Contributes to the miniaturization and standardization of the operation unit's control panel
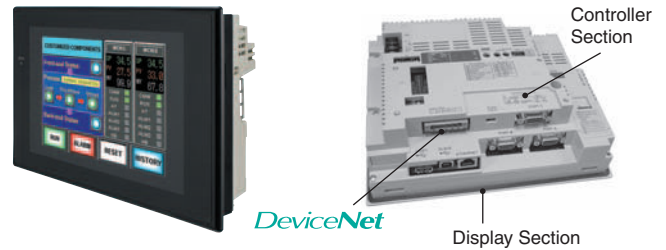
- Yes, this One-package Controller SYSMAC One NSJ series is the only solution to the increasing demand for small control panels to save space in today's production facilities

Controller Section

DeviceNet

Display Section

Features

- A programmable controller with HMI that realizes both saving space and high reliance control
- A DeviceNet Master comes as standard for I/O
- Use of a single USB cable allows transferring of both screen data and ladder programs
- Models are also available with Ethernet as a standard feature
  Easy Access from a PC on ethernet
- 5.7 to 12.1 inch sizes are available
- PLC Troubleshooter and DeviceNet Troubleshooter come as a Standard Feature
  When an error occurs, simply follow the on-screen instructions to confirm the error details and quickly implement countermeasures, without referring to the manual
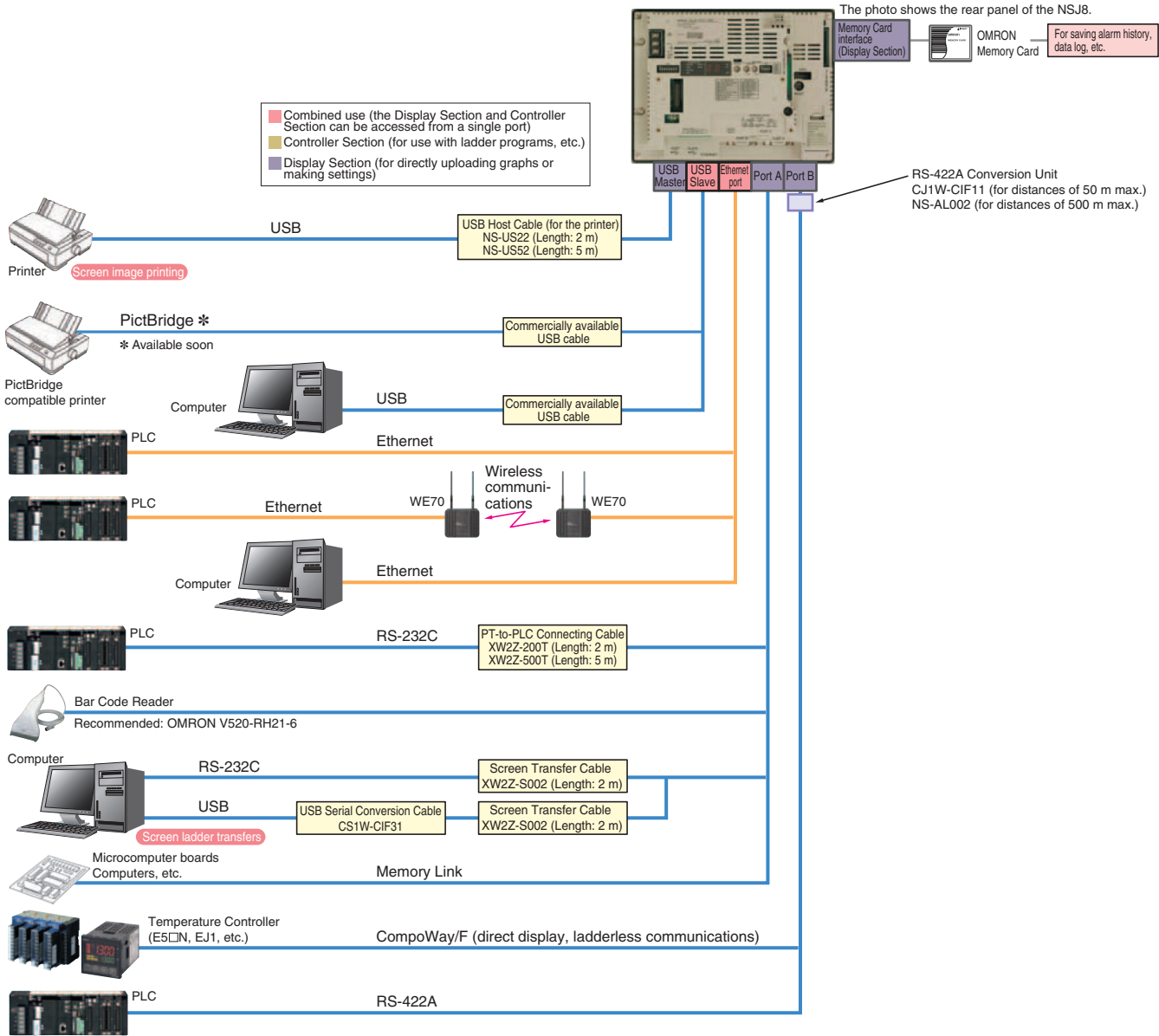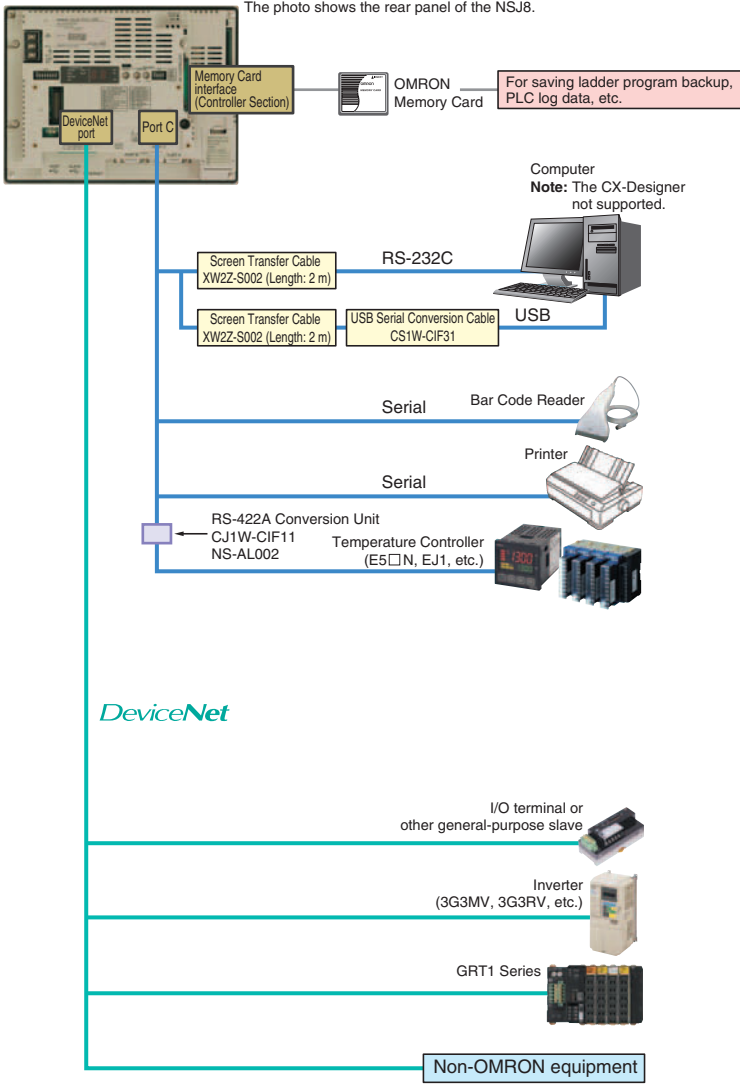- Even control with various Special I/O Units and CPU Bus Units is possible with the CJ-series Expansion Racks

1

System Configuration

The photo shows the rear panel of the NSJ8.

