

Machine Automation Controller NJ series

Sysmac solutions for every machine
New controllers ideal for simple machines



NJ101-□□□□

Features

- Fully compatible with NJ501/301 Machine Automation Controllers, having the same concept, dimensions, general specifications, and functions. Ideal for machines without or with a low number of axes.
- The user program including the double precision floating point arithmetic instruction that is necessary for the coordinates correction, ST language and Function Blocks is executed fast, as well as the basic instructions and the special instructions.
- Integration of Logic and Motion in one CPU
- Synchronous control of all machine network devices : vision sensors, servo drives and field devices with the machine control network, EtherCAT. Synchronize the PLC Engine and the Motion Engine with the EtherCAT control period. Fast and highly-accurate control is possible.
- Standard programming : Conforms IEC 61131-3 standards and JIS B 3503, variable-based instructions including the PLCopen® Motion function blocks
- Complete and robust machine automation: fast control performance and basic functions and reliability of industrial controllers
 - Fan-free operation in ambient temperature between 0 to 55°C
 - Complete RAS functions: Transmission frame error check, timeout, bus diagnosis, Watchdog (WDT), memory check, and topology check, etc.

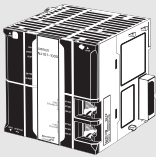
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Ordering Information

International Standards

- The standards are abbreviated as follows: U: UL, U1: UL(Class I Division 2 Products for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Products for Hazardous Locations), CU: cUL, N: NK, L: Lloyd, CE: EC Directives, C-Tick: C-Tick mark, and KC: KC Registration.
- Contact your OMRON representative for further details and applicable conditions for these standards.



NJ101 CPU Units

Product Name	Specifications				Current consumption (A)		Model	Standards
	I/O capacity / maximum number of configuration Units (Expansion Racks)	Program capacity	Memory capacity for variables	Number of motion axes	5 VDC	24 VDC		
 NJ101 CPU Units	2,560 points / 40 Units (3 Expansion Racks)	3 MB	0.5 MB: Retained during power interruption 2 MB: Not retained during power interruption	2	1.90	-	NJ101-1000	UC1, N, L, CE, C-Tick, KC
				0				

Recommended EtherCAT and EtherNet/IP Communications Cables

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

Cable with Connectors

Item	Recommended manufacturer	Cable length (m) *1	Model	
Wire Gauge and Number of Pairs: AWG27, 4-pair Cable Sheath material: LSZH *2 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	
Wire Gauge and Number of Pairs: AWG22, 2-pair Cable 	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	
	OMRON	10	XS5W-T421-JMD-K	
		OMRON	0.3	XS5W-T421-AMC-K
			0.5	XS5W-T421-BMC-K
			1	XS5W-T421-CMC-K
			2	XS5W-T421-DMC-K
5	XS5W-T421-GMC-K			
OMRON	10	XS5W-T421-JMC-K		
	OMRON	0.3	XS5W-T422-AMC-K	
		0.5	XS5W-T422-BMC-K	
		1	XS5W-T422-CMC-K	
2		XS5W-T422-DMC-K		
OMRON	5	XS5W-T422-GMC-K		
	10	XS5W-T422-JMC-K		

*1. Standard type cables length 0.2, 0.3, 0.5, 1, 1.5, 2, 3, 5, 7.5, 10, 15 and 20m are available.

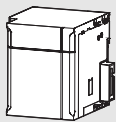
Rugged type cables length 0.3, 0.5, 1, 2, 3, 5, 10 and 15m are available.

*2. The lineup features Low Smoke Zero Halogen cables for in-cabinet use and PUR cables for out-of-cabinet use.


*3. Cables colors are available in blue, yellow, or Green

Note: For details, refer to Cat.No.G019.

