OMRON

Industrial PC Platform

NY-series

Industrial Box PC

Hardware User's Manual

 $NYB \square \square - \square \square 0$

NYB□□-□□1

NYB□□-□□2

NYB□□-□□3

NYB□□-□□4

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□□-□□0
	• NYB□□-□□1
	• NYB 2
	• NYB□□-□□3
	• NYB□□-□□4

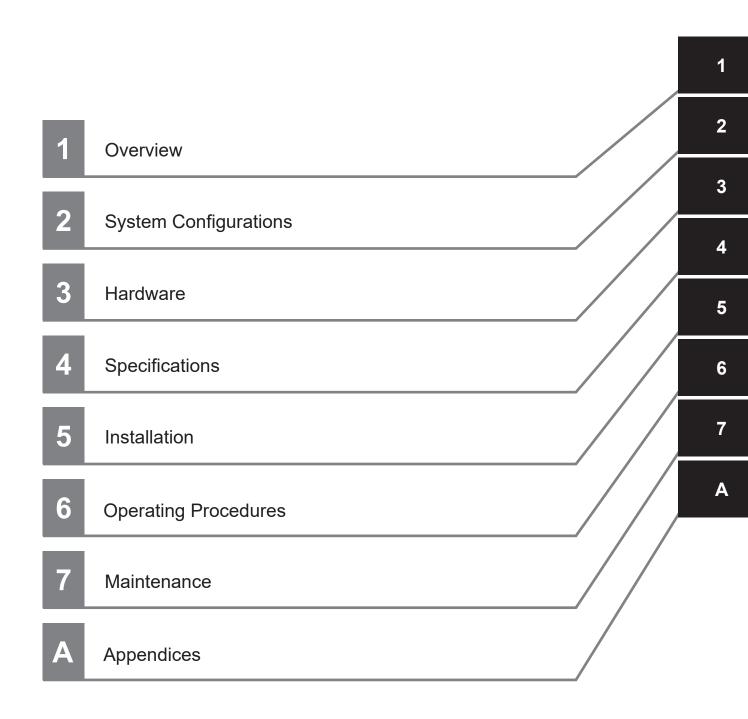


Additional Information

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

Introduction

Sections in this Manual



CONTENTS

Introduction	
Intended Audience	
Applicable Products	
Sections in this Manual	3
Manual Information	9
Page Structure	
Special Information	
Terms and Conditions Agreement	
Warranty, Limitations of Liability	
Application Considerations	
Disclaimers	
Safety Precautions	14
Definition of Precautionary Information	
Symbols	
Warnings	
Cautions	17
Precautions for Safe Use	18
Disassembly, Dropping, Mounting, Installation and Storage	18
Wiring	
Power Supply Design and Turning ON/OFF the Power Supply	
Actual Operation	
Operation	
General Communications	
Battery and Fan Replacement	
Precautions for Correct Use	24
Storage, Installation and Mounting	
Actual Operation and Operation	
Battery Replacement	
SD Memory Cards	
Regulations and Standards	23
Conformance to EU Directives	
Conformance to KC Certification	
Conformance to UL and CSA Standards	
Software Licenses and Copyrights	
Related Manuals	25
Related Box PC Manual	25
Related Products Manuals	
Industrial Monitor Manual	26
Terminology and Abbreviations	27
Industrial PC Platform	
Hardware	
Software	28
Revision History	29

Section 1 Overview

	1-1 Inte	ended Use	1-2
	1-2 Hai	rdware Features	1-3
	1-3 ID I	Information Label	1-4
	1-4 Pro	oduct Configuration Box PC	1-5
		rerall Setup Procedure	
		dustrial PC Platform Overview	
	1 -6 1110	Industrial Monitor	
	1-6-2	Industrial Box PC	1-9
	1-6-3	Industrial Panel PC	1-9
Sec	tion 2	System Configurations	
	2-1 Co	nfiguration for NYB and NYP	2-2
Sac	tion 3	Hardware	
			
	3-1 Lay 3-1-1	yers and Components Cooling Layer	
	3-1-1 3-1-2	Base Layer	
	3-1-3		
	3-2 I F	D Indicators	
	3-2-1	PWR LED Indicator	
	3-2-2	ERR LED Indicator	
	3-2-3	HDD LED Indicator	
	3-2-4	RUN LED Indicator	3-8
	3-3 Po	wer Button	3-9
	3-4 Co	nnectors	
	3-4-1	Power Connector	
	3-4-2	I/O Connector	
	3-4-3	USB Connectors	
	3-4-4 3-4-5	Ethernet Connectors	
	3-4-5 3-4-6	DVI ConnectorRS-232C Connector (Optional)	
	3-4-0	` ' '	
	3-4-8	NY Monitor Link Connector (Optional)	
	3-4-9	Ethernet Connector (Optional)	
	3-5 SD	Memory Card Slot	3-16
	3-6 CF	ast Card Slot (Optional)	3-17
		ive Bays	
	3-8 PC	le Card Slot	3-19
	3-9 Spa	are Parts	
	3-9-1	Battery	
	3-9-2	Fan Unit	
	3-9-3	Accessory Kit	
	3-9-4	Connectors	
		tional Hardware	
	3-10-1 3-10-2	3	
	3-10-2 3-10-3	· · · · · · · · · · · · · · · · · · ·	
	3-10-3		
	0.0		

	;	3-10-5	HDD and SSD Storage Devices	3-25
	;	3-10-6	DVI Cables	3-26
	;	3-10-7	USB Type-A to USB Type-B Cables	
	;	3-10-8	NY Monitor Link Cables	3-27
	;	3-10-9	Industrial Monitor	3-30
	;	3-10-10	Power Supply	3-30
	;	3-10-11	UPS	
	;	3-10-12	UPS Communication Cable	3-31
Secti	on 4	4 :	Specifications	
	4-1	Gana	ral Specifications	4.2
		4-1-1	Dimensions and Weight	
		4-1-1 4-1-2	General Electrical Specifications	
		4-1-2 4-1-3	Power Consumption Specifications	
		4-1-3 4-1-4	Power Supply Specifications	
		4-1- 4 4-1-5	CPU Specifications	
		4 -1-6	Memory Specifications	
		4-1-0 4-1-7	Storage Device Specifications	
		4-1-8	PCIe Card Specifications	
		4-1-0 4-1-9	Bracket Specifications	
			ector Specifications	
		4-2-1	Power Connector Specifications	
		4-2-2	I/O Connector Specifications	
		4-2-3	USB Connector Specifications	
		4-2-4	Ethernet Connector Specifications	
		4-2-5	DVI Connector Specifications	
		4-2-6	DVI-D Connector Specifications	
		4-2-7	RS-232C Connector Specifications	
	•	4-2-8	NY Monitor Link Connector Specifications	4-29
	4-3	Envir	onmental Specifications	
	4	4-3-1	Operation Environment Specifications	
	4	4-3-2	Temperature and Humidity Specifications	4-32
	•	4-3-3	Recycling Specifications	4-40
Secti	on (5 I	Installation	
	- 5-1	Hana	al.	F. 2
		•	ckUnpack Procedure	
		5-1-1 5-1-2	Items Supplied	
	;	3-1-2	nems Supplied	5-2
	5-2	Instal	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	Moun	ıt	5-16
		5-3-1	Installation Method in Control Panels	
		5-3-1 5-3-2	Product Orientation	
		5-3-2 5-3-3	Temperature	
		5-3-4	Humidity	
		5-3- 4 5-3-5	Vibration and Shock	
		5-3-6	Atmosphere	
		5-3-0 5-3-7	Electrical Environment	
		5-3-7 5-3-8	Book Mount Procedure	
		5-3-6 5-3-9	Wall Mount Procedure	
	,			
	5-4		Minimum Marania are and October a	
		5-4-1	Wiring Warnings and Cautions	5-28
				5-28 5-29

		5-4-4	Wire the I/O Connector	5-39
	5-5	Conne	ect	5-42
		5-5-1	Connector Identification	5-42
		5-5-2	Connection Procedure	5-43
	5-6	Initial I	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	Conne	ect UPS	5-50
	J- 0	5-8-1	Connect UPS Using the USB Connector	
		5-8-2	Connect UPS Using the I/O Connector	
	5-9	Create	Backup and Repair Data	5-56
Section	n	6 C	Operating Procedures	
	6-1	Power	· ON	6-2
		6-1-1	Power ON Using the Power Button	
		6-1-2	Power ON Using the Power ON/OFF Input	
		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	
		6-2-3	Power OFF Using the Power ON/OFF Input	
		6-2-4	Forced Power OFF Using the Power Button	
	6-3	React	to Product Messages	6-5
	6-4	React	to Windows Messages	6-6
Section	7-1		Maintenance	7.2
	7-1	7-1-1	Preventive Maintenance Schedule	
		7-1-2	Clean the Box PC	
	7-2	Corroc	ctive Maintenance	
	1-2	7-2-1	Warning and Error Messages	
		7-2-2	Remove the Cover	
		7-2-3	Replace the Fan Unit	
		7-2-4	Replace the Battery	
		7-2-5	Replace a Drive	
		7-2-6 7-2-7	Replace the PCIe Card	
		1-2-1	Replace the Grast Galu	7-21
Appen	dic			
		ces		
	A-1	BIOS		
		BIOS	BIOS Overview	A-2
		BIOS A-1-1 A-1-2	BIOS Overview BIOS for 4 th generation CPUs	A-2 A-5
		BIOS A-1-1 A-1-2 A-1-3	BIOS Overview	A-2 A-5 A-13
		BIOS A-1-1 A-1-2 A-1-3 A-1-4	BIOS Overview	A-2 A-5 A-13 A-31
		BIOS A-1-1 A-1-2 A-1-3	BIOS Overview	A-2 A-5 A-13 A-31
		BIOS A-1-1 A-1-2 A-1-3 A-1-4 A-1-5	BIOS Overview BIOS for 4 th generation CPUs BIOS for 6 th generation CPUs BIOS for 7 th generation CPUs BIOS for Atom CPUs Dennector Pin Details	A-2 A-5 A-13 A-31 A-61 A-61
		BIOS A-1-1 A-1-2 A-1-3 A-1-4 A-1-5 DVI Co A-2-1	BIOS Overview BIOS for 4 th generation CPUs BIOS for 6 th generation CPUs BIOS for 7 th generation CPUs BIOS for Atom CPUs Dinnector Pin Details DVI-I Connector Pin Details	A-2 A-5 A-13 A-31 A-61 A-67 A-67
		BIOS A-1-1 A-1-2 A-1-3 A-1-4 A-1-5 DVI Co A-2-1 A-2-2	BIOS Overview BIOS for 4 th generation CPUs BIOS for 6 th generation CPUs BIOS for 7 th generation CPUs BIOS for Atom CPUs Dennector Pin Details	A-2 A-5 A-13 A-31 A-61 A-61 A-67 A-68

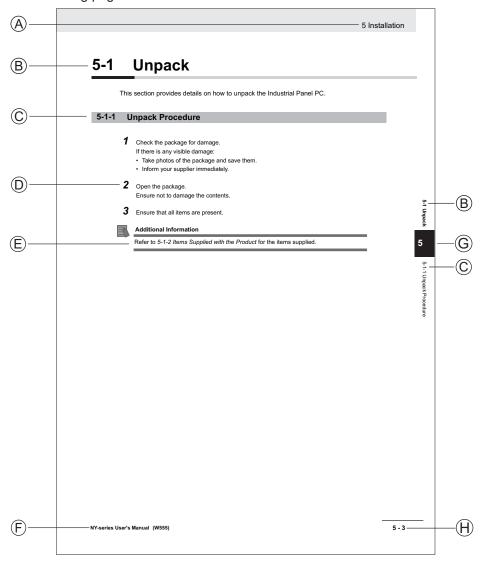
Index

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
Α	Level 1 heading	Е	Special Information
В	Level 2 heading	F	Manual name
С	Level 3 heading	G	Page tab with the number of the main section
D	Step in a procedure	Н	Page number

Special Information

Special information in this manual is classified as follows:



Precautions for Safe Use

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



Precautions for Correct Use

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



Additional Information

Additional information to read as required.

This information is provided to increase understanding or make operation easier.



Version Information

Information on differences in specifications and functionality between different versions.

Terms and Conditions Agreement

Warranty, Limitations of Liability

Warranties

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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.

Programmable Products

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

Disclaimers

Performance Data

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Change in Specifications

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

Errors and Omissions

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

Safety Precautions

Definition of Precautionary Information

The following notation is used in this manual to provide precautions required to ensure safe usage of the 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

MARNING

Disassembly and Dropping

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



Installation

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



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



Fail-safe Measures

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



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



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



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



Actual Operation

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



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



Cautions

A CAUTION

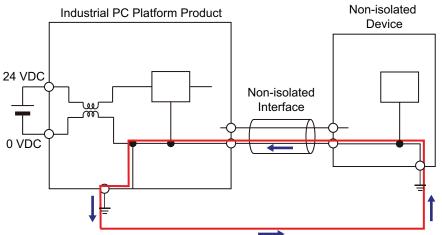
Installation

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, PCle 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 uninterruptable 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 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.



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 Industrial Box PC is used complies with EU Directives, the following precautions must be observed:

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

Applicable Directive

EMC Directive

EMC Directive

OMRON devices that comply with EU Directives also conform to the related EMC standards so that they can be more easily built into other devices or the overall machine. The actual products have been checked for conformity to EMC standards.

Applicable EMC (Electromagnetic Compatibility) standards are as follows:

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

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

Conformance to KC Certification

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

사용자안내문

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

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

Conformance to UL and CSA Standards

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

Software Licenses and Copyrights

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

Related Manuals

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

Related Box PC Manual

Manual name	Cat. No.	Model- ID	Application	Description
NY-series Op- erating Sys- tems and Soft- ware 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: 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: Overview Preparation Installation and Connection Check and Start Operation Maintenance and Inspection Shutdown Processing I/O Signal Functions Troubleshooting
UPS Setting Utili- ty Instruction Manual		• SB8A • BU-2RWL	Learning the information that is necessary to connect the UPS and to configure all settings.	An introduction to the UPS Setting Utility is provided along with the following information: Overview Operating Environment Software License Agreement Connect Use the UPS Setting Utility Setting Details
UPS Power Attendant Lite for Win- dows User's Manual		S8BA	Learning the information that is necessary to use the software to monitor, test and control the UPS and to configure all settings.	An introduction to the software is provided along with the following information: Overviews Connection and Installation The Simple Usage and Operation Test Settings

Industrial Monitor Manual

This table contains the related manual of the Industrial Monitor.

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

Terminology and Abbreviations

Industrial PC Platform

Term / Abbreviation	Description
Industrial PC Platform	An integrated range of OMRON products designed for use in any industrial applica-
	tion 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 indus-
	trial environments
Industrial Box PC	A box-shaped industrial PC including an OS designed to work in industrial environ-
	ments
IPC	Industrial PC
Sysmac	OMRON's brand name of the product family for the industrial automation equip-
	ment

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 in-
	structions 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
НМІ	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
PCle	The PCI Express is a high-speed computer bus standard called Peripheral Component Interconnect Express
PoE	Power over Ethernet
pSLC	Pseudo Single Level Cell type of SSD storage device
SATA	The Serial AT Attachment is a serial bus interface primarily used with mass storage
	devices such as hard disk drives
SLC	Single-Level Cell type of SSD storage device
SO-DIMM	Small Outline Dual Inline Memory Module
SSD	A Solid State Drive storage device
USB	Universal Serial Bus

Software

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

Revision History

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

Cat. No. W553-E2-13

Revision code

Revision code	Date	Revised content	
13	September 2021	Added hardware RAID 1 configurationMinor modifications	
12	April 2021	Updated BIOS details for • Intel [®] Core [™] i5-7300U • Intel [®] Celeron [®] 3965U	
11	November 2020	 Added Intel[®] Core[™] i7-7820EQ CPU Minor modifications 	
10	July 2020	 Added SSD 256 GB NY000-AS08 Updated bracket details Added Overal Setup Procedure Minor modifications 	
09	July 2019	Updated Conformance to KC certification	
08	May 2019	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	
07	May 2018	 Added Intel[®] Xeon[®] E3-1515M v5 CPU Added main memory DDR4 32 GB Added main memory DDR4 ECC 8 GB and 16 GB Added SSD 500 GB NY000-AS05 Added CFast 64 GB NY000-AT00, 128 GB NY000-AT01, 256 GB NY000-AT02 Added RJ45 Gb Ethernet option Minor modifications 	
06	April 2018	 Added layer information Added thin cooling layer Added Intel[®] Core[™] i5-7300U CPU Added Intel[®] Celeron[®] 3965U CPU Added SSD 64 GB NY000-AS03 Added SSD 128 GB NY000-AS04 Added main memory DDR4 4 GB and 8 GB Updated Power Consumption Specifications Implemented new location for the product code of an operating system 	
05	January 2018	 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	

Revision code	Date	Revised content
03	May 2017	Added operating system Windows 10 IoT Enterprise LTSB
		Added Storage Device Considerations
		Modified UPS configuration procedure
		Minor modifications
02	December	UL implementation
	2016	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	Hardware Features				
1-3	ID Information Label1-				
1-4	Product Configuration Box PC1				
1-5	Overall Setup Procedure1				
1-6	Indu	strial 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- [©]		

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

RAID 0 and RAID 1 are supported. For 4th generation CPUs starting with Main BIOS version A□27R110. Hot-swap of storage devices is not supported.

· LED indicators

LED indicators provide a clear indication of the operational status of the Box PC.

· DVI visual interface

The video interface for the Box PC is provided with a DVI connector for connection to a monitor. An extra (optional) DVI interface is available for connection to a second monitor.

· NY Monitor Link interface

The interface combines video signals and USB signals for a connection to an OMRON Industrial Monitor using a single NY Monitor Link cable up to 100 meter.

• 3 Ethernet ports 1Gb/s

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

• Built-in I/O

Built-in I/O for UPS status and Box PC shutdown control are provided.

· 4 USB ports

2 USB2.0 ports and 2 USB3.0 ports are provided for connection to external USB devices such as keyboards, memory sticks, or other peripheral hardware.

· Built-in SD Memory Card slot

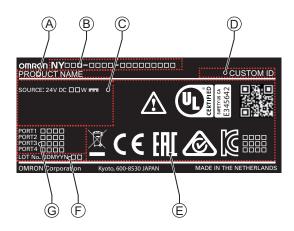
An SD Memory Card slot is provided for removable memory.

· Built-in CFast Card slot

An optional CFast Card slot is provided as a removable storage device.

1-3 ID Information Label

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



Item	Name	Description	
Α	Product name	The name of your product	
В	Model *1	Model and configuration details	
С	Power rating	Power rating details and optional UL related information	
D	Custom ID	A custom ID [NYC	
	(Optional)	Only applicable for customized IPC platform products.	
Е	Standards and QR	The applicable standards and a QR code for OMRON internal use.	
	code		
F	LOT number and	Production details, consisting of:	
	serial number	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	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 4-25 for Ethernet specifications.



Additional Information

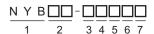
Refer to 3-1-2 Base Layer on page 3-5 for the ID label location.

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 \square - \square \square .

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



Item	Description	Option / Description
1	Series name	NYB: NY- series Industrial Box PC
2	Processor	1C: Intel® Celeron® 2980U, 4 th generation CPU
		1E: Intel® Xeon® E3-1515M v5
		6 th generation CPU with active cooling
		17: Intel [®] Core [™] i7-4700EQ,
		4 th generation CPU with active cooling
		2A: Intel® Atom® x5-E3940
		2C: Intel® Celeron® 3965U, 7 th generation CPU
		25: Intel [®] Core [™] i5-4300U, 4 th generation CPU
		27: Intel [®] Core [™] i7-7820EQ,
		7 th generation CPU with active cooling
		35: Intel [®] Core [™] i5-7300U, 7 th generation CPU
3	Main memory	1: 2 GB, non-ECC
	,	2: 4 GB, non-ECC
		3: 8 GB, non-ECC
		4: 16 GB, non-ECC
		5: 32 GB, non-ECC
		C: 8 GB, ECC
		D: 16 GB, ECC
4	Expansion slots	0: None
		1: 1 PCle slot
		2: 1 PCle slot + Storage hardware RAID 1
5	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 LTSB - 64 bit
		4: Windows 10 IoT Enterprise 2019 LTSC - 64 bit

Item	Description	Option / Description
6	Storage	0: None
		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
		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
		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.



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.







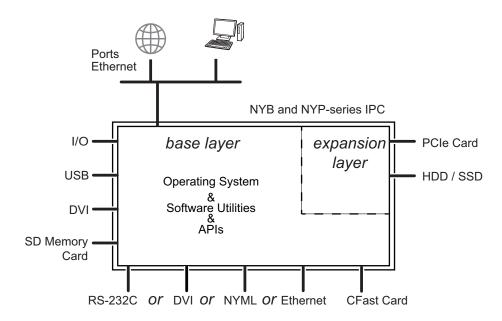
System Configurations

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

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

2-1 Configuration for NYB and NYP

The Industrial PC supports the following hardware configurations.



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.



- 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

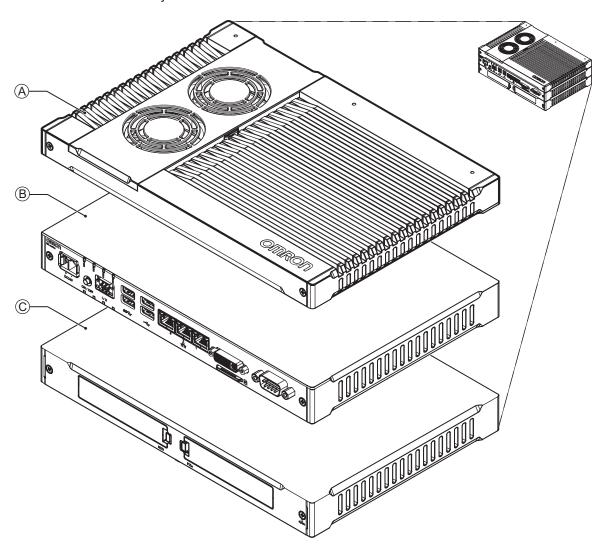
This section provides an overview of the hardware of the Industrial Box PC.

3-1	Laye	rs and Components	3-3
	3-1-1	Cooling Layer	
	3-1-2	Base Layer	3-5
	3-1-3	Expansion Layer (Optional)	3-6
3-2	LED I	Indicators	3-7
	3-2-1	PWR LED Indicator	3-7
	3-2-2	ERR LED Indicator	
	3-2-3	HDD LED Indicator	
	3-2-4	RUN LED Indicator	3-8
3-3	Powe	er Button	3-9
3-4	Conn	nectors	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	DVI Connector	3-12
	3-4-6	RS-232C Connector (Optional)	
	3-4-7	DVI-D Connector (Optional)	
	3-4-8	NY Monitor Link Connector (Optional)	
	3-4-9	Ethernet Connector (Optional)	3-15
3-5	SD M	lemory Card Slot	3-16
3-6	CFas	et Card Slot (Optional)	3-17
3-7	Drive	Bays	3-18
3-8	PCle	Card Slot	3-19
3-9	Spare	e Parts	3-20
	3-9-1	Battery	
	3-9-2	Fan Unit	
	3-9-3	Accessory Kit	
	3-9-4	Connectors	
3-10	0 Optic	onal Hardware	3-22
	3-10-1	Mounting Brackets	3-22
	3-10-2	SD Memory Cards	3-23
	3-10-3	USB Flash Drives	3-24
	3-10-4	CFast Cards	
	3-10-5	HDD and SSD Storage Devices	3-25

3-10-6	DVI Cables	3-26
3-10-7	USB Type-A to USB Type-B Cables	3-26
	NY Monitor Link Cables	
3-10-9	Industrial Monitor	3-30
3-10-10	Power Supply	3-30
	UPS	
		3-31

3-1 Layers and Components

This section shows the layers of the Industrial Box PC.