Memory Card interface (Display Section) — OMRON Memory Card — For saving alarm history, data log, etc.

Combined use (the Display Section and Controller Section can be accessed from a single port)

Controller Section (for use with ladder programs, etc.)

Display Section (for directly uploading graphs or making settings)

USB Master | USB Slave | Ethernet port | Port A | Port B

RS-422A Conversion Unit
CJ1W-CIF11 (for distances of 50 m max.)
NS-AL002 (for distances of 500 m max.)

Printer — Screen image printing
USB — USB Host Cable (for the printer) NS-US22 (Length: 2 m) NS-US52 (Length: 5 m)

PictBridge *
*Available soon
PictBridge compatible printer
Commercially available USB cable

Computer
USB — Commercially available USB cable

PLC
Ethernet

PLC
Ethernet — WE70 — Wireless communications — WE70

Computer
Ethernet

PLC
RS-232C — PT-to-PLC Connecting Cable XW2Z-200T (Length: 2 m) XW2Z-500T (Length: 5 m)

Bar Code Reader
Recommended: OMRON V520-RH21-6

Computer
RS-232C — Screen Transfer Cable XW2Z-S002 (Length: 2 m)
USB — USB Serial Conversion Cable CS1W-CIF31 — Screen Transfer Cable XW2Z-S002 (Length: 2 m)
Screen ladder transfers

Microcomputer boards Computers, etc.
Memory Link

Temperature Controller (E5□N, EJ1, etc.)
CompoWay/F (direct display, ladderless communications)

PLC
RS-422A

The photo shows the rear panel of the NSJ8.

Memory Card interface (Controller Section)

DeviceNet port

Port C

OMRON Memory Card

For saving ladder program backup, PLC log data, etc.

Computer
Note: The CX-Designer not supported.

Screen Transfer Cable XW2Z-S002 (Length: 2 m) — RS-232C

Screen Transfer Cable XW2Z-S002 (Length: 2 m) — USB Serial Conversion Cable CS1W-CIF31 — USB

Serial — Bar Code Reader

Serial — Printer

RS-422A Conversion Unit CJ1W-CIF11 NS-AL002

Temperature Controller (E5□N, EJ1, etc.)

*Device*Net

I/O terminal or other general-purpose slave

Inverter (3G3MV, 3G3RV, etc.)

GRT1 Series

Non-OMRON equipment

Combined use (the Display Section and Controller Section can be accessed from a single port)
Controller Section (for use with ladder programs, etc.)
Display Section (for directly uploading graphs or making settings)

Ordering Information

Controllers

NSJ☐-☐☐☐☐-M3D

Name	Controller Section							Display Section				Built-in Ethernet port	Model number	Standards
	I/O	User program memory	Data memory	Extended data memory	LD instruction execution time	Number of Expansion Racks	FB program memory (bytes)	Display device	Case color	Effective display area	Resolution			
SYSMAC One NSJ-series NSJ Controller	640 points	20 Ksteps	32 Kwords (DM: 32 Kwords)	EM: None	0.04 μs	1	256 KB	5.7-inch color STN LCD	Ivory	117.2 × 88.4 mm (W × H) (5.7 inches)	320 × 240 (QVGA)	No	**NSJ5-SQ00-M3D**	UC1, CE, UL Type 4
									Black			No	**NSJ5-SQ00B-M3D**	
									Ivory			Yes	**NSJ5-SQ01-M3D**	
									Black			Yes	**NSJ5-SQ01B-M3D**	
								5.7-inch color TFT LCD	Ivory			No	**NSJ5-TQ00-M3D**	
									Black			No	**NSJ5-TQ00B-M3D**	
									Ivory			Yes	**NSJ5-TQ01-M3D**	
									Black			Yes	**NSJ5-TQ01B-M3D**	
								8.4-inch color TFT LCD	Ivory	170.9 × 128.2 mm (W × H) (8.4 inches)	640 × 480 (VGA)	No	**NSJ8-TV00-M3D**	UC1, CE
									Black			No	**NSJ8-TV00B-M3D**	
									Ivory			Yes	**NSJ8-TV01-M3D**	
									Black			Yes	**NSJ8-TV01B-M3D**	

NSJ☐-☐☐☐☐-G5D

Name	Controller Section							Display Section				Built-in Ethernet port	Model number	Standards
	I/O	User program memory	Data memory	Extended data memory	LD instruction execution time	Number of Expansion Racks	FB program memory (bytes)	Display device	Case color	Effective display area	Resolution			
SYSMAC One NSJ-series NSJ Controller	1280 points	60 Ksteps	128 Kwords (DM: 32 Kwords)	EM: 32 Kwords × 3 banks	0.04 μs	3	1024 KB	5.7-inch color STN LCD	Ivory	117.2 × 88.4 mm (W × H) (5.7 inches)	320 × 240 (QVGA)	No	**NSJ5-SQ00-G5D**	UC1, CE, UL Type 4
									Black			No	**NSJ5-SQ00B-G5D**	
									Ivory			Yes	**NSJ5-SQ01-G5D**	
									Black			Yes	**NSJ5-SQ01B-G5D**	
								5.7-inch color TFT LCD	Ivory			No	**NSJ5-TQ00-G5D**	
									Black			No	**NSJ5-TQ00B-G5D**	
									Ivory			Yes	**NSJ5-TQ01-G5D**	
									Black			Yes	**NSJ5-TQ01B-G5D**	
								8.4-inch color TFT LCD	Ivory	170.9 × 128.2 mm (W × H) (8.4 inches)	640 × 480 (VGA)	No	**NSJ8-TV00-G5D**	UC1, CE
									Black			No	**NSJ8-TV00B-G5D**	
									Ivory			Yes	**NSJ8-TV01-G5D**	
									Black			Yes	**NSJ8-TV01B-G5D**	
								10.4-inch color TFT LCD	Ivory	215.2 × 162.4 mm (W × H) (10.4 inches)		No	**NSJ10-TV00-G5D**	
									Black			No	**NSJ10-TV00B-G5D**	
									Ivory			Yes	**NSJ10-TV01-G5D**	
									Black			Yes	**NSJ10-TV01B-G5D**	
								12.1-inch color TFT LCD	Ivory	246.0 × 184.5 mm (W × H) (12.1 inches)	800 × 600 (SVGA)	No	**NSJ12-TS00-G5D**	
									Black			No	**NSJ12-TS00B-G5D**	
									Ivory			Yes	**NSJ12-TS01-G5D**	
									Black			Yes	**NSJ12-TS01B-G5D**	

