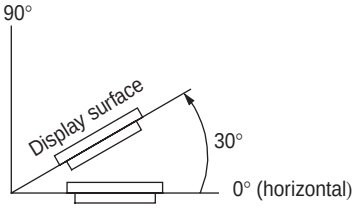
the specified value. When selecting fuses or breakers for external circuits, allow sufficient margin in shut-off performance.

(2) Display angles off horizontal are as follows:



(3) Refer to *4-2-1 Dimensions* for details.

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

NSJ Controller Link Unit

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

Other specifications conform to those of the NSJ Controller.

NSJ Ethernet Unit

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

Other specifications conform to those of the NSJ Controller.

NSJ I/O Control Unit

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

Other specifications conform to those of the NSJ Controller.

Power Supply Unit (when Connecting CJ-series Racks)

Item	Specifications				
Power Supply Unit	CJ1W-PA205R	CJ1W-PA205C	CJ1W-PA202	CJ1W-PD025	CJ1W-PD022
Supply voltage	100 to 240 V AC (wide-range), 50/60 Hz			24 V DC	
Operating voltage and frequency ranges	85 to 264 V AC, 47 to 63 Hz			19.2 to 28.8 V DC	21.6 to 26.4 V DC
Power consumption	100 VA max.		50 VA max.	50 W max.	35 W max.
Inrush current (See note 1.)	At 100 to 120 V AC: 15 A/8 ms max. for cold start at room temperature At 200 to 240 V AC: 30 A/8 ms max. for cold start at room temperature		At 100 to 120 V AC: 20 A/8 ms max. for cold start at room temperature At 200 to 240 V AC: 40 A/8 ms max. for cold start at room temperature	At 24 V DC: 30 A/20 ms max. for cold start at room temperature	
Output capacity	5.0 A, 5 V DC		2.8 A, 5 V DC	5.0 A, 5 V DC	2.0 A, 5 V DC
	0.8 A, 24 V DC		0.4 A, 24 V DC	0.8 A, 24 V DC	0.4 A, 24 V DC
	Total: 25 W max.		Total: 14 W max.	Total: 25 W max.	Total: 19.6 W max.
Output terminal (service supply)	Not provided				
Replacement notification function	Not provided.	Provided. Alarm output (open-collector output) 30 V DC max., 50 mA max.	Not provided.		
Insulation resistance	20 MΩ min. (at 500 V DC) between AC external and GR terminals (See note 3.)	20 MΩ min. (at 500 V DC) between all external terminals and GR terminal, and between all alarm output terminals. 20 MΩ min. (at 250 V DC) between all alarm output terminals and GR terminal.	20 MΩ min. (at 500 V DC) between AC external and GR terminals (See note 3.)	20 MΩ min. (at 500 V DC) between DC external and GR terminals (See note 3.)	--- (See note 6.)
Dielectric strength (See note 4.)	2,300 V AC 50/60 Hz for 1 min between AC external and GR terminals (See note 3.) Leakage current: 10 mA max.	2,300 V AC, 50/60 Hz for 1 minute between AC external terminals and GR terminal with a leakage current of 10 mA max. 1,000 V AC, 50/60 Hz for 1 minute between all alarm output terminals with a leakage current of 10 mA max.	2,300 V AC 50/60 Hz for 1 min between AC external terminals and GR terminal with a leakage current of 10 mA max. (See note 3.)	1,000 V AC 50/60 Hz for 1 min between DC external terminals and GR terminal with a leakage current of 10 mA max. (See note 3.)	--- (See note 6.)
	1,000 V AC 50/60 Hz for 1 min between DC external and GR terminals (See note 3.), Leakage current: 10 mA max.				
Noise immunity	2 kV on power supply line (conforming to IEC61000-4-4)				

Item	Specifications		
Vibration resistance	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 (Time coefficient: 8 minutes × coefficient factor 10 = total time 80 min.)		
Shock resistance	147 m/s^2 3 times each in X, Y, and Z directions (Relay Output Unit: 100 m/s^2)		
Ambient operating temperature	0 to 55°C		
Ambient operating humidity	10% to 90% (with no condensation)	10% to 90% (with no condensation) (See note 5.)	10% to 90% (with no condensation)
Atmosphere	Must be free from corrosive gases.		
Ambient storage temperature	–20 to 75°C (excluding battery)	–20 to 75°C (See note 5.)	–20 to 75°C (excluding battery)
Grounding	Ground to less than 100 Ω		
Enclosure	Mounted in a panel.		
Weight	All Racks are each 5 kg max.		
Safety measures	Conforms to cULus and EC Directives.		

Note

1. The inrush current is given for a cold start at room temperature for AC Power Supply Units and for a cold start for DC Power Supply Units. The inrush control circuit uses a thermistor element with a low-temperature current control characteristic. If the ambient temperature is high or the NSJ Controller is hot-started, the thermistor will not be sufficiently cool, and the inrush currents given in the table may be exceeded by up to twice the given values. When selecting fuses or breakers for external circuits, allow sufficient margin in shut-off performance.
   A delay circuit that charges a capacitor is used to limit the inrush current in DC Power Supply Units. 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 twice the specified value.
2. Disconnect the Power Supply Unit's LG terminal from the GR terminal when testing insulation and dielectric strength. Testing the insulation and dielectric strength with the LG terminal and the GR terminals connected will damage internal circuits in the NSJ Controller.
3. Change the applied voltage gradually using the adjuster on the Tester. If the full dielectric strength voltage is applied or turned OFF using the switch on the Tester, the generated impulse voltage may damage the Power Supply Unit.
4. Maintain an ambient storage temperature of –25 to 30°C and an ambient humidity of 25% to 70% when storing the Unit for longer than 3 months to keep the replacement notification function in optimum working condition.
5. CJ1W-PD022 is not insulated between the primary DC power and secondary DC power.

3-1-2 Performance Specifications

Controller Section

Model	I/O bits	User program memory (See note.)	Data Memory	Extended Data Memory	Function blocks		Flash memory			
					Max. No. of definitions	Max. No. of instances	FB program memory	Comment file	Program index file	Symbol table
NSJ5-TQ00-G5D NSJ5-TQ00B-G5D NSJ5-TQ01-G5D NSJ5-TQ01B-G5D	1,280	60 Ksteps	32 Kwords	32 Kwords x 3 banks E0_00000 to E2_32767	1,024	2,048	1,024 Kbytes	64 Kbytes	64 Kbytes	128 Kbytes
NSJ5-SQ00-G5D NSJ5-SQ00B-G5D NSJ5-SQ01-G5D NSJ5-SQ01B-G5D										
NSJ5-TQ10-G5D NSJ5-TQ10B-G5D NSJ5-TQ11-G5D NSJ5-TQ11B-G5D										
NSJ5-SQ10-G5D NSJ5-SQ10B-G5D NSJ5-SQ11-G5D NSJ5-SQ11B-G5D										
NSJ8-TV00-G5D NSJ8-TV00B-G5D NSJ8-TV01-G5D NSJ8-TV01B-G5D										
NSJ10-TV00-G5D NSJ10-TV00B-G5D NSJ10-TV01-G5D NSJ10-TV01B-G5D										
NSJ12-TS00-G5D NSJ12-TS00B-G5D NSJ12-TS01-G5D NSJ12-TS01B-G5D										
NSJ5-TQ00-M3D NSJ5-TQ00B-M3D NSJ5-TQ01-M3D NSJ5-TQ01B-M3D	640	20 Ksteps		None	128	256	256 Kbytes			64 Kbytes
NSJ5-SQ00-M3D NSJ5-SQ00B-M3D NSJ5-SQ01-M3D NSJ5-SQ01B-M3D										
NSJ5-TQ10-M3D NSJ5-TQ10B-M3D NSJ5-TQ11-M3D NSJ5-TQ11B-M3D										
NSJ5-SQ10-M3D NSJ5-SQ10B-M3D NSJ5-SQ11-M3D NSJ5-SQ11B-M3D										
NSJ8-TV00-M3D NSJ8-TV00B-M3D NSJ8-TV01-M3D NSJ8-TV01B-M3D										

Note The number of steps in a program is not the same as the number of instructions. Each instruction requires from 1 to 7 steps. For example, LD and OUT

require 1 step each, but MOV(021) requires 3 steps. The program capacity indicates the total number of steps for all instructions in the program. Refer to *10-4 Instruction Execution Times and Number of Steps* in the *CJ Series Setup Manual* for the number of steps required for each instruction.

Display Section

Model	Display panel (See note 5.)					Backlight (See note 1.)		
	Display device	Effective area	Number of dots	Display color	View angle	Life expectancy (See note 2.)	Brightness adjustment (See note 3.)	Backlight error detection (See note 4.)
NSJ5-TQ00-G5D	High-luminance TFT color LCD (See note 6.)	117.2 × 88.4 mm (W × H) (5.7 inches)	320 × 240 (QVGA)	256 colors (32,768 colors for BMP/JPEG images)	Left 70°, Right 70°, Top 70°, Bottom 50°	75,000 hours min.	There are 3 levels of adjustment by operating the touch panel.	Error is detected automatically, and the RUN indicator flashes green for notification.
NSJ5-TQ00B-G5D								
NSJ5-TQ01-G5D								
NSJ5-TQ01B-G5D								
NSJ5-TQ00-M3D								
NSJ5-TQ00B-M3D								
NSJ5-TQ01-M3D								
NSJ5-TQ01B-M3D								
NSJ5-TQ10-G5D					Left 80°, Right 80°, Top 80°, Bottom 60°	75,000 hours min.	There are 3 levels or 32 levels of adjustment by operating the touch panel. (See note 7.)	
NSJ5-TQ10B-G5D								
NSJ5-TQ11-G5D								
NSJ5-TQ11B-G5D								
NSJ5-TQ10-M3D								
NSJ5-TQ10B-M3D								
NSJ5-TQ11-M3D								
NSJ5-TQ11B-M3D								
NSJ5-SQ00-G5D	STN color LCD	115.2 × 86.4 mm (W × H) (5.7 inches)		256 colors (4,096 colors for BMP/JPEG images)	Left 50°, Right 50°, Top 45°, Bottom 50°	75,000 hours min.	There are 3 levels of adjustment by operating the touch panel.	
NSJ5-SQ00B-G5D								
NSJ5-SQ01-G5D								
NSJ5-SQ01B-G5D								
NSJ5-SQ00-M3D								
NSJ5-SQ00B-M3D								
NSJ5-SQ01-M3D								
NSJ5-SQ01B-M3D								
NSJ5-SQ10-G5D	TFT color LCD	115.2 × 86.4 mm (W × H) (5.7 inches)		256 colors (32,768 colors for BMP/JPEG images)	Left 80°, Right 80°, Top 80°, Bottom 60°	75,000 hours min.	There are 3 levels or 32 levels of adjustment by operating the touch panel. (See note 7.)	
NSJ5-SQ10B-G5D								
NSJ5-SQ11-G5D								
NSJ5-SQ11B-G5D								
NSJ5-SQ10-M3D								
NSJ5-SQ10B-M3D								
NSJ5-SQ11-M3D								
NSJ5-SQ11B-M3D								

Model	Display panel (See note 5.)					Backlight (See note 1.)		
	Display device	Effective area	Number of dots	Display color	View angle	Life expectancy (See note 2.)	Brightness adjustment (See note 3.)	Backlight error detection (See note 4.)
NSJ8-TV00-G5D	High-definition TFT color LCD	170.9 × 128.2 mm (W × H) (8.4 inches)	640 × 480 (VGA)	256 colors (32,768 colors for BMP/JPEG images)	Left 65°, Right 65°, Top 50°, Bottom 60°	50,000 hours min.	There are 3 levels of adjustment by operating the touch panel.	Error is detected automatically, and the RUN indicator flashes green for notification.
NSJ8-TV00B-G5D								
NSJ8-TV01-G5D								
NSJ8-TV01B-G5D								
NSJ8-TV00-M3D								
NSJ8-TV00B-M3D								
NSJ8-TV01-M3D								
NSJ8-TV01B-M3D								
NSJ10-TV00-G5D		215.2 × 162.4 mm (W × H) (10.4 inches)			Left 60°, Right 60°, Top 35°, Bottom 65°	50,000 hours min.		
NSJ10-TV00B-G5D								
NSJ10-TV01-G5D								
NSJ10-TV01B-G5D								
NSJ12-TS00-G5D		246.0 × 184.5 mm (W × H) (12.1 inches)	800 × 600 (QVGA)		Left 60°, Right 60°, Top 45°, Bottom 75°	50,000 hours min.		
NSJ12-TS00B-G5D								
NSJ12-TS01-G5D								
NSJ12-TS01B-G5D								

Note

(1) Contact your nearest OMRON representative to replace the backlight.

(2) This is the estimated time before brightness is reduced by half at room temperature and humidity. It is not a guaranteed value. The life expectancy will be drastically shortened if the NSJ Controller is used at low temperatures. For example, use at temperatures of 0°C will reduce the life expectancy to approximately 10,000 hours (reference value).

(3) The brightness cannot be adjusted much.

(4) This function does not detect service life expectancy. It detects when the backlight is not lit due to a disconnection or other errors. Backlight error detection indicates that all backlights (2) are OFF.

(5) There are sometimes faulty pixels in the touch panel of the Display Section, but this does not indicate an error as long as the number of bright or dark pixels does not exceed the following limits.

Model	Limit
NSJ12-TS□□(B)-□□□ NSJ10-TV□□(B)-□□□ NSJ8-TV□□(B)-□□□	10 bright or dark pixels max. with no more than 3 contiguous defective pixels.
NSJ5-□Q□□(B)-□□□	4 total defects max. of the following size with no more than one per 20-mm square: 0.2 mm < (short dia. + long dia.)/2 ≤ 0.55 mm

(6) The NSJ5-TQ Controllers (high-luminance TFT LCDs) are approx. 40 cd/m^2 brighter than the NSJ5-SQ1□ Controllers (TFT LCDs).

