



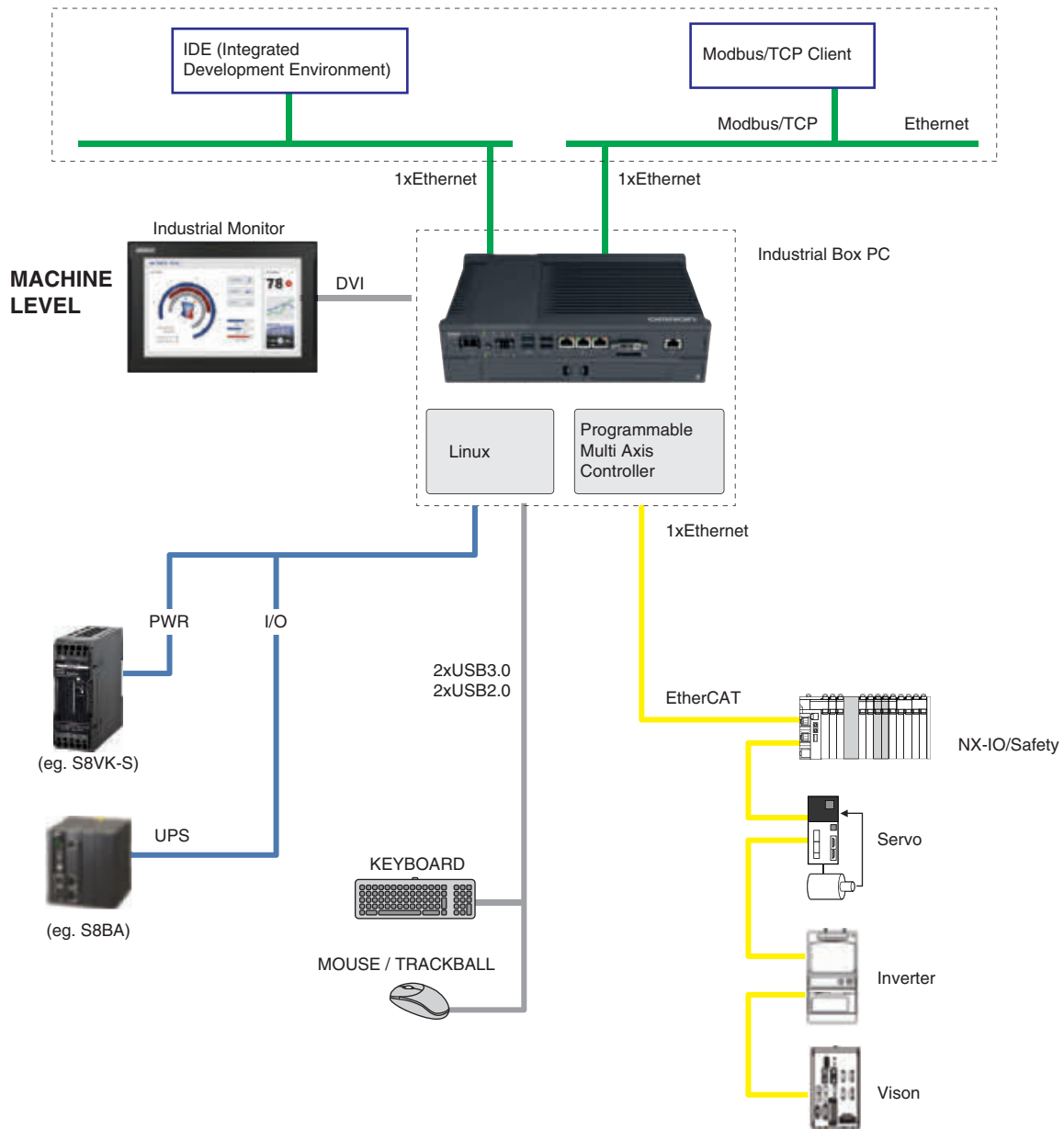
### High-speed, high-precision motion controller plus PC - in one box

The IPC Programmable Multi-Axes Controller offers exceptionally precise motion control, with proven technology from Omron's Delta Tau Data Systems, Inc. It was developed to help manufacturers boost both their productivity and their manufacturing quality, delivering world-beating<sup>\*1</sup> output speeds allied to exception precision. It comes equipped with Linux operating systems which, combined with powerful control capability, provides great flexibility.