Options and Expansion Units

Name		Specifications			Model	Standards
Expansion Units	NSJ Controller Link Unit	For increasing the number of Controller Link ports Same as the CJ1W-CLK21-V1 Controller Link Unit for the CJ Series.			NSJW-CLK21-V1	UC1, CE
	NSJ Ethernet Unit	For increasing the number of Ethernet ports Same as the CJ1W-ETN21 Ethernet Unit for the CJ Series.			NSJW-ETN21	
	NSJ I/O Control Unit	For adding CJ-series Expansion Racks. Same as the CJ1W-IC101 I/O Control Unit for the CJ Series. Use the following I/O Connecting Cables.			NSJW-IC101	
I/O Connecting Cables		For connecting CJ-series Expansion Racks.	0.3 m		CS1W-CN313	L, CE
			0.7 m		CS1W-CN713	
			2 m		CS1W-CN223	
			3 m		CS1W-CN323	
			5 m		CS1W-CN523	
			10 m		CS1W-CN133	
			12 m		CS1W-CN133-B2	
Memory Cards (for both Controller Section and Display Section)		Flash memory: 128 MB			HMC-EF183	L, N, CE
		Flash memory: 256 MB			HMC-EF283	CE
		Flash memory: 512 MB			HMC-EF583	
		Memory Card Adapter (for computer PCMIA slot)			HMC-AP001	
Peripheral Device Connecting Cables for the RS-232C port		Connects computer, D-Sub 9-pin, Length: 2.0 m	Used for peripheral bus or Host Link. Anti-static connectors		XW2Z-200S-CV	–
		Connects computer, D-Sub 9-pin, Length: 5.0 m			XW2Z-500S-CV	
		Connects computer, D-Sub 9-pin, Length: 2.0 m	Used for Host Link only. Peripheral bus not supported.		XW2Z-200S-V	
		Connects computer, D-Sub 9-pin, Length: 5.0 m			XW2Z-500S-V	
RS-422A Conversion Adapter		Adapter for converting a RS-232C port to a RS-422A/485 port.	Communications distance: 500 m max.		NS-AL002	–
			Communications distance: 50 m max.		CJ1W-CIF11	UC1, CE, N, L
Battery life		5 years at 25°C			CJ1W-BAT01	CE

International Standards

- The standards indicated in the "Standards" column are those current for UL, CSA, cULus, cUL, NK, and Lloyd standards and EC Directives as of the end of January 2008. The standards are abbreviated as follows: U: UL: U1: UL (Class I Division 2 Product for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Product for Hazardous Locations), CU: cUL, N: NK, L: Lloyd, CE: EC Directives.
- Ask your OMRON representatives for the conditions under which the standards were met.

EC Directives

The EC Directives applicable to PLCs include the EMC Directives. OMRON complies with these directives as described below.
EMC Directives
Applicable Standards EMI: EN61131-2
                                    EN61000-6-4
                          EMS: EN61131-2
                                    EN61000-6-2

PLCs are electrical devices that are incorporated in machines and manufacturing installations. OMRON PLCs conform to the related EMC standards so that the devices and machines into which they are built can more easily conform to EMC standards. The actual PLCs have been checked to ensure conformity to EMC standards. Whether these standards are satisfied for the actual system, however, must be checked by the customer.
EMS-related performance will vary depending on the configuration, wiring, and other conditions of the equipment or control panel in which the PLC is installed. The customer must, therefore, perform final checks to confirm that the overall machine or device conforms to EMC standards.
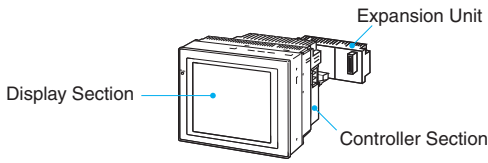**Note:** The applicable EMS standards depend on the product.

Differences between the NSJ☐-☐☐☐☐-G5D and NSJ☐-☐☐☐☐-M3D

Function Model	NSJ☐-☐☐☐☐-G5D	NSJ☐-☐☐☐☐-M3D
UM capacity	60 Ksteps	20 Ksteps
I/O	1,280 points	640 points
Extended data memory	32 Kwords × 3 banks	None
EM file memory	Yes	None
Maximum number of Expansion Racks	3	1
FB program memory capacity	1024 KB	256 KB
Maximum number of FB definitions	1,024	128
Maximum number of FB instances	2,048	256
Variable table size	128 KB	64 KB

General Specifications

Parts Names

Expansion Unit

Display Section

Controller Section

NSJ Controllers

Model Item		Specifications			
		NSJ5-TQ0□-G5D NSJ5-SQ0□-G5D NSJ5-TQ0□-M3D NSJ5-SQ0□-M3D	NSJ8-TV0□-G5D NSJ8-TV0□-M3D	NSJ10-TV0□-G5D	NSJ12-TS0□-G5D
Supply voltage		24 VDC			
Allowable supply voltage range		20.4 to 27.6 VDC (24 VDC ±15%)			
Power consumption		SQ0□: 21 W max. TQ0□: 22 W max.	30 W max.		
Current consumption		Controller Section Internal 5 V: 500 mA max. DeviceNet Section Internal 5 V: 200 mA max., External 24 V: 18 mA max.			
Inrush current (See note 1.)		At 24 VAC: 10 A/20 ms max. for cold start at room temperature			
Ambient operating temperature (depending on angle of display surface off horizontal) (See note 2.)		90° to 30°: 0 to 50°C 30° to 0°: 0 to 40°C	90° to 60°: 0 to 50°C 60° to 30°: 0 to 45°C 30° to 0°: Use prohibited.		
Ambient storage temperature		−20 to 60°C			
Ambient operating humidity		0 to 40°C: 35% to 85% (with no condensation) 40 to 50°C: 35% to 60% (with no condensation)			
Ambient operating environment		No corrosive gases			
Insulation resistance		20 MΩ min. (at 100 VDC) between DC external and GR terminals			
Dielectric strength		800 VDC for 1 min between DC external and GR terminals, leakage current: 10 mA max.			
Noise immunity		2 kV on power supply line (conforming to IEC 61000-4-4)			
Vibration resistance (during operation)		10 to 57 Hz, 0.075-mm amplitude, 57 to 150 Hz, acceleration: 9.8 m/s^2 in X, Y, and Z directions for 80 minutes			
Shock resistance (during operation)		147 m/s^2, 3 times each in X, Y, and Z directions			
External dimensions (See note 3.)	Without Expansion Unit	195 × 142 × 79 mm (W × H × D)	232 × 177 × 73.3 mm (W × H × D)	315 × 241 × 73.3 mm (W × H × D)	
	With Expansion Unit	195 × 142 × 95 mm (W × H × D)	232 × 177 × 89.3 mm (W × H × D)	315 × 241 × 89.3 mm (W × H × D)	
Panel cutout dimensions		184 $^{+0.50}_{0}$ × 131 $^{+0.50}_{0}$ mm (W × H) Panel thickness: 1.6 to 4.8 mm	220.5 $^{+0.50}_{0}$ × 165.5 $^{+0.50}_{0}$ mm (W × H) Panel thickness: 1.6 to 4.8 mm	302 $^{+1}_{0}$ × 228 $^{+1}_{0}$ mm (W × H) Panel thickness: 1.6 to 4.8 mm	
Grounding		100 Ω or less			
Weight		1.1 kg max.	2.0 kg max.	2.5 kg max.	2.7 kg max.
Degree of protection		Front operating panel: Equivalent to IP65 Oil-proof type, NEMA4 and UL Type 4 (See note 4.)	Front operating panel: Equivalent to IP65 Oil-proof type and NEMA4 (See note 4.)		
Battery life		5 years (at 25°C) The SRAM and RTC will be backed up for 5 days after the battery runs low (i.e., after the indicator lights orange). The SRAM and RTC will be backed up by a super capacitor for 5 minutes after removing the old battery (i.e., after turning ON power after 5 minutes).			
International standards		Conforms to cULus and EC Directives.			

