Artificial Intelligence Machine Automation Controller (Abbreviation: AI Controller)

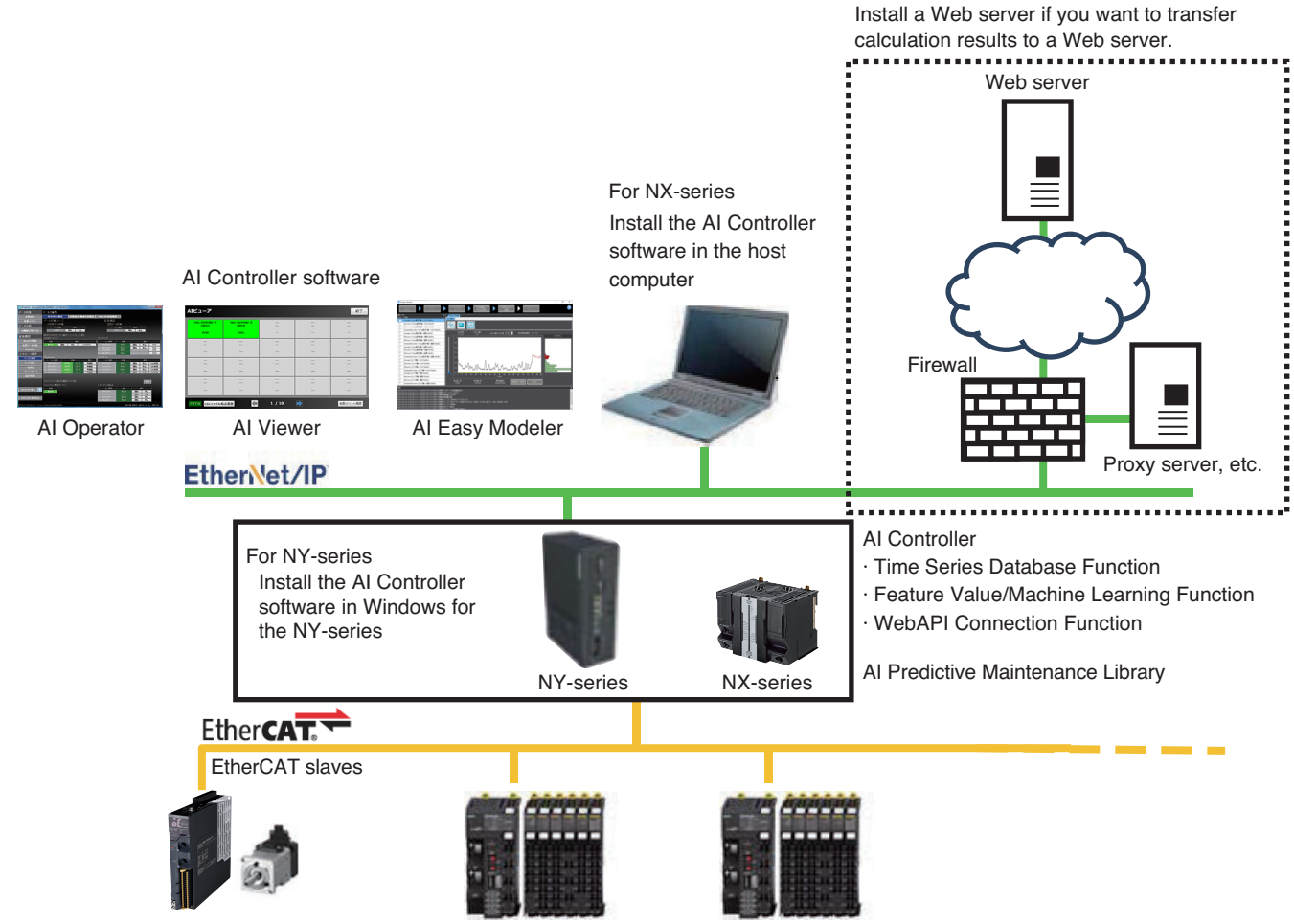
NX/NY-Series

CSM_NX_NY_AI_Controller_DS_E_4_1

Ultimate AI edge controller born from the fusion of AI and control

- The AI Controllers refer to Machine Automation Controllers with AI functions.
- The AI functions are designed to improve the equipment's utilization rate as they detect equipment events including equipment errors and the end of service life, as well as behaviors that are the signs of such events.
- The AI Controller has the Time Series Database Function designed for data collection in the storage mounted to the NX and NY series Controllers. The data collection intervals are synchronized with the PLC function module's scheduling.
- The AI Controllers have a function to upload files to Web Server securely.
- The AI Predictive Maintenance Library allows you to perform predictive maintenance easily with the AI functions.