- Up to 64 axes of control
- Motion control period: 250 ms/16 axes<sup>\*2</sup>
- Flexible function development capability (G-Code/ANSI C/original programming language)
- EtherCAT for flexible system configuration
- Multi-tasking of Motion Control and Linux applications
- Hypervisor allows to continue to control even if OS crashes

<sup>\*1</sup>. Refers to the motion control performance of 16.6 ms/1 axes or 50 ms/8 axes (Omron survey as of July 2016).  
<sup>\*2</sup>. Reference value.

### System Configuration



Model Number Structure

**NYB 2C - 3 1 P K 1**  
 1 2 3 4 5 6 7

Item	Description	Option
1	Series name	NYB: NY-series Industrial Box PC
2	Processor	2C: Intel® Celeron® 3965U, 7th generation CPU
3	Main memory	3: 8 GB, non-ECC
4	Expansion slots	1: 1 PCIe slot
5	Operating system	P: Programmable Multi Axis Controller with Linux
6	Storage	K: 128GB, SSD iMLC
7	Interface	1: RS-232C

Ordering Information

Product name	Specifications				Order code
	Processor type	Main memory	Storage size	OS	
Industrial Box PC	Intel® Celeron® 3965U 7th generation CPU fanless processor	8 GB, non-ECC	SSD iMLC 128 GB	Linux	NYB2C-31PK1

Optional Hardware

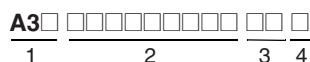
Product name	Specifications	Order code
Mounting Brackets*1	Book mount	NY000-AB02
	Wall mount	NY000-AB01
SD Memory Cards	Card type: SD Card Capacity: 2 GB Format: FAT16	HMC-SD291
	Card type: SDHC Card Capacity: 4 GB Format: FAT32	HMC-SD491
USB Flash Drives	Capacity: 2 GB	FZ-MEM2G
	Capacity: 8 GB	FZ-MEM8G
Storage Devices	Storage type: HDD Capacity: 320 GB	NY000-AH00
	Storage type: SSD SLC Capacity: 32 GB	NY000-AS00
	Storage type: SSD SLC Capacity: 64 GB	NY000-AS01
	Storage type: SSD MLC Capacity: 128 GB	NY000-AS04
USB Type-A to USB Type-B Cables	Cable length: 2 m USB 2.0 Minimum bend radius: 25 mm	FH-VUAB 2M
	Cable length: 5 m USB 2.0 Minimum bend radius: 25 mm	FH-VUAB 5M
DVI Cables	Cable length: 2 m Supports DVI-D Minimum bend radius: 36 mm	NY000-AC00 2M
	Cable length: 5 m Supports DVI-D Minimum bend radius: 36 mm	NY000-AC00 5M
Industrial Monitor	<ul style="list-style-type: none"> <li>• LCD touchscreen</li> <li>• Multi-touch functionality</li> <li>• Supply voltage: 24 VDC</li> <li>• Up to 1,920 × 1,080 pixels at 60 Hz</li> <li>• 2 USB Type-A Connectors</li> <li>• Programmable brightness control</li> </ul>	NYM1□W-C100□
Power Supply	<ul style="list-style-type: none"> <li>• Output voltage: 24 VDC</li> <li>• Push-In Plus terminal blocks</li> </ul>	S8VK-S□□□24
UPS*2	Output voltage during backup operation: 24 VDC ± 5%	S8BA
UPS Communication Cable	Cable length: 2 m Signals for <ul style="list-style-type: none"> <li>• Signal output (BL, TR, BU, WB)</li> <li>• Remote ON/OFF input</li> <li>• UPS Stop Signal input (BS)</li> </ul>	S8BW-C02

\*1 Select the required type.

\*2 Revision number 04 or higher.