(7) There are only 3 levels for lot number 14Z0 or earlier.

Other Display Section Specifications

Model	Touch panel (matrix type)				Standard screen data capacity	Built-in USB slave port	Built-in RS-232C port	Built-in Ethernet	Built-in USB printer port	Language	Frame color
	Method	Number of switches	Input	Service life							
NSJ5-TQ00-M3D	Resistive membrane	300 (20 horizontal × 15 vertical) 16 × 16 dots for each switch	Pressure-sensitive	1,000,000 touch operations.	20 MB	1 port	3 ports (Display Section: A and B, Controller Section: C	None	None	Japanese and English	Ivory
NSJ5-TQ00-G5D											
NSJ5-TQ00B-M3D											Black
NSJ5-TQ00B-G5D											
NSJ5-TQ01-M3D								10/100 Base-T			Ivory
NSJ5-TQ01-G5D											
NSJ5-TQ01B-M3D											Black
NSJ5-TQ01B-G5D											
NSJ5-SQ00-M3D								None			Ivory
NSJ5-SQ00-G5D											
NSJ5-SQ00B-M3D											Black
NSJ5-SQ00B-G5D											
NSJ5-SQ01-M3D								10/100 Base-T			Ivory
NSJ5-SQ01-G5D											
NSJ5-SQ01B-M3D											Black
NSJ5-SQ01B-G5D											
NSJ5-TQ10-M3D					60 MB			None			Ivory
NSJ5-TQ10-G5D											
NSJ5-TQ10B-M3D											Black
NSJ5-TQ10B-G5D											
NSJ5-TQ11-M3D								10/100 Base-T			Ivory
NSJ5-TQ11-G5D											
NSJ5-TQ11B-M3D											Black
NSJ5-TQ11B-G5D											
NSJ5-SQ10-M3D								None			Ivory
NSJ5-SQ10-G5D											
NSJ5-SQ10B-M3D											Black
NSJ5-SQ10B-G5D											
NSJ5-SQ11-M3D								10/100 Base-T			Ivory
NSJ5-SQ11-G5D											
NSJ5-SQ11B-M3D											Black
NSJ5-SQ11B-G5D											
NSJ8-TV00-M3D		768 (32 horizontal × 24 vertical) 20 × 20 dots for each switch			60 MB			None	1 port		Ivory
NSJ8-TV00-G5D											
NSJ8-TV00B-M3D											Black
NSJ8-TV00B-G5D											
NSJ8-TV01-M3D								10/100 Base-T			Ivory
NSJ8-TV01-G5D											
NSJ8-TV01B-M3D											Black
NSJ8-TV01B-G5D											
NSJ10-TV00-G5D		1,200 (40 horizontal × 30 vertical) 16 × 16 dots for each switch						None			Ivory
NSJ10-TV00B-G5D											Black
NSJ10-TV01-G5D								10/100 Base-T			Ivory
NSJ10-TV01B-G5D											Black
NSJ12-TS00-G5D		1,900 (50 horizontal × 58 vertical) 16 × 16 dots for each switch						None			Ivory
NSJ12-TS00B-G5D											Black
NSJ12-TS01-G5D								10/100 Base-T			Ivory
NSJ12-TS01B-G5D											Black

Built-in Serial Ports

Port	Description
USB slave port (for Programming Device connection)	Can be connected to a computer running the CX-Programmer or CX-Designer. Set the network type to “USB.”
Serial port C (on Controller Section)	Serial communications modes: Toolbus, Host Link, Non-protocol, NT Link, or Serial Gateway
Serial ports A and B (on Display Section)	Serial communications modes: Toolbus, Host Link, Non-protocol (barcode reader only), NT Link, or CompoWay/F (Temperature Controller.)

Built-in Ethernet Port

Port	Description
Built-in Ethernet port	• FINS message communications (send and receive) • FTP server (Accesses Memory Card in Display Section.)

Common Specifications

Controller Section

Item	Specifications	Reference
Control method	Stored program	---
I/O control method	Cyclic scan and immediate processing are both possible.	---
Programming	Ladder diagram	---
CPU processing mode	Normal Mode, Parallel Processing Mode with Asynchronous Memory Access, Parallel Processing Mode with Synchronous Memory Access, or Peripheral Servicing Priority Mode	---
Instruction length	1 to 7 steps per instruction	*CJ Series Operation Manual* (W393): *10-5 Instruction Execution Times and Number of Steps*
Ladder instructions	Approx. 400 (3-digit function codes)	---
Execution time	Basic instructions: 0.04 μs min. Special instructions: 0.06 μs min.	*CJ Series Operation Manual* (W393): *10-5 Instruction Execution Times and Number of Steps*
Overhead time	Normal mode: 0.3 ms min. Parallel processing: 0.3 ms min.	---
Mounting method	Mounted using Panel Mounting Bracket.	This manual: *5-1-3 Mounting the NSJ Controller to the Control Panel*
Mountable Expansion Units	One of the following Units can be mounted. NSJ I/O Control Unit (NSJW-IC101) NSJ Controller Link Unit (NSJW-CLK21-V1) NSJ Ethernet Unit (NSJW-ETN21)	This manual: *3-2 System Configuration*
Number of Expansion Racks	One CJ-series Expansion Rack can be connected to the NSJ□-□□□□-M3D and up to three CJ-series Expansion Racks can be connected to all other NSJ Controllers by mounting an NSJ I/O Control Unit (NSJW-IC101). Each Expansion Rack requires an CJ-series I/O Interface Unit (CJ1W-II101) and a Power Supply Unit.	*CJ Series Operation Manual* (W393): *2-3-3 CJ-series Expansion Racks*

Item	Specifications	Reference
Connectable Units	Per Expansion Rack: 10 Units including Basic I/O Units, Special I/O Units, and CPU Bus Units. NSJ□-□□□□-G5D: Total per NSJ Controller: 10 Units on each of 3 Expansion Racks = 30 Units total NSJ□-□□□□-M3D: Total per NSJ Controller: 10 Units on one Expansion Rack = 10 Units total	*CJ Series Operation Manual* (W393): *2-3-3 CJ-series Expansion Racks*
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. **Note 2** The following 3 types of interrupt tasks are supported. Power OFF interrupt tasks: 1 max. Scheduled interrupt tasks: 2 max. External interrupt tasks: 256 max.	CS/CJ Series *Programming Manual* (W394)*: 1-3 Programs and Tasks* and *SECTION 4: Tasks*
Interrupt types	Scheduled Interrupts: Interrupts generated at a time scheduled by the Controller Section’s built-in timer. (See note. 1) Power OFF Interrupts (See note 2.): Interrupts 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. **Note 2** Not supported when the CJ1W-PD022 Power Supply Unit is mounted.	CS/CJ Series Programming Manual (W394): *4-3 Interrupt Tasks*
Calling subroutines from more than one task	Supported (called “global subroutines”).	CS/CJ Series *Programming Manual* (W394): *4-2-5 Global Subroutines*
Function blocks	Languages in function block definitions: ladder programming, structured text	*CX-Programmer Ver. 6.□ CS1-H, CJ1-H, CJ1M CPU Units Operation Manual Function Blocks* (W438)

Item	Specifications	Reference
Connectable Units	Per Expansion Rack: 10 Units including Basic I/O Units, Special I/O Units, and CPU Bus Units. NSJ□-□□□□-G5D: Total per NSJ Controller: 10 Units on each of 3 Expansion Racks = 30 Units total NSJ□-□□□□-M3D: Total per NSJ Controller: 10 Units on one Expansion Rack = 10 Units total	*CJ Series Operation Manual* (W393): *2-3-3 CJ-series Expansion Racks*
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. **Note 2** The following 3 types of interrupt tasks are supported. Power OFF interrupt tasks: 1 max. Scheduled interrupt tasks: 2 max. External interrupt tasks: 256 max.	CS/CJ Series *Programming Manual* (W394)*: 1-3 Programs and Tasks* and *SECTION 4: Tasks*
Interrupt types	Scheduled Interrupts: Interrupts generated at a time scheduled by the Controller Section’s built-in timer. (See note. 1) Power OFF Interrupts (See note 2.): Interrupts 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. **Note 2** Not supported when the CJ1W-PD022 Power Supply Unit is mounted.	CS/CJ Series Programming Manual (W394): *4-3 Interrupt Tasks*
Calling subroutines from more than one task	Supported (called “global subroutines”).	CS/CJ Series *Programming Manual* (W394): *4-2-5 Global Subroutines*
Function blocks	Languages in function block definitions: ladder programming, structured text	*CX-Programmer Ver. 6.□ CS1-H, CJ1-H, CJ1M CPU Units Operation Manual Function Blocks* (W438)

<table>
<tr><th colspan="2">Item</th><th>Specifications</th><th></th><th>Reference</th></tr>
<tr><td rowspan="5">CIO (Core I/O) Area</td><td>I/O Area</td><td>2,560 (160 words): CIO 000000 to CIO 015915 (80 words from CIO 0000 to CIO 0159)
The setting of the first 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.</td><td rowspan="5">The CIO Area can be used as work bits if the bits are not used as shown here.</td><td>CJ Series Operation Manual (W393):9-3 I/O Area</td></tr>
<tr><td>Link Area</td><td>3,200 (200 words): CIO 10000 to CIO 119915 (words CIO 1000 to CIO 1199)</td><td>CJ Series Operation Manual (W393):9-4 Data Link Area and 2-5-3 Communications Network System
Controller Link Unit Operation Manual (W309)</td></tr>
<tr><td>CPU Bus Unit Area</td><td>6,400 (400 words): CIO 150000 to CIO 189915 (words CIO 1500 to CIO 1899)
CPU Bus Unit bits store the operating status of CPU Bus Units (25 words per Unit, 16 Units max.).</td><td>CJ Series Operation Manual (W393):9-5 CPU Bus Unit Area
Operation Manual for each CPU Bus Unit</td></tr>
<tr><td>Inner Board Area</td><td>1,600 (100 words): CIO 190000 to CIO 199915 (words CIO 1900 to CIO 1999)
Inner Board bits are allocated to storing Display Section Status</td><td>---</td></tr>
<tr><td>Special I/O Unit Area</td><td>15,360 (960 words): CIO 200000 to CIO 295915 (words CIO 2000 to CIO 2959)
Special I/O Unit bits are allocated to Special I/O Units (10 words per Unit, 96 Units max.).</td><td>CJ Series Operation Manual (W393):9-6 Special I/O Unit Area
Operation Manual for each Special I/O Unit</td></tr>
<tr><td rowspan="2">CIO (Core I/O) Area</td><td>DeviceNet Area</td><td>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 is used with fixed allocations.
<table><tr><td>Fixed allocation setting 1</td><td>Outputs: CIO 3200 to CIO 3263
Inputs: CIO 3300 to CIO 3363</td></tr><tr><td>Fixed allocation setting 2</td><td>Outputs: CIO 3400 to CIO 3463
Inputs: CIO 3500 to CIO 3563</td></tr><tr><td>Fixed allocation setting 3</td><td>Outputs: CIO 3600 to CIO 3663
Inputs: CIO 3700 to CIO 3763</td></tr></table>The following words are allocated in the master when the DeviceNet Section is used as a slave with fixed allocations.
<table><tr><td>Fixed allocation setting 1</td><td>Outputs: CIO 3370 (Master to Slave)
Inputs: CIO 3270 (Slave to Master)</td></tr><tr><td>Fixed allocation setting 2</td><td>Outputs: CIO 3570 (Master to Slave)
Inputs: CIO 3470 (Slave to Master)</td></tr><tr><td>Fixed allocation setting 3</td><td>Outputs: CIO 3770 (Master to Slave)
Inputs: CIO 3670 (Slave to Master)</td></tr></table></td><td>The CIO Area can be used as work bits if the bits are not used as shown here.</td><td>DeviceNet Unit Operation Manual (W380)
CJ Series Operation Manual (W393): 9-7 DeviceNet Area</td></tr>
<tr><td>Internal I/O Area</td><td colspan="2">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 the CIO Area are used as work bits in programming to control program execution. They cannot be used for external I/O.</td><td>CJ Series Operation Manual (W393): 9-2-2 Overview of the Data Areas</td></tr>
</table>

Item	Specifications	Reference
Work Area	8,192 bits (512 words): W00000 to W51115 (W000 to W511) Controls the programs only. (I/O from external I/O terminals is not possible.) **Note** When using work bits in programming, use the bits in the Work Area first before using bits from other areas.	*CJ Series Operation Manual* (W393): *9-2-2 Overview of the Data Areas* and *9-7 Serial PLC Link Area*
Holding Area	8,192 bits (512 words): H00000 to H51115 (H000 to H511) Holding bits are used to control the execution of the program, and maintain their ON/OFF status when the NSJ Controller is turned OFF or the operating mode is changed. **Note** The Function Block Holding Area words are allocated from H512 to H1535. These words can be used only for the function block instance area (internally allocated variable area).	*CJ Series Operation Manual* (W393): *9-2-2 Overview of the Data Areas* and *9-10 Holding 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.	*CJ Series Operation Manual* (W393): *9-2-2 Overview of the Data Areas* and *9-11 Auxiliary Area*
Temporary Area	16 bits (TR0 to TR15) Temporary bits are used to temporarily store the ON/OFF execution conditions at program branches.	*CJ Series Operation Manual* (W393): *9-2-2 Overview of the Data Areas* and *9-12 TR (Temporary Relay) Area*
Timer Area	4,096: T0000 to T4095 (used for timers only)	*CJ Series Operation Manual* (W393): *9-2-2 Overview of the Data Areas* and *9-13 Timer Area*
Counter Area	4,096: C0000 to C4095 (used for counters only)	*CJ Series Operation Manual* (W393): *9-2-2 Overview of the Data Areas* and *9-14 Counter Area*
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. Internal 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.	*CJ Series Operation Manual* (W393): *9-2-2 Overview of the Data Areas* and *9-15 Data Memory (DM) Area*
EM Area	NSJ□-□□□□-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 the EM Area maintain their status when the NSJ Controller is turned OFF or the operating mode is changed. The EM Area is divided into banks, and the addresses can be set by either of the following methods. Changing the 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 the number of the first bank. NSJ□-□□□□-M3D Not supported.	*CJ Series Operation Manual* (W393): *9-2-2 Overview of the Data Areas* and *9-16 Extended Data Memory (EM) Area*