Item	Name	Description		
Α	Cooling layer	Layer to cool the base layer		
		Depending on the product configuration fans can be present and the thick-		
		ness can vary.		
В	Base layer	The layer with the CPU and the main interfaces		
		The connector layout and the installed option board depend on the product		
		configuration.		
С	Expansion layer	Depending on the product configuration this optional layer can add addition-		
		al storage devices or a PCle Card.		

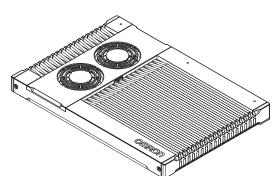
3-1-1 Cooling Layer

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.

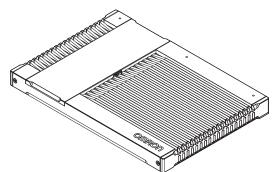
Cooling layer with removable cover and active cooling



The cover provides access to:

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

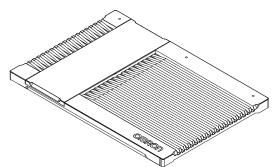
Cooling layer with removable cover and passive cooling



The cover provides access to:

- The battery
- The battery replacement date

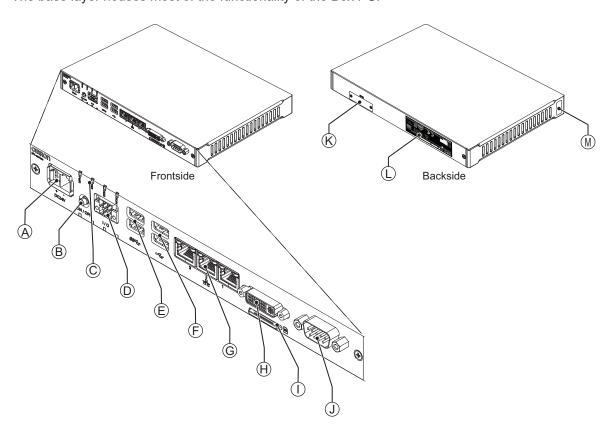
Cooling layer with passive cooling and a non-removable cover



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

Item	Name	Description
L	ID information label	Label containing model-ID, LOT No. and other product specific information. Refer to 1-3 ID Information Label on page 1-4 for label details.
M	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)

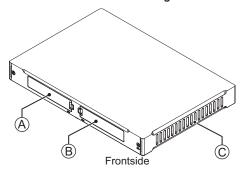
This section shows the component names and functions for the expansion layer.

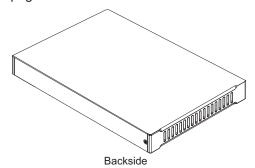
The expansion layer adds additional functionality to the base layer.

The Expansion Layer is available for models:

- NYB□□-□1
- NYP□□-□1

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: • 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.
В	PCIe bay	PCI Express mounting slot
С	PCle drawer	Mounting location for the PCIe Card

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

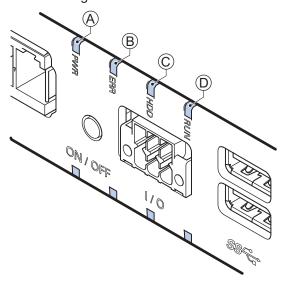
Refer to 4-1-7 Storage Device Specifications on page 4-11 for the number of supported drives and for bay details.

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.

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

The following LED indicators are available:



Item	LED Indicator	Name	Description	
Α	PWR	Power	Indicates the operating mode of the Industrial Box PC.	
В	ERR	Error	Indicates the presence and type of an error.	
С	HDD	Hard Disk Drive	Indicates activity of the storage device	
D	RUN	Run	Indicates the status of a user-defined function. *1	

^{*1.} Not for products NY512-A $\square\square$.

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

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	The 24 VDC power is not supplied
			No error is present
		Blinking	Fan Error
			Battery low
		Lit	Thermal shutdown
			Watchdog Error
			Power Supply undervoltage error
			Power Supply overvoltage error
			Power supply defective



Additional Information

- The status of this LED can also be defined by users using the Industrial PC System API.
 Refer to 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	Sta	tus	Meaning
Green		Not lit	User-defined. The status can be defined in a user program using the
		Blinking	Industrial PC System API.
		Lit	



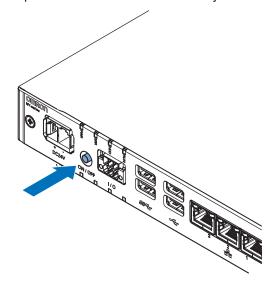
Additional Information

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.





- 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.

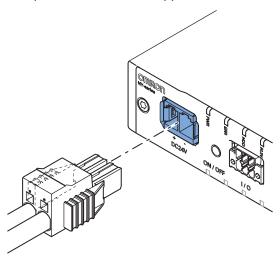
3-4 Connectors

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

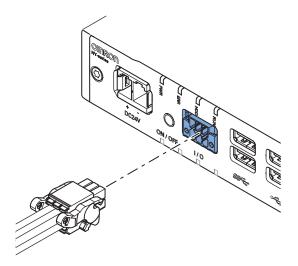
- Refer to 4-2-1 Power Connector Specifications on page 4-19 for specifications.
- Refer to 5-4-3 Wire the Power Connector on page 5-36 for wiring details.
- Refer to 5-5 Connect on page 5-42 for connection details.

3-4-2 I/O Connector

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

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

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



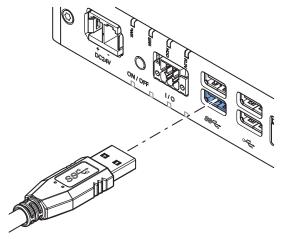


Additional Information

- Refer to 4-2-2 I/O Connector Specifications on page 4-20 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

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

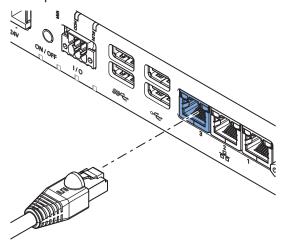




- Refer to 4-2-3 USB Connector Specifications on page 4-24 for specifications.
- Refer to 5-5 Connect on page 5-42 for connection details.

3-4-4 Ethernet Connectors

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



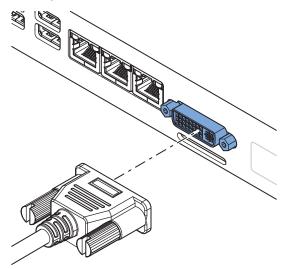


Additional Information

- Refer to 4-2-4 Ethernet Connector Specifications on page 4-25 for specifications.
- Refer to 5-5 Connect on page 5-42 for connection details.

3-4-5 DVI Connector

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

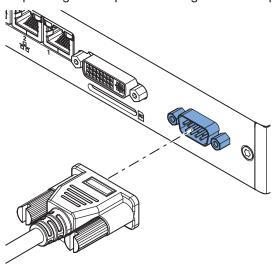




- Refer to 1-4 Product Configuration Box PC on page 1-5 for configuration details.
- Refer to 4-2-5 DVI Connector Specifications on page 4-27 for specifications.
- Refer to 5-5 Connect on page 5-42 for connection details.

3-4-6 RS-232C Connector (Optional)

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



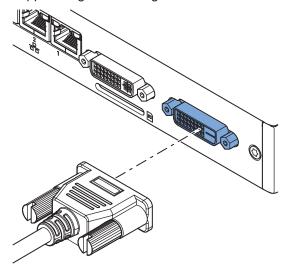


Additional Information

- Refer to 1-4 Product Configuration Box PC on page 1-5 for configuration details.
- Refer to 4-2-7 RS-232C Connector Specifications on page 4-29 for specifications.
- Refer to 5-5 Connect on page 5-42 for connection details.

3-4-7 DVI-D Connector (Optional)

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

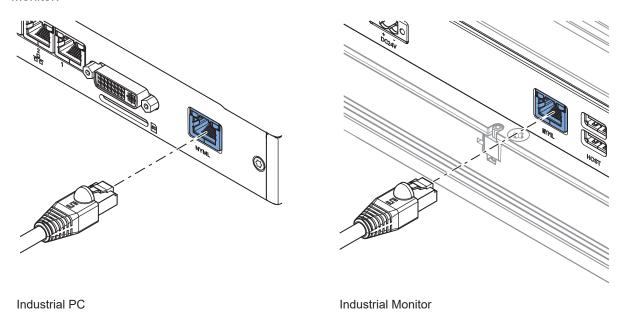




- Refer to 1-4 Product Configuration Box PC on page 1-5 for configuration details.
- Refer to 4-2-6 DVI-D Connector Specifications on page 4-28 for specifications.
- Refer to 5-5 Connect on page 5-42 for connection details.

3-4-8 NY Monitor Link Connector (Optional)

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

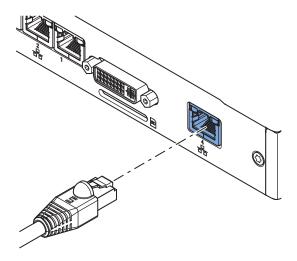




- Refer to 1-4 Product Configuration Box PC on page 1-5 for configuration details.
- Refer to 4-2-8 NY Monitor Link Connector Specifications on page 4-29 for specifications.
- Refer to 5-5 Connect on page 5-42 for connection details.

3-4-9 Ethernet Connector (Optional)

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





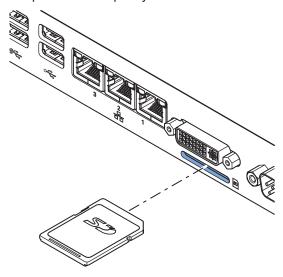
- Refer to 1-4 Product Configuration Box PC on page 1-5 for configuration details.
- Refer to 4-2-4 Ethernet Connector Specifications on page 4-25 for specifications.
- Refer to 5-5 Connect on page 5-42 for connection details.

3-5 SD Memory Card Slot

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





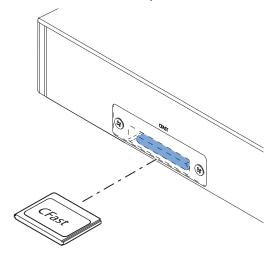
Additional Information

Refer to 3-10-2 SD Memory Cards on page 3-23 for SD Memory Card details.

3-6 CFast Card Slot (Optional)

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

The CFast Card slot accepts CFast Cards that comply with the CFast 2.0 specification.





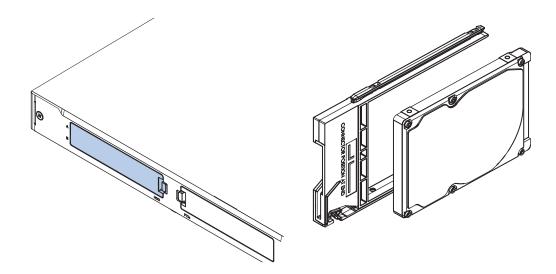
Additional Information

Refer to 3-10-4 CFast Cards on page 3-24 for details.

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.





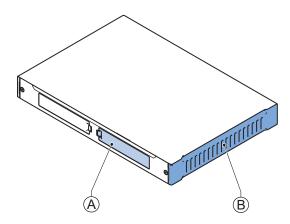
- Refer to 4-1-5 CPU Specifications on page 4-6 for the number of supported drives.
- Refer to 4-1-7 Storage Device Specifications on page 4-11 for storage device specifications.
- Refer to 5-2-2 Install a Drive on page 5-6 for install information.
- Refer to 7-2-5 Replace a Drive on page 7-11 for maintenance 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.





- Refer to 4-1-8 PCIe Card Specifications on page 4-14 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 PCle Card on page 7-16 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. The battery is:

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

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



Additional Information

Refer to 7-2-4 Replace the Battery on page 7-9 for the replacement procedure.

3-9-2 Fan Unit

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

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



Additional Information

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

3-9-3 Accessory Kit

The accessory kit for the Box PC.

Model	Appearance	Specifications
NY000-AK00		Accessory Kit containing all accessories supplied with the Box PC. Power connector I/O connector Drive bracket for drive installation *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 connectors are provided below.

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

Model	Appearance	Specifications
NY000-AK01		Power Connectors for Omron Industrial PCs. 10 pieces.

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		
 NYB1C-□1 NYB1E-□1 NYB1E-□2 NYB17-□1 NYB25-□1 NYB27-□1 NYB27-□2 	With Expansion layer With Cooling layer with removable cover	NY000-AB00	NY000-AB01		
NYB2C-□1 NYB35-□1 NYB35-□2	With Expansion layer With Cooling layer with non-removable cover	NY000-AB02	NY000-AB01		

	Model	Bracket ID an	d appearance
NYB27-□0	Without Expansion layer With Cooling layer with removable cover	NY000-AB05	NY000-AB01
 NYB2A-□0 NYB2C-□0 NYB35-□0 	Without Expansion layer With Cooling layer with non-removable cover	NY000-AB04	NY000-AB01

Refer to 4-1-9 Bracket Specifications on page 4-17 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-SD291	omnon A	SD Card	2 GB	FAT16
HMC-SD491	\$ 5 >	SDHC Card	4 GB	FAT32
HMC-SD1A1	2GB	SDHC Card	16 GB	FAT32

3-10-3 USB Flash Drives

USB Flash Drive details are provided below.

OMRON is not responsible for the operation, performance, or write life of any other brand of USB Flash Drives.

Model	Appearance	Capacity
FZ-MEM2G		2 GB
FZ-MEM8G	C. Phas	8 GB

3-10-4 CFast Cards

CFast Card details are provided below.

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

Model	Appearance	Storage type	Capacity	Details
NY000-AT00		CFast	64 GB	Innodisk DECFA-64GM41BW1DC
NY000-AT01	Crasr	Card	128 GB	Innodisk DECFA-A28M41BW1DC
NY000-AT02	35.		256 GB	Innodisk DECFA-B56M41BW1DC



Additional Information

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

3-10-5 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	32 GB	Apacer APS25AB7032G-AT
NY000-AS01 *1		SLC	64 GB	Apacer APS25AB7064G-AT
NY000-AS03 *2			64 GB	Hagiwara HFD25S-064GD(A23AE)-HC
NY000-AS06		SSD-	128 GB	Innodisk DHS25-A28M41BC1DC
		pSLC		
NY000-AS04 *1*2		SSD	128 GB	Innodisk DES25-A28M41BC1DC
NY000-AS08		MLC	256 GB	Innodisk DES25-B56M41BC1DC
NY000-AS05			500 GB	Innodisk DES25-C12D08BC1QC
NY000-AS07		3D TLC	1 TB	Innodisk DES25-01TDK1EC1QF

^{*1.} Default for Box PC models: NY□25-□1, NY□17-□1 and NY□1C-□1

^{*2.} Default for Box PC models: NY□35-□1, NY□35-□2, NY□2C-□1, NY□1E-□1 ,NY□1E-□2 and NY□27-□1, NY□27-□2



Additional Information

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

Storage Device Considerations

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

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



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

3-10-6 DVI Cables

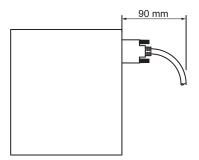
DVI cable details are provided below.

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

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

DVI Cable Clearance

The DVI cable requires a minimum clearance of 90 mm from the connector entry to prevent excessive strain on the connector and cable assembly.



3-10-7 USB Type-A to USB Type-B Cables

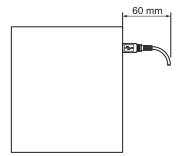
USB Type-A to USB Type-B cable details are provided below.

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

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

USB Type-A to USB Type-B Cable Clearance

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



3-10-8 NY Monitor Link Cables

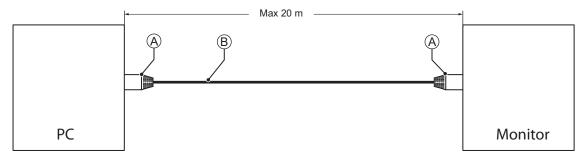
Depending on the installation situation specific cables are recommended for an NY Monitor Link (NYML).

Refer to:

- NYML Recommendations up to 20 m on page 3-27 for details.
- NYML Recommendations up to 100 m on page 3-28 for details.
- NYML Recommendations for Custom Cables on page 3-29 for details.

NYML Recommendations up to 20 m

Connectors ${\textcircled{A}}$ and cables ${\textcircled{B}}$ 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		
item		ID	Details	
Patch Cable with straight con-	1.5 m	IE-C6FP8LB0015M40M40-B	Industrial Ethernet cable:	
nectors	3 m	IE-C6FP8LB0030M40M40-B	RJ45 IP 20, RJ45 IP 20, Cat.6A /Class EA (ISO/IEC 11801 2010), LSZH, UL, Molded Connector. Qualified for 10Gb/s, S/FTP	
Manufacturer: Weidmuller	5 m	IE-C6FP8LB0050M40M40-B		
Color: Blue	10 m	IE-C6FP8LB0100M40M40-B		
	15 m	IE-C6FP8LB0150M40M40-B		
	20 m	IE-C6FP8LB0200M40M40-B		

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:

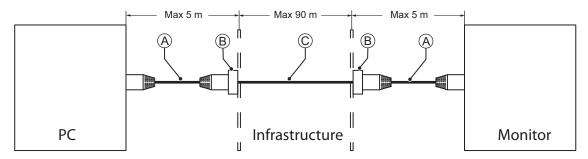
- · Connector length
- · Maximum bending radius of the cable in a fixed position

NYML Recommendations up to 100 m

Patch Cables A with different lengths can be used.

Use a DIN rail socket [®] when connecting patch cables to infrastructures.

Use installation cable © 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		
item		ID	Details	
A	1.5 m	IE-C6FP8LB0015M40M40-B	Industrial Ethernet cable: RJ45 IP 20, RJ45 IP 20, Cat.6A /Class EA (ISO/IEC 11801 2010), LSZH, UL, Molded Connector. Qualified for 10Gb/s, S/FTP	
Patch Cable with straight con-	3 m	IE-C6FP8LB0030M40M40-B		
nectors Manufacturer: Weidmuller	5 m	IE-C6FP8LB0050M40M40-B		
B		IE-XM-RJ45/IDC	Mounting rail outlet, RJ45	
D- DIN rail socket			module design according to IEC 60603-7-51, for wires with	
Manufacturer: Weidmuller			diameters up to 1.6 mm UL	
©		ETHERLINE ® PN Cat.6A	Industrial Ethernet cable	
Installation Cable		FLEX	ETHERLINE PN Cat.6A FLEX Cat.6A for flexible use, 4	
Manufacturer: Lapp			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.

ltem		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

3-10-9 Industrial Monitor

Details for the recommended monitor are provided below.

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

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



Additional Information

Refer to the OMRON website for specifications and manuals.

3-10-10 Power Supply

Details for the recommended power supply are provided below.

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

Model	Appearance	Specifications
S8VK-G□□□24 S8VK-X□□□24A-EIP S8VK-S□□□24 S8VK-WA□□□24		Output voltage: 24 VDC



- Refer to 4-1-3 Power Consumption Specifications on page 4-4 for power consumption details.
- Refer to <u>the OMRON website</u> for specifications and manuals.
 Note that the power consumption details of the Box PC determine the minimum power rating of your power supply.

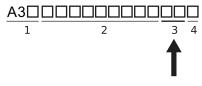
3-10-11 UPS

Details for the recommended UPS are provided below.

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

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

^{1.} The revision number of the UPS can be retrieved from the serial number label on the product and the product packaging.



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



Precautions for Safe Use

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



Additional Information

- Refer to 3-10-10 Power Supply on page 3-30 for power supply details.
- Refer to 4-1-3 Power Consumption Specifications on page 4-4 for power consumption details.
- Refer to the OMRON website for S8BA specifications or to the UPS S8BA User's Manual (Cat. No. U702) for the UPS manual.

Note that the power consumption details determine the output current/capacity of your UPS.

3-10-12 UPS Communication Cable

Communication cable details are provided below.

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

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

3 Hardware



Specifications

This section provides specifications of the Industrial Box PC.

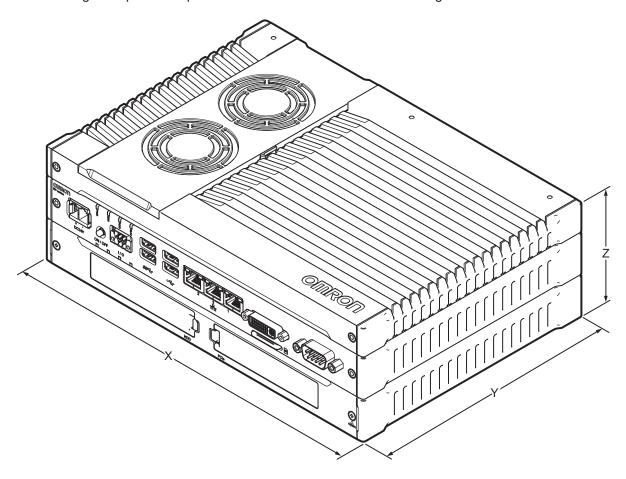
4-1	Gene	eral Specifications	4-2
	4-1-1	Dimensions and Weight	
	4-1-2	General Electrical Specifications	
	4-1-3	Power Consumption Specifications	
	4-1-4	Power Supply Specifications	
	4-1-5	CPU Specifications	4-6
	4-1-6	Memory Specifications	4-9
	4-1-7	Storage Device Specifications	
	4-1-8	PCIe Card Specifications	
	4-1-9	Bracket Specifications	4-17
4-2	Conn	ector Specifications	4-19
	4-2-1	Power Connector Specifications	
	4-2-2	I/O Connector Specifications	
	4-2-3	USB Connector Specifications	
	4-2-4	Ethernet Connector Specifications	4-25
	4-2-5	DVI Connector Specifications	4-27
	4-2-6	DVI-D Connector Specifications	4-28
	4-2-7	RS-232C Connector Specifications	4-29
	4-2-8	NY Monitor Link Connector Specifications	4-29
4-3	Envir	onmental Specifications	4-31
	4-3-1	Operation Environment Specifications	
	4-3-2	Temperature and Humidity Specifications	
	4-3-3	Recycling Specifications	

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	With Expansion	Not mounted	282 mm	200 mm	89 mm	3.8 kg
• NYB1E-□1	layer	Book mount	319 mm *4	211 mm	96 mm *4	4.2 kg
NYB1E-□2 • NYB17-□1 • NYB25-□1 • NYB27-□1 NYB27-□2	With Cooling layer with re- movable cover	Wall mount	282 mm	245 mm *4	92 mm	3.9 kg
• NYB2C-□1	With Expansion	Not mounted	282 mm	200 mm	73 mm	3.0 kg
• NYB35-□1	layer	Book mount	319 mm *4	211 mm	80 mm *4	3.3 kg
NYB35-□2	With Cooling layer with non- removable cover	Wall mount	282 mm	245 mm *4	76 mm	3.1 kg

Model			Specifications			
Model ID *1 *2	Model details	Mount details	Width X	Depth Y *3	Height Z	Weight
NYB27-□0	Without Expan-	Not mounted	282 mm	200 mm	56 mm	2.6 kg
	sion layer	Book mount	339 mm *4	211 mm	63 mm	2.9 kg
	With Cooling layer with re- movable cover	Wall mount	282 mm	245 mm	59 mm	2.7 kg
• NYB2A-□0	Without Expan-	Not mounted	282 mm	200 mm	41 mm	2.1 kg
• NYB2C-□0	sion layer	Book mount	339 mm *4	211 mm	47 mm *4	2.3 kg
• NYB35-□0	With Cooling layer with non- removable cover	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.