Note: 1. A delay circuit that charges a capacitor is used to limit the inrush current. If a hot start is performed when the power supply has been OFF only a short period of time, the capacitor will still be charged and the inrush current specified above will be exceeded by up to approximately five times the specified value. When selecting fuses or breakers for external circuits, allow sufficient margin in the melting temperatures, detection characteristics, and inrush current

2. Display angles off horizontal are as follows:

90°

Display surface

30°

Horizontal 0°
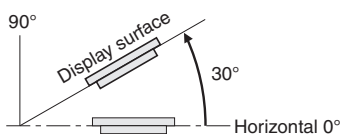
3. For detailed information, refer to *"Dimensions"* on page 14.

4. May not be applicable in locations with long-term exposure to oil.

NSJ Expansion Units

Controller Link Unit

Item	Specifications
Model	NSJW-CLK21-V1
Current consumption	300 mA
Weight	100 g max.

Note: Other general specifications are the same as the NSJ Controller.

I/O Control Unit

Item	Specifications
Model	NSJW-IC101
Current consumption	20 mA
Weight	100g max.

Note: Other general specifications are the same as the NSJ Controller.

Ethernet Unit

Item	Specifications
Model	NSJW-ETN21
Current consumption	370 mA
Weight	100 g max.

Note: Other general specifications are the same as the NSJ Controller.

Controller Section Specifications

Item		Specifications
Control method		Stored program
I/O control method		Cyclic scan and immediate processing are both possible.
Programming		Ladder diagram
CPU processing modes		Normal Mode, Parallel Processing Mode with Asynchronous Memory Access, Parallel Processing Mode with Synchronous Memory Access, and Peripheral Servicing Priority Mode
Instruction length		1 to 7 steps per instruction
Ladder instructions		Approx. 400 (3-digit function codes)
Execution time	**Basic instructions**	0.04 μs min.
	Special instructions	0.06 μs min.
Overhead time		Normal mode: 0.3 ms Parallel processing: 0.3 ms
Installation		Installed using Panel Mounting Bracket.
Mountable Expansion Units		One of the following can be mounted as an Expansion Unit: • NSJ I/O Control Unit (NSJW-IC101) • NSJ Controller Link Unit (NSJW-CLK21-V1) • NSJ Ethernet Unit (NSJW-ETN21)
Maximum number of Expansion Racks		• With the NSJW-IC101 I/O Control Unit mounted, a maximum of three CJ-series Expansion Racks can be used with the NSJ☐-☐☐☐☐(B)-G5D, and a maximum of one CJ-series Expansion Rack can be used with the NSJ☐-☐☐☐☐(B)-M3D. • A CJ-series CJ1W-II101 Interface Unit and Power Supply Unit are required for each Expansion Rack.
Maximum number of connectable Units		• Per Expansion Rack: 10 Units max. (Basic I/O Units, Special I/O Units, or CPU Bus Units) • A maximum of 30 Units (10 Units on CJ-series Expansion Rack × 3) can be mounted to the entire NSJ☐-☐☐☐☐(B)-G5D system. A maximum of 10 Units (10 Units on CJ-series Expansion Rack × 1) can be mounted to the entire NSJ☐-☐☐☐☐(B)-M3D system.
Number of tasks		288 (cyclic tasks: 32, interrupt tasks: 256) Interrupt tasks can be defined as cyclic tasks called "extra cyclic tasks." Including these, up to 288 cyclic tasks can be used. **Note:** 1. Cyclic tasks are executed each cycle and are controlled with TKON(820) and TKOF(821) instructions. 2. The following 3 types of interrupt tasks are supported: Power OFF interrupt task: 1 max., Scheduled interrupt tasks: 2 max., External interrupt tasks: 256 max.
Interrupt types		Scheduled Interrupts: Interrupts generated at a time scheduled by the Controller Section's built-in timer. (See note. 1) Power OFF Interrupt (See note. 2.): Interrupt executed when the Controller Section's power is turned OFF. External I/O Interrupts: Interrupts from the Special I/O Units or CPU Bus Units. **Note:** 1. Scheduled interrupt time interval is either 1 ms to 9,999 ms or 10 ms to 99,990 ms, in units of 1 ms or 10 ms. 2. Not supported when the CJ1W-PD022 Power Supply Unit is mounted.
Calling subroutines from more than one task		Supported using global subroutines.
Function blocks		Languages supported in function block definitions: Ladder programming language and structured text

	Item	Specifications	
CIO (Core I/O) Area	I/O Area	2,560 (160 words): CIO 000000 to CIO 015915 (words CIO 0000 to CIO 0159) The setting of the first rack word can be changed from the default (CIO 0000) so that CIO 0000 to CIO 0999 can be used. I/O bits are allocated to Basic I/O Units.	The CIO Area can be used as work bits if the bits are not used as shown here.
	Link Area	3,200 (200 words): CIO 10000 to CIO 119915 (words CIO 1000 to CIO 1199)	
	CPU Bus Unit Area	6,400 (400 words): CIO 150000 to CIO 189915 (words CIO 1500 to CIO 1899) CPU Bus Unit bits store operating status of CPU Bus Units. (25 words per Unit, 16 Units max.)	
	Inner Board Area	1,600 (100 words): CIO 190000 to CIO 199915 (words CIO 1900 to CIO 1999) Bits in the Inner Board Area are allocated to the display status area.	
	C200H Special I/O Unit Area	15,360 (960 words): CIO 200000 to CIO 295915 (words CIO 2000 to CIO 2959) Bits in the Special I/O Area can be allocated to Special I/O Units (10 words per Unit, 96 Units max.)	
	DeviceNet Area	9,600 (600 words): CIO 320000 to CIO 379915 (words CIO 3200 to CIO 3799) DeviceNet bits are allocated to Slaves for DeviceNet Section remote I/O communications when the master function is used with fixed allocations. Fixed allocation setting 1 Outputs: CIO 3200 to CIO 3263 Inputs: CIO 3300 to CIO 3363 Fixed allocation setting 2 Outputs: CIO 3400 to CIO 3463 Inputs: CIO 3500 to CIO 3563 Fixed allocation setting 3 Outputs: CIO 3600 to CIO 3663 Inputs: CIO 3700 to CIO 3763 **Note:** The following words are allocated to the master function even when the DeviceNet Unit is used as a slave. Fixed allocation setting 1 Outputs: CIO 3370 (master to slave) Inputs: CIO 3270 (slave to master) Fixed allocation setting 2 Outputs: CIO 3570 (master to slave) Inputs: CIO 3470 (slave to master) Fixed allocation setting 3 Outputs: CIO 3770 (master to slave) Inputs: CIO 3670 (slave to master)	
Work bits	CIO (Core I/O) Area	4,800 (300 words): CIO 120000 to CIO 149915 (words CIO 1200 to CIO 1499) 37,504 (2,344 words): CIO 380000 to CIO 614315 (words CIO 3800 to CIO 6143) These bits in CIO Area are used as work bits in programming to control program execution. They cannot be used for external I/O.	
	Work Area	8,192 bits (512 words): W00000 to W51115 (words W000 to W511) Control programs only. (I/O from external I/O terminals is not possible.) **Note:** When using work bits in programming, use bits in Work Area first before using bits from other areas.	
Holding Area		8,192 bits (512 words): H00000 to H51115 (words H000 to H511) Holding bits are used to control execution of program, and maintain their ON/OFF status when the PLC is turned OFF or operating mode is changed. **Note:** Words H512 to H1535 are allocated to the Function Block Holding Area and are used only for the function block instance area (internally allocated variable area).	
Auxiliary Area		Read only: 7,168 bits (448 words): A00000 to A44715 (words A000 to A447) Read/write: 8,192 bits (512 words): A44800 to A95915 (words A448 to A959) Auxiliary bits are allocated specific functions.	
Temporary Area		16 bits (TR00 to TR15) Temporary bits are used to store ON/OFF execution conditions at program branches.	The bits on the left can be used as work bits when they are not used for their normal application
Timer Area		4,096: T0000 to T4095 (used for timers only)	
Counter Area		4,096: C0000 to C4095 (used for counters only)	
DM Area		32 Kwords: D00000 to D32767	Used as a general-purpose data area for reading and writing data in word units (16 bits). Words in the DM Area maintain their status when the NSJ Controller is turned OFF or the operating mode is changed.
		Special I/O Unit DM Area: D20000 to D29599 (100 words × 96 Units). / Used to set parameters for Special I/O Units.	
		CPU Bus Unit DM Area: D30000 to D31599 (100 words × 16 Units). / Used to set parameters for CPU Bus Units.	
EM Area		NSJ□-□□□□(B)-G5D: 32 Kwords per bank, 3 banks max.: E0_00000 to E2_32767 max. Used as a general-purpose data area for reading and writing data in word units (16 bits). Words in EM Area maintain their status when the NSJ Controller is turned OFF or operating mode is changed. The EM Area is divided into banks, and addresses can be set by either of following methods. Changing current bank using the EMBC (281) instruction and setting addresses for the current bank. Setting bank numbers and addresses directly. EM data can be stored in files by specifying number of first bank. (EM file memory) NSJ□-□□□□(B)-M3D: None	
Index Registers		IR0 to IR15. Store actual memory addresses for indirect addressing. Index registers can be used independently in each task. One register is 32 bits (2 words). Index registers can be specified as shared or independent for each task.	
Task Flag Area		32 (TK0000 to TK0031). Task Flags are read-only flags that are ON when corresponding cyclic task is executable and OFF when corresponding task is not executable or in standby status.	
Trace Memory		4,000 words (traceable data: 31 bits and 6 words)	
File Memory		Memory Cards: Compact flash memory cards can be used (MS-DOS format). EM file memory: Part of EM Area can be converted to file memory (MS-DOS format). The NSJ□-□□□□(B)-M3D does not support EM file memory.	