Item	Specifications	Reference
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).	*CJ Series Operation Manual* (W393): *9-17 Index Registers* *CS/CJ Series Programming Manual* (W394): *6-2 Index Registers*
Task Flag Area	32 (TK0000 to TK0031) Task Flags are read-only flags that are ON when the corresponding cyclic task is executable and OFF when the corresponding task is not executable or in standby status.	*CJ Series Operation Manual* (W393): *9-19 Task Flags* *CS/CJ Series Programming Manual* (W393): *4-2-3 Flags Related to Cyclic Tasks*
Trace Memory	4,000 words (trace data: 31 bits, 6 words)	*CS/CJ Series Programming Manual* (W394): *7-2-4 Tracing Data*
File Memory	Memory Cards: OMRON Memory Cards can be used (MS-DOS format). EM file memory: Part of the EM Area can be converted to file memory (MS-DOS format). The NSJ□-□□□□-M3D does not support the use of EM file memory.	*CS/CJ Series Programming Manual* (W394): *SECTION 5: File Memory Functions*

Function Specifications

Item	Specifications	Reference
Constant cycle time	1 to 32,000 ms (Unit: 1 ms) When a Parallel Processing Mode is used, the cycle time for executing instructions is constant.	*CJ Series Operation Manual* (W393): *10-4 Computing the Cycle Time* *CS/CJ Series Programming Manual* (W394): *6-1-1 Minimum Cycle Time*
Cycle time monitoring	Possible (Unit stops operating if the cycle is too long): 10 to 40,000 ms (Unit: 10 ms) When a Parallel Processing Mode is used, the instruction execution cycle is monitored. Controller Section operation will stop if the peripheral servicing cycle time exceeds 2 s (fixed).	*CJ Series Operation Manual* (W393): *10-4 Computing the Cycle Time* *CS/CJ Series Programming Manual* (W394): *6-1-2* Maximum Cycle Time (Watch Cycle Time) and *6-1-3 Cycle Time Monitoring*
I/O refreshing	Cyclic refreshing, immediate refreshing, refreshing by IORF(097). 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.	*CJ Series Operation Manual* (W393): *10-4 Computing the Cycle Time* *CS/CJ Series Programming Manual* (W394): *6-1-6 I/O Refresh Methods*
Timing of special refreshing for CPU Bus Units	Data links for Controller Link, remote I/O for DeviceNet, and other special refreshing for CPU Bus Units is performed during the I/O refresh period and when the CPU BUS UNIT I/O REFRESH (DLNK(226)) instruction is executed.	*CJ Series Operation Manual* (W393): *10-4 Computing the Cycle Time*

Item	Specifications	Reference
I/O memory holding when changing operating modes	Depends on the ON/OFF status of the IOM Hold Bit in the Auxiliary Area.	*CJ Series Operation Manual* (W393): *SECTION 9 Memory Areas* and *9-2-3 Data Area Properties* *CS/CJ Series Programming Manual* (W394): *6-4-1 Hot Start/Cold Start Function*
Load OFF	All outputs on Output Units can be turned OFF when the Controller Section is operating in RUN, MONITOR, or PROGRAM mode.	*CS/CJ Series Programming Manual* (W394): *6-5-2 Load OFF Function* and *7-2-3 Online Editing*
Timer/Counter PV refresh method	BCD or binary (CX-Programmer Ver. 3.0 or higher).	*CS/CJ Series Programming Manual* (W394): *6-4 Changing the Timer/Counter PV Refresh Mode*
Input response time setting	Time constants can be set for inputs from CJ-series Basic I/O Units. The time constant can be increased to reduce the influence of noise and chattering or it can be decreased to detect shorter pulses on the inputs.	*CJ Series Operation Manual* (W393): *10-4-6 I/O Response Time* *CS/CJ Series Programming Manual* (W394): *6-6-1 I/O Response Time Settings*
Mode setting at startup	Possible	*CJ Series Operation Manual* (W393): *7-1-2 PLC Setup Settings* *CS/CJ Series Programming Manual* (W394): *1-2 Operating Modes* and *1-2-3 Startup Mode*
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.	---

Item	Specifications		Reference
Memory Card functions (Controller Section)	Automatically reading programs (autoboot) from the Memory Card when the power is turned ON.	Possible	*CJ Series Operation Manual* (W393): *3-2 File Memory* *CS/CJ Series Programming Manual* (W394): *SECTION 5 File Memory Functions, 5-1-3 Files*, and *5-2-2 CMND Instruction*
	Program replacement during Controller Section operation	Possible	*CS/CJ Series Programming Manual* (W394): *5-2-3 Using Instruction in User Program*
	Format in which data is stored in Memory Card	User program: Program file format PLC Setup and other parameters: Data file format I/O memory: Data file format (binary format), text format, or CSV format	*CS/CJ Series Programming Manual* (W394): *5-1 File Memory*
	Functions for which Memory Card read/write is supported	User program instructions, Programming Devices (e.g., CX-Programmer), Host Link computers, AR Area control bits, easy backup operation	*CS/CJ Series Programming Manual* (W394): 5-2 File Memory Operations This manual: *11-1 Backup Function*
Filing (Controller Section)	Memory Card data and the EM (Extended Data Memory) Area can be handled as files.		*CS/CJ Series Programming Manual* (W394): *SECTION 5 File Memory Functions*
Debugging	Force-set/reset, differential monitoring, data tracing (scheduled, each cycle, or when instruction is executed), storing location generating error when a program error occurs.		*CS/CJ Series Programming Manual* (W394): *7-2 Trial Operation and Debugging*
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.		*CS/CJ Series Programming Manual* (W394): *1-2 Operating Modes* and *7-2-3 Online Editing*
Program protection	Overwrite protection: Set using DIP switch or via password from Programming Device. Copy protection: Password set using CX-Programmer.		*CS/CJ Series Programming Manual* (W394): *6-4-6 Program Protection*
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 the execution time and logic of each programming block. FAL and FALS instructions can be used to simulate errors.		*CJ Series Operation Manual* (W393): *11-2-5 Error Messages* *CS/CJ Series Programming Manual* (W394): *6-5 Diagnostic Functions* and *6-5-3 Failure Alarm Functions*
Error log	Up to 20 errors are stored in the error log. Information includes the error code, error details, and the time the error occurred. The Controller Section can be set so that user-defined FAL errors are not stored in the error log.		*CS/CJ Series Programming Manual* (W394): *6-4-1 Error Log*

Item	Specifications	Reference
Clock	Provided on all models. Accuracy: Ambient temperature 25°C — Monthly error −1.5 min to +1.5 min **Note** The accuracy will vary with the temperature. **Note** Used to store the time when power is turned ON and when errors occur.	*CS/CJ Series Programming Manual* (W394): *6-4-5 Clock Functions*
Power OFF detection time	2 ms	*CJ Series Operation Manual* (W393): *10-3 Power OFF Operation*
Power OFF detection delay time	0 ms (fixed)	*CS/CJ Series Programming Manual* (W394): *6-4-4 Power OFF Detection Delay Time*
Memory protection	Held Areas: Holding bits, contents of Data Memory and Extended Data Memory, and status of the counter Completion Flags and present values. **Note** If the IOM Hold Bit in the Auxiliary Area is turned ON, and the PLC Setup is set to maintain the IOM Hold Bit status when power to the NSJ Controller is turned ON, the contents of the CIO Area, the Work Area, part of the Auxiliary Area, timer Completion Flag and PVs, Index Registers, and the Data Registers will be saved.	*CJ Series Operation Manual* (W393): *9-2-3 Data Area Properties*
Sending commands to a Host Link computer	FINS commands can be sent to a computer connected via the Host Link System by executing Network Communications Instructions from the Controller Section.	*CJ Series Operation Manual* (W393): *2-5-2 Systems*
Remote programming and monitoring	Host Link communications can be used for remote programming and remote monitoring through a Controller Link System or Ethernet network.	*CJ Series Operation Manual* (W393): *2-5-3 Communications Network System* *CS/CJ Series Programming Manual* (W394): *6-4-7 Remote Programming and Monitoring*
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 or Ethernet Network).	*CJ Series Operation Manual* (W393): *2-5-2 Systems*
Storing comments in Controller Section	I/O comments can be stored as symbol table files in the Memory Card in the Controller Section, EM file memory, or comment memory (see note). **Note** Comment memory is supported for CX-Programmer version 5.0 or higher.	I/O comments: *CX-Programmer Ver. 5.0 Operation Manual* (W437) Storing comments in CPU Unit: *CS/CJ Series Programming Manual* (W394)
Program check	Program checks are performed at the beginning of operation for items such as no END instruction and instruction errors. CX-Programmer can also be used to check programs.	*CS/CJ Series Programming Manual* (W394): *2-3 Checking Programs*
Control output signals	RUN output: The internal contacts will turn ON (close) while the Controller Section is operating (CJ1W-PA205R).	*CS/CJ Series Programming Manual* (W394): *6-4-3 RUN Output*
Battery life	Refer to *11-3 Maintenance and Replacement Methods.* Battery Set: CJ1W-BAT01	This manual: *11-3-2 Battery Replacement*

Item	Specifications	Reference
Self-diagnostics	Controller Section errors (watchdog timer), I/O bus errors, memory errors, and battery errors.	*CJ Series Operation Manual* (W393): *11-2-5 Error Messages* This manual: *6-1 PLC Setup* and *10-2 NSJ Troubleshooter Function*
Other functions	Storage of number of times power has been interrupted. (Stored in A514.)	*CJ Series Operation Manual* (W393): *10-3 Power OFF Operation*

Display Section Display Specifications

Item		Specification
Functional objects		A total of 1,024 functional and fixed objects in frames or tables can be created for each screen. There are some functional objects, however, for which it is not possible to create more than one functional object for the same screen.
	ON/OFF Buttons	• Button shape Rectangle, circle, 2-light rectangle, select shape. • Button operation Momentary, alternate, SET, RESET.
	Word Buttons	• Button type Rectangle, select shape. • Button operation Set value, increase/reduce value, display pop-up menu. • Numeral specifications Word, 2-word, real number
	Command Buttons	• Button operation Screen switching, key buttons, pop-up screen control, system menu display, buzzer stop, no processing, video control-video capture, video control-contrast adjustment, video control-vision sensor console output, data control block, canceling authentication
	Bit lamps	• Lamp type: Single-line circle, single-line rectangle, double-line circle, double-line rectangle, specify shape.
	Word lamps	• Lamp type: Single-line circle, single-line rectangle, double-line circle, double-line rectangle, specify shape. • Color change Up to 10 colors.
	Numeral display and input objects	• Number of display digits Up to 25. Integer part: Up to 15 digits Decimal fraction part: Up to 10 digits. (Decimal fraction display is available only when decimal display format has been selected and gradations have been set or when Real number has been selected for the storage format.) • Input method Keypad or Command Button.
	String display and input objects	• Character display format ASCII code (Shift JIS), Unicode. • Number of characters Up to 256. • Input method Keypad, Command Button, bar code reader.
	Text objects	• Fixed string display or indirect specification. (With indirect specification, either multibyte code or Unicode can be selected.) • Number of characters Up to 256. • Reference file format File name (8 characters) + .TXT

Item		Specification
	List selection objects	• Reference file format File name (up to 8 characters) +.LST • Operations at list selection Display/no display of selected bar. Store selected line number to specified address. Store selected line character string to specified address. • Character display format ASCII code (Shift JIS), Unicode. • Number of characters per line Up to 256. • Maximum number of display lines 1,024.
	Thumbwheel switches	• Number of displayable digits Integer part: Up to 15 digits Decimal fraction part: Up to 10 digits. (Decimal fraction input is enabled only when the display format is set to decimal and scaling is set, or when real number storage is set.) • Input method + and – Buttons.
	Analog meters	• Display direction Up, down, left, right. • Incremental direction Clockwise, counterclockwise. • Shape Quarter circle, half circle, circle. • Display format Colored, needle.
	Level display objects	• Display direction From bottom to top, top to bottom, right to left, left to right • Coloring 3 levels
	Broken-line graphs	• Number of graph points per broken line Up to 1,000 • Number of displayable graph lines per broken-line graph Up to 256 • Number of groups per project Up to 16 • Number of graph lines per group Up to 256 • Data saved in history Up to 300,000 bytes
	Bitmaps	• Displayable file formats BMP, JPEG (RLE and progressive jpeg are not supported.)
	Alarm/Event display objects	• Display format Fixed character, flowing text • Maximum number of display objects 5,000
	Alarm/Event summary and history objects	• Display data Current alarms/events, alarm/event history. • Maximum number of display objects 2,048 (for histories).
	Date objects	• Date displayed on Display Section (year, month, day) • Display format: 45 types.
	Time objects	• Time displayed on Display Section (hour, minute, seconds) (Synchronized to Controller Section clock.) • Display format: 8 types.