System Configuration



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Ordering Information

NX-series AI Controller

Product Name	Specifications			Current (Power) consumption	Model
	Program capacity	Memory capacity for variables	Number of motion axes		
NX701 CPU Units with AI function	80 MB	4 MB: Retained during power interruption 256 MB: Not retained during power interruption	256	40 W (including SD Memory Card and End Cover)	**NX701-Z700**
			128		**NX701-Z600**

NY-series AI Controller

Product name	Specifications						Model
	Operating system	CPU type	Number of motion axes	RAM memory (non-ECC type)	Storage size	Interface option	
Industrial Box PC with AI function	Windows 10 IoT Enterprise 2019 LTSC - 64bit	Intel® Core™ i5-7440EQ	64	32 GB	128 GB × 2 SSD iMLC/pSLC	RS-232C	**NY512-Z500-1XX445T1X**
			32				**NY512-Z400-1XX445T1X**
			16				**NY512-Z300-1XX445T1X**
			64			DVI-D	**NY512-Z500-1XX445T2X**
			32				**NY512-Z400-1XX445T2X**
			16				**NY512-Z300-1XX445T2X**
Industrial Panel PC with AI function			64			RS-232C	**NY532-Z500-112445T10**
			32				**NY532-Z400-112445T10**
			16				**NY532-Z300-112445T10**
			64			DVI-D	**NY532-Z500-112445T20**
			32				**NY532-Z400-112445T20**
			16				**NY532-Z300-112445T20**

Model Number Structure

The purpose of this model number structure is to provide understanding of the meaning of specifications from the model number. Models are not available for all combinations of code numbers.

NY 5 □ □ - □ □ 0 0 - □ □ □ □ □ □ □ □ □

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

Item		Description	Option
1	Series name	NY	NY-series Industrial PC Platform
2	Controller specifications	5	Large scale, high speed and high precision control application for up to 64 axes.
3	Model type	1	Industrial Box PC
		3	Industrial Panel PC
4	Sequential number	2 or more	
5	Function module	Z	AI function
6	Number of axes for motion control	3	16 axes
		4	32 axes
		5	64 axes
7	Additional function software module	0	---
8	Reserved	0	---
9	Expansion slots	1	1 PCIe slots
10	Frame type	1	Aluminum frame, black, and projected capacitive touch type
		X	No display (Industrial Box PC)
11	Display size	2	15.4 inch model
		X	No display (Industrial Box PC)
12	OS	4	Windows 10 IoT Enterprise 2019 LTSC - 64 bit
13	Processor	4	Intel® Core™ i5-7440EQ 7th generation CPU with Fan Unit for active cooling
14	Main memory	5	32 GB, non- ECC
15	Storage	T	128 GB, SSD iMLC/pSLC
16	Optional interface	1	RS-232C
		2	DVI-D
17	Logo	0	OMRON
		X	No display (Industrial Box PC)

Sysmac Library for AI Controller

Download Sysmac Library for AI Controller to your PC using AI Operator. Install the library before you use it.

Target Mechanism	Software model	Specification
AI Predictive Maintenance Library (Cylinder)	**SYSMAC-ZPA001000W**	CylinderStatus generates mechanism state variables that reflect the status of the cylinder referenced by the feature value / machine learning functions.
AI Predictive Maintenance Library (Ball Screw)	**SYSMAC-ZPA002000W**	BallScrewStatus generates mechanism state variables that reflect the status of the ball screw referenced by the feature value / machine learning functions.
AI Predictive Maintenance Library (Belt & Pulley)	**SYSMAC-ZPA003000W**	BeltPulleyStatus generates mechanism state variables that reflect the status of the belt & pulley referenced by the feature value / machine learning functions.

Target Mechanism	Number of licenses ✻	Model
AI Predictive Maintenance Library (Cylinder)	5 licenses	**SYSMAC-ZPA001005L**
	10 licenses	**SYSMAC-ZPA001010L**
	50 licenses	**SYSMAC-ZPA001050L**
AI Predictive Maintenance Library (Ball Screw)	5 licenses	**SYSMAC-ZPA002005L**
	10 licenses	**SYSMAC-ZPA002010L**
	50 licenses	**SYSMAC-ZPA002050L**
AI Predictive Maintenance Library (Belt & Pulley)	5 licenses	**SYSMAC-ZPA003005L**
	10 licenses	**SYSMAC-ZPA003010L**
	50 licenses	**SYSMAC-ZPA003050L**

✻ One license is required for each mechanism to monitor.