- *3. This includes the 5 mm of the protruding DVI connector.
- *4. This is the mounting bracket dimension.

4-1-2 General Electrical Specifications

The following table provides the general electrical specifications.

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

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-□1	45 W
NYB1E-□1, NYB1E-□2	86 W
NYB17-□1	81 W
NYB2A-□0	26 W
NYB2C-□0, NYB2C-□1	27 W
NYB25-□1	52 W
NYB27-□0, NYB27-□1, NYB27-□2	86 W
NYB35-□0, NYB35-□1, NYB35-□2	46 W

Installed drives

Drives	Power consumption
Bay A	Refer to 4-1-7 Storage Device Specifications on page 4-11 for Omron drive de-
Bay B	tails. For other drives refer to the applicable specifications for maximum power con-
CFast	sumption details.

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 4-24 for maximum power consumption details.
PCle	Refer to the power consumption specifications of the installed PCIe Card. Refer to 4-1-8 PCIe Card Specifications on page 4-14 for maximum power consumption details.

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 4-5 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 4-4 for details.

With a UPS installed the minimum power requirements are:

M. J.I	Minimum power requirements		
Model	Power supply *1	UPS *2	
• NY□1C	120 W	120 W	
• NY□2A			
• NY□2C			
• NY□25			
• NY□35			
• NYB17	240 W	120 W	
• NYB1E	240 W	240 W	
• NYP17			
• NY□27			

^{*1.} Refer to 3-10-10 Power Supply on page 3-30 for power supply products.

^{*2.} Refer to 3-10-11 UPS on page 3-31 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 $Intel^{\circledR}$ Celeron $^{\circledR}$ 2980U CPU.

Item	Specifications
Cores / Threads	2/2
CPU base frequency	1.6 GHz
Maximum turbo frequency	
Cache	2 MB
Cooling details	Passive cooling (fanless)
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	
Cooling details	Requires active cooling (fan)	
Graphics controller Intel® Iris TM Pro Graphics P580		
DDR type	DDR4-2400, ECC and 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	
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
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
Cooling details	Passive cooling (fanless)
Graphics controller	Intel ® HD Graphics 610
DDR type	DDR4-2400, non-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	
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	
Cooling details Requires active cooling (fan)		
Graphics controller	Intel ® HD Graphics 630	
DDR type	DDR4-2400, non-ECC	

NY□35 Intel[®] Core[™] i5-7300U CPU Specifications

CPU specifications for an Intel[®] Core $^{\text{™}}$ i5-7300U CPU.

Item	Specifications
Cores / Threads	2/4
CPU base frequency	2.6 GHz
Maximum turbo frequency	3.5 GHz
Cache	3 MB
Cooling details	Passive cooling (fanless)
Graphics controller	Intel ® HD Graphics 620
DDR type	DDR4-2400, non-ECC

4-1-6 Memory Specifications

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

DDR4 ECC

The following table provides specification details of the DDR4 memory.

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

^{*1.} The applicable type of memory is determined by the CPU type.

Refer to *4-1-5 CPU Specifications* on page 4-6 for CPU details.

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

DDR4 Non-ECC

The following table provides specification details of the DDR4 memory.

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

^{*1.} The applicable type of memory is determined by the CPU type.
Refer to 4-1-5 CPU Specifications on page 4-6 for CPU details.
Refer to 1-4 Product Configuration Box PC on page 1-5 for product configuration details.

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

^{*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 No	n-ECC					
Package memory for-		SO-DIMM						
mat								
Serial	Speed	1600	1866	1600	1866	1600	1866	1600
Presence	grade *2	MT/s	MT/s	MT/s	MT/s	MT/s	MT/s	MT/s
Detect (SPD)	CAS La- tency	CL11	CL13	CL11	CL13	CL11	CL13	CL11

^{*1.} The applicable type of memory is determined by the CPU type.
Refer to 4-1-5 CPU Specifications on page 4-6 for CPU details.
Refer to 1-4 Product Configuration 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.

		Model Specifications			
Item	320 GB *1	500 GB *1	1 TB*1		
Model *2	NY000-AH00 NY000-AH01		NY000-AH02		
Power consumption	2 W max.	W max.			
S.M.A.R.T. support	Yes				
Rotation speed	5,400 r/min				
Interface	Serial ATA 3.0				
Operating temperature	5 to 55°C *3		0 to 60°C *3		
Operating humidity (with no condensation)	8 to 90% RH29°C wet-bulb temperature max.				
Storage temperature	-40 to 65°C				
Storage humidity (with no condensation)	 8 to 90% RH 40°C wet-bulb temperature max. 5 to 95% RH 40°C wet-bulb tem ature max. 				
Endurance	Approximately 5 years or 20,00 (whichever comes first) under to 25°C at 101.3 kPa • Less than 333 powered-ON • Less than 20% operation who have the seeks/	Average Annualized Failure Rate (AFR): 0.50% under the following conditions: • Case Temperature 40°C • Power on Hours (POH) ≤ 3120			

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

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 the table below.

Item	Model Specifications *1							
item	32 GB	64	GB	128	GB	256 GB	500 GB	1 TB
Model *2	NY000- AS00	NY000- AS01	NY000- AS03	NY000- AS06	NY000- AS04	NY000- AS08	NY000- AS05	NY000- AS07
Туре	SLC			pSLC	MLC			3D TLC
Max. power consumption	1.4 W	1.4 W	2.5 W	0.8W	0.8 W	0.8 W	2.7 W	2.2 W
S.M.A.R.T. sup- port	Yes							
Interface	Serial ATA	3.1						
Max. sequential read speed	160 MB/s	160 MB/s	500 MB/s	530 MB/s	530 MB/s	530 MB/s	415 MB/s	550 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	340 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				
Storage tem- perature	-40 to 100°C	-40 to 100°C	-45 to 90°C	-55 to 95°C				
Max. storage humidity (with no condensa- tion)	10 to 95%	RH						
Endurance	749 TBW	1497 TBW	1900 TBW	1389 TBW	208 TBW	416 TBW	154 TBW	1000 TBW

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

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.

^{*2.} Refer to 3-10-5 HDD and SSD Storage Devices on page 3-25 for brand details.

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

CFast Card Specifications

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

14		Model Specifications				
Item	64 GB *1	128 GB *1	256 GB *1			
Model *2	NY000-AT00	NY000-AT01	NY000-AT02			
Туре	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.

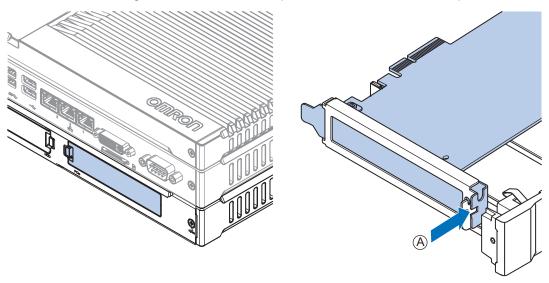
^{*2.} Refer to 3-10-4 CFast Cards on page 3-24 for brand details.

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

4-1-8 PCIe Card Specifications

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

Ensure that, according to the PCIe hardware specifications, the indent (A) 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.
- Refer to NY \(\subseteq 1C \(\subseteq 1 \) PCIe Card Slot Specifications on page 4-14 for details.
- Refer to NY \(\times 1 E \(\times 1 \), NY \(\times 1 E \(\times 2 \) PCIe Card Slot Specifications on page 4-15 for details.
- Refer to NY \$\sumsymbol{N}\$17-\$\sumsymbol{D}\$1 PCle Card Slot Specifications on page 4-15 for details.
- Refer to NY \(\subseteq 2C- \subseteq 1 PCIe Card Slot Specifications \) on page 4-15 for details.
- Refer to NY \(\sigma 25- \subseteq 1 PCIe Card Slot Specifications \) on page 4-16 for details.
- Refer to NY \(\subseteq 27- \subseteq 1, \text{ NY } \subseteq 27- \subseteq 2 \text{ PCIe Card Slot Specifications} \) on page 4-16 for details.
- Refer to NY □35-□1, NY □35-□2 PCIe Card Slot Specifications on page 4-16 for details.

NY□1C-□1 PCle Card Slot Specifications

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

Item	Specifications
Configuration	X1 (1 lane) up to Gen 2
Card height	Standard height cards, 4.20 inches (106.7 mm) ^{*1}
Card length	Half-length cards, 6.6 inches (167.65 mm)
Power consumption	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.

NY□1E-□1, NY□1E-□2 PCle Card Slot Specifications

The table below provides PCIe Card slot details for Industrial Box PCs with an Intel[®] Xeon[®] E3-1515M v5 CPU.

Item	Specifications
Configuration	X4 (4 lanes) up to Gen 3
Card height	Standard height cards, 4.20 inches (106.7 mm) ^{*1}
Card length	Half-length cards, 6.6 inches (167.65 mm)
Power consumption	15 W max.
Maximum current	3 A with 3.3 VC, 1.25 A with 12 VDC

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

NY□17-□1 PCle Card Slot Specifications

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

Item	Specifications
Configuration	X4 (4 lanes) up to Gen 3
Card height	Standard height cards, 4.20 inches (106.7 mm)*1
Card length	Half-length cards, 6.6 inches (167.65 mm)
Power consumption	15 W max.
Maximum current	3 A with 3.3 VDC, 1.25 A with 12 VDC

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

NY□2C-□1 PCle Card Slot Specifications

The table below provides PCIe Card slot details for Industrial Box PCs with an Intel[®] Celeron[®] 3965U CPU.

Item	Specifications
Configuration	X2 (2 lanes) up to Gen 3
Card height	Standard height cards, 4.20 inches (106.7 mm)*1
Card length	Half-length cards, 6.6 inches (167.65 mm)
Power consumption	5 W max.
Maximum current	1.5 A with 3.3 VDC, 0.5 A with 12 VDC

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

NY□25-□1 PCle Card Slot Specifications

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

Item	Specifications
Configuration	X1 (1 lane) up to Gen 2
Card height	Standard height cards, 4.20 inches (106.7 mm) ^{*1}
Card length	Half-length cards, 6.6 inches (167.65 mm)
Power consumption	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.

NY□27-□1, NY□27-□2 PCle Card Slot Specifications

The table below provides PCIe Card slot details for Industrial Box PCs with an Intel[®] Core[™] i7-7820EQ CPU.

Item	Specifications
Configuration	X4 (4 lanes) up to Gen 3
Card height	Standard height cards, 4.20 inches (106.7 mm) ^{*1}
Card length	Half-length cards, 6.6 inches (167.65 mm)
Power consumption	15 W max.
Maximum current	3 A with 3.3 VDC, 1.25 A with 12 VDC

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

NY□35-□1, NY□35-□2 PCle Card Slot Specifications

The table below provides PCle Card slot details for Industrial Box PCs with an Intel[®] Core[™] i5-7300U CPU.

Item	Specifications
Configuration	X2 (2 lanes) up to Gen 3
Card height	Standard height cards, 4.20 inches (106.7 mm) ^{*1}
Card length	Half-length cards, 6.6 inches (167.65 mm)
Power consumption	5 W max.
Maximum current	1.5 A with 3.3 VDC, 0.5 A with 12 VDC

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

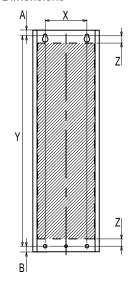
4-1-9 Bracket Specifications

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

Book Mount Brackets

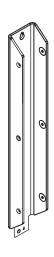
The metal mounting brackets mount your Box PC.

Dimensions











- Refer to 3-10-1 Mounting Brackets on page 3-22 for bracket IDs.
- Refer to 5-3-8 Book Mount Procedure on page 5-26 for book mount details.

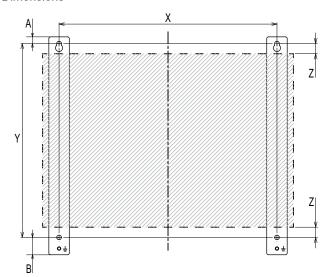
Bracket Details	General Specification
Material thickness	3 mm
Hole diameters	5.5 mm

Bracket Details	Drill Specifications				Product D	imensions	
Bracket ID	Hole Dis-	Hole Dis-	Distance Z	Bracket	Bracket	Top to	Hole to
	tance X	tance Y		Width	Height	hole A	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







- Refer to 3-10-1 Mounting Brackets on page 3-22 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 D	imensions	
Bracket ID	Hole Dis-	Hole Dis-	Distance Z	Bracket	Bracket	Top to	Hole to
	tance X	tance Y		Width	Height	hole A	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.

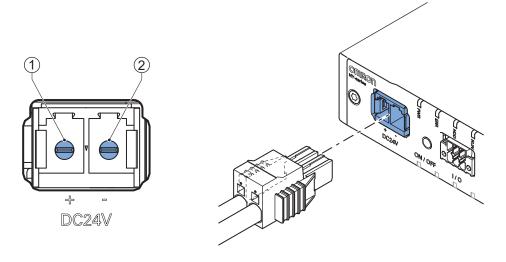
4-2-1 Power Connector Specifications

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

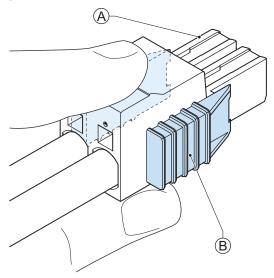
Item	Specifications
Conductor isolation rating	90°C
Termination rating	90°C



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

Locking and Removing the Power Connector

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



Pushing both orange sliders [®] towards the end of the connector [®] will release the lock when removing the connector.

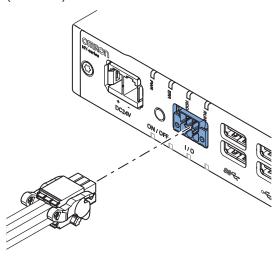
4-2-2 I/O Connector Specifications

Details of the I/O connector are provided below.

The I/O connector is locked when inserted to prevent unintentional disconnection.

The connector can only be inserted in the correct way.

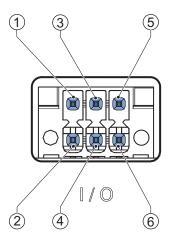
The Lock-and-Release Latch connector is a Phoenix Contact type DFMC 1,5/ 3-ST-3,5-LR BK (1711658).



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

I/O Connector Pin Details

The pin details of the I/O connector.



The pin layout represents the I/O connector on the Box PC.

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

Pin details of the I/O Connector:

Pin	Descrip- tion	Туре	Electrical Specifications	Details
1 2	Power Status Output	Contact output	SPST-NO contact configuration 24 VDC at 2A switching capacity (resistive load) Operation lifetime 150,000 cycles at 2A max. Connect to SELV	 Open: The Power Status Output is OFF when the Box PC is OFF or has been disconnected from the power supply. Closed: The Power Status Output is ON when the Box PC has shutdown successfully and is connected to the power supply and has not been disconnected from that power supply since power OFF. Refer to I/O Connector Power Status Output Details on page 4-22 for details.
3	Power	Isolated tran-	ON: 8.8 VDC min./5	
4	ON/OFF Input *2	sistor input (sinking or sourcing)	 ON: 8.8 VDC min./5 mA min. OFF: 1.1 VDC max./0.5 mA max. Connect to SELV 	 If the signal changes from inactive to active, the Box PC will perform one of the following operations. When powered ON, the Box PC will shut down and power OFF. When powered OFF, the Box PC will power ON.
5	UPS Mode			This input is provided to allow monitoring the
6	Input			state of an external UPS unit that provides a compatible power state output signal.

^{*1.} Refer to I/O Connector Power Status Output Details on page 4-22 for Power Status Output details.

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



Additional Information

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

I/O Connector Power Status Output Details

This section provides details of the Power Status Output relay.

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

Power ON Power Status Output Operation

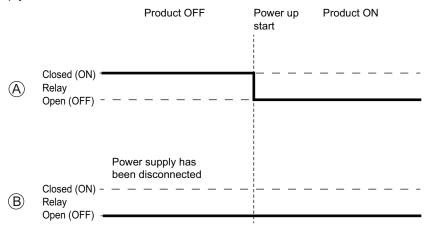
This section provides power ON details of the Power Status Output operation.

The Power Status Output turns ON to indicate that the system has been shut down and the power supply to the Box PC can be turned OFF.

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

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

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





Additional Information

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

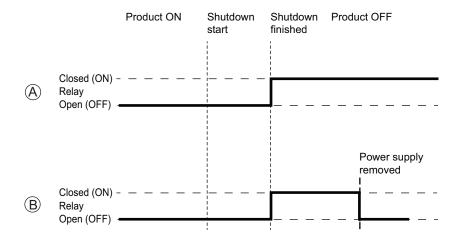
Power OFF Power Status Output Operation

This section provides power OFF details of the Power Status Output operation.

The Power Status Output turns ON to indicate that the system has been shut down and the power supply to the Box PC can be turned OFF.

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

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



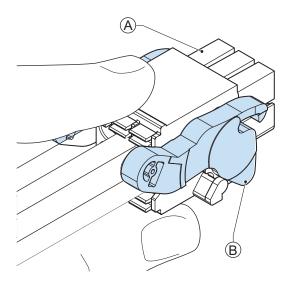


Additional Information

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

Lock and Remove the I/O Connector

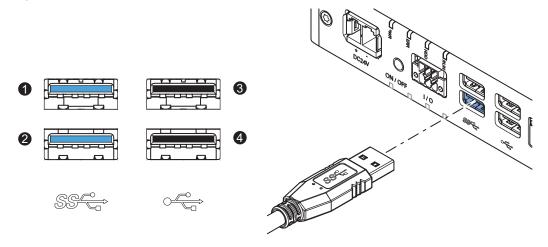
The I/O connector locks into place when the black part of the connector is held and pushed in.



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

4-2-3 USB Connector Specifications

The Industrial Box PC includes four USB connectors. Two connectors provide version 2.0 performance and two connectors provide version 3.0 performance. Details of the USB interface connectors are provided below.



The connector layout represents the USB connectors on the Box PC.

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

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

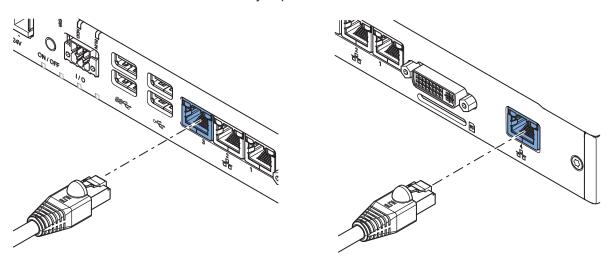


- Refer to 5-4-2 Ground on page 5-29 for grounding details.
- Note that the read/write speed of the connected USB device determines the actual data transfer speed. Use a fast USB device to reduce data transfer durations.

4-2-4 Ethernet Connector Specifications

Details of the RJ45 Ethernet connectors are provided below.

The Ethernet connector locks automatically to prevent unintentional disconnection.



Base layer: 3 RJ45 connectors

Base layer: 1 optional RJ45 connector

The set of 3 RJ45 Ethernet connectors is available on the base layer of all models.

Ethernet Connector Specification Details

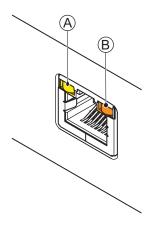
Details of the RJ45 Ethernet connectors are provided below.

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

Ethernet Connector LED Indicators

Details of the RJ45 Ethernet connectors in the base layer are provided below.

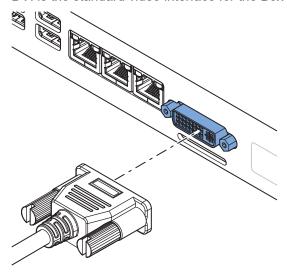
Each connector has LED indicators that display the link, activity and speed status.



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

4-2-5 DVI Connector Specifications

DVI is the standard video interface for the Box PC.





Additional Information

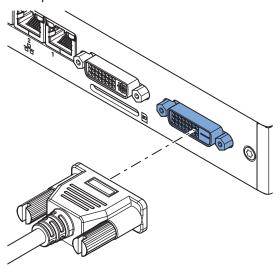
- Refer to 4-1-5 CPU Specifications on page 4-6 for graphics controller details.
- Refer to 5-4-2 Ground on page 5-29 for grounding details.
- Refer to A-2 DVI Connector Pin Details on page A-67 for pin details.

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
Туре	Dual link
Maximum DVI cable length	Dependent upon connected monitor type and resolu-
	tion

4-2-6 DVI-D Connector Specifications

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



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

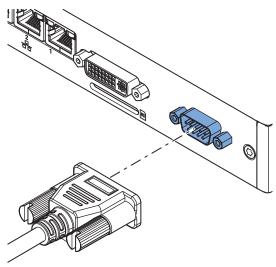


- Refer to 4-1-5 CPU Specifications on page 4-6 for graphics controller details.
- Refer to 5-4-2 Ground on page 5-29 for grounding details.
- Refer to A-2-2 DVI-D Connector Pin Details on page A-68 for pin details.

4-2-7 RS-232C Connector Specifications

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

The RS-232C interface is not isolated from the internal Box PC's components.





Additional Information

- Refer to 5-4-2 Ground on page 5-29 for grounding details.
- Refer to A-3 RS-232C Connector Pin Details on page A-70 for pin details.

4-2-8 NY Monitor Link Connector Specifications

The optional NY Monitor Link connector connects an OMRON Industrial Monitor with an OMRON Industrial PC that has an NY monitor link connector.

The NY Monitor Link communication is a combination of video and USB information.

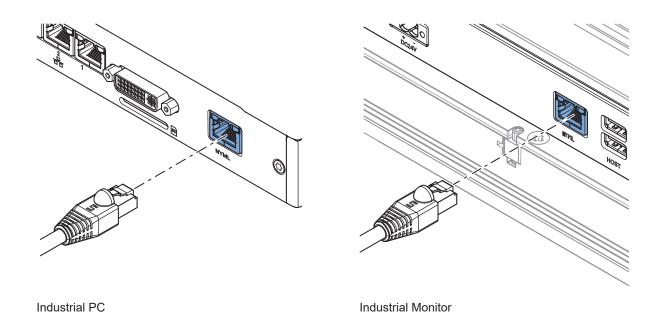
Item	Specifications
Connector type	RJ45
Transmission media	Twisted pair cable of category 6A or higher (double-shielded straight cable with copper braiding and aluminum foil)
Maximum cable length between Industrial PC and Industrial Monitor	100 m
Topology	Line (direct) connection only *1
Video resolution	1,280 x 800 pixels at 60 Hz (12", 15") 1,920 x 1,080 pixels at 60 Hz (19")
Data throughput rate	280 Mbps max.