Power Supply Units

Product Name	Power supply voltage	Output current		Output capacity	Options			Model	Standards
		5-VDC output capacity	24-VDC output capacity	Total power consumption	24-VDC service power supply	RUN output	Maintenance forecast monitor		
AC Power Supply Unit	 100 to 240 VAC 24 VDC	6.0 A	1.0 A	30 W	No	Yes	No	NJ-PA3001	UC1, N, L, CE
DC Power Supply Unit								NJ-PD3001	

Cables / Connectors

Item		Recommended manufacturer	Model
For EtherCAT and EtherNet/IP	Wire Gauge and Number of Pairs: AWG24, 4-pair Cable	Cables	Tonichi Kyosan Cable, Ltd. NETSTAR-C5E SAB 0.5 × 4P *1
			Kuramo Electric Co. KETH-SB *1
			SWCC Showa Cable Systems Co. FAE-5004 *1
	Wire Gauge and Number of Pairs: AWG22, 2-pair Cable	RJ45 Connectors	Panduit Corporation MPS588-C *1
		Cables	Kuramo Electric Co. KETH-PSB-OMR *2
		RJ45 Assembly Connector	Nihon Electric Wire&Cable Co.,Ltd. PNET/B *2
		OMRON XS6G-T421-1 *2	
For EtherNet/IP	Wire Gauge and Number of Pairs: 0.5 mm, 4-pair Cable	Cables	Fujikura Ltd. F-LINK-E 0.5mm × 4P *3
		RJ45 Connectors	Panduit Corporation MPS588 *3

*1. We recommend you to use above cable for EtherCAT and EtherNet/IP, and RJ45 Connector together.

*2. We recommend you to use above cable for EtherCAT and EtherNet/IP, and RJ45 Assembly Connector together.

*3. We recommend you to use above cable For EtherNet/IP and RJ45 Connectors together.

Accessories

The following accessories come with the CPU Unit.

Item	Specification
Battery	CJ1W-BAT01
End Cover	CJ1W-TER01 (necessary to be connected to the right end of the CPU Rack.)
End Plate	PFP-M (2 pcs)

General Specification

Item		NJ101-□□□□
Enclosure		Mounted in a panel
Grounding method		Ground to less than 100 Ω
Dimensions (height×depth×width)		90 mm × 90 mm × 90 mm
Weight		550 g (including the End Cover)
Current consumption		5 VDC, 1.90 A (including SD Memory Card and End Cover)
Operation environment	Ambient operating temperature	0 to 55°C
	Ambient operating humidity	10% to 90% (with no condensation)
	Atmosphere	Must be free from corrosive gases.
	Ambient storage temperature	-20 to 75°C (excluding battery)
	Altitude	2,000 m or less
	Pollution degree	2 or less: Conforms to JIS B3502 and IEC 61131-2.
	Noise immunity	2 kV on power supply line (Conforms to IEC 61000-4-4.)
	Overvoltage category	Category II: Conforms to JIS B3502 and IEC 61131-2.
	EMC immunity level	Zone B
	Vibration resistance	Conforms to IEC 60068-2-6. 5 to 8.4 Hz with 3.5-mm amplitude, 8.4 to 150 Hz Acceleration of 9.8 m/s ² for 100 min in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total)
Shock resistance		Conforms to IEC 60068-2-27. 147 m/s ² , 3 times in X, Y, and Z directions (100 m/s ² for Relay Output Units)
Battery	Life	5 years at 25°C
	Model	CJ1W-BAT01
Applicable standards		Conforms to cULus, NK, LR, EC Directives, C-Tick and KC.