AI Controller Software

Please purchase a DVD and required number of licenses the first time you purchase the Sysmac Studio. DVDs and licenses are available individually. Each model of licenses does not include any DVD.

Product Name	Number of licenses	Model
AI Controller Standard Software ✻	--- (Media only: DVD)	**SYSMAC-AICSTE00D**
	1 license	**SYSMAC-AICSTE01L**
	10 licenses	**SYSMAC-AICSTE10L**
	30 licenses	**SYSMAC-AICSTE30L**
	50 licenses	**SYSMAC-AICSTE50L**

✻ The AI Controller Standard Software and one license are bundled with the NY AI Controller.

Support Software

Software Name	Specification
AI Operator	The AI Operator is a tool to configure AI function settings of the AI Controller as well as to monitor the status. It works on Windows. The AI Operator also provides a function for transferring results of calculation performed by the Feature Value/Machine Learning Function from the AI Controller to a computer.
AI Viewer	The AI Viewer is a tool to visualize feature values and results of equipment events that are output by the Feature Value/Machine Learning Function. It works on Windows. The AI Operator reads out data transferred from the AI Controller and displays it on a computer for the users to view.

AI Controller Data Mining Software

Please purchase a DVD and required number of licenses the first time you purchase the Sysmac Studio.
DVDs and licenses are available individually. Each model of licenses does not include any DVD.

Product Name	Number of License	Model
AI Controller Data Mining Software ∗1	--- (Media only: DVD)	**SYSMAC-AICSTENGE00D**
	1 license	**SYSMAC-AICSTENGE01L**
	10 licenses	**SYSMAC-AICSTENGE10L**
	30 licenses	**SYSMAC-AICSTENGE30L**
	50 licenses	**SYSMAC-AICSTENGE50L**
AI Controller Data Mining Software Model setting edition ∗2	1 license	**SYSMAC-AICMSENGE01L**
	10 licenses	**SYSMAC-AICMSENGE10L**
	30 licenses	**SYSMAC-AICMSENGE30L**
	50 licenses	**SYSMAC-AICMSENGE50L**

∗1. The AI Controller Data Mining Software Model setting edition is included.
∗2. This edition is only available to the AI Easy Modeler for Model setting.

Support Software

Software Name	Specification
AI Easy Modeler	The AI Easy Modeler is a tool designed to generate AI machine learning models necessary for the AI Controller's AI function, and used in a data analytic phase. The AI Easy Modeler makes data analyses easier for users with limited controller programming experiences and statistic knowledge. It works on Windows.
AI Easy Modeler for Model setting	The AI Easy Modeler for Model Setting is a tool designed to generate AI machine learning models necessary for the AI Controller's AI function, and used in an operational phase. It is specialized in threshold setting and machine learning model creation. The operation of the tool is streamlined and easy. It works on Windows.

Automation Software Sysmac Studio

Please purchase a DVD and required number of licenses the first time you purchase the Sysmac Studio. DVDs and licenses are available individually. Each model of licenses does not include any DVD.
Before programming the AI Controller with Sysmac Studio, you must register your license number of AI Controller Standard Software.
For registration procedure, see "Displaying and Registering Licenses" in "Sysmac Studio Version1 Operation Manual (Cat. No. W504)".
Refer to the file below for the NY-series AI Controllers:
D:\OMRON-NY\Installers\AI_Controller_Standard_Software\README.txt

Product name	Specifications	Number of licenses	Media	Model
Sysmac Studio Standard Edition Ver.1.□□	The Sysmac Studio is the software that provides an integrated environment for setting, programming, debugging and maintenance of machine automation controllers including NJ/NX-series CPU Units, NY-series Industrial PC, EtherCAT Slaves, and HMI. Sysmac Studio runs on the following OS. Windows 7 (32-bit/64-bit version)/Windows 8 (32-bit/64-bit version)/ Windows 8.1 (32-bit/64-bit version)/Windows 10 (32-bit/64-bit version) ∗1 The Sysmac Studio Standard Edition DVD includes Support Software to set up EtherNet/IP Units, DeviceNet slaves, Serial Communications Units, and Support Software for creating screens on HMIs (CX-Designer). For details, refer to your OMRON website.	--- (Media only)	Sysmac Studio (32-bit) DVD	**SYSMAC-SE200D**
		--- (Media only)	Sysmac Studio (64-bit) DVD	**SYSMAC-SE200D-64**
		1 license ∗2	---	**SYSMAC-SE201L**
Sysmac Studio Team Development Option ∗3	Sysmac Studio Team Development Option is a licence to enable the project version control function.	1 license ∗2	---	**SYSMAC-TA401L**