^{*1.} Use a direct connection between the OMRON Industrial PC and the OMRON Industrial Monitor.

Do not use:

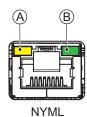
- · Ethernet switches
- · Ethernet hubs
- · Daisy chain connections

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



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
			\ <u> </u>	Lit	Connected
			\ <mark></mark> \		USB communication active
В	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 opera-	Conforms to IEC 60068-2-6.			
tion)	For a Box PC with an SSD: 5 to 8.4 Hz with 3.5 mm single amplitude an			
	8.4 to 150 Hz with 9.8 m/s² for 10 times each in X, Y and Z directions.			
	For a Box PC with a HDD the vibration resistance depends on the mount-			
	ing orientation*2.			
Shock resistance (during operation)	Conforms to IEC 60068-2-27.			
	147 m/s², 3 times in each X, Y and Z directions			
Pollution degree	JIS B3502 and IEC 61131-2: 2 or less			
RTC accuracy	At ambient temperature of 55°C: −3.5 to +0.5 min error per month			
	At ambient temperature of 25°C: −1.5 to +1.5 min error per month			
	At ambient temperature of 0°C: −3 to +1 min error per month			

^{*1.} Refer to 4-3-2 Temperature and Humidity Specifications on page 4-32 for ambient operating temperature details per CPU type.

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

Mounting Orientation	SSD or CFast Card	HDD
Book	9.8 m/s²	2.5 m/s ²
Wall		4.9 m/s²

4-3-2 Temperature and Humidity Specifications

The allowed ambient operating temperature and ambient humidity depend on the model, mounting orientation, and storage device type.

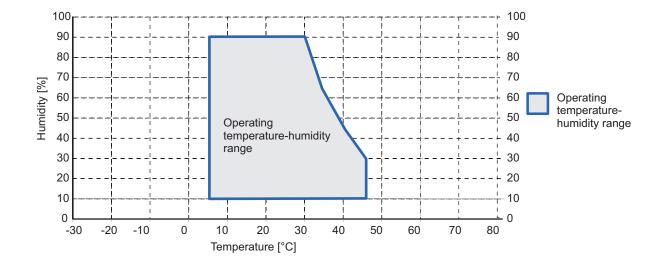
The following sections provide temperature and humidity details and temperature specifications per model.

Temperature and Humidity Graphs

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

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

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

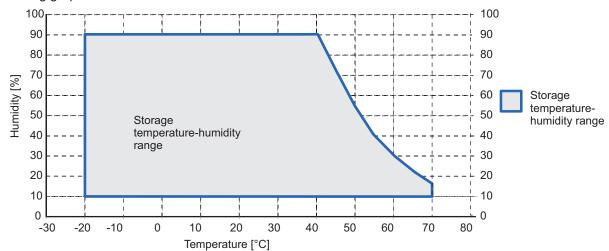




Additional Information

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

- Store the Box PC with a SSD 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.



NYB1C- Temperature Specifications

Ambient operating temperature specifications for model NYB1C-□1.

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



Additional Information

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

Mounting Orientation	Storage device type *1			
Mounting Orientation	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.

NYB1E-□1, NYB1E-□2 Temperature Specifications

Ambient operating temperature specifications for models NYB1E-□1 and NYB1E-□2.

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



Additional Information

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

^{*1.} Refer to 1-4 Product Configuration 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			
Mounting Orientation	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	

NYB17- Temperature Specifications

Ambient operating temperature specifications for model NYB17-□1.

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

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

^{*1.} Refer to 1-4 Product Configuration 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			
Mounting Orientation	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	

NYB2A-□0 Temperature Specifications

Ambient operating temperature specifications for model NYB2A- \square 0.

This Box PC has an Intel® Atom® x5-E3940 CPU.



Additional Information

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

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

NYB2C-□0 Temperature Specifications

Ambient operating temperature specifications for model NYB2C-□0.

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



Additional Information

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

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

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

NYB2C- Temperature Specifications

Ambient operating temperature specifications for model NYB2C-□1.

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



Additional Information

Mounting Ori	Storage device type *1				
Mounting Ori- entation	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:

Manusting Orientation	Storage device type			
Mounting Orientation	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	

NYB25- Temperature Specifications

Ambient operating temperature specifications for model NYB25-□1.

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



Additional Information

Mounting Ori	Storage device type *1				
Mounting Ori- entation	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			
wounting Orientation	1 x HDD 2 x HDD 1 x SSD 1 x F			
Book	0 to 40°C	Not supported	0 to 40°C	
Wall	0 to 35°C	Not supported	0 to 35°C	

NYB27-□0 Temperature Specifications

Ambient operating temperature specifications for model NYB27-□0.

This Box PC has an Intel[®] Core[™] i7-7820EQ CPU.



Additional Information

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

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

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

NYB27-□1, NYB27-□2 Temperature Specifications

Ambient operating temperature specifications for model NYB27-□1 and NYB27-□2.

This Box PC has an Intel[®] Core[™] i7-7820EQ CPU.



Additional Information

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

^{*1.} Refer to 1-4 Product Configuration 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			
Mounting Orientation	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	

NYB35-□0 Temperature Specifications

Ambient operating temperature specifications for model NYB35-□0.

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



Additional Information

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

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

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

NYB35-□1, NYB35-□2 Temperature Specifications

Ambient operating temperature specifications for models NYB35-□1 and NYB35-□2.

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



Additional Information

Mounting Ori- entation	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			
Mounting Orientation	1 x HDD	2 x HDD	1 x SSD 1 x HDD	
Book	0 to 40°C	Not supported	0 to 40°C	
Wall	0 to 35°C	Not supported	0 to 35°C	

4-3-3 Recycling Specifications

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

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



Precautions for Safe Use



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



Dispose in accordance with applicable regulations.

Installation

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

Unpac	k	5-2
5-1-1		
5-1-2		
Install	Options	5-5
5-2-1		
5-2-2		
5-2-3	Install the PCIe Card	5-10
Mount		5-16
5-3-1		
5-3-2		
5-3-3		
5-3-4		
5-3-5		
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
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
Conne	ct	5-42
5-5-1		
5-5-2		
Initial I	Power ON	5-45
5-6-2		
Install	Software	5-49
Conne	ct UPS	5-50
5-8-1		
5-8-2		
Create	Backup and Repair Data	5-56
	5-1-1 5-1-2 Install 5-2-1 5-2-2 5-2-3 Mount 5-3-1 5-3-2 5-3-3 5-3-4 5-3-5 5-3-6 5-3-7 5-3-8 5-3-9 Wire 5-4-1 5-4-2 5-4-3 5-4-4 Conne 5-5-1 5-6-1 5-6-2 Install Conne 5-8-1 5-8-2	5-1-1 Unpack Procedure 5-1-2 Items Supplied

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:

in 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

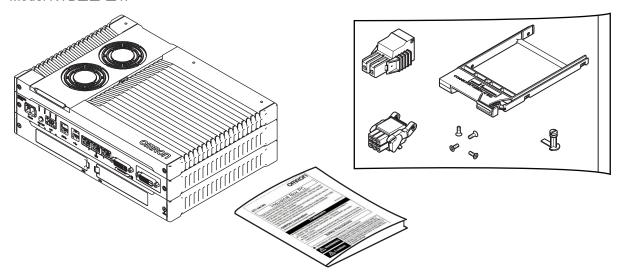
- Refer to Items Supplied with the Industrial Box PC on page 5-3 for more details.
- Refer to Items Supplied with the Brackets on page 5-4 for more details.

Items Supplied with the Industrial Box PC

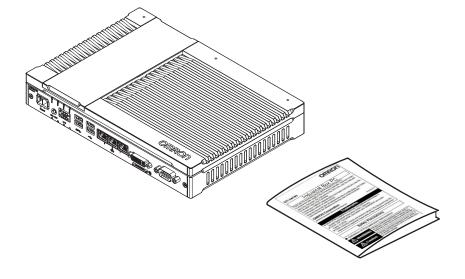
This section describes the items supplied with your Industrial Box PC.

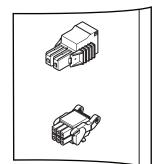
- · Industrial Box PC
- Documentation:
 - Safety Precautions sheets (English and Japanese)
 - General Compliance Information and Instructions for EU
 - · Standards and Certifications sheet
- · Bag with:
 - Power connector
 - I/O connector
- Models with an Expansion Layer will have inside the bag also:
 - · Drive bracket for drive installation
 - 4 Mounting screws for drive installation
 - PCle Card support for PCle 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 3-22 for bracket details.
- Refer to 5-3-8 Book Mount Procedure on page 5-26 for book mount installation.
- Refer to 5-3-9 Wall Mount Procedure on page 5-27 for wall mount installation.

Book Mount

Check if the content is complete.

Supplied items:

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

Wall Mount

Check if the content is complete.

Supplied items:

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

5-2 Install Options

This section describes the installable options for the Industrial Box PC.

5-2-1 Install RAID 1

RAID is only available for models NYB \(\subseteq - \subseteq 2 \subseteq \subseteq.

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



Additional Information

- Refer to 3-10-5 HDD and SSD Storage Devices on page 3-25 for the recommended drive models.
- Refer to 4-1-7 Storage Device Specifications on page 4-11 for drive specifications.

Prepare the following items:

- · 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

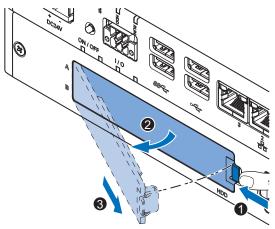
- Depending on the product configuration 0, 1 or 2 drives can be pre-installed. Refer to 1-4 Product Configuration Box PC on page 1-5 for details.
- Depending on the CPU type one or two drives are supported.
 Refer to 4-1-5 CPU Specifications on page 4-6 for the number of supported drives.
- Refer to 3-10-5 HDD and SSD Storage Devices on page 3-25 for the recommended drive models.
- Refer to 4-1-7 Storage Device Specifications on page 4-11 for drive specifications.

Prepare the following items:

- The drive
 - A drive is not supplied with the Box PC.
- The drive bracket with mounting screws
 These are supplied with the Box PC.

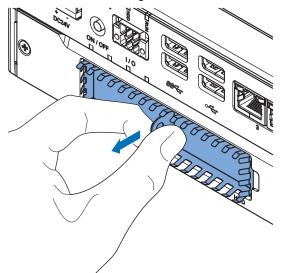
To install a drive:

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

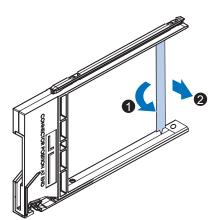


- 1) Push the lock lever 1.
- 2) Tilt the drive cover 2.
- 3) Remove the drive cover 3.

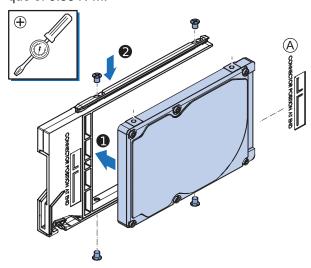
3 Pull the metal shielding cover out of the Box PC.



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

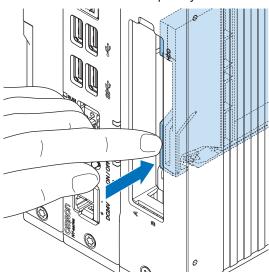


5 Align the connectors of the drive as shown ⓐ on the bracket. Then insert the replacement drive **1** in the bracket and insert the 4 mounting screws **2**. Tighten these screws with a torque of 0.35 N⋅m.



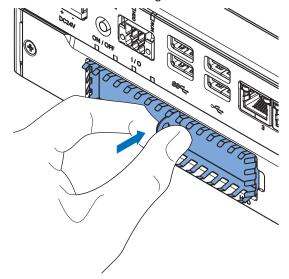
6 Insert the bracket with the drive in the correct bay.
Refer to 3-1-3 Expansion Layer (Optional) on page 3-6 for bay details.

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



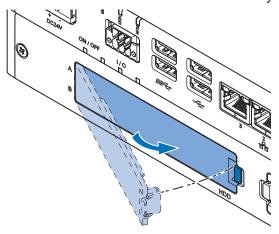
The drive bracket will lock into place when it is fully inserted.

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.
 - 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 PCle Card

Prepare the following items:

The PCle Card.
 A PCle Card is not supplied with the Box PC.



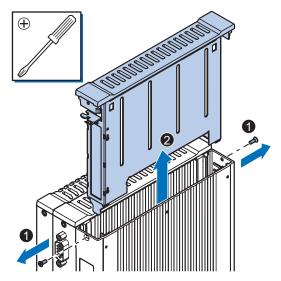
Additional Information

- Depending on the product configuration a PCle 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 4-14 for PCIe specifications.
- The PCle 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 PCle Drawer.

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

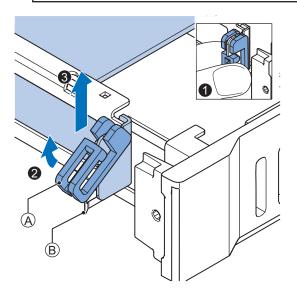


Remove the Card Clip from the PCle Drawer.

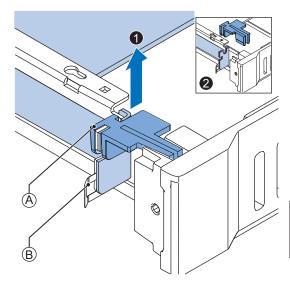
There are two types of Card Clips available. Use the steps applicable to your type.

riangle CAUTION

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



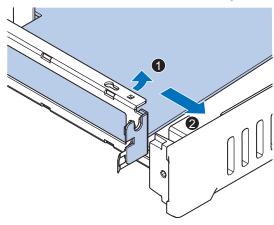
- A Card Clip
- B Sheet metal frame tab
- Grip the Card Clip (A) on the sides (1). Pull the middle of the Card Clip to unlock it (2) and remove it (3) from the PCle Drawer.



- A Card Clip
- B Sheet metal frame tab

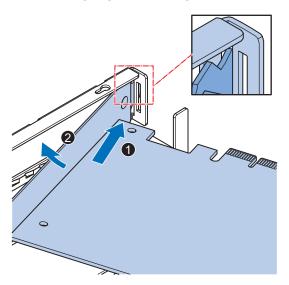
Grip the Card Clip (A) on the sides. Lift the Card Clip (1) and remove it (2) from the PCle Drawer.

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 PCle Card in the PCle Drawer.



Ensure to insert the PCIe Card in the correct opening.

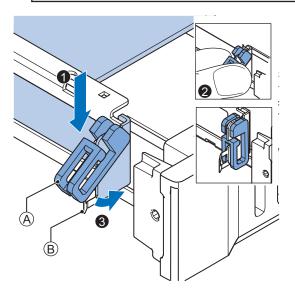
Ensure the thin sheet metal frame is positioned between the PCIe Card and the PCIe Drawer to ensure a good conductive contact.

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.

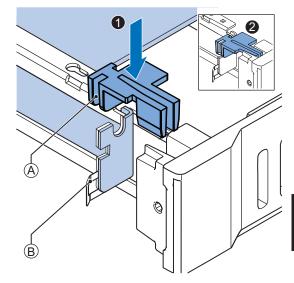
⚠ CAUTION

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

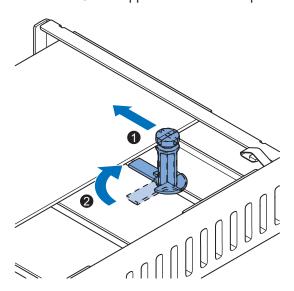
Place the Card Clip (a) in the PCIe Card and PCIe Drawer (b), grip the Card Clip on the sides (c) and then rotate the Clip (d) to lock it in place.



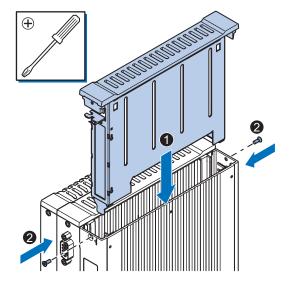
- A Card Clip
- B Sheet metal frame tab

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

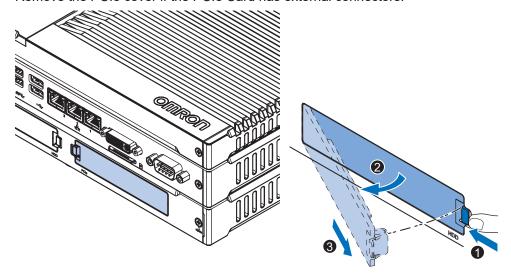
Slide the Card Support of so that it supports the side of the PCle Card.
The card should be in small groove so there is support below and above the card.
Rotate the Card Support of to lock it in place.



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 PCle 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.

riangle 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

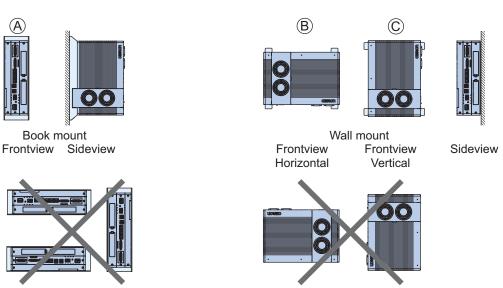
- Ensure you have installed the options before you mount the product. Refer to *5-2 Install Options* on page 5-5 for option details.
- Refer to 5-3-8 Book Mount Procedure on page 5-26 or 5-3-9 Wall Mount Procedure on page 5-27 for orientation details.
- Refer to 5-3-3 Temperature on page 5-17 for temperature 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
 © and vertically mounted

Do not install the Box PC in other orientations.



5-3-3 Temperature

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

Distance for Cooling

Adequate airflow around the Industrial Box PC is required.

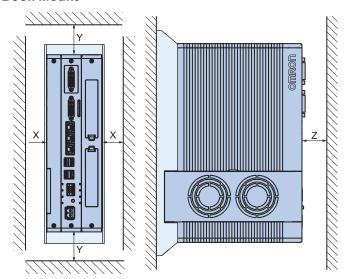


Additional Information

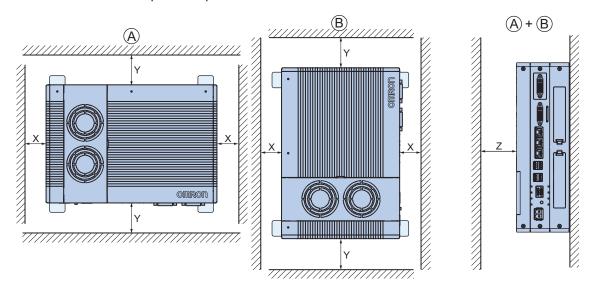
- The ambient temperature must be within the operating range.
 Refer to 4-3-1 Operation Environment Specifications on page 4-31 for temperature specifications.
- Allow space to accommodate for the bending radius of the cables.
 - Refer to 3-10 Optional Hardware on page 3-22 for cable bending requirements 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
Υ	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.

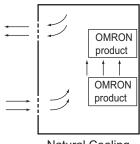
High Temperatures

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.

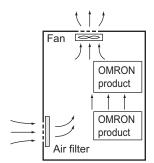
- Do not install the Box PC at the top of the panel, where hot air tends to stagnate.
- · To provide ventilation space above and below the Box PC, leave sufficient distance from other devices, wiring ducts, etc.
- · Do not mount the Box PC in the wrong direction (e.g., vertically or upside down). Doing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



Natural Cooling

Forced Ventilation

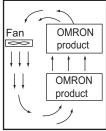
Forced ventilation with a fan in the top of the control cabinet.



Forced Ventilation Method

Forced Air Circulation

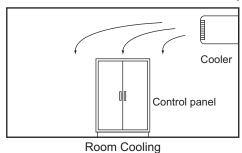
Forced circulation with a fan inside the closed control cabinet.



Forced Air Circulation

Room Cooling

Cool the entire room where the control panel is located.



Low Temperatures

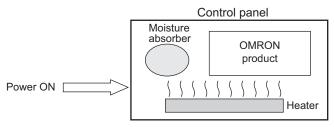
The Box PC may not start normally if the temperature is below 0°C when the power is turned ON. Maintain an air temperature of at least 5°C inside the panel, by implementing measures such as installing a low-capacity space heater in the panel.

Alternatively, leave the Box PC power ON to keep the Box PC warm.

5-3-4 Humidity

Rapid temperature changes can cause condensation to occur, resulting in malfunctioning due to short-circuiting.

When there is a possibility of this occurring, take measures against condensation, such as leaving the Box PC power ON at night or installing a heater in the control panel to keep it warmer.



Examples of Measures against Condensation

5-3-5 Vibration and Shock

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

designed so that malfunctioning will not occur within the specifications for vibration and shock. If, however, the Box PC is to be used in a location in which it will be directly subjected to regular vibration or shock, then implement the following countermeasures:

- Separate the Box PC control panel from the source of the vibration or shock. Or secure the Box PC and the control panel with rubber padding to prevent vibration.
- · Make the building or the floor vibration-resistant.
- Prevent shocks when other devices in the panel, such as electromagnetic contactors, operate. Secure either the source of the shock or the Box PC with rubber padding.

5-3-6 Atmosphere

Using the Box PC in any of the following locations can cause defective contact with connectors and corrosion of components. Implement countermeasures such as purging the air as required.

- In locations exposed to dust, dirt, salt, metal powder, soot, or organic solvents, use a panel with an airtight structure. Be careful of temperature increases inside the panel.
- In locations exposed to corrosive gas, purge the air inside the panel to clear the gas and then pressurize the inside of the panel to prevent gas from entering from outside.
- In locations where flammable gas is present, either use an explosion-protected construction or do not use the Box PC.

5-3-7 Electrical Environment

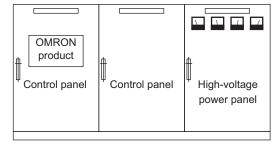
When installing or wiring devices, make sure that there will be no danger to people and that noise will not interfere with electrical signals.

Installation Location

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

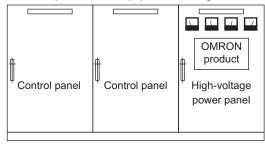
Example of Recommended Equipment Arrangement





Example of Poor Equipment Arrangement

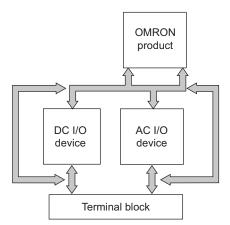
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Examples of Equipment Arrangement in Panel with High-voltage Devices

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.

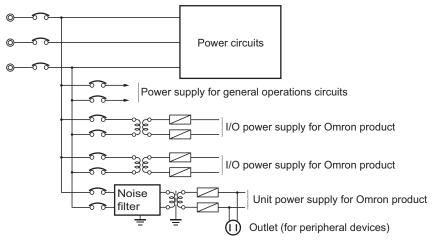


Example of Arrangement in Panel

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.