Performance Specifications

Item			NJ101-	
			1000	9000
Processing time	Instruction execution times	LOAD instructions	3.3ns (5.0ns or less)	
		Math instructions (for Long Real Data)	70 ns or more	
Programming	Program capacity*1	Size	3 MB	
		Number	POU definition	450
			POU instance	1,800
		Variables capacity	No Retain attribute*2	Size
	Number			22,500
	Retain attribute*3		Size	0.5 MB
		Number	5,000	
	Data type	Number	1,000	
	Memory for CJ-Series Units (Can be specified with AT specifications for variables.)	CIO Area	6,144 words (CIO 0 to CIO 6143)	
		Work Area	512 words (W0 to W511)	
Holding Area		1,536 words (H0 to H1535)		
DM Area		32,768 words (D0 to D32767)		
EM Area		32,768 words × 4 banks (E0_00000 to E3_32767)		
Unit configuration	Maximum number of connectable Units	Maximum number of CJ/NX unit per CPU Rack or Expansion Rack	10 Units	
		Maximum number of CJ unit on the system	40 Units	
		Maximum number of NX unit on the system	400 (on NX series EtherCAT slave terminal)	
	Maximum number of expansion racks	3 max.		
	I/O Capacity	Maximum number of I/O points on CJ-series units	2,560 points max.	
	Power supply unit for CPU rack and expansion racks	Model	NJ-P□3001	
		Power OFF detection time	AC power supply	30 to 45 ms
DC power supply			22 to 25 ms	
Motion control	Number of controlled axes	Maximum number of controlled axes *4	6 axes	
		Maximum number of used real axes *5	2 axes	
		Maximum number of axes for single-axis control	6 axes	
		Maximum number of axes for linear interpolation axis control	4 axes per axes group	
		Number of axes for circular interpolation axis control	2 axes per axes group	
	Maximum number of axes groups	32 groups		
	Motion control period	The same control period as that is used for the process data communications cycle for EtherCAT.		
	Cams	Number of cam data points	Maximum points per cam table	65,535 points
			Maximum points for all cam tables	262,140 points
		Maximum number of cam tables	160 tables	
Position units	Pulses, millimeters, micrometers, nanometers, degrees or inches			
Override factors	0.00% or 0.01% to 500.00%			
Peripheral USB port	Supported services	Sysmac Studio connection		
	Physical layer	USB 2.0-compliant B-type connector		
	Transmission distance between Hub and Node	5 m max.		
Built-in EtherNet/IP Port	Number of port	1		
	Physical layer	10Base-T or 100Base-TX		
	Frame length	1514 max.		
	Media access method	CSMA/CD		
	Modulation	Baseband		
	Topology	Star		
	Baud rate	100 Mbps (100Base-TX)		

*1. This is the capacity for the execution objects and variable tables (including variable names).

*2. Words for CJ-series Units in the CIO and Work Areas are not included.

*3. Words for CJ-series Units in the Holding, DM, and EM Areas are not included.

*4. This is the total for all axis types.

*5. This is the total number of axes that are set as servo axes or encoder axes and are also set as used axes.

Item		NJ101-		
		1000	9000	
Built-in EtherNet/IP Port	Transmission media		STP (shielded, twisted-pair) cable of Ethernet category 5, 5e or higher	
	Maximum transmission distance between hub and node		100m	
	Maximum number of cascade connections		There are no restrictions if a switching hub is used.	
	CIP service: Tag Data Links (Cyclic Communications)	Maximum number of connections		32
		Packet interval *6		1 to 10,000 ms in 1.0-ms increments*8 Can be set for each connection. (Data will be refreshed at the set interval, regardless of the number of nodes.)
		Permissible communications band		3,000 pps*7 (including heartbeat)
		Maximum number of tag sets		32
		Tag types		Network variables, CIO, Work, Holding, DM, and EM Areas
		Number of tags per connection (i.e., per tag set)		8 (7 tags if Controller status is included in the tag set.)
		Maximum number of tag		256
		Maximum link data size per node (total size for all tags)		19,200 bytes
		Maximum data size per connection		600 bytes
		Maximum number of registrable tag sets		32 (1 connection = 1 tag set)
	Maximum tag set size		600 bytes (Two bytes are used if Controller status is included in the tag set.)	
	Multi-cast packet filter *8		Supported.	
	Cip message service: Explicit messages	Class 3 (number of connections)		32 (clients plus server)
		UCMM (non- connection type)	Maximum number of clients that can communicate at one time	32
			Maximum number of servers that can communicate at one time	32
	Maximum number of TCP socket service		30	
	Built-in EtherCAT Port	Communications standard		IEC 61158 Type12
EtherCAT master specifications		Class B (Feature Pack Motion Control compliant)		
Physical layer		100BASE-TX		
Modulation		Baseband		
Baud rate		100 Mbps (100Base-TX)		
Duplex mode		Auto		
Topology		Line, daisy chain, and branching		
Transmission media		Twisted-pair cable of category 5 or higher (double-shielded straight cable with aluminum tape and braiding)		
Maximum transmission distance between nodes		100m		
Maximum number of slaves		64		
Range of node address		1-192		
Maximum process data size		Inputs: 5,736 bytes Outputs: 5,736 bytes (However, the maximum number of process data frames is 4.)		
Maximum process data size per slave		Inputs: 1,434 bytes Outputs: 1,434 bytes		
Communications cycle		1,000/2,000/4,000 μs		
Sync jitter		1 μs max.		
Internal clock		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		