∗1. Model "SYSMAC-SE200D-64" runs on Windows 10 (64 bit).
∗2. Multi licenses are available for the Sysmac Studio (3, 10, 30, or 50 licenses).
∗3. This product is a license only. You need the Sysmac Studio Standard Edition DVD media to install it.
This option can be used by applying the Team Development Option to Sysmac Studio version 1.20 or higher.
Project version control function is supported by CPU Unit version 1.16 or later.

Recommended EtherCAT and EtherNet/IP Communications Cables

Use a straight STP (shielded twisted-pair) cable of category 5 or higher with double shielding (aluminum tape and braiding) for EtherCAT.
For EtherNet/IP, required specification for the communications cables varies depending on the baud rate.
For 100BASE-TX/10BASE-T, use a straight or cross STP (shielded twisted-pair) cable of category 5 or higher.
For 1000BASE-T, use a straight or cross STP cable of category 5e or higher with double shielding (aluminum tape and braiding).

Cable with Connectors

Item		Recommended manufacturer	Cable length (m)	Model
Wire Gauge and Number of Pairs: AWG26, 4-pair Cable Cable Sheath material: LSZH ✻2	Cable with Connectors on Both Ends (RJ45/RJ45) Standard RJ45 plug type ✻1 Cable color: Yellow ✻3 	OMRON	0.3	**XS6W-6LSZH8SS30CM-Y**
			0.5	**XS6W-6LSZH8SS50CM-Y**
			1	**XS6W-6LSZH8SS100CM-Y**
			2	**XS6W-6LSZH8SS200CM-Y**
			3	**XS6W-6LSZH8SS300CM-Y**
			5	**XS6W-6LSZH8SS500CM-Y**
Wire Gauge and Number of Pairs: AWG22, 2-pair cable	Cable with Connectors on Both Ends (RJ45/RJ45) Rugged RJ45 plug type ✻1 Cable color: Light 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**
			10	**XS5W-T421-JMD-K**
	Cable with Connectors on Both Ends (M12 Straight/M12 Straight) Shield Strengthening Connector cable ✻4 M12/Smartclick Connectors 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**
			10	**XS5W-T421-JM2-SS**
	Cable with Connectors on Both Ends (M12 Straight/RJ45) Shield Strengthening Connector cable ✻4 M12/Smartclick Connectors Rugged RJ45 plug type 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**

✻1. Cables with standard RJ45 plugs are available in the following lengths: 0.2 m, 0.3 m, 0.5 m, 1 m, 1.5 m, 2 m, 3 m, 5 m, 7.5 m, 10 m, 15 m, 20 m. Cables with rugged RJ45 plugs are available in the following lengths: 0.3 m, 0.5 m, 1 m, 2 m, 3 m, 5 m, 10 m, 15 m. For details, refer to the *Industrial Ethernet Connectors Catalog* (Cat. No. G019).
✻2. 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.
✻3. Cable colors are available in yellow, green, and blue.
✻4. For details, contact your OMRON representative.

Cables / Connectors

Item			Recommended manufacturer	Model
Products for EtherCAT or EtherNet/IP (1000BASE-T ✻2/ 100BASE-TX)	Wire Gauge and Number of Pairs: AWG24, 4-pair Cable	Cables	Hitachi Metals, Ltd.	**NETSTAR-C5E SAB 0.5 × 4P CP** ✻1
			Kuramo Electric Co.	**KETH-SB** ✻1
		RJ45 Connectors	Panduit Corporation	**MPS588-C** ✻1
Products for EtherCAT or EtherNet/IP (100BASE-TX/10BASE-T)	Wire Gauge and Number of Pairs: AWG22, 2-pair Cable	Cables	Kuramo Electric Co.	**KETH-PSB-OMR** ✻3
			JMACS Japan Co., Ltd.	**PNET/B** ✻3
		RJ45 Assembly Connector 	OMRON	**XS6G-T421-1** ✻3

✻1. We recommend you to use the above Cable and RJ45 Connector together.
✻2. The products can be used only with the NX701.
✻3. We recommend you to use the above Cable and RJ45 Assembly Connector together.