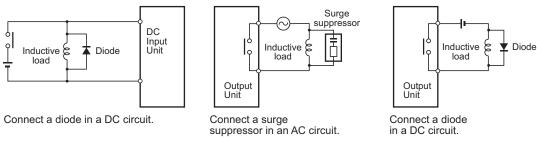


Power Supply System Diagram

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.

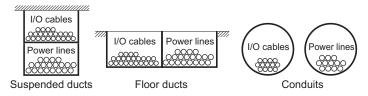


Input Signal Noise Countermeasures

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.



I/O Cable Arrangement

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

External Wiring

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

Wiring Routes

Each of the following combinations includes different signal types, properties, or levels. They will cause the signal-to-noise ratio to drop due to factors such as electrical induction. As a general rule

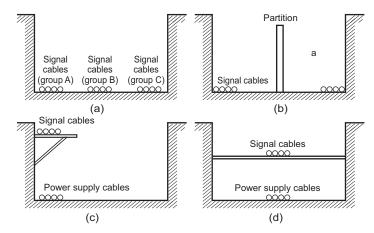
when wiring, either use separate cables or separate wiring routes for these items. Future maintenance operations and changes to the system will also be made easier by carefully organizing the wiring from the start.

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

(Routing of) Wiring

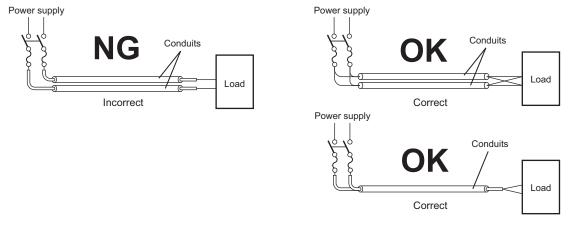
Observe the following points when wiring power supply and signal cables.

- When routing signal cables with differing characteristics through the same duct, always keep them separated.
- As much as possible, avoid routing multiple power supply lines through the same duct. If it cannot be avoided, then construct a partition between them in the duct and ground the partition.



Partitioning Methods for Signal and Power Supply Cables

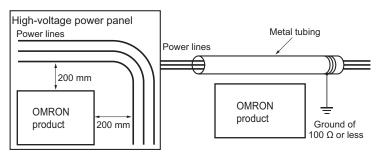
• To avoid overheating the conduits when using conduits for wiring, do not place wires for a single circuit in separate conduits.



Parallel Wiring (Single Phase)

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

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



Example: Separating an OMRON product from Power Lines

Wiring Ducts

Whenever possible, route the cables and wires through wiring ducts.

Install the wiring ducts so that it is easy to route the wires from the Industrial Box PC directly into the duct.



Additional Information

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

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



Other Precautions

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

5-3-8 Book Mount Procedure

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



Additional Information

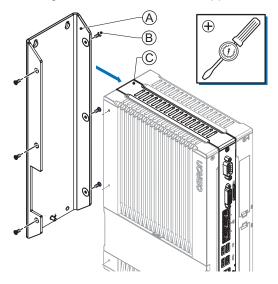
- Refer to 5-4-2 Ground on page 5-29 for grounding details.
- Refer to 3-10-1 Mounting Brackets on page 3-22 for the bracket model.

To mount the Box PC:

1 The Box PC has on one side light grey circles around the threaded mounting holes. The bookmount 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 4-17 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.



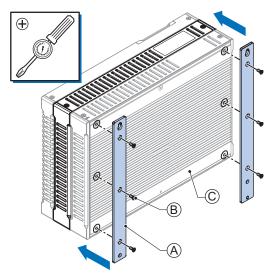
Additional Information

- Refer to 5-4-2 Ground on page 5-29 for grounding details.
- Refer to 3-10-1 Mounting Brackets on page 3-22 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 4-17 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.

riangle 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.



riangle WARNING

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



riangle 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.

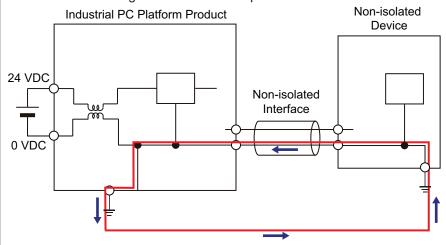
WARNING

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.





riangle 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.

Charification of commu	and if in the community of the community		Earthing methods	
Specification of commu- nications cables	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.

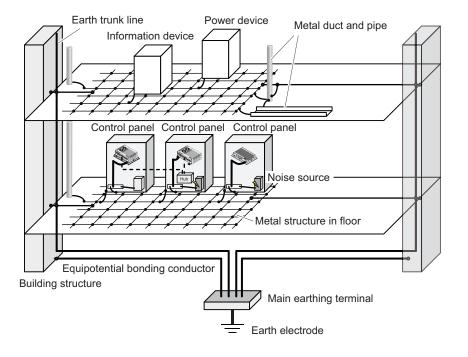
Equipotential Bonding System

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

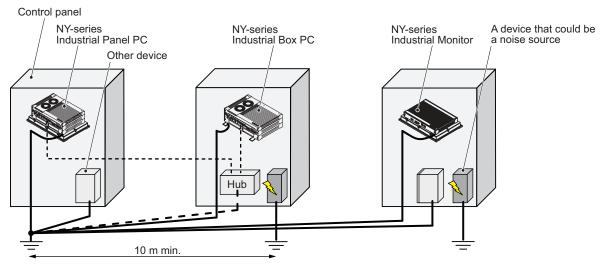
If the earthing method used for the building is not equipotential bonding or the earthing system is unknown, choose (a) from among the earthing methods given below.

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.

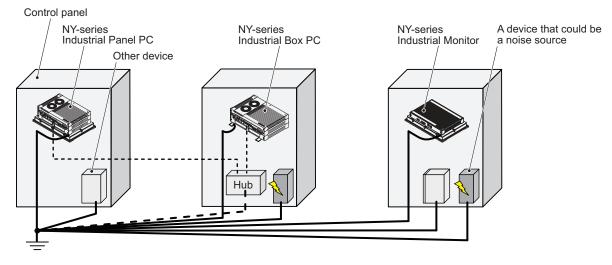
Connect the ground lines of the device that is connected with a communications cable and other devices as a bundle to a single earth electrode. Be sure that the earth electrode is separated by a minimum of 10 m from any other earth electrode of a device that could be a noise source.



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.

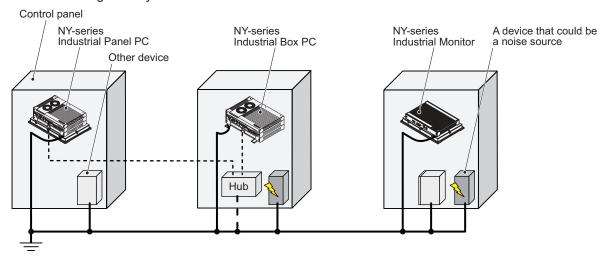
This earthing method is not recommended because the device that could be a noise source may interfere electromagnetically with other devices.



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

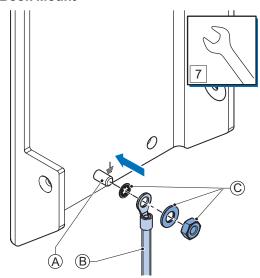
This section provides details about the ground connection.

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

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

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

Book Mount

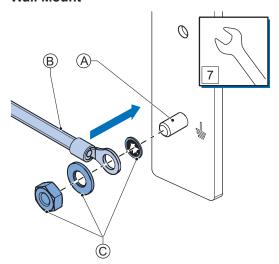


Mount the ground connection wire $^{\textcircled{B}}$ to the functional ground terminal $^{\textcircled{A}}$ using the washers and nut

 \bigcirc . 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 mm max.





5-4-3 Wire the Power Connector

This section describes how to wire the power connector.



Precautions for Safe Use

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



Additional Information

- The selected conductor size must match with the used maximum power supply capacity or an overcurrent protection device must be used.
- The used wires and the overcurrent protection device must meet the applicable national standards.

Standards are:

- NEC (National Electric Code)
- CEC (Canadian Electrical Code)
- · international applicable standards
- Refer to 4-1-2 General Electrical Specifications on page 4-3 for electrical specifications.
- Refer to 4-1-3 Power Consumption Specifications on page 4-4 for power consumption specifications.
- Refer to 3-10-11 UPS on page 3-31 for UPS information.

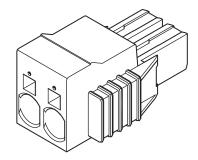
Power Connector Wiring Materials

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 3-10-10 Power Supply on page 3-30 for more information.
- Refer to 4-1-3 Power Consumption Specifications on page 4-4 for power consumption details.

Power Connector Wiring Procedure

Use the following procedure to wire the power connector.

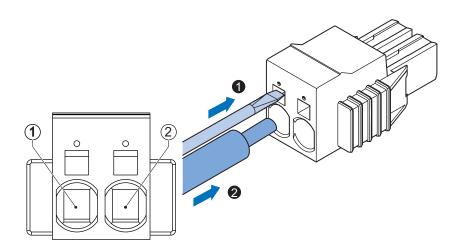
- **1** Ensure the power connector is not connected to the Box PC.
- 2 Remove the sheath from the power supply wires.



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 to unlock the cable entry and then push the wire all the way to the back of the cable opening •.



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.

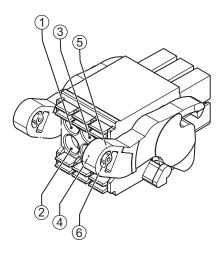
I/O Connector Wiring Materials

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	Power Status Output	The Power Status Output has an internal relay. Wire this accord-
2		ing to the input device connected to the Power Status Output.

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



Additional Information

- Refer to 4-2-2 I/O Connector Specifications on page 4-20 for I/O connector specifications.
- Refer to I/O Connector Power Status Output Details on page 4-22 for power status output details.
- Refer to 3-10-11 UPS on page 3-31 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.

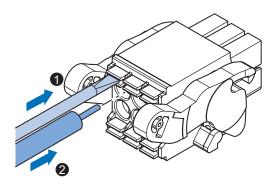




Precautions for Safe Use

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.
- 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.

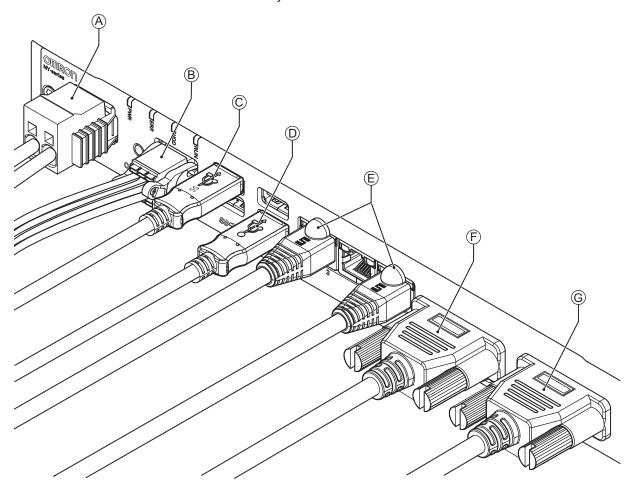
Do not apply stress to the cable after you have connected the wires.

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
Α	Power connector	Lockable power connector
В	I/O connector	2 inputs (UPS signal and power OFF control) and 1 output (power state)
С	USB 3.0 connector	2 USB 3.0 connectors
D	USB 2.0 connector	2 USB 2.0 connectors
E	10BASE-T/100BASE-TX/ 1000BASE-T Ethernet con- nectors	3 RJ45 Gb Ethernet connectors
F	DVI connector	Digital Visual Interface connector

Item	Name	Description
G	Option port	Interface connection options for peripheral devices or an additional
		monitor:
		RS-232C connector (default)
		DVI-D connector
		NY Monitor Link connector
		RJ45 Gb Ethernet connector

5-5-2 Connection Procedure

Use the following procedure to connect the 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.

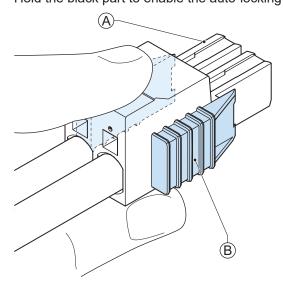


Additional Information

- Refer to 5-3 Mount on page 5-16 for mounting details.
- Refer to 3-10 Optional Hardware on page 3-22 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:

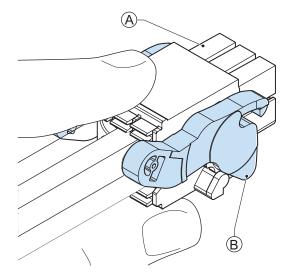
- **1** Ensure the ground terminal is connected. Refer to *5-4-2 Ground* on page 5-29 for grounding details.
- Connect the power connector (A).Hold the black part to enable the auto-locking mechanism.



Do not push the orange sliders $^{\textcircled{B}}$ 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 [®] because this will unlock the connector.

4 Connect an external monitor such as the Industrial Monitor.

Connect the monitor to the DVI connector and tighten the fastening screws or use the optional NYML connector.

For an Industrial Panel PC 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 <u>OMRON</u> website for download details.

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 DVI-D cable while power is supplied to the Box PC.
- If a Windows operating system is preinstalled the Windows configuration will automatically start.



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



Precautions for Safe Use

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



Additional Information

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

5-6-2 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 procedure an automatic restart will result in the Windows home screen.

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

Pay special attention to the following steps:

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

MARNING

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.

- **3** Login
- **4** Check and if necessary adjust the time and the timezone

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



Additional Information

- Use the Industrial Monitor Utility to adjust the display and/or the connected OMRON Industrial Monitor.
- Verify that the Box PC is responding to finger touches on the touchscreen of the product.
- 6 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 Power Attendant Lite Utility Software.
 Refer to 5-8-1 Connect UPS Using the USB Connector on page 5-51 for details.
 This is the preferred connection method.
- The I/O connector and a custom software program
 Refer to 5-8-2 Connect UPS Using the I/O Connector on page 5-53 for details.

riangle WARNING

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





Precautions for Safe Use

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



Additional Information

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

5-8-1 Connect UPS Using the USB Connector

The Power Attendant Lite Utility software monitors the UPS status via the USB interface and shuts down the Industrial Box PC when needed.

UPS Drivers and the required software is available.

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

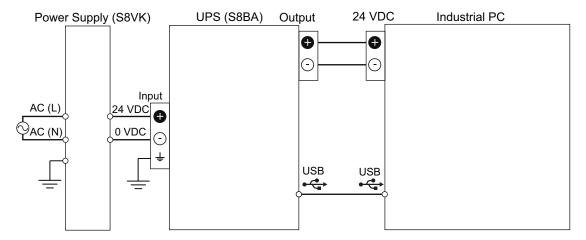


Precautions for Safe Use

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

Follow the steps below to connect the S8BA UPS with a USB cable and to configure it correctly. Refer to *3-10-11 UPS* on page 3-31 for more information.

- **1** Ensure the revision number of the UPS is correct. Refer to *3-10-11 UPS* on page 3-31 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 Install the Power Attendant Lite Utility.
 Refer to NY-series Operating Systems and Software Utilities Manual (Cat. No. W616) for Power Attendant Lite Utility details.
- **9** Configure the UPS using the Power Attendant Lite Utility.

 Refer to *NY-series Operating Systems and Software Utilities Manual (Cat. No. W616)* for Power Attendant Lite Utility details.
- **10** Configure the Box PC to auto-start after power loss within the BIOS settings. Refer to *A-1 BIOS* on page A-2 for BIOS details.
- 11 Simulate a power interruption and confirm a correct shutdown of the Box PC.
 - · Start the Box PC
 - · Start applications
 - Create a power interruption
 - Monitor the shutdown sequence and confirm a correct shutdown sequence

The UPS is connected and configured.

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



Additional Information

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

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

The I/O connector of the Industrial Box PC:

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



Additional Information

- A UPS connection using the I/O connector is only possible for a Box PC with a Windows operating system. For all other operating systems use the USB connector to connect the UPS. Refer to 5-8-1 Connect UPS Using the USB Connector on page 5-51 for details.
- The Box PC does not react automatically to the UPS Mode Input.
 A custom software program is required to shut down the Box PC when needed.

UPS Drivers and the required software is available.

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



Precautions for Safe Use

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

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

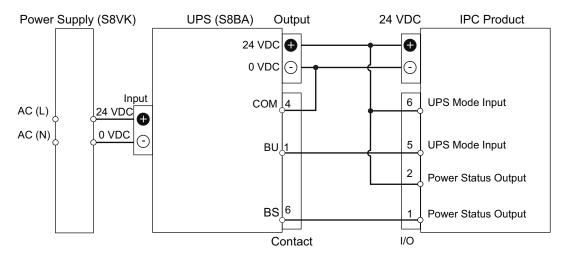
Refer to 5-4-4 Wire the I/O Connector on page 5-39 for I/O Connector details.

1

Ensure the revision number of the UPS is correct.

Refer to *3-10-11 UPS* on page 3-31 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 Contact port of the S8BA UPS to the I/O port of the Box PC with the connection cable S8BW-C02.



- **4** Power ON the Box PC.
- **5** Configure the UPS.
 - 1) Connect the USB cable supplied with the UPS to the USB connector of the UPS and to the USB connector of the Box PC.
 - Configure the UPS using the UPS Settings Utility.
 Refer to UPS Setting Utility Instruction Manual for S8BA/BU-2RWL for details.
 - 3) Remove the USB cable between the UPS and the Box PC
- **6** Configure the Box PC to auto-start after power loss within the BIOS settings. Refer to *A-1 BIOS* on page A-2 for BIOS details.
- 7 Create a software program that monitors the UPS Mode Input and initiates Power OFF of the Box PC when the UPS Mode Input becomes active.

If the Box PC has a Windows operating system then use the Industrial PC System API to create the software program.

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

- 8 Install the created software program.
- **9** Test the created software program and ensure it functions correctly.

 ${f 10}$ Simulate a power interruption and confirm a correct shutdown of the Box PC.

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

The UPS is connected and configured.

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



Additional Information

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

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

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

2 Wait until the PWR LED is ON and verify that the ERR LED is OFF.

The Box PC is ON and the Operating System, if installed, starts.



Additional Information

- Refer to 4-2-2 I/O Connector Specifications on page 4-20 for connector specifications.
- Refer to 5-4-4 Wire the I/O Connector on page 5-39 for wiring details.

6-1-3 Auto Power ON

The Box PC can be configured to start up when power is supplied to the power connector.

The Power Loss Control BIOS setting controls this behavior.

Set the Power Loss Control setting to **Turn ON** to activate the Auto Power ON function.



Additional Information

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

6-2 Power OFF

This section provides Power OFF details.

Before following power OFF procedures below, check that the 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.
- 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 the Power ON/OFF Input (pins 3 and 4) of the I/O connector. The input signal must remain ON for a minimum of 60 ms and a maximum of 750 ms to be correctly detected by the Industrial Box PC.

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 4-2-2 I/O Connector Specifications on page 4-20 for connector specifications.
- Refer to 5-4-4 Wire the I/O Connector on page 5-39 for wiring details.

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



Precautions for Safe Use

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

- 1 Ensure all programs are closed.
 If required, close all active programs to prevent losing unsaved data.
- 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 Industrial Box PC will power OFF.
 Any optional operating system settings related to power OFF will be disregarded.

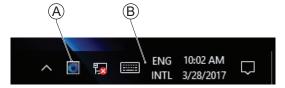
The Box PC is powered OFF.

Wait until the PWR LED is 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.

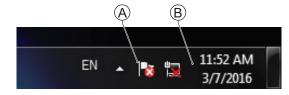
To react to a product message:

- Select the Industrial PC Tray Utility icon.
 A pop-up window will appear.
- **2** Read the message available in the pop-up.
- 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

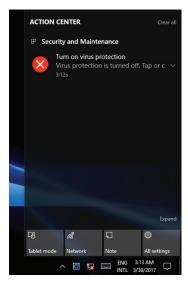
Check the Windows Action Center icon for a Warning or Error symbol.

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.

Maintenance

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

7-1	Preve	entive Maintenance	7-2
	7-1-1	Preventive Maintenance Schedule	
	7-1-2	Clean the Box PC	7-3
7-2	Corre	ective Maintenance	7-4
	7-2-1	Warning and Error Messages	7-4
	7-2-2	Remove the Cover	
	7-2-3	Replace the Fan Unit	7-7
	7-2-4	Replace the Battery	7-9
	7-2-5	Replace a Drive	
	7-2-6	Replace the PCIe Card	7-16
	7-2-7	Replace the CFast Card	7-21

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	 Refer to 7-2-1 Warning and Error Messages on page 7-4 for Box PC Messages. Refer to 6-4 React to Windows Messages on page 6-6 for Windows Messages. Refer to 3-2 LED Indicators on page 3-7 for LED details.
Monitor storage devices that do not comply to the Omron specifications	Refer to Storage Device Considerations on page 3-25 for details.

the Box PC on page 7-3 for cleaning details.
perating Systems and Software Utilities Manual (Cat.
ľ

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

Periodically but at least every 6 months	Reference
Check the ambient environment: Temperature and humidity within specifications Noise sources not close to the Industrial Box PC	Refer to 4-3 Environmental Specifications on page 4-31 for environmental specifications.
Check installation: Industrial Box PC mounted secure- ly	Refer to 5-3 Mount on page 5-16 for installation details.
 Check wiring and connections: Cable connectors fully inserted and locked No damaged wiring or connectors 	Refer to 5-4 Wire on page 5-28 for wiring details. Refer to 5-5 Connect on page 5-42 for connection details.
For a cooling layer with removable cover: Check the battery replacement date. Replace the battery before the replacement date.	 Refer to 7-2-2 Remove the Cover on page 7-6 to check the label. Refer to 7-2-4 Replace the Battery on page 7-9 to replace the battery.
Check the backup and repair media.	Refer to NY-series Operating Systems and Software Utilities Manual (Cat. No. W616) for details.

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

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.

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



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

7-2-1 Warning and Error Messages

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

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

The following message channels are available.

LED Indicators

The ERR LED indicator provides information on warnings and errors.

Industrial PC Support Utility

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

The Industrial PC Support Utility indicates:

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

Replace the battery.

Windows Action Center

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

The Windows Action Center indicates security and maintenance issues.

Some examples:

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

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

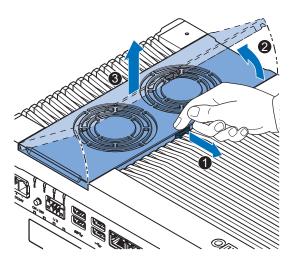
Power OFF your Box PC if it has active cooling.



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 1 to unlock the Cover.
- 2) Lift the side **2** to tilt the Cover.
- 3) Remove 3 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 3-20 for the model.

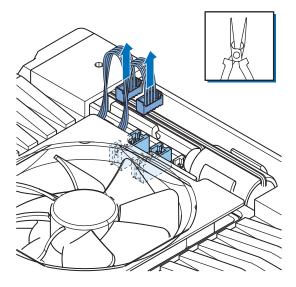
- **1** Power OFF the Box PC.
- **2** Remove the Cover of the Box PC.