*6. Data is updated on the line in the specified interval regardless of the number of nodes.

*7. Means packets per second, i.e., the number of communications packets that can be sent or received in one second.

*8. An IGMP client is mounted for the EtherNet/IP port. If an ethernet switch that supports IGMP snooping is used, filtering of unnecessary multicast packets is performed.

Function Specifications

Item		NJ101-□□□□			
Tasks	Function	I/O refreshing and the user program are executed in units that are called tasks. Tasks are used to specify execution conditions and execution priority.			
		Periodically executed tasks	Maximum number of primary periodic tasks	1	
			Maximum number of periodic tasks	3	
		Conditionally executed tasks	Maximum number of event tasks	32	
	Execution conditions		When Activate Event Task instruction is executed or when condition expression for variable is met.		
Setup	System service monitoring settings		The execution interval and the percentage of the total user program execution time are monitored for the system services (processes that are executed by the CPU Unit separate from task execution).		
Programming	POU (program organization units)	Programs		POUs that are assigned to tasks.	
		Function blocks		POUs that are used to create objects with specific conditions.	
		Functions		POUs that are used to create an object that determine unique outputs for the inputs, such as for data processing.	
	Programming languages	Types		Ladder diagrams *1 and structured text (ST)	
	Namespaces		A concept that is used to group identifiers for POU definitions.		
	Variables	External access of variables	Network variables	The function which allows access from the HMI, host computers, or other Controllers	
	Data types	Data types	Boolean	BOOL	
			Bit strings	BYTE, WORD, DWORD, LWORD	
			Integers	INT, SINT, DINT, LINT, UINT, USINT, UDINT, ULINT	
			Real numbers	REAL, LREAL	
			Durations	TIME	
			Dates	DATE	
			Times of day	TIME_OF_DAY	
			Date and time	DATE_AND_TIME	
		Text strings	STRING		
		Derivative data types		Structures, unions, enumerations	
		Structures	Function	A derivative data type that groups together data with different variable types.	
			Maximum number of members	2048	
			Nesting maximum levels	8	
	Member data types		Basic data types, structures, unions, enumerations, array variables		
Unions	Specifying member offsets	You can use member offsets to place structure members at any memory locations.			
	Function	A derivative data type that groups together data with different variable types.			
	Maximum number of members	4			
Enumerations	Member data types	BOOL, BYTE, WORD, DWORD, LWORD			
	Function	A derivative data type that uses text strings called enumerators to express variable values.			
Data type attributes	Array specifications	Function	An array is a group of elements with the same data type. You specify the number (subscript) of the element from the first element to specify the element.		
		Maximum number of dimensions	3		
		Maximum number of elements	65535		
		Array specifications for FB Instances	Supported.		
	Range specifications		You can specify a range for a data type in advance. The data type can take only values that are in the specified range.		
Libraries		User libraries			

*1. Inline ST is supported. (Inline ST is ST that is written as an element in a ladder diagram.)

