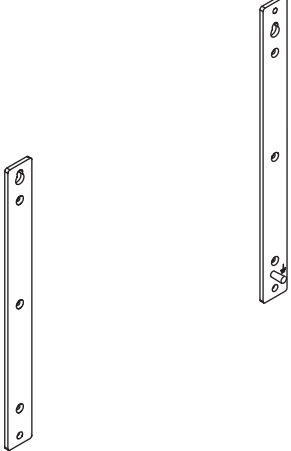
The following optional hardware is available for the Industrial Box PC.


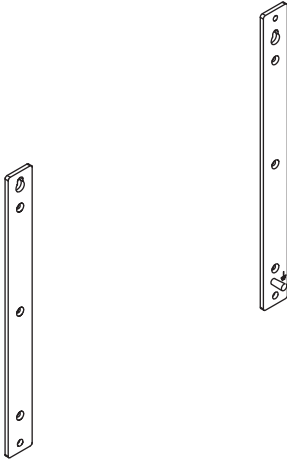

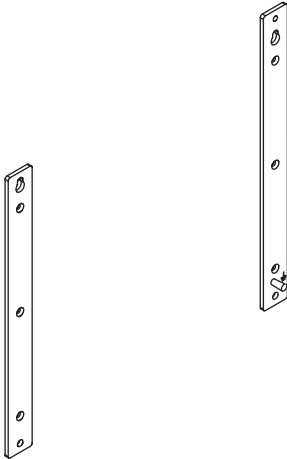
3-10-1 Mounting Brackets

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

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

Bracket details per model-ID.

Model		Bracket ID and appearance	
Model-ID	Model details	Book mount details	Wall mount details
<ul style="list-style-type: none"> • NYB1C-□1 • NYB1E-□1 • NYB1E-□2 • NYB17-□1 • NYB2E-□1 • NYB2E-□2 • NYB25-□1 • NYB27-□1 • NYB27-□2 • NYB37-□1 • NYB37-□2 • NYB55-□1 • NYB55-□2 	<ul style="list-style-type: none"> • With Expansion layer • With Cooling layer with removable cover 	NY000-AB00 	NY000-AB01 
<ul style="list-style-type: none"> • NYB13-□1 • NYB13-□2 • NYB2C-□1 • NYB35-□1 • NYB35-□2 • NYB65-□1 • NYB65-□2 	<ul style="list-style-type: none"> • With Expansion layer • With Cooling layer with non-removable cover 	NY000-AB02 	NY000-AB01 


Model		Bracket ID and appearance	
<ul style="list-style-type: none">• NYB2E-□0• NYB27-□0• NYB37-□0• NYB55-□0	<ul style="list-style-type: none">• Without Expansion layer• With Cooling layer with removable cover	NY000-AB05 	NY000-AB01 
<ul style="list-style-type: none">• NYB13-□0• NYB2A-□0• NYB2C-□0• NYB3A-□0• NYB35-□0• NYB65-□0	<ul style="list-style-type: none">• Without Expansion layer• With Cooling layer with non-removable cover	NY000-AB04 	NY000-AB01 

Refer to 4-1-9 *Bracket Specifications* on page 4-21 for bracket dimension details.

3-10-2 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-SD292		SD Card	2 GB	FAT16
HMC-SD492		SDHC Card	4 GB	FAT32
HMC-SD1A2		SDHC Card	16 GB	FAT32

3-10-3 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
NY000-AT05 *1			128 GB	Acon AD5CFPIAR0128085-11
NY000-AT06 *1			256 GB	Acon AD5CFPIAR0256085-11
NY000-AT07 *1			512 GB	Acon AD5CFPIAR0512085-11

*1. Default for Box PC models: NY□13, NY□2E, NY□3A, NY□37, NY□55 and NY□65



Additional Information

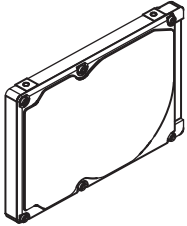
Refer to *CFast Card Specifications* on page 4-17 for CFast Card specifications.

3-10-4 HDD and SSD Storage Devices

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

HDD and SSD storage device details are provided below.

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

Model	Appearance	Storage type	Capacity	Details
NY000-AH00		HDD	320 GB	Toshiba MQ01ABF032
NY000-AH01			500 GB	Toshiba MQ01ABF050
NY000-AH02			1 TB	WD HTS541010B7E610
NY000-AS00		SSD SLC	32 GB	Apacer APS25AB7032G-AT
NY000-AS01 ^{*1}			64 GB	Apacer APS25AB7064G-AT
NY000-AS03 ^{*2}			64 GB	Hagiwara HFD25S-064GD(A23AE)-HC
NY000-AS06		SSD-pSLC	128 GB	Innodisk DHS25-A28M41BC1DC
NY000-AS04 ^{*1*2}		SSD MLC	128 GB	Innodisk DES25-A28M41BC1DC
NY000-AS08			256 GB	Innodisk DES25-B56M41BC1DC
NY000-AS05			500 GB	Innodisk DES25-C12D08BC1QC
NY000-AS07		3D TLC	1 TB	Innodisk DES25-01TDK1EC1QF
NY000-AS09 ^{*3}			128 GB	Acon AD5S27IAR0128070-11
NY000-AS10 ^{*3}			256 GB	Acon AD5S27IAR0256070-11
NY000-AS11 ^{*3}			512 GB	Acon AD5S27IAR0512070-11
NY000-AS12 ^{*3}			1 TB	Acon AD5S27IAR1000070-11
NY000-AS13			2 TB	Acon AD5S27IAR2000070-11

*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 and -□2, NY□2C-□1, NY□1E-□1 and -□2, NY□27-□1 and -□2

*3. Default for Box PC models: NY□13, NY□2E, NY□3A, NY□37, NY□55 and NY□65



Additional Information

Refer to *4-1-7 Storage Device Specifications* on page 4-14 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 4-14 for storage device specifications.
- Refer to *4-3-1 Operation Environment Specifications* on page 4-36 for environment specifications, specifically temperature and vibration specifications.

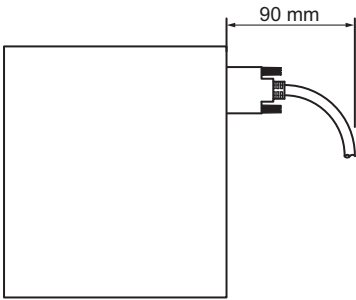
3-10-5 DVI Cables

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

Model	Appearance	Cable length	Specifications
NY000-AC00 2M		2 m	<ul style="list-style-type: none">• 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.



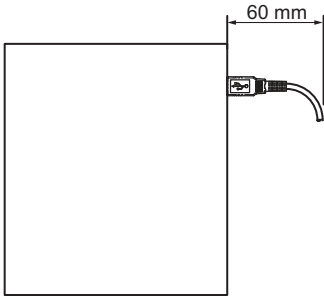
3-10-6 USB Type-A to USB Type-B Cables

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

Model	Appearance	Cable length	Specifications
FH-VUAB 2M		2 m	<ul style="list-style-type: none">• 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.



3-10-7 NY Monitor Link Cables

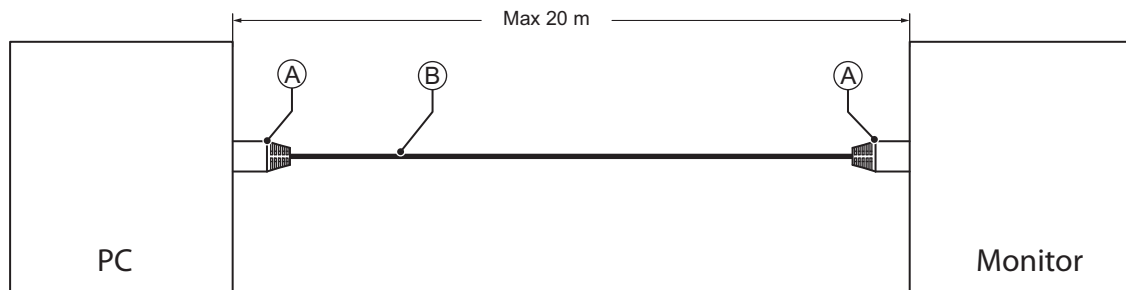
Depending on the installation situation specific cables are recommended for an NY Monitor Link (NYML).

Refer to:

- *NYML Recommendations up to 20 m* on page 3-29 for details.
- *NYML Recommendations up to 100 m* on page 3-30 for details.
- *NYML Recommendations for Custom Cables* on page 3-31 for details.

NYML Recommendations up to 20 m

Connectors (A) and cables (B) with different lengths can be used.



The following table lists the recommended cables and connectors for the NY Monitor Link cable applications up to 20 m.

Item	Length	Specifications	
		ID	Details
Standard Patch cable with straight connectors.	1.5 m	XS6W-6LSZH8SS150CM-[]	Industrial Ethernet cable: RJ45 IP20, RJ45 IP20, Cat.6A, IEC 60332-1 /UL444, LSZH, Molded Connector. Qualified for 10Gb/s, S/FTP
	3 m	XS6W-6LSZH8SS300CM-[]	
	5 m	XS6W-6LSZH8SS500CM-[]	
	10 m	XS6W-6LSZH8SS1000CM-[]	
	15 m	XS6W-6LSZH8SS1500CM-[]	
	20 m	XS6W-6LSZH8SS2000CM-[]	
Patch cable (Flexibility-improved) with straight connectors.	1.5 m	XS6W-6PUR8SS150CM-[]F	Industrial Ethernet cable: RJ45 IP20, RJ45 IP20, Cat.6A, IEC 61156-6, IEC11801, IEC 60332-1, PUR, Molded Connector. Qualified for 10Gb/s, S/FTP
	3 m	XS6W-6PUR8SS300CM-[]F	
	5 m	XS6W-6PUR8SS500CM-[]F	
	10 m	XS6W-6PUR8SS1000CM-[]F	
	15 m	XS6W-6PUR8SS1500CM-[]F	
	20 m	XS6W-6PUR8SS2000CM-[]F	

● NY Monitor Link Cable Clearance

Ensure to prevent excessive strain on the connector and cable assembly.

The minimum clearance from the connector entry consists of the sum of:

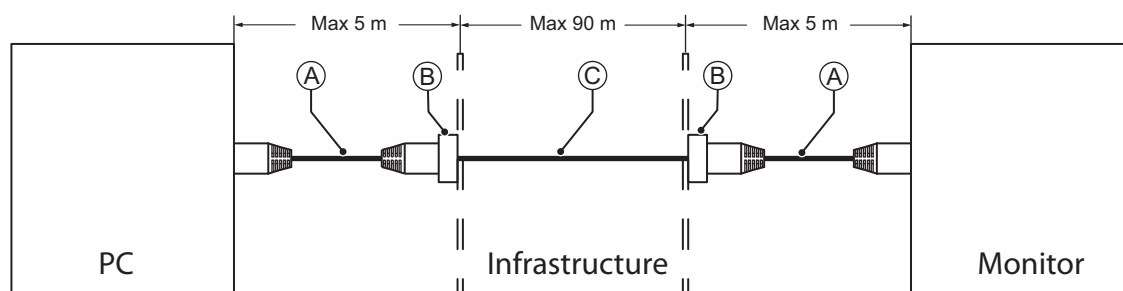
- Connector length
- Maximum bending radius of the cable in a fixed position

NYML Recommendations up to 100 m



Patch Cables (A) with different lengths can be used.

Use a DIN rail socket (B) when connecting patch cables to infrastructures.

Use installation cable (C) inside infrastructures.



The following table lists the recommended cables and materials for the NY Monitor Link cable applications up to 100 m.

Item	Length	Specifications	
		ID	Details
(A) Standard Patch cable with straight connectors.	1.5 m	XS6W-6LSZH8SS150CM-□	Industrial Ethernet cable: RJ45 IP20, RJ45 IP20, Cat.6A, IEC 60332-1 /UL444, LSZH, Molded Connector. Qualified for 10Gb/s, S/FTP
	3 m	XS6W-6LSZH8SS300CM-□	
	5 m	XS6W-6LSZH8SS500CM-□	
(A) Patch cable (Flexibility-improved) with straight connectors.	1.5 m	XS6W-6PUR8SS150CM-□F	Industrial Ethernet cable: RJ45 IP20, RJ45 IP20, Cat.6A, IEC 61156-6, IEC11801, IEC 60332-1, PUR, Molded Connector. Qualified for 10Gb/s, S/FTP
	3 m	XS6W-6PUR8SS300CM-□F	
	5 m	XS6W-6PUR8SS500CM-□F	
(B) D- DIN rail socket Manufacturer: Weidmuller 		IE-XM-RJ45/IDC	Mounting rail outlet, RJ45 module design according to IEC 60603-7-51, for wires with diameters up to 1.6 mm UL
(C) Installation Cable Manufacturer: Lapp 		ETHERLINE ® PN Cat.6A FLEX	Industrial Ethernet cable ETHERLINE PN Cat.6A FLEX Cat.6A for flexible use, 4 pairs, PVC or FRNC outer sheath UL 4x2xAWG23/7 Qualified for 10Gb/s

● NY Monitor Link Cable Clearance

Ensure to prevent excessive strain on the connector and cable assembly.

The minimum clearance from the connector entry consists of the sum of:

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

NYML Recommendations for Custom Cables

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

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

Ensure to prevent excessive strain on the connector and cable assembly.

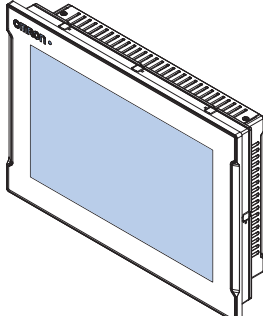
The minimum clearance consists of the sum of:

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

3-10-8 Industrial Monitor

Details for the recommended monitor are provided below.

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

Model	Appearance	Specifications
NYM12W-C1□□□ NYM15W-C1□□□ NYM19W-C1□□□		<ul style="list-style-type: none"> • LCD touchscreen • Multi-touch functionality • Supply voltage: 24 VDC • Up to 1,280 x 800 pixels at 60 Hz (12", 15") or 1,920 x 1,080 pixels at 60 Hz (19") • 2 USB Type-A Connectors • Programmable brightness control



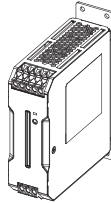
Additional Information

Refer to [the OMRON website](#) for specifications and manuals.

3-10-9 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 S8VK-X□□□24A-EIP S8VK-S□□□24 S8VK-WA□□□24		Output voltage: 24 VDC

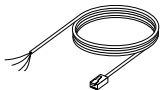


Additional Information

- 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.
Note that the power consumption details of the Box PC determine the minimum power rating of your power supply.

3-10-11 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 <ul style="list-style-type: none">• Signal output (BL, TR, BU, WB)• Remote ON/OFF input• UPS Stop Signal input (BS)

Specifications

This section provides specifications of the Industrial Box PC.

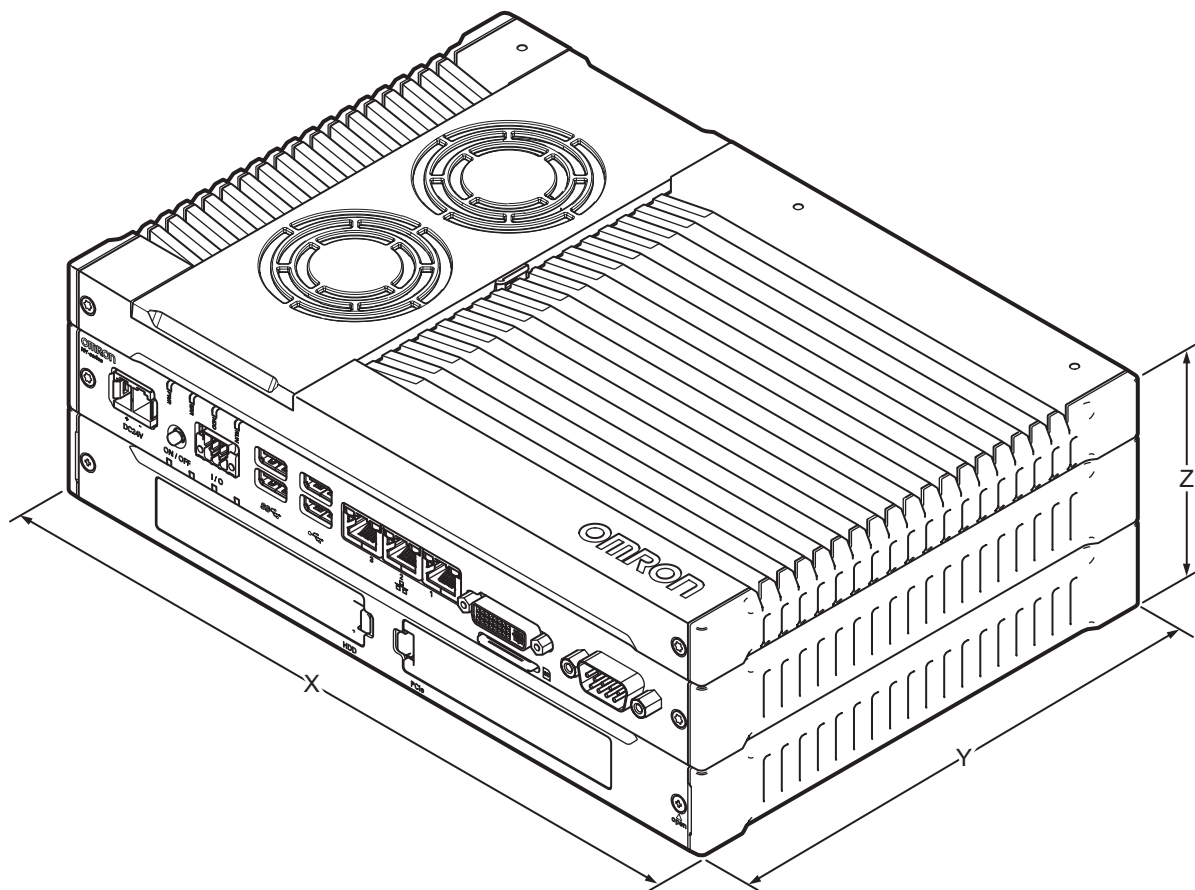
4-1	General Specifications	4-2
4-1-1	Dimensions and Weight	4-2
4-1-2	General Electrical Specifications	4-4
4-1-3	Power Consumption Specifications	4-5
4-1-4	Power Supply Specifications	4-6
4-1-5	CPU Specifications	4-7
4-1-6	Memory Specifications	4-12
4-1-7	Storage Device Specifications	4-14
4-1-8	PCIe Card Specifications	4-18
4-1-9	Bracket Specifications	4-21
4-2	Connector Specifications	4-23
4-2-1	Power Connector Specifications	4-23
4-2-2	I/O Connector Specifications	4-24
4-2-3	USB Connector Specifications	4-28
4-2-4	Ethernet Connector Specifications	4-29
4-2-5	DVI Connector Specifications	4-31
4-2-6	DisplayPort Connector Specifications	4-32
4-2-7	DVI-D Connector Specifications	4-33
4-2-8	RS-232C Connector Specifications	4-34
4-2-9	NY Monitor Link Connector Specifications	4-34
4-3	Environmental Specifications	4-36
4-3-1	Operation Environment Specifications	4-36
4-3-2	Temperature and Humidity Specifications	4-37
4-3-3	Recycling Specifications	4-42

4-1 General Specifications

This section provides general specifications of the Industrial Box PC.

4-1-1 Dimensions and Weight

The following table provides specification details on dimensions and weights.



Model			Specifications			
Model ID *1 *2	Model details	Mount details	Width X	Depth Y *3	Height Z	Weight
• NYB1C-□1 • NYB1E-□1 NYB1E-□2 • NYB17-□1 • NYB2E-□1 NYB2E-□2 • NYB25-□1 • NYB27-□1 NYB27-□2 • NYB37-□1 NYB37-□2 • NYB55-□1 NYB55-□2	• 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

Model			Specifications			
Model ID *1 *2	Model details	Mount details	Width X	Depth Y *3	Height Z	Weight
<ul style="list-style-type: none"> • NYB13-□1 • NYB13-□2 • NYB2C-□1 • NYB35-□1 • NYB35-□2 • NYB65-□1 • NYB65-□2 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • NYB2E-□0 • NYB27-□0 • NYB37-□0 • NYB55-□0 	<ul style="list-style-type: none"> • Without Expansion layer • With Cooling layer with removable cover 	Not mounted	282 mm	200 mm	56 mm	2.6 kg
		Book mount	339 mm *4	211 mm	63 mm	2.9 kg
		Wall mount	282 mm	245 mm	59 mm	2.7 kg
<ul style="list-style-type: none"> • NYB13-□0 • NYB2A-□0 • NYB2C-□0 • NYB3A-□0 • NYB35-□0 • NYB65-□0 	<ul style="list-style-type: none"> • Without Expansion layer • With Cooling layer with non-removable cover 	Not mounted	282 mm	200 mm	41 mm	2.1 kg
		Book mount	339 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 Box PC* 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 3-1-2 *Base Layer* on page 3-5 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 <i>1-4 Product Configuration Box PC</i> on page 1-5 for details.
Battery life	Refer to Battery 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.

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

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

The Box PC

Model ID	Power consumption
NYB1C	45 W
NYB1E	86 W
NYB13	41 W
NYB17	81 W
NYB2A	26 W
NYB2C	27 W
NYB2E	130 W
NYB25	52 W
NYB27	86 W
NYB3A	24 W
NYB35	46 W
NYB37	86 W
NYB55	71 W
NYB65	62 W

Installed drives

Drives	Power consumption
Bay A	Refer to <i>4-1-7 Storage Device Specifications</i> on page 4-14 for Omron drive details. For other drives refer to the applicable specifications for maximum power consumption details.
Bay B	
CFast	

Connected expansions

Expansions	Power consumption
USB	Refer to the power consumption specifications of your connected USB devices. Refer to <i>4-2-3 USB Connector Specifications</i> on page 4-28 for maximum power consumption details.
PCIe	Refer to the power consumption specifications of the installed PCIe Card. Refer to <i>4-1-8 PCIe Card Specifications</i> on page 4-18 for maximum power consumption details.

Calculation for the total power consumption:

Industrial Box PC with my specific model-ID 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}
<ul style="list-style-type: none"> • NY□1C • NY□13 • NY□2A • NY□2C • NY□25 • NY□3A • NY□35 • NY□65 	120 W	120 W
<ul style="list-style-type: none"> • NYB17 • NYB55 	240 W	120 W
<ul style="list-style-type: none"> • NY□1E • NYP17 • NY□2E • NY□27 • NY□37 • NYP55 	240 W	240 W

*1. Refer to *3-10-9 Power Supply* on page 3-32 for power supply products.

*2. Refer to *3-10-10 UPS* on page 3-33 for UPS products.

4-1-5 CPU Specifications

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

NY□1C 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
Maximum memory size	16 GB
Cooling details	Passive cooling (fanless)
Graphics controller	Intel® HD Graphics
DDR type	DDR3L-1600, non-ECC

NY□1E 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
Maximum memory size	64 GB
Cooling details	Requires active cooling (fan)
Graphics controller	Intel® Iris™ Pro Graphics P580
DDR type	DDR4-2400, ECC and non-ECC

NY□13 Intel® Core™ i3-1115GRE CPU Specifications

CPU specifications for an Intel® Core™ i3-1115GRE CPU.

Item	Specifications
Cores / Threads	2 / 4
CPU base frequency	2.2 GHz
Maximum turbo frequency	3.9 GHz
Cache	6 MB
Maximum memory size	64 GB
Cooling details	Passive cooling (fanless)
Graphics controller	Intel® UHD Graphics
DDR type	DDR4-3200, non-ECC

NY□17 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
Maximum memory size	32 GB
Cooling details	Requires active cooling (fan)
Graphics controller	Intel® HD Graphics 4600
DDR type	DDR3L-1600, non-ECC

NY□2A Intel® Atom® x5-E3940 CPU Specifications

CPU specifications for an Intel® Atom® x5-E3940 CPU.

Item	Specifications
Cores / Threads	4 / 4
CPU base frequency	1.6 GHz
Maximum turbo frequency	1.8 GHz
Cache	2 MB
Maximum memory size	8 GB
Cooling details	Passive cooling (fanless)
Graphics controller	Intel® HD Graphics 500
DDR type	DDR3L-1866, non-ECC

NY□2C 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
Maximum memory size	32 GB
Cooling details	Passive cooling (fanless)
Graphics controller	Intel® HD Graphics 610
DDR type	DDR4-2400, non-ECC

NY□2E Intel® Xeon® W-11865MRE CPU Specifications

CPU specifications for an Intel® Xeon® W-11865MRE CPU.

Item	Specifications
Cores / Threads	8 / 16
CPU base frequency	2.6 GHz
Maximum turbo frequency	4.7 GHz
Cache	24 MB
Maximum memory size	96 GB
Cooling details	Active cooling
Graphics controller	Intel® UHD Graphics
DDR type	DDR4-3200, non-ECC and ECC

NY□25 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
Maximum memory size	16 GB
Cooling details	Passive cooling (fanless)
Graphics controller	Intel® HD Graphics 4400
DDR type	DDR3L-1600, non-ECC

NY□27 Intel® Core™ i7-7820EQ CPU Specifications

CPU specifications for an Intel® Core™ i7-7820EQ CPU.

Item	Specifications
Cores / Threads	4 / 8
CPU base frequency	3.0 GHz
Maximum turbo frequency	3.7 GHz
Cache	8 MB
Maximum memory size	64 GB
Cooling details	Requires active cooling (fan)
Graphics controller	Intel® HD Graphics 630
DDR type	DDR4-2400, non-ECC

NY□3A Intel® Atom® x6425RE CPU Specifications

CPU specifications for an Intel® Atom® x6425RE CPU.

Item	Specifications
Cores / Threads	4 / 4
CPU base frequency	1.9 GHz
Maximum turbo frequency	---
Cache	1.5 MB
Maximum memory size	32 GB
Cooling details	Passive cooling (fanless)
Graphics controller	Intel® UHD Graphics
DDR type	DDR4-3200, non-ECC

NY□35 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
Maximum memory size	32 GB
Cooling details	Passive cooling (fanless)
Graphics controller	Intel® HD Graphics 620
DDR type	DDR4-2400, non-ECC

NY□37 Intel® Core™ i7-1185GRE CPU Specifications

CPU specifications for an Intel® Core™ i7-1185GRE CPU.

Item	Specifications
Cores / Threads	4 / 8
CPU base frequency	2.8 GHz
Maximum turbo frequency	4.4 GHz
Cache	12 MB
Maximum memory size	64 GB
Cooling details	Active cooling
Graphics controller	Intel® Iris® Xe Graphics
DDR type	DDR4-3200, non-ECC

NY□55 NY□65 Intel® Core™ i5-1145GRE CPU Specifications

CPU specifications for an Intel® Core™ i5-1145GRE CPU.

For products NY□55 with active cooling.

Item	Specifications
Cores / Threads	4 / 8
CPU base frequency	2.6 GHz
Maximum turbo frequency	4.1 GHz
Cache	8 MB
Maximum memory size	64 GB
Cooling details	Active cooling
Graphics controller	Intel® Iris® Xe Graphics
DDR type	DDR4-3200, non-ECC

For products NY□65 with passive cooling.

Item	Specifications
Cores / Threads	4 / 8
CPU base frequency	1.5 GHz
Maximum turbo frequency	4.1 GHz
Cache	8 MB
Maximum memory size	64 GB
Cooling details	Passive cooling (fanless)
Graphics controller	Intel® Iris® Xe Graphics
DDR type	DDR4-3200, non-ECC

4-1-6 Memory Specifications

This section provides the memory specifications of the Industrial Box PC.

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	64 GB	96 GB
Memory configuration	1 x 4 GB	2 x 4 GB	2 x 8 GB	2 x 16 GB	2 x 32 GB	3 x 32 GB
Memory type	DDR4 Non-ECC					
Package memory format	SO-DIMM					
Speed grade - CAS Latency ^{*2}	2400 MT/s - CL17, 3200 MT/s - CL22					

*1. The applicable type of memory and the maximum size are determined by the CPU type.

Refer to *4-1-5 CPU Specifications* on page 4-7 for CPU details.

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

*2. The actual speed depends on the CPU type.

DDR4 ECC

The following table provides specification details of the DDR4 memory.

Item	Model Specifications ^{*1}				
	8 GB	16 GB	32 GB	64 GB	96 GB
Memory configuration	2 x 4 GB	2 x 8 GB	2 x 16 GB	2 x 32 GB	3 x 32 GB
Memory type	DDR4 ECC				
Package memory format	SO-DIMM				
Speed grade - CAS Latency ^{*2}	2400 MT/s - CL17, 3200 MT/s - CL22				

*1. The applicable type of memory and the maximum size are determined by the CPU type.

Refer to *4-1-5 CPU Specifications* on page 4-7 for CPU details.

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

*2. The 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 - CAS Latency ^{*2}	1600 MT/s - CL11 1866 MT/s - CL13			

^{*1.} The applicable type of memory and the maximum size are determined by the CPU type.
Refer to *4-1-5 CPU Specifications* on page 4-7 for CPU details.

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

^{*2.} The actual speed depends on the CPU type.

4-1-7 Storage Device Specifications

This section provides the specifications of the storage devices.

Hard Disk Drive Specifications

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

Item	Model Specifications		
	320 GB ^{*1}	500 GB ^{*1}	1 TB ^{*1}
Model ^{*2}	NY000-AH00	NY000-AH01	NY000-AH02
Power consumption	2 W max.		
S.M.A.R.T. support	Yes		
Rotation speed	5,400 r/min		
Operating temperature	5 to 55°C ^{*3}		0 to 60°C ^{*3}
Operating humidity (with no condensation)	<ul style="list-style-type: none"> • 8 to 90% RH • 29°C wet-bulb temperature max. 		
Storage temperature	-40 to 65°C		
Storage humidity (with no condensation)	<ul style="list-style-type: none"> • 8 to 90% RH • 40°C wet-bulb temperature max. 		<ul style="list-style-type: none"> • 5 to 95% RH • 40°C wet-bulb temperature max.
Endurance	Approximately 5 years or 20,000 powered-ON hours (whichever comes first) under the following conditions: <ul style="list-style-type: none"> • 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 10⁶ seeks/month 		Average Annualized Failure Rate (AFR): 0.50% under the following conditions: <ul style="list-style-type: none"> • Case Temperature 40°C • Power on Hours (POH) ≤ 3120

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

*2. Refer to *3-10-4 HDD and SSD Storage Devices* on page 3-26 for brand details.

*3. Refer to *4-3-1 Operation Environment Specifications* on page 4-36 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.

● RAID 1 Specifications

For a Box PC with storage devices in RAID 1 both storage devices are required to be of the same model.



Additional Information

When replacing a RAID 1 storage device, ensure the replacement storage device is of the same model as the remaining storage device.

Solid State Drive Specifications

Specifications for the Solid State Drive (SSD) are provided in two tables:

- The first table for SSDs of type SLC, pSLC and MLC.
- The second table for SSDs of type 3D TLC.

Item	Model Specifications SSD types SLC, pSLC, MLC * ¹						
	32 GB	64 GB	128 GB	256 GB	500 GB		
Model * ²	NY000-AS00	NY000-AS01	NY000-AS03	NY000-AS06	NY000-AS04	NY000-AS08	NY000-AS05
Type	SLC			pSLC	MLC		
Max. power consumption	1.4 W	1.4 W	2.5 W	0.8W	0.8 W	0.8 W	2.7 W
S.M.A.R.T. support	Yes						
Max. sequential read speed	160 MB/s	160 MB/s	500 MB/s	530 MB/s	530 MB/s	530 MB/s	415 MB/s
Max. sequential write speed	145 MB/s	150 MB/s	370 MB/s	380 MB/s	190 MB/s	210 MB/s	200 MB/s
Operating temperature	0 to 70°C * ³						
Max. operating humidity (with no condensation)	10 to 95% RH	10 to 95% RH	10 to 85% RH	10 to 95% RH	10 to 95% RH	10 to 95% RH	10 to 95% RH
Storage temperature	-40 to 100°C	-40 to 100°C	-45 to 90°C	-55 to 95°C	-55 to 95°C	-55 to 95°C	-55 to 95°C
Max. storage humidity (with no condensation)	10 to 95% RH						
Endurance	749 TBW	1497 TBW	1900 TBW	1389 TBW	208 TBW	416 TBW	154 TBW

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

*2. Refer to 3-10-4 *HDD and SSD Storage Devices* on page 3-26 for brand details.

*3. Refer to 4-3-1 *Operation Environment Specifications* on page 4-36 for the temperature specifications of the complete Box PC.

Item	Model Specifications SSD type 3D TLC *1					
	128 GB	256 GB	512 GB	1 TB	1 TB	2 TB
Model *2	NY000-AS09	NY000-AS10	NY000-AS11	NY000-AS07	NY000-AS12	NY000-AS13
Type	3D TLC					
Max. power consumption	1.2 W	1.3 W	1.6 W	2.2 W	1.7 W	1.8 W
S.M.A.R.T. support	Yes					
Max. sequential read speed	550 MB/s					
Max. sequential write speed	450 MB/s	485 MB/s	500 MB/s	340 MB/s	510 MB/s	510 MB/s
Operating temperature	0 to 70°C *3					
Max. operating humidity (with no condensation)	5 to 90% RH			10 to 95% RH	5 to 90% RH	
Storage temperature	-40 to 85°C			-55 to 95°C	-40 to 85°C	
Max. storage humidity (with no condensation)	5 to 93% RH			10 to 95% RH	5 to 93% RH	
Endurance	90 TBW	230 TBW	550 TBW	1000 TBW	1200 TBW	3000 TBW

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

*2. Refer to *3-10-4 HDD and SSD Storage Devices* on page 3-26 for brand details.