Note: Orders for NY000-AS02 are no longer accepted, as of November 30, 2018.

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

### Spare Parts

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

Product name	Specifications	Order code
Battery	One battery is supplied with the Industrial Box PC. The battery supplies power to the real-time clock. The battery is located inside the Industrial Box PC. Service life: 5 years at 25°C	CJ1W-BAT01
Fan Unit	The Fan Unit is available for the Industrial Box PC that has active cooling. 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.	NY000-AF00
Accessory Kit	Accessory Kit containing all accessories supplied with the Industrial Box PC. <ul style="list-style-type: none"> <li>• Power connector</li> <li>• I/O connector</li> <li>• Drive bracket for drive installation</li> <li>• 4 mounting screws for drive installation</li> <li>• PCIe Card support for PCIe Card installation</li> <li>• PCIe Card clip for PCIe Card installation</li> </ul>	NY000-AK00

### Installed Support Software

Item	Specifications
Industrial PC Support Utility	The Industrial PC Support Utility is a software utility to assist in diagnosing and resolving problems of the Industrial Box PC. It is pre-installed on the Industrial Box PC and the Industrial Panel PC.
Industrial PC Tray Utility	The Industrial PC Tray Utility is a software utility that provides information about the current state of the Industrial PC, its related devices, and associated software. It is pre-installed on the Industrial Box PC and the Industrial Panel PC.
Industrial PC System API	The Industrial PC System API allows programmers to create programs that can retrieve information or set an indicator status of the Industrial Box PC. The API makes use of the included IPC System Service to manage the hardware. It is pre-installed on the Industrial Box PC and the Industrial Panel PC.
Industrial Monitor Utility	For the optional OMRON Industrial Monitor. The Industrial Monitor Utility provides a user interface to control settings and display details of connected Industrial Monitors. It is pre-installed on the Industrial Box PC and the Industrial Panel PC.
Industrial Monitor Brightness Utility	For the optional OMRON Industrial Monitor. The Industrial Monitor Brightness Utility is a small software utility that allows you to control the brightness of the screen backlight of all connected Industrial Monitors. It is pre-installed on the Industrial Box PC and the Industrial Panel PC.
Industrial Monitor API	For the optional OMRON Industrial Monitor. The Industrial Monitor API allows programmers to create applications that can control the hardware features and retrieve information from connected Industrial Monitors. It is pre-installed on the Industrial Box PC and the Industrial Panel PC.

### Support Software

The following table shows the Support Software used to configure, monitor, program, and debug the Programmable Multi-Axis Controller.

Software Name	Application	How to Procure
Power PMAC IDE*1	This computer software is used to configure the Controller, create user programs, and debug the programs.	This is free software. Contact your OMRON representative for information on how to procure.
Power PMAC NC16	Power PMAC-NC16 SDK	This computer software is used to control working machines and other CNC machines with the Controller. Use this software when you want to customize the HMI screen. The product contains extension source codes used for customization.
	Power PMAC-NC16 Runtime	This computer software is used to control working machines and other CNC machines with the Controller. Use this software when you do not customize the HMI screen.
Acontis EC Engineer	This computer software is used to configure and monitor the EtherCAT network by using the Controller as the EtherCAT master.	This is free software. Contact your OMRON representative for information on how to procure.

\*1 Power PMAC IDE should be version 1.43 or higher.

Note: PMAC is an abbreviation for Programmable Multi Axis Controller.

**Recommended EtherCAT and Ethernet Communications Cables**

Use Straight STP (shielded twisted-pair) cable of category 5 or higher with double shielding (braiding and aluminum foil tape) for EtherCAT.

For EtherCAT, use a shielded twisted-pair cable (double shielding with aluminum tape and braiding) of Ethernet category 5 (100BASE-TX) or higher, and use straight wiring.





For Ethernet, required specification for the communications cables varies depending on the baud rate.

For 100BASE-TX/10BASE-T, use an STP (shielded twisted-pair) cable of Ethernet category 5 or higher. You can use either a straight or cross cable.