Item		NJ101-□□□□		
Motion Control *2	Control modes		position control, velocity control, torque control	
	Axis types		Servo axes, virtual servo axes, encoder axes, and virtual encoder axes	
	Positions that can be managed		Command positions and actual positions	
	Single-axis	Single-axis position control	Absolute positioning	Positioning is performed for a target position that is specified with an absolute value.
			Relative positioning	Positioning is performed for a specified travel distance from the command current position.
			Interrupt feeding	Positioning is performed for a specified travel distance from the position where an interrupt input was received from an external input.
			Cyclic synchronous absolute positioning	A positioning command is output each control period in Position Control Mode.
		Single-axis velocity control	Velocity control	Velocity control is performed in Position Control Mode.
			Cyclic synchronous velocity control	A velocity command is output each control period in Velocity Control Mode.
		Single-axis torque control	Torque control	The torque of the motor is controlled.
		Single-axis synchronized control	Starting cam operation	A cam motion is performed using the specified cam table.
			Ending cam operation	The cam motion for the axis that is specified with the input parameter is ended.
			Starting gear operation	A gear motion with the specified gear ratio is performed between a master axis and slave axis.
			Positioning gear operation	A gear motion with the specified gear ratio and sync position is performed between a master axis and slave axis.
			Ending gear operation	The specified gear motion or positioning gear motion is ended.
			Synchronous positioning	Positioning is performed in sync with a specified master axis.
			Master axis phase shift	The phase of a master axis in synchronized control is shifted.
			Combining axes	The command positions of two axes are added or subtracted and the result is output as the command position.
		Single-axis manual operation	Powering the servo	The Servo in the Servo Drive is turned ON to enable axis motion.
			Jogging	An axis is jogged at a specified target velocity.
		Auxiliary functions for single-axis control	Resetting axis errors	Axes errors are cleared.
			Homing	A motor is operated and the limit signals, home proximity signal, and home signal are used to define home.
			Homing with parameter	Specifying the parameter, a motor is operated and the limit signals, home proximity signal, and home signal are used to define home.
			High-speed homing	Positioning is performed for an absolute target position of 0 to return to home.
			Stopping	An axis is decelerated to a stop at the specified rate.
			Immediately stopping	An axis is stopped immediately.
			Setting override factors	The target velocity of an axis can be changed.
Changing the current position	The command current position or actual current position of an axis can be changed to any position.			
Enabling external latches	The position of an axis is recorded when a trigger occurs.			
Disabling external latches	The current latch is disabled.			
Zone monitoring	You can monitor the command position or actual position of an axis to see when it is within a specified range (zone).			
Enabling digital cam switches	You can turn a digital output ON and OFF according to the position of an axis.			
Monitoring axis following error	You can monitor whether the difference between the command positions or actual positions of two specified axes exceeds a threshold value.			
Resetting the following error	The error between the command current position and actual current position is set to 0.			
Torque limit	The torque control function of the Servo Drive can be enabled or disabled and the torque limits can be set to control the output torque.			
Command position compensation	The function which compensate the position for the axis in operation.			
Start velocity	You can set the initial velocity when axis motion starts.			

*2. Supported only by the NJ101-1000.