Item		Specifications
Functions	**Constant cycle time**	1 to 32,000 ms (Unit: 1 ms) **Note:** Using the Parallel Processing Mode will create a constant cycle time for program execution.
	Cycle time monitoring	Possible (Unit stops operating if cycle is too long): 10 to 40,000 ms (Unit: 10 ms) **Note:** When the Parallel Processing Mode is used, the program execution cycle is monitored. Controller Section operation will stop if the peripheral servicing time exceeds 2 s.
	I/O refreshing	Cyclic refreshing, immediate refreshing, refreshing by IORF(097). **Note:** IORF(097) refreshes I/O bits allocated to Basic I/O Units and Special I/O Units. The CPU BUS UNIT I/O REFRESH (DLNK(226)) instruction can be used to refresh bits allocated to CPU Bus Units in the CIO and DM Areas.
	Timing of refreshing for CPU Bus Units	Data links for Control Link Units, remote I/O communications for DeviceNet Units, and other special data for CPU Bus Units is refreshed at the following times. During I/O refresh period or when CPU BUS UNIT I/O REFRESH (DLNK(226)) instruction is executed.
	I/O memory holding when changing operating modes	Depends on ON/OFF status of IOM Hold Bit in Auxiliary Area.
	Load OFF	All outputs on Output Units can be turned OFF when the Controller Section is operating in RUN, MONITOR, or PROGRAM mode.
	Timer/counter PV refresh method	BCD or binary (CX-Programmer version 3.0 or higher)
	Input time constant setting	Time constants can be set for inputs from CJ-series Basic I/O Units. The time constant can be increased to reduce influence of noise and chattering or it can be decreased to detect shorter pulses on inputs.
	Mode setting at power-up	The operating mode can be specified.
	Flash memory	• The user program and parameter area data (e.g., PLC Setup) are always backed up automatically in flash memory. (automatic backup and restore.) • When downloading projects from CX-Programmer Ver. 5.0 or higher, symbol table files (including CX-Programmer symbol names, I/O comments), comment files (CX-Programmer rung comments, other comments), and program index files (CX-Programmer section names, section comments, or program comments) are stored in comment memory within the flash memory.
	Memory Card functions (Controller Section)	Automatically reading programs (autoboot) from the Memory Card when the power is turned ON. — Possible
		Program replacement during Controller Section operation — Possible
		Memory Card storage data — User program: Program file format PLC Setup and other parameters: Data file format I/O memory: Data file format (binary), text format, CSV format
		Memory Card read/write method — User program instructions, Programming Devices (including CX-Programmer and Programming Console), Host Link computers, Auxiliary Area control bits, easy backup operation
	Filing (Controller Section)	Memory Card data and EM (Extended Data Memory) Area can be handled as files.
	Debugging	Force-set/reset, differential monitoring, data tracing (scheduled, each cycle, or when instruction is executed), storing location generating error.
	Online editing	User programs can be overwritten in program block units when the Controller Section is in MONITOR or PROGRAM mode. This function is not supported for block programming areas. With the CX-Programmer, more than one program block can be edited at the same time.
	Program protection	Overwrite protection: Set using DIP switch or via the password from CX-Programmer peripheral device. Copy protection: Password set using CX-Programmer.
	Error check	User-defined errors (i.e., user can define fatal errors and non-fatal errors) The FPD(269) instruction can be used to check execution time and logic of each programming block. **Note:** FAL and FALS instructions can be used to simulate errors.
	Error log	Up to 20 errors are stored in error log. Information includes error code, error details, and time error occurred. **Note:** The Controller Section can be set so that user-defined FAL errors are not stored in the error log.
	Clock	Provided on all models. Accuracy: | Ambient temperature	Monthly variation
---	---
25°C	−1.5 to +1.5 min	 **Note:** 1. Accuracy varies with the temperature. 2. Used to store time when power is turned ON and when errors occur.
	Power OFF detection time	2 ms
	Power OFF detection delay time	0 ms fixed
	Memory protection	Held Areas: Holding bits, Data Memory, Extended Data Memory, and status of counter Completion Flags and present values. **Note:** If IOM Hold Bit in Auxiliary Area is turned ON, and PLC Setup is set to maintain IOM Hold Bit status when power to the NSJ Controller is turned ON, contents of CIO Area, Work Area, part of Auxiliary Area, timer Completion Flag and present values, Index Registers, and Data Registers will be saved.
	Sending commands to a Host Link computer	FINS commands can be sent to a computer connected via Host Link System by executing Network Communications Instructions from the Controller Section.
	Remote programming and monitoring	Host Link communications can be used for remote programming and remote monitoring through a Controller Link System or Ethernet network.

Item		Specifications
Functions	Eight-level communications	Host Link communications can be used for remote programming and remote monitoring from devices on networks up to eight levels away (Controller Link Network, Ethernet Network, or other network).
	Storing comments in CPU Unit	I/O comments can be stored as symbol table files in Memory Cards in the Controller Section, EM file memory, or Comment Memory (see note). **Note:** Supported for CX-Programmer Ver. 5.0 or later only.
	Program check	Program checks are performed at the beginning of operation for items such as no END(001) instruction and instruction errors. CX-Programmer can also be used to check programs.
	Battery life	5 years at 25°C (The battery life depends on the ambient operating temperature; 1.1 years min.) (Battery set: CJ1W-BAT01; Use a Replacement Battery that is within two years of its date of manufacture.)
	Self-diagnostics	Controller Section errors (watchdog timer), I/O bus errors, memory errors, and battery errors
	Other functions	Storage of number of times power has been interrupted. (Stored in A514.)