*3. Refer to *4-3-1 Operation Environment Specifications* on page 4-36 for the temperature specifications of the complete Box PC.

● RAID 1 Specifications

For a Box PC with storage devices in RAID 1 both storage devices are required to be of the same model.



Additional Information

When replacing a RAID 1 storage device, ensure the replacement storage device is of the same model as the remaining storage device.

CFast Card Specifications

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

- The first table for CFast Cards of type MLC
- The second table for CFast Cards of type 3D TLC

Item	Model Specifications ^{*1}		
	64 GB	128 GB	256 GB
Model ^{*2}	NY000-AT00	NY000-AT01	NY000-AT02
Type	MLC		
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% RH		
Storage temperature	-55 to 95°C		
Max. storage humidity (with no condensation)	10 to 95% RH		
Endurance	125 TBW	208 TBW	417 TBW

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

*2. Refer to 3-10-3 *CFast Cards* on page 3-25 for brand details.

*3. Refer to 4-3-1 *Operation Environment Specifications* on page 4-36 for the temperature specifications of the complete Box PC.

Item	Model Specifications ^{*1}		
	128 GB	256 GB	512 GB
Model ^{*2}	NY000-AT05	NY000-AT06	NY000-AT07
Type	3D TLC		
Max. power consumption	1.2 W	1.4 W	1.6 W
Max. sequential read speed	550 MB/s		
Max. sequential write speed	450 MB/s	485 MB/s	500 MB/s
Operating temperature	-40 to 85°C ^{*3}		
Max. operating humidity (with no condensation)	5 to 90% RH		
Storage temperature	-40 to 85°C		
Max. storage humidity (with no condensation)	5 to 93% RH		
Endurance	90 TBW	230 TBW	550 TBW

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

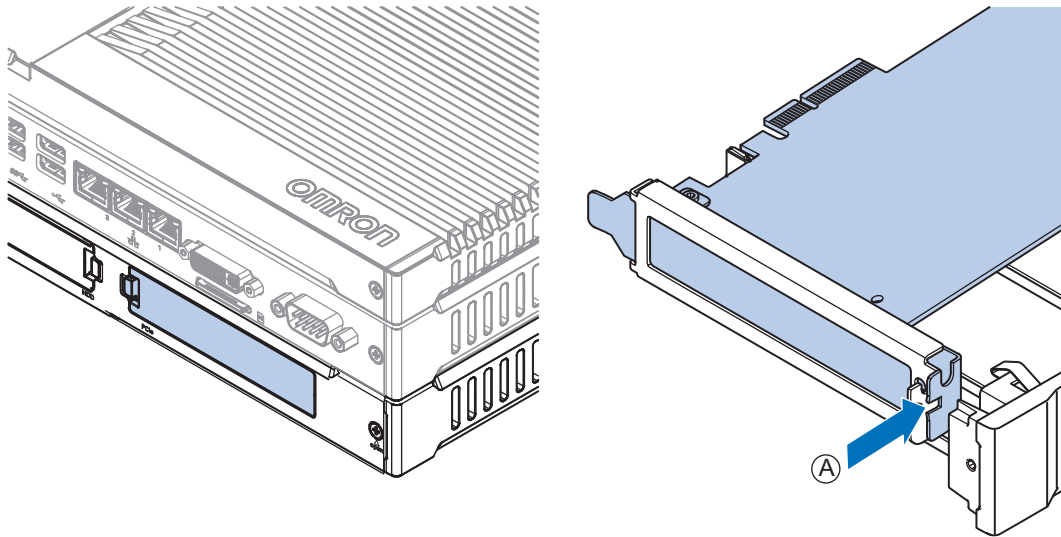
*2. Refer to 3-10-3 *CFast Cards* on page 3-25 for brand details.

*3. Refer to 4-3-1 *Operation Environment Specifications* on page 4-36 for the temperature specifications of the complete Box PC.

4-1-8 PCIe Card Specifications

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

Ensure that, according to the PCIe hardware specifications, the indent ① 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 Box PC* on page 1-5 for product configuration details.

PCIe X1 Card Slot Specifications

The table below provides PCIe X1 Card slot details.

Model-ID	Item	Specifications
<ul style="list-style-type: none"> NY□1C-□1 NY□25-□1 	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 X2 Card Slot Specifications

The table below provides PCIe X2 Card slot details.

Model-ID	Item	Specifications
<ul style="list-style-type: none"> NY□2C-□1 NY□35-□1 NY□35-□2 	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 X4 Card Slot Specifications

The table below provides PCIe X4 Card slot details.

Cards with max 15 W power consumption.

Model-ID	Item	Specifications
<ul style="list-style-type: none"> • NY□1E-□1 • NY□1E-□2 	Configuration	X4 (4 lanes) up to Gen 3
	Card height	Standard height cards, 4.20 inches (106.7 mm) ^{*1}
<ul style="list-style-type: none"> • NY□17-□1 • NY□27-□1 • NY□27-□2 	Card length	Half-length cards, 6.6 inches (167.65 mm)
	Power consumption	15 W max.
<ul style="list-style-type: none"> • NY□2E-□1 • NY□2E-□2 • NY□37-□1 • NY□37-□2 • NY□55-□1 • NY□55-□2 	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.

Cards with max 5 W power consumption.

Model-ID	Item	Specifications
<ul style="list-style-type: none"> • NY□13-□1 • NY□13-□2 	Configuration	X4 (4 lanes) up to Gen 3
	Card height	Standard height cards, 4.20 inches (106.7 mm) ^{*1}
<ul style="list-style-type: none"> • NY□65-□1 • NY□65-□2 	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.

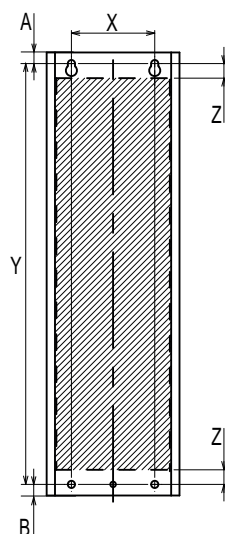
4-1-9 Bracket Specifications

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

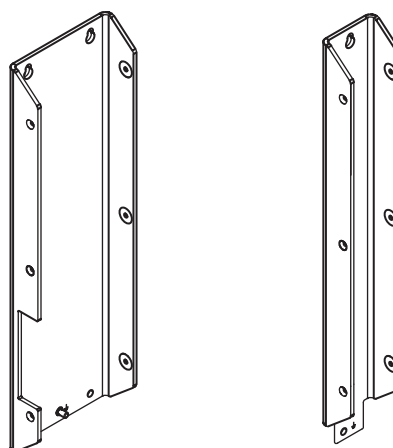
Book Mount Brackets

The metal mounting brackets mount your Box PC.

Dimensions



Examples of book mount brackets



Additional Information

- Refer to 3-10-1 *Mounting Brackets* on page 3-23 for bracket IDs.
- Refer to 5-3-8 *Book Mount Procedure* on page 5-26 for book mount details.

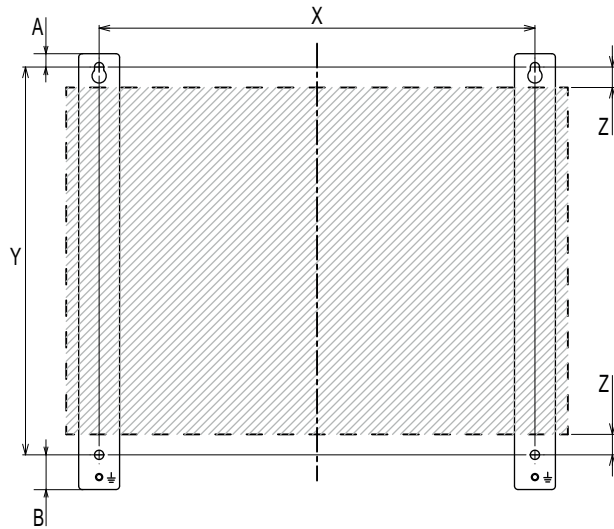
Bracket Details	General Specification
Material thickness	3 mm
Hole diameters	5.5 mm

Bracket Details	Drill Specifications			Product Dimensions			
Bracket ID	Hole Distance X	Hole Distance Y	Distance Z	Bracket Width	Bracket Height	Top to hole A	Hole to bottom B
NY000-AB00	60 mm	303 mm	11 mm	96 mm	319 mm	8 mm	8 mm
NY000-AB02	50 mm	303 mm	11 mm	80 mm	319 mm	8 mm	8 mm
NY000-AB04	n.a.	303 mm	11 mm	47 mm	339 mm	8 mm	8 mm
NY000-AB05	25 mm	303 mm	11 mm	63 mm	339 mm	8 mm	28 mm

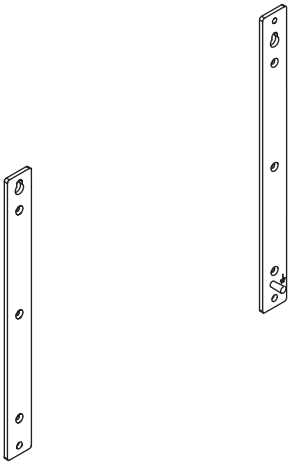
Wall Mount Brackets

The metal mounting brackets mount your Box PC.

Dimensions



Appearance of wall mount brackets



Additional Information

- Refer to 3-10-1 Mounting Brackets on page 3-23 for bracket IDs.
- Refer to 5-3-9 Wall Mount Procedure on page 5-27 for wall mount details.

Bracket Details	General Specification
Material thickness	3 mm
Hole diameters	5.5 mm

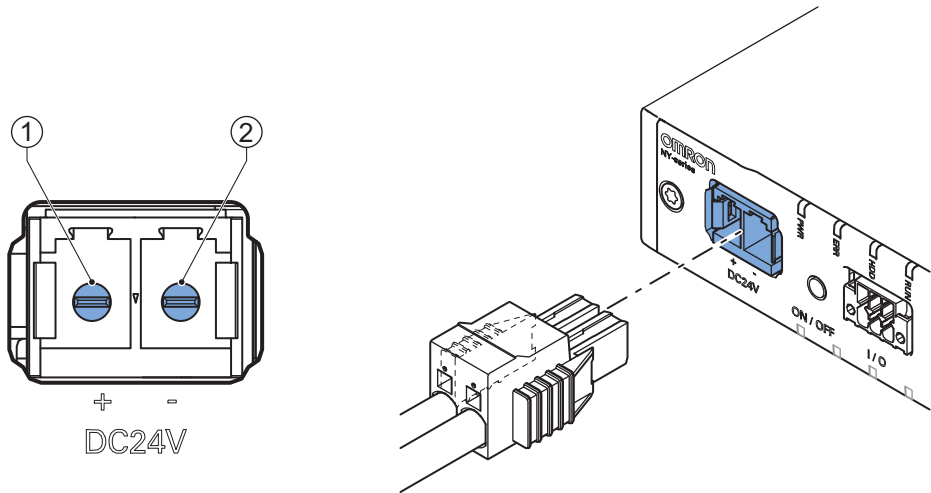
Bracket Details	Drill Specifications			Product Dimensions			
Bracket ID	Hole Dis- tance X	Hole Dis- tance Y	Distance Z	Bracket Width	Bracket Height	Top to hole A	Hole to bottom B
NY000-AB01	245 mm	218 mm	12 mm	23 mm	245 mm	7.5 mm	19.5 mm

4-2 Connector Specifications

This section provides the connector specifications of the Industrial Box PC.

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

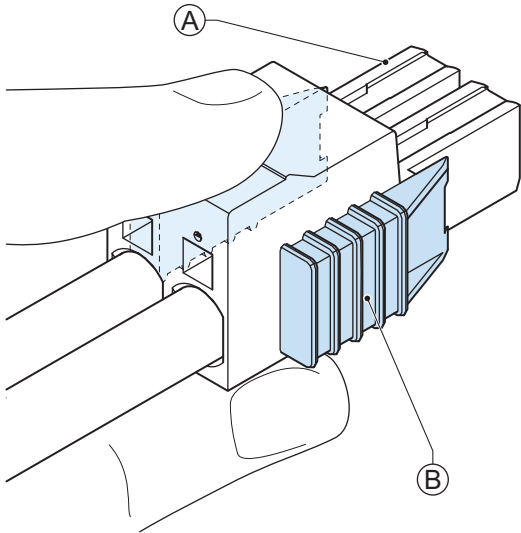


Additional Information

- 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

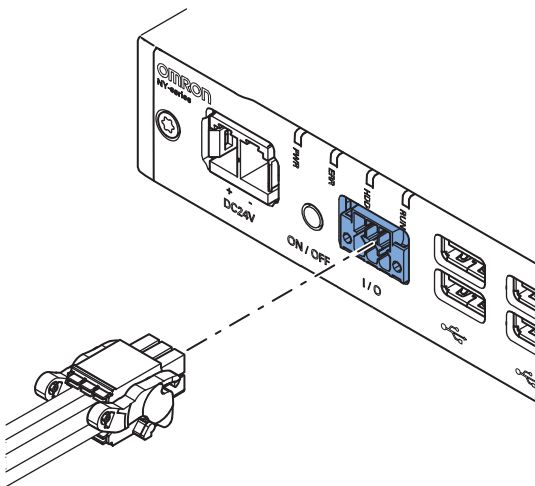
The power connector automatically locks into place when the black part of the connector is held and pushed in.



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

4-2-2 I/O Connector Specifications

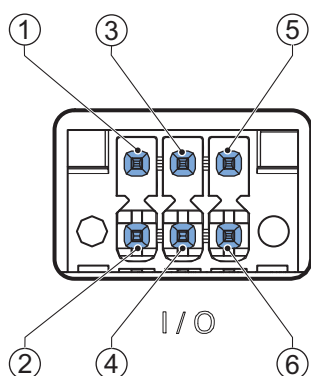
Details of the I/O connector are provided below.
Lock the I/O connector when inserted to prevent unintentional disconnection.
The connector can only be inserted in the correct way.
The Lock-and-Release Latch connector is a Phoenix Contact type DFMC 1,5/ 3-ST-3,5-LR BK (1711658).



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.

For model-IDs NY□13, NY□2E, NY□3A, NY□37, NY□55, NY□65 the functionality of the pins of the I/O connector can be reconfigured using the System SDK. Refer to NY-series Software Development Kit User's Manual for configuration details.

Default pin details of the I/O Connector:

Pin	Description	Type	Electrical Specifications	Details
1 2	Output 1 *1	Contact output	<ul style="list-style-type: none"> SPST-NO contact configuration 24 VDC at 2A switching capacity (resistive load) Operation lifetime 150,000 cycles at 2A max. Connect to SELV 	<ul style="list-style-type: none"> Open: Output 1 is OFF when the Box PC is ON or has been disconnected from the power supply. Closed: Output 1 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. <p>Refer to <i>I/O Connector Output Details</i> on page 4-26 for details.</p>
3 4	Input 1 *2	Isolated transistor input (sinking or sourcing)	<ul style="list-style-type: none"> ON: 8.8 VDC min./5 mA min. OFF: 1.1 VDC max./0.5 mA max. Connect to SELV 	<p>Configured as Power ON/OFF a signal change from inactive to active, will perform one of the following operations.</p> <ul style="list-style-type: none"> When powered ON, the Box PC will shut down and power OFF. When powered OFF, the Box PC will power ON.
5 6	Input 2 *3			<p>This input is provided to allow monitoring the state of an external UPS unit that provides a compatible power state output signal.</p>

*1. Refer to *I/O Connector Output Details* on page 4-26 for Output 1 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.

*3. This input is provided to allow monitoring the state of an external UPS unit that provides a compatible power state output signal.



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 Output Details

This section provides details of Output 1.
Output 1 has a relay between pin 1 and 2 that can be used as a Power Status Output.

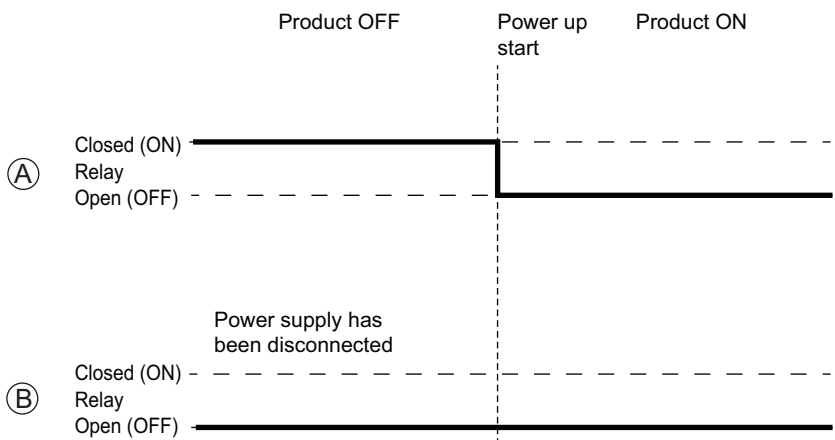


Additional Information

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

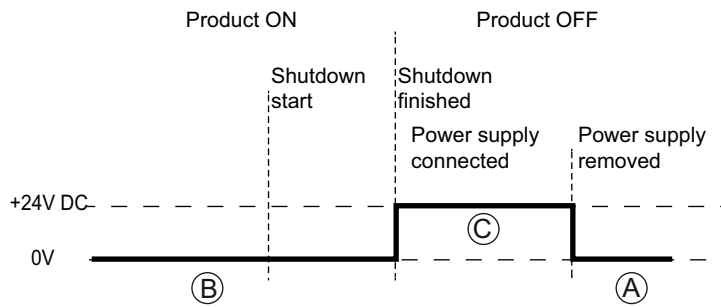
● Power ON Output 1 Operation

This section provides power ON details of the Output 1 operation.
Output 1 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, Output 1 will turn OFF when the Box PC is turned ON.
Output 1 is ON ^(A) when the Box PC has been used and has not been disconnected from the power supply.
Output 1 is OFF ^(B) when the Box PC has been disconnected from the power supply.



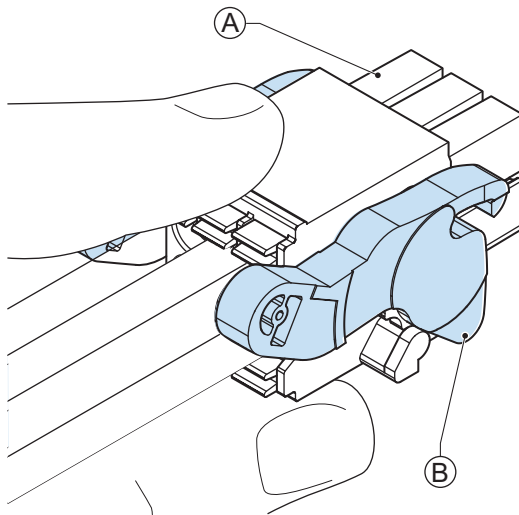
● Power OFF Output 1 Operation

This section provides power OFF details of the Output 1 operation.
Output 1 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, Output 1 will stay ON ^(A). It will turn OFF when the Box PC is turned ON.
If power is turned OFF, Output 1 will turn OFF ^(B).



Lock and Remove the I/O Connector

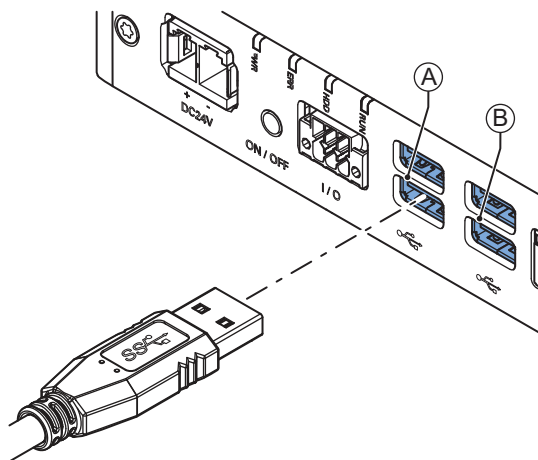
The I/O connector locks into place when the black part of the connector is held and pushed in to the I/O Port.



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

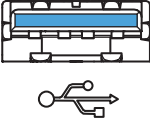
4-2-3 USB Connector Specifications

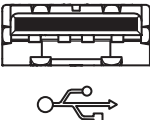
The Industrial Box PC includes several USB connectors.
The connector layout represents the USB connectors on the Box PC.



- (A)
2 USB3.x connectors.
- (B)
2 USB3.x connectors for model-IDs NY□13, NY□2E, NY□37, NY□55, NY□65.
2 USB2.x connectors for all other model-IDs.

The power consumption is provided per USB Connector, calculate the sum for the maximum power consumption off all USB Connectors.

Interface	Details	Specification	Details
USB-A USB3.x		Maximum current	900 mA at 5V DC
		Maximum power consumption	4.5 W per USB connection
		Maximum cable length	3 m

Interface	Details	Specification	Details
USB-A USB2.x		Maximum current	500 mA at 5V DC
		Maximum power consumption	2.5 W per USB connection
		Maximum cable length	5 m



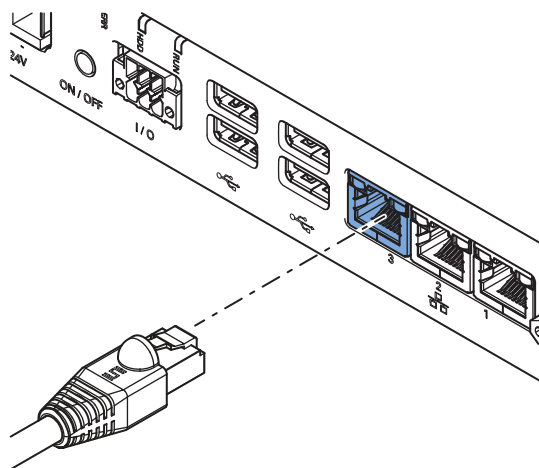
Additional Information

Note that the read/write speed of the connected USB device determines the actual data transfer speed. Use a fast USB device to reduce data transfer durations.

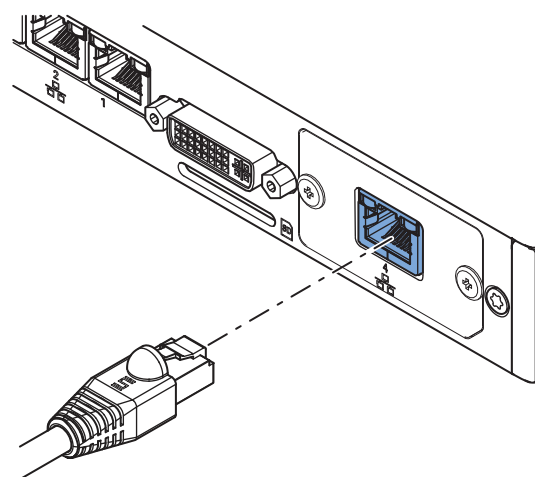
4-2-4 Ethernet Connector Specifications

Details of the RJ45 Ethernet connectors are provided below.

The Ethernet connector locks automatically to prevent unintentional disconnection.



Base layer: 3 RJ45 connectors



Base layer: 1 optional RJ45 connector

Ethernet Connector Specification Details

Details of the RJ45 Ethernet connectors are provided below.

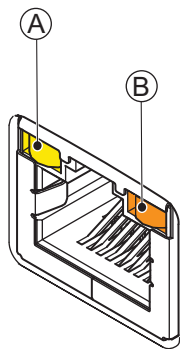
Item		Specifications
Physical layer	3 RJ45 connectors	10BASE-T, 100BASE-TX or 1000BASE-T 2500BASE-T *1
	1 optional RJ45 connector	1000BASE-T
Frame length		1,514 bytes max.
Media access method		CSMA/CD
Modulation		Baseband
Topology		Star
Transmission media		STP (shielded, twisted pair) cable of Ethernet category 5, 5e or higher
Maximum transmission distance between Ethernet switch and node		100 m
Cascade connections		There are no restrictions if an Ethernet switch is used







*1. For model-IDs NY□13, NY□2E, NY□37, NY□55, NY□65: the 3 RJ45 connectors support 2500BASE-T.
For model-ID NY□3A: Ethernet connectors 2 and 3 support 2500BASE-T.

Ethernet Connector LED Indicators

This section explains the RJ45 Ethernet connector LED indicators.

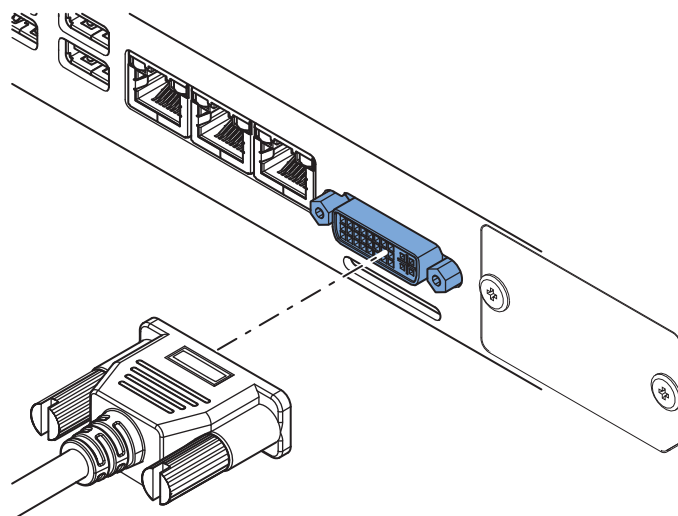
Each connector has LED indicators that display the link, activity and speed status.



Item	Indicator	Color	Status		Description
A	Link/Act	Yellow		Not lit	No link
				Lit	Link
				Flashing	Link and activity
B	Speed	Not lit		Not lit	10 Mbps or no link
		Green		Lit	100 Mbps link
		Orange		Lit	1 or 2.5 Gbps link

4-2-5 DVI Connector Specifications

DVI is the standard video interface for the Box PC.



Additional Information

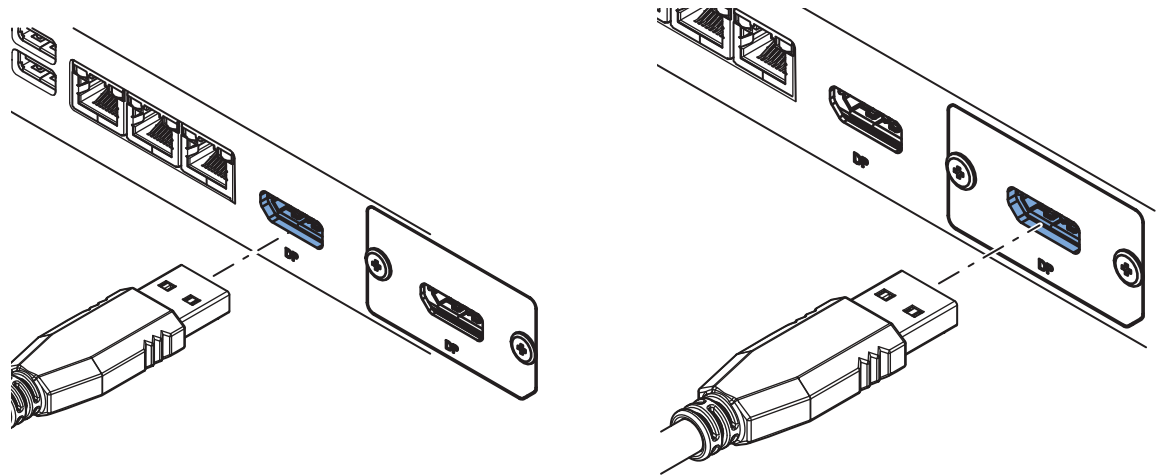
- Refer to 4-1-5 *CPU Specifications* on page 4-7 for graphics controller details.
- Refer to 5-4-2 *Ground* on page 5-29 for grounding details.
- Refer to A-2 *DVI Connector Pin Details* on page A-94 for pin details.

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

Item	Specifications
Video interface NY□1C	Digital only
Video interface NY□1E	Digital or Analog
Video interface NY□17	Digital or Analog
Video interface NY□2A	Digital only
Video interface NY□2C	Digital only
Video interface NY□25	Digital only
Video interface NY□27	Digital or Analog
Video interface NY□35	Digital only
Resolution	Up to 1920 x 1200 pixels at 60 Hz
Type	Dual link
Maximum DVI cable length	Dependent upon connected monitor type and resolution

4-2-6 DisplayPort Connector Specifications

The DisplayPort is the standard video interface for the Box PC for model-IDs NY□13, NY□2E, NY□3A, NY□37, NY□55 and NY□65.



IPC left DisplayPort Connector

IPC right DisplayPort Connector



Additional Information

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

The DisplayPort specifications depend on the CPU and thus on the product configuration.

Item	Specifications
Video interface	Video and Audio
Version	1.2
Resolution	Up to 3840 x 2160 pixels at 75 Hz
Features	Multi-sst operation
Maximum DisplayPort cable length	Dependent upon connected monitor type and resolution.

The DisplayPort interface supports DP++ mode.

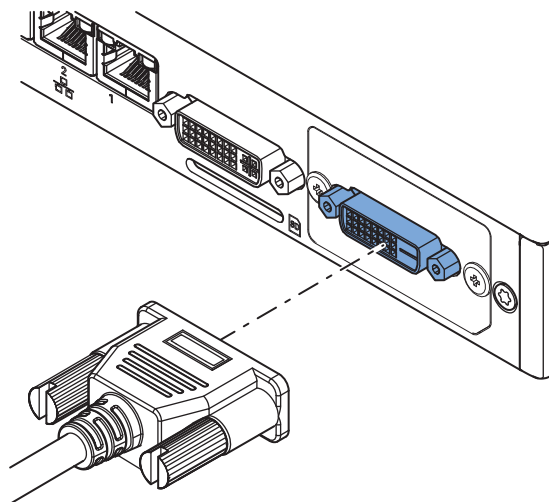
A commercially available cable can be used to convert to a DVI-D, HDMI or VGA interface.

Make sure a thick, fully shielded, and high-resolution cable is used to prevent disturbance on the display.

Refer to [the OMRON website](#) for more information.

4-2-7 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

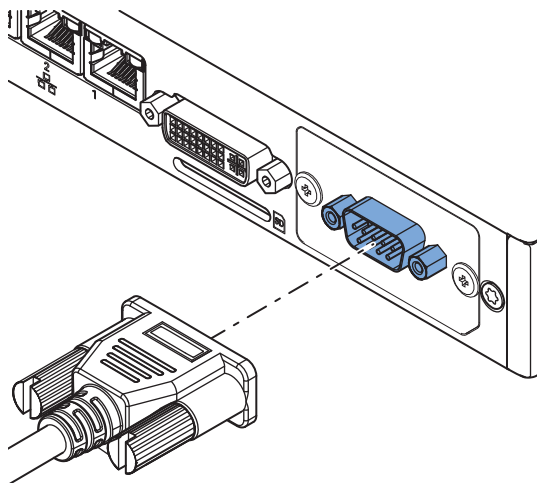


Additional Information

- 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-95 for pin details.

4-2-8 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-97 for pin details.

4-2-9 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) Refer to 3-10-7 <i>NY Monitor Link Cables</i> on page 3-29 for more information.
Maximum cable length between Industrial PC and Industrial Monitor	100 m
Topology	Line (direct) connection only *1
Video resolution	1,280 x 800 pixels at 60 Hz (12.1", 15.4") 1,920 x 1,080 pixels at 60 Hz (18.5")
USB Data throughput rate	280 Mbps max.

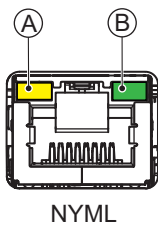
*1. Use a direct connection between the OMRON Industrial PC and the OMRON Industrial Monitor.
Do not use:

- Ethernet switches
- Ethernet hubs

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

NY Monitor Link Connector LED Indicators

The connector has LED indicators Connected (A) and Video (B).



Item	Indica- tor	Color	Status		Description
A	Con- nected	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.

4-3 Environmental Specifications

This section provides environmental specifications of the Industrial Box PC.

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/s ² 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/s ² , 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 4-37 for more information.

*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/s ²	2.5 m/s ²
Wall		4.9 m/s ²

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.