For 1000BASE-T, use an STP (double shielding with aluminum tape and braiding) cable of Ethernet category 5e or higher. You can use either a straight or cross cable.

In the table, materials indicated available for Ethernet 100BASE-TX are available for both of 100BASE-TX and 10BASE-T.

**Cable with Connectors**

Item	Appearance	Recommended manufacturer	Cable length (m)	Order code
Products for EtherCAT Cable with Connectors on Both Ends (RJ45/RJ45) Standard RJ45 plugs type <sup>*1</sup> Wire Gauge and Number of Pairs: AWG26, 4-pair Cable Cable Sheath material: LSZH <sup>*2</sup> Cable color: Yellow <sup>*3</sup>		OMRON	0.3	XS6W-6LSZH8SS30CM-Y
			0.5	XS6W-6LSZH8SS50CM-Y
			1	XS6W-6LSZH8SS100CM-Y
			2	XS6W-6LSZH8SS200CM-Y
			3	XS6W-6LSZH8SS300CM-Y
Cable with Connectors on Both Ends (RJ45/RJ45) Rugged RJ45 plugs type <sup>*1</sup> Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Right blue		OMRON	0.3	XS5W-T421-AMD-K
			0.5	XS5W-T421-BMD-K
			1	XS5W-T421-CMD-K
			2	XS5W-T421-DMD-K
			5	XS5W-T421-GMD-K
Cable with Connectors on Both Ends (M12 Straight/M12 Straight) Shield Strengthening Connector cable <sup>*4</sup> M12/Smartclick Connectors Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Black		OMRON	0.5	XS5W-T421-BM2-SS
			1	XS5W-T421-CM2-SS
			2	XS5W-T421-DM2-SS
			3	XS5W-T421-EM2-SS
			5	XS5W-T421-GM2-SS
Cable with Connectors on Both Ends (M12 Straight/RJ45) Shield Strengthening Connector cable <sup>*4</sup> M12/Smartclick Connectors Rugged RJ45 plugs type Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Black		OMRON	0.5	XS5W-T421-BMC-SS
			1	XS5W-T421-CMC-SS
			2	XS5W-T421-DMC-SS
			3	XS5W-T421-EMC-SS
			5	XS5W-T421-GMC-SS
10	XS5W-T421-JMC-SS			

<sup>\*1</sup> Standard type cables length 0.2, 0.3, 0.5, 1, 1.5, 2, 3, 5, 7.5, 10, 15 and 20 m are available.  
Rugged type cables length 0.3, 0.5, 1, 2, 3, 5, 10 and 15 m are available.  
For details, refer to Cat.No.G019.

<sup>\*2</sup> The lineup features Low Smoke Zero Halogen cables for in-cabinet use and PUR cables for out-of-cabinet use. Although the LSZH cable is single shielded, its communications and noise characteristics meet the standards.

<sup>\*3</sup> Cables colors are available in blue, yellow, or Green.

<sup>\*4</sup> For details, contact your OMRON representative.

**Cables / Connectors**

Item	Wire Gauge and Number of Pairs:	Cables	Recommended manufacturer	Order code
Products for EtherCAT or Ethernet (1000BASE-T/100BASE-TX)	AWG24, 4-pair Cable	Cables	Hitachi Metals, Ltd.	NETSTAR-C5E SAB 0.5 × 4P CP <sup>*1</sup>
			Kuramo Electric Co.	KETH-SB <sup>*1</sup>
			SWCC Showa Cable Systems Co.	FAE-5004 <sup>*1</sup>
Products for EtherCAT or Ethernet (100BASE-TX)	AWG22, 2-pair Cable	RJ45 Connectors	Panduit Corporation	MPS588-C <sup>*1</sup>
		Cables	Kuramo Electric Co.	KETH-PSB-OMR <sup>*2</sup>
			JMACS Japan Co., Ltd.	PNET/B <sup>*2</sup>
RJ45 Assembly Connector	OMRON	XS6G-T421-1 <sup>*2</sup>		

<sup>\*1</sup> We recommend you to use above cable for EtherCAT and Ethernet, and RJ45 Connector together.