Item		Specification
	Data log graphs	• Number of log points 1 to 50,000 • Number of data logs per project Up to 100 groups • Number of logging points per project Up to 160,000 (NS5: 120,000 points) • Number of addresses that can be recorded to 1 group Up to 16 • Number of addresses for standard logging Up to 50 • Number of always logging points 50,000 max.
	Data Block Table	• Maximum number of records Up to 1,000 lines • Maximum number of fields Up to 500 columns • Data Quantity for 1 Data Block 102,400 bytes
	Consecutive line drawing	Maximum number of coordinates Up to 128
Graphic display (fixed)		• Displayed at any position. Rectangle, circle, ellipse, line, polyline, polygon, sector, arc.
Frames		• Up to 10 can be created per screen. • Up to 256 functional objects can be created per frame page. However, a limit of 1,024 objects per screen applies, and this may restrict the number of objects per frame page.
Tables		• Number of tables Any number of tables can be created, as long as the total number of objects per screen does not exceed 1,024. • Horizontal Up to 30 columns • Vertical Up to 40 lines • Number of functional objects per table Up to 256
Libraries		• Up to 4,096 libraries can be registered.
User screens		• Up to 4,000 screens, including base and pop-up screens, can be created per project. • Up to 3 pop-up screens can be overlapped.
Sheets		• Up to 32 sheets can be created per project. • Up to 10 sheets can be set for layered display on standard screens. • Up to 1,024 functional and fixed objects, including those inside frames and tables, can be created per sheet.
Number of label switches		• Up to 16.
Background screen files		• Displayable file formats BMP, JPEG (RLE-format bmp files and progressive jpeg are not supported.)
Background colors		256.
Project registration method		Transfer from CX-Designer to Display Section using one of the following menu commands. • PT - Transfer - Transfer [Computer->PT] • PT - Transfer - Quick Transfer [Computer->PT] • PT - Transfer - Transfer Tool

Note Refer to *Appendix 1 Specifications* in the *NS-Series PT Programming Manual* (V073) for other display element specifications and special features.

DeviceNet Section Communications Specifications

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	Baud rate	Network length	Branch line length	Total branch line length
	500 kbps	100 m max.	6 m max.	39 m max.
	250 kbps	250 m max. (See note 2.)	6 m max.	78 m max.
	125 kbps	500 m max. (See note 2.)	6 m max.	156 m max.
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) Keep the maximum network length to 100 m or less when using Thin Cables.

Wired Controller Link Communications Specifications

Items	Specifications
Communications method	N:N token bus
Code	Manchester code
Modulation	Baseband code
Synchronization	Flag synchronization (conforms to HDLC frames)
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 2.)
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, NSJW-CLK21-V1, CS1W-CLK23, CJ1W-CLK23, 3G8F7-CLK23, and 3G2NL-CLK23

(2) The limit of 62,000 data link words applies to configurations of 62 nodes.

Refer to the *Controller Link Unit Operation Manual* (W309) for other specifications.

Ethernet Communications Specifications (Expansion 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 Mbit/s (100Base-TX)	10 Mbit/s (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 service (UDP/TCP) • FTP server • Email send/receive • Automatic clock adjustment	

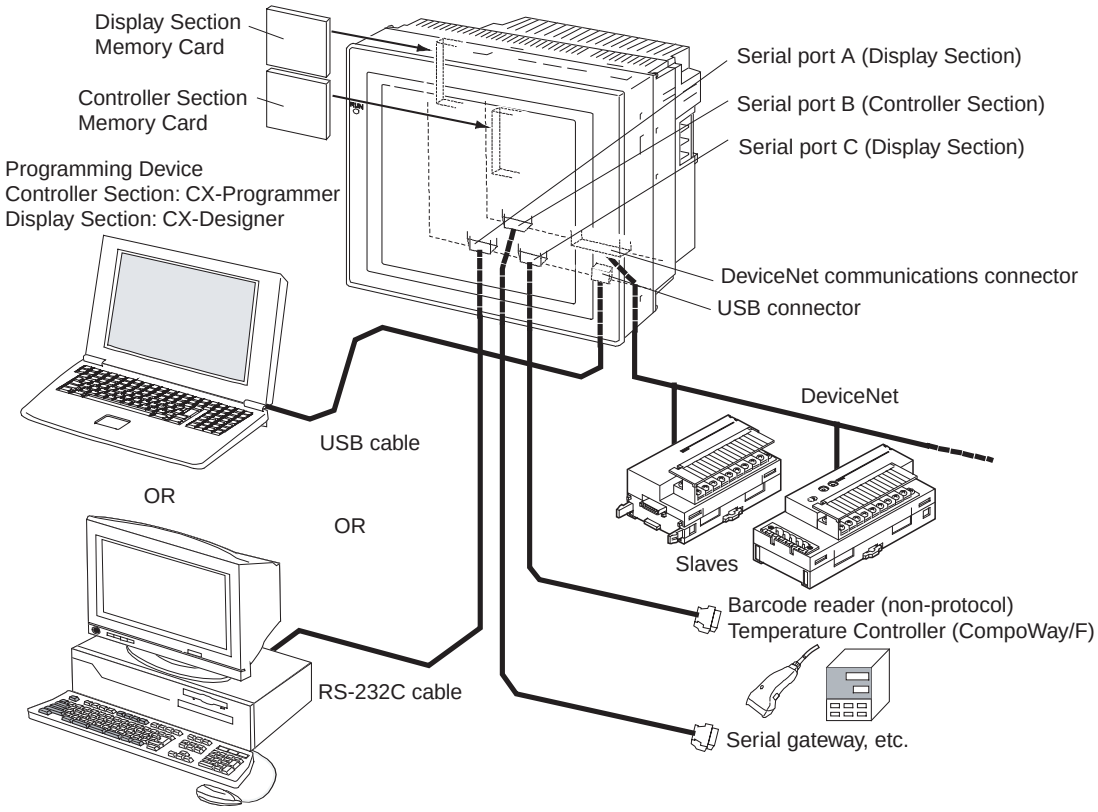
Refer to the *Ethernet Units Construction of Networks Operation Manual* (W420) and the *Ethernet Units Construction of Applications Operation Manual* (W421) for other specifications.

3-2 System Configuration

3-2-1 Basic System Configuration

Systems without Expansion Unit

The basic system configuration when an Expansion Unit is not used is shown below.



A Programming Device can be connected to the USB port, serial port A, or serial port B (Display Section). The functionality of serial ports A and B are the same as the ports on an NS-V2-series PT. If a Programming Device is not connected, a barcode reader, temperature controller, or other device can be connected.

Serial port C (Controller Section, RS-232C) has the same functionality as the RS-232C port on a CJ1-H CPU Unit with unit version 3.0. It can be used for a Host Link, NT Link, non-procedural, or serial gateway (CompoWay/F) connection.

The Controller Section provides DeviceNet master functionality as a standard feature. I/O can be controlled and message communications performed using DeviceNet within the limitations of the DeviceNet communications cycle.

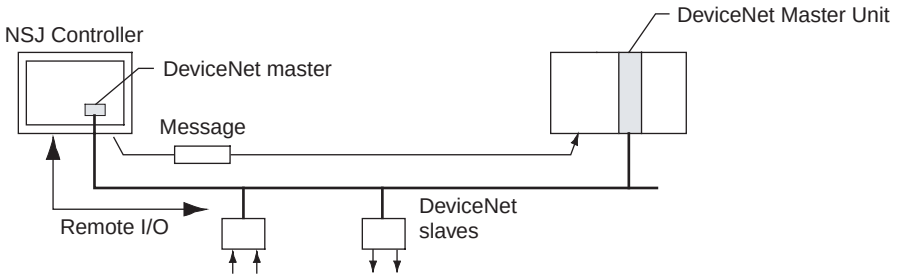
Memory Cards are optional for both the Controller Section and Display Section.

The user must provide a 24-V DC power supply.

DeviceNet

DeviceNet is a multi-vendor network consisting of multi-bit control and information systems and conforms to the Open Field DeviceNet specification. Using the DeviceNet master functionality enables remote I/O communications between the NSJ Controller and the slaves on the network. Remote I/O communications enable large-capacity I/O and user-set allocations. Analog I/O Terminals and other devices are used for the slaves. Message communica-

tions are possible between NSJ Controllers and between the NSJ Controller and DeviceNet devices manufactured by other companies.



The DeviceNet functionality built into the NSJ Controller is equivalent to the functionality of the CJ-series DeviceNet Unit (CJ1W-DRM21). Refer to the following manuals for communications specifications, wiring methods, and functional details.

- DeviceNet Operation Manual (W267)
- CS/CJ Series DeviceNet Unit Operation Manual (W380)

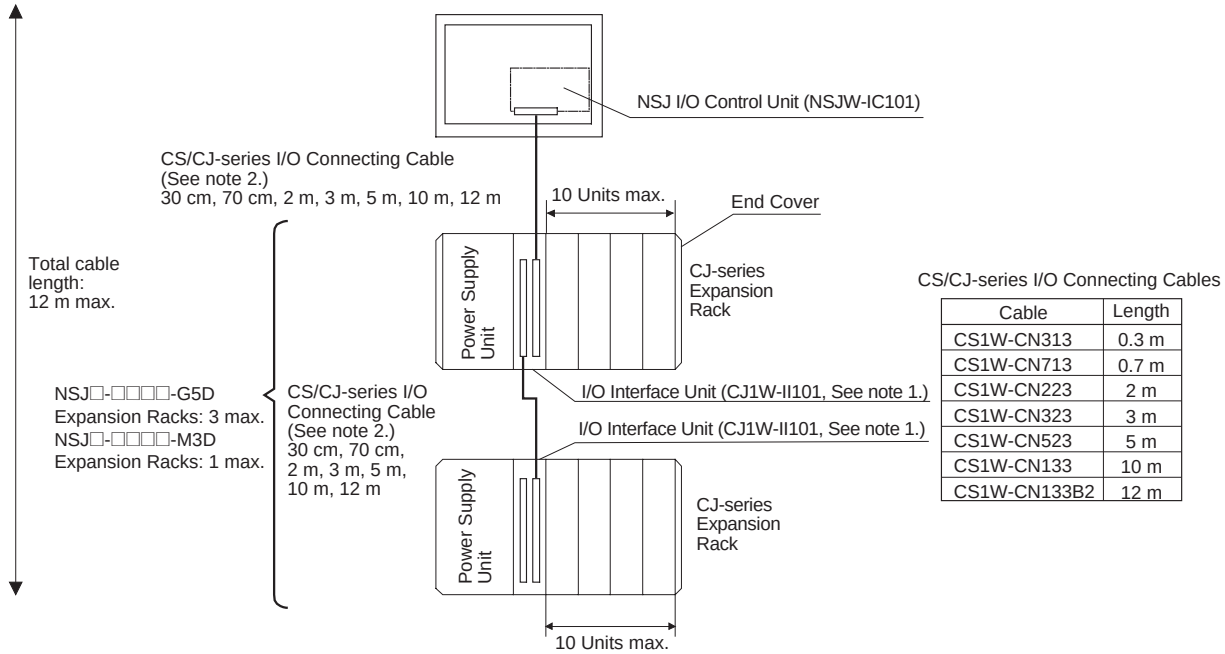
System Configurations with an Expansion Unit

One of the NSJ Expansion Units can be mounted to enable connecting CJ-series Expansion Racks, to add a Controller Link port, or to add an Ethernet port. Refer to *SECTION 5 Installation and Wiring* for mounting methods.

NSJ I/O Control Unit

An NSJ I/O Control Unit (NSJW-IC101) can be mounted to enable connecting one CJ-series Expansion Rack to the NSJ□-□□□□-M3D or up to three CJ-series Expansion Racks to any other NSJ Controller. Up to 10 CJ-series I/O Units (Basic I/O Units, Special I/O Units, or CPU Bus Units) can be mounted to each Expansion Rack. The maximum number of I/O Units that can be connected in one NSJ Controller is thus 10 for the NSJ□-□□□□-M3D and 30 for any other NSJ Controller. Each Expansion Rack must have a Power Supply Unit and I/O Interface Unit (CJ1W-II101).

The maximum cable length for connecting all of the Expansion Racks is 12 m.



CS/CJ-series I/O Connecting Cables

Cable	Length
CS1W-CN313	0.3 m
CS1W-CN713	0.7 m
CS1W-CN223	2 m
CS1W-CN323	3 m
CS1W-CN523	5 m
CS1W-CN133	10 m
CS1W-CN133B2	12 m

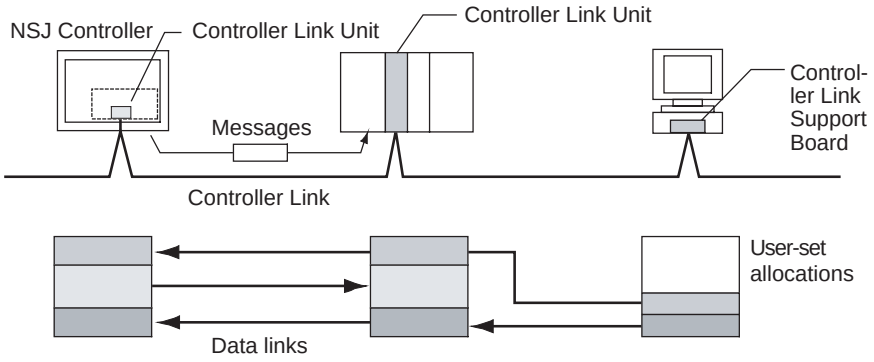
Note (1) Connect the I/O Interface Unit to the right of the Power Supply Unit.