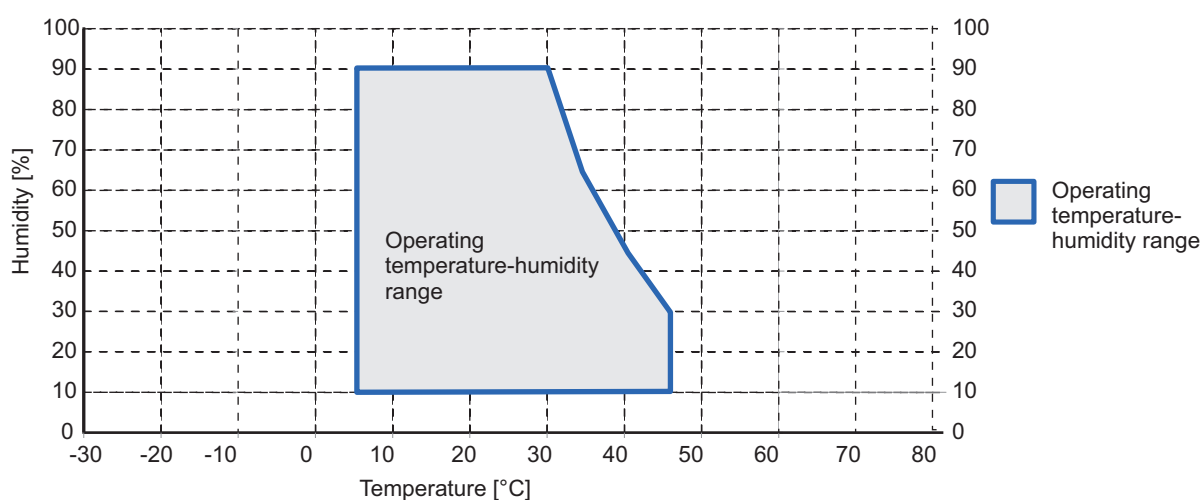
The following sections provide temperature and humidity details and temperature specifications per model.

Operating 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 HDD within the ambient temperature and humidity ranges as shown in following graph.



Additional Information

Refer to the ambient temperature specifications per Model-ID for ambient operating temperature details.

- Operate the Box PC with a SSD or CFast within the general environmental specifications.

Model-ID	Specifications
<ul style="list-style-type: none"> • NYB13-□0 • NYB2A-□0 • NYB2C-□0 • NYB2E-□0 • NYB27-□0 • NYB3A-□0 • NYB35-□0 • NYB37-□0 • NYB55-□0 • NYB65-□0 	Refer to <i>Temperature Specifications Without Expansion Layer</i> on page 4-39 for more information.

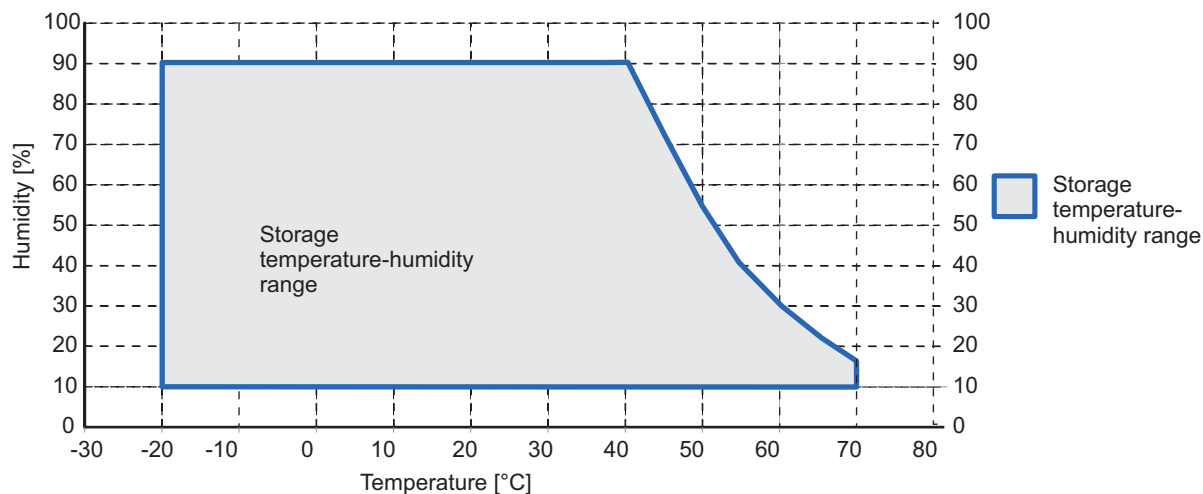
Model-ID	Specifications
<ul style="list-style-type: none"> • NYB1C-□1 • NYB13-□1, NYB13-□2 • NYB2C-□1 • NYB25-□1 • NYB35-□1, NYB35-□2 • NYB65-□1, NYB65-□2 	Refer to <i>Temperature Specifications with Expansion and Passive Cooling</i> on page 4-40 for more information.
<ul style="list-style-type: none"> • NYB1E-□1 and NYB1E-□2 • NYB17-□1 • NYB2E-□1, NYB2E-□2 • NYB27-□1, NYB27-□2 • NYB37-□1, NYB37-□2 • NYB55-□1, NYB55-□2 	Refer to <i>Temperature Specifications with Expansion and Active Cooling</i> on page 4-41 for more information.

Storage Temperature and Humidity Graphs

The maximum ambient storage temperature and ambient humidity are specified per storage device type.

The following graph provides ambient storage temperature and humidity details per storage device type.

- Store the Box PC with a SSD or CFast 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 Without Expansion Layer

Ambient operating temperature specifications for IPC models without an expansion layer.
Cooling can be passive or active.



Additional Information

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

Model-IDs: NYB13-□0, NYB2C-□0, NYB2E-□0, NYB35-□0, NYB65-□0.

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

Model-IDs: NYB2A-□0, NYB27-□0, NYB3A-□0, NYB37-□0, NYB55-□0.

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

Temperature Specifications with Expansion and Passive Cooling

Ambient operating temperature specifications for models with an expansion layer and with a passive cooling layer.

For Model-ID NYB1C-□1 refer to *NYB1C-□1 Temperature Specifications* on page 4-40 for more information.

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 Box PC* 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

● NYB1C-□1 Temperature Specifications

Ambient operating temperature specifications for model NYB1C-□1.



Additional Information

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

Temperature Specifications with Expansion and Active Cooling

Ambient operating temperature specifications for models with an expansion layer and with an active cooling layer.

Mounting Orientation	Storage device type ^{*1}				
	1 x SSD	2 x SSD	1 x HDD ^{*4}	2 x HDD ^{*4}	1 x SSD 1 x HDD ^{*4}
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 ^{*2}	5 to 30°C ^{*3}	5 to 40°C ^{*2}

^{*1}. Refer to *1-4 Product Configuration Box PC* on page 1-5 for model details.

^{*2}. 45°C for NYB-17-□1, NYB-27-□1, NYB-27-□2.

^{*3}. 35°C for NYB-17-□1, NYB-27-□1, NYB-27-□2.

^{*4}. 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

4-3-3 Recycling Specifications

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

Part	Recycle specifications
Battery	Chemical waste
Other electrical components	Electrical waste



Precautions for Safe Use



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



Dispose in accordance with applicable regulations.

5

Installation

This section provides all installation details for the Industrial Box PC.

5-1	Unpack	5-2
5-1-1	Unpack Procedure.....	5-2
5-1-2	Items Supplied.....	5-2
5-2	Install Options	5-5
5-2-1	Install RAID 1	5-5
5-2-2	Install a Drive.....	5-6
5-2-3	Install the PCIe Card	5-10
5-3	Mount.....	5-16
5-3-1	Installation Method in Control Panels.....	5-16
5-3-2	Product Orientation	5-17
5-3-3	Temperature	5-17
5-3-4	Humidity	5-20
5-3-5	Vibration and Shock	5-20
5-3-6	Atmosphere	5-21
5-3-7	Electrical Environment.....	5-21
5-3-8	Book Mount Procedure.....	5-26
5-3-9	Wall Mount Procedure	5-27
5-4	Wire.....	5-28
5-4-1	Wiring Warnings and Cautions	5-28
5-4-2	Ground	5-29
5-4-3	Wire the Power Connector	5-36
5-4-4	Wire the I/O Connector.....	5-39
5-5	Connect.....	5-42
5-5-1	Connector Identification.....	5-42
5-5-2	Connection Procedure.....	5-43
5-6	Initial Power ON.....	5-45
5-6-1	Initial Power ON Procedure	5-45
5-6-2	Windows Startup First Time	5-47
5-7	Install Software.....	5-49
5-8	Connect UPS	5-50
5-8-1	Connect UPS Using the USB Connector	5-51
5-8-2	Connect UPS Using the I/O Connector	5-53
5-9	Create Backup and Repair Data.....	5-57

5-1 Unpack

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

5-1-1 Unpack Procedure

- 1** Check the package for damage.
If there is any visible damage:
 - Take photos of the package and save them.
 - Inform your supplier immediately.
- 2** Open the package.
Ensure not to damage the contents.
- 3** Ensure that all items are present.



Additional Information

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

5-1-2 Items Supplied

The Industrial Box PC is supplied with several items.



Additional Information

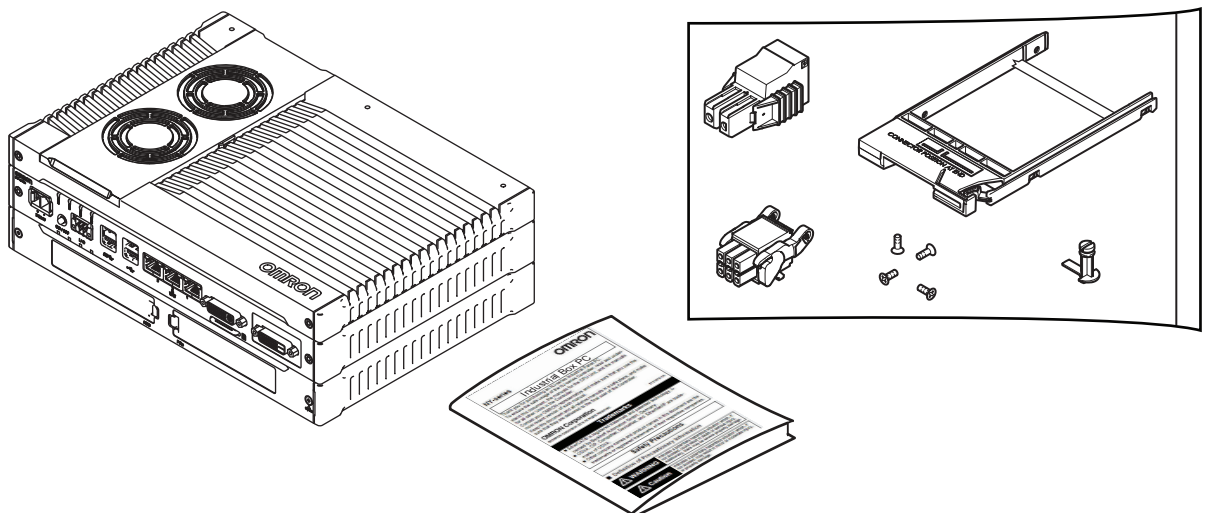
- Refer to *Items Supplied with the Industrial Box PC* on page 5-3 for more details.
 - Refer to *Items Supplied with the Brackets* on page 5-4 for more details.
-

Items Supplied with the Industrial Box PC

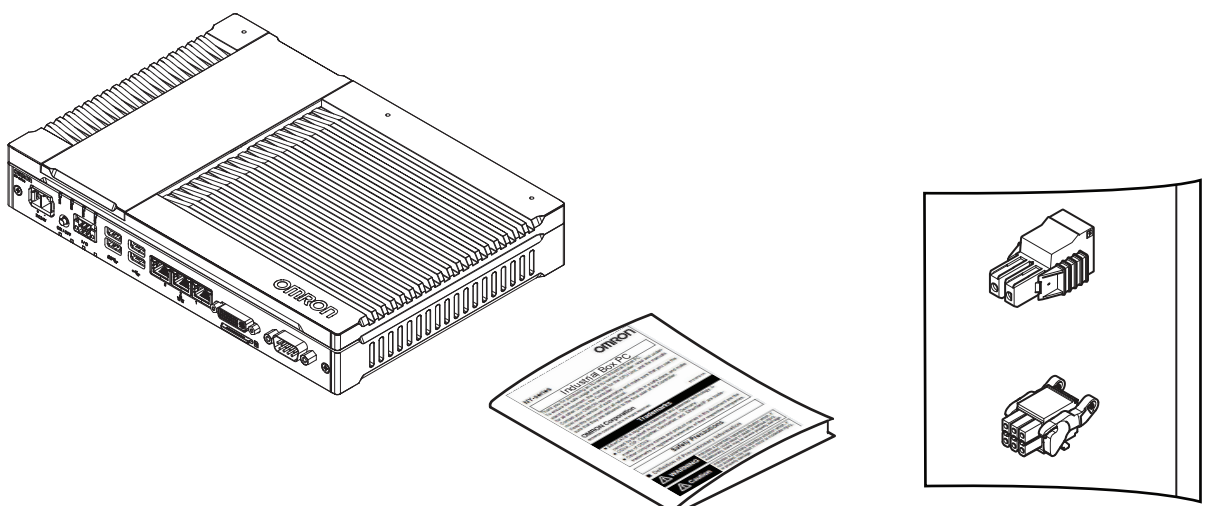
This section describes the items supplied with your Industrial Box PC.

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

Model NYB□□-□1.



Model NYB□□-□0.



Items Supplied with the Brackets

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



Additional Information

- Refer to *3-10-1 Mounting Brackets* on page 3-23 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 Industrial Box PC.

5-2-1 Install RAID 1

RAID is only available for models NYB□□-□2□□□.

RAID 1 requires two storage devices for the Industrial Box PC.



Additional Information

- Refer to *3-10-4 HDD and SSD Storage Devices* on page 3-26 for the recommended drive models.
- Refer to *4-1-7 Storage Device Specifications* on page 4-14 for drive specifications.

Prepare the following items:

- Two drives
- Two drive brackets with mounting screws

These are supplied with the Box PC.

To install RAID 1:

- 1** Ensure the Box PC is OFF.
- 2** Install 2 storage devices of the same model.
Refer to *5-2-2 Install a Drive* on page 5-6 for details.

There are no other actions required.

Both storage devices are installed in RAID 1 configuration automatically.

5-2-2 Install a Drive

A drive is a storage device for the Industrial Box PC.



Additional Information

- Depending on the product configuration 0, 1 or 2 drives can be pre-installed.
Refer to *1-4 Product Configuration Box PC* on page 1-5 for details.
- Depending on the CPU type one or two drives are supported.
Refer to *4-1-5 CPU Specifications* on page 4-7 for the number of supported drives.
- Refer to *3-10-4 HDD and SSD Storage Devices* on page 3-26 for the recommended drive models.
- Refer to *4-1-7 Storage Device Specifications* on page 4-14 for drive specifications.

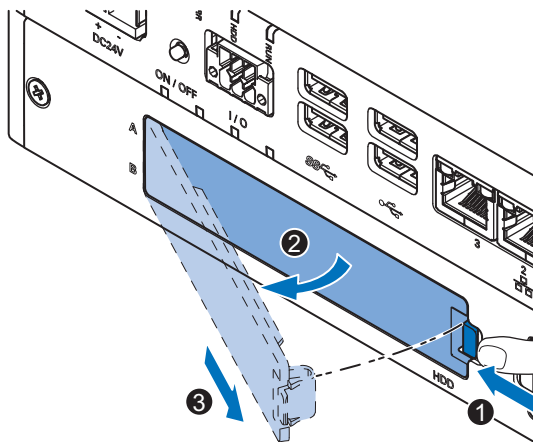
Prepare the following items:

- 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:

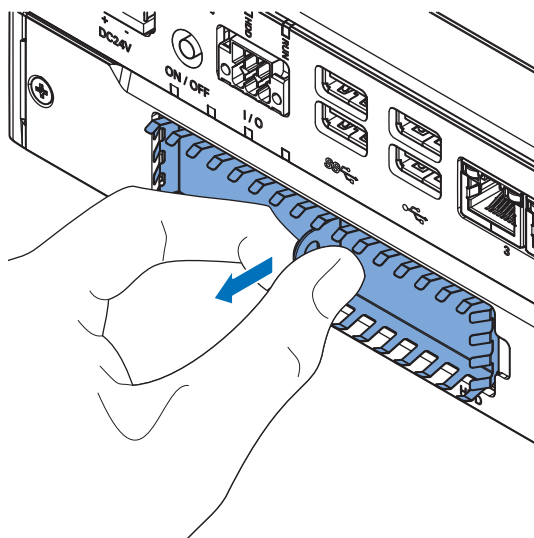
1 Ensure the Box PC is OFF.

2 Remove the drive cover.

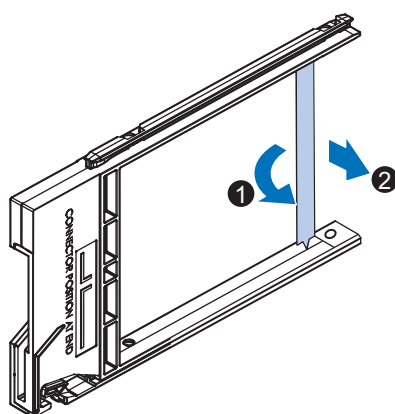


- 1) Push the lock lever ❶.
- 2) Tilt the drive cover ❷.
- 3) Remove the drive cover ❸.

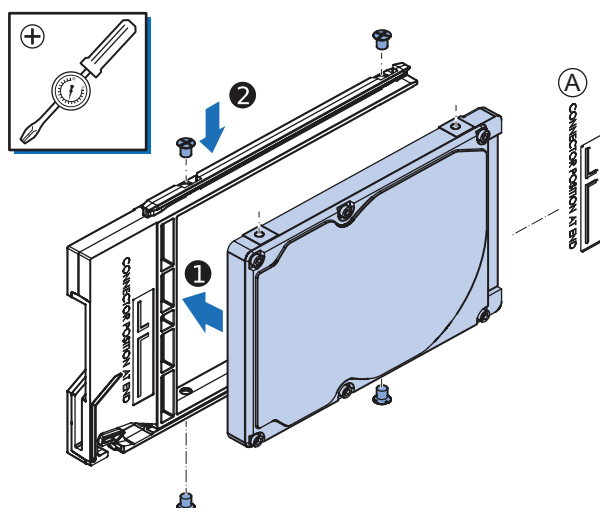
- 3** Pull the metal shielding cover out of the Box PC.



- 4** Rotate ① and then remove ② the break out part from the drive bracket.

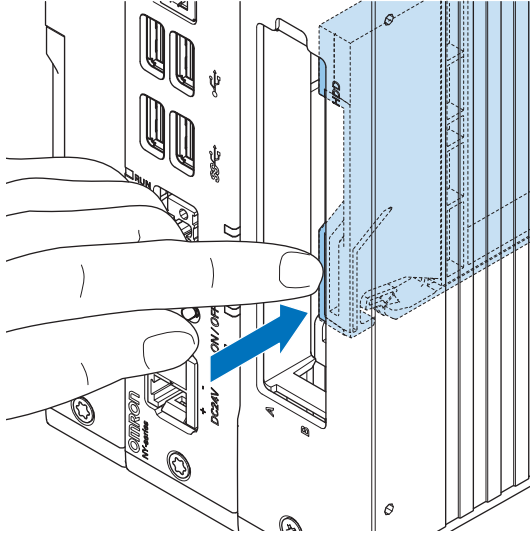


- 5** Align the connectors of the drive as shown (A) on the bracket. Then insert the replacement drive ① in the bracket and insert the 4 mounting screws ②. Tighten these screws with a torque of 0.35 N·m.



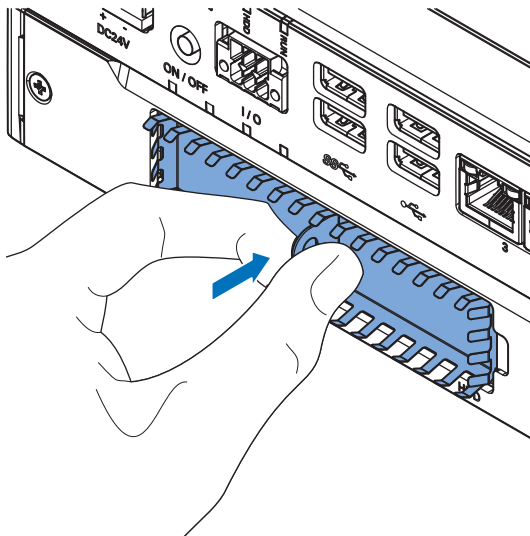
- 6** Insert the bracket with the drive in the correct bay.
Refer to 3-1-3 *Expansion Layer (Optional)* on page 3-6 for bay details.

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

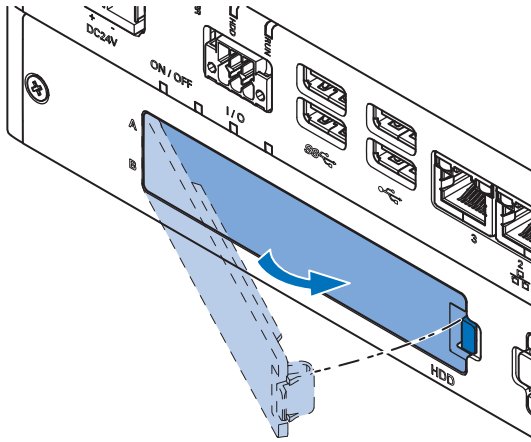


The drive bracket will lock into place when it is fully inserted.

- 7** Insert the metal shielding cover.



- 8** Mount the drive cover.
The lock lever will click when closed correctly.



- 9** Finalize the drive installation when the Box PC installation is completed.
- For a drive that requires an operating system:
 - 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.
 - For storage drives:
 - 1) Ensure the drive is functional and confirm normal operation.
 - 2) For a Box PC with a Windows operating system:
If the storage drive should be visible in Windows but it is not visible then that drive needs to be allocated.
Refer to 3-1-3 Expansion Layer (Optional) on page 3-6 for details on the visibility per storage drive.

The drive is installed and functional.

5-2-3 Install the PCIe Card

Prepare the following items:

- The PCIe Card.

A PCIe Card is not supplied with the Box PC.



Additional Information

- Depending on the product configuration a PCIe card can be pre-installed. Refer to *1-4 Product Configuration Box PC* on page 1-5 for details.
- Refer to *4-1-8 PCIe Card Specifications* on page 4-18 for PCIe specifications.

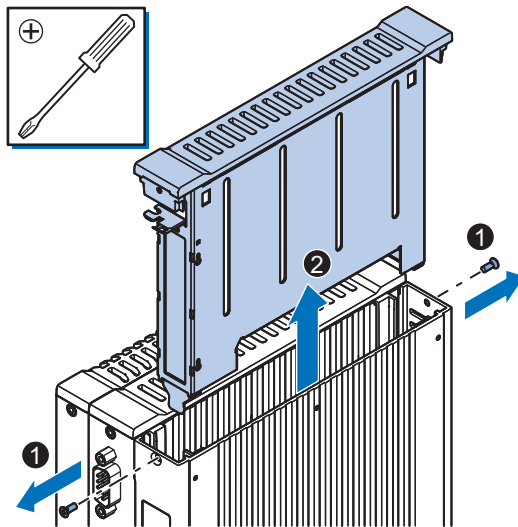
- The PCIe Card mounting material: Card Support.

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 **1** indicated with "open" and then pull up **2** the PCIe Drawer.

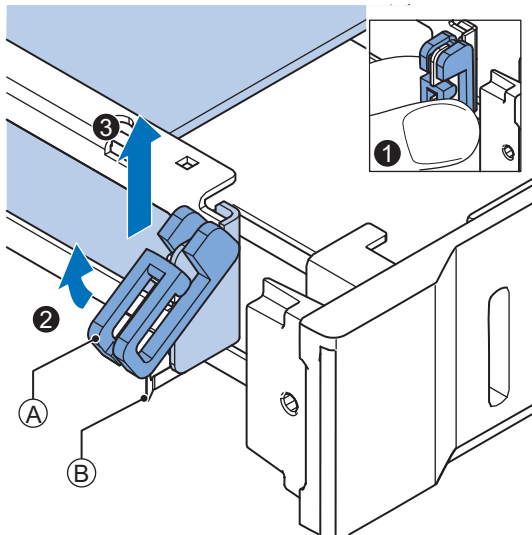
The indent at the side of the drawer will help you to pull the drawer from the Box PC.



- 3** Remove the Card Clip from the PCIe Drawer.
There are two types of Card Clips available. Use the steps applicable to your type.

CAUTION

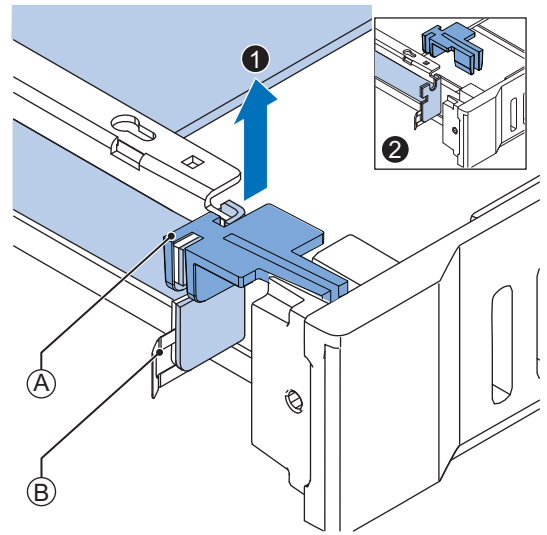
When installing or removing a PCIe card, avoid touching the sharp edges of the sheet metal frame tab. Injury may result.



(A) Card Clip

(B) Sheet metal frame tab

Grip the Card Clip (A) on the sides (1). Pull the middle of the Card Clip to unlock it (2) and remove it (3) from the PCIe Drawer.

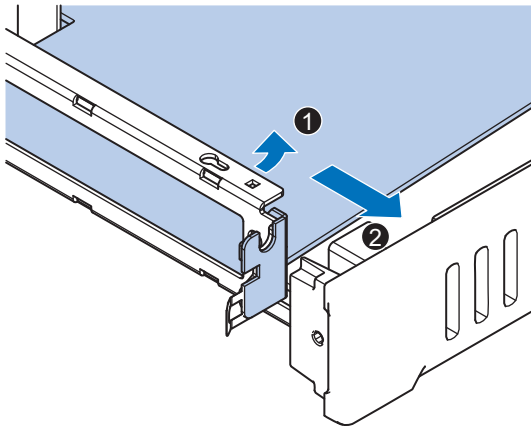


(A) Card Clip

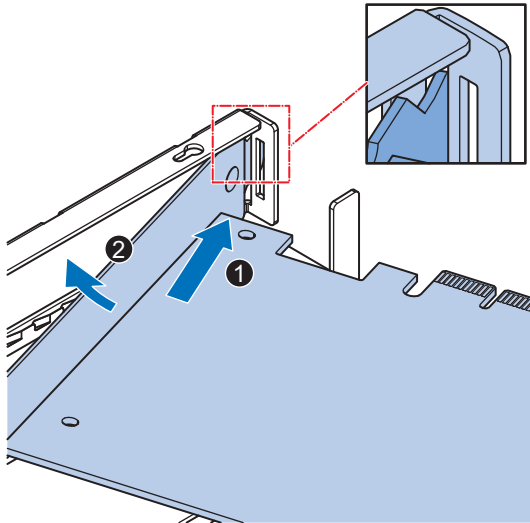
(B) Sheet metal frame tab

Grip the Card Clip (A) on the sides. Lift the Card Clip (1) and remove it (2) from the PCIe Drawer.

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



The slot cover is now removed.

5 Place the PCIe Card in the PCIe Drawer.

Ensure to insert the PCIe Card in the correct opening.

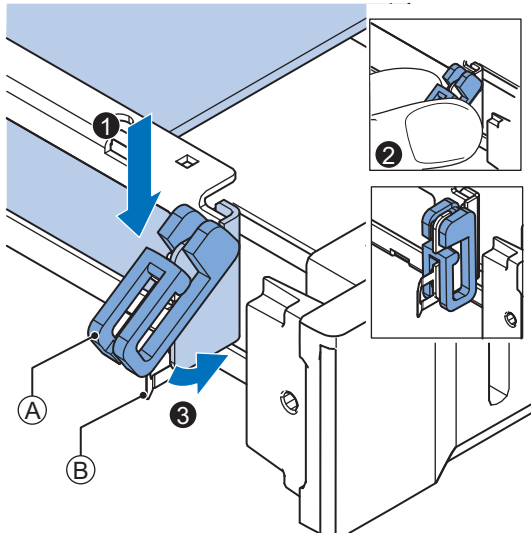
Ensure the thin sheet metal frame is positioned between the PCIe Card and the PCIe Drawer to ensure a good conductive contact.

6 Place the Card Clip (A) in the PCIe Card and PCIe Drawer.

There are two types of Card Clips available. Use the steps applicable to your type.

CAUTION

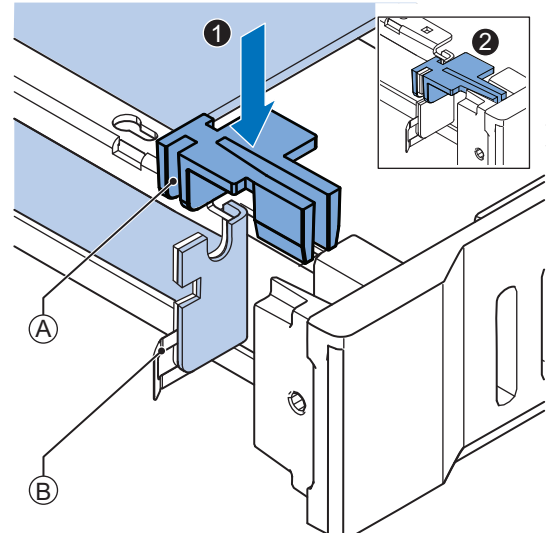
When installing or removing a PCIe card, avoid touching the sharp edges of the sheet metal frame tab. Injury may result.



(A) Card Clip

(B) Sheet metal frame tab

Place the Card Clip (A) in the PCIe Card and PCIe Drawer (1), grip the Card Clip on the sides (2) and then rotate the Clip (3) to lock it in place.

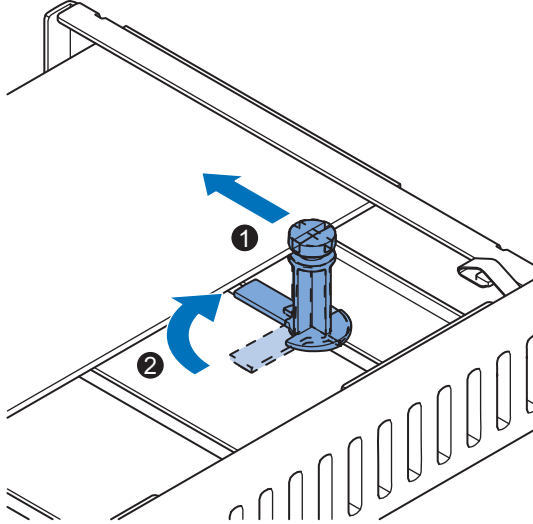


(A) Card Clip

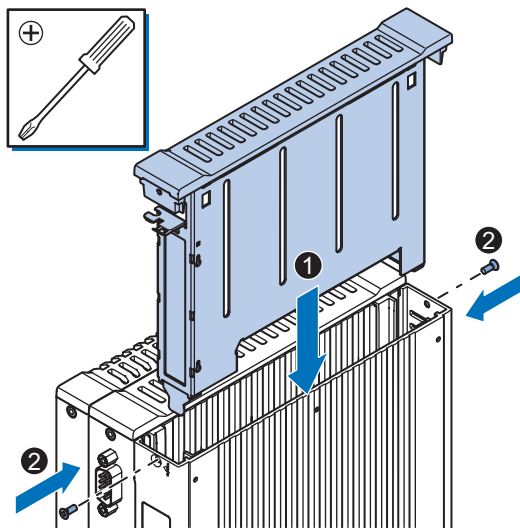
(B) Sheet metal frame tab

Place the Card Clip (A) in the PCIe Card and PCIe Drawer and push it down (1) to lock it in place (2).

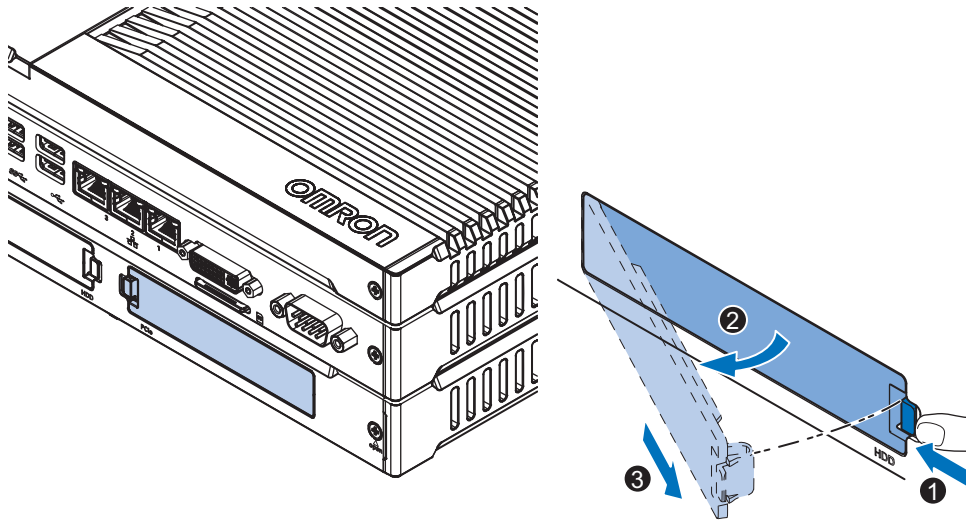
- 7** Slide the Card Support **1** so that it supports the side of the PCIe Card.
The card should be in small groove so there is support below and above the card.
Rotate the Card Support **2** to lock it in place.