<sup>\*2</sup> We recommend you to use above cable for EtherCAT and Ethernet, and RJ45 Assembly Connector together.

**Note:** Connect both ends of cable shielded wires to the connector hoods.

Specifications

Performance/Function Specifications Supported by NYB2C-31PK1

Item		NYB2C-31PK1
External terminals		Communications Connector For EtherCAT communications. • RJ45 × 1 For Ethernet communications. • RJ45 × 2
Motion control	Maximum Number of Controlled Axes	64 axes
	Motion control period	250 μ or more
	Control method	Issuing control commands using EtherCAT communications
EtherCAT communications specifications	Number of available ports	1
	Communications protocol	EtherCAT protocol
	Baud rate	100 Mbps
	Physical layer	100BASE-TX (IEEE 802.3)
	Topology	Line and branching
	Transmission media	Twisted-pair cable of category 5 or higher (double-shielded cable with aluminum tape and braiding)
	Transmission distance	Distance between nodes: 100 m or less
	Maximum number of controlled axes	64
	Maximum number of slaves	128
Range of node addresses that can be set	1 to 128	
Ethernet Port	Number of available ports	2
	Physical Layer	10BASE-T/100BASE-TX/1000BASE-T
	Frame length	1,514 bytes max.
	Media access method	CSMA/CD
	Modulation	Baseband
	Topology	Star
	Transmission Media	Twisted-pair cable of category 5, 5e, or higher (shielded cable)
	Maximum Transmission Distance between Ethernet Switch and Node	100 m
	Maximum number of cascade connections	There are no restrictions if an Ethernet switch is used.
USB port	Communication standard	2 × USB2.0 and 2 × USB3.0
	Transmission distance	5 m (USB2.0) and 3 m (USB3.0)

Performance Specifications

Item		NYB2C-31PK1		
Main system	CPU	CPU type	Intel® Celeron® 3965U	
		Cores / Threads	2 / 2	
		CPU base frequency	2.2 GHz	
		Cache	2 MB	
		Cooling details	Passive cooling (fanless)	
	Memory	Memory size	8 GB	
		Memory type	DDR3L (non ECC)	
	Trusted platform module (TPM)		<ul style="list-style-type: none"> <li>• Ensure the integrity of the platform</li> <li>• Disk encryption</li> <li>• Password protection and other uses of encryption</li> </ul>	
Graphics controller		Intel® HD Graphics. Up to two independent screens. Intel® HD Graphics 610		
Watchdog		Yes		
Operating system		PMAC w/Linux		
Storage devices	Drives	Hard disk drive	<ul style="list-style-type: none"> <li>• 320 GB Serial ATA 3.0</li> </ul>	
		Solid state drive	SLC type	<ul style="list-style-type: none"> <li>• 64 GB Serial ATA 3.1</li> </ul>
			MLC type	<ul style="list-style-type: none"> <li>• 128 GB Serial ATA 3.1</li> </ul>
	Drive bays (HDD/SSD)*1		2	
Connectors	Power connector		<ul style="list-style-type: none"> <li>• 24 VDC</li> </ul>	
	I/O connector		2 inputs (UPS signal and power OFF control) and 1 output (Industrial Box PC power state)	
	USB2.0 Type-A	Number of ports	2	
		Maximum current	500 mA	
		Maximum cable length	5 m	
	USB3.0 Type-A	Number of ports	2	
		Maximum current	900 mA	
		Maximum cable length	3 m	
	Ethernet connectors	Number of available ports	3	
Physical layer		10BASE-T, 100BASE-TX or 1000BASE-T		
DVI-I connector	Video interface	Digital		
	Resolution	Up to 1,920 x 1,200 pixels at 60 Hz		
	Maximum DVI cable length	Dependent upon connected monitor type and resolution		

Item		NYB2C-31PK1
Optional connector (select one per system)	RS-232C	Standard DSUB9 connector (Non-Isolated)
PCIe Card Slot	Configuration	X2 (2 lanes) up to Gen 3
	Card height	Standard height cards, 4.20 inches (106.7 mm) <sup>*2</sup>
	Card length	Half length cards, 6.6 inches (167.65 mm)
Battery	Model	CJ1W-BAT01
	Service life	10 years at 25°C
LED		PWR, ERR, HDD, RUN

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

\*2 Low profile cards, 2.536 inches (64.4 mm) are not supported.