Memory Card

Use	Access point	Specifications	Model
Storage for AI Controller	NX701	SDHC Card, 16 GB	**HMC-SD1A1 ✻1**
	NY5□2	SSD, 128 GB	**NY000-AS06 ✻2**

✻1. This is a storage device for NX701-Z□□□. Do not use it for any other purpose.
✻2. It is a dedicated storage device to be inserted into Drive A of an NY5□2-Z□□□ Controller and is used as the expanded storage. Do not use it for any other purpose.

NX701-Z□00 Accessories

The following accessories come with the CPU Unit.

Item	CPU Unit
	NX701-Z□00
Battery	CJ1W-BAT01
End Cover	NX-END01 (must be attached ti the right end of the CPU Rack)
End Plate	---
Fan Unit	NX-FAN01
Memory Card (Flash Memory)	HMC-SD1A1 (16 GB)

NY5□2-Z□00 Accessories

The following accessories come with the IPC Controller.

Product Name	Specifications	Model
SSD (Expanded storage)	It is designed for the Machine Automation Control Software. It cannot be accessed from the Windows operating systems. Drive Bay A is a bay for a connector.	**NY000-AS06**
SSD (Main storage)	It is designed for the Windows operating systems. It cannot be accessed from the Machine Automation Control Software. Drive Bay B is a bay for a display panel.	**NY000-AS04**
Battery	One battery is supplied with the Industrial PC. The battery supplies power to the real-time clock. The battery is located inside the Industrial PC. Service life: 5 years at 25°C	**CJ1W-BAT01**
Fan Unit	The Fan Unit is available for the Industrial 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	Replacement kit containing all accesories supplied with Industrial PC. • Power connector • I/O connector • Drive bracket for drive installation • 4 mounting screws for drive installation • PCIe Card support for PCIe Card installation • PCIe Card clip for PCIe Card installation	**NY000-AK00**

NY5□2-Z□00 Optional Hardware

Product name	Specifications	Model
Mounting Brackets ✻1	Book mount	**NY000-AB00**
	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-SD492**
USB Flash Drives	Capacity: 2 GB	**FZ-MEM2G**
	Capacity: 8 GB	**FZ-MEM8G**
Storage Devices	Storage type: iMLC Capacity: 128 GB	**NY000-AS04**
	Storage type: pSLC Capacity: 128 GB	**NY000-AS06**
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	LCD touchscreen Multi-touch functionality Supply voltage: 24 VDC Up to 1,280 x 800 pixels at 60 Hz 2 USB Type-A Connectors Programmable brightness control	**NYM1□W-C10□□**
Power Supply	Output voltage: 24 VDC Push-In Plus terminal blocks	**S8VK-S□□□24**
UPS ✻2	Output voltage during backup operation: 24 VDC ± 5%	**S8BA**
UPS Communication Cable	Cable length: 2 m Signals for Signal output (BL, TR, BU, WB) Remote ON/OFF input UPS Stop Signal input (BS)	**S8BW-C02**

✻1. Select the required type. Industrial Box PC type only.
✻2. Revision number 04 or higher.

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

A3□ □□□□□□□□□ □□ □
1 2 3 4

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

NY5□2-Z□00 Install 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 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 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	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	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	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.
Industrial PC Rescue Disk Creator	The Industrial PC Rescue Disk Creator creates a USB Rescue Disk which can be used to back-up and restore the Omron IPC Operating System. It is pre-installed on the Industrial Box PC and the Industrial Panel PC.
AI Controller Software	An installer used to install the AI Controller Software that is called the AI Viewer and the AI Operator into Windows is saved in the NY-series AI Controllers.

Specifications Unique to the AI Controllers

Function Specifications of AI Functions

This section describes the AI Controller specifications that are unique to the AI Controllers.

Item		Description
AI Functions	**Time Series Database Function**	The Time Series Database Function collects values of user-specified variables and calculation results of the Feature Value/Machine Learning Function into the storage for each sampling interval. This function allows you to collect data such as variable values to the storage without program. The collected data can be checked on the AI Viewer. In addition, the data can be transferred to a web server by the WebAPI Connection Function.
	Feature Value/Machine Learning Function	The Feature Value/Machine Learning Function determines whether equipment events occur from the collected data and AI machine learning model. It consists of the Feature Extraction Function and the Machine Learning Function. The Feature Extraction Function calculates feature values from data. The Machine Learning Function on the other hand is designed to determines whether equipment events occur from feature values and AI machine learning model.
	WebAPI Connection Function	The WebAPI Connection Function transmits data (CSV files) that is collected by the Time Series Database Function in the AI Controller to a web server periodically. This function can be used to transfer files that is collected by the Time Series Database Function to a web server and to save and analyze data. Considering that data will be transmitted via Internet, data is encrypted in the transmission path to the web server.