(2) The total length of I/O Connecting Cable between the NSJ Controller and first Expansion Rack and between Expansion Racks must be 12 m or less.

(3) Connect the I/O Interface Unit directly to the right of the Power Supply Unit. Proper operation may not be possible if it is connected any other location.

NSJ Controller Link Unit

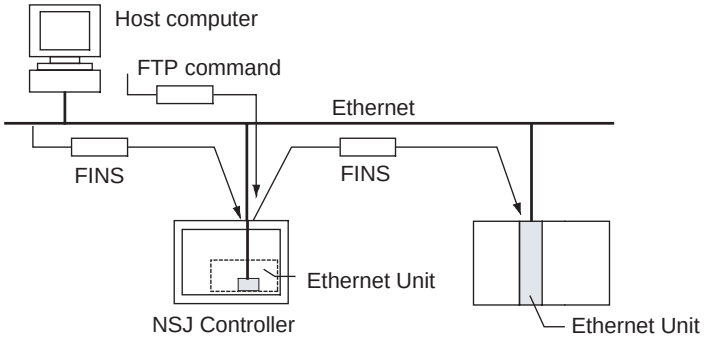
An NSJ Controller Link Unit (NSJW-CLK21-V1) can be mounted to enable using data links between NSJ Controllers and between NSJ Controllers and PLCs, so that data can be shared without programming, and FINS message communications between NSJ Controllers and between NSJ Controllers and PLCs, which enable separate control and data transfer when required. Data links and message communications are also possible between NSJ Controllers and personal computers. Data links enable large-capacity and user-set allocations. FINS message communications also allow large-capacity data transfer.



The functionality of the NSJ Controller Link Unit (NSJW-CLK21-V1) is equivalent to the functionality of the CJ-series Controller Link Unit (CJ1W-CLK21-V1, unit version 1.2).

NSJ Ethernet Unit

An NSJ Ethernet Unit (NSJW-ETN21) can be mounted to enable using FINS message communications between NSJ Controllers, between NSJ Controllers and PLCs, and between NSJ Controllers and host computers. By executing FTP commands for the NSJ Controller from a host computer connected to the Ethernet, the contents of the files on the Memory Card installed in the Controller Section can be read or written (transferred). Data can be sent and received using UDP and TCP protocols by sending/receiving data using SEND and RECV instructions or by using a socket service with CMND instructions. These functions enable a greater compatibility with information networks.



The functionality of the NSJ Ethernet Unit (NSJW-ETN21) is equivalent to the functionality of the CJ-series Ethernet Unit (CJ1W-ETN21, unit version 1.4).

Products Used in the System Configuration

Name		Model	Specifications
NSJ-series NSJ Controller		NSJ□-□□□□-G5D	I/O capacity: 1,280 points, Program capacity: 60K steps, data memory capacity: 128 Kwords (DM Area: 32 Kwords, EM Area: 32 Kwords × 3 banks)
		NSJ□-□□□□-M3D	I/O capacity: 640 points, Program capacity: 20K steps, data memory capacity: 32 Kwords (DM Area: 32 Kwords, EM Area: None)
Memory Cards (for Controller Section or Display Section, optional)		HMC-EF372	Flash memory, 30 MB
		HMC-EF672	Flash memory, 64 MB
		HMC-AP001	Memory Card Adapter
Programming Device Connecting Cables	USB port	---	Use an off-the-shelf USB cable with a type B connector and a cable length of 5 m or less.
	RS-232C port	XW2Z-200S-CV	DOS D-sub 9-pin connector, cable length: 2.0 m. A connector with ESD countermeasures is used.
		XW2Z-500S-CV	DOS D-sub 9-pin connector, cable length: 5.0 m. A connector with ESD countermeasures is used.
	Ethernet port	---	Use an off-the-shelf 10Base-T or 100Base-T cable.
Battery Set		CJ1W-BAT01	---
Expansion Units	NSJ I/O Control Unit	NSJW-IC101	Enables connecting CJ-series Expansion Racks. Provides the same functionality as a CJ-series I/O Control Unit (CJ1W-IC101).
	NSJ Controller Link Unit	NSJW-CLK21-V1	Adds a Controller Link port. Provides the same functionality as a CJ-series Controller Link Unit (CJ1W-CLK21-V1).
	NSJ Ethernet Unit	NSJW-ETN21	Adds an Ethernet port. Provides the same functionality as a CJ-series Ethernet Unit (CJ1W-ETN21).

Note The following products are used when mounting an NSJ I/O Control Unit to the NSJ Controller and connecting CJ-series Expansion Racks.

Name	Model	Specifications	
NSJ I/O Control Unit	NSJW-IC101	Enables connecting CJ-series Expansion Racks to the NSJ Controller. (Connected to an I/O Interface Unit (CJ1W-II101) on a CJ-series Expansion Rack using a CS/CJ-series I/O Connecting Cables.)	
I/O Interface Unit	CJ1W-II101	One I/O Interface Unit is required on each CJ-series Expansion Rack. One End Cover is included. (Connected to the previous I/O Interface Unit or the NSJ I/O Control Unit using a CS/CJ-series I/O Connecting Cable.)	
CS/CJ-series I/O Connecting Cables	CS1W-CN313	Connect an I/O Control Unit (NSJW-IC101) to an I/O Interface Unit (CJ1W-II101) or connect two I/O Interface Units.	0.3 m
	CS1W-CN713		0.7 m
	CS1W-CN223		2 m
	CS1W-CN323		3 m
	CS1W-CN523		5 m
	CS1W-CN133		10 m
	CS1W-CN133B2		12 m
CJ-series Power Supply Units	CJ1W-PA205R	100 to 240 V AC (with RUN output), output capacity: 5 A at 5 V DC, 0.8 A at 24 V DC	
	CJ1W-PA205C	100 to 240 V AC (with replacement notification), output capacity: 4.6 A at 5 V DC, 0.8 A at 24 V DC	
	CJ1W-PA202	100 to 240 V AC, output capacity: 2.8 A at 5 V DC, 0.4 A at 24 V DC	
	CJ1W-PD025	24 V DC, output capacity: 5 A at 5 V DC, 0.8 A at 24 V DC	
	CJ1W-PD022	24 V DC (not insulated), output capacity: 2.0 A at 5 V DC, 0.4 A at 24 V DC	

Name	Model	Specifications
End Cover	CJ1W-TER01	An End Cover must be attached to the right end of a CJ-series Expansion Rack. A fatal error will occur if an End Cover is not attached. **Note** One End Cover is provided with each I/O Interface Unit.
DIN Tracks	PFP-50N	Length: 50 cm, height: 7.3 mm
	PFP-100N	Length: 1 m, height: 7.3 mm
	PFP-100N2	Length: 1 m, height:16 mm
	PFP-M	Stopper. Stoppers must be connected to the left and right ends of the Rack to prevent it from moving. Two Stoppers are included with the I/O Interface Unit.

Optional Products for the Display Section

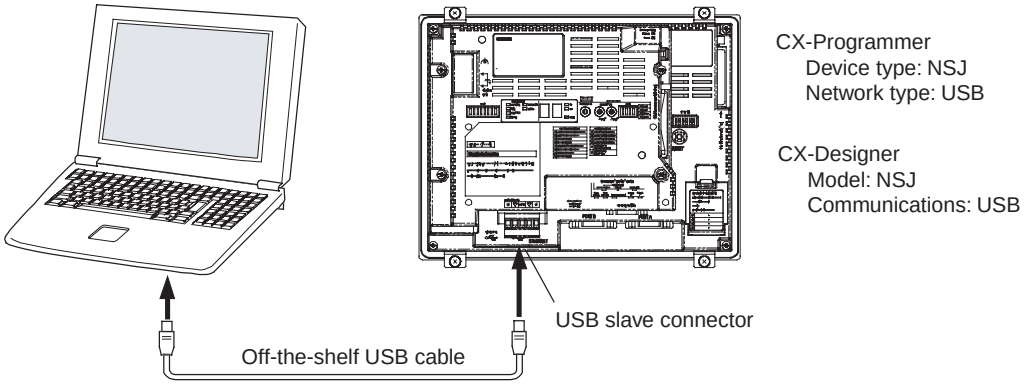
Model	Description
NS12-KBA04	Anti-reflection Sheets for NS12/NS10
NS7-KBA04	Anti-reflection Sheets for NS8
NT30-KBA04	Anti-reflection Sheets for NS5
NS12-KBA05	Opaque White Protective Cover for NS12 and NS10 (anti-reflection coating)
NS7-KBA05	Opaque White Protective Cover for NS8 (anti-reflection coating)
NT31C-KBA05	Opaque White Protective Cover for NS5 (anti-reflection coating)
NS12-KBA05N	Transparent Protective Cover for NS12 and NS10
NS7-KBA05N	Transparent Protective Cover for NS8
NT31C-KBA05N	Transparent Protective Cover for NS5
NT30-KBA01	Chemical-resistant Cover

Use the suitable NS5, NS8, NS10, and NS12 options for the size of the Display Section on the NSJ Controller.

Connecting Programming Devices

USB Port

Use an off-the-shelf USB cable to connect to the USB slave connector on the Display Section. The Display Section has a type B USB connector.

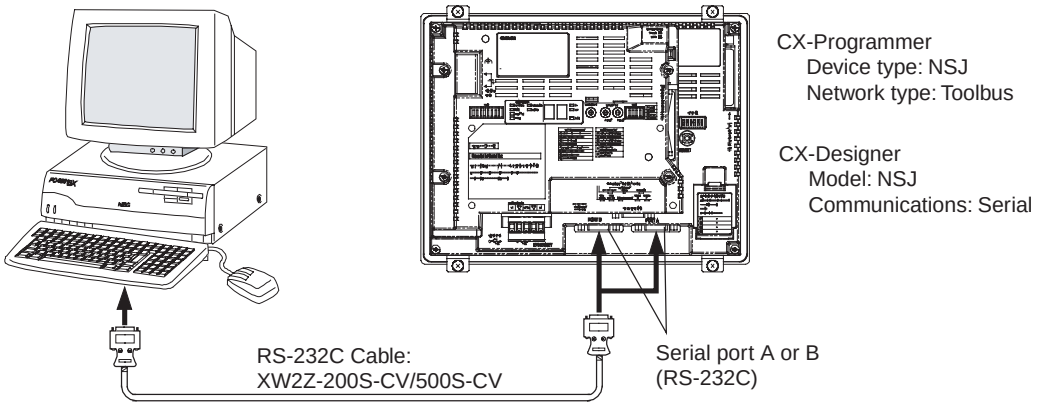


Note The USB driver must be installed in the computer. Refer to *2-2 Installing the USB Driver* for details.

Serial Port A or B on Display Section (RS-232C)

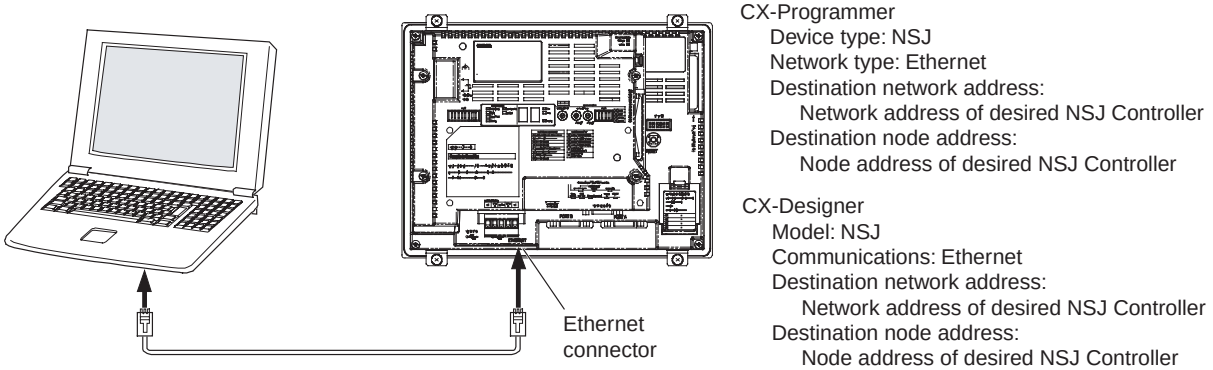
Use one of the following Connecting Cables.

- XW2Z-200S-CV
- XW2Z-500S-CV



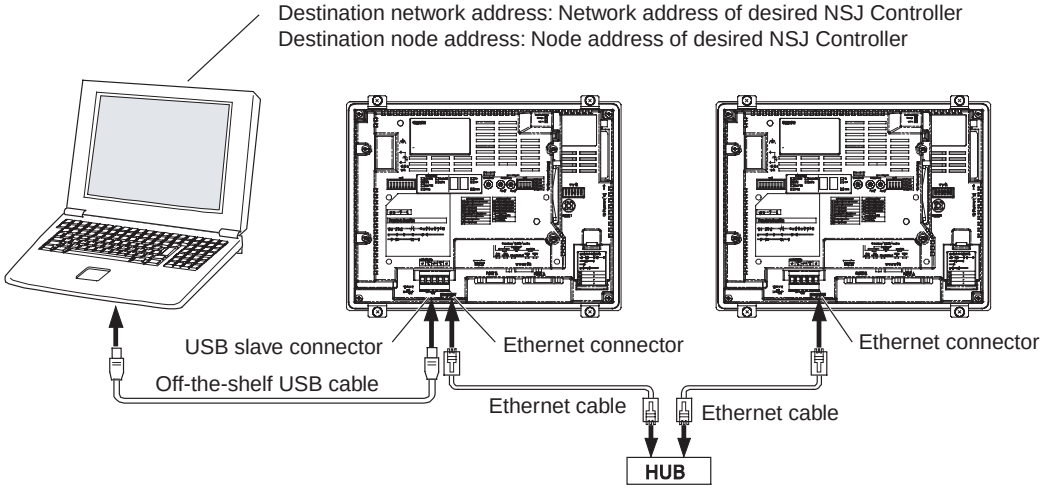
Ethernet Port

The Programming Device can be connected to the Ethernet Port on any NSJ Controller model with a built-in Ethernet port.