Item			NJ101-□□□□		
Motion Control *2	Axes groups	Multi-axes coordinated control	Absolute linear interpolation	Linear interpolation is performed to a specified absolute position.	
			Relative linear interpolation	Linear interpolation is performed to a specified relative position.	
			Circular 2D interpolation	Circular interpolation is performed for two axes.	
			Axes group cyclic synchronous absolute positioning	A positioning command is output each control period in Position Control Mode.	
		Auxiliary functions for multi-axes coordinated control	Resetting axes group errors	Axes group errors and axis errors are cleared.	
			Enabling axes groups	Motion of an axes group is enabled.	
			Disabling axes groups	Motion of an axes group is disabled.	
			Stopping axes groups	All axes in interpolated motion are decelerated to a stop.	
			Immediately stopping axes groups	All axes in interpolated motion are stopped immediately.	
			Setting axes group override factors	The blended target velocity is changed during interpolated motion.	
			Reading axes group positions	The command current positions and actual current positions of an axes group can be read.	
			Changing the axes in an axes group	The Composition Axes parameter in the axes group parameters can be overwritten temporarily.	
		Common items	Cams	Setting cam table properties	The end point index of the cam table that is specified in the input parameter is changed.
				Saving cam tables	The cam table that is specified with the input parameter is saved in non-volatile memory in the CPU Unit.
	Generating cam tables			The cam table that is specified with the input parameter is generated from the cam property and cam node.	
	Parameters		Writing MC settings	Some of the axis parameters or axes group parameters are overwritten temporarily.	
			Changing axis parameters	You can access and change the axis parameters from the user program.	
	Auxiliary functions	Count modes		You can select either Linear Mode (finite length) or Rotary Mode (infinite length).	
		Unit conversions		You can set the display unit for each axis according to the machine.	
		Acceleration/ deceleration control	Automatic acceleration/ deceleration control	Jerk is set for the acceleration/deceleration curve for an axis motion or axes group motion.	
			Changing the acceleration and deceleration rates	You can change the acceleration or deceleration rate even during acceleration or deceleration.	
		In-position check		You can set an in-position range and in-position check time to confirm when positioning is completed.	
		Stop method		You can set the stop method to the immediate stop input signal or limit input signal.	
		Re-execution of motion control instructions		You can change the input variables for a motion control instruction during execution and execute the instruction again to change the target values during operation.	
		Multi-execution of motion control instructions (Buffer Mode)		You can specify when to start execution and how to connect the velocities between operations when another motion control instruction is executed during operation.	
		Continuous axes group motions (Transition Mode)		You can specify the Transition Mode for multi-execution of instructions for axes group operation.	
		Monitoring functions	Software limits		Software limits are set for each axis.
			Following error		The error between the command current value and the actual current value is monitored for an axis.
Velocity, acceleration rate, deceleration rate, torque, interpolation velocity, interpolation acceleration rate, and interpolation deceleration rate			You can set and monitor warning values for each axis and each axes group.		
Absolute encoder support		You can use an OMRON G5-Series Servomotor with an Absolute Encoder to eliminate the need to perform homing at startup.			
Input signal logic inversion		You can inverse the logic of immediate stop input signal, positive limit input signal, negative limit input signal, or home proximity input signal.			
External interface signals			The Servo Drive input signals listed on the right are used. Home signal, home proximity signal, positive limit signal, negative limit signal, immediate stop signal, and interrupt input signal		

*2. Supported only by the NJ101-1000.