Time Series Database Function - General specifications

TimeSeries	Item	Specifications
TimeSeries common	**Method**	Time-series database (It uses a circular queue where the oldest data is deleted if it reaches the maximum number of data.)
	Number of TimeSeries	4
	Sampling start/stop method	It can be executed in any of the following methods: • AI Operator • System-defined variables • Instructions
	Export start/stop method	It can be executed in any of the following methods: • AI Operator • System-defined variables • Instructions
	Number of used variables with a Retain attribute	2 ✻1
Variable data (RAW_DATA)	**Size of the TimeSeries**	NX-series: 900 MB NY-series: 41 GB
	Number of variables [variables/record] ✻2	1024
	Category of variable	Global variable
	Variable type	The following variables can be specified: • Basic data types • Specifying array elements: • Specifying members of a structure or a union
Analysis data (ANL_DATA)	**Size of the TimeSeries database**	NX-series: 1 GB NY-series: 30 GB
	Number of variables [variables/record] ✻2	2048 (including variable data, frame variables, subframe variables, and label variables)
	Category of variable	Global variable
	Variable type	The following variables can be specified: • Basic data types • Specifying array elements: • Specifying members of a structure or a union

✻1. The Time Series Database Function uses two variables with a Retain attribute in the system. The maximum number of available variables with a Retain attribute is 39,998.

✻2. A record refers to a set of data saved in the TimeSeries in a sampling task. It corresponds to a row in the exported CSV file.

Feature Value/Machine Learning Function - General specifications

Item				Specifications
Number of equipment events				128 max.
In each equipment event	Frame variables		Number of variables that can be registered	1
			Supported data type	SINT, INT, DINT, LINT, USINT, UINT, UDINT, ULINT
	Feature extraction output frame variables		Number of variables that can be registered	1
			Supported data type	Same types as the frame variables
	Feature value		Number of variables that can be registered	16 max.
	Per feature value	Variable data	Number of variables that can be registered	1
			Supported data type	LREAL, BOOL
		Subframe variables	Number of variables that can be registered	1 ✻
			Supported data type	BOOL
	Machine learning output frame variables		Number of variables that can be registered	1
			Supported data type	Same types as the frame variables
	Number of classifications for equipment event monitoring			3 (Normal, Alarm Level 1, Alarm Level 2)
Equipment event detection algorithm				isolation forest

✻ Up to six subframe variables can be registered to an equipment event.

WebAPI Connection Function - General specifications

Item			Specifications
Function specifications	Execution trigger		File transfer can be executed in the period specified by a user on the AI Operator.
	Destination specification		Specify a URL of the server to which files are transferred. Specify a URL starting with http:// or https://.When you specify https://, SSL/TLS communications are established.
	File deletion after transfer		Once the file has been transferred to the Web server successfully, the WebAPI Connection Function deletes the file in the AI Controller.
	Connection check function		To check the connection with the Web server, a file transfer can be triggered by the AI Operator at a given timing. Refer to *NX/NY-series Artificial Intelligence Machine Automation Controller User's Manual (Cat. No. W594)* for details.
	Transfer specifications		If there is more than one file to transfer at the transfer timing, all the files are transferred. If the last file transfer is in progress and the next file transfer timing arrives, the execution of the last file transfer continues.
	Transfer protocol		The file transfer executes in accordance with the RFC1867 procedures. The multipart/form-data in the form is used. The tag name "datafile" is used for the transfer.
Communication specifications	HTTP/HTTPS client	Supported versions	1.1
		DNS	Supported
		Proxy	Supported
		Basic authentication	Supported (Basic authentication for the proxy server and Web server connection is supported.)
		Number of files that can be transferred simultaneously	3
	Security (when https:// is specified for the address)	TLS version	1.0, 1.1, 1.2
		Server certificates	Import the certificates to the AI Controller with the AI Operator. Up to 32 certificates can be set.
		Revocation check for the certificates	Revocation is checked by OSCP stapling.

Common Specifications with Standard Models

The specifications of the AI Controller other than the specifications described in *Specifications Unique to the AI Controllers* on page 8 are in common with those of standard CPU Units or IPC Machine Controllers. Refer to the corresponding specifications for each AI Controller model according to the table below.