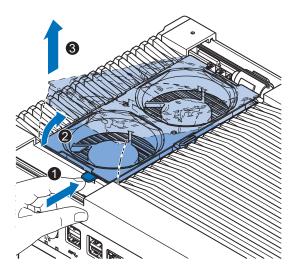
Additional Information

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

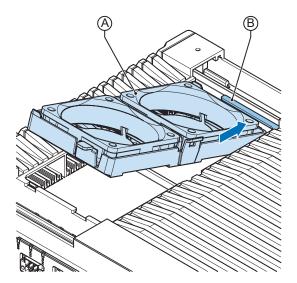
3 Disconnect the Fan Connectors from the board.



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.
- Insert the new Fan Unit in the Box PC.
 Ensure the end of the Fan Unit is positioned under the fan guide is.



- **6** Connect the Fan Connectors to the board.
- **7** Mount the Cover.
- 8 Power ON the system.
 Confirm both fans rotate immediately after Power ON.

The fans are replaced and the alarm is automatically reset.

7-2-4 Replace the Battery

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



Precautions for Safe Use

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



Precautions for Correct Use

- Always touch a grounded piece of metal to discharge static electricity from your body before starting an installation or maintenance procedure.
- Make sure to use a battery of the correct type and install the battery properly.
- Apply power for at least five minutes before changing the battery. Mount a new battery within
 five minutes after turning OFF the power supply. If power is not supplied for at least five minutes, the clock data may be lost. Check the clock data after changing the battery.
- Turn ON the power after replacing the battery for a product that has been unused for 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 3-20 for the battery model.

Use the following procedure to replace the battery:

- 1
- Power OFF the Box PC.
- 2

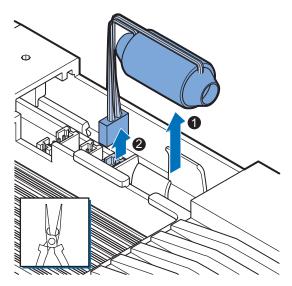
Remove the cover.



Additional Information

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

- **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.
- Place the new battery in the Box PC.
 Ensure the wires are at the side of the battery and not on top of the battery. If the wires are on top of the battery this might make closing and opening the cover more difficult.
- **7** Write the next date of replacement on the label at the inside of the cover.



Additional Information

Refer to 3-9-1 Battery on page 3-20 for lifetime of the battery.

- **8** Mount the cover.
- **9** Remove the power connector for at least 3 seconds to reset the battery warning.
- **10** Power ON the Box PC.
- **11** Check the Date and Time in the operating system. Correct the Date and Time if this is required.

The battery is replaced and the alarm is reset.

7-2-5 Replace a Drive

Use the following procedure to replace a drive.

Prepare the new drive.

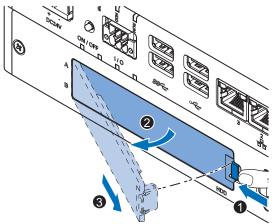


Additional Information

- Refer to 1-4 Product Configuration Box PC on page 1-5 for the installed drive model.
- Refer to 3-10-5 HDD and SSD Storage Devices on page 3-25 for the available drive models.
- Refer to 4-1-7 Storage Device Specifications on page 4-11 for drive specifications.

To replace a drive:

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



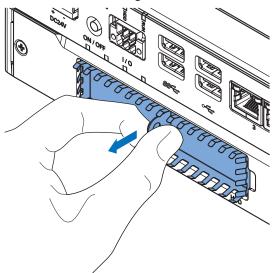
- 1) Push the lock lever 1.
- 2) Tilt the cover 2.
- 3) Remove the drive cover **3**.



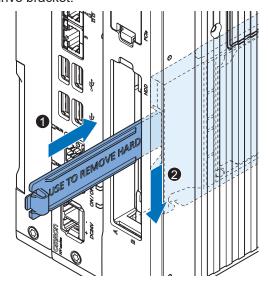
Additional Information

- Refer to 3-7 Drive Bays on page 3-18 for the location of the drive cover.
- The Box PC has 2 drive bays, marked with "A" and "B" at the left side of the drive cover. Take
 note of the bay position for the drive that is being removed and do not place a drive in the
 incorrect bay.

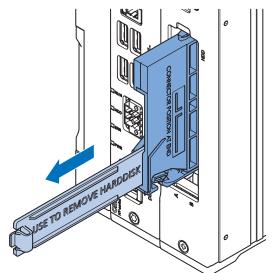
3 Pull the metal shielding cover out of the Box PC.



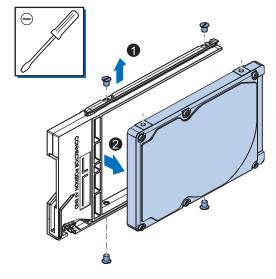
4 Insert the drive cover in the drive bracket bay 1 and move it down 2 so that it locks in the drive bracket.



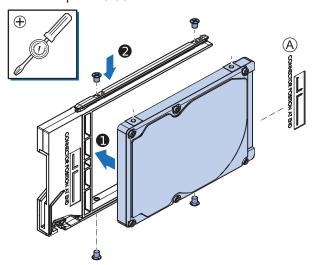
5 Remove the drive bracket from the Box PC using the drive cover.



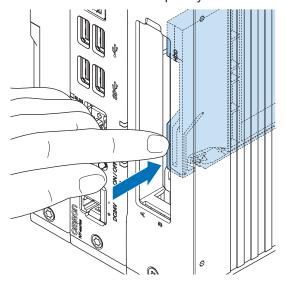
6 Remove the 4 mounting screws **1** and then remove the drive **2** from the drive bracket.



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

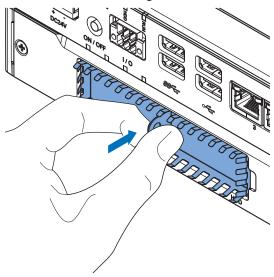


8 Insert the bracket with the replacement drive into the correct bay of the Box PC. Ensure the bracket is completely in the Box PC with an extra push.



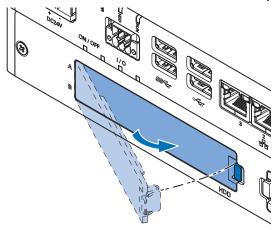
The drive bracket will lock into place when it is fully inserted.





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

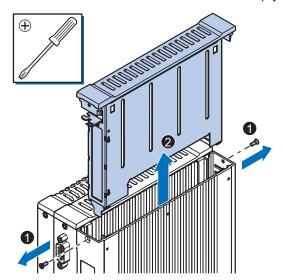
Refer to 4-1-8 PCIe Card Specifications on page 4-14 for PCIe specifications.

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

To replace the PCIe Card:

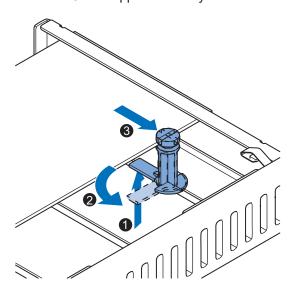
- **1** Power OFF the system.
- **2** Unmount the Box PC.
- **3** Remove the two crosshead screws **1** indicated with "open" and then pull up **2** the PCle Drawer.

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



4 Push the notch • at the bottom of the Card Support up and rotate • the Card Support.

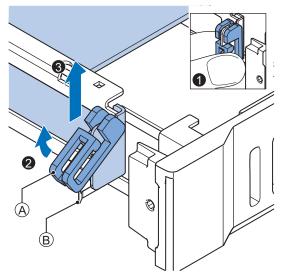
Slide the Card Support • away from the card to create space and to remove it.



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

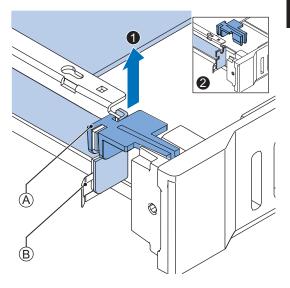
⚠ CAUTION

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



- A Card Clip
- B Sheet metal frame tab

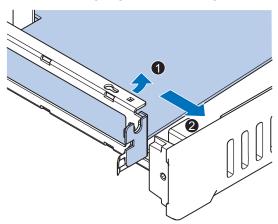
Grip the Card Clip (A) on the sides (1). Pull the middle of the Card Clip to unlock it (2) and remove it (3) from the PCle Drawer.



- A Card Clip
- B Sheet metal frame tab

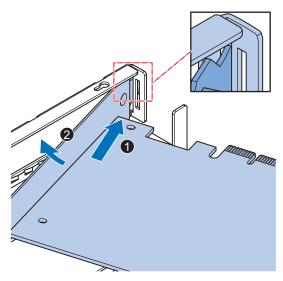
Grip the Card Clip (A) on the sides. Lift the Card Clip (1) and remove it (2) from the PCle Drawer.

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.



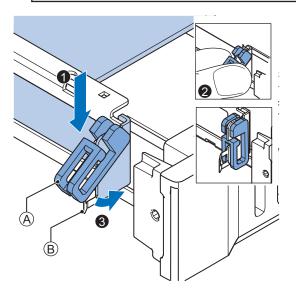
Ensure the PCIe Card is inserted into the correct opening.

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.

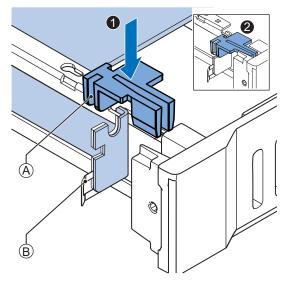
riangle CAUTION

When installing or removing a PCle 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 PCle Card and PCle Drawer (1), grip the Card Clip on the sides (2) and then rotate the Clip (3) to lock it in place.

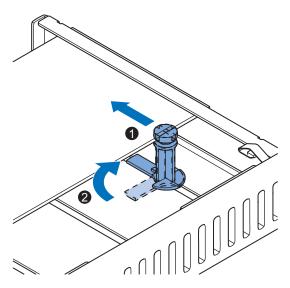


- A Card Clip
- B Sheet metal frame tab

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

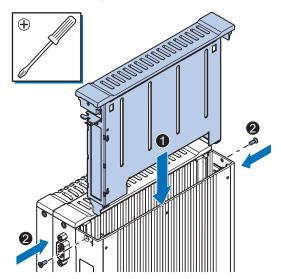
9 Slide the Card Support • so that it supports the side of the PCIe Card.

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.

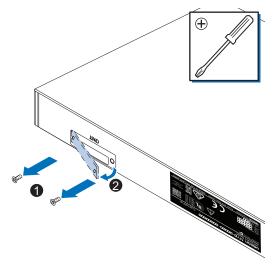


Additional Information

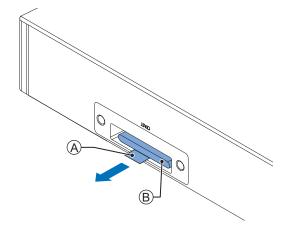
- Refer to 1-4 Product Configuration Box PC on page 1-5 for the installed CFast Card model.
- Refer to 3-10-4 CFast Cards on page 3-24 for the available CFast Card models.
- Refer to CFast Card Specifications on page 4-13 for specification details.

To replace the CFast Card:

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



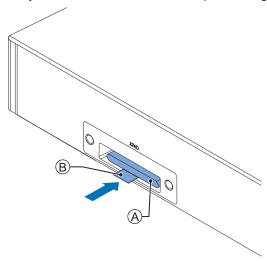
- 1) Remove the two screws 1.
- 2) Remove the cover 2.
- **3** Pull the plastic Pull Tab (A) to remove the CFast Card (B) from the Box PC.



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 with an extra push using the CFast Card slot cover.

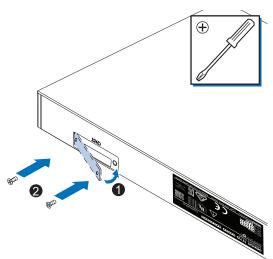
If the CFast Card can not go in completely then the CFast Card orientation is incorrect. Remove the CFast Card, turn it upside down and reinsert it. Ensure the CFast Card (A) is completely in the Box PC with an extra push using the CFast Card slot cover.



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**.



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-1-2	BIOS for 4 th generation CPUs	A-5
	A-1-3	BIOS for 6 th generation CPUs	A-13
	A-1-4	BIOS for 7 th generation CPUs	A-31
	A-1-5	•	
A-2	DVI C	Connector Pin Details	A-67
	A-2-1	DVI-I Connector Pin Details	A-67
	A-2-2	DVI-D Connector Pin Details	A-68
A-3	RS-23	32C Connector Pin Details	A-70

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 setting 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 DELkey repeatedly directly after Power ON to access the BIOS Setup Program.



Additional Information

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

Boot Selection Popup Menu

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

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

BIOS Structure

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

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

The left frame uses following colors:

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

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

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

Use the → ← keys to navigate between pages.

The menu bar gives access to following pages:

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

BIOS Navigation and Function Keys

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

Top part

Provides additional information on selected screens or parameters.

Bottom part.

Provides information on Keys.

• → ←: Select Screen

Changed between different BIOS pages.

↑↓ : Select Item

Changed between different parameters.

• Enter: Select

Selects the parameter that has the focus and displays a submenu or the possibility to change the parameter.

• + / -: Change Option

Change settings. A numerical value will be increased or decreased. A boolean value will toggle.

• F1: General Help

Displays help information.

• F2: Previous Values

Changes all parameters to the values they had when entering the BIOS.

• F9: Optimized Defaults

Changes all settings to the default values.

• F10: Save & Exit

Saves all changes and exits the BIOS.

• ESC: Exit

Go one level up. For parameters this is the previous level. For the main pages this exits the BIOS.

BIOS Password & Write Protection

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

The BIOS uses encryption for the password.

The BIOS password is case sensitive with a minimum of 3 characters and a maximum of 20 characters. Once a BIOS password has been assigned, the BIOS activates the grayed out **BIOS Update and Write Protection** option. If this option is set to **enabled**, only authorized users (users with the correct password) can update the BIOS. With the BIOS password protection and the BIOS update and write protection, the system configuration is completely secured. If the BIOS is password protected, you cannot change the configuration of an end application without the correct password.

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

	Item		Default / Remark
PCI & PCI Express	PCI Express Gen 2 Set-	Completion Timeout	Default
	tings	ARI Forwarding	Disabled
		AtomicOp Requester Enable	Disabled
		AtomicOp Egress Block- ing	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 Manage- ment	Disabled
		Compliance SOS	Disabled
		Hardware Autonomous Width	Enabled
		Hardware Autonomous Speed	Enabled
	PCI Express Gen3 Set-	Run-time C7 Allowed	Disabled
	tings (for Port 0 and 1) *1	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	8
		Lane. Lane 015	_
		- PEG Gen3 Endpoint Preset Value for each Lane, Lane 015	7
		- PEG Gen3 Endpoint Hint Value for each Lane. Lane 015	2
		- Gen3 Eq Preset Search	Enabled
		– Always Re-search Gen3Eq Preset	Disabled
		- Preset Search Dwell Time	1000
		- Error Target	1
		PEG RxCEM Loopback Mode	Disabled
		PCIe Gen3 RxCTLEp Setting. PCIe Gen3	8
		RxCTLEp 07	

	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	PEG1 Speed	Auto
	Gen3) *4	PEG1 ASPM	Disabled
		PEG1 De-emphasis Control	-3.5 dB
	PCI Express Port 2, 3, 4,	PCI Express Port x	Enabled
	5 (x1 Gen2) *4	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 Poir	nt	Enabled
RTC Wake	Make System At Fixed Tim	e	Disabled
Trusted Computing	Security Device Support		Enable
	TPM State		Enabled
	Pending operation		None

	Item		Default / Remark
CPU	CPU Information	CPU Information	
	Set Boot Freq Ratio		255
	Hyper-Threading *2 *1	Hyper-Threading *2 *1	
	Active Processor Cores	71	
	Limit CPUID Maximum		
	Execute Disable Bit	Execute Disable Bit	
	Intel Vitalization Technolog	у	Enabled
	Hardware Prefetcher		
	Adjacent Cache Line Prefe	tch	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)		
	SATA Mode Selection		AHCI
	SATA Test Mode	SATA Test Mode	
	Aggressive LPM Support	Aggressive LPM Support	
	SATA Controller Speed		
	Serial ATA Port 0, 1, 2, 3	SATA Port	Enabled *5
	*5	Hot Plug	Disabled
		External SATA	Disabled
		SATA Device Type	Hard Disk Drive
		Spin Up Device	Disabled
lemory Configurat	tion		Display of memory parameters
ntel (R) Rapid Star	t Technology		Disabled
JSB	XHCI Mode		
	Overcurrent Protection		Disabled
	USB Ports Per-Port Disa- ble Control	USB Ports Per-Port Disa- ble Control	Enabled
		- USB Port 06	Enabled
		- USB 3.0 Port 01	Enabled
	Legacy USB Support		
	External USB Controllers S	External USB Controllers Support	
	XHCI Hand-off		
	EHCI Hand-off		Disabled
	USB Mass Storage Driver	Support	Enabled
	USB Transfer Timeout		20 sec
	Device Reset Timeout		20 sec
	Device Power-up Delay Se	Device Power-up Delay Selection	
		Generic Ultra HS-COMBO	

	Default / Remark		
SMART Settings	Smart Self Test *6	Smart Self Test *6	
UEFI Network Stack	UEFI Network Stack		Disabled
NVMe Configuration	NVMe Configuration		
Intel® Ethernet	NIC Configuration	NIC Configuration Link Speed	
Connection I218-LM -	Enabled		
Unique MAC Address	Blink LEDs		0

^{*1.} Only for Box PCs with a CPU type Intel[®] Core[™] i7-4700EQ.

- 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	PCI Express Clock Gating	Disabled
(PCH)	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	Processor (Integrated VT-d *1 *2	
Components	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[™] 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

^{*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:

	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 Sup	pport	Enabled
	Native ASPM		Disabled
	BDAT ACPI Table Supp	ort	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 in	nput type	No Change in Owner EPOCHs
	CPU Flex Ratio Override	e	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 Protecti	Flash Wear Out Protection	
	Debug Interface		
	Debug Interface Lock		Enabled
	Processor trace memory	y allocation	Disabled
	CPU SMM Enhance-	SMM Code Access Check	Enabled
	ment	SMM Use Delay Indication	Enabled
		SMM Use Block Indication	Enabled
	FCLK Frequency for Ea	rly Power On	1 GHz
	Three Strike Counter		Enabled
	Voltage Optimization		Auto

	Item		Default / Remark
Power & Performance	CPU - Power Manage-	Boot performance mode	Max Non-Turbo Per-
	ment Control		formance
		Intel ® SpeedStep ™	Enabled
		Race To Halt (RTH)	Enabled
		Intel ® Speed Shift Technology	Enabled
		HDC Control	Enabled
		Turbo Mode	Enabled
	CPU - Power Managem	ent Control /View/Configure Turbo Op	tions
		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 Configuration		S
		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 Managem	ent 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		
	or or rewer managem	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		
	Of O Towor Managorn	VR Mailbox Command options	0
		Intersil VR Command	Send for IA/GT/SA
		more in the command	rails
	CPU - Power Manage-	Platform PL1 Enable	Disabled
	ment Control	Platform PL2 Enable	Disabled
		Power Limit 4 Override	Disabled
		C states	Disabled
		Thermal Monitor	Enabled
		Interrupt Redirection Mode Selec-	PAIR with Fixed Priori-
		tion	ty
		Timed MWAIT	Disabled
		Custom P-state Table	Number of P states = 0
		Energy Performance Gain	Disabled
		Power Limit 3 Settings	Power Limit 3 Override = Disabled
		CPU Lock Configuration	CFG Lock = Enabled
			Overclocking Lock
			=Disabled
	GT - Power Manage-	Maximum GT frequency	Default Max Frequen-
	ment Control		су

Item			Default / Remark
PCH-FW Configuration	Comms Hub Support		Disabled
	JHI Support		Disabled
	Core Bios Done Messag	ge	Enabled
	Firmware Update Con-	Me FW Image Re-Flash	Disabled
	figuration		
	PTT Configuration	TPM Device Selection	dTPM
	ME Debug Configura-	HECI Timeouts	Enabled
	tion	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 Configu-	DTS SMM	Disabled
	ration	Tcc Activation Offset	0
		Tcc Offset Time Window	Disabled
		Tcc Offset Clamp Enable	Disabled
		Tcc Offset Lock Enable	Disabled
		Bi-directional PROCHOT#	Enabled
		Disable PROCHOT# Output	Enabled
		Disable VR Thermal Alert	Disabled
		PROCHOT Response	Disabled
		PROCHOT Lock	Disabled
		ACPI T-States	Disabled
		PECI Reset	Disabled
		PECI C10 Reset	Disabled
	Platform Thermal Con-	PCH Thermal Device	Enabled in PCI mode
	figuration	PCH Temp Read	Enabled
		CPU Energy Read	Enabled
		CPU Temp Read	Enabled
		Alert Enable Lock	Disabled
	DPTF Configuration	DPTF	Disabled
Intel ICC	ICC/OC Watchdog Time	er	Disabled
Watchdog	POST Watchdog		Disabled
3	Runtime Watchdog		Disabled

	Item		Default / Remark
Hardware Health Moni-	Fan PWM Frequency M	ode	High Frequency
toring	Fan PWM Frequency (k	Hz)	31
	Pulses Per Revolution		2
	Default Fan Speed		60%
	Automatic Fan Speed C	ontrol	Enabled
	Fan Control Temperatur	e	CPU Temperature
	Lower Temperature Limit	it	50 C
	Upper Temperature Limi	80 C	
	Minimum Fan Speed		40%
	Mid Range Bottom Fan	Speed	60%
	Mid Range Top Fan Spe	eed	80%
	Maximum Fan Speed		100%
Trusted Computing	Security Device Support	t	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 Confi	guration	Disabled
	Hibernation Support	<u> </u>	Disabled
	ACPI Sleep State		Suspend Disabled
	Lock Legacy Resources	1	Disabled
	S3 Video Repost		Disabled
	Automatic Critical Trip P	oint	Enabled
	Lid Button Support		Disabled
	Sleep Button Support		Disabled
SMART Settings	SMART Self Test		Disabled
Acoustic Management	Acoustic Management C	Configuration	Disabled
PCI Configuration	PCI Latency Timer		32 PCI Bus Clocks
-	PCI-X Latency Timer		64 PCI Bus Clocks
	VGA Palette Snoop		Disabled
	PERR# Generation		Disabled
	SERR# Generation		Disabled
	Above 4G Decoding		Disabled
	PCI Hot-Plug Settings	BIOS Hot-Plug Support	Enabled
		PCI Buses Padding	1
		I/O Resoruces Padding	4 K
		MMIO 32 bit Resources Padding	16 M
		PFMMIO 32 bit Resources Padding	16 M
UEFI Network Stack	UEFI Network Stack		Disabled

	Item	Default / Remark
CSM & Option ROM	CSM Support	Enabled
Control	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
	xHCl 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:

	ltem		Default / Remark
Processor (Integrated Components)	Memory Configuration /	Memory Thermal Configuration	Refer to Memory Ther- mal Configuration on page A-26 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	Memory Configuration /	Memory Training Algorithms	
(Integrated		Write Voltage Centering 2D	Enabled
Components)		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 inde-	Disabled
		pendently	
		CMD Slew Rate Training	Enabled
		CMD Drive Strength / Tx Equaliza-	Enabled
		tion	
		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
		C. S. M. O. D. D. M. O. O. M.	