Accessing Ethernet Nodes with a USB Connections

A Programming Device connected to the USB port on an NSJ Controller can be used to access and control other NSJ Controllers on the Ethernet network by setting the Ethernet node address of the desired NSJ Controller.



Support Software

NSJ Controller	OS	Name	Model	Remarks
NSJ□-□□□□-G5D	Windows	CX-One Ver. 1.1 or higher	CXONE-AL□□C-E	Provided on CD-ROM.
NSJ□-□□□□-M3D	Windows	CX-One Ver. 2.0 or higher	CXONE-AL□□C-E	Provided on CD-ROM.

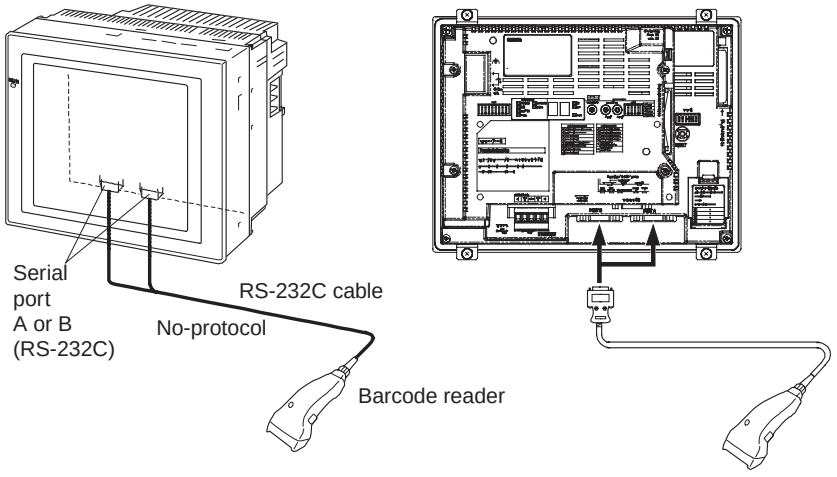
3-2-2 Expanded System Configurations

Serial Communications

Serial ports A and B on the Display Section and serial port C on the Controller Section can be used in various ways, as described in this section.

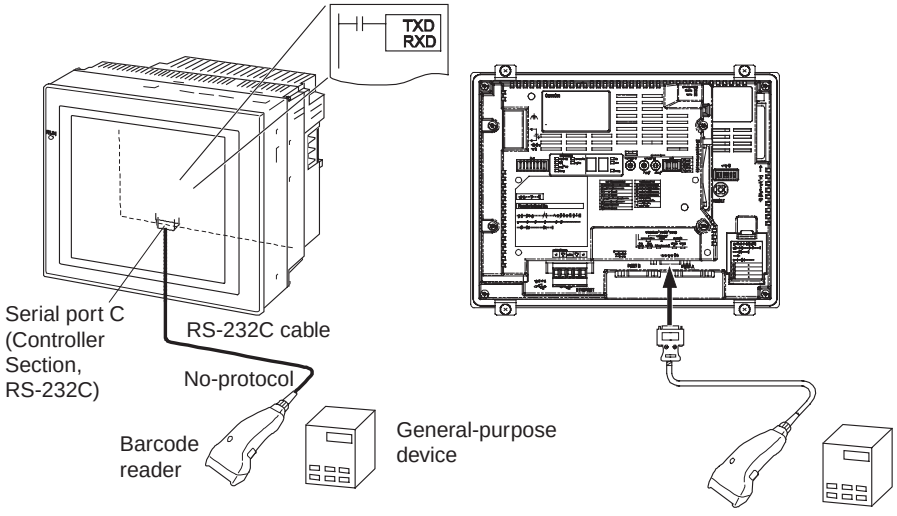
Barcode Readers

Information from a barcode reader can be input to the Display Section without going through the Controller Section by connecting the barcode reader to serial port A or B on the Display Section.



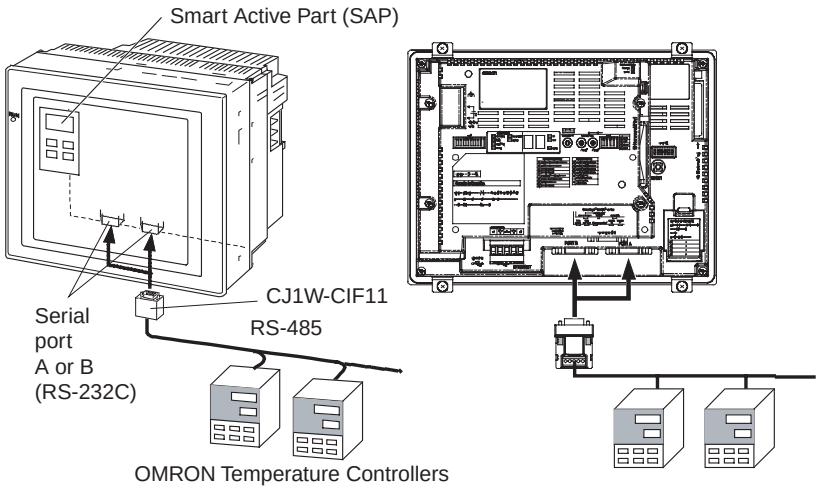
If data input via no-protocol communications must be processed using the ladder program in the Controller Section, serial port C on the Controller Section is used.

No-protocol communications with barcode reader or other external device using ladder programming in the Controller Section

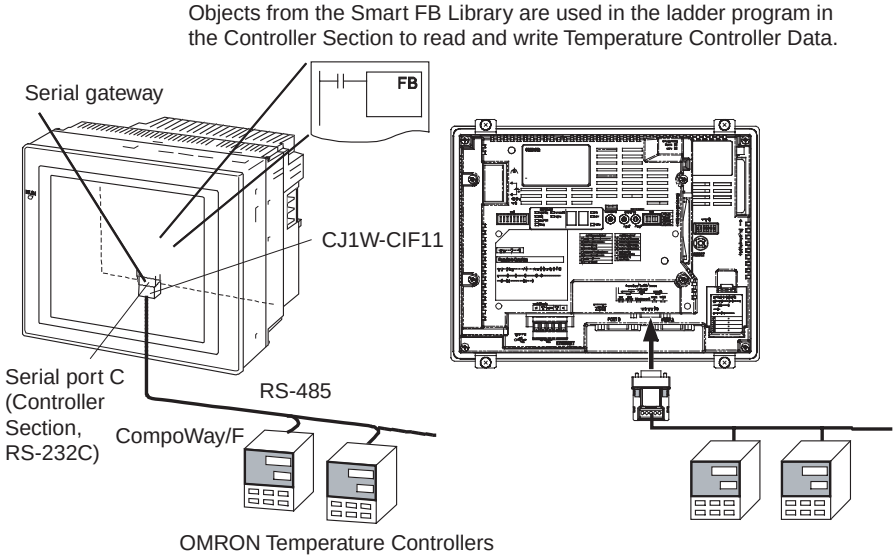


Temperature Controllers

If Smart Active Parts (SAP) are to be used with direct connections to OMRON Temperature Controllers, serial port A or B on the Display Section is used. The Display Section internally sends FINS messages to the Temperature Controllers.



If objects from the Smart FB Library are used to read or write data to OMRON Temperature Controllers using the ladder program in the Controller Section, serial port C on the Controller Section is used. The Controller Section send FINS message through the serial port on the Controller Section. If the serial gateway is used for the serial port on the Controller section, CompoWay/F can be used to access any of the OMRON Temperature Controllers connected serially.



SECTION 4
Nomenclature, Functions, and Dimensions

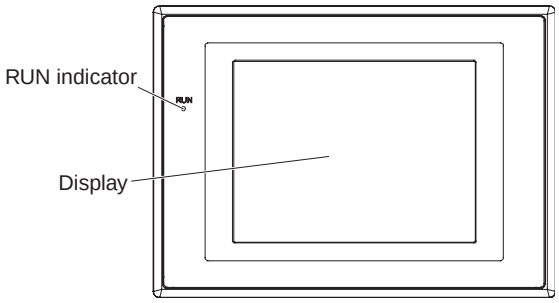
The section give the names of the parts of the NSJ Controller, describes the function of each part, and provides NSJ Controller Dimensions.

4-1 Nomenclature and Functions

4-1-1 Nomenclature

Front

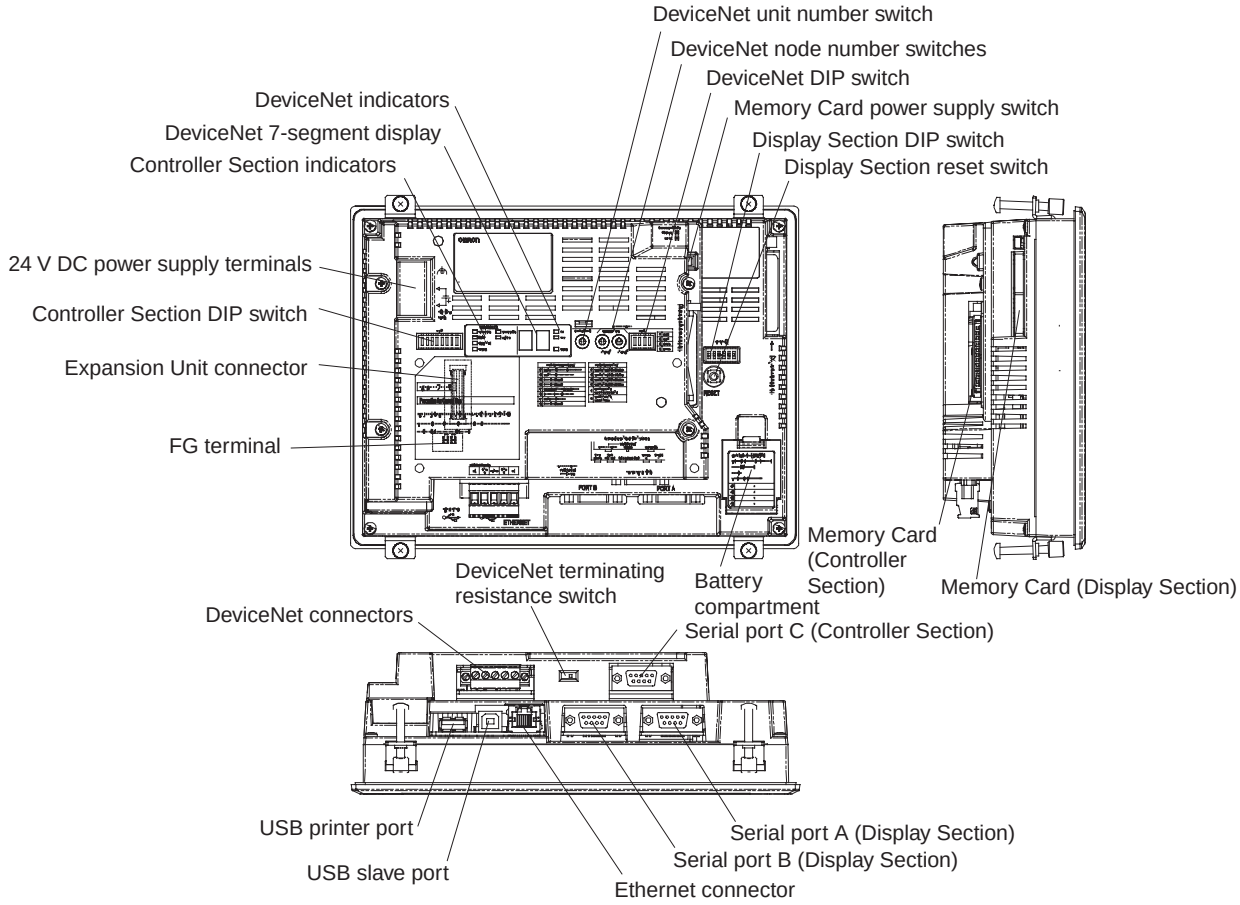
NSJ12-TS0□(B)-G5D, NSJ10-TV0□(B)-G5D, NSJ8-TV0□(B)-□□□, NSJ5-TQ□□(B)-□□□, and NSJ5-SQ□□(B)-□□□