AI Controller model	Corresponding standard model
NX701-Z700	NX701-1700
NX701-Z600	NX701-1600
NY532-Z500	NY532-1500
NY532-Z400	NY532-1400
NY532-Z300	NY532-1300
NY512-Z500	NY512-1500
NY512-Z400	NY512-1400
NY512-Z300	NY512-1300

General Specifications

Refer to the hardware user's manual for general specifications.

- NX-series AI Controller:
  NX-series CPU Unit Hardware User's Manual (Cat. No. W535)
- NY-series AI Controller (NY532-Z□□□):
  NY-series Industrial Panel PC Hardware User's Manual (Cat. No. W557)
- NY-series AI Controller (NY512-Z□□□):
  NY-series Industrial Box PC Hardware User's Manual (Cat. No. W556)

Performance Specifications

Refer to the following manual for the performance specifications.

- NX-series AI Controller:
  NJ/NX-series CPU Unit Software User's Manual (Cat. No. W501)
- NY-series AI Controller:
  NY-series Industrial Panel PC / Industrial Box PC Software User's Manual (Cat. No. W558)

Function Specifications

Specifications of non-AI functions are same as those for the standard CPU Units or for the IPC Machine Controllers without the AI functions. Refer to the following manual.

- NX-series AI Controller:
  NJ/NX-series CPU Unit Software User's Manual (Cat. No. W501)
- NY-series AI Controller:
  NY-series Industrial Panel PC / Industrial Box PC Software User's Manual (Cat. No. W558)

Related Manuals

Manual name	Cat. No.	Model numbers	Application	Description
NX-series CPU Unit Hardware User's Manual	W535	NX701-□□□□	Learning the basic specifications of the NX701 CPU Units, including introductory information, designing, installation, and maintenance. Mainly hardware information is provided.	An introduction to the entire NX701 system is provided along with the following information on the CPU Unit. • Features and system configuration • Introduction • Part names and functions • General specifications • Installation and wiring • Maintenance and inspection
NJ/NX-series CPU Unit Software User's Manual	W501	NX701-□□□□ NX102-□□□□ NX1P2-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	Learning how to program and set up an NJ/NX-series CPU Unit. Mainly software information is provided.	The following information is provided on a Controller built with an NJ/NX-series CPU Unit. • CPU Unit operation • CPU Unit features • Initial settings • Programming based on IEC 61131-3 language specifications
NJ/NX-series Instructions Reference Manual	W502	NX701-□□□□ NX102-□□□□ NX1P2-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	Learning detailed specifications on the basic instructions of an NJ/NX-series CPU Unit.	The instructions in the instruction set (IEC 61131-3 specifications) are described.
NJ/NX-series CPU Unit Motion Control User's Manual	W507	NX701-□□□□ NX102-□□□□ NX1P2-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	Learning about motion control settings and programming concepts.	The settings and operation of the CPU Unit and programming concepts for motion control are described.
NJ/NX-series Motion Control Instructions Reference Manual	W508	NX701-□□□□ NX102-□□□□ NX1P2-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	Learning about the specifications of the motion control instructions.	The motion control instructions are described.
NJ/NX-series CPU Unit Built-in EtherCAT® Port User's Manual	W505	NX701-□□□□ NX102-□□□□ NX1P2-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	Using the built-in EtherCAT port on an NJ/NX-series CPU Unit.	Information on the built-in EtherCAT port is provided. This manual provides an introduction and provides information on the configuration, features, and setup.
NJ/NX-series CPU Unit Built-in EtherNet/IP™ Port User's Manual	W506	NX701-□□□□ NX102-□□□□ NX1P2-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	Using the built-in EtherNet/IP port on an NJ/NX-series CPU Unit.	Information on the built-in EtherNet/IP port is provided. Information is provided on the basic setup, tag data links, and other features.
NX-series CPU Unit FINS Function User's Manual	W596	NX701-□□20 NX102-□□□□	Using the FINS function of an NX-series CPU Unit.	Describes the FINS function of an NX-series CPU Unit.
NX/NY-series Artificial Intelligence Machine Automation Controller User's Manual	W594	NX701-Z□□□ NY532-Z□□□ NY512-Z□□□	Learning about the NX/NY-series Artificial Intelligence Equipped Machine Automation Controller.	Describes the NX/NY-series Artificial Intelligence Equipped Machine Automation Controller overview, AI function specifications, system start-up, maintenance, and error details.
AI Controller Standard Software Operation Manual	W611	SYSMAC-AICSTE□□L	Learning an introduction of the AI Controller standard software and how to use it.	An introduction of the AI Controller standard software (AI Operator, AI Viewer), installation procedures, basic operations, connection operations, and operating procedures for main functions are described.
AI Controller Data Mining Software Operation Manual	W612	SYSMAC-AICSTENGE□□L	Learning an introduction of the AI Controller Data Mining Software and how to use it.	An introduction of the AI Controller Data Mining software (AI Easy Modeler), basic operations, connection operations, and operating procedures for main functions are described.
Sysmac Library AI Predictive Maintenance Library User's Manual	W610	SYSMAC-ZPA00□000W	Learning about AI predictive maintenance library and FB specifications.	Information necessary to use AI predictive maintenance library is provided.
NJ/NX-series Troubleshooting Manual	W503	NX701-□□□□ NX102-□□□□ NX1P2-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	Learning about the errors that may be detected in an NJ/NX-series Controller.	Concepts on managing errors that may be detected in an NJ/NX-series Controller and information on individual errors are described.
Sysmac Studio Version 1 Operation Manual	W504	SYSMAC-SE2□□□	Learning about the operating procedures and functions of the Sysmac Studio.	Describes the operating procedures of the Sysmac Studio.