- 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 ①.
- 2) Tilt the PCIe cover ②.
- 3) Remove the PCIe cover ③.

The PCIe Card is installed.

5-3 Mount

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

WARNING

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



5-3-1 Installation Method in Control Panels

The Industrial Box PC must be mounted in a cabinet or a control panel.

Consider 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

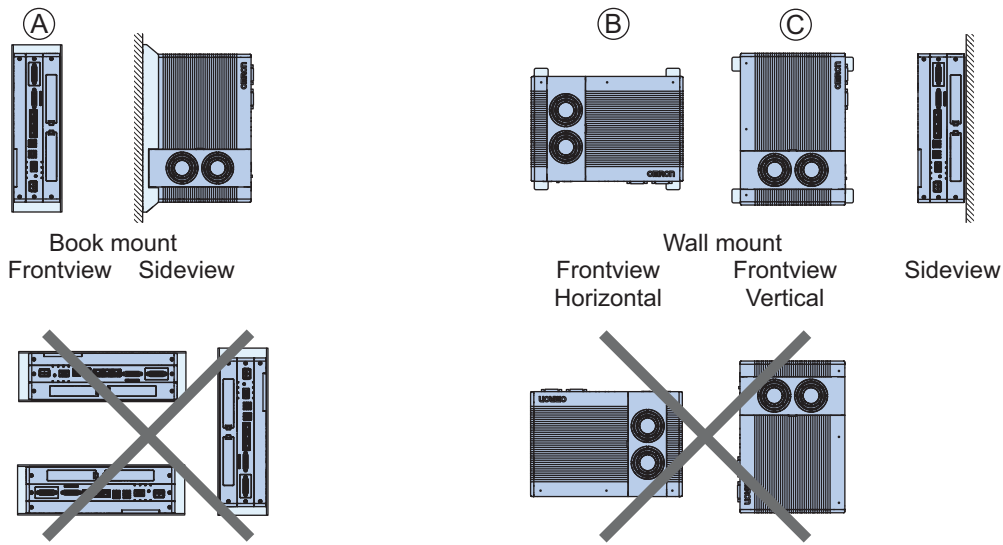
- Ensure you have installed the options before you mount the product.
Refer to 5-2 *Install Options* on page 5-5 for option details.
- Refer to 5-3-8 *Book Mount Procedure* on page 5-26
or 5-3-9 *Wall Mount Procedure* on page 5-27 for orientation details.
- Refer to 5-3-3 *Temperature* on page 5-17 for temperature details.
- Refer to 5-3-4 *Humidity* on page 5-20 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 (A) or wall (B) (C) orientation.

- For book mount there is one allowed orientation (A).
- For wall mount there are two allowed orientations, horizontally mounted (B) and vertically mounted (C).

Do not install the Box PC in other orientations.



5-3-3 Temperature

Distance for Cooling

Adequate airflow around the Industrial Box PC is required.

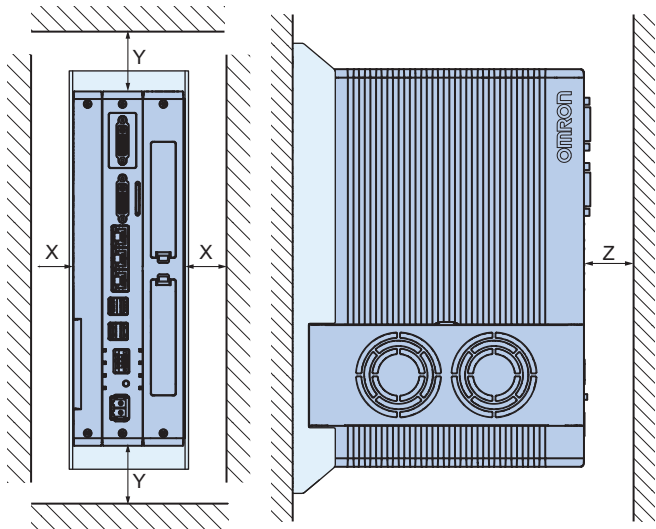


Additional Information

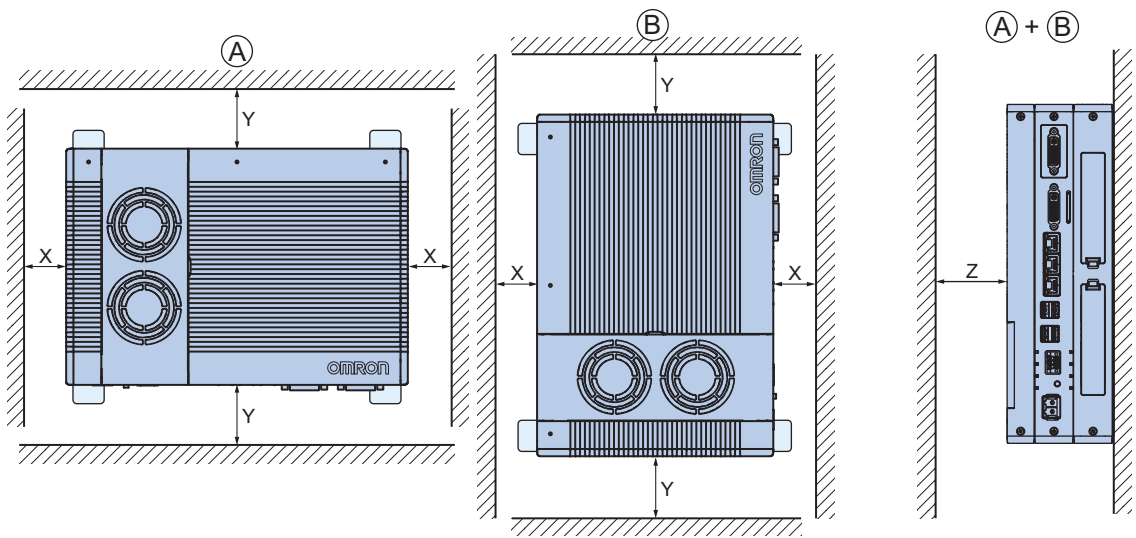
- The ambient temperature must be within the operating range.
Refer to 4-3-1 *Operation Environment Specifications* on page 4-36 for temperature specifications.
- Allow space to accommodate for the bending radius of the cables.
 - Refer to 3-10 *Optional Hardware* on page 3-23 for cable bending requirements of cables advised by Omron.
 - Refer to the cable specifications of the supplier for all other cables.

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 **(A)** or portrait **(B)** 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.
Check the required bending radius of all wires for the actual required minimum distance.

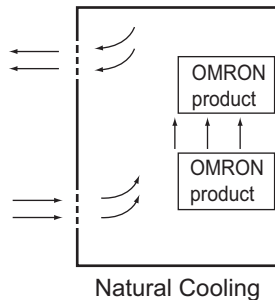
High Temperatures

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

● Natural Cooling

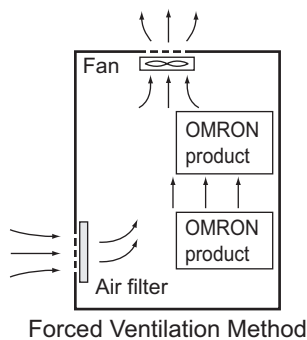
Natural cooling relies on natural ventilation through slits in the panel, rather than using cooling devices such as fans or coolers. When using this method, observe the following points.

- Do not install the 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.



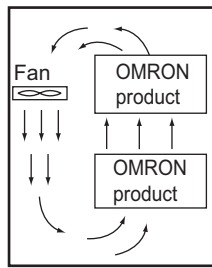
● Forced Ventilation

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



● Forced Air Circulation

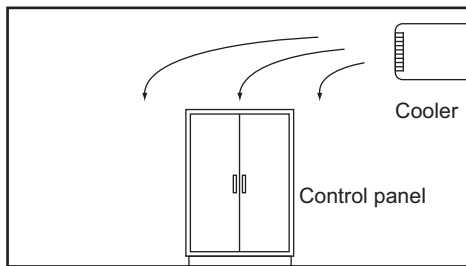
Forced circulation with a fan inside the closed control cabinet.



Forced Air Circulation

● Room Cooling

Cool the entire room where the control panel is located.



Room Cooling

Low Temperatures

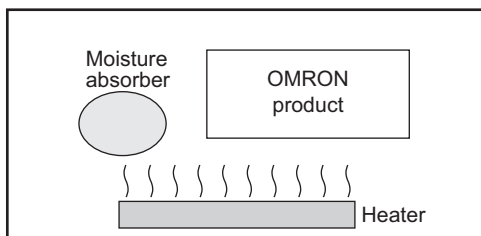
The Box PC may not start normally if the temperature is below 0°C when the power is turned ON. Maintain an ambient air temperature of at least 5°C by implementing measures such as installing a low-capacity space heater in the panel.

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 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 from the source of the vibration or shock. Or secure the Box PC with rubber padding to prevent vibration.
- Make the building or the floor vibration-resistant.
- Prevent shocks when other devices, 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.

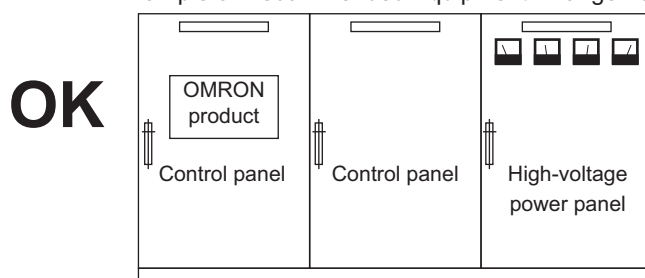
5-3-7 Electrical Environment

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

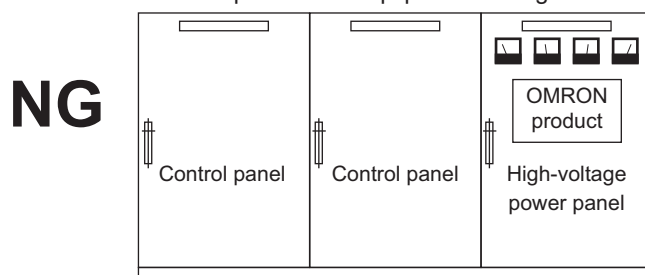
Installation Location

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



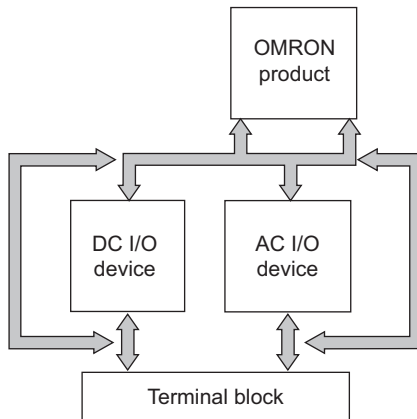
Example of Poor Equipment Arrangement



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.

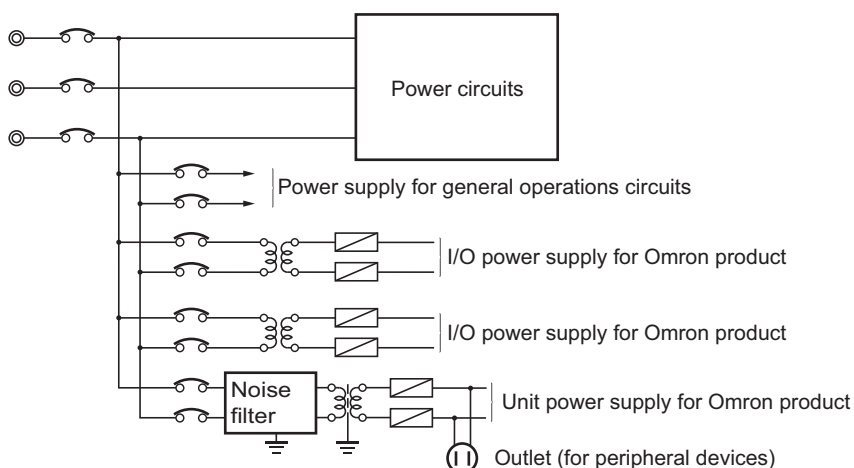


Example of Arrangement in Panel

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.

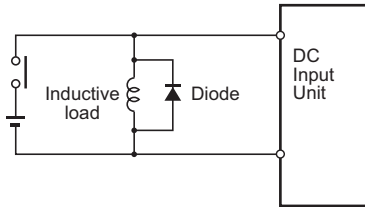


Power Supply System Diagram

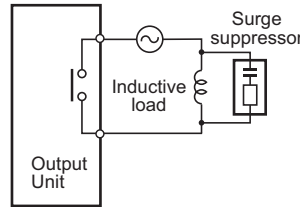
Wire External I/O Signal Lines

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

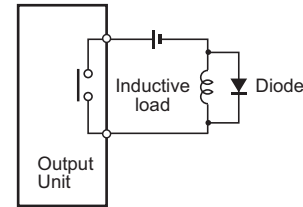
- To absorb reverse electromotive force when an inductive load is connected to an output signal, connect a surge suppressor near the inductive load in an AC circuit, or connect a diode near the inductive load in a DC circuit.



Connect a diode in a DC circuit.



Connect a surge suppressor in an AC circuit.

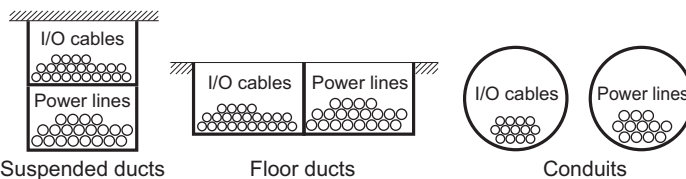


Connect a diode in a DC circuit.

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

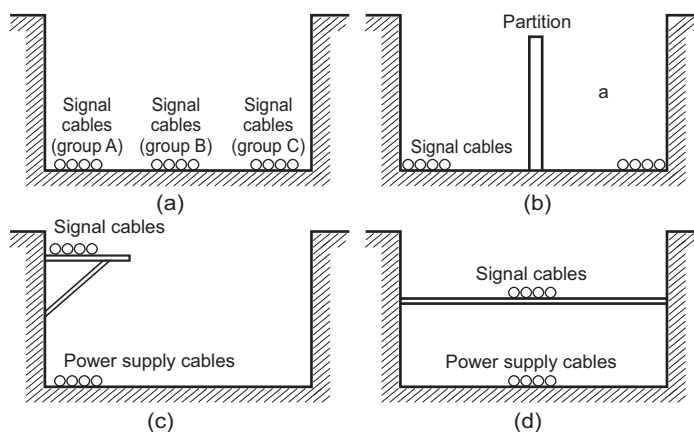
when wiring, either use separate cables or separate wiring routes for these items. Future maintenance operations and changes to the system will also be made easier by carefully organizing the wiring from the start.

- 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

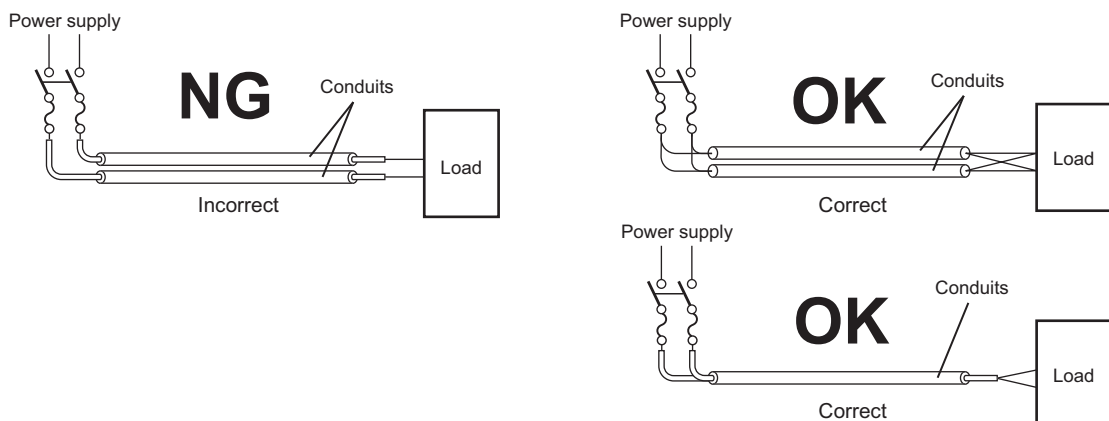
Observe the following points when wiring power supply and signal cables.

- 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

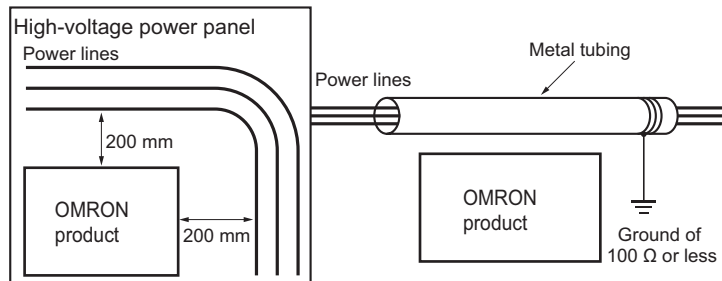
- To avoid overheating the conduits when using conduits for wiring, do not place wires for a single circuit in separate conduits.



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 directly into the duct.



Additional Information

Refer to *Distance for Cooling* on page 5-17 for the minimum required distances.

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



● Other Precautions

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

5-3-8 Book Mount Procedure

Use the following procedure to mount the Industrial Box PC in the book orientation.

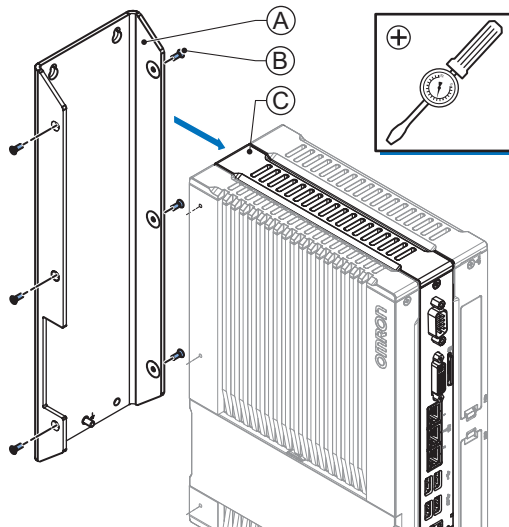


Additional Information

- Refer to 5-4-2 *Ground* on page 5-29 for grounding details.
- Refer to 3-10-1 *Mounting Brackets* on page 3-23 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 (A) to the Box PC (C) with the 6 Phillips screws (B) supplied with the bracket.
First tighten the 3 screws at the side of the contact areas with a torque of 0.6 N·m.
Then tighten the 3 screws at the opposite side, also with a torque of 0.6 N·m.



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

- 3 Mount the Box PC with the bracket in position.
 - Arrange the two or four holes at the location where the Box PC with bracket will be mounted. Refer to 4-1-9 *Bracket Specifications* on page 4-21 for details.
 - Position the Box PC with bracket in the mounting location.
 - Insert screws through the bracket and into or through the mounting surface.
Note that these screws are not in the scope of delivery.
 - Tighten the screws with a torque matching the screw size and the mounting materials.

The Box PC is mounted.

5-3-9 Wall Mount Procedure

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

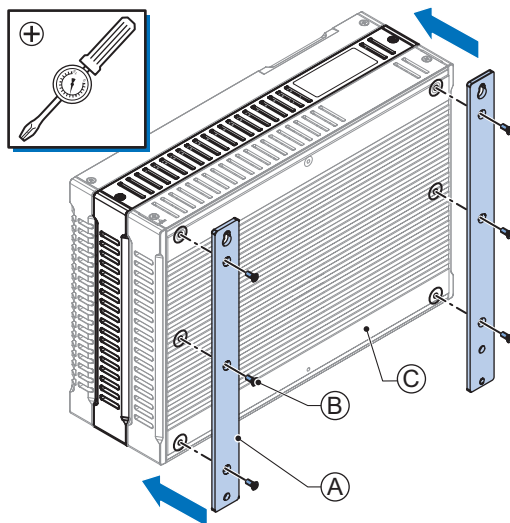


Additional Information

- Refer to 5-4-2 *Ground* on page 5-29 for grounding details.
- Refer to 3-10-1 *Mounting Brackets* on page 3-23 for the bracket model.

To mount the Box PC:

- 1 Mount the Brackets (A) to the Box PC (C) with the 6 Phillips screws (B) supplied with the brackets.
Tighten these screws with a torque of 0.6 N·m.



The Box PC can differ depending on the product configuration.

- 2 Mount the Box PC with the brackets in position.
 - Arrange four holes at the location where the Box PC with brackets will be mounted. Refer to 4-1-9 *Bracket Specifications* on page 4-21 for details.
 - Position the Box PC with bracket in the mounting location.
 - Insert screws through the bracket and into or through the mounting surface. Note that these screws are not in the scope of delivery.
 - Tighten all four screws with a torque matching the screw size and the mounting materials.

The Box PC is mounted.

5-4 Wire

This section describes how to wire the Industrial Box PC.

5-4-1 Wiring Warnings and Cautions

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

WARNING

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



WARNING

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



WARNING

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



Precautions for Safe Use

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

5-4-2 Ground

This section describes how to ground the Industrial Box PC.



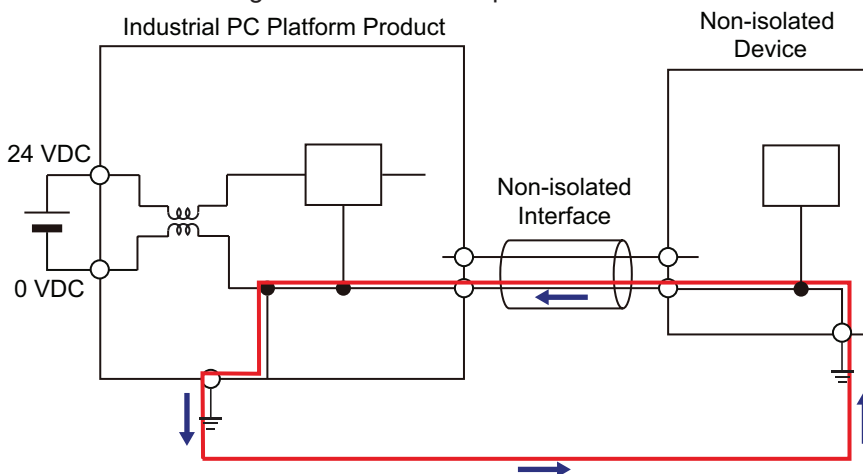
WARNING

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



CAUTION

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



CAUTION

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



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

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

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

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

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

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

Considerations for Earthing Methods

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

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

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



Additional Information

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

Each of these earthing methods is given below.

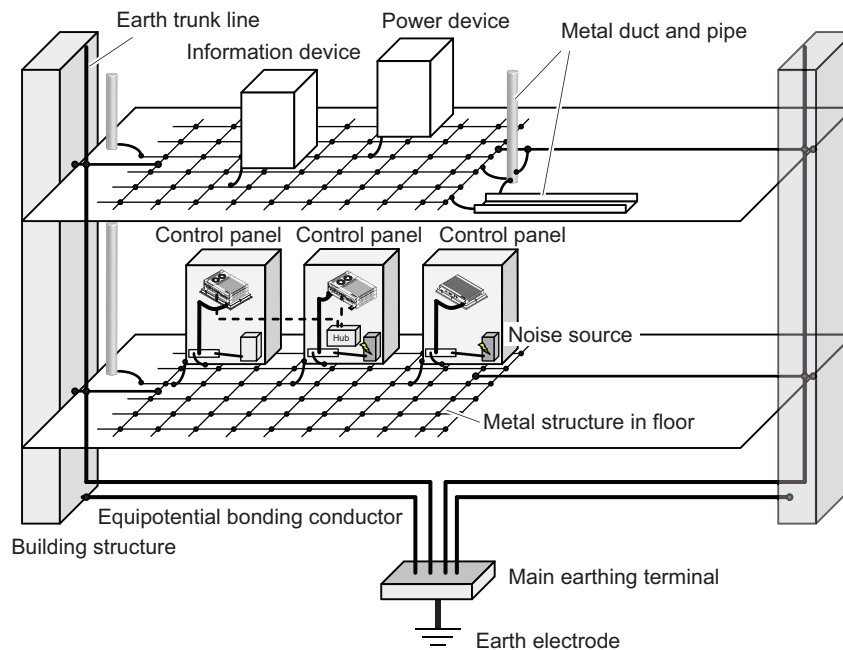
Equipotential Bonding System

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

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

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

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



Star Earthing

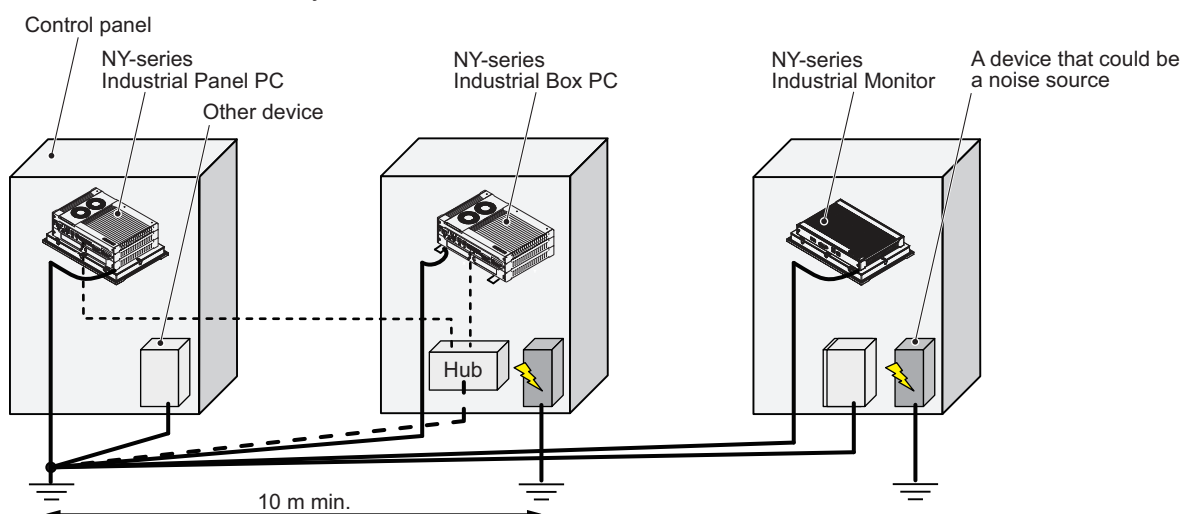
If the earthing method used for the building is not equipotential bonding or the earthing system is unknown, choose (a) from among the earthing methods given below.

a. Connecting devices and noise sources to separate earth electrodes

This is an earthing method to separately ground an earth electrode of the device that is connected with a communications cable or other devices and an earth electrode of a high-power device that could be a noise source, such as a motor or inverter.

Each earth electrode must be ground to 100 Ω or less.

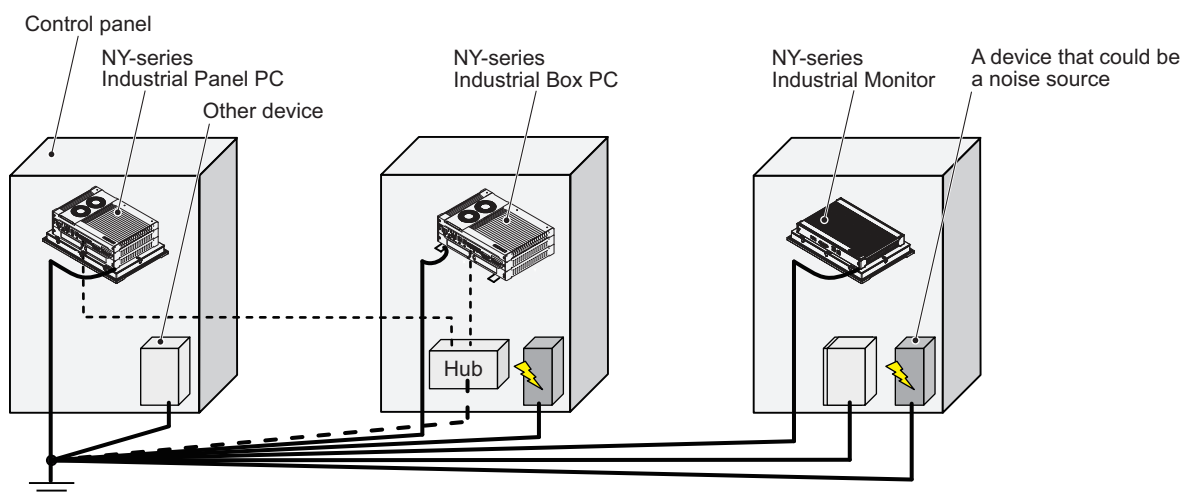
Connect the ground lines of the device that is connected with a communications cable and other devices as a bundle to a single earth electrode. Be sure that the earth electrode is separated by a minimum of 10 m from any other earth electrode of a device that could be a noise source.



b. Connecting devices and noise sources to a common earth electrode

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

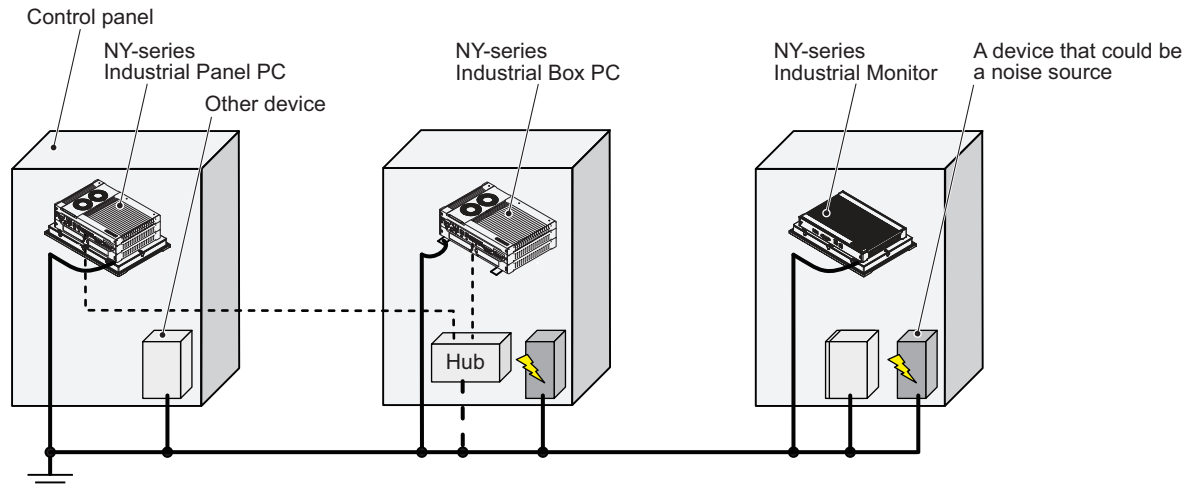
This earthing method is not recommended because the device that could be a noise source may interfere electromagnetically with other devices.



Daisy Chain

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

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



Ground Connection Details

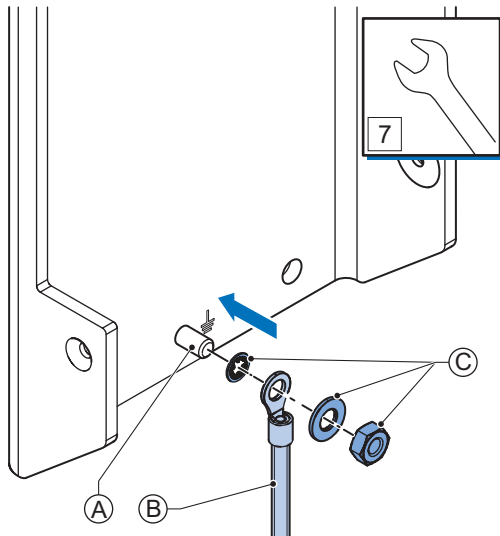
This section provides details about the ground connection.

Use the functional ground terminal on the mounting bracket(s) to ground your Industrial Box PC.

The washers and nut ③ are supplied with the bracket(s).

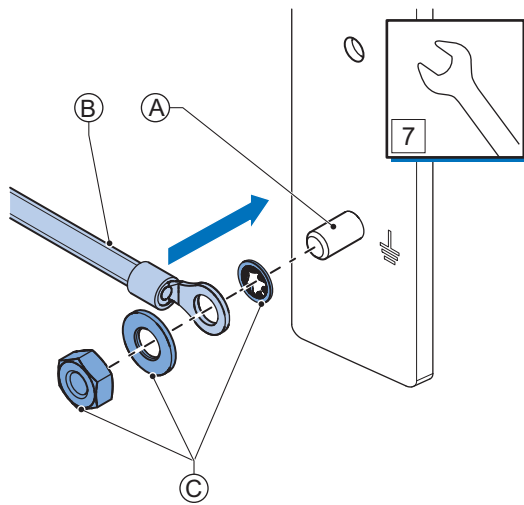
Refer to *Items Supplied with the Brackets* on page 5-4 for details.