Memory Configuration (Integrated Components)		Item		Default / Remark
Time Measure	Processor	Memory Configuration	Force Single Rank	Disabled
DLL Weak Lock Support DLL Weak Lock Support Pwr Down Idle Timer OMrc Fast Boot Lpddr Mem WL Set EV Loader EV Loader EV Loader Delay Enabled EXT Loader Delay Enabled EXT Loader Delay Enabled EXT Loader Delay External GK Card Primary Display Configuration Internal Graphics Device Auto GTT Size BMB Aperture Size IGD Pre-Allocated Graphics Memo- ry IGD Total Graphics Memory JIGD Total Graphics Memory Disabled Enabled Cd Clock Frequency G75 Mhz GOP Config Driver Enabled Cd Clock Frequency G75 Mhz GOP Config Driver Enabled DMI Gen3 Eq Phase 2 Auto DMI Gen3 Eq Phase 2 Auto DMI Gen3 Eq Phase 2 Auto DMI Control DMI Vor Control DMI Vor Control DMI Vor Control Enabled Gen3 Root Port Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 Endpoint Prosessor Side DMI Extended Sync Control Disabled	(Integrated		Memory Remap	Enabled
Pwr Down Idle Timer 0 Mrc Fast Boot Enabled Lpddr Mem WL Set Set B EV Loader Disabled EV Loader Delay Enabled Frimary Display Enabled External Gr. Card Primary Display Primary PEG = Auto Configuration Internal Graphics Device Auto GTT Size 8MB Aperture Size 256MB IGD Pre-Allocated Graphics Memory IGD Total Graphics Memory 256M PM support Disabled PAVP Enable Enabled Cd Clock Frequency 675 Mhz GOP Config Driver Enabled Cd Clock Frequency 675 Mhz GOP Config Driver Enabled DMI Gen3 Eq Phase 2 Auto DMI Gen3 Eq Phase 2 Auto DMI Gen3 Eq Phase 2 Auto DMI Vor Control Disabled Program Static Phase 1 Enabled Gen3 Root Port Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control Disabled DMI Extended Sync Control Disabled	Components)		Time Measure	Disabled
Mrc Fast Boot			DLL Weak Lock Support	Enabled
Lpddr Mem WL Set			Pwr Down Idle Timer	0
EV Loader			Mrc Fast Boot	Enabled
EV Loader Delay Enabled Graphics Configuration Primary Display External Gfx Card Primary Display Configuration Internal Graphics Device Auto Frimary PCIE = Auto Internal Graphics Device Auto GTT Size Aperture Size IGD Pre-Allocated Graphics Memory IGD Total Graphics Memory PM support PAVP Enable Enabled Cdynmax Clamping Enable Enabled Cd Clock Frequency GOP Config Driver IUER Button Enable DMI/OPI Configuration DMI Gen3 Eq Phase 2 DMI Gen3 Eq Phase 3 Method DMI Vc1 Control DMI Vc2 Control DMI Vc2 Control DMI Vc3 Enabled Auto DMI Vc3 Control DMI Vc3 Control DMI Vc4 Control DMI Vc5 Program Static Phase 1 Eq Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control All values = 3 DMI Link ASPM Processor Side DMI Extended Sync Control DMI Sabled DMI Extended Sync Control DMI Sabled DMI Extended Sync Control Disabled DMI Extended Sync Control Disabled DMI Extended Sync Control DMI Sabled DMI Extended Sync Control Disabled DMI Extended Sync Control Disabled DMI Extended Sync Control DMI De-emphasis Control Jisabled DMI De-emphasis Control Jisabled			Lpddr Mem WL Set	Set B
Graphics Configuration Primary Display External Gfx Card Primary Display Primary PEG = Auto Primary PCIE = Auto Primary PCIE = Auto Primary PCIE = Auto Internal Graphics Device Auto GTT Size BMB Aperture Size 256MB IGD Pre-Allocated Graphics Memory 256M IGD Total Graphics Memory Disabled PAVP Enable Enabled Cdynmax Clamping Enable Enabled Cd Clock Frequency 675 Mhz GOP Config Driver Enabled DMI/OPI Configuration DMI Max Link Speed Auto DMI Gen3 Eq Phase 3 Method Auto DMI Gen3 Eq Phase 3 Method Auto DMI Vc1 Control Disabled DMI Vc2 Control Enabled Program Static Phase1 Eq Enabled All values = 4 Each Lane Gen3 Endpoint Preset value for each Lane Enabled Enabled Enabled Enabled Enabled Enabled Enabled Enabled Enabled Enabl			EV Loader	Disabled
External Gfx Card Primary Display Configuration Internal Graphics Device Auto GTT Size Aperture Size IGD Pre-Allocated Graphics Memory IGD Total Gra			EV Loader Delay	Enabled
Configuration		Graphics Configuration	Primary Display	Auto
Internal Graphics Device			External Gfx Card Primary Display	Primary PEG = 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 Max Link Speed Auto DMI Gen3 Eq Phase 2 Auto DMI Gen3 Eq Phase 3 Method Auto DMI Vc1 Control Disabled DMI Vc2 Control Enabled Program Static Phase1 Eq Enabled Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each All values = 2 Lane Gen3 RXCTLE Control All values = 3 DMI Link ASPM Processor Side Disabled DMI De-emphasis Control Disabled DMI De-emphasis Control Disabled			Configuration	Primary PCIE = Auto
Aperture Size			Internal Graphics Device	Auto
IGD Pre-Allocated Graphics Memory IGD Total Graphics Memory IGD Total Graphics Memory PM support Disabled PAVP Enable Enabled Cdynmax Clamping Enable Enabled Cd Clock Frequency G75 Mhz GOP Config Driver 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 Program Static Phase1 Eq Enabled Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control All values = 3 DMI Link ASPM Processor Side DMI Extended Sync Control Disabled DMI De-emphasis Control Disabled DMI De-emphasis Control Jisabled DMI De-emphasis Control Jisabled DMI De-emphasis Control Jisabled DMI De-emphasis Control Jisabled			GTT Size	8MB
Py IGD Total Graphics Memory 256M			Aperture Size	256MB
IGD Total Graphics Memory PM support PM support Disabled PAVP Enable Enabled Cdynmax Clamping Enable Enabled Cd Clock Frequency G75 Mhz GOP Config Driver IUER Button Enable Disabled DMI/OPI Configuration DMI Max Link Speed Auto DMI Gen3 Eq Phase 2 Auto DMI Vc1 Control DMI Vc2 Control DMI Vc3 Control Program Static Phase1 Eq Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 RxCTLE Control All values = 3 DMI Link ASPM Processor Side DMI Extended Sync Control Disabled DMI De-emphasis Control Jisabled Disabled Disabled Disabled Disabled Disabled Disabled Disabled DMI De-emphasis Control Jisabled Jisabled DMI De-emphasis Control Jisabled DMI De-emphasis Control Jisabled DMI De-emphasis Control Jisabled				32M
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 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 Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control All values = 3 DMI Link ASPM Processor Side Disabled DMI De-emphasis Control Disabled DMI De-emphasis Control Jisabled DMI De-emphasis Control Jisabled DMI De-emphasis Control Jisabled			ry	
PAVP Enable Cdynmax Clamping Enable Enabled Cd Clock Frequency G75 Mhz GOP Config Driver Enabled IUER Button Enable Disabled DMI/OPI Configuration DMI Gen3 Eq Phase 2 DMI Gen3 Eq Phase 3 Method DMI Vc1 Control DMI Vc2 Control DMI Vc2 Control DMI Vc3 Control Program Static Phase 1 Eq Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control DMI Values = 3 DMI Link ASPM Processor Side DMI Sabled DMI Values = 3 DMI Extended Sync Control Disabled DMI De-emphasis Control Jisabled DMI De-emphasis Control Jisabled DMI De-emphasis Control Jisabled			IGD Total Graphics Memory	256M
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 Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control All values = 3 DMI Link ASPM Processor Side Disabled DMI Extended Sync Control Disabled DMI De-emphasis Control -3.5 dB			PM support	Disabled
Cd Clock Frequency GOP Config Driver IUER Button Enable DMI/OPI Configuration DMI Max Link Speed Auto DMI Gen3 Eq Phase 2 Auto DMI Vc1 Control DMI Vc2 Control DMI Vc2 Control Program Static Phase1 Eq Enabled Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control All values = 3 DMI Link ASPM Processor Side DMI De-emphasis Control Disabled DMI De-emphasis Control Disabled DMI De-emphasis Control Jisabled			PAVP Enable Enabled	Enabled
GOP Config Driver IUER Button Enable DMI/OPI Configuration DMI Max Link Speed DMI Gen3 Eq Phase 2 DMI Gen3 Eq Phase 3 Method DMI Vc1 Control DMI Vc2 Control DMI Vc2 Control DMI Vc3 Control Program Static Phase 1 Eq Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control All values = 3 DMI Link ASPM Processor Side Disabled DMI De-emphasis Control Jisabled DMI De-emphasis Control Jisabled DMI De-emphasis Control Jisabled			Cdynmax Clamping Enable	Enabled
IUER Button Enable 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 Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each All values = 2 Lane Gen3 RxCTLE Control All values = 3 DMI Link ASPM Processor Side Disabled DMI Extended Sync Control Disabled DMI De-emphasis Control -3.5 dB			Cd Clock Frequency	675 Mhz
DMI/OPI Configuration DMI Max Link Speed DMI Gen3 Eq Phase 2 DMI Gen3 Eq Phase 3 Method DMI Vc1 Control DMI Vc1 Control DMI Vcm Control Enabled Program Static Phase1 Eq Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control DMI values = 3 DMI Link ASPM Processor Side Disabled DMI De-emphasis Control Jatoba Auto Auto Auto Auto Auto Auto Auto Auto Disabled DMI value Enabled Enabled Enabled All values = 4 All values = 7 All values = 2 DMI Link ASPM Processor Side Disabled DMI Extended Sync Control Disabled DMI De-emphasis Control DISABLED -3.5 dB			GOP Config Driver	Enabled
DMI Gen3 Eq Phase 2 DMI Gen3 Eq Phase 3 Method Auto DMI Vc1 Control Disabled DMI Vcm Control Enabled Program Static Phase1 Eq Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control DMI Values = 3 DMI Link ASPM Processor Side DMI Extended Sync Control DMI De-emphasis Control -3.5 dB			IUER Button Enable	Disabled
DMI Gen3 Eq Phase 3 Method DMI Vc1 Control Disabled DMI Vcm Control Enabled Program Static Phase1 Eq Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 Endpoint		DMI/OPI Configuration	DMI Max Link Speed	Auto
DMI Vc1 Control Disabled DMI Vcm Control Enabled Program Static Phase1 Eq Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 Endpoint Hint value for each All values = 2 Lane 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 Gen3 Eq Phase 2	Auto
DMI Vcm Control Enabled Program Static Phase1 Eq Enabled Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 Endpoint Hint value for each All values = 2 Lane 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 Gen3 Eq Phase 3 Method	Auto
Program Static Phase1 Eq Enabled Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 Endpoint Hint value for each All values = 2 Lane 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 Vc1 Control	Disabled
Gen3 Root Port Preset value for each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control All values = 2 Lane Gen3 RxCTLE Control Disabled DMI Extended Sync Control DMI De-emphasis Control -3.5 dB			DMI Vcm Control	Enabled
each Lane Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control All values = 2 All values = 3 DMI Link ASPM Processor Side DMI Extended Sync Control DMI De-emphasis Control -3.5 dB			Program Static Phase1 Eq	Enabled
Gen3 Endpoint Preset value for each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control All values = 3 DMI Link ASPM Processor Side Disabled DMI Extended Sync Control Disabled DMI De-emphasis Control -3.5 dB			Gen3 Root Port Preset value for	All values = 4
each Lane Gen3 Endpoint Hint value for each Lane Gen3 RxCTLE Control All values = 2 DMI Link ASPM Processor Side DMI Extended Sync Control DMI De-emphasis Control -3.5 dB				
Lane Gen3 RxCTLE Control All values = 3 DMI Link ASPM Processor Side Disabled DMI Extended Sync Control Disabled DMI De-emphasis Control -3.5 dB			-	All values = 7
DMI Link ASPM Processor Side Disabled DMI Extended Sync Control Disabled DMI De-emphasis Control -3.5 dB				All values = 2
DMI Extended Sync Control Disabled DMI De-emphasis Control -3.5 dB			Gen3 RxCTLE Control	All values = 3
DMI De-emphasis Control -3.5 dB			DMI Link ASPM Processor Side	Disabled
DMI De-emphasis Control -3.5 dB				Disabled
· · · · · · · · · · · · · · · · · · ·			-	-3.5 dB
DMI IOT Disabled			· · · · · · · · · · · · · · · · · · ·	

	Item		Default / Remark
Processor	Stop Grant Configuration	on	Auto
(Integrated	VT-d		Enabled
Components)	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	Isolate SMBus Segmer	nts	Always
Hub (PCH)	PCI Express Configu-	PCI Express Clock Gating	Disabled
, ,	ration	Legacy IO Low Latency	Disabled
		DMI Link ASPM PCH Side	Disabled
		Port8xh Decode	Disabled
		Peer Memory Write Enable	Disabled
		•	
		Compliance Test Mode	Disabled
		PCIe-USB Glitch W/A	Disabled
		PCIe function swap	Disabled
		PCI Express Gen3 Eq Lanes	Every Cm = 6 Every Cp = 2 Override SW EQ Settings = Disabled
		PCI Express Port 0	Refer to PCI Express
		PCI Express Port 1	Port on page A-27 for details.
		PCI Express Port 2	
		PCI Express Port 3	
		PCI Express Port 4	
		PCI Express Port 5	
		PCI Express Port 6	
		PCI Express Port 7	1
	SATA And RST Con-	SATA Controller(s)	Enabled
	figuration	SATA Mode Selection	AHCI
		SATA Test Mode	Disabled
		Software Feature Mask Configuration	HDD Unlock = Ena- bled LED Locate = Enabled
		Aggressive LPM Support	Disabled
		SATA Controller Speed	Default
		Serial ATA Port 0	Boladit
		SATA Port	Enabled
		Hot Plug	Disabled
		Spin Up Device	Disabled
			Hard Disk Drive
		SATA Device Type	
		Topology	Unknown
		SATA Port 0 DevSlp	Disabled
		DITO Configuration	Disabled

	Item		Default / Remark
Platform Controller	SATA And RST Con-	Serial ATA Port 1	
Hub (PCH)	figuration	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 Configura-	TraceHub Enable Mode	Disable
	tion menu	MemRegion 0 Buffer Size	1MB
		MemRegion 1 Buffer Size	1MB
	DCI enable (HDCIEN)		Disabled
	PCH LAN Controller		Enabled
	DeepSx Power Policies	S	Disabled
	LAN Wake From Deep	Sx	Enabled
	Wake on LAN Enable		Enabled
	SLP_LAN# Low on DC	Power	Enabled
	K1 off		Enabled
	Wake on WLAN and B	T Enable	Disabled
	Disable DSX ACPRES	ENT Pulldown	Disabled
	Serial IRQ Mode		Continuous
	Port 61h Bit-4 Emulation	on	Enabled
	Port 80h Redirection		LPC Bus
	Enhance Port 80h LPC	Decoding	Disabled
	Compatible Revision ID)	Disabled
	PCH Cross Throttling		Enabled
	Disable Energy Report	ing	FALSE

	Item	Default / Remark
Platform Controller	Enable TCO Timer	Disabled
Hub (PCH)	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-43 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:

	Default / Remark		
Memory Power and	DDR PowerDown an	d idle counter	BIOS
Thermal Throttling	For LPDDR Only: DE	R PowerDown annd idle counter	BIOS
	REFRESH_2X_MOD)E	Disabled
	LPDDR Thermal Ser	nsor	Enabled
	SelfRefresh Enable		Enabled
	SelfRefresh IdleTime	r	512
	Throttler CKEMin De	feature	Disabled
	Throttler CKEMin Tin	ner	48
	For LPDDR Only: Th	rottler CKEMin Defeature *1	Enabled
	For LPDDR Only: Th	rottler CKEMin Timer *1	64
	DRAM Power Meter	Use user provided power weights, scale factor, and channel power floor values	Disabled
	Memory Thermal	Lock Thermal Management Registers	Enabled
	Reporting	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 Ma	ınagement		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:

Ite	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
СТО		Disabled
SEFE		Disabled
SENFE		Disabled
SECE		Disabled
PME SCI		Enabled
Hot Plug		Disabled
Advanced Error Reporting		Enabled
PCIe Speed		Auto
Transmitter Half Swing		Disabled
Detect Timeout		0
PCH PCIE□ LTR *2		Enabled
Snoop Latency Override		Auto
Non Snoop Latency Override		Auto
Force LTR Override	Disabled	
PCIE□ LTR Lock *2		Disabled
Extra options	Detect Non-Compliance Device	Disabled
	Prefetchable Memory	10
	Reserved Memory Alignment	1
	Prefetchable Memory Alignment	1

^{*1.} CPU specific:

- For 7th generation CPUs: Port 0, 4 = Unknown. Port 2, 3, 6 = x1.
- For 6th generation CPUs: Port 0, 1, 2, 5, 6, 7 = Unknown. Port 3, 4 = x1.
- *2. The default does not change but the PCIE number is port specific.
 - For 7th generation CPUs: Port 0: PCIE1. Port 2: PCIE3. Port 3: PCIE4. Port 4: PCIE5. Port 6: PCIE9.
 - For 6th generation CPUs:
 Port 0: PCIE5. Port 1: PCIE6. Port 2: PCIE7. Port 3: PCIE8. Port 4: PCIE9. Port 5: PCIE10. Port 6:

PCIE11. Port 7: PCIE12.

BIOS - Security

Provides security information like BIOS Password and HDD information.

MARNING

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	Diskname		
Secure Boot Menu	Secure Boot	Secure Boot		
	Secure Boot Customization	Secure Boot Customization		
	Key Management *3	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 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 □)
Boot Option #2 UEFI OS (P1: CFast □)	
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 $^{\!8}$ Celeron $^{\!8}$ 3965U with BIOS version BU \square \square 115 and higher a	ind for C	PU
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	BIOS - Advanced BIOS up to version 008 on	
		page A-33	
	Version BV□□□115 and	BIOS - Advanced BIOS version 115 and higher	
	higher	on page A-39	
Intel® Celeron® 3965U	Up to version BU□□□008	8 BIOS - Advanced BIOS up to version 008 on	
		page A-33	
	Version BU□□□115 and	BIOS - Advanced BIOS version 115 and higher	
	higher	on page A-39	
Intel [®] Core [™] i7-7820EQ	All versions	BIOS - Advanced for CPU Type Intel [®] Core [™]	
		<i>i7-7820EQ</i> on page A-41	

• 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 \square \square 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-32 for details.

Changeable BIOS Advanced parameters and their factory default values:

	Item	Default / Remark
Intel RC ACPI Set-	PTID Support	Disabled
tings	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) Select Owner EPOCH input type		Software Controlled
			No Change in Owner
			EPOCHs
	CPU Flex Ratio Overrio	le	Disabled
	Hardware Prefetcher		Enabled
	Adjacent Cache Line P	refetch	Enabled
	Intel (VMX) Virtualization	on Technology	Enabled
	PECI		Enabled
	Active Processor Cores	8	All
	Hyper-Threading *1		Enabled
	BIST		Disabled
	JTAG C10 Power		Disabled
	AP threads Idle Manne	r	MWAIT Loop
	AP threads Handoff Ma	inner	MWAIT Loop
	AES		Enabled
	MachineCheck		Enabled
	MonitorMWait		Enabled
	Intel Trusted Execution Technology *1		Disabled
	Reset AUX Content *1		No
	Flash Wear Out Protect	tion	Disabled
	Debug Interface		Disabled
	Debug Interface Lock		Enabled
	Processor trace memory allocation		Disabled
	CPU SMM Enhance-	SMM Code Access Check	Enabled
	ment	SMM Use Delay Indication	Enabled
		SMM Use Block Indication	Enabled
	FCLK Frequency for Early Power On		Normal (800 Mhz)
	Three Strike Counter		Enabled
	Voltage Optimization		Auto

Item Default / Remark						
			Max Non-Turbo Per-			
Power & Performance	agement Control	Boot performance mode	formance			
		Intel ® SpeedStep ™	Enabled			
		Race To Halt (RTH)	Enabled			
		Intel ® Speed Shift Technology	Enabled			
		HDC Control	Enabled			
		Turbo Mode *1	Enabled			
	CPU - Power Manager	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 Manager	ment Control /Config TDP Configurati	ons			
		Configurable TDP Boot Mode	Nominal			
		Configurable TDP Lock	Enabled			
	CPU - Power Manager	ment Control / CPU VR Settings *2				
		PSYS Slope	0			
		PSYS Offset	0			
		PSYS PMax Power	0			
		Acoustic Noise Settings	Acoustic Noise Mitiga-			
			tion = Disabled			
		System Agent VR Settings	VR Config Enable = Disabled			
		Core/IA VR Settings	VR Config Enable = Disabled			
		GT-Sliced VR Settings	VR Config Enable = Disabled			
		VR Mailbox Command options	0			
		Intersil VR Command	Disabled			
	CPU - Power Man-	Platform PL1 Enable	Disabled			
	agement Control	Platform PL2 Enable	Disabled			
		Power Limit 4 Override	Disabled			
		C states	Disabled			
		Thermal Monitor	Enabled			
		Interrupt Redirection Mode Selec-	PAIR with Fixed Prior-			
		tion	ity			
		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 Over-			
			ride = Disabled			
		CPU Lock Configuration	CFG Lock = Enabled			
			Overclocking Lock = Enabled			

	Item		Default / Remark
Power & Performance	GT - Power Manage-	Maximum GT frequency	Default Max Frequen-
	ment Control		су
PCH-FW Configura-	Comms Hub Support		Disabled
tion	JHI Support		Disabled
	Core Bios Done Messa	ge	Enabled
	Firmware Update Configuration	Me FW Image Re-Flash	Disabled
	PTT Configuration	TPM Device Selection	dTPM
	ME Debug Configura-	HECI Timeouts	Enabled
	tion	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 Config-	DTS SMM	Disabled
	uration	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	PCH Thermal Device	Enabled in PCI mode
	Configuration	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-	16 M
		ding	
UEFI Network Stack	UEFI Network Stack		Disabled
CSM & Option ROM	CSM Support		Enabled
Control	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		inch Policy	UEFI ROM Only
SDIO Configuration SD Card or COMx GPIO		0	COMx GPIO
	UARTO Controller		Disabled
	SDIO Access Mode		Auto
USB	Overcurrent Protection		Disabled
	Legacy USB Support		Enabled
	xHCl Hand-off		Enabled
	USB Mass Storage Dri	ver Support	Enabled
	USB Transfer Timeout		20 sec
	Device Reset Timeout		20 sec
	Device Power-up Delay	y 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® CoreTM 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 7^{th} generation CPUs:

- Intel[®] Core [™] i5-7300U with a BIOS version BU \square \square 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-32 for details.