Back

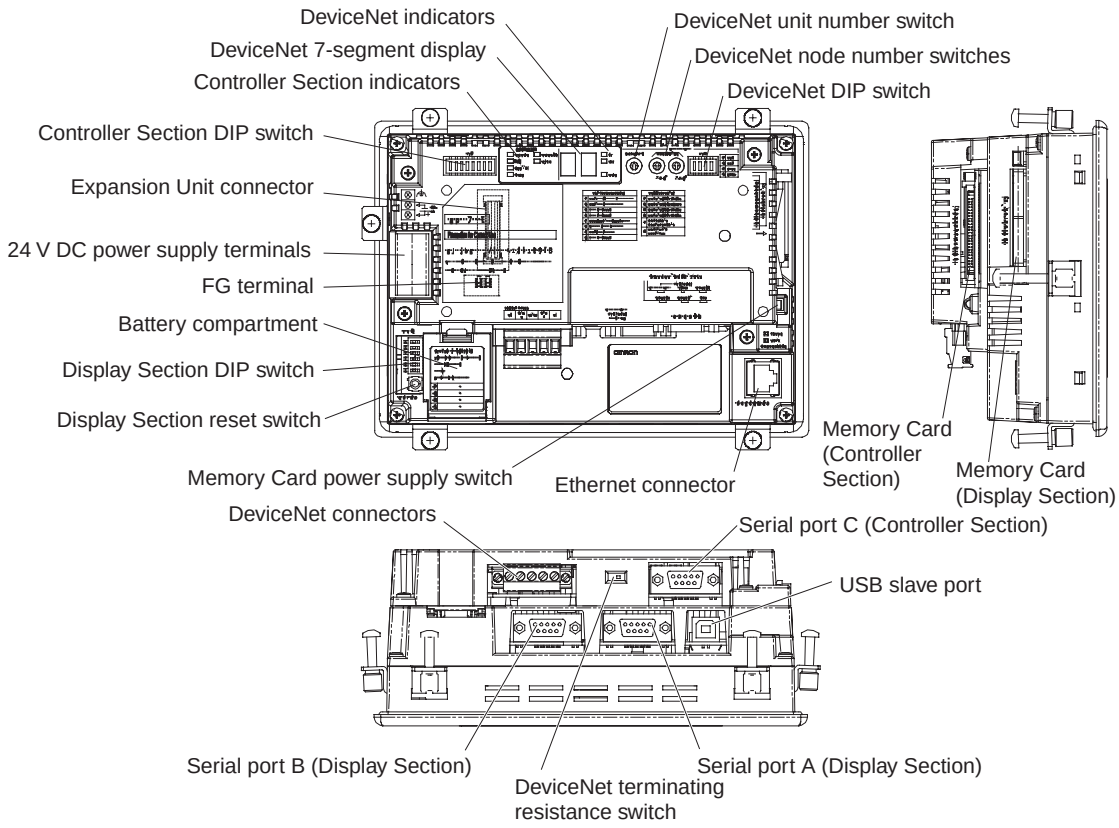
NSJ12-TS0□(B)-G5D, NSJ10-TV0□(B)-G5D, and NSJ8-TV0□(B)-□□□

The NSJ8-TV0□(B)-□□□ is shown below. The sizes of the NSJ12-TS0□(B)-G5D, and NSJ10-TV0□(B)-G5D differ, but the basic structure is the same.



Note The following NSJ Controllers do not have an Ethernet connector: NSJ12-TS00(B)-G5D, NSJ10-TV00(B)-G5D, and NSJ8-TV00(B)-□□□.

NSJ5-TQ□□(B)-□□□ and NSJ5-SQ□□(B)-□□□



Note The following NSJ Controllers do not have an Ethernet connector: NSJ5-TQ□0(B)-□□□ and NSJ5-SQ□0(B)-□□□.

4-1-2 Functions of Parts

RUN Indicator

The RUN indicator shows the operating status of the NSJ Controller (including the Controller Section and Expansion Unit).

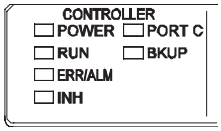
Indicator	Green	Orange	Red
Lit	NSJ Controller is operating normally.	The file system check that is performed immediately after the power is turned ON is in progress.	A fatal error has occurred in the Controller Section. A WDT error has occurred in the Controller Section.
Flashing	Memory Card transfer ended normally, but a backlight error occurred immediately after the power supply was turned ON.	Memory Card transfer in progress.	Memory Card transfer ended in an error. A non-fatal error has occurred in the Controller Section. An initialization error has occurred in the Controller Section.
Not lit	• Power is not being supplied to the NSJ Controller. • The fuse is broken. • The system program is corrupted and the system cannot be booted.		

For lot number 15Z0 or later, the brightness of the indicator will change according to the backlight brightness setting. (NSJ5-SQ1/-TQ1 only)

Controller Section

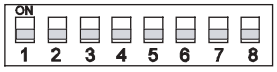
Controller Section Indicators

The Controller Section indicators show the status of the Controller Section.



Indicator	Color	Status	Meaning
POWER	Green	ON	Power is being supplied.
		OFF	Power is not being supplied.
RUN	Green	ON	The Controller Section is operating normally in MONITOR or RUN mode.
		Flashing	DIP switch settings error.
		OFF	The Controller Section has stopped operating while in PROGRAM mode or has stopped operating due to a fatal error.
ERR/ALM	Red	ON	A fatal error has occurred (including FALS instruction execution) or a hardware error (watchdog timer error) has occurred. The Controller Section will stop operating, and all outputs will turn OFF.
		Flashing	A non-fatal error has occurred (including FAL instruction execution). The Controller Section will continue operating.
		OFF	The Controller Section is operating normally.
INH	Orange	ON	The Output OFF Bit (A50015) is ON. Outputs from all Output Units will turn OFF.
		OFF	The Output OFF Bit (A50015) is OFF.
PORTC	Orange	Flashing	The Controller Section is communicating (sending or receiving) via the Controller Section's RS-232C port.
		OFF	The Controller Section is not communicating via the Controller Section's RS-232C port.
BKUP	Orange	ON	Data is being written to flash memory (backup memory). This indicator will also light when the user program is being restored after the power supply to the NSJ Controller is turned ON. **Note** Do not turn OFF the power supply to the NSJ Controller while this indicator is lit.
		OFF	Data is not being written to flash memory.

Controller Section DIP Switch



Pin no.	Setting	Function	Usage	Default
1	ON	Writing disabled for user program memory. (See note.)	Used to prevent programs from being accidentally overwritten from Programming Devices (the CX-Programmer).	OFF
	OFF	Writing enabled for user program memory.		
2	ON	The user program is automatically transferred from the Memory Card when power is turned ON.	Used to store the programs in the Memory Card to switch operations, or to automatically transfer programs at startup (Memory Card ROM operation). **Note** When pin 7 is ON and pin 8 is OFF, easy backup reading from the Memory Card is given priority, so even if pin 2 is ON, the user program will not be automatically transferred from the Memory Card when power is turned ON.	OFF
	OFF	The user program is not automatically transferred from the Memory Card when power is turned ON.		
3	Keep turned OFF.	---	---	OFF
4		---	---	OFF

Pin no.	Setting	Function	Usage	Default
5	ON	RS-232C port communications parameters set using the CX-Programmer (Toolbus only) are used.	Turn ON to use the RS-232C port for the CX-Programmer in Toolbus mode.	OFF
	OFF	RS-232C port communications parameters set in the PLC Setup are used.		
6	ON	User-defined pin. Turns ON the User DIP Switch Pin Flag (A39512).	Set pin 6 to ON or OFF and use A39512 in the program to create a user-defined condition without using an Input Unit.	OFF
	OFF	User-defined pin. Turns OFF the User DIP Switch Pin Flag (A39512).		
7		Easy backup type	Determines the type of easy backup to be performed. See *Table 1*, below.	OFF
8	Keep turned OFF.	---		OFF

Table 1

DIP switch pin Pin No. 7	Easy backup type	Required operations
ON	Writing from Controller Section to Memory Card.	Press the Memory Card Power Supply Switch for 3 s while power is ON.
	Writing from Memory Card to Controller Section.	Turn ON the power supply to the NSJ Controller. **Note** This operation is given priority over automatic transfer (pin 2 is ON) at startup.
OFF	Verifying contents of Memory Card against the contents of the Controller Section.	Press the Memory Card Power Supply Switch for 3 s while power is ON.

Note

1. The following data cannot be overwritten when pin 1 is ON:
   - All parts of the user program (programs in all tasks)
   - All data in the parameter area (such as the PLC Setup and I/O tables)

   When pin 1 is ON, the user program and parameter area will not be cleared when the memory clear operation is performed from the CX-Programmer.
2. The Controller Section will not enter any mode except PROGRAM mode after backing up data to a Memory Card using the easy backup operation. To enter RUN or MONITOR mode, turn OFF the power supply, turn OFF pin 7, and then restart the NSJ Controller. This will enable changing the operating mode as normal.

Controller Section Memory Card

A Memory Card can be used to back up all Controller Section data, including the user program, parameters, I/O memory, and comment memory files. Automatically transferring data from the Memory Card at startup can also be used to enable batteryless operation.

Memory Card Power Supply Switch

Press the power supply switch to disconnect power before removing the Memory Card. Also, press the Memory Card Power Supply Switch to perform an easy backup operation.

Serial Port C

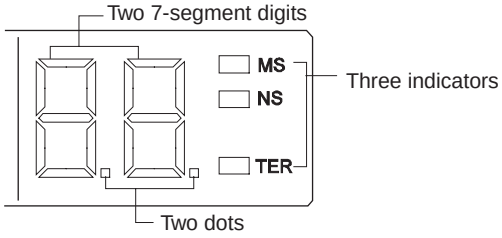
Serial port C has the same functionality as the RS-232C port on a CJ1-H CPU Unit with unit version 3.0. The following serial communications modes are supported: Toolbus, Host Link, NT Link, No-protocol, and Serial Gateway.

Expansion Unit Connector

An Expansion Unit can be mounted here.

DeviceNet Section (in Controller Section)

DeviceNet Indicators



■ MS, NS, and TER Indicators

The MS (Module Status) indicator indicates the status of the node and the NS (Network Status) indicator indicates the status of the network.

The TER indicator indicates whether terminating resistance is connected.

The MS and NS indicators can be green or red and they can be OFF, ON, or flashing, and the TER indicator can be ON or OFF. The following table shows the meaning of these indicator conditions.

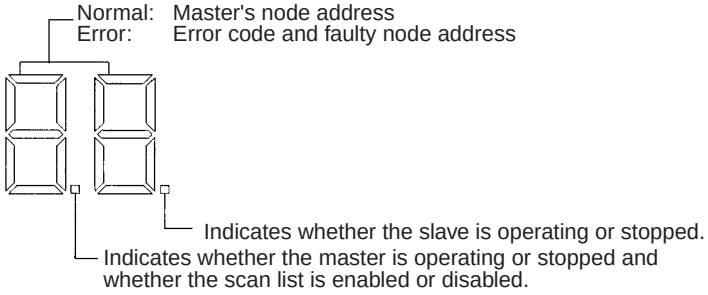
Indicator	Color	Status	Meaning (likely errors)
MS	Green	ON	Normal operating status. Communications are being performed normally.
	Red	ON	A non-recoverable, fatal error has occurred (watchdog timer error, memory error, or system error). If the error persists even when the power supply is cycled, replace the NSJ Controller.
		Flashing	A recoverable, non-fatal error has occurred (configuration error, switch setting error, Controller Section initialization error, Controller Section interface error, or routing table error). Correct the error and reset the Unit.
	---	OFF	Power isn't being supplied or the Unit is being reset.
NS	Green	ON	The NSJ Controller is online with the network and remote I/O communications have been established with a slave registered in the scan list or message communications have been established.
		Flashing	The NSJ Controller is online with the network, but neither remote I/O communications nor message communications have been established. Either the scan list is being read, or both remote I/O communications and message communications are disabled.
	Red	ON	A fatal communications error has occurred. Network communications are not possible (node address duplicated or Bus Off error).
		Flashing	A non-fatal communications error has occurred (communications error, configuration error, or verification error).
	---	OFF	The NSJ Controller is not online with the network. (There is no network power supply, the Controller Section is being reset, a minor failure, or a sending error has occurred.)
TER	Orange	ON	Terminating resistance connected.
	---	OFF	Terminating resistance not connected.

Note Flashing indicators are ON for 0.5 s and OFF for 0.5 s.

■ Seven-Segment Display

The 7-segment display normally indicates the master node address in decimal between 00 and 63. When an error occurs, the display will alternate between the error code and the node address of the faulty slave.

There are dot indicators at the lower-right corner of each digit. The left dot indicator shows whether the scan list is enabled or disabled. The right dot indicator shows whether the slave is operating.

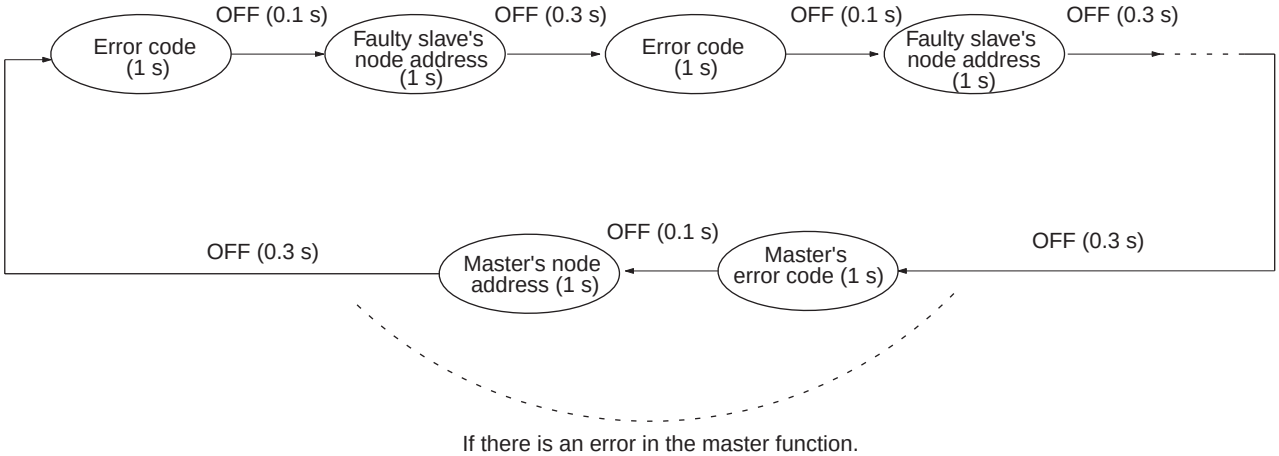


Seven-segment Display

The following table shows the functions of the 7-segment display.