Display Section Specifications

Model	Built-in ports					Display Section			
	USB port (Slave: For Support Software)	RS-232C port	DeviceNet port	Ethernet port	USB port (Host: For printer)	Display color	Field of view	Language	Standard screen data capacity
NSJ5-SQ00-M3D/-G5D	1 port	3 ports • Display Section: Serial ports A, B • Controller Section: Serial port	1 port	None	None	256 colors (BMP/JPEG, 32,768 colors for images)	Right/left: ±50°, Top: 45°, Bottom: 50°	Japanese and English	20 MB
NSJ5-SQ00B-M3D/-G5D				None					
NSJ5-SQ01-M3D/-G5D				10/100Base-T					
NSJ5-SQ01B-M3D/-G5D				10/100Base-T					
NSJ5-TQ00-M3D/-G5D				None			Right/left: ±70°, Top: 70°, Bottom: 50°		
NSJ5-TQ00B-M3D/-G5D				None					
NSJ5-TQ01-M3D/-G5D				10/100Base-T					
NSJ5-TQ01B-M3D/-G5D				10/100Base-T					
NSJ8-TV00-M3D/-G5D				None	1 port		Right/left: ±65°, Top: 50°, Bottom: 60°		60 MB
NSJ8-TV00B-M3D/-G5D				None					
NSJ8-TV01-M3D/-G5D				10/100Base-T					
NSJ8-TV01B-M3D/-G5D				10/100Base-T					
NSJ10-TV00-G5D				None			Right/left: ±60°, Top: 35°, Bottom: 65°		
NSJ10-TV00B-G5D				None					
NSJ10-TV01-G5D				10/100Base-T					
NSJ10-TV01B-G5D				10/100Base-T					
NSJ12-TS00-G5D				None			Right/left: ±60°, Top: 45°, Bottom: 75°		
NSJ12-TS00B-G5D				None					
NSJ12-TS01-G5D				10/100Base-T					
NSJ12-TS01B-G5D				10/100Base-T					

Communications Section Specifications

DeviceNet Section

Item	Specifications
Communications protocol	DeviceNet
DeviceNet master/slave	Can function as master or slave.
Connection forms (See note 1.)	Combination of multi-drop and T-branch connections (for trunk or branch lines)
Terminating resistance.	SW4 (TER) is used to connect/disconnect terminating resistance. The TER indicator lights when terminating resistance is connected.
Baud rate	500 kbps, 250 kbps, or 125 kbps (Set via DIP switch.)
Communications distances	<table><tr><td>Baud rate</td><td>Network length</td><td>Branch line length</td><td>Total branch line length</td></tr><tr><td>500 kbps</td><td>100 m max.</td><td>6 m max.</td><td>39 m max.</td></tr><tr><td>250 kbps</td><td>250 m max. (See note 2.)</td><td>6 m max.</td><td>78 m max.</td></tr><tr><td>125 kbps</td><td>500 m max. (See note 2.)</td><td>6 m max.</td><td>156 m max.</td></tr></table>
Max. number of Slaves	63 Slaves
Error control	CRC error check, node address redundancy check, scan list verification
Cable	Special 5-wire cable (2 signal lines, 2 power lines, 1 shield line)

Note: 1. Terminating resistance is required at both ends of the trunk line.
2. Communications distances are for Thick Cables. Keep the maximum network length to 100 m or less when using Thin Cables.

Controller Link (Wired)

Item	Specifications
Communications method	N: N token bus
Code	Manchester code
Modulation	Baseband code
Synchronization	Flag synchronization (conforms to HDLC frames)
Error control	Manchester code checks and CRC checks (CCITT $X^{16}+X^{12}+X^5+1$)
Transmission path form	Multi-drop bus
Baud rate and maximum transmission distance	The maximum transmission distance varies with the baud rate as follows: 2 Mbps: 500 m 1 Mbps: 800 m 500 Kbps: 1 km
Media	Specified shielded twisted-pair cable Number of signal lines: 2, shield line: 1
Node connection method	NSJ Controller Link Unit: Connected via a special connector (included) PLC: Connected to a terminal block IBM PC/AT or compatible: Connected via a special connector (included)
Maximum number of nodes	32 or 62 nodes (See note 1.)
Communications functions	Data links and message service

Number of data link words	• Transmission area per node: 1,000 words max.
	• Data link area (send/receive words) per node
	  NSJ Controller: 20,000 words
	  CS/CJ Series: 20,000 words max. (unit Ver. 1.2 or later)
	                        12,000 words max. (pre-Ver. 1.2)
	  C200HX/HG/HE, CVM1/CV, CQM1H: 8,000 words max.
	  Personal computer: 32,000 or 62,000 words max. (See note 2.)

Data link areas	Bit-access areas (IR, AR, LR, CIO), DM Area (DM), and extended DM Area (EM)
Message length	2,012 bytes max. (including the header)
RAS functions	• Polling node backup function • Self-diagnosis function (hardware checking at startup) • Echoback test and broadcast test (using the FINS command) • Watchdog timer • Error log function

Note: 1. At least one Repeater Unit (CS1W-RPT01) is required to construct networks that uses a node address higher than 32. The following Controller Link Units/Support Boards must also be used, and the Wired Network 62 Node Enable Bit of the DM Parameter Area software switch of all nodes must be turned ON (62 nodes max.).
CS1W-CLK21-V1, CJ1W-CLK21-V1, 3G8F7-CLK21-V1, and NSJW-CLK21-V1
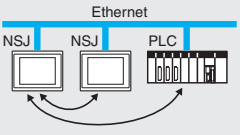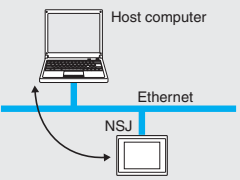
2. For a maximum configuration of 62 nodes
For other specifications, refer to the Controller Link Unit Operation Manual (Cat. No. W309).

Ethernet Unit

Item	Specifications	
Type	100Base-TX (can be used as 10Base-T)	
Media access method	CSMA/CD	
Modulation method	Baseband	
Transmission paths	Star form	
Baud rate	100 Mbps (100Base-TX)	100 Mbps (10Base-T)
Transmission media	Unshielded twisted-pair (UTP) cable 　　Categories: 5, 5e Shielded twisted-pair (STP) cable 　　Categories: 100 Ω at 5, 5e	Unshielded twisted-pair (UTP) cable 　　Categories: 3, 4, 5, 5e Shielded twisted-pair (STP) cable 　　Categories: 100 Ω at 3, 4, 5, 5e
Transmission distance	100 m (distance between hub and node)	
Number of cascade connections	2	4
Functions	• FINS communications service • Socket services (UDP/TCP) • FTP server • Email send/receive • Automatic clock adjustment	

Note: Refer to the Ethernet Units Construction of Networks Operation Manual (Cat. No. W420) and the Ethernet Units Construction of Applications Operation Manual (Cat. No. W421) for other specifications.