Book Mount



Mount the ground connection wire ② to the functional ground terminal ① using the washers and nut ③. 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 (B) to the functional ground terminal (A) using the washers and nut (C). 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 $Y = 8 \text{ mm max.}$



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 *3-10-10 UPS* on page 3-33 for UPS information.
-

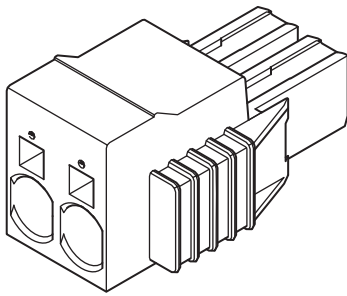
Power Connector Wiring Materials

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

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

Wire type	Conductor cross-section
Solid conductor	0.5 to 10 mm ²
Flexible conductor	0.5 to 6 mm ²
Flexible conductor, with ferrule and no plastic sleeve	0.5 to 6 mm ²
Flexible conductor, with ferrule and plastic sleeve	0.5 to 4 mm ²
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 Industrial Box PC.



Additional Information

- Refer to 3-10-9 *Power Supply* on page 3-32 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 Ensure the power connector is not connected to the Box PC.

- 2 Remove the sheath from the power supply wires.

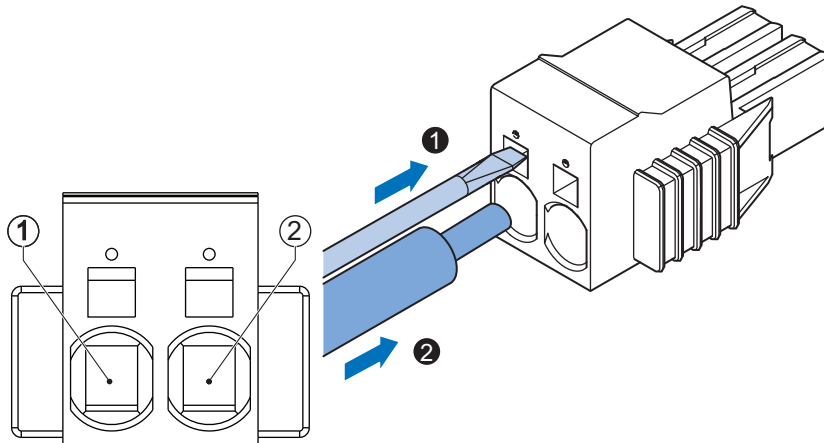


Precautions for Safe Use

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.

- 3 Insert a 2.5 mm flat-blade screwdriver in the small opening above the cable opening ① to unlock the cable entry and then push the wire all the way to the back of the cable opening ②.



Pin	Description
1	24 VDC
2	0 VDC

- 4 Remove the screwdriver.

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

5-4-4 Wire the I/O Connector

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

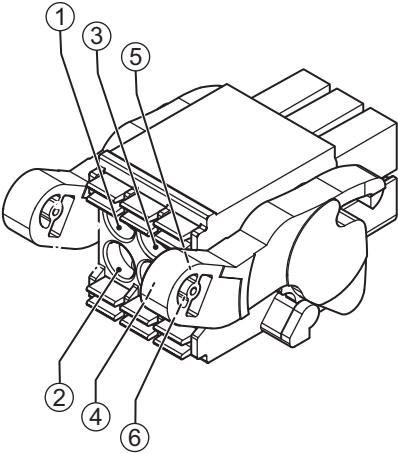
I/O Connector Wiring Materials

Use the supplied I/O connector to connect the inputs and outputs to the Industrial Box PC.
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 2	Output 1	Output 1 has an internal relay. Wire this according to the input device connected to this output.
3 4 5 6	Input 1 Input 2	Input 1 and Input 2 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.



Additional Information

- Refer to:
- 4-2-2 I/O Connector Specifications on page 4-24 for I/O connector specifications.
 - I/O Connector Output Details on page 4-26 for power status output details.
 - 3-10-10 UPS on page 3-33 for UPS information.

I/O Connector Wiring Procedure

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

- 1 Ensure the I/O connector is not connected to the Box PC.

- 2 Remove the sheath from the wires.

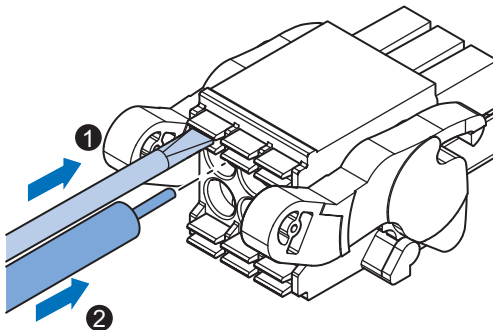


Precautions for Safe Use

Observe the following precautions to prevent broken wires.

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

- 3 Remove the I/O connector from the Box PC.
- 4 Insert a screwdriver in the small groove above the cable entry ① to unlock the cable entry and then push the wire all the way to the back of the cable opening ②.



- 5 Remove the screwdriver.

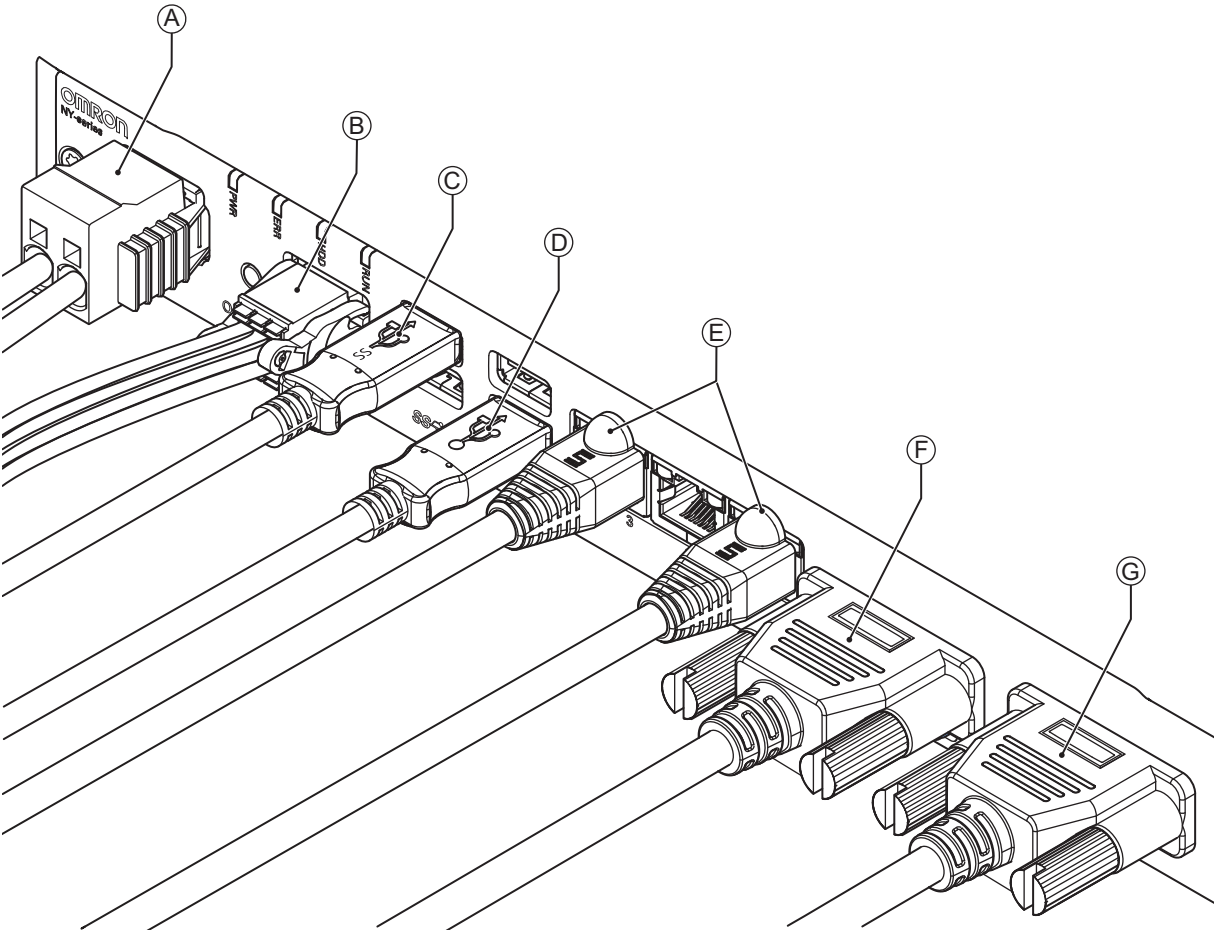
Do not apply stress to the cable after you have connected the wires.

5-5 Connect

This section describes how to connect the Industrial Box PC.

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 connectors	2 USB connectors
D	USB connector	2 USB connectors
E	10BASE-T/100BASE-TX/ 1000BASE-T Ethernet connectors	3 RJ45 Gb Ethernet connectors
F	Video connector	Video connector: <ul style="list-style-type: none"> • DisplayPort connector (default) • Digital Visual Interface connector

Item	Name	Description
G	Option port	Interface connection options for peripheral devices or an additional monitor: <ul style="list-style-type: none"> • DisplayPort connector • RS-232C connector • DVI-D connector • NY Monitor Link connector • RJ45 Gb Ethernet connector

5-5-2 Connection Procedure

Use the following procedure to connect the Industrial Box PC.

Ensure the Box PC is securely fastened to the mounting surface.

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

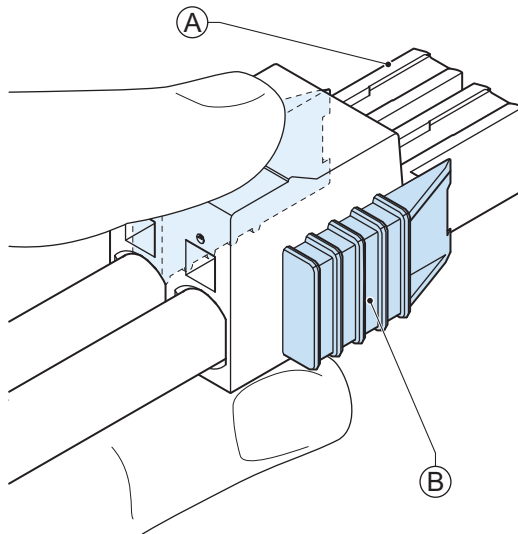


Additional Information

- Refer to *5-3 Mount* on page 5-16 for mounting details.
- Refer to *3-10 Optional Hardware* on page 3-23 for the cables advised by Omron.
Refer to individual cable specifications for cable bending requirements and connector clearance.

Use the following procedure to connect the Box PC:

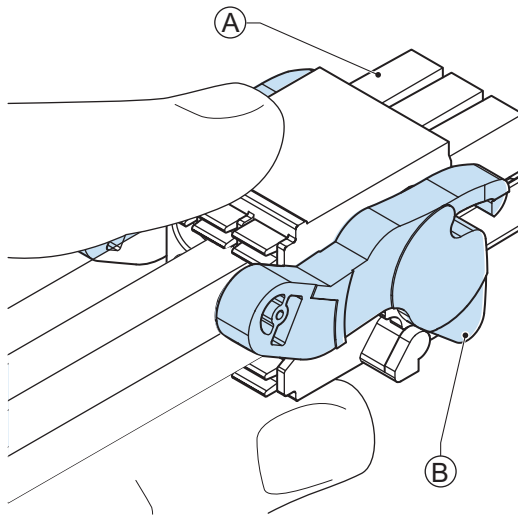
- 1 Ensure the ground terminal is connected.
Refer to *5-4-2 Ground* on page 5-29 for grounding details.
- 2 Connect the power connector **(A)**.
Hold the black part to enable the auto-locking mechanism.



Do not push the orange sliders **(B)** in the direction of the Box PC because this will unlock the connector.

3 Connect the I/O connector.

Hold the black part (A) when inserting the connector, this enables the auto-locking mechanism.



Do not tilt the orange levers (B) because this will unlock the connector.

4 Connect an external monitor such as the Industrial Monitor to the video connector.

Optional tighten the fastening screws or use the optional NYML connector.
For an Industrial Panel PC and for several other IPC configurations this is optional.

5 Connect all remaining connectors and tighten the fastening screws when applicable.

6 Connect the USB ports to peripheral devices .

7 Connect the Box PC to the Ethernet interface connector(s).

The Box PC is connected.

5-6 Initial Power ON

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



WARNING

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



5-6-1 Initial Power ON Procedure

Use the following procedure to power ON the Industrial Box PC for the first time.

- 1** Ensure the following conditions are present before applying power for the first time:
 - The Box PC is securely fastened to the mounting surface.
 - The Box PC is connected to ground.
 - All connectors are securely fastened.
- 2** Ensure that the connected monitor(s) is powered ON.
- 3** Connect a keyboard and/or a mouse.



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 3-3 *Power Button* on page 3-9 for the power button location.
The Box PC starts and the PWR LED will go ON.



Additional Information

- Do not connect or disconnect the monitor cable while power is supplied to the Box PC.
 - If a Windows operating system is preinstalled the Windows configuration will automatically start.
-

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.
-



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.

5-6-2 Windows Startup First Time

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



Additional Information

Do not power OFF the Box PC during this procedure!
At the end of this Out Of Box Experience (OOBE) will result in the Windows home screen.

- 1** Ensure an input device is present.
 - For an Industrial Box PC connect a keyboard and mouse or a touch monitor.
 - For an Industrial Panel PC touch functionality is available. A keyboard and mouse are not required.

- 2** If a UPS or I/O connector is connected then disconnect it from the Box PC.

- 3** Power ON the Box PC.

- 4** Follow the windows installation procedure.

Pay special attention to the following steps:

- Language
Select the preferred language in the Language Selection Window
Select the language carefully, the selected system language can not be changed.
- Legal stuff like license agreements
 - Windows 10: Select **Accept** to accept the combined Windows and OMRON license agreements.
 - Windows 7: Select **Accept** separately for Windows and for the OMRON utilities.
- The **Sign in with Microsoft** Window.
Select:
 - Enter your existing Microsoft account when your Industrial Box PC is connected to a network.
 - Select **Domain join instead** when a local account is preferred.
- Settings
 - Windows 10: Select **Customize** instead of **Use Express settings**.
Set the settings according to your application environment.
 - Windows 7: Select **Use recommended settings**.
- Create a user account and password and enter the **password hint**

WARNING

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



Precautions for Safe Use

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

The Box PC will automatically restart.

A black screen will be visible for a few seconds and then the Box PC will boot to the Windows start screen.

Recent Windows 10 Operating Systems will automatically perform a Windows Update when the Box PC is connected to the internet. This will keep the Box PC occupied for a longer period of time, wait until it is completed and the Box PC automatically reboots.

- 5** Login.
- 6** Check and if necessary adjust the time and the timezone.
- 7** Adjust the backlight, Logo LED, and Status LED brightness to your settings.



Additional Information

Verify that the Box PC is responding to finger touches on the touchscreen of the product.

- 8** Reconnect the UPS connector or I/O connector if applicable.
- 9** Install any third party software and drivers that may be required for your applications.



Precautions for Safe Use

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

5-7 Install Software

Install applicable software and activate Windows.



Additional Information

Refer to *NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)* for details.

5-8 Connect UPS

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

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

- The USB connector and the Industrial PC Support Utility Software.
This is the preferred connection method.
Refer to *5-8-1 Connect UPS Using the USB Connector* on page 5-51 for more information.
- The I/O connector and the Industrial PC Support Utility or a custom software program.
Refer to *5-8-2 Connect UPS Using the I/O Connector* on page 5-53 for more information.

WARNING

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



Precautions for Safe Use

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



Additional Information

- The minimum power requirements of the UPS are dependent on the power consumption. Refer to *4-1-3 Power Consumption Specifications* on page 4-5 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.

5-8-1 Connect UPS Using the USB Connector

Use the following procedure for a UPS connection using the USB connector.

The Industrial PC Support Utility monitors the UPS status via the USB interface and shuts down the Industrial Box PC when needed.

For Box PCs with Windows:

- the drivers for the S8BA UPS are pre-installed
- Installation files and the manual for the UPS Settings Utility are available in the directory D:\OMRON-NY\Installers\UPS Settings Utility

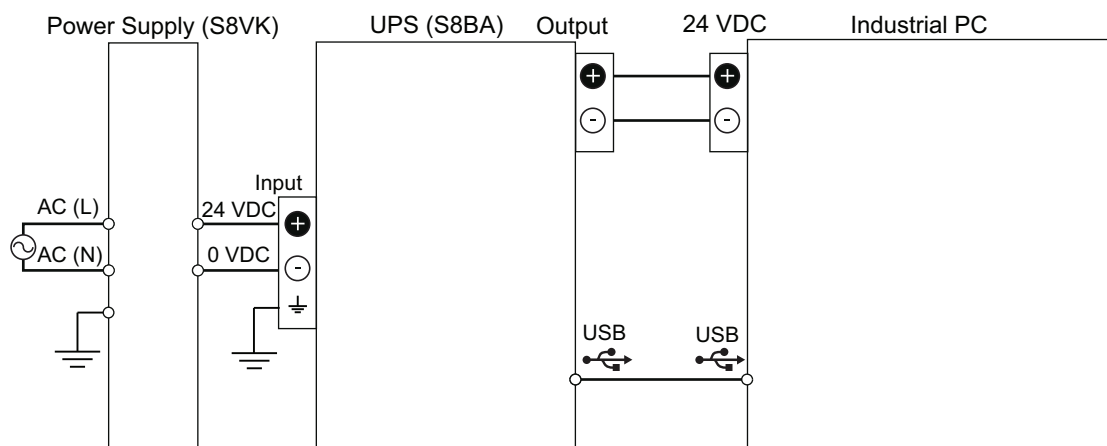


Additional Information

Refer to *5-8 Connect UPS* on page 5-50 for safety details.

Follow the steps below to connect the S8BA UPS with a USB cable and to configure it correctly.
Refer to *3-10-10 UPS* on page 3-33 for more information.

- 1 Ensure the revision number of the UPS is correct.
Refer to *3-10-10 UPS* on page 3-33 for more information.
- 2 For Box PCs that do not have Windows pre-installed: Download the above mentioned software.
- 3 Wire the S8BA UPS.
 - 1) Wire the input of the UPS to the output of the Power Supply.
 - 2) Wire the output of the UPS to the power connector of the 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 wiring details.

- 4 Supply power to the Power Supply.

- 5** Press and hold the UPS power button until **On** appears on the UPS display.
- 6** Power ON the Box PC and then wait until the device drivers are successfully installed.
- 7** Configure the UPS using the UPS Settings Utility.
Refer to UPS Setting Utility Instruction Manual for S8BA/BU-2RWL for details.
- 8** Configure the UPS using the Industrial PC Support Utility.
Refer to *NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)* for details.
- 9** 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.
- 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 with USB and correctly 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.

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

Use the following procedure for a UPS connection using the I/O connector.

The I/O connector of the Industrial Box PC can receive the power status of the UPS with an input and set the power status of the UPS with an output.



Additional Information

- A UPS connection using the I/O connector in combination with the Industrial PC Support Utility is possible for a Box PC with a Windows operating system.
- Without the Industrial PC Support Utility a custom software program is required to shut down the Box PC when needed. This is required because the Box PC does not react automatically to the UPS Mode Input.

UPS Drivers and the required software is available.

- For Box PCs with Windows:
 - the drivers for the S8BA UPS are pre-installed
 - Installation files and the manual for the UPS Settings Utility are available in the directory D:\OMRON-NY\Installers\ UPS Settings Utility
- For all other Box PCs:
 - the drivers for the S8BA UPS can be downloaded from [this OMRON website](#)
 - Installation files and the manual for the UPS Settings Utility can be downloaded from [this OMRON website](#)

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

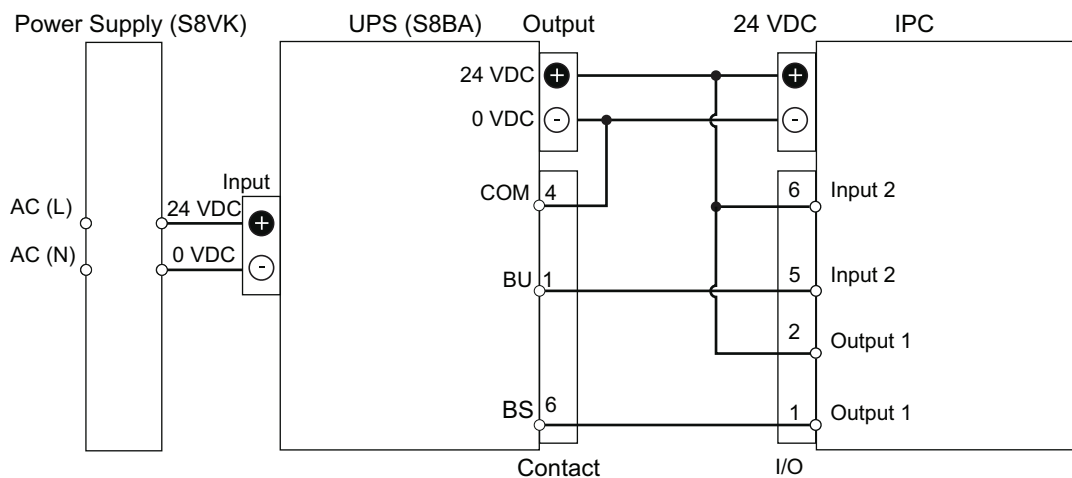


Precautions for Safe Use

- 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 *3-10-10 UPS* on page 3-33 for more information.
- 2** 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-C02.



- 3** For a Box PC with Windows:
Connect, configure and test the UPS connection with the procedure *Connect UPS - I/O Connector and Industrial PC Support Utility* on page 5-55.

For a Box PC with another Operating System or when custom software is preferred:
Connect, configure and test the UPS connection with the procedure *Connect UPS - I/O Connector and Custom Software* on page 5-56.

The UPS is connected using the I/O connector and configured correctly..

Connect UPS - I/O Connector and Industrial PC Support Utility

Use the following procedure for a UPS connection using the I/O connector in combination with the Industrial PC Support Utility.

The Industrial PC Support Utility is available for Box PCs with a Windows operating system.



Additional Information

Refer to *5-8-2 Connect UPS Using the I/O Connector* on page 5-53 and to *5-8 Connect UPS* on page 5-50 for safety details.

For the start of this procedure refer to *5-8-2 Connect UPS Using the I/O Connector* on page 5-53. Follow the steps below to connect the S8BA UPS to the I/O connector of the Box PC and to configure it correctly.

- 1** Supply power to the Power Supply.
- 2** Press and hold the UPS power button until **On** appears on the UPS display.
- 3** Power ON the Box PC and then wait until the device drivers are successfully installed.
- 4** Configure the UPS using the UPS Settings Utility.
Refer to UPS Setting Utility Instruction Manual for S8BA/BU-2RWL for details.
- 5** Configure the UPS using the Industrial PC Support Utility.
Refer to *NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)* for details.
- 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** 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.



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.

Connect UPS - I/O Connector and Custom Software

Use the following procedure for a UPS connection using the I/O connector in combination with a custom software program.

The I/O connector of the Industrial Box PC can receive the power status of the UPS with an input and set the power status of the UPS with an output.

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.



Additional Information

Refer to *5-8-2 Connect UPS Using the I/O Connector* on page 5-53 and to *5-8 Connect UPS* on page 5-50 for safety details.

For the start of this procedure refer to *5-8-2 Connect UPS Using the I/O Connector* on page 5-53. Follow the steps below to connect the S8BA UPS to the I/O connector of the Box PC and to configure it correctly.

- 1** Power ON the Box PC.
- 2** Configure the UPS using the UPS Settings Utility.
Refer to UPS Setting Utility Instruction Manual for S8BA/BU-2RWL for details.
- 3** 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.
- 4** Create a software program that monitors the UPS Mode Input and initiates Power OFF of the Box PC when the UPS Mode Input becomes active.
If the Box PC has a Windows operating system then use the Industrial PC System SDK to create the software program.
Refer to *NY-series Software Development Kit User's Manual* for SDK details.
- 5** Install the created software program.
- 6** Test the created software program and ensure it functions correctly.
- 7** 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.

5-9 Create Backup and Repair Data

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

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

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



Precautions for Correct Use

Refer to *NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)* for the Overview of Recover, Restore and Repair Methods.

Operating Procedures

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

6-1	Power ON	6-2
6-1-1	Power ON Using the Power Button	6-2
6-1-2	Power ON Using the Power ON/OFF Input.....	6-2
6-1-3	Auto Power ON	6-2
6-2	Power OFF	6-3
6-2-1	Power OFF Using the Power Button	6-3
6-2-2	Power OFF Using Windows Shut Down.....	6-3
6-2-3	Power OFF Using the Power ON/OFF Input	6-4
6-2-4	Forced Power OFF Using the Power Button	6-4
6-3	React to Product Messages	6-5
6-4	React to Windows Messages	6-6

6-1 Power ON

This section provides Power ON details.

6-1-1 Power ON Using the Power Button

Start condition: Power is supplied to the Box PC and the Box PC is OFF.

- 1** Press the power button and release within 1 second.
Refer to *3-3 Power Button* on page 3-9 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 a 24 VDC signal to pin 3 of the Power and I/O connector. This activates the Power ON/OFF input that consists of pins 3 and 4.
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 Connector Specifications* on page 4-23 for connector details.
- Refer to *5-4 Wire* on page 5-28 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 Industrial Box PC is ON by examining the LED indicators on the Box PC.

6-2-1 Power OFF Using the Power Button

- 1** Ensure all programs are closed.
If required close all active programs.
- 2** Press and release the power button on the Industrial Box PC within 1 second.
The Industrial Box PC will shutdown.
Note that this behaviour of can be reconfigured with the Power Options settings.
Refer to 3-3 *Power Button* on page 3-9 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 shutdown of the Box PC.

6-2-2 Power OFF Using Windows Shut Down

- 1** Ensure all programs are closed.
If required close all active programs.
- 2** Select the Windows **Shutdown** button.
To display the **Shutdown** button:
 - For Windows 10 select the **Windows** button and then the **Power** button.
 - For Windows 7 select the **Windows** button.
 The Industrial Box PC will shut down.
- 3** Wait until the PWR LED is OFF.
The Industrial Box PC is powered OFF.

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

- 1** Ensure all programs are closed.
If required, close all active programs.
- 2** Supply a 24 VDC signal to pin 3 of the Power and I/O connector. This activates the Power ON/OFF input that consists of pins 3 and 4.
The input signal must remain ON for a minimum of 60 ms and a maximum of 750 ms to be correctly detected by the Industrial Box PC.
The Industrial Box PC 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 Connector Specifications* on page 4-23 for connector details.
- Refer to *5-4 Wire* on page 5-28 for wiring details.

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



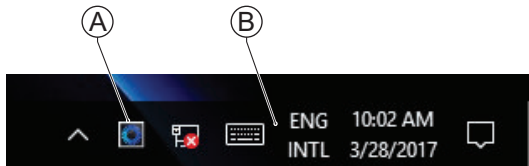
Precautions for Safe Use

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 *3-3 Power Button* on page 3-9 for power button location information.
The Box PC 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.

6-3 React to Product Messages

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



Check the Industrial PC Tray Utility icon for a Warning or Error symbol.

A Warning or Error symbol displayed on the Industrial PC Tray Utility icon indicates a product message.

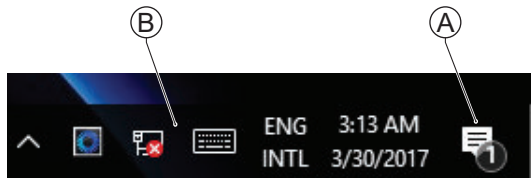
To react to a product message:

- 1** Select the Industrial PC Tray Utility icon.
A pop-up window will appear.
- 2** Read the message available in the pop-up.
- 3** Refer to *7-2-1 Warning and Error Messages* on page 7-4 for all details on the message.
Perform the actions presented for the message until the Warning or Error is resolved.

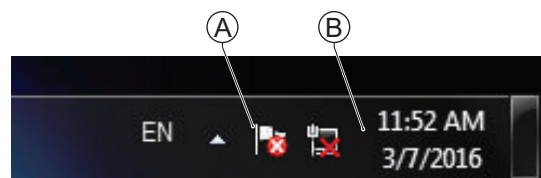
The product messages for the Industrial Box PC are resolved.

6-4 React to Windows Messages

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



Windows 10



Windows 7

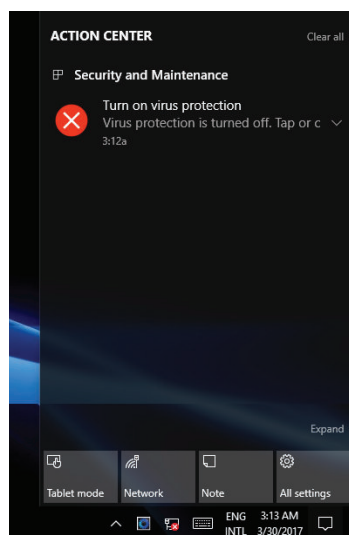
Check the Windows Action Center icon for a Warning or Error symbol.

A Warning or Error symbol displayed on the Windows Action Center icon indicates a Windows message.

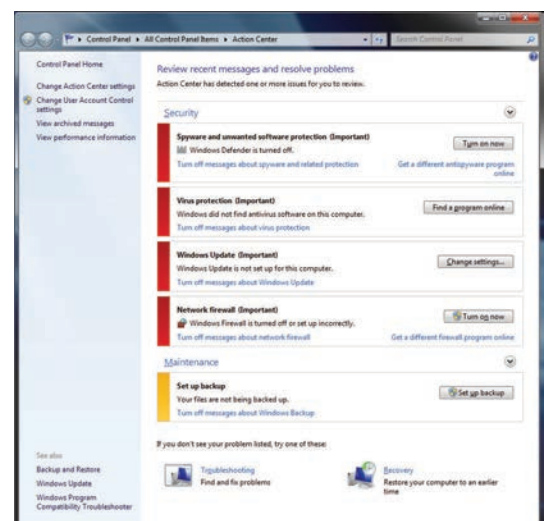
To react to a Windows message:

- 1 Open the Windows Action Center.
 - For Windows 10: Click the Windows Action Center icon.
 - For Windows 7: Right-click the Windows Action Center icon and select **Open Action Center** from the pop-up window.

A pop-up window will appear.



Windows 10



Windows 7

- 2 Read the message available in the window.
- 3 Perform the actions until each Warning or Error is resolved.

The Windows messages for the Industrial Box PC are resolved.

7

Maintenance

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

7-1	Preventive Maintenance	7-2
7-1-1	Preventive Maintenance Schedule	7-2
7-1-2	Clean the Box PC	7-3
7-2	Corrective Maintenance.....	7-4
7-2-1	Warning and Error Messages.....	7-4
7-2-2	Remove the Cover	7-6
7-2-3	Replace the Fan Unit.....	7-7
7-2-4	Replace the CJ1W Battery	7-9
7-2-5	Replace a Drive	7-14
7-2-6	Replace the PCIe Card	7-19
7-2-7	Replace the CFast Card	7-24

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 Industrial Box PC status	<ul style="list-style-type: none"> Refer to <i>7-2-1 Warning and Error Messages</i> on page 7-4 for Box PC Messages. Refer to <i>6-4 React to Windows Messages</i> on page 6-6 for Windows Messages. Refer to <i>3-2 LED Indicators</i> on page 3-7 for LED details.
Monitor storage devices that do not comply to the Omron specifications	Refer to <i>Storage Device Considerations</i> on page 3-26 for details.

Weekly	Reference
Clean the Box PC	Refer to <i>7-1-2 Clean the Box PC</i> on page 7-3 for cleaning details.
Ensure you have the latest software updates	Refer to <i>NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)</i> for details.

When changing applications or configurations	Reference
Create a backup of the Industrial Box PC	Refer to <i>NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)</i> for backup details.

Periodically but at least every 6 months	Reference
Check the ambient environment: <ul style="list-style-type: none"> Temperature and humidity within specifications Noise sources not close to the Industrial Box PC 	Refer to <i>4-3 Environmental Specifications</i> on page 4-36 for environmental specifications.
Check installation: Industrial Box PC mounted securely	Refer to <i>5-3 Mount</i> on page 5-16 for installation details.
Check wiring and connections: <ul style="list-style-type: none"> Cable connectors fully inserted and locked No damaged wiring or connectors 	Refer to <i>5-4 Wire</i> on page 5-28 for wiring details. Refer to <i>5-5 Connect</i> on page 5-42 for connection details.
For models with a replaceable battery: <ul style="list-style-type: none"> Check the battery replacement date. Replace the battery before the replacement date. 	Refer to <i>7-2-4 Replace the CJ1W Battery</i> on page 7-9 for more information.
Check the backup and repair media.	Refer to <i>NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)</i> for details.

When the Industrial Box PC is not powered for 6 months	Reference
<p>For a cooling layer with removable cover and active cooling:</p> <ul style="list-style-type: none"> • Confirm both fans rotate immediately after Power ON. • Replace the Fan Unit when the fans do not rotate smoothly. 	<p>Refer to 7-2-3 <i>Replace the Fan Unit</i> on page 7-7 to replace the Fan Unit.</p>

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.

7-2 Corrective Maintenance

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

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

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

7-2-1 Warning and Error Messages

Warning and Error messages are provided by the Industrial Box PC when there is a potential problem that may cause downtime. This section provides details about these messages.

Warning messages inform you about a situation that will lead to downtime of the Industrial Box PC.