Status		Display	
Remote I/O communications active and normal		Displays the master's node address (00 to 63)	Lit
From power ON to completion of node address check (master function disabled, slave function disabled, or both disabled)			Flashing
Remote I/O communications started			Flashing (until communications actually start)
From completion of the node address check until the start of remote I/O communications			Flashing
Error	Watchdog timer	Not lit	
	Memory error or system error	Error code only	Lit
	Other errors	Alternately displays the error code and error node address (see diagram below).	
Scan list	Reading	"- -"	Flashing
	Registered		

The following diagram shows the alternating error code/ node address display.



If there is an error in the master function.

The master's error code and master's node address will be displayed if an error has occurred in the master.

There is no priority in the error codes; all errors that have occurred will be displayed in order.

Dot Indicators

The following table shows the functions of the dot indicators.

Indicator	Content	Display
Left dot	Scan list enabled/ disabled, master function disabled	ON: Master function disabled Flashing: Scan list disabled mode OFF: Scan list enabled mode
Right dot	Slave function disabled	ON: Slave function disabled OFF: Slave operating

DeviceNet Unit Number Switch

Use this switch to set the unit number of the DeviceNet Section as a CPU Bus Unit. The unit number setting determines the CIO and DM area words allocated to the DeviceNet Section as software switches and the status area.

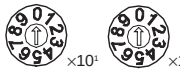
Setting method	One-digit hexadecimal
Setting range	0 to F

Note

1. The unit number is set to 0 at the factory.
2. Any unit number from 0 to F can be set as long as it hasn't been set on another CPU Bus Unit connected to the same NSJ Controller.
3. Use a small flat-blade screwdriver to turn the rotary switch; be careful not to damage the switch.
4. If the unit number is the same as one set on another CPU Bus Unit connected to the same NSJ Controller, a duplicate number error will occur in the NSJ Controller and it won't be possible to start the DeviceNet network.
5. Always turn OFF the NSJ Controller before changing the unit number setting.

DeviceNet Node Address Switches

Use these switches to set the node address of the Unit.



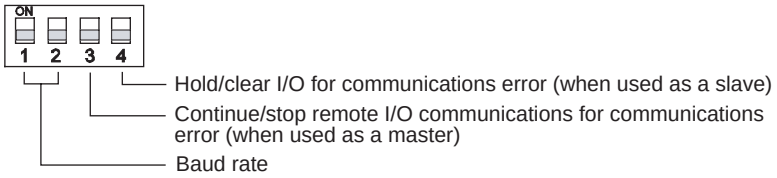
Setting method	Two-digit decimal
Setting range	0 to 63

Note

1. The node address is set to 63 at the factory.
2. Any node address from 0 through 63 can be set as long as it hasn't been set on another slave node.
3. If the node address is the same as one set on another node, a node address duplication error will occur and it won't be possible to start up network communications.
4. Node address 0 cannot be used for FINS message communication. Use a node address other than 0 for FINS message communication.

DeviceNet DIP Switch

The DeviceNet DIP switch is used to set the baud rate, whether remote I/O communications will be continued or stopped when a communications error occurs, and whether to hold or clear the remote outputs when a communications error occurs in the slave function.



The settings of the DIP switch pins are shown in the following table. All pins are set to OFF at the factory.

Pin	Function	Setting
1	Baud rate	See the next table.
2		
3	Continue/stop remote I/O communications for communication errors (when used as a master)	OFF: Continue communications ON: Stop communications
4	Hold/clear remote outputs for communications error (when used as a slave)	OFF: Clear remote outputs ON: Hold remote outputs

Baud Rate

Pins 1 and 2 are used to set the baud rate as shown in the following table.

Pin 1	Pin 2	Baud rate
OFF	OFF	125 kbps
ON	OFF	250 kbps
OFF	ON	500 kbps
ON	ON	Not allowed.

Note

1. Always turn OFF the NSJ Controller before changing the DIP switch settings.
2. Set the same baud rate on all of the nodes (master and slaves) in the Network. Any slaves with baud rates different from the master's rate won't be able to participate in communications and may cause a communications error between nodes that have been set properly.

Continue/Stop Remote I/O Communications

When the DeviceNet Section is used as a master, pin 3 is used to set whether or not communications will stop after a communications error.

If pin 3 is ON, remote I/O communications will be stopped if one of the following errors occurs.

Remote I/O Communications Error Flag (n+12, bit 02 is ON, See note.)
Send Timeout Flag (n+10, bit 08 is ON)
Network Power Error Flag (n+10, bit 07 is ON)

Remote I/O communications will remain stopped even if the error is cleared. (Message communications and slave functions will continue.) To resume communications, turn ON the Remote I/O Communications Start Bit (word n, bit 02) of Software Switches 1. Refer to *3-2 Allocated CIO Area Words* in the *CS/CJ-series DeviceNet Unit Operation Manual* for details.

Note The 7-segment display will show "A0" when remote I/O communications stop.

If pin 3 is OFF, remote I/O communications will stop if a send timeout or network power error occurs, but will restart automatically when the cause of the error is cleared.

Hold/Clear Remote Outputs

When the DeviceNet Section is used as a slave, pin 4 is used to set whether to hold or clear remote outputs when a communications error occurs.

Note If the DeviceNet Section is used as a slave, the 7-segment display will show "L9" when remote I/O communications stop.

DeviceNet Terminating Resistance Switch

Turn ON this switch to connect terminating resistance at each of the nodes on the end of the DeviceNet network's trunk line. The status of this switch is shown by the TER indicator.

Note This switch is set to OFF (terminating resistance not connected) at the factory.

DeviceNet Connectors

Color stickers that match communications cable colors are attached to the communications connectors. Match the colors when connecting communications cables to the connectors. These colors are given in the following table

Color	Signal
Black	Power line, negative voltage (V–)
Blue	Communications line, low (CAN L)
---	Shield
White	Communications line, high (CAN H)
Red	Power line, positive voltage (V+)

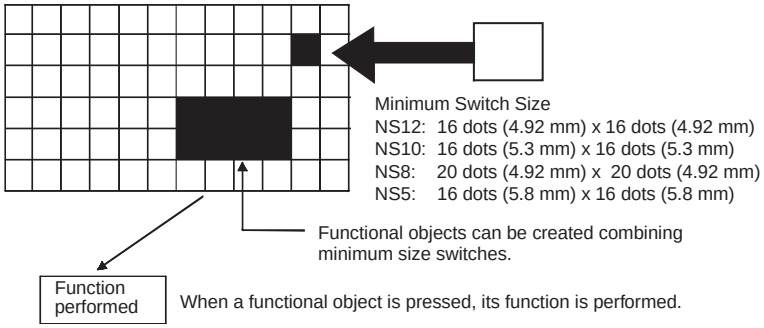
For details on communications specifications and wiring, refer to the *DeviceNet Operation Manual* (W267).

Note Before connecting communications cables, turn OFF the NSJ Controller power supply, all slave power supplies, and the communications power supply.

Display Section

Touch Panel

The touch panel is a color TFT LCD screen or a color STN LCD (NSJ5-SQ0□(B)-□□□ only). The touch switches on the front panel of the Display Section are used to perform input operations.



To ensure correct input operations, create touch switches so that they consist of at least two switches horizontally and vertically.

Note

(1) Press the touch switches with a pressure of 30 N max.

(2) Do not press the touch switches when the backlight is not lit or when there is no display.

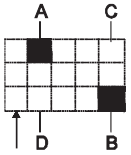
(3) Check system safety before pressing the touch switches.

(4) Inputs may not be recognized if the touch switches are pressed in rapid succession. Check that one input operation has finished before performing the next one.

(5) Pressing Three Switches Simultaneously

If the positions of multiple touch switches are set as shown in the example and three switches are pressed simultaneously, the touch switches will malfunction due to structural characteristics.

Position the touch switches carefully. In the example shown below, switches have been created in positions A and B, and at points C and D, where the vertical and horizontal lines through A and B intersect.



Minimum touch switch frame

- If touch switches A, B, and C are turned ON simultaneously, switch D may also turn ON due to structural characteristics of the touch panel.
- In the same way, if touch switches A, B, and D are turned ON simultaneously, switch C may also turn ON.

Display Section Memory Card

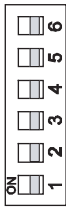
The Memory Card in the Display Section is used to back up screen data and log files.

Display Section DIP Switch

The DIP switch on the Display Section is used to specify banks and transfer methods for the Memory Card.

NSJ8/NSJ10/NSJ12

NSJ5



Pin No.	Function
1	Specifies bank 1 when transferring. (ON: Specifies bank 1.)
2	Specifies bank 2 when transferring. (ON: Specifies bank 2.)
3	Specifies bank 3 when transferring. (ON: Specifies bank 3.)
4	Specifies bank 4 when transferring. (ON: Specifies bank 4.)
5	Specifies upload or download. (ON: Upload, OFF: Download)
6	Specifies manual or automatic transfer. (ON: Manual, OFF: Automatic)

Reset Switch

The reset switch initializes Display Section status. It will not affect the Controller Section.

24 V DC Power Supply Terminals

Connect a 24 V DC power supply to these terminals.

Item	Value
Power supply voltage	24 V DC
Allowable power supply voltage range	20.4 to 27.6 V DC (24 V DC ±15%)
Power supply capacity	25 W min. (NSJ5: 15 W min.)

USB Slave Connector

Connect a Programming Device to this connector. This is a type B USB connector.

USB Printer Connector

Connect a printer to this connector. This is a type A USB connector. There is no USB printer connector on the NSJ5-TQ□□-□□□ or NSJ5-SQ□□-□□□.

Serial Ports A and B

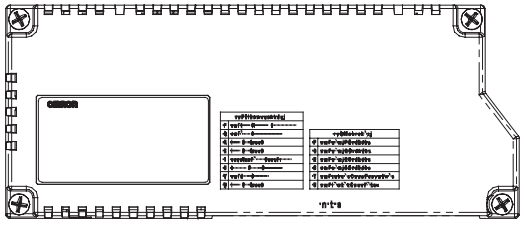
These ports have the same functionality as the RS-232C port on an NS-series PT. A Programming Device can also be connected.

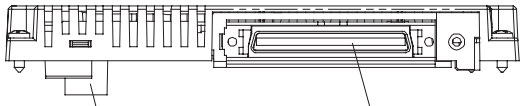
Ethernet Connector Connect an Ethernet cable with a 10Base-T or 100Base-T, 8-pin modular plug. A Programming Device can also be connected. The following models do not have an Ethernet connector: NSJ12-TS00-G5D, NSJ10-TV00-G5D, NSJ8-TV00-□□□, NSJ5-TQ□0-□□□, and NSJ5-SQ□0-□□□.

Battery Compartment The CJ1W-BAT01 Battery for the NSJ Controller is mounted inside this compartment.

4-1-3 Expansion Unit Nomenclature and Functions

NSJ I/O Control Unit (NSJW-IC101)



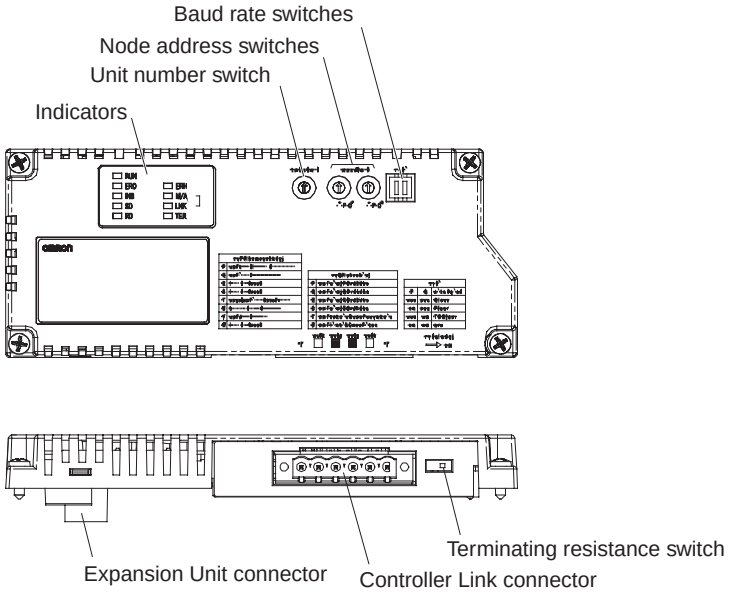


The I/O Connecting Cables listed in the following table can be used. Refer to *5-3-2 Wiring an NSJ I/O Control Unit* for connecting methods.

Model	Cable length
CS1W-CN313	0.3 m
CS1W-CN713	0.7 m
CS1W-CN223	2 m
CS1W-CN323	3 m
CS1W-CN523	5 m
CS1W-CN133	10 m
CS1W-CN133B2	12 m

NSJ Controller Link Unit (NSJW-CLK21-V1)

The functionality of the NSJ Controller Link Unit is equivalent to the functionality of the CJ-series Controller Link Unit (CJ1W-CLK21-V1, unit version 1.2). Refer to the *Controller Link Units Operation Manual* (W309) for details.



Indicators

The indicators show the status of the Unit and the network.

Unit Number Switch

Set the unit number of the NSJ Controller Link Unit as a CPU Bus Unit as a 1-digit hexadecimal value.

Node Address Switches

Set the node address of the NSJ Controller Link Unit on the Controller Link network as a 2-digit decimal value.

Baud Rate Switch

Set the 2-pin DIP switch to the baud rate of the Controller Link network.

Terminating Resistance Switch

Turn ON the terminating resistance switch to connect terminating resistance at both end of the Controller Link network.