Differences between the Built-in Ethernet and Ethernet Unit Ports

	Built-in Ethernet port	Ethernet Unit port
Communications with another host (PLC)	Communications is possible with another host via Ethernet. For example, from one NSJ Controller, data can be displayed or settings can be made to another NSJ Controller or PLC.	Same functions as at left.
Connection with a host computer	**Support Software Connections** CX-One (CX-Programmer, CX-Designer, etc.) can be used via Ethernet. Screen data and ladder programs can be transferred from a host computer. **Access to a Memory Card in the Display Section** A memory card in the Display Section can be accessed using Support Software or FTP and Ethernet. For example, Display Section recipe data and alarm or data log files can be downloaded from a host computer. **Access to the Host from a Host Application** A host computer can access the Controller Section using FINS communications. For example, an application on a host computer can read or data can be written to the NSJ data memory (DM) (UDP only).	Same functions as at left, plus the following: • A Memory Card in the Controller Section can be accessed. • The clock can be set using SNTP • TCP/IP support (See note.) 　(The Memory Card in the Display Section cannot be accessed.) **Note:** Ethernet (FINS/TCP) not supported by CX-Programmer.
E-mail	–	E-mail can be sent and received.
Communications using ladder programming	–	• Socket communications are possible using the CMND instruction. • SEND/RCV instructions

Ordering Information

Item	Specifications		Media	Model number	Standards
CX-One FA Integrated Tool Package Ver. 2.□	The CX-One is an integrated tool package that provides programming and monitoring software for OMRON PLCs and components. The CX-One runs on any of the following operating systems: OS: Windows 98 SE, Me, NT 4.0 (Service Pack 6a), 2000 (Service Pack 3 or higher), XP or Vista CX-Designer version 2.□ is included in the CX-One Ver. 2.0. Refer to the CX-One catalog (Cat. No. R134) for details. **Note:** Site licenses are also available for users that need to use the CX-One on many computers. Ask your OMRON representative for details.	1 licence	CD	**CXONE-AL01C-EV2**	–
			DVD	**CXONE-AL01D-EV2**	
		3 licenses	CD	**CXONE-AL03C-EV2**	
			DVD	**CXONE-AL03D-EV2**	
		10 licenses	CD	**CXONE-AL10C-EV2**	
			DVD	**CXONE-AL10D-EV2**	
		30 licenses	CD	**CXONE-AL30C-EV2**	
			DVD	**CXONE-AL30D-EV2**	
		50 licenses	CD	**CXONE-AL50C-EV2**	
			DVD	**CXONE-AL50D-EV2**	

System Requirements for the CX-One FA Integrated Tool Package

Item	Specifications
Operating system	Windows 98 SE, Me, NT4.0 (Service Pack6a), 2000 (Service Pack 3 or higher), XP or Vista
Compute	IBM PC/AT or compatible with a Pentium II 333 MHz or faster processor (Pentium III 1 GHz or faster recommended.)
Memory	256 MB minimum, 512 MB recommended.
Hard disk	Approx. 1.9 GB or more available space is required to install the complete CX-One package.
Display	SVGA (800 x 600) or better high-resolution display with 256 colors min.
Disk drive	CD-ROM drive or DVD drive
Communications ports	One RS-232C port min. (See note.)
Other	Internet access is required to use online user registration, including a modem or other hardware connection method.

Note: An RS-232C port is required to connect the Support Software applications in CX-One to a PLC. If the computer provides only a USB port, use a CS1W-CIF31 USB/RS-232C Conversion Cable. To connect to a CP-series PLC or NSJ-series Controller, however, a commercially available USB cable (type A-B) can be used to connected to the built-in USB port on the CP-series PLC/NSJ-series Controller.

Dimensions

NSJ12-TS0☐(B)-G5D
NSJ10-TV0☐(B)-G5D

With NSJW-CLK21-V1 Mounted

No Expansion Unit

140 241
227 249
15.5
264
315
323

39 (min.)
42 (max.)
7.5
73.3
(NSJ10, 12 max. dimension)
89.3
(With Expansion Unit mounted)
1.1
(90.4)

32.2
69.1 78
43.6
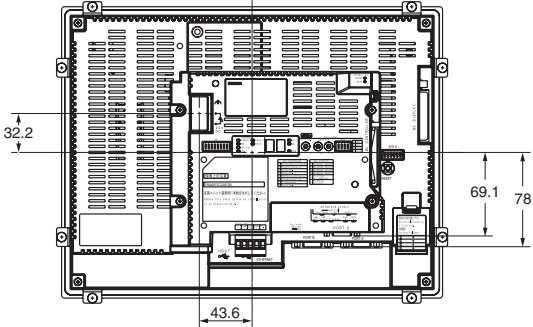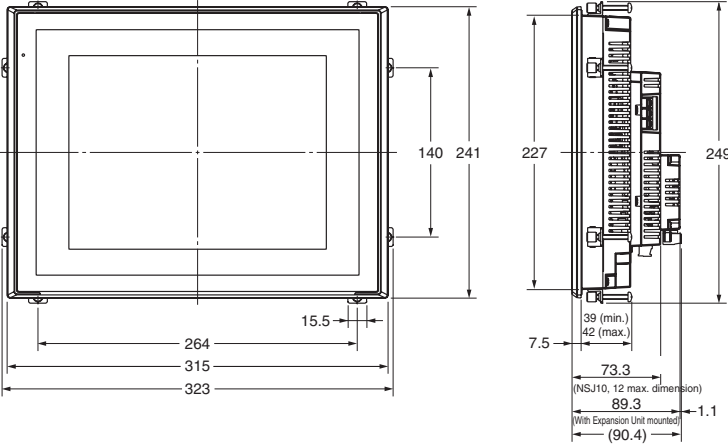
NSJ8-TV0☐(B)-M3D
NSJ8-TV0☐(B)-G5D

With NSJW-CLK21-V1 Mounted

No Expansion Unit

177
165 188
15.5
180
232

39 (min.)
42 (max.)
7.5
73.3
(NSJ8 max. dimension)
89.3
(With Expansion Unit mounted)
1.1
(90.4)

8.4
45.7
55.6 64.5

OMRON   http://www.ia.omron.com/
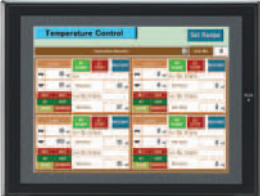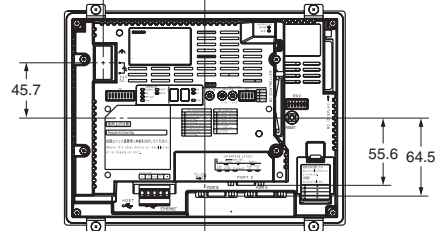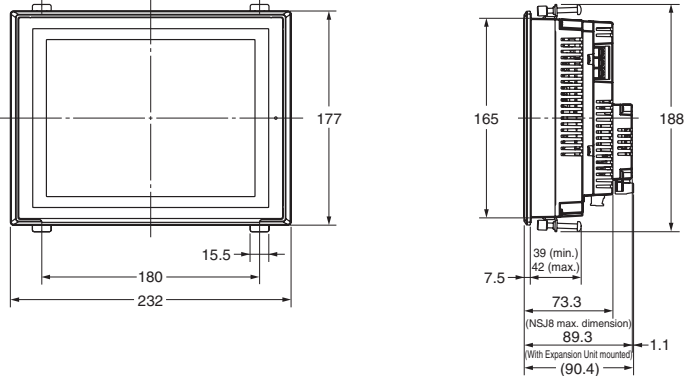
NSJ5-TQ0□(B)-M3D
NSJ5-TQ0□(B)-G5D
NSJ5-SQ0□(B)-M3D
NSJ5-SQ0□(B)-G5D

With NSJW-CLK21-V1 Mounted

No Expansion Unit

25
142
15.5
145
195
206.3

130.5
153.3
34 (min.)
38 (max.)
5
53.8
79
(NSJ5 max. dimension)
95
(With Expansion Unit mounted)
1.1
(96.1)