Manual name	Cat. No.	Model numbers	Application	Description
NY-series IPC Machine Controller Industrial Panel PC Hardware User's Manual	W557	NY532-1□□□	Learning the basic specifications of the NY-series Industrial Panel PCs, including introductory information, designing, installation, and maintenance. Mainly hardware information is provided.	An introduction to the entire NY-series system is provided along with the following information on the Industrial Panel PC. • Features and system configuration • Introduction • Part names and functions • General specifications • Installation and wiring • Maintenance and inspection
NY-series IPC Machine Controller Industrial Box PC Hardware User's Manual	W556	NY512-1□□□	Learning the basic specifications of the NY-series Industrial Box PCs, including introductory information, designing, installation, and maintenance. Mainly hardware information is provided.	An introduction to the entire NY-series system is provided along with the following information on the Industrial Box PC. • Features and system configuration • Introduction • Part names and functions • General specifications • Installation and wiring • Maintenance and inspection
NY-series IPC Machine Controller Industrial Panel PC/ Industrial Box PC Setup User's Manual	W568	NY532-1□□□ NY512-1□□□	Learning about initial setting of the NY-series Industrial PCs and preparations to use Controllers.	The following information is provided on an introduction to the entire NY-series system. • Two OS systems • Initial settings • Industrial PC Support Utility • NYCompolet • Industrial PC API • Backup and recovery
NY-series IPC Machine Controller Industrial Panel PC/ Industrial Box PC Software User's Manual	W558	NY532-1□□□ NY512-1□□□	Learning how to program and set up the Controller functions of an NY-series Industrial PC.	The following information is provided on the NY-series Controller functions. • Controller operation • Controller features • Controller settings • Programming based on IEC 61131-3 language specifications
NY-series Instructions Reference Manual	W560	NY532-1□□□ NY512-1□□□	Learning detailed specifications on the basic instructions of an NY-series Industrial PC.	The instructions in the instruction set (IEC 61131-3 specifications) are described.
NY-series IPC Machine Controller Industrial Panel PC/ Industrial Box PC Motion Control User's Manual	W559	NY532-1□□□ NY512-1□□□	Learning about motion control settings and programming concepts of an NY-series Industrial PC.	The settings and operation of the Controller and programming concepts for motion control are described.
NY-series Motion Control Instructions Reference Manual	W561	NY532-1□□□ NY512-1□□□	Learning about the specifications of the motion control instructions of an NY-series Industrial PC.	The motion control instructions are described.
NY-series IPC Machine Controller Industrial Panel PC/ Industrial Box PC Built-in EtherCAT® Port User's Manual	W562	NY532-1□□□ NY512-1□□□	Using the built-in EtherCAT port in an NY-series Industrial PC.	Information on the built-in EtherCAT port is provided. This manual provides an introduction and provides information on the configuration, features, and setup.
NY-series IPC Machine Controller Industrial Panel PC/ Industrial Box PC Built-in EtherNet/IP™ Port User's Manual	W563	NY532-1□□□ NY512-1□□□	Using the built-in EtherNet/IP port in an NY-series Industrial PC.	Information on the built-in EtherNet/IP port is provided. Information is provided on the basic setup, tag data links, and other features.
NY-series Troubleshooting Manual	W564	NY532-1□□□ NY512-1□□□	Learning about the errors that may be detected in an NY-series Industrial PC.	Concepts on managing errors that may be detected in an NY-series Controller and information on individual errors are described.

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