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

The following message channels are available.

LED Indicators

The ERR LED indicator provides information on warnings and errors.

Industrial PC Support Utility

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

The Industrial PC Support Utility indicates:

- Internal temperature above setting
Check the status of the Fan Unit and check the ambient conditions.
- Low revolution speed of the Fan Unit
 - Check for excessive dust on the fans and in the Fan Unit.
 - If required replace the Fan Unit.
- Low battery status
Replace the battery.
- The status of the UPS.

Windows Action Center

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

The Windows Action Center indicates security and maintenance issues.

Some examples:

- Virus protection (Important)
Windows did not find anti-virus software on this computer.
- Windows Update (Important)
windows Update is not set up for this computer.
- Set up backup
Your files are not being backed up.

Windows Pop Up Window

Windows Pop Up windows provide information on Windows issues.

An example of a Windows Pop Up

- Close programs to prevent information loss.



To solve this change the paging file size.

7-2-2 Remove the Cover

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

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

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

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

No tools are required to open the Cover.

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

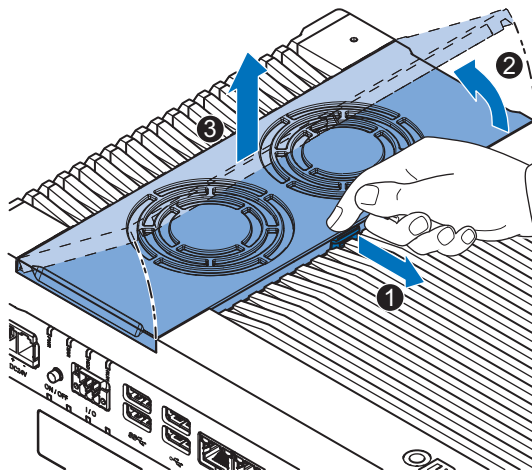
- 1 Power OFF your Box PC if it has active cooling.



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 storage period of the replacement fan exceeds 6 months, check the performance of the Fan Unit directly after replacement.



Additional Information

Refer to 3-9-2 *Fan Unit* on page 3-21 for the model.

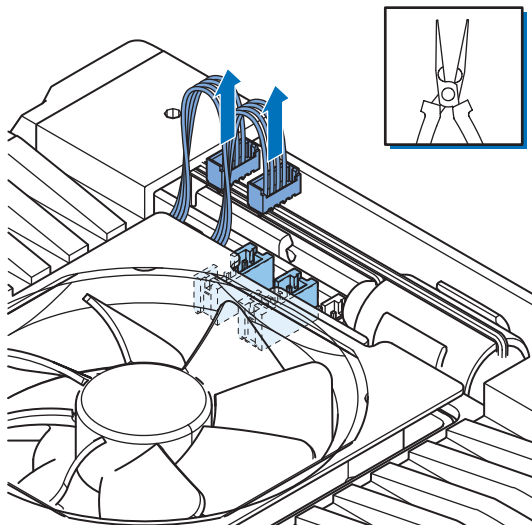
- 1** Power OFF the Box PC.
- 2** Remove the Cover of the Box PC.



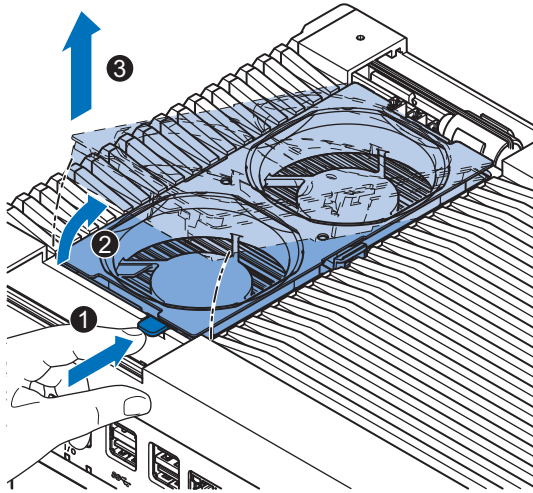
Additional Information

Refer to 7-2-2 *Remove the Cover* on page 7-6 for the cover removal procedure.

- 3** Disconnect the Fan Connectors from the board.



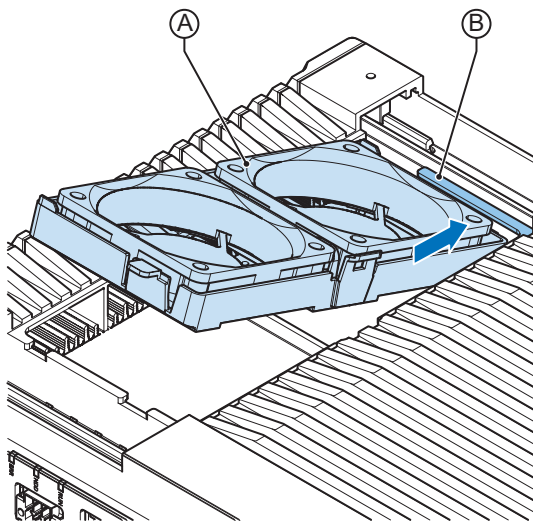
4 Replace the complete Fan Unit.



- 1) Push the lever ① to unlock the Fan Unit.
- 2) Lift the lever to tilt ② the Fan Unit.
- 3) Remove ③ the complete Fan Unit.

5 Insert the new Fan Unit in the Box PC.

Ensure the end of the Fan Unit (A) is positioned under the fan guide (B).



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 CJ1W Battery

Use the following information to replace the CJ1W Battery.



Precautions for Safe Use

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



Precautions for Correct Use

- Always touch a grounded piece of metal to discharge static electricity from your body before starting an installation or maintenance procedure.
- Make sure to use a battery of the correct type and install the battery properly.
- Apply power for at least five minutes before changing the battery. Mount a new battery within five minutes after turning OFF the power supply. If power is not supplied for at least five minutes, the clock data may be lost. Check the clock data after changing the battery.
- Turn ON the power after replacing the battery for a product that has been unused for 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.



Additional Information

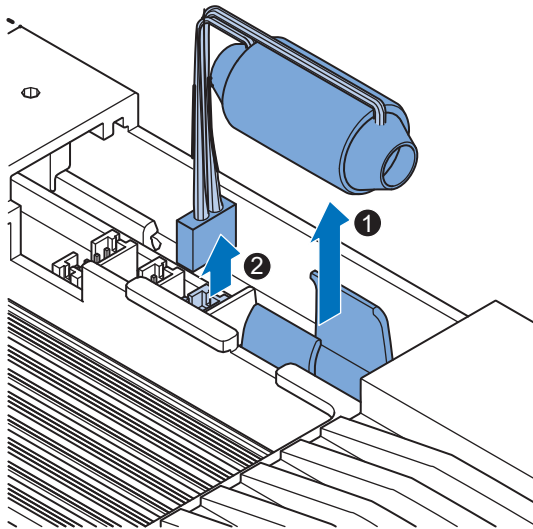
- Refer to 3-9-1 *Battery* on page 3-21 for the battery model.

Replace CJ1W Battery in the Cooling Layer

For models with a cooling layer that has a removable cover.

Use the following procedure to replace the battery:

- 1** Power OFF the Box PC.
- 2** Remove the cover.
Refer to *7-2-2 Remove the Cover* on page 7-6 for more details.
- 3** Lift the battery **①** from the compartment.
- 4** Disconnect the battery from the battery connector **②**.



- 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.

Be sure to replace the battery within 5 minutes.	
Next date of replacement	
1	
2	
3	
4	



Additional Information

Refer to *3-9-1 Battery* on page 3-21 for lifetime of the battery.

8 Mount the cover.

9 Power ON the Box PC.

10 Check the Date and Time in the operating system.
Correct the Date and Time if this is required.

11 Dispose of the battery according to local ordinances as they apply.



廢電池請回收 A battery is chemical waste.

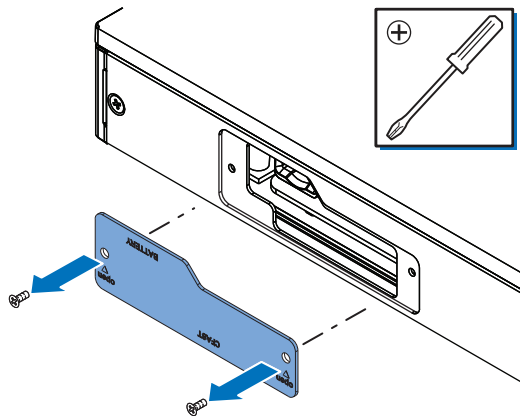
The battery in the cooling layer is replaced.

Replace CJ1W Battery in the Base Layer

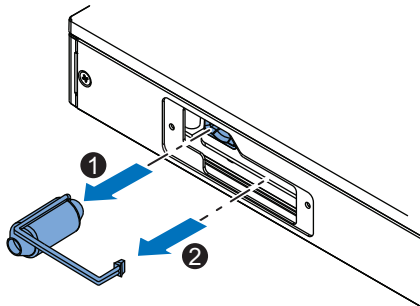
For models with the battery in the Base Layer behind a removable cover.

Use the following procedure to replace the battery:

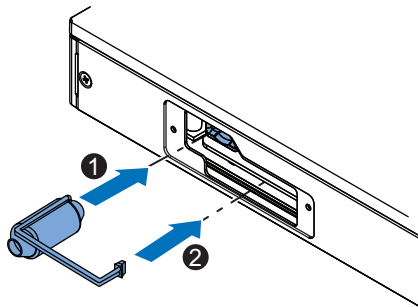
- 1** Power OFF the Box PC.
- 2** Remove the two screws that are marked with "open" at the backside of the product and open the battery cover.



- 3** Pull the battery **1** from the battery holder and disconnect the battery from the battery connector **2**.



- 4** Connect the new battery to the battery connector **2** and then insert the new battery **1** in the battery holder.



Ensure the wires are flat and inside the unit. If the wires are e.g. on top of the battery this might make closing and opening the cover more difficult.

- 5** Write the next date of replacement on the label at the inside of the cover.

Be sure to replace the battery within 5 minutes.

Next date of replacement

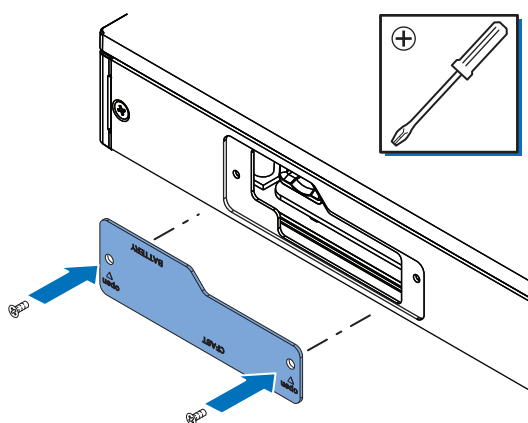
1	
2	
3	
4	



Additional Information

Refer to 3-9-1 *Battery* on page 3-21 for lifetime of the battery.

- 6** Mount the cover.



- 7** Power ON the Box PC.
- 8** Check the Date and Time in the operating system.
Correct the Date and Time if this is required.
- 9** Dispose of the battery according to local ordinances as they apply.



廢電池請回收 A battery is chemical waste.

The battery in the base layer is replaced.

7-2-5 Replace a Drive

Use the following procedure to replace a drive.

Prepare the new drive.

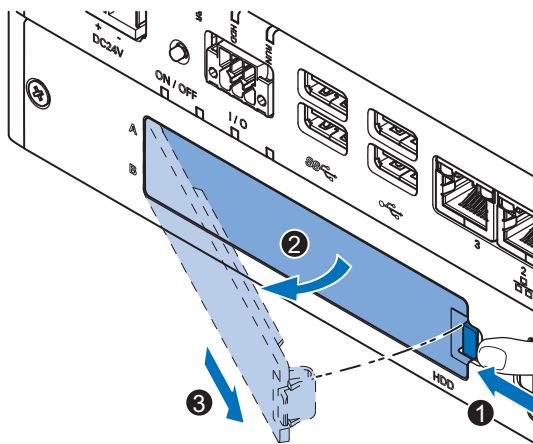


Additional Information

- Refer to *1-4 Product Configuration Box PC* on page 1-5 for the installed drive model.
- Refer to *3-10-4 HDD and SSD Storage Devices* on page 3-26 for the available drive models.
- Refer to *4-1-7 Storage Device Specifications* on page 4-14 for drive specifications.

To replace a drive:

- 1** Power OFF the Box PC.
- 2** Remove the drive cover.



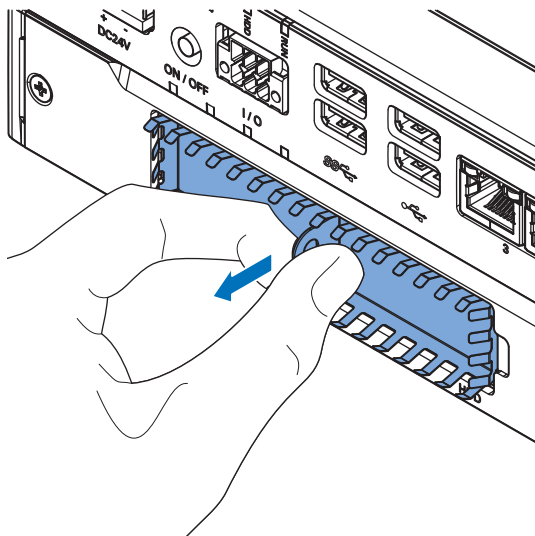
- 1) Push the lock lever **1**.
- 2) Tilt the cover **2**.
- 3) Remove the drive cover **3**.



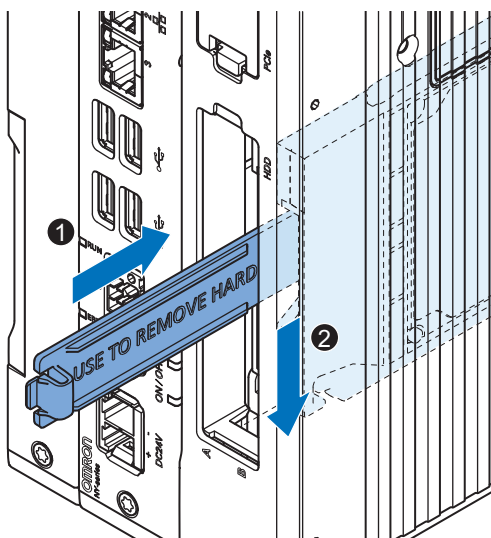
Additional Information

- Refer to *3-7 Drive Bays* on page 3-19 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.

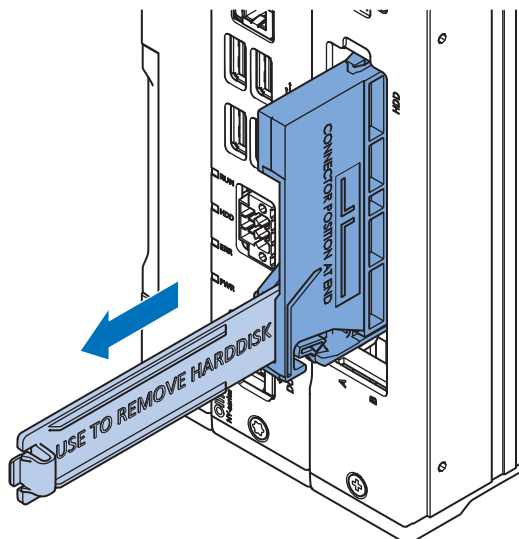
- 3** Pull the metal shielding cover out of the Box PC.



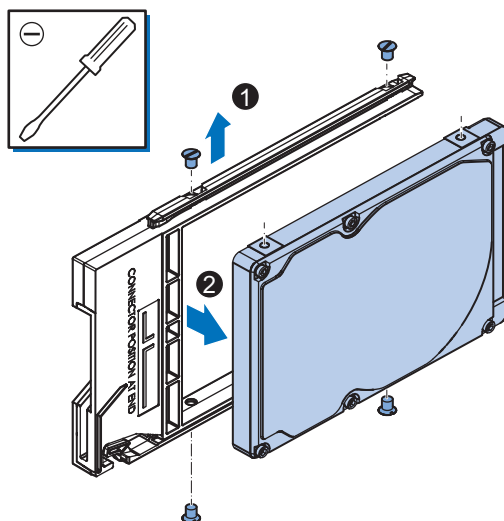
- 4** Insert the drive cover in the drive bracket bay **①** and move it down **②** so that it locks in the drive bracket.



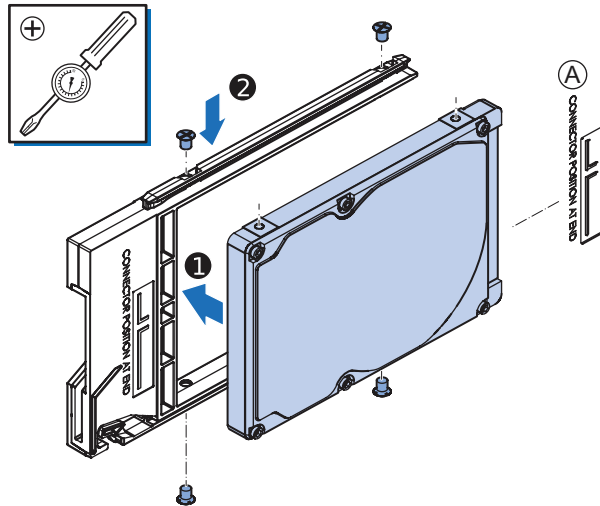
- 5** Remove the drive bracket from the Box PC using the drive cover.



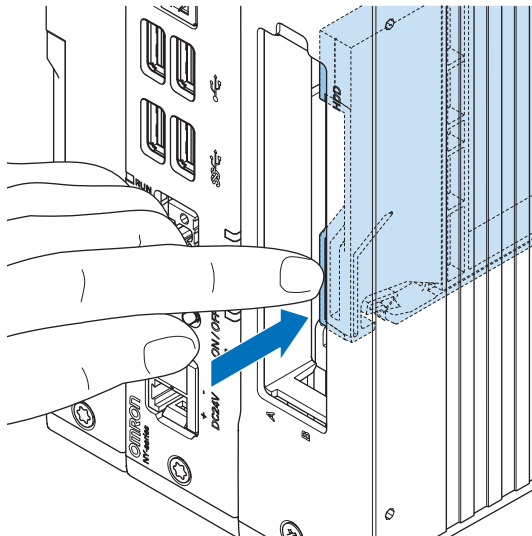
- 6** Remove the 4 mounting screws **①** and then remove the drive **②** from the drive bracket.



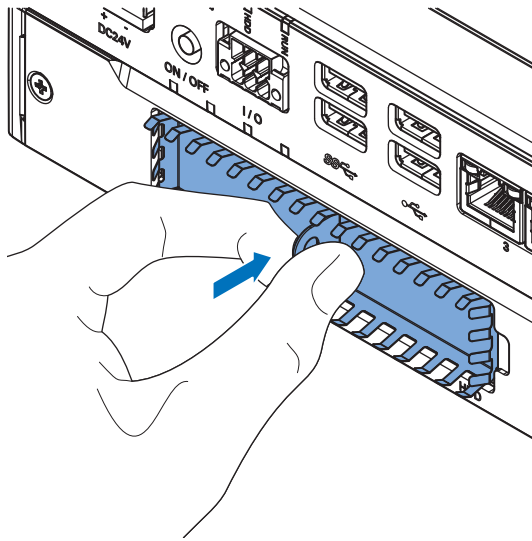
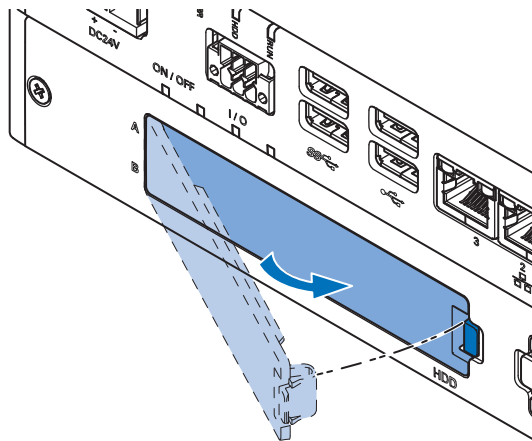
- 7** Align the connectors of the replacement drive as shown **(A)** on the bracket. Then insert the replacement drive **①** in the bracket and insert the 4 mounting screws **②**. Tighten these screws with a torque of 0.35 N·m.



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

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 4-18 for PCIe specifications.

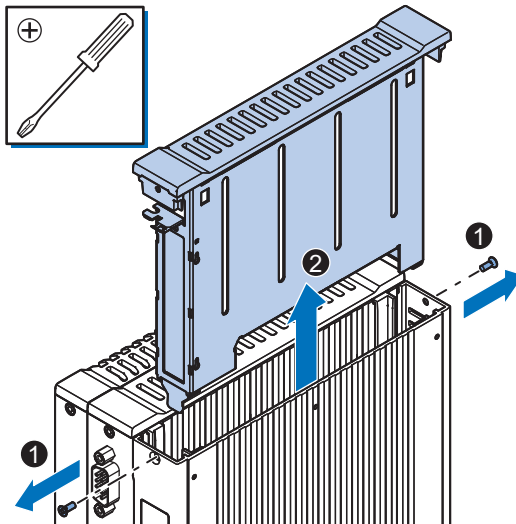
- The PCIe Card mounting materials: Card Clip and Card Support

These are supplied with the Industrial Box PC.

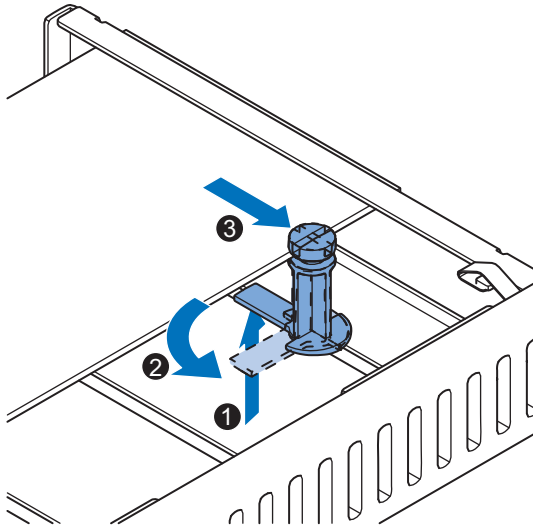
To replace the PCIe Card:

- 1** Power OFF the system.
- 2** Unmount the Box PC.
- 3** Remove the two crosshead screws **①** indicated with "open" and then pull up **②** the PCIe Drawer.

The indent at the side of the drawer will help you to pull the drawer from the Box PC.



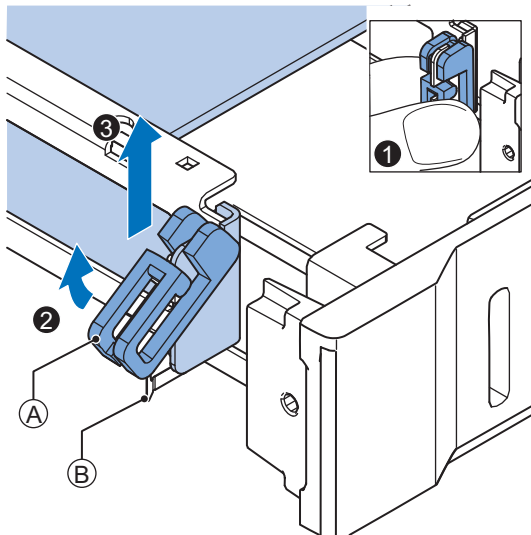
- 4** Push the notch **1** at the bottom of the Card Support up and rotate **2** the Card Support. Slide the Card Support **3** away from the card to create space and to remove it.



- 5** Remove the Card Clip from the PCIe Drawer. There are two types of Card Clips available. Use the steps applicable to your type.

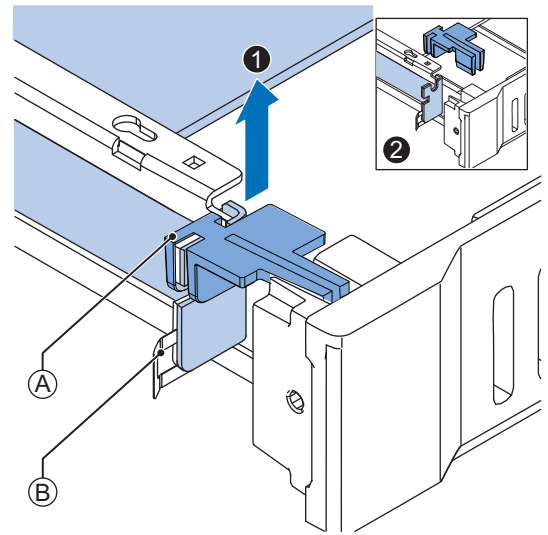
⚠ CAUTION

When installing or removing a PCIe card, avoid touching the sharp edges of the sheet metal frame tab. Injury may result.



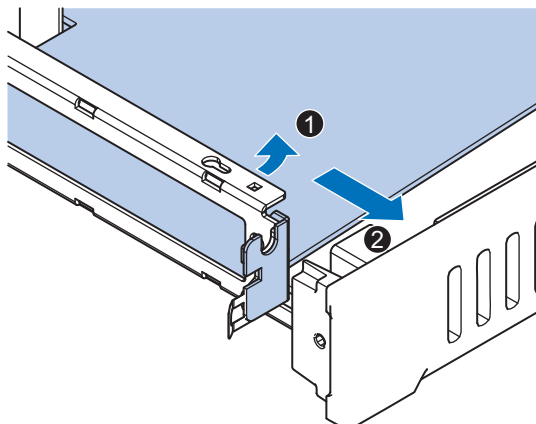
- (A) Card Clip
(B) Sheet metal frame tab

Grip the Card Clip (A) on the sides **1**. Pull the middle of the Card Clip to unlock it **2** and remove it **3** from the PCIe Drawer.

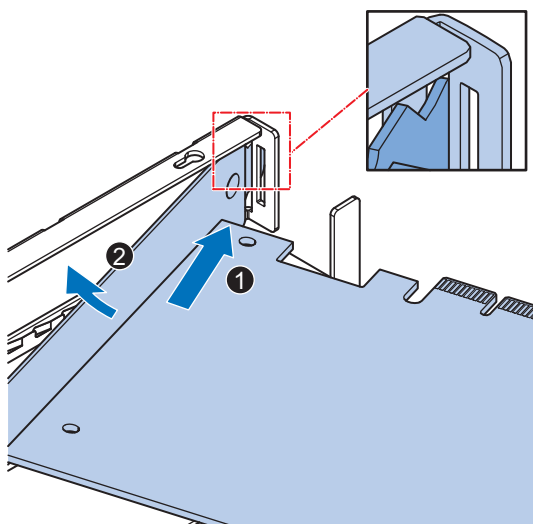


- (A) Card Clip
(B) Sheet metal frame tab

Grip the Card Clip (A) on the sides. Lift the Card Clip **1** and remove it **2** from the PCIe Drawer.

6 Remove the PCIe Card from the PCIe Drawer.

The PCIe Card is now removed.

7 Place the replacement PCIe Card in the PCIe Drawer.

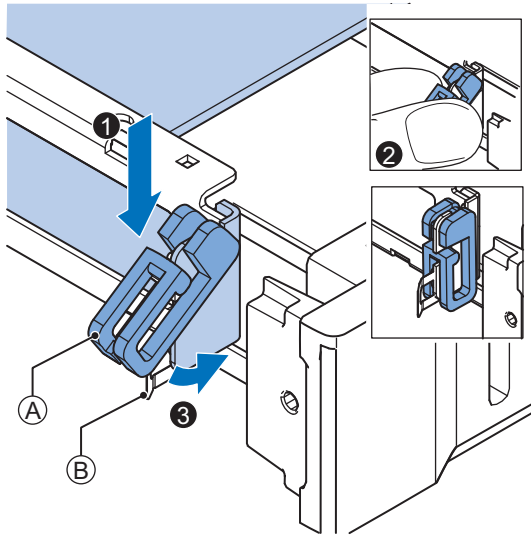
Ensure the PCIe Card is inserted into the correct opening.

8 Place the Card Clip (A) in the PCIe Card and PCIe Drawer.

There are two types of Card Clips available. Use the steps applicable to your type.

CAUTION

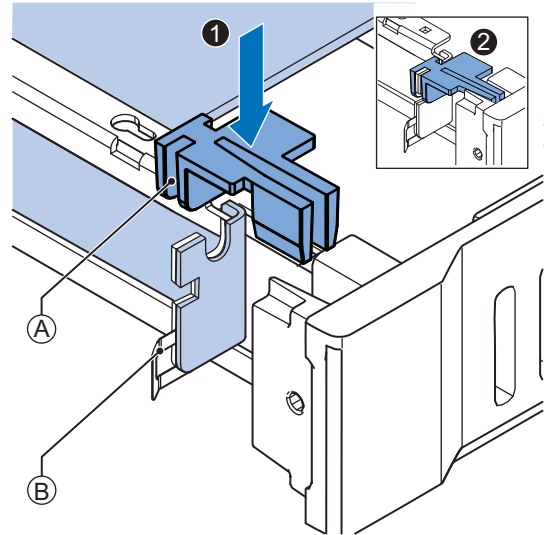
When installing or removing a PCIe card, avoid touching the sharp edges of the sheet metal frame tab. Injury may result.



(A) Card Clip

(B) Sheet metal frame tab

Place the Card Clip (A) in the PCIe Card and PCIe Drawer (1), grip the Card Clip on the sides (2) and then rotate the Clip (3) to lock it in place.

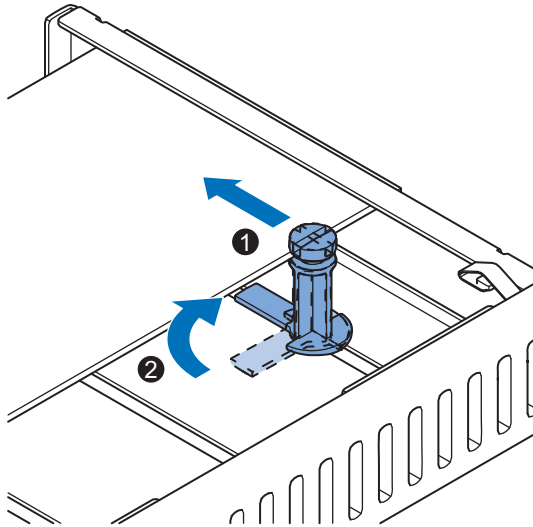


(A) Card Clip

(B) Sheet metal frame tab

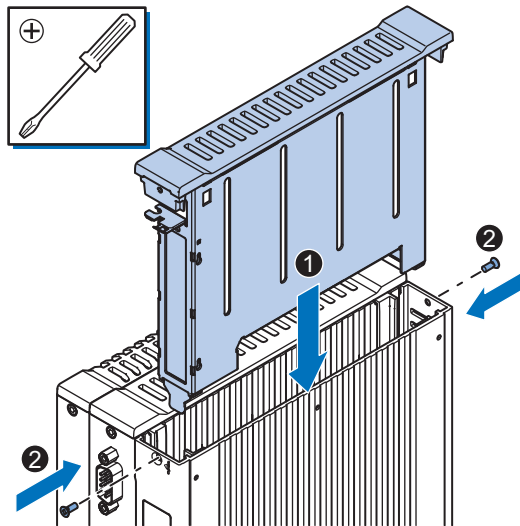
Place the Card Clip (A) in the PCIe Card and PCIe Drawer and push it down (1) to lock it in place (2).

- 9** Slide the Card Support **1** so that it supports the side of the PCIe Card.
Rotate the Card Support **2** 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.

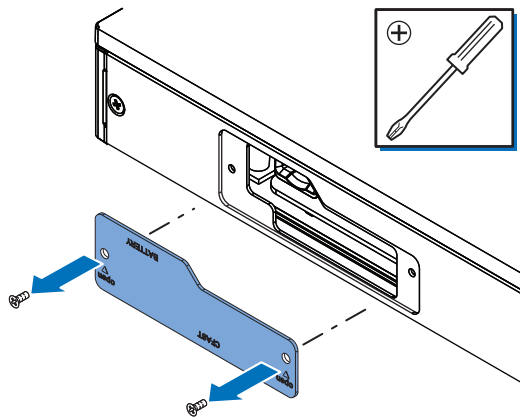


Additional Information

- Refer to *1-4 Product Configuration Box PC* on page 1-5 for the installed CFast Card model.
- Refer to *3-10-3 CFast Cards* on page 3-25 for the available CFast Card models.
- Refer to *CFast Card Specifications* on page 4-17 for specification details.

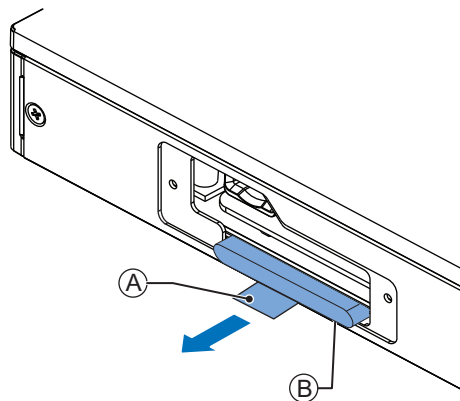
To replace the CFast Card:

- 1** Power OFF the Box PC.
- 2** Remove the CFast Card slot cover.