6.5
23.7 25.4
44.55
81.5
77
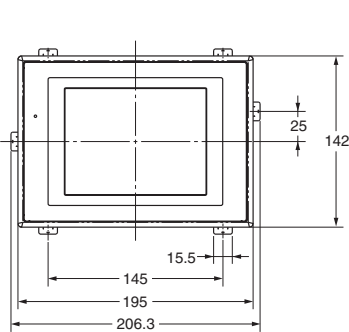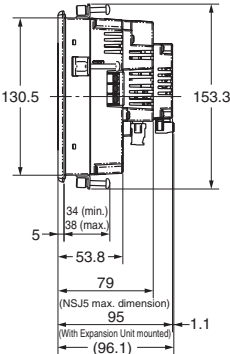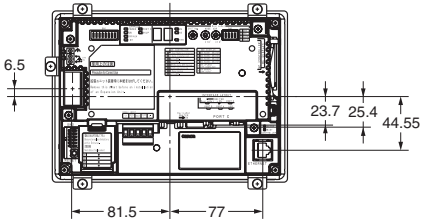
Related Manuals

The NSJ-series programmable controller related manuals are organized as shown in the chart below.

Cat. No.	Name	Contents
W452	SYSMAC One NSJ Series NSJ5-TQ☐☐(B)-G5D, NSJ5-SQ☐☐(B)-G5D, NSJ8-TV☐☐(B)-G5D, NSJ10-TV☐☐(B)-G5D, NSJ12-TS☐☐(B)-G5D, NSJ5-TQ☐☐(B)-M3D, NSJ5-SQ☐☐(B)-M3D, NSJ8-TV☐☐(B)-M3D, NSJW-ETN21, NSJW-CLK21-V1, NSJW-IC101 NSJ Controllers Operation Manual	Provides an outline of, and describes the design, installation, maintenance, and other basic operations for the NSJ-series NSJ Controllers. Information is also included on features, system configuration, wiring, I/O memory allocations, and troubleshooting.
W393	SYSMAC CJ Series CJ1G-CPU☐☐, CJ1M-CPU☐☐, CJ1G-CPU☐☐P, CJ1G/H-CPU☐☐H Programmable Controllers Operation Manual	Provides an outline of, and describes the design, installation, maintenance, and other basic operations for the CJ-series PLCs. Information is also included on features, system configuration, wiring, I/O memory allocations, and troubleshooting.
W394	SYSMAC CS/CJ Series CS1G/H-CPU☐☐-EV1, CS1G/H-CPU☐☐H, CS1D-CPU☐☐H, CS1D-CPU☐☐S, CJ1G-CPU☐☐, CJ1M-CPU☐☐, CJ1G-CPU☐☐P, CJ1G/H-CPU☐☐H Programmable Controllers Programming Manual	Describes programming, tasks, file memory, and other functions for the CS-series and CJ-series PLCs.
W340	SYSMAC CS/CJ Series CS1G/H-CPU☐☐-EV1, CS1G/H-CPU☐☐H, CS1D-CPU☐☐H, CS1D-CPU☐☐S, CJ1G-CPU☐☐, CJ1M-CPU☐☐, CJ1G-CPU☐☐P, CJ1G/H-CPU☐☐H Programmable Controllers Instructions Reference Manual	Describes the ladder diagram programming instructions supported by CS-series and CJ-series PCs.
W342	SYSMAC CS/CJ Series CS1G/H-CPU☐☐-EV1, CS1G/H-CPU☐☐H, CS1D-CPU☐☐H, CS1D-CPU☐☐S, CJ1G-CPU☐☐, CJ1M-CPU☐☐, CJ1G-CPU☐☐P, CJ1G/H-CPU☐☐H, CS1W-SCB21-V1/41-V1, CS1W-SCU21-V1, CJ1W-SCU21-V1/41-V1 Communications Commands Reference Manual	Describes the C-series (Host Link) and FINS communications commands used with CS/CJ-series PLCs.
V083	NS-Series NS5-SQ0☐(B)-V1/V2, NS5-TQ0☐(B)-V2, NS5-MQ0☐(B)-V2, NS8-TV☐☐(B)-V1/V2, NS10-TV0☐(B)-V1/V2, NS12-TS0☐(B)-V1/V2 Programmable Terminals Setup Manual	Provides an outline of, and describes the design, installation, maintenance, and other basic operations for the NS-series PTs. Information is also included on connecting to hosts and Programming Devices, and settings required for communications and PT operation.
V073	NS-Series NS5-SQ0☐(B)-V1/V2, NS5-TQ0☐(B)-V2, NS5-MQ0☐(B)-V2, NS8-TV☐☐(B)-V1/V2, NS10-TV0☐(B)-V1/V2, NS12-TS0☐(B)-V1/V2 Programmable Terminals Programming Manual	Describes the functions of NS-series PTs, including screen configurations, object functions, and host communications for the PT.
W380	CS/CJ-series CS1W-DRM21(-V1) and CJ1W-DRM21 DeviceNet Units Operation Manual	Provides information on the DeviceNet Section of an NSJ Controller, including descriptions of functions, settings required for operation, and maintenance.
W267	DeviceNet Operation Manual	Provides DeviceNet communications specifications and wiring methods.
W404	DeviceNet DRT2 Series Slaves Operation Manual	Describes DeviceNet DRT2-series Smart Slaves.
W347	DeviceNet DRT1 Series Slaves Operation Manual	Describes DeviceNet DRT1-series Smart Slaves.
W348	DeviceNet MULTIPLE I/O TERMINAL Operation Manual	Describes MULTIPLE I/O TERMINALs, which are one type of DeviceNet Slave.
W309	CS/CJ Series CS1W-CLK21-V1, CJ1W-CLK21-V1, C200HW-CLK21, CVM1-CLK21, CQM1H-CLK21 (CS1W-RPT01/02/03 Repeater Units) Controller Link Units Operation Manual	Describes the functions, settings required for operation, and maintenance of Controller Link Units. Controller Link Units are used to connect to a Controller Link Network.
W420	CS1W-ETN21, CJ1W-ETN21 Ethernet Units Operation Manual Construction of Networks	Provides information on operating and installing 100Base-TX Ethernet Units, including details on basic settings and FINS communications.
W421	CS1W-ETN21, CJ1W-ETN21 Ethernet Units Operation Manual Construction of Applications	Provides information on constructing host applications for 100Base-TX Ethernet Units, including functions for sending/receiving mail, socket service, automatic clock adjustment, FTP server functions, and FINS communications.
W446	SYSMAC WS02-CXPC1-E-V61 CX-Programmer Ver. 7.0 Operation Manual	Provides information on how to use the CX-Programmer, a Windows-based programming device.
W464	CX-Integrator Ver. 2.0 Operation Manual	Describes CX-Integrator operating methods, e.g., for setting up and monitoring networks including data link settings, routing table settings, and Communications Unit settings.

Cat. No.	Name	Contents
W447	SYSMAC WS02-CXP☐☐-E CX-Programmer Operation Manual: Function Blocks	Describes specifications and operation methods related to function blocks.
V088	SYSMAC CX-Designer Ver. 1.0 NS-CXDC1-V1 Operation Manual	Describes how to install and use the CX-Designer, including screen data creation methods, screen data transfer methods, and system settings.
W382	DeviceNet Configurator Ver. 2.☐ Operation Manual	Describes the operating procedures of the DeviceNet Configurator.