**Electrical Specifications**

Item		NYB2C-31PK1
Rated power supply voltage		24 VDC, non-isolated
Allowable power supply voltage range		20.4 to 28.8 VDC
Grounding method		Ground to less than 100 Ω
Inrush current		At 24 VDC: 12 A / 6 ms max. for cold start at room temperature
Overvoltage category		JIS B3502 and IEC 61131-2: Category II
EMC immunity level		IEC 61132-2: 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
Battery life		5 years at 25°C (for battery CJ1W-BAT01)
Power consumption		50 W max.

Note: Refer to the *Industrial PC Platform NYseries IPC Programmable Controller Industrial Box PC Hardware User's Manual (W580)* for detail.

**Environmental Specifications**

Item		Specifications
Operation environment	Ambient operating temperature <sup>*1</sup>	0 to 55°C (Book mount) 0 to 50°C (Wall mount)
	Ambient storage temperature <sup>*1</sup>	-20 to 70°C
	Ambient operating humidity <sup>*1</sup>	10% to 90% with no condensation
	Ambient storage humidity <sup>*1</sup>	10% to 90% with no condensation
	Operating atmosphere	No corrosive gases
	Altitude	2,000 m max.
	Noise resistance (during operation)	Conforms to IEC61000-4-4, 2kV (power lines)
	Vibration resistance (during operation)	Conforms to IEC 60068-2-6. For a product with an SSD: 5 to 8.4 Hz with 3.5 mm single amplitude and 8.4 to 150 Hz with 9.8 m/s <sup>2</sup> for 10 times each in X, Y and Z directions. For a product with a HDD the vibration resistance depends on the mounting orientation <sup>*2</sup> .
	Shock resistance (during operation)	Conforms to IEC 60068-2-27. 147 m/s <sup>2</sup> , 3 times in each X, Y and Z directions
	Installation method	Book mount, Wall mount
Pollution degree	2 or less: Conforms to JIS B3502 and IEC 61131-2.	
Applicable standards <sup>*3</sup>	EU Directives: EMC Directive 2014/30/EU (EN 61131-2), and RoHS Directive KC Registration, RCM, cULus, EAC	

\*1 The allowed ambient operating temperature and ambient humidity depend on product type, CPU type, mounting orientation, and storage device type.

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

Mounting orientation	SSD	HDD
Book	9.8 m/s <sup>2</sup>	2.5 m/s <sup>2</sup>
Wall		4.9 m/s <sup>2</sup>

\*3 Refer to the OMRON website (www.ia.omron.com) or contact your OMRON representative for the most recent applicable standards for each model.

**Storage Device Specifications**

Item	Specifications			
Model	NY000-AS00	NY000-AS01	NY000-AS04	NY000-AH00
Capacity	32 GB	64 GB	128 GB	320 GB
Type	SSD (SLC)		SSD (MLC)	HDD
S.M.A.R.T. support	Yes			
Rotation speed	-		-	5,400 r/min
Interface	Serial ATA 3.1			
Sustained standard read speed	Up to 160 MB/s		Up to 530 MB/s	-
Sustained standard write speed	Up to 150 MB/s		Up to 190 MB/s	-
Operating temperature	0 to 70°C			5 to 55°C
Operating humidity	10% to 95% (with no condensation)			<ul style="list-style-type: none"> <li>10% to 95% (with no condensation)</li> <li>29°C wet-bulb temperature max.</li> </ul>
Storage temperature	-40 to 100°C		-55 to 95°C	-40 to 65°C