- 1) Remove the two screws that are marked with "open" ①.
- 2) Remove the cover ②.

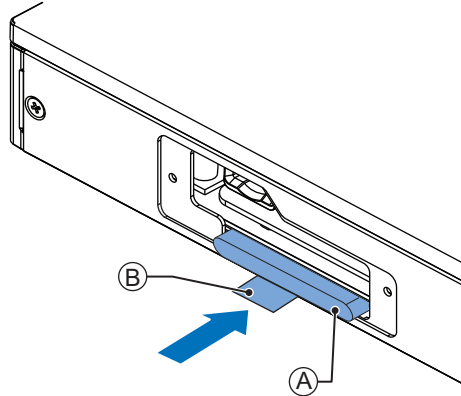
- 3** Pull the plastic Pull Tab (A) to remove the CFast Card (B) from the Box PC.



- 4** Insert the replacement CFast Card (A) into the slot of the Box PC.

Ensure the CFast Card (A) is completely in the Box PC.

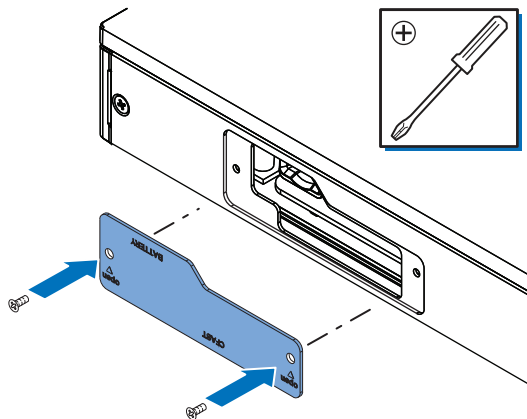
If the CFast Card can not go in completely then the CFast Card orientation is incorrect. Remove the CFast Card, turn it upside down and reinsert it. Ensure the CFast Card (A) is completely in the Box PC.



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

- 5** Mount the CFast Card slot cover.

Place the slot cover (1) and then mount the screws (2).



- 6** Restore the drive data from a backup.

Refer to *NY-series Operating Systems and Software Utilities Manual* (Cat. No. W616) for details.

The CFast Card is replaced.



Appendices

A-1	BIOS	A-2
A-1-1	BIOS Overview	A-2
A-1-2	BIOS for 4 th generation CPUs	A-6
A-1-3	BIOS for 6 th generation CPUs	A-14
A-1-4	BIOS for 7 th generation CPUs	A-32
A-1-5	BIOS for 11 th generation CPU - CVWNA111 CVWNR111 CVWGR111	A-62
A-1-6	BIOS for 11 th generation CPU - CQWGA111	A-71
A-1-7	BIOS for Atom CPU - 1AWGR113	A-79
A-1-8	BIOS for Atom CPU - 3AWNR113	A-85
A-2	DVI Connector Pin Details	A-94
A-2-1	DVI-I Connector Pin Details	A-94
A-2-2	DVI-D Connector Pin Details	A-95
A-3	RS-232C Connector Pin Details	A-97

A-1 BIOS

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



WARNING

Changing BIOS information is only allowed for the engineer in charge that possesses a thorough understanding of the BIOS settings because it can change the behavior of the product.



A-1-1 BIOS Overview

The BIOS contains settings that influence the behavior of the Industrial Box PC.

BIOS settings are specific for your CPU type.

Refer to *1-4 Product Configuration Box PC* on page 1-5 for CPU details.

The touchscreen functionality is not functional when working in BIOS.

Ensure a USB keyboard is connected.

BIOS Setup Program

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



Additional Information

For 4th, 6th and 7th generation CPUs also the **F2** key can be used.

For Atom CPUs also the **Esc** key can be used.

Boot Selection Popup Menu

Press the **F11** key repeatedly directly after Power ON to display the Boot Selection Popup menu.

The popup menu allows selection of the boot device and the option to enter the BIOS setup program.

BIOS Structure

The BIOS contains a menu bar, a left frame and a right frame.

The left frame displays all the options that can be configured in the selected menu.

The left frame uses following colors:

- Blue = Configurable options
- Greyed-out = Not configurable
- Inverse white = Selected

The right frame displays the key legend. Above the key legend is an area reserved for text messages.

These text messages explain the options and the possible impacts when you change the selected option in the left frame.

Use the →← keys to navigate between pages.

The menu bar gives access to following pages:

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

BIOS Navigation and Function Keys

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

Top part.

Provides additional information on selected screens or parameters.

Bottom part.

Provides information on Keys.

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

BIOS Password & Write Protection

A BIOS password protects the BIOS setup program from unauthorized access. This ensures that users cannot change the system configuration without authorization. With an assigned BIOS password, the BIOS prompts the user for a password on a setup entry. If the password entered is wrong, the BIOS setup program will not launch.

The BIOS uses encryption for the password.

When a BIOS password is set the password is case sensitive with a minimum of 3 characters and a maximum of 20 characters. Setting no characters removes the BIOS password.

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.



Precautions for Safe Use

Remember the BIOS password. The BIOS is inaccessible without it.

To change an empty BIOS password:

1. Enter a new password at **Create New Password**
Confirm with **Enter**
2. Enter the New Password a second time at **Confirm New Password**
Confirm with **Enter**
3. Select **F10** to save the new password and exit the BIOS

The new password is set.

To change an existing BIOS password:

1. Enter the Current Password at **Enter Current Password**
Confirm with **Enter**
2. Enter the New Password at **Create New Password**
Confirm with **Enter**
3. Enter the New Password a second time at **Confirm New Password**
Confirm with **Enter**
4. Select **F10** to save the new password and exit the BIOS

A new password is set.

To clear an existing BIOS password:

1. Enter the Current Password at **Enter Current Password**
Confirm with **Enter**
 2. Leave the password field empty at **Create New Password**
Confirm with **Enter**
 3. Confirm your change with **Yes** at the question **WARNING: Clear Old Password. Continue?**
 4. Select **F10** to save the new password and exit the BIOS
- The password is removed.

A-1-2 BIOS for 4th generation CPUs

The BIOS settings for 4th generation CPUs.

Refer to the CPU information in *1-4 Product Configuration Box PC* on page 1-5 for generation details.

The BIOS is divided in the pages Main, Advanced, Chipset, Boot, Security 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		<ul style="list-style-type: none">eDP / for Industrial Panel PCNo 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 Res-ervation	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		Enabled
	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 Industrial Box PC will stay OFF when power is supplied to the power connector

Turn ON: The Industrial Box PC will automatically start up when power is supplied to the power connector.

Last State: The Industrial Box PC will start up or remain OFF when power is supplied based on the Industrial Box PC state at the moment power was removed from the power connector.

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

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:

- **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.

Refer to the CPU information in *1-4 Product Configuration Box PC* on page 1-5 for generation details.

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
		SMM Use Delay Indication
		SMM Use Block Indication
	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
		Platform PL2 Enable
		Power Limit 4 Override
		C states
		Thermal Monitor
		Interrupt Redirection Mode Selection
		Timed MWAIT
		Custom P-state Table
		Energy Performance Gain
		Power Limit 3 Settings
		CPU Lock Configuration
	GT - Power Management Control	Maximum GT 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
	PTT Configuration	TPM Device Selection
	ME Debug Configuration	HECI Timeouts
		Force ME DID Init Status
		CPU Replaced Polling Disable
		ME DID Message
		HECI Retry Disable
		HECI Message check Disable
		MBP HOB Skip
		HECI2 Interface Communication
		KT Device
		IDER Device
		End Of Post Message
		DOI3 Setting for HECI Disable
Thermal Configuration	CPU Thermal Configuration	DTS SMM
		Tcc Activation Offset
		Tcc Offset Time Window
		Tcc Offset Clamp Enable
		Tcc Offset Lock Enable
		Bi-directional PROCHOT#
		Disable PROCHOT# Output
		Disable VR Thermal Alert
		PROCHOT Response
		PROCHOT Lock
		ACPI T-States
		PECI Reset
		PECI C10 Reset
	Platform Thermal Configuration	PCH Thermal Device
		PCH Temp Read
		CPU Energy Read
		CPU Temp Read
		Alert Enable Lock
	DPTF Configuration	DPTF
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
		PCI Buses Padding
		I/O Resources Padding
		MMIO 32 bit Resources Padding
		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 <i>Memory Thermal Configuration</i> on page A-27 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 <i>PCI Express Port</i> on page A-28 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)	
	PCH LAN Controller	
	DeepSx Power Policies	
	LAN Wake From DeepSx	
	Wake on LAN Enable	
	SLP_LAN# Low on DC Power	
	K1 off	
	Wake on WLAN and BT Enable	
	Disable DSX ACPI PRESENT Pulldown	
	Serial IRQ Mode	
	Port 61h Bit-4 Emulation	
	Port 80h Redirection	
	Enhance Port 80h LPC Decoding	
	Compatible Revision ID	
	PCH Cross Throttling	
	Disable Energy Reporting	

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 - Chipset Details

This section provides BIOS Chipset details for:

- 6th generation CPUs
- 7th generation CPUs with a BIOS version upto version 008

For all other CPU types or BIOS versions refer to *BIOS - Chipset* on page A-44 for details.

● 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
SECFE		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.

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		CPU specific *2
	Key Management *3	Factory Key Provision	Disabled
		Secure Boot variable	Display variable details

- *1. Only when a storage device is installed. The default password for a storage device is empty.
- *2. For:
 - Intel® Core™ i7-7820EQ CPU Secure Boot Customization = Standard
 - other CPU types with a BIOS version up to B□□□□008 CPU Secure Boot Customization = Custom
 - other CPU types with a BIOS version B□□□□115 and higher CPU Secure Boot Customization = Standard
- *3. Only applicable for:
 - Intel® Celeron® 3965U with a BIOS version up to BU□□□008
 - Intel® Core™ i5-7300U with a BIOS version up to BV□□□008

BIOS - Boot

This section provides BIOS Boot information for the 6th and 7th generation CPUs.

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 *3		Hot S5
Enter Setup If No Boot Device		No
Enable Popup Boot Menu		Yes
Boot Priority Selection		Type Based
Boot Option Sorting Method *3		UEFI First
Type Based Boot Priority *3	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 *3		Auto (Battery Manager)
System Off Mode *3		G3/Mech Off
UEFI Fast Boot		Disabled
UEFI Screenshot Capability		Disabled

*1. Power Loss Control settings are :

Remain OFF: The Industrial Box PC will stay OFF when power is supplied to the power connector

Turn ON: The Industrial Box PC will automatically start up when power is supplied to the power connector.

Last State: The Industrial Box PC will start up or remain OFF when power is supplied based on the Industrial Box PC state at the moment power was removed from the power connector.

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

For 6th generation CPUs: SATA 2 Drive.

*3. Not applicable for CPU type Intel® Core™ i7-7820EQ

Boot settings specific for CPU type Intel® Core™ i7-7820EQ:

Item	Default / Remark
Boot Option #1	Windows Boot Manager (P1: CFast <input type="checkbox"/>)
Boot Option #2	UEFI OS (P1: CFast <input type="checkbox"/>)
New Boot Option Policy	Default

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:

- **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.

Only for CPU type Intel® Celeron® 3965U with BIOS version BU□□□115 and higher and for CPU type Intel® Core™ i7-7820EQ:

- UEFI OS (P1: ☐)
Boots the system with the UEFI OS.
- Windows Boot Manager (P1: ☐)
Boots the system with the Windows Boot Manager.

A-1-4 BIOS for 7th generation CPUs

The BIOS settings for 7th generation CPUs.

Refer to the CPU information in *1-4 Product Configuration Box PC* on page 1-5 for generation details.

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 are grouped with the combination of your CPU type and the BIOS version.

CPU type	BIOS version	Refer to
Intel® Core™ i5-7300U	Up to version BV□□□008	<i>BIOS - Advanced BIOS up to version 008 on page A-34</i>
	Version BV□□□115 and higher	<i>BIOS - Advanced BIOS version 115 and higher on page A-40</i>
Intel® Celeron® 3965U	Up to version BU□□□008	<i>BIOS - Advanced BIOS up to version 008 on page A-34</i>
	Version BU□□□115 and higher	<i>BIOS - Advanced BIOS version 115 and higher on page A-40</i>
Intel® Core™ i7-7820EQ	All versions	<i>BIOS - Advanced for CPU Type Intel® Core™ i7-7820EQ on page A-42</i>

● BIOS - Advanced BIOS up to version 008

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

- Intel® Core™ i5-7300U with a BIOS version up to BU□□□008
- Intel® Celeron® 3965U with a BIOS version up to BV□□□008

For all other CPU types or BIOS versions refer to *BIOS - Advanced* on page A-33 for details.

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

Item		Default / Remark
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
		SMM Use Delay Indication
		SMM Use Block Indication
	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
	CPU - Power Management Control	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
		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

Item			Default / Remark
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 Pad- ding		16 M	
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
	UART0 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 CPU type Intel® Core™ i5-7300U

*2. Only for 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 - Advanced BIOS version 115 and higher

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

- Intel® Core™ i5-7300U with a BIOS version BU□□□115 and higher
- Intel® Celeron® 3965U with a BIOS version BV□□□115 and higher

For all other CPU types or BIOS versions refer to *BIOS - Advanced* on page A-33 for details.

Changeable BIOS Advanced parameters and their factory default values:

Item			Default / Remark
CPU	SW Guard Extensions (SGX)		Software Controlled
	Select Owner EPOCH input type		No Change in Owner EPOCHs
	Hardware Prefetcher		Enabled
	Adjacent Cache Line Prefetch		Enabled
	Intel (VMX) Virtualization Technology		Enabled
	Active Processor Cores		All
	Hyper-Threading* ²		Enabled
	BIST		Disabled
	AP threads Idle Manner		MWAIT Loop
	AP threads Handoff Manner		MWAIT Loop
	AES		Enabled
	MachineCheck		Enabled
	MonitorMWait		Enabled
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
		Turbo Mode* ¹	Enabled
		C states	Disabled
		Timed MWAIT	Disabled
	GT - Power Management Control	Maximum GT frequency	Default Max Frequency
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
RTC Wake Settings	RTC Wake Mode		Disabled
AMI Graphic Output Protocol Policy	Output Select* ²		EDP1
CSM & Option ROM Control	CSM Support* ³		Disabled

Item		Default / Remark
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

*1. Only for CPU type Intel® Celeron® 3965U

*2. Only for CPU type Intel® Core™ i5-7300U

*3. For IPC's with Windows 10 IoT Enterprise 2016 LTSB - 64 bit (OS option 3) CSM Support = Enabled

● BIOS - Advanced for CPU Type Intel® Core™ i7-7820EQ

This section provides Advanced BIOS information for the 7th generation CPU type Intel® Core™ i7-7820EQ.

For all other CPU types refer to *BIOS - Advanced* on page A-33 for details.

Changeable BIOS Advanced parameters and their factory default values:

Item			Default / Remark
CPU	SW Guard Extensions (SGX)		Software Controlled
	Select Owner EPOCH input type		No Change in Owner EPOCHs
	Hardware Prefetcher		Enabled
	Adjacent Cache Line Prefetch		Enabled
	Intel (VMX) Virtualization Technology		Enabled
	Active Processor Cores		All
	Hyper-Threading		Enabled
	BIST		Disabled
	AP threads Idle Manner		MWAIT Loop
	AP threads Handoff Manner		MWAIT Loop
	AES		Enabled
	MachineCheck		Enabled
	MonitorMWait		Enabled
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
		Turbo Mode	Enabled
		C states	Disabled
		Timed MWAIT	Disabled
	GT - Power Management Control	Maximum GT frequency	Default Max Frequency
Graphics	Digital Display Interface 1		Auto Selection
	Digital Display Interface 2		Auto Selection
	VGA Port		Enabled
	DisplayPort Spread Spectrum Clock		Disabled
Hardware Health Monitoring	Fan Control Temperature		CPU Temperature
	Lower Temperature Threshold		50 C
	Upper Temperature Threshold		80 C
	Minimum Fan Speed		Fan Off
	Lower Temperature Fan Speed		30%
	Upper Temperature Fan Speed		100%
	Maximum Fan Speed		100%

Item		Default / Remark
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
RTC Wake Settings	RTC Wake Mode	Disabled
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
AMI Graphic Output Protocol Policy	Output Select	EDP1
	Brightness Setting	255
	BIST Enable	Disabled
PCI Configuration	PCI Latency Timer	32 PCI Bus Clocks
	PERR# Generation	Disabled
	SERR# Generation	Disabled
	Above 4G Decoding	Disabled
UEFI Network Stack	UEFI Network Stack	Disabled
CSM & Option ROM Control	CSM Support	Disabled
NVMe Configuration	–	–
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

BIOS - Chipset

This section provides Chipset information for 7th generation CPUs.

Changeable Chipset parameters and their factory default values are grouped with the combination of your CPU type and the BIOS version.

CPU type	BIOS version	Refer to
Intel® Core™ i5-7300U	Up to version BV□□□008	<ul style="list-style-type: none"> • <i>BIOS - Chipset BIOS up to version 008</i> on page A-45 • <i>BIOS - Chipset Details</i> on page A-27
	Version BV□□□115 and higher	<i>BIOS - Chipset BIOS version 115 and higher</i> on page A-52
Intel® Celeron® 3965U	Up to version BU□□□008	<ul style="list-style-type: none"> • <i>BIOS - Chipset BIOS up to version 008</i> on page A-45 • <i>BIOS - Chipset Details</i> on page A-27
	Version BU□□□115 and higher	<i>BIOS - Chipset BIOS version 115 and higher</i> on page A-52
Intel® Core™ i7-7820EQ	All versions	<i>BIOS - Chipset for CPU Type Intel® Core™ i7-7820EQ</i> on page A-54

● BIOS - Chipset BIOS up to version 008

This section provides Chipset information for 7th generation CPUs:

- Intel® Core™ i5-7300U with a BIOS version up to BU□□□008
- Intel® Celeron® 3965U with a BIOS version up to BV□□□008

For all other CPU types or BIOS versions refer to *BIOS - Chipset* on page A-44 for details.

Changeable BIOS Chipset parameters and their factory default values:

Item		Default / Remark
Processor (Integrated Components)	Memory Configuration / Memory Thermal Configuration	Refer to <i>Memory Thermal Configuration</i> on page A-27 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 <i>PCI Express Port</i> on page A-28 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
		Spin Up Device
		SATA Device Type
		Topology
		SATA Port 2 DevSlp
		DITO Configuration
	USB Configuration	XHCI Disable Compliance Mode
		xDCI Support
		USB Port Disable Override
	TraceHub Configuration menu	TraceHub Enable Mode
		MemRegion 0 Buffer Size
		MemRegion 1 Buffer Size
	DCI enable (HDCIEN)	
	PCH LAN Controller	
	DeepSx Power Policies	
	LAN Wake From DeepSx	
	Wake on LAN Enable	
	SLP_LAN# Low on DC Power	
	K1 off	
	Wake on WLAN and BT Enable	
	Disable DSX ACPRESENT Pulldown	
	Serial IRQ Mode	
	Port 61h Bit-4 Emulation	
	Port 80h Redirection	
	Enhance Port 80h LPC Decoding	
	Compatible Revision ID	
	PCH Cross Throttling	
	Disable Energy Reporting	
	Enable TCO Timer	
	Pcie P11 SSC	
	IOAPIC 24-119 Entries	
	Unlock PCH P2SB	
	Flash Protection Range Registers (FPRR)	
	SPD Write Disable	
	ChipsetInit HECI Message	
	Bypass ChipsetInit sync reset	

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

● BIOS - Chipset Details

This section provides BIOS Chipset details for:

- 6th generation CPUs
- 7th generation CPUs with a BIOS version upto version 008

For all other CPU types or BIOS versions refer to *BIOS - Chipset* on page A-44 for details.

■ 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 Me-ter	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
SENE		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.

● BIOS - Chipset BIOS version 115 and higher

This section provides Chipset BIOS information for 7th generation CPUs:

- Intel® Core™ i5-7300U with a BIOS version BU□□□115 and higher
- Intel® Celeron® 3965U with a BIOS version BV□□□115 and higher

For all other CPU types or BIOS versions refer to *BIOS - Chipset* on page A-44 for details.

Changeable BIOS Chipset parameters and their factory default values:

Item			Default / Remark
Processor (Integrated Components)	Memory Configuration	Max TOLUD	Dynamic
		Memory Remap	Enabled
	Graphics Configuration	Primary Display	Auto
		Select PCIE Card	Auto
		Internal Graphics Device	Auto
		GTT Size	8MB
		Aperture Size	256MB
		IGD Pre-Allocated Graphics Memory	32M
		IGD Total Graphics Memory	256M
		GOP Config Driver	Enabled
	VT-d		Enabled
	Above 4GB MMIO BIOS assignment		Disabled

Item		Default / Remark
Platform Controller Hub (PCH)	Isolate SMBus Segments	Always
	PCI Express Configuration / PCI Express x2 Slot	PCI Express Port
		ASPM
		Hot Plug
		PCIe Speed
		Extra options
		Detect Non-Compliance Device = Disabled
		Prefetchable Memory = 10
		Reserved Memory Alignment = 1
		Prefetchable Memory Alignment = 1
	PCI Express Configuration / Ethernet Port 2, 3	PCI Express Port
		ASPM
	PCI Express Configuration / PCI Express Port 4,6	PCI Express Port
		ASPM
		Hot Plug
		PCIe Speed
		Extra options
		Detect Non-Compliance Device = Disabled
		Prefetchable Memory = 10
		Reserved Memory Alignment = 1
		Prefetchable Memory Alignment = 1
	SATA And RST Configuration	SATA Controller(s)
		SATA Mode Selection
		Software Feature Mask Configuration
		HDD Unlock = Enabled
		LED Locate = Enabled
		SATA Controller Speed
		SATA Port 0
		SATA Port 1
		SATA Device Type
		SATA Port 2
		SATA Device Type
	USB Configuration	USB Port Disable Override
	PCH LAN Controller	Enabled
	LAN Wake From DeepSx	Enabled
	Wake on LAN Enable	Enabled
	Serial IRQ Mode	Continuous
	PCIe Spread Spectrum Clocking	Auto
	IOAPIC 24-119 Entries	Enabled

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

● BIOS - Chipset for CPU Type Intel® Core™ i7-7820EQ

This section provides Chipset information for the 7th generation CPU type Intel® Core™ i7-7820EQ. For all other CPU types refer to *BIOS - Chipset* on page A-44 for details.

Changeable BIOS Chipset parameters and their factory default values:

Item			Default / Remark
Processor (Integrated Components)	Memory Configuration	Max TOLUD	Dynamic
		Memory Remap	Enabled
	Graphics Configura- tion	Primary Display	Auto
		Select PCIE Card	Auto
		Internal Graphics Device	Auto
		GTT Size	8MB
		Aperture Size	256MB
		IGD Pre-Allocated Graphics Mem- ory	32M
		IGD Total Graphics Memory	256M
		GOP Config Driver	Enabled
	VT-d		Enabled
	GMM Device		Enabled
	Above 4GB MMIO BIOS assignment		Disabled

Item		Default / Remark
Platform Controller Hub (PCH)	Isolate SMBus Segments	During POST
	PCI Express Configuration / PCI Express Port 0, 4, 6, 7	PCI Express Port
		ASPM
		Hot Plug
		PCIe Speed
		Extra options
		Detect Non-Compliance Device = Disabled
		Prefetchable Memory = 10
		Reserved Memory Alignment = 1
		Prefetchable Memory Alignment = 1
	PCI Express Configuration / Ethernet Port 2, 3	PCI Express Port
		ASPM
	SATA And RST Configuration	SATA Controller(s)
		SATA Mode Selection
		Software Feature Mask Configuration
		HDD Unlock = Enabled
		LED Locate = Enabled
		SATA Controller Speed
		SATA Port 0
		SATA Port 1
		SATA Port 2
		SATA Device Type
		SATA Port 3
		SATA Device Type
	USB Configuration	USB Port Disable Override
	PCH LAN Controller	Enabled
	LAN Wake From DeepSx	Enabled
	Wake on LAN Enable	Enabled
	Serial IRQ Mode	Continuous
	PCIe Spread Spectrum Clocking	Auto

*1. Disabled when a storage device is not present on the 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	CPU specific *2
	Key Management *3	Factory Key Provision
		Secure Boot variable
		Display variable details

- *1. Only when a storage device is installed. The default password for a storage device is empty.
- *2. For:
 - Intel® Core™ i7-7820EQ CPU Secure Boot Customization = Standard
 - other CPU types with a BIOS version up to B□□□□008 CPU Secure Boot Customization = Custom
 - other CPU types with a BIOS version B□□□□115 and higher CPU Secure Boot Customization = Standard
- *3. Only applicable for:
 - Intel® Celeron® 3965U with a BIOS version up to BU□□□008
 - Intel® Core™ i5-7300U with a BIOS version up to BV□□□008

BIOS - Boot

This section provides Boot information for 7th generation CPUs.

Changeable Boot parameters and their factory default values are grouped with the combination of your CPU type and the BIOS version.

CPU type	BIOS version	Refer to
Intel® Core™ i5-7300U	Up to version BV□□□008	<i>BIOS - Boot BIOS up to version 008</i> on page A-58
	Version BV□□□115 and higher	<i>BIOS - Boot BIOS version 115 and higher</i> on page A-59
Intel® Celeron® 3965U	Up to version BU□□□008	<i>BIOS - Boot BIOS up to version 008</i> on page A-58
	Version BU□□□115 and higher	<i>BIOS - Boot BIOS version 115 and higher</i> on page A-59
Intel® Core™ i7-7820EQ	All versions	<i>BIOS - Boot for CPU Type Intel® Core™ i7-7820EQ</i> on page A-60

● BIOS - Boot BIOS up to version 008

This section provides BIOS Boot information for 7th generation CPUs with a BIOS version up to B□□□008.

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	SATA 1 Drive
	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 Industrial Box PC will stay OFF when power is supplied to the power connector

Turn ON: The Industrial Box PC will automatically start up when power is supplied to the power connector.

Last State: The Industrial Box PC will start up or remain OFF when power is supplied based on the Industrial Box PC state at the moment power was removed from the power connector.

● BIOS - Boot BIOS version 115 and higher

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

- Intel® Core™ i5-7300U with a BIOS version BU□□□115 and higher
- Intel® Celeron® 3965U with a BIOS version BV□□□115 and higher

For all other CPU types or BIOS versions refer to *BIOS - Advanced* on page A-33 for details.

Changeable BIOS Boot parameters and their factory default values:

Item	Default / Remark
Quiet Boot	Disabled
Setup Prompt Timeout	2
Bootup NumLock State	On
Power Loss Control *1	Remain Off
Enter Setup If No Boot Device	No
Enable Popup Boot Menu	Yes
Boot Priority Selection	UEFI Standard
Boot Option #1*2	UEFI OS (P1: □)
Boot Option #2*2	Windows Boot Manager (P1: □)
UEFI Fast Boot	Disabled
UEFI Screenshot Capability	Disabled
New Boot Option Policy	Default

*1. Power Loss Control settings are :

Remain OFF: The Industrial Box PC will stay OFF when power is supplied to the power connector

Turn ON: The Industrial Box PC will automatically start up when power is supplied to the power connector.

Last State: The Industrial Box PC will start up or remain OFF when power is supplied based on the Industrial Box PC state at the moment power was removed from the power connector.

*2. For Intel® Core™ i5-7300U Setup Prompt Timeout = 1

*3. For Intel® Core™ i5-7300U:

Boot Option #1 = Windows Boot Manager (P1: □)

Boot Option #2 = UEFI OS (P1: □)

● BIOS - Boot for CPU Type Intel® Core™ i7-7820EQ

This section provides BIOS Boot information for CPU type Intel® Core™ i7-7820EQ.

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
Enter Setup If No Boot Device	No
Enable Popup Boot Menu	Yes
Boot Priority Selection	Type Based
Boot Option #1	Windows Boot Manager (P1: □)
Boot Option #2	UEFI OS (P1: □)
UEFI Fast Boot	Disabled
UEFI Screenshot Capability	Disabled
New Boot Option Policy	Default

*1. Power Loss Control settings are :

Remain OFF: The Industrial Box PC will stay OFF when power is supplied to the power connector

Turn ON: The Industrial Box PC will automatically start up when power is supplied to the power connector.

Last State: The Industrial Box PC will start up or remain OFF when power is supplied based on the Industrial Box PC state at the moment power was removed from the power connector.

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:

- **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.

Only for CPU type Intel® Celeron® 3965U with BIOS version BU□□□115 and higher and for CPU type Intel® Core™ i7-7820EQ:

- UEFI OS (P1: ☐)
Boots the system with the UEFI OS.
- Windows Boot Manager (P1: ☐)
Boots the system with the Windows Boot Manager.

A-1-5 BIOS for 11th generation CPU - CVWNA111 CVWNR111 CVWGR111

Changeable BIOS Chipset parameters and their factory default values for BIOS CVWNA111, CVWNR111 and CVWGR111.

Refer to the CPU information in *1-4 Product Configuration Box PC* on page 1-5 for generation details.

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:

Item	Default / Remark
Main	
System Date	System Date Use the Enter key to the next Date field.
System Time	System Time Use the Enter key to the next Time field.
Main / License Information	
License message	Disabled

BIOS - Advanced

This section provides Advanced BIOS information for 11th generation CPUs with BIOS CVWNA111, CVWNR111 and CVWGR111.

Changeable BIOS Advanced parameters and their factory default values are grouped with the combination of your CPU type and the BIOS version.

Item	Default / Remark
Advanced	
Advanced	
Advanced / CPU	
Hardware Prefetcher	Enabled
Adjacent Cache Line Prefetch	Enabled
Intel (VMX) Virtualization Technology	Enabled
AVX	Enabled
AVX3	Enabled
Active Processor Cores	All
Hyper-Threading	Enabled
BIST	Disabled
AP threads Idle Manner	MWAIT Loop
AES	Enabled
MachineCheck	Disabled
RaceConditionResponse Policy	Disabled
Advanced / Power & Performance	
Advanced / Power & Performance / CPU - Power Management Control	
Boot performance mode	[Max Non-Turbo Performance]
Intel(R) SpeedStep(tm)	Enabled
Race To Halt (RTH)	Enabled
Intel(R) Speed Shift Technology	Enabled
Per Core P State OS control mode	Enabled
Turbo Mode	Enabled
C states	Disabled
Timed MWAIT	Disabled
Advanced / Power & Performance / GT - Power Management Control	
Maximum GT frequency	Default Max Frequency
Disable Turbo GT frequency	Enabled for CVWNA111 Disabled for CUWNR111, CVWGR111
Advanced / Intel(R) Time Coordinated Computing	
#AC Split Lock	Disabled
IFU Enable	Disabled
Software SRAM	Disabled
Data Streams Optimizer	Disabled
Error Log	Enabled
Intel(R) TCC Mode	Disabled
IO Fabric Low Latency	Enabled
GT CLOS	Disabled
OPIO Recentering	Disabled
Advanced / Intel(R) Time Coordinated Computing / Intel(R) TCC Authentication Menu	

Item	Default / Remark
Intel(R) TCC Authentication	OEM Enrolled Key
Advanced / Hardware Health Monitoring only for BIOS CVWGR111	
Fan Control Temperature	CPU Temperature
Lower Temperature Threshold	50 C
Upper Temperature Threshold	80 C
Minimum Fan Speed	Fan Off
Lower Temperature Fan Speed	30%
Upper Temperature Fan Speed	100%
Maximum Fan Speed	100%
Advanced / Trusted Computing	
Security Device Support	Enable
SHA256 PCR Bank	Enabled
Pending operation	None
Platform Hierarchy	Enabled
Storage Hierarchy	Enabled
Endorsement Hierarchy	Enabled
Physical Presence Spec Version	1.3
Device Select	Auto
Advanced / USB	
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
Advanced / Network Boot	
UEFI Network Stack	Disabled
Advanced / NVMe Configuration	
Advanced / Boot Delay Settings	
Seconds to Delay Before Memory Detection	0
Seconds to Delay After Memory Detection	0
Seconds to Delay Before PCI Enumeration	0
Seconds to Delay After PCI Enumeration	0
Advanced / RTC Wake Settings	
RTC Wake Mode	Disabled
Advanced / Power On Delay	
Power On Delay	100 ms

BIOS - Chipset

This section provides Chipset BIOS information for 11th generation CPUs with BIOS CVWNA111, CVWNR111 and CVWGR111.

Changeable BIOS Advanced parameters and their factory default values are grouped with the combination of your CPU type and the BIOS version.