Changeable BIOS Advanced parameters and their factory default values:

ltem			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 P	refetch	Enabled
	Intel (VMX) Virtualization	on Technology	Enabled
	Active Processor Core	s	All
	Hyper-Threading*2		Enabled
	BIST		Disabled
	AP threads Idle Manne	er	MWAIT Loop
	AP threads Handoff Ma	anner	MWAIT Loop
	AES		Enabled
	MachineCheck		Enabled
	MonitorMWait		Enabled
Power & Performance	CPU - Power Man- agement Control	Boot performance mode	Max Non-Turbo Per- formance
		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 Manage- ment 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 Hierarch	у	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
	xHCl 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® $\mathsf{Core}^\mathsf{TM}$ 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 $^{\text{TM}}$ i7-7820EQ.

For all other CPU types refer to *BIOS - Advanced* on page A-32 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 F	refetch	Enabled
	Intel (VMX) Virtualizati	on Technology	Enabled
	Active Processor Core	s	All
	Hyper-Threading		Enabled
	BIST		Disabled
	AP threads Idle Manne	er	MWAIT Loop
	AP threads Handoff Ma	anner	MWAIT Loop
	AES		Enabled
	MachineCheck		Enabled
	MonitorMWait		Enabled
Power & Performance	CPU - Power Man- agement Control	Boot performance mode	Max Non-Turbo Per- formance
		Intel ® SpeedStep ™	Enabled
		Race To Halt (RTH)	Enabled
		Intel ® Speed Shift Technology	Enabled
		Turbo Mode	Enabled
		C states	Disabled
		Timed MWAIT	Disabled
	GT - Power Manage-	Maximum GT frequency	Default Max Frequen-
	ment Control		су
Graphics	Digital Display Interfac		Auto Selection Auto Selection
		Digital Display Interface 2	
	VGA Port		Enabled
	DisplayPort Spread Sp		Disabled
Hardware Health	Fan Control Temperatu	ıre	CPU Temperature
Monitoring	Lower Temperature Th		50 C
	Upper Temperature Th	reshold	80 C
	Minimum Fan Speed		Fan Off
	Lower Temperature Fa	n Speed	30%
	Upper Temperature Fa	n 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	Output Select	EDP1
Protocol Policy	Brightnesst 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
	xHCl Hand-off	Enabled
	USB Mass Storage Driver Support	Enabled
	USB Transfer Timeout	20 sec
	Device Reset Timeout	20 sec
	5 . 5 . 5	Α (
	Device Power-up Delay Selection	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	BIOS - Chipset BIOS up to version 008 on
		page A-44
		BIOS - Chipset Details on page A-26
	Version BV□□□115 and	BIOS - Chipset BIOS version 115 and higher on
	higher	page A-51
Intel® Celeron® 3965U	Up to version BU□□□008	BIOS - Chipset BIOS up to version 008 on
		page A-44
		BIOS - Chipset Details on page A-26
	Version BU□□□115 and	BIOS - Chipset BIOS version 115 and higher on
	higher	page A-51
Intel [®] Core [™] i7-7820EQ	All versions	BIOS - Chipset for CPU Type Intel [®] Core [™]
		<i>i7-7820EQ</i> on page A-53

• 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 \square \square 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-43 for details.

Changeable BIOS Chipset parameters and their factory default values:

	Item		Default / Remark
Processor (Integrated Components)	Memory Configuration	Memory Thermal Configuration	Refer to Memory Thermal Configuration on page A-26 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	Memory Configuration /	Memory Training Algorithms	
(Integrated		Write Voltage Centering 2D	Enabled
Components)		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	Memory Configuration	Force Single Rank	Disabled
(Integrated		Memory Remap	Enabled
Components)		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 Configura-	Graphics Turbo IMON Current	31
	tion	Primary Display	Auto
		Select PCIE Card	Auto
		External Gfx Card Primary Display	Primary PEG = Auto
		Configuration	Primary PCIE = Auto
		Internal Graphics Device	Auto
		GTT Size	8MB
		Aperture Size	256MB
		IGD Pre-Allocated Graphics Mem-	32M
		ory	
		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 Configura-	DMI Vc1 Control	Disabled
	tion	DMI Vcm Control	Enabled
	Stop Grant Configuration	on	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 Segmen	te.	
Hub (PCH)	DCI Everess Configu	ilo	Always
	PCI Express Configu-	PCI Express Clock Gating	Disabled
	ration	Legacy IO Low Latency	Disabled
		DMI Link ASPM PCH Side	Disabled
		Port8xh Decode	Disabled
		Peer Memory Write Enable	Disabled
		Compliance Test Mode	Disabled
		PCIe-USB Glitch W/A	Disabled
		PCIe function swap	Disabled
		PCI Express Gen3 Eq Lanes	Every Cm = 6 Every Cp = 2 Override SW EQ Settings = Disabled
		PCI Express Port 0	Refer to PCI Express
		PCI Express Port 2	Port on page A-27 for
		PCI Express Port 3	details.
		PCI Express Port 4	
		PCI Express Port 6	
	SATA And RST Con-	SATA Controller(s)	Enabled
	figuration	SATA Mode Selection	AHCI
		SATA Test Mode	Disabled
		Software Feature Mask Configuration	HDD Unlock = Ena- bled LED Locate = Ena- bled
		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	SATA And RST Con-	Hot Plug	Disabled
Hub (PCH)	figuration	Spin Up Device	Disabled
		SATA Device Type	Hard Disk Drive
		Topology	Unknown
		SATA Port 2 DevSlp	Disabled
		DITO Configuration	Disabled
	USB Configuration	XHCI Disable Compliance Mode	False
		xDCI Support	Disabled
		USB Port Disable Override	Disabled
	TraceHub Configura-	TraceHub Enable Mode	Disable
	tion menu	MemRegion 0 Buffer Size	1MB
		MemRegion 1 Buffer Size	1MB
	DCI enable (HDCIEN)		Disabled
	PCH LAN Controller		Enabled
	DeepSx Power Policies		Disabled
	LAN Wake From DeepSx		Enabled
	Wake on LAN Enable		Enabled
	SLP_LAN# Low on DC Power		Enabled
	K1 off		Enabled
	Wake on WLAN and B	T Enable	Disabled
	Disable DSX ACPRES	ENT Pulldown	Disabled
	Serial IRQ Mode		Continuous
	Port 61h Bit-4 Emulation	on	Enabled
	Port 80h Redirection		LPC Bus
	Enhance Port 80h LPC	Decoding	Disabled
	Compatible Revision II)	Disabled
	PCH Cross Throttling		Enabled
	Disable Energy Report	ing	FALSE
	Enable TCO Timer		Disabled
	Pcie P11 SSC		Auto
	IOAPIC 24-119 Entries		Enabled
	Unlock PCH P2SB		Disabled
	Flash Protection Range	e Registers (FPRR)	Disabled
	SPD Write Disable		TRUE
	ChipsetInit HECI Mess	age	Enabled
	Bypass ChipsetInit syn	c reset	Disabled

^{*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
- 7^{th} generation CPUs with a BIOS version upto version 008

For all other CPU types or BIOS versions refer to BIOS - Chipset on page A-43 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:

	Ito	em	Default / Remark
Memory Power	DDR PowerDown a	nd idle counter	BIOS
and Thermal	For LPDDR Only: D	For LPDDR Only: DDR PowerDown annd idle counter	
Throttling	REFRESH_2X_MO	REFRESH_2X_MODE	
	LPDDR Thermal Se	ensor	Enabled
	SelfRefresh Enable		Enabled
	SelfRefresh IdleTim	er	512
	Throttler CKEMin D	efeature	Disabled
	Throttler CKEMin Ti	mer	48
	For LPDDR Only: T	hrottler CKEMin Defeature *1	Enabled
	For LPDDR Only: T	hrottler CKEMin Timer *1	64
	DRAM Power Me- ter	Use user provided power weights, scale factor, and channel power floor values	Disabled
	Memory Thermal	Lock Thermal Management Registers	Enabled
	Reporting	Extern Therm Status	Disabled
		Extern Therm Status Disabled Closed Loop Therm Manage Disabled	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 I	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
СТО		Disabled
SEFE		Disabled
SENFE		Disabled
SECE		Disabled
PME SCI		Enabled
Hot Plug		Disabled
Advanced Error Reporting		Enabled
PCIe Speed		Auto
Transmitter Half Swing		Disabled
Detect Timeout		0
PCH PCIE□ LTR *2		Enabled
Snoop Latency Override		Auto
Non Snoop Latency Override		Auto
Force LTR Override	Disabled	
PCIE□ LTR Lock *2		Disabled
Extra options	Detect Non-Compliance Device	Disabled
	Prefetchable Memory	10
	Reserved Memory Alignment	1
	Prefetchable Memory Alignment	1

^{*1.} CPU specific:

- For 7th generation CPUs: Port 0, 4 = Unknown. Port 2, 3, 6 = x1.
- For 6^{th} 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 \square \square 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-43 for details.

Changeable BIOS Chipset parameters and their factory default values:

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

	Item		Default / Remark	
Platform Controller	Isolate SMBus Segments		Always	
Hub (PCH)	PCI Express Configu-	PCI Express Port	Enabled	
	ration / PCI Express	ASPM	Disabled	
	x2 Slot	Hot Plug	Disabled	
		PCIe Speed	Auto	
		Extra options	Detect Non-Compli- ance Device = Disa- bled	
			Prefetchable Memory = 10	
			Reserved Memory Alignment = 1	
			Prefetchable Memory Alignment = 1	
	PCI Express Configu-	PCI Express Port	Enabled	
	ration / Ethernet Port 2, 3	ASPM	Disabled	
	PCI Express Configu-	PCI Express Port	Enabled	
	ration / PCI Express	ASPM	Disabled	
	Port 4,6	Hot Plug	Disabled	
		PCIe Speed	Auto	
		Extra options	Detect Non-Compliance Device = Disabled	
		ance Device = Disabled Prefetchable Memore = 10 Reserved Memory		
			Reserved Memory Alignment = 1	
			Always Enabled Disabled Auto Detect Non-Compliance Device = Disabled Prefetchable Memory = 10 Reserved Memory Alignment = 1 Prefetchable Memory Alignment = 0 Enabled Disabled Disabled Disabled Disabled Disabled Auto Detect Non-Compliance Device = Disabled Prefetchable Memory = 10 Reserved Memory = 10 Reserved Memory = 10 Reserved Memory Alignment = 1 Prefetchable Memory Alignment = 1 Prefetchable Memory Alignment = 1 Enabled AHCI	
	SATA And RST Con-	SATA Controller(s)	Enabled	
	figuration	SATA Mode Selection		
		Software Feature Mask Configuration		
		SATA Controller Speed	Default	
		SATA Port 0	Enabled *1	
		SATA Port 1	Enabled *1	
		SATA Device Type		
		SATA Port 2		
		SATA Device Type		
	USB Configuration	USB Port Disable Override		
	PCH LAN Controller	1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -		
	LAN Wake From Deep	Sx	-	
	Wake on LAN Enable			
	Serial IRQ Mode			
	PCIe Spread Spectrum	Clockina		
	IOAPIC 24-119 Entries			
*1 Disabled when a s	storage device is not pres			

^{*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-43 for details.

Changeable BIOS Chipset parameters and their factory default values:

	Item		
Processor	Memory Configuration	Max TOLUD	Dynamic
(Integrated		Memory Remap	Enabled
Components)	Graphics Configura-	Primary Display	Auto
	tion	Select PCIE Card	Auto
		Internal Graphics Device	Auto
		GTT Size	8MB
		Aperture Size	256MB
		IGD Pre-Allocated Graphics Mem-	32M
		ory	
		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	Isolate SMBus Segmer	nts	During POST
Hub (PCH)	PCI Express Configu-	PCI Express Port	Enabled
	ration / PCI Express	ASPM	Disabled
	Port 0, 4, 6, 7	Hot Plug	Disabled
		PCIe Speed	Auto
		Extra options	Detect Non-Compli- ance Device = Disa- bled
			Prefetchable Memory = 10
			Reserved Memory Alignment = 1
			Prefetchable Memory Alignment = 1
	PCI Express Configu-	PCI Express Port	Enabled
	ration / Ethernet Port 2, 3	ASPM	Disabled
	SATA And RST Con-	SATA Controller(s)	Enabled
	figuration	SATA Mode Selection	AHCI
		Software Feature Mask Configuration	HDD Unlock = Ena- bled
			LED Locate = Ena- bled
		SATA Controller Speed	Default
		SATA Port 0	Enabled *1
		SATA Port 1	Enabled *1
		SATA Port 2	Enabled *1
		SATA Device Type	Hard Disk Drive
		SATA Port 3	Enabled *1
PCH		SATA Device Type	Hard Disk Drive
	USB Configuration	USB Port Disable Override	Disabled
	PCH LAN Controller		Enabled
	LAN Wake From DeepSx		Enabled
	Wake on LAN Enable		Enabled Continuous
	Serial IRQ Mode	Serial IRQ Mode	
	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	Diskname	
Secure Boot Menu	Secure Boot	Secure Boot	
	Secure Boot Customizatio	Secure Boot Customization	
	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 $\square \square \square 008$
 - 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	BIOS - Boot BIOS up to version 008 on page
		A-57
	Version BV□□□115 and	BIOS - Boot BIOS version 115 and higher on
	higher	page A-58
Intel® Celeron® 3965U	Up to version BU□□□008	BIOS - Boot BIOS up to version 008 on page
		A-57
	Version BU□□□115 and	BIOS - Boot BIOS version 115 and higher on
	higher	page A-58
Intel [®] Core [™] i7-7820EQ	All versions	BIOS - Boot for CPU Type Intel [®] Core [™]
		<i>i7-7820EQ</i> on page A-59

• BIOS - Boot BIOS up to version 008

This section provides BIOS Boot information for 7^{th} generation CPUs with a BIOS version up to B \square \square \square 008.

Changeable BIOS Boot parameters and their factory default values:

	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-32 for details.

Changeable BIOS Boot parameters and their factory default values:

ltem	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 $^{\!8}$ Celeron $^{\!8}$ 3965U with BIOS version BU \square \square 115 and higher a	ind for C	PU
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 Atom CPUs

The BIOS settings for Atom CPUs.

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

BIOS - Main

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

Changeable BIOS Main parameters and their factory default values:

System Date
 Use the Enter key to the next Date field.

• System Time
Use the Enter key to the next Time field.

BIOS - Advanced

This section provides Advanced BIOS information for a Box PC with an Atom CPU.

Changeable BIOS Advanced parameters and their factory default values:

	Item		Default / Remark
Trusted Computing	Security Device Support		Enabled
	SHA-1 PCR Bank	SHA-1 PCR Bank	
	SHA256 PCR Bank		Enabled
	Pending operation		None
	Platform Hierarchy		Enabled
	Storage Hierarchy		Enabled
	Endorsement Hierarchy		Enabled
	TPM2.0 UEFI Spec Vers	sion	TCG_2
	Physical Presence Spec	c Version	1.3
	Device Select		Auto
RTC Wake Settings	RTC Wake Mode		Disabled
CPU	CPU Power Manage-	EIST	Enabled
	ment	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	Output Select	
UEFI Network Stack	UEFI Network Stack		Disabled
CSM & Option ROM Control	CSM Support		
USB	Legacy USB Support		Enabled
	xHCl Hand-off	xHCl Hand-off	
	USB Mass Storage Driver Support		Enabled
	USB Transfer Timeout	USB Transfer Timeout	
	Device Reset Timeout	Device Reset Timeout	
	Device Power-up Delay	Selection	Auto
	Generic Ultra HS-COME	30	Auto

BIOS - Chipset

This section provides Chipset information for a Box PC with an Atom CPU.

Changeable BIOS Chipset parameters and their factory default values:

Item			Default / Remark
Processor	Max TOLUD		2 GB
(Integrated Components)	Above 4GB MMIO BIOS	S assignment	Disabled
Extention Graphic	GOP Driver		Enabled
Configuration	Intel Graphics Pei Displ	ay Peim	Disabled
	Integrated Graphics De	vice	Enabled
	Primary Display		IGD
	RC6(Render Standby)		Disabled
	GTT Size		8MB
	Aperture Size IGD Pre-Allocated Graphics Memory		256MB
			64M
	IGD Total Graphics Mer	nory	256M
	GT PM Support		Enabled
South Cluster	SATA Drives	Chipset SATA	Enabled
Configuration		SATA Port 0	Enabled
		SATA Port 1	Enabled
	USB Configuration	USB Port Disable Override	Disabled
	Miscellaneous Configuration	Wake On Lan	Disabled

BIOS - Security

Provides security information like BIOS Password and HDD information for a Box PC with an Atom CPU.

riangle 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	BIOS Password		Empty
P1: CFast □	Set User Password		Empty
Secure Boot Menu	Secure Boot		Disabled
	Secure Boot Customiza	ation	Custom
	Key Management Factory Key Provision		Disabled
		Platform Key(PK)	0 0 No Keys
		Key Exchange Keys	
		Authorized Signatures	
		Forbidden Signatures	
		Authorized TimeStamps	
		OsRecovery Signatures	

BIOS - Boot

Provides Boot information and configuration settings for a Box PC with an Atom CPU.

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 □)
UEFI Fast Boot	Disabled
UEFI Screenshot Capability	Enabled

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 $\Box\Box\Box$ 115 and higher a second contract the contract of the second contract of the contract of th	and for (CPU
type Intel [®] Core [™] i7-7820EQ:		

• UEFI OS (P1: □)

Boots the system with the UEFI OS.

Windows Boot Manager (P1: □)

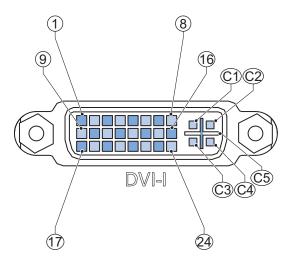
Boots the system with the Windows Boot Manager.

A-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

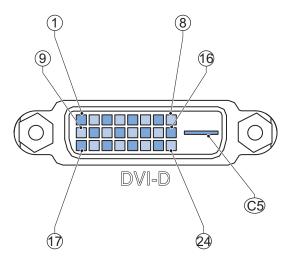
Pin	Signal Name	Function
23	TMDS clock+	Digital clock+
24	TMDS clock-	Digital clock-
C1	Analog red	Analog red *1
C2	Analog green	Analog green *1
C3	Analog blue	Analog blue *1
C4	Analog horizontal sync	Analog horizontal sync *1
C5	0 VDC	0 VDC *1

^{*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.

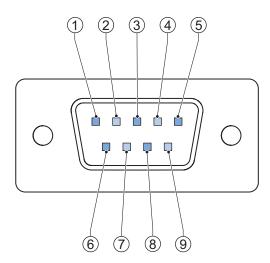


The pin layout represents the DVI connector on the Industrial Box PC. Pin numbers increase from left to right for every row.

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.

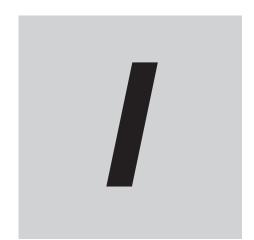
Pin	Signal Name
1	CD
2	RXD
3	TXD
4	DTR
5	0 VDC *1
6	DSR
7	RTS
8	CTS
9	RI

^{*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		Replace	
		Ducts	
Accessory kit	3-21	DVI connector	
B		Specifications	
<u> </u>		DVI-D connector	
Backup	5-56	Specifications	4-28
Base layer		E	
Battery low			
Battery		Electrical	
Replace		Specifications	4-3
BIOS		Err LED	
Book mount brackets		Ethernet connector	
Specifications	4-17	Ethernet connectors	3-12
Book mount	3-22	LED indicators	4-26
Book mounting	5-26	Link/Act indicator	4-26
Brackets		Specifications	4-25
Scope of delivery	5-4	Speed indicator	4-26
Specifications	4-17	Expansion layer	3-6
C		F	
Cables		Fan error	3-8
Communication cable S8BW	3-31	Fan Unit	
DVI cables	3-26	Replace	7-7
NY Monitor Link cable	3-27	•	
USB Type-A - USB Type-B cable	3-26	Н	
CFast Card Slot	3-17		
CFast Card	3-24	HDD LED	
Replace	7-21	HDD	
Specifications	4-13	Specifications	
Configuration	1-5	Humidity	4-32
Connect	5-42		
Connectors		I	
Cooling distance		1/0	0.40
Cooling layer		I/O connector Connections	
Corrective maintenance			
Cover	7-6	Specifications Wiring	
CPU		willing	5-39, 5-4
Intel [®] Atom [®] x5-E3940	4-7	I	
Intel [®] Celeron [®] 2980U	4-6		
Intel® Celeron® 3965U	4-7	Layers	3-3
Intel [®] Core [™] i5-4300U		LED Indicators	
Intel® Core [™] i5-7300U			
		M	
Intel [®] Core [™] i7-4700EQ			
Intel [®] Core [™] i7-7820EQ		Memory Card	
Intel [®] Xeon [®] E3-1515M v5	4-6	Memory	
_		DDR3L Non-ECC	
D		DDR4 ECC	
		DDR4 Non-ECC	4-9
Dimensions		Messages Error	7 /
Orive bays	3-18	Product	
Orive Install	5-6	Warning	
insiail	n-h	v v a i i i i i i u	

Windows	6-6
Model-ID	1-5
Monitor	3-30
Mounting	
Book mount	5-26
Brackets	3-22
Wall mount	5-27
N	
NY Monitor Link	
Cable	
LED Indicators	4-30
Specifications	4-29
P	
PCle Card	3-19
Install	5-10
Replace	7-16
Specifications	
Power button	
Power connector	
Specifications	
Wiring	
Power OFF	
Forced with power button	
Input signal	
Power button	
Windows shut down	
Power ON	
Automatic	
Details	
First time	
Input signal	6-2
Power button	6-2
Power supply	3-30
Overvoltage error	3-8
Undervoltage error	
Preventive maintenance	
Product key	
Product	
PWR LED	
_	
<u>R</u>	
RAID	
Install	5.5
Repair	
RS-232C connector	
Specifications	
RUN LED	3-8
S	
Scope of delivery	5.2
SD Memory Card	
SSD	
Specifications	4-12 3-7
OLATIO-UV HICOE	/

Startup	
Т	
Temperature Thermal shutdown	
U	
Unpack	5-2
UPS	
Connect I/O	5-53
Connect USB	5-51
USB connectors	3-11
Specifications	4-24
USB flash drives	3-24
W	
Wall mount brackets	
Specifications	4-18
Wall mount	3-22
Wall mounting	5-27
Watchdog error	3-8
Weights	4-2
Wiring	
Warnings	5-28

Index

OMRON Corporation Industrial Automation Company

Kyoto, JAPAN

Contact: www.ia.omron.com

Regional Headquarters
OMRON EUROPE B.V.

Wegalaan 67-69, 2132 JD Hoofddorp The Netherlands Tel: (31)2356-81-300/Fax: (31)2356-81-388

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

Authorized Distributor:

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

OMRON ELECTRONICS LLC

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

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Cat. No. W553-E2-13