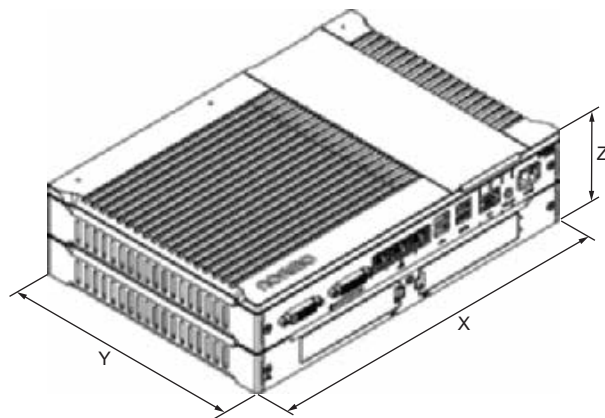
Item	Specifications			
Storage humidity	10% to 95% (with no condensation)			<ul style="list-style-type: none"> <li>• 8% to 90% (with no condensation)</li> <li>• 40°C wet-bulb temperature max.</li> </ul>
Life	1,500 TB written / 11 years at a daily workload of 350 GB	3,000 TB written / 23 years at a daily workload of 350 GB	208 TB written / 5 years at a daily workload of 100 GB	Approximately 5 years or 20,000 powered-ON hours (whichever comes first) under the following conditions: <ul style="list-style-type: none"> <li>• 25°C at 101.3 kPa</li> <li>• Less than 333 powered-ON hours/month<sup>*1</sup></li> <li>• Less than 20% operation while powered-ON<sup>*2</sup></li> <li>• Less than 1.30 x 10<sup>6</sup> seeks/month</li> </ul>

\*1 Powered-ON hours include sleep and standby modes.

\*2 Operation includes seeking, writing, and reading functions.

Note: Orders for NY000-A502 are no longer accepted, as of November 30, 2018.

**Dimensions**



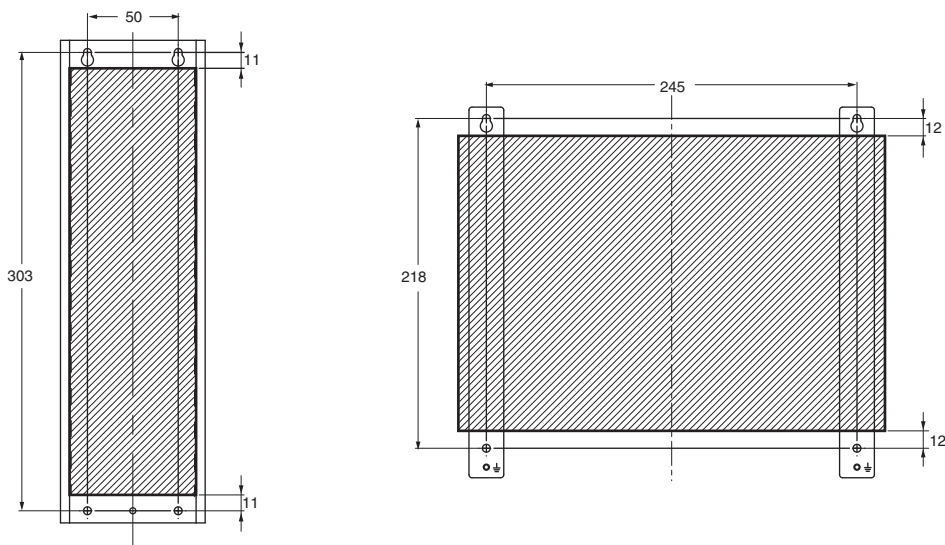
Item	Specifications
Dimensions	Width X = 282 mm Depth Y = 195 mm. Y = 200 mm including the DVI connectors. Height Z = 73 mm
Weight	3.0 kg

**Bracket Specifications**

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

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

Mounting screw locations for book mount and wall mount orientation:



(Unit: mm)

**Version Information**

**Unit Versions**

Units	Models	Unit Version
NY-series Programmable Multi-Axis Controller	NYB2C-31PK1	2.5

**Unit Versions and Programming Devices Supported by NYB2C-31PK1**

The following tables show the relationship between unit versions and Power PMAC IDE versions.

Unit Version	Corresponding version of Power PMAC IDE
2.5	Version 4.3 or higher

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 The product photographs and figures that are used in this document may vary somewhat from the actual products.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.  
 To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.