Item	Default / Remark
Chipset	
Chipset / Processor (Integrated Components)	
VT-d	Enabled
GNA Device (B0:D8:F0)	Enabled
Above 4GB MMIO BIOS assignment	Enabled
Chipset / Processor (Integrated Components) / Memory Configuration	
Max TOLUD	Dynamic
Extended Bank Hashing	Enabled
Per Bank Refresh	Enabled
In-Band ECC Support	Disabled
Memory Remap	Enabled
Chipset / Processor (Integrated Components) / Graphics Configuration	
Skip Scanning of External Gfx Card	Disabled
Primary Display	Auto
Select PCIe Card	Auto
Internal Graphics Device	Auto
GTT Size	8MB
Aperture Size	256MB
IGD Pre-Allocated Graphics Memory	60M
IGD Total Graphics Memory	256M
Chipset / Processor (Integrated Components) / Graphics Configuration / External Gfx Card Primary Display Configuration	
Primary PEG	Auto
Primary PCIe	Auto
Chipset / Processor (Integrated Components) / PCI Express Configuration	
PCIe function swap	Enabled
Chipset / Processor (Integrated Components) / PCI Express Configuration / PCI Express Slot Root Port	
PCI Express Slot Root Port	Enabled
ASPM	Disabled
PTM	Enabled
VC	Enabled
Multi-VC	Disabled
EDPC	Disabled
Hot Plug	Disabled
PCIe Speed	Auto
Chipset / Platform Controller Hub (PCH)	
Isolate SMBus Segments	Always
Legacy IO Low Latency	Enabled
Pcie Ref PII SSC	Auto
IOAPIC 24-119 Entries	Enabled

Item	Default / Remark
Enable 8254 Clock Gate	Disabled
Hybrid Storage Detection and Configuration Mode	Disabled
Chipset / Platform Controller Hub (PCH) / PCI Express Configuration	
Chipset / Platform Controller Hub (PCH) / PCI Express Configuration / Ethernet Port 2	
PCI Express Root Port 5	Enabled
ASPM	Disabled
PTM	Enabled
Chipset / Platform Controller Hub (PCH) / PCI Express Configuration / Ethernet Port 3	
PCI Express Root Port 6	Enabled
ASPM	Disabled
PTM	Enabled
Chipset / Platform Controller Hub (PCH) / PCI Express Configuration / Ethernet Port 1	
PCI Express Root Port 9	Enabled
ASPM	Disabled
PTM	Enabled
Chipset / Platform Controller Hub (PCH) / PCI Express Configuration / Option Board Port	
PCI Express Root Port 10	Enabled
ASPM	Disabled
PTM	Enabled
PCIe Speed	Auto
Chipset / Platform Controller Hub (PCH) / SATA And RST Configuration	
SATA Controller(s)	Enabled
SATA Mode Selection	AHCI
SATA Port	Enabled
SATA Port	Enabled
Chipset / Platform Controller Hub (PCH) / USB Configuration	
USB Overcurrent	Enabled
USB Overcurrent Lock	Enabled
USB Port Disable Override	Disabled

The Chipset BIOS CVWNR111 has additional:

Item	Default / Remark
Chipset / Platform Controller Hub (PCH) / Seriallo Configuration	
I2C0 Controller	Disabled
I2C4 Controller	Disabled
I2C5 Controller	Disabled
I2C6 Controller	Disabled
I2C7 Controller	Disabled
SPI0 Controller	Disabled
SPI1 Controller	Disabled
SPI2 Controller	Disabled
SPI3 Controller	Disabled
SPI4 Controller	Disabled
SPI5 Controller	Disabled
SPI6 Controller	Disabled
UART0 Controller	Disabled
UART1 Controller	Disabled

Item	Default / Remark
UART2 Controller	Disabled
UART3 Controller	Disabled
UART4 Controller	Disabled
UART5 Controller	Disabled
UART6 Controller	Disabled
Seriallo D3 State	Enabled
GPIO IRQ Route	IRQ14
WITT/MITT Test Device	Disabled
UART Test Device	Disabled
Additional Serial IO devices	Disabled
SerialIO timing parameters	Disabled

BIOS - Security

This section provides Security BIOS information for 11th generation CPUs with BIOS CVWNA111, CVWNR111 and CVWGR111.

Changeable BIOS Advanced parameters and their factory default values are grouped with the combination of your CPU type and the BIOS version.

**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
Security	
BIOS Lock	Enabled
Storage Media Security	SAT3
Security / Secure Boot Menu	
Secure Boot	Disabled
Secure Boot Mode	Standard

BIOS - Boot

This section provides Boot BIOS information for 11th generation CPUs with BIOS CVWNA111, CVWNR111 and CVWGR111.

Changeable BIOS Advanced parameters and their factory default values are grouped with the combination of your CPU type and the BIOS version.

Item	Default / Remark
Boot	
Setup Prompt Timeout	1
Bootup NumLock State	On
Power Loss Control	Remain Off
Prevent auto-start without RTC wake-up	Enabled
Enter Setup If No Boot Device	No
Enable Popup Boot Menu	Yes
Boot Priority Selection	Type Based
1st Boot Device	SATA 0 Drive
2nd Boot Device	SATA 1 Drive
3rd Boot Device	USB Harddisk
4th Boot Device	Other USB Device
5th Boot Device	Disabled
6th Boot Device	NVMe Storage
7th Boot Device	Onboard LAN
8th Boot Device	Other Device
Quiet Boot	Disabled
UEFI Fast Boot	Disabled
S5e	Disabled
UEFI Screenshot Capability	Disabled

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:

- **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.

Optional a BIOS versions can also have following options:

- **UEFI OS (P1:...)**
Boots the system with the UEFI OS.
- **Windows Boot Manager (P1:...)**
Boots the system with the Windows Boot Manager.

A-1-6 BIOS for 11th generation CPU - CQWGA111

Changeable BIOS Chipset parameters and their factory default values for BIOS CQWGA111.

Refer to the CPU information in *1-4 Product Configuration Box PC* on page 1-5 for generation details.

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:

Item	Default / Remark
Main	
System Date	System Date Use the Enter key to the next Date field.
System Time	System Time Use the Enter key to the next Time field.
Main / License Information	
License message	Disabled

BIOS - Advanced - CQWGA111

This section provides Advanced BIOS information for 11th generation CPUs with BIOS CQWGA111. Changeable BIOS Advanced parameters and their factory default values are grouped with the combination of your CPU type and the BIOS version.

Item	Default / Remark
Advanced	
Advanced / CPU	
Hardware Prefetcher	Enabled
Adjacent Cache Line Prefetch	Enabled
Intel (VMX) Virtualization Technology	Enabled
AVX	Enabled
AVX3	Enabled
Active Processor Cores	All
Hyper-Threading	Enabled
BIST	Disabled
AP threads Idle Manner	MWAIT Loop
AES	Enabled
MachineCheck	Disabled
Advanced / Power & Performance	
Advanced / Power & Performance / CPU - Power Management Control	
Boot performance mode	[Max Non-Turbo Performance]
Intel(R) SpeedStep(tm)	Enabled
Race To Halt (RTH)	Enabled
Intel(R) Speed Shift Technology	Enabled
Per Core P State OS control mode	Enabled
Turbo Mode	Enabled
C states	Disabled
Timed MWAIT	Disabled
Advanced / Power & Performance / GT - Power Management Control	
Maximum GT frequency	Default Max Frequency
Disable Turbo GT frequency	Disabled
Advanced / Intel(R) Time Coordinated Computing	
#AC Split Lock	Disabled
IFU Enable	Disabled
Software SRAM	Disabled
Data Streams Optimizer	Disabled
Error Log	Enabled
Intel(R) TCC Mode	Disabled
IO Fabric Low Latency	Enabled
GT CLOS	Disabled
OPIO Recentering	Disabled
Advanced / Intel(R) Time Coordinated Computing / Intel(R) TCC Authentication Menu	
Intel(R) TCC Authentication	OEM Enrolled Key
Advanced / Hardware Health Monitoring	
Fan Control Temperature	CPU Temperature

Item	Default / Remark
Lower Temperature Threshold	50 C
Upper Temperature Threshold	80 C
Minimum Fan Speed	Fan Off
Lower Temperature Fan Speed	30%
Upper Temperature Fan Speed	100%
Maximum Fan Speed	100%
Advanced / Trusted Computing	
Security Device Support	Enable
SHA256 PCR Bank	Enabled
Pending operation	None
Platform Hierarchy	Enabled
Storage Hierarchy	Enabled
Endorsement Hierarchy	Enabled
Physical Presence Spec Version	1.3
Device Select	Auto
Advanced / USB	
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
Advanced / Network Boot	
UEFI Network Stack	Disabled
Advanced / NVMe Configuration	
Advanced / Boot Delay Settings	
Seconds to Delay Before Memory Detection	0
Seconds to Delay After Memory Detection	0
Seconds to Delay Before PCI Enumeration	0
Seconds to Delay After PCI Enumeration	0
Advanced / RTC Wake Settings	
RTC Wake Mode	Disabled
Advanced / Power On Delay	
Power On Delay	100 ms

BIOS - Chipset - CQWGA111

This section provides Chipset BIOS information for 11th generation CPUs with BIOS CQWGA111. Changeable BIOS Advanced parameters and their factory default values are grouped with the combination of your CPU type and the BIOS version.

Item	Default / Remark
Chipset	
Chipset / Processor (Integrated Components)	
VT-d	Enabled
GNA Device (B0:D8:F0)	Enabled
Above 4GB MMIO BIOS assignment	Enabled
Chipset / Processor (Integrated Components) / Memory Configuration	
Max TOLUD	Dynamic
Extended Bank Hashing	Enabled
Per Bank Refresh	Enabled
Memory Remap	Enabled
Chipset / Processor (Integrated Components) / Graphics Configuration	
Skip Scanning of External Gfx Card	Disabled
Primary Display	Auto
Select PCIe Card	Auto
Internal Graphics Device	Auto
GTT Size	8MB
Aperture Size	256MB
IGD Pre-Allocated Graphics Memory	60M
IGD Total Graphics Memory	256M
Chipset / Processor (Integrated Components) / Graphics Configuration / External Gfx Card Primary Display Configuration	
Primary PEG	Auto
Primary PCIe	Auto
Chipset / Processor (Integrated Components) / PCI Express x4 Slot Configuration	
PCIe function swap	Enabled
Chipset / Processor (Integrated Components) / PCI Express x4 Slot Configuration / PCI Express x4 Slot A	
PEG10 Root Port(x16 or x8)	Enabled
ASPM	Disabled
PTM	Enabled
VC	Enabled
EDPC	Disabled
Hot Plug	Disabled
PCIe Speed	Auto
Chipset / Processor (Integrated Components) / PCI Express x4 Slot Configuration / PCI Express x4 Slot B	
PEG11 Root Port(x8 or x4)	Enabled
ASPM	Disabled
PTM	Enabled
VC	Enabled
EDPC	Disabled

Item	Default / Remark
Hot Plug	Disabled
PCIe Speed	Auto
Chipset / Platform Controller Hub (PCH)	
Isolate SMBus Segments	Always
Legacy IO Low Latency	Enabled
Pcie Ref Pll SSC	Auto
Enable 8254 Clock Gate	Disabled
Hybrid Storage Detection and Configuration Mode	Disabled
Chipset / Platform Controller Hub (PCH) / PCI Express x4 Slot Configuration	
Chipset / Platform Controller Hub (PCH) / PCI Express x4 Slot Configuration / Ethernet Port 2	
PCI Express Root Port 5	Enabled
ASPM	Disabled
PTM	Enabled
Chipset / Platform Controller Hub (PCH) / PCI Express x4 Slot Configuration / Ethernet Port 3	
PCI Express Root Port 6	Enabled
ASPM	Disabled
PTM	Enabled
Chipset / Platform Controller Hub (PCH) / PCI Express x4 Slot Configuration / Ethernet Port 1	
PCI Express Root Port 9	Enabled
ASPM	Disabled
PTM	Enabled
Chipset / Platform Controller Hub (PCH) / PCI Express x4 Slot Configuration / Option Board Port	
PCI Express Root Port 17	Enabled
ASPM	Disabled
PTM	Enabled
PCIe Speed	Auto
Chipset / Platform Controller Hub (PCH) / PCI Express x4 Slot Configuration / PCI Express x1 slot	
PCI Express Root Port 18	Enabled
ASPM	Disabled
PTM	Enabled
PCIe Speed	Auto
Chipset / Platform Controller Hub (PCH) / SATA And RST Configuration	
SATA Controller(s)	Enabled
SATA Mode Selection	AHCI
SATA Port	Enabled
SATA Port	Enabled
SATA Port	Enabled
External	Disabled
SATA Device Type	Hard Disk Drive
SATA Port	Enabled
External	Disabled
SATA Device Type	Hard Disk Drive
Chipset / Platform Controller Hub (PCH) / USB Configuration	
USB Overcurrent	Enabled
USB Overcurrent Lock	Enabled
USB Port Disable Override	Disabled

BIOS - Security - CQWGA111

This section provides Security BIOS information for 11th generation CPUs with BIOS CQWGA111. Changeable BIOS Advanced parameters and their factory default values are grouped with the combination of your CPU type and the BIOS version.

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
Security	
BIOS Lock	Enabled
Storage Media Security	SAT3
Security / Secure Boot Menu	
Secure Boot	Disabled
Secure Boot Mode	Standard

BIOS - Boot - CQWGA111

This section provides Boot BIOS information for 11th generation CPUs with BIOS CQWGA111. Changeable BIOS Advanced parameters and their factory default values are grouped with the combination of your CPU type and the BIOS version.

Item	Default / Remark
Boot	
Setup Prompt Timeout	1
Bootup NumLock State	On
Power Loss Control	Remain Off
Prevent auto-start without RTC wake-up	Enabled
Enter Setup If No Boot Device	No
Enable Popup Boot Menu	Yes
Boot Priority Selection	Type Based
1st Boot Device	SATA 0 Drive
2nd Boot Device	SATA 1 Drive
3rd Boot Device	USB Harddisk
4th Boot Device	Other USB Device
5th Boot Device	SATA 2 Drive
6th Boot Device	SATA 3 Drive
7th Boot Device	Onboard LAN
8th Boot Device	NVMe Storage
Quiet Boot	Disabled
UEFI Fast Boot	Disabled
S5e	Disabled
UEFI Screenshot Capability	Disabled

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:

- **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.

Optional a BIOS versions can also have following options:

- **UEFI OS (P1:...)**
Boots the system with the UEFI OS.
- **Windows Boot Manager (P1:...)**
Boots the system with the Windows Boot Manager.

A-1-7 BIOS for Atom CPU - 1AWGR113

The BIOS settings for Atom CPUs with BIOS 1AWGR113.

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 - 1AWGR113

This section provides Advanced BIOS information for a Box PC with an Atom CPU and BIOS 1AWGR113.

Changeable BIOS Advanced parameters and their factory default values:

Item			Default / Remark
Trusted Computing	Security Device Support		Enabled
	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
RTC Wake Settings	RTC Wake Mode		Disabled
CPU	CPU Power Management	EIST	Enabled
		Turbo Mode	Enabled
		C-States	Disabled
	Active Processor Cores		Disabled
	Intel Virtualization Technology		Enabled
	VT-d		Enabled
	Monitor Mwait		Auto
AMI Graphic Output Protocol Policy	Output Select		DVI2
UEFI Network Stack	UEFI Network Stack		Disabled
CSM & Option ROM Control	CSM Support		Disabled
USB	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

BIOS - Chipset - 1AWGR113

This section provides Chipset information for a Box PC with an Atom CPU and BIOS 1AWGR113.

Changeable BIOS Chipset parameters and their factory default values:

Item			Default / Remark
Processor (Integrated Components)	Max TOLUD		2 GB
	Above 4GB MMIO BIOS assignment		Disabled
Extention Graphic Configuration	GOP Driver		Enabled
	Intel Graphics Pei Display Peim		Disabled
	Integrated Graphics Device		Enabled
	Primary Display		IGD
	RC6(Render Standby)		Disabled
	GTT Size		8MB
	Aperture Size		256MB
	IGD Pre-Allocated Graphics Memory		64M
	IGD Total Graphics Memory		256M
	GT PM Support		Enabled
South Cluster Configuration	SATA Drives	Chipset SATA	Enabled
		SATA Port 0	Enabled
		SATA Port 1	Enabled
	USB Configuration	USB Port Disable Override	Disabled
	Miscellaneous Configuration	Wake On Lan	Disabled

BIOS - Security - 1AWGR113

Provides security information like BIOS Password and HDD information for a Box PC with an Atom CPU and BIOS 1AWGR113.



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
P1: CFast <input type="checkbox"/>	Set User Password	Empty
Secure Boot Menu	Secure Boot	Disabled
	Secure Boot Customization	Custom
	Key Management	Factory Key Provision
		Platform Key(PK)
		Key Exchange Keys
		Authorized Signatures
		Forbidden Signatures
		Authorized TimeStamps
		OsRecovery Signatures

BIOS - Boot - 1AWGR113

Provides Boot information and configuration settings for a Box PC with an Atom CPU and BIOS 1AWGR113.

Changeable BIOS Boot parameters and their factory default values:

Item	Default / Remark
Setup Prompt Timeout	0
Bootup NumLock State	On
Enter Setup If No Boot Device	No
Enable Popup Boot Menu	Yes
Boot Priority Selection	Type Based
1st Boot Device	SATA 1 Drive
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
Power Loss Control	Remain Off
Quiet Boot	Disabled
Boot Option #1	Windows Boot Manager (P1: CFast <input type="checkbox"/>)
UEFI Fast Boot	Disabled
UEFI Screenshot Capability	Enabled

*1. Turn On for model-ID NYE□□-□□F□□

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:

- **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.

Optional a BIOS versions can also have following options:

- **UEFI OS (P1:...)**
Boots the system with the UEFI OS.
- **Windows Boot Manager (P1:...)**
Boots the system with the Windows Boot Manager.

A-1-8 BIOS for Atom CPU - 3AWNR113

The BIOS settings for Atom CPUs with BIOS 3AWNB112.

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 - 3AWNR113

This section provides Advanced BIOS information for a Box PC with an Atom CPU and BIOS 3AWNB112.

Changeable BIOS Advanced parameters and their factory default values:

Item	Default / Remark
Advanced	
Advanced / CPU	
Hardware Prefetcher	Enabled
Intel (VMX) Virtualization Technology	Enabled
Active Processor Cores	All
BIST	Disabled
AP threads Idle Manner	MWAIT Loop
AES	Enabled
MachineCheck	Disabled
MonitorMWait	Enabled
#AC Split Lock	Disabled
Advanced / CPU / CPU SMM Enhancement	
SMM Use Delay Indication	Enabled
SMM Use Block Indication	Enabled
SMM Use SMM en-US Indication	Enabled
Advanced / Power & Performance	
Advanced / Power & Performance / CPU - Power Management Control	
Boot performance mode	[Max Non-Turbo Performance]
Intel(R) SpeedStep(tm)	Enabled
Race To Halt (RTH)	Enabled
Intel(R) Speed Shift Technology	Enabled
C states	Disabled
Timed MWAIT	Disabled
Advanced / Power & Performance / GT - Power Management Control	
Maximum GT frequency	Default Max Frequency
Disable Turbo GT frequency	Disabled
Advanced / Intel(R) Time Coordinated Computing	
Software SRAM	Disabled
Data Streams Optimizer	Disabled
Error Log	Enabled
Intel(R) TCC Mode	Disabled
IO Fabric Low Latency	Enabled
GT CLOS	Disabled
Advanced / Intel(R) Time Coordinated Computing / Intel(R) TCC Authentication Menu	
Intel(R) TCC Authentication	OEM Enrolled Key
Advanced / Hardware Health Monitoring	
Advanced / Trusted Computing	
Security Device Support	Enable
SHA256 PCR Bank	Enabled
Pending operation	None

Item	Default / Remark
Platform Hierarchy	Enabled
Storage Hierarchy	Enabled
Endorsement Hierarchy	Enabled
Physical Presence Spec Version	1.3
Device Select	Auto
Advanced / RTC Wake Settings	
RTC Wake Mode	Disabled
Advanced / Power On Delay	
Power On Delay	0
Advanced / AMI Graphic Output Protocol Policy	
Output Select	HDMI1[ACTIVE]
Advanced / USB	
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
Advanced / Network Boot	
UEFI Network Stack	Disabled
Advanced / NVMe Configuration	
Advanced / Boot Delay Settings	
Seconds to Delay Before Memory Detection	0
Seconds to Delay After Memory Detection	0
Seconds to Delay Before PCI Enumeration	0
Seconds to Delay After PCI Enumeration	0

BIOS - Chipset - 3AWNR113

This section provides Chipset information for a Box PC with an Atom CPU and BIOS 3AWNB112.

Changeable BIOS Chipset parameters and their factory default values:

Item	Default / Remark
Chipset	
Chipset / Processor (Integrated Components)	
VT-d	Enabled
IGD VTD Enable	Enabled
IOP VTD Enable	Enabled
GNA Device (B0:D8:F0)	Enabled
Above 4GB MMIO BIOS assignment	Enabled
Chipset / Processor (Integrated Components) / Memory Configuration	
Max TOLUD	Dynamic
In-Band ECC	Disabled
Memory Remap	Enabled
Chipset / Processor (Integrated Components) / Graphics Configuration	
Skip Scanning of External Gfx Card	Disabled
Primary Display	Auto
Internal Graphics Device	Auto
GTT Size	8MB
Aperture Size	256MB
IGD Pre-Allocated Graphics Memory	60M
IGD Total Graphics Memory	256M
Chipset / Processor (Integrated Components) / Graphics Configuration / External Gfx Card Primary Display Configuration	
Primary PCIE	Auto
Chipset / Platform Controller Hub (PCH)	
Isolate SMBus Segments	Always
PCH Master Clock Gating Control	Default
PCH Master Power Gating Control	Disabled
Legacy IO Low Latency	Enabled
Pcie Ref PII SSC	Auto
IOAPIC 24-119 Entries	Enabled
Enable 8254 Clock Gate	Disabled
Chipset / Platform Controller Hub (PCH) / PCI Express Configuration	
PCH PCI Express Clock Gating	Disabled
Chipset / Platform Controller Hub (PCH) / PCI Express Configuration / Ethernet Port 2	
PCI Express Root Port 1	Enabled
ASPM	Disabled
PTM	Disabled
Chipset / Platform Controller Hub (PCH) / PCI Express Configuration / Ethernet Port 3	
PCI Express Root Port 2	Enabled
ASPM	Disabled
PTM	Disabled
Chipset / Platform Controller Hub (PCH) / PCI Express Configuration / PCI Express x1 slot	
PCI Express Root Port 5	Enabled

Item	Default / Remark
ASPM	Disabled
Multi-VC	Enabled
PTM	Disabled
PCIe Speed	Auto
Chipset / Platform Controller Hub (PCH) / PCI Express Configuration / PCI Express x1 slot / VC to TC Mapping	
TC1	VC0
TC2	VC0
TC3	VC0
TC4	VC0
TC5	VC0
TC6	VC1
TC7	VC1
Chipset / Platform Controller Hub (PCH) / PCI Express Configuration / Option Board Port	
PCI Express Root Port 7	Enabled
ASPM	Disabled
Multi-VC	Enabled
PTM	Disabled
PCIe Speed	Auto
Chipset / Platform Controller Hub (PCH) / PCI Express Configuration / Option Board Port / VC to TC Mapping	
TC1	VC0
TC2	VC0
TC3	VC0
TC4	VC0
TC5	VC0
TC6	VC1
TC7	VC1
Chipset / Platform Controller Hub (PCH) / SATA Configuration	
SATA Controller(s)	Enabled
SATA Mode Selection	AHCI
SATA Speed	Auto
SATA Port	Enabled
SATA Port	Enabled
Chipset / Platform Controller Hub (PCH) / USB Configuration	
USB Overcurrent	Enabled
USB Overcurrent Lock	Enabled
USB Port Disable Override	Disabled
USB Device/HOST Mode Override	Disabled
USB UCSI ACPI device	Disabled
Chipset / Platform Controller Hub (PCH) / TSN GBE Configuration	
PCH TSN LAN Controller	Disabled
PCH TSN GBE Multi-Vc	Disabled
PCH TSN GBE SGMII Support	Disabled
PCH TSN Link Speed	RefClk 38.4Mhz 1Gbps
PSE TSN GBE 0 Multi-Vc	Disabled
PSE TSN GBE 0 SGMII Support.	Disabled

Item	Default / Remark
PSE TSN GBE 0 Link Speed	RefClk 38.4Mhz 1Gbps
PSE TSN GBE 1 SGMII Support	Disabled
PSE TSN GBE 1 Link Speed	RefClk 38.4Mhz 1Gbps

BIOS - Security - 3AWNR113

Provides security information like BIOS Password and HDD information for a Box PC with an Atom CPU and BIOS 3AWNB112.

**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
Security	
BIOS Lock	Disabled
Security / Secure Boot Menu	
Secure Boot	Disabled
Secure Boot Mode	Standard

BIOS - Boot - 3AWNR113

Provides Boot information and configuration settings for a Box PC with an Atom CPU and BIOS 3AWNB112.

Changeable BIOS Boot parameters and their factory default values:

Item	Default / Remark
Boot	
Quiet Boot	Disabled
Setup Prompt Timeout	1
Bootup NumLock State	On
Power Loss Control	Remain Off
Enter Setup If No Boot Device	No
Enable Popup Boot Menu	Yes
Boot Priority Selection	Type Based
1st Boot Device	SATA 0 Drive
2nd Boot Device	USB Harddisk
3rd Boot Device	Other USB Device
4th Boot Device	Disabled
5th Boot Device	Disabled
6th Boot Device	Disabled
7th Boot Device	Disabled
8th Boot Device	Disabled
UEFI Fast Boot	Disabled
UEFI Screenshot Capability	Disabled
S5e	Disabled

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:

- **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.

Optional a BIOS versions can also have following options:

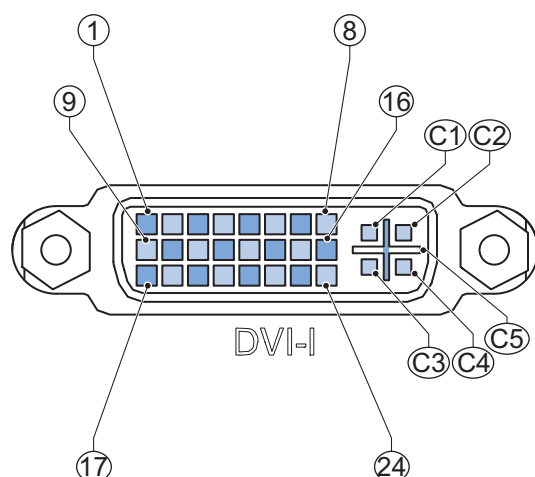
- **UEFI OS (P1:....)**
Boots the system with the UEFI OS.
- **Windows Boot Manager (P1:....)**
Boots the system with the Windows Boot Manager.

A-2 DVI Connector Pin Details

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

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 Industrial Box PC.

Pin numbers increase from left to right for every row.

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

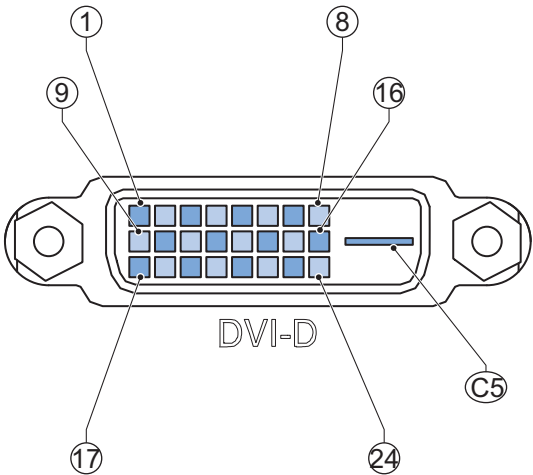
Pin	Signal Name	Function
23	TMDS clock+	Digital clock+
24	TMDS clock-	Digital clock-
C1	Analog red	Analog red *1
C2	Analog green	Analog green *1
C3	Analog blue	Analog blue *1
C4	Analog horizontal sync	Analog horizontal sync *1
C5	0 VDC	0 VDC *1

*1. Only for models NY□17, NY□1E, NY□27 and NY5.

Refer to 1-4 Product Configuration Box PC on page 1-5 for details.

A-2-2 DVI-D Connector Pin Details

Pin details of the DVI-D connector.

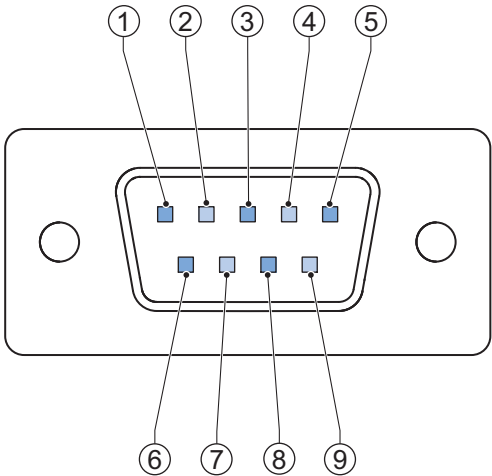


The pin layout represents the DVI connector on the Industrial Box PC.
Pin numbers increase from left to right for every row.

Pin	Signal Name	Function
1	TMDS data 2-	Digital red- (link 1)
2	TMDS data 2+	Digital red+ (link 1)
3	0 VDC	TMDS data 2/4 shield
4	Not connected	---
5	Not connected	---
6	DDC clock	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	---
14	+5 V	Power for monitor DDC interface

Pin	Signal Name	Function
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.



Index

Index

A

Accessory kit 3-22

B

Backup 5-57
 Base layer 3-5
 Battery low 3-8
 Battery Slot..... 3-18
 Battery 3-21, 7-6
 Replace 7-9
 BIOS A-2
 Book mount brackets
 Specifications 4-21
 Book mount 3-23
 Book mounting 5-26
 Brackets
 Scope of delivery 5-4
 Specifications 4-21

C

Cables
 Communication cable S8BW 3-34
 DVI cables 3-27
 NY Monitor Link cable 3-29
 USB Type-A - USB Type-B cable 3-28
 CFAST Card Slot..... 3-17, 3-18
 CFAST Card 3-25
 Replace 7-24
 Specifications 4-17
 Configuration 1-5
 Connect 5-42
 Connectors 3-22
 Cooling distance 5-17
 Cooling layer 3-4
 Corrective maintenance 7-4
 Cover..... 7-6
 CPU
 Intel® Atom® x5-E3940 4-8
 Intel® Atom® x6425RE 4-10
 Intel® Celeron® 2980U 4-7
 Intel® Celeron® 3965U 4-8
 Intel® Core™ i3-1115GRE 4-7
 Intel® Core™ i5-1145GRE 4-11
 Intel® Core™ i5-4300U 4-9
 Intel® Core™ i5-7300U 4-10
 Intel® Core™ i7-1185GRE 4-10
 Intel® Core™ i7-4700EQ 4-8
 Intel® Core™ i7-7820EQ 4-9
 Intel® Xeon® E3-1515M v5 4-7
 Intel® Xeon® W-11865MRE 4-9

D

Dimensions 4-2
 DisplayPort connector 3-12
 Specifications 4-32
 Drive bays..... 3-19
 Drive
 Install 5-6
 Replace 7-14
 Ducts 5-25
 DVI connector 3-13
 Specifications 4-31
 DVI-D connector 3-14
 Specifications 4-33

E

Electrical
 Specifications 4-4
 Err LED 3-8
 Ethernet connector 3-15
 Ethernet connectors 3-12
 LED indicators 4-30
 Link/Act indicator 4-30
 Specifications 4-29
 Speed indicator 4-30
 Expansion layer 3-6

F

Fan error 3-8
 Fan Unit 3-21
 Replace 7-7

H

HDD LED 3-8
 HDD 3-26
 Specifications 4-14
 Humidity 4-37

I

I/O connector 3-10
 Connections 5-40
 Specifications 4-24
 Wiring 5-39, 5-41

L

Layers 3-3
 LED Indicators 3-7

M

Memory Card..... 3-16

Memory	4-12	RS-232C connector	3-13
DDR3L Non-ECC	4-13	Specifications	4-34
DDR4 ECC	4-12	RUN LED	3-8
DDR4 Non-ECC	4-12	S	
Messages		Scope of delivery.....	5-2
Error	7-4	SD Memory Card.....	3-16, 3-25
Product	6-5	SSD	3-26
Warning	7-4	Specifications	4-15
Windows	6-6	Stand-by mode	3-7
Model-ID	1-5	Startup	5-47
Monitor	3-32	Storage devices	
Mounting		Specifications	4-14
Book mount	5-26	T	
Brackets	3-23	Temperature	4-37
Wall mount	5-27	Thermal shutdown	3-8
N		U	
NY Monitor Link	3-14	Unpack	5-2
Cable.....	3-29	UPS	3-33, 5-50
LED Indicators.....	4-35	Connect I/O.....	5-53, 5-55, 5-56
Specifications.....	4-34	Connect USB.....	5-51
O		USB connectors	3-11
Output 1	4-26	Specifications	4-28
P		W	
PCIe Card	3-20	Wall mount brackets	
Install	5-10	Specifications	4-22
Replace	7-19	Wall mount	3-23
Specifications	4-18	Wall mounting	5-27
Power button	3-9	Watchdog error	3-8
Power connector	3-10	Weights	4-2
Specifications	4-23	Wiring	
Wiring	5-36, 5-38	Warnings	5-28
Power OFF	6-3		
Forced with power button	6-4		
Input signal	6-4		
Power button	6-3		
Windows shut down	6-3		
Power ON	6-2		
Automatic	6-2		
First time	5-45		
Input signal	6-2		
Power button	6-2		
Power supply	3-32		
Overvoltage error	3-8		
Undervoltage error	3-8		
Preventive maintenance	7-2		
Product key.....	3-5		
Product	1-5		
PWR LED	3-7		
R			
RAID			
Install	5-5		
Repair	5-57		

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