Item			NJ101-□□□□	
Unit (I/O) management	EtherCAT slaves	Maximum number of slaves	64	
	CJ-series Units	Maximum number of Units	40	
Communications	Peripheral USB port		A port for communications with various kinds of Support Software running on a personal computer.	
	EtherNet/IP port	Communications protocol		TCP/IP, UDP/IP
		CIP communications service	Tag data links	Programless cyclic data exchange is performed with the devices on the EtherNet/IP network.
			Message communications	CIP commands are sent to or received from the devices on the EtherNet/IP network.
		TCP/IP applications	Socket services	Data is sent to and received from any node on Ethernet using the UDP or TCP protocol. Socket communications instructions are used.
			FTP client	File can be read from or written to computers at other Ethernet nodes from the CPU Unit. FTP client communications instructions are used.
			FTP server	Files can be read from or written to the SD Memory Card in the CPU Unit from computers at other Ethernet nodes.
			Automatic clock adjustment	Clock information is read from the NTP server at the specified time or at a specified interval after the power supply to the CPU Unit is turned ON. The internal clock time in the CPU Unit is updated with the read time.
	Supported services	Process data communications	A communications method to exchange control information in cyclic communications between the EtherCAT master and slaves. This communications method is defined by CoE.	
		SDO communications	A communications method to exchange control information in noncyclic event communications between EtherCAT master and slaves. This communications method is defined by CoE.	
	EtherCAT port	Network scanning		Information is read from connected slave devices and the slave configuration is automatically generated.
		DC (distributed clock)		Time is synchronized by sharing the EtherCAT system time among all EtherCAT devices (including the master).
		Packet monitoring		The frames that are sent by the master and the frames that are received by the master can be saved. The data that is saved can be viewed with WireShark or other applications.
		Enable/disable settings for slaves		The slaves can be enabled or disabled as communications targets.
		Disconnecting/connecting slaves		Temporarily disconnects a slave from the EtherCAT network for maintenance, such as for replacement of the slave, and then connects the slave again.
		Supported application protocol	CoE	SDO messages of the CAN application can be sent to slaves via EtherCAT.
	Communications instructions			The following instructions are supported. CIP communications instructions, socket communications instructions, SDO message instructions, no-protocol communications instructions, protocol macro instructions, and FTP client instructions
Operation management	RUN output contacts		The output on the NJ-P□3001 Power Supply Unit turns ON in RUN mode.	
System management	Event logs	Categories	Events are recorded in the following logs. System event log Access event log User-defined event log	
		Maximum number of events per event log	512	

Item			NJ101-□□□□	
Debugging	Online editing	Single	Programs, function blocks, functions, and global variables can be changed online. Different operators can change different POU's across a network.	
	Forced refreshing		The user can force specific variables to TRUE or FALSE.	
	Maximum number of forced variables	Device variables for EtherCAT slaves	64	
		Device variables for CJ-series Units and variables with AT specifications	64	
	MC test run		Motor operation and wiring can be checked from the Sysmac Studio. *	
	Synchronizing		The project file in the Sysmac Studio and the data in the CPU Unit can be made the same when online.	
	Differentiation monitoring		Rising/falling edge of contacts can be monitored.	
	Maximum number of contacts		8	
	Data tracing	Types	Single triggered trace	When the trigger condition is met, the specified number of samples are taken and then tracing stops automatically.
			Continuous trace	Data tracing is executed continuously and the trace data is collected by the Sysmac Studio.
		Maximum number of simultaneous data trace		2
		Maximum number of records		10,000
		Sampling	Maximum number of sampled variables	48 variables
		Timing of sampling		Sampling is performed for the specified task period, at the specified time, or when a sampling instruction is executed.
		Triggered traces	Trigger conditions	
Delay			Trigger position setting: A slider is used to set the percentage of sampling before and after the trigger condition is met.	
Simulation			The operation of the CPU Unit is emulated in the Sysmac Studio.	
Reliability functions	Self-diagnosis	Controller errors	Levels	Major fault, partial fault, minor fault, observation, and information
		User-defined errors		User-defined errors are registered in advance and then records are created by executing instructions.
		Levels		8 levels
Security	Protecting software assets and preventing operating mistakes	CPU unit names and serial IDs		When going online to a CPU Unit from the Sysmac Studio, the CPU Unit name in the project is compared to the name of the CPU Unit being connected to.
		Protection	User program transfer with no restoration information	You can prevent reading data in the CPU Unit from the Sysmac Studio.
			CPU Unit write protection	You can prevent writing data to the CPU Unit from the Sysmac Studio or SD Memory Card.
			Overall project file protection	You can use passwords to protect .smc files from unauthorized opening on the Sysmac Studio.
			Data protection	You can use passwords to protect POU's on the Sysmac Studio.
		Verification of operation authority		Online operations can be restricted by operation rights to prevent damage to equipment or injuries that may be caused by operating mistakes.
		Number of groups		5
Verification of user program execution ID		The user program cannot be executed without entering a user program execution ID from the Sysmac Studio for the specific hardware (CPU Unit).		

* Supported only by the NJ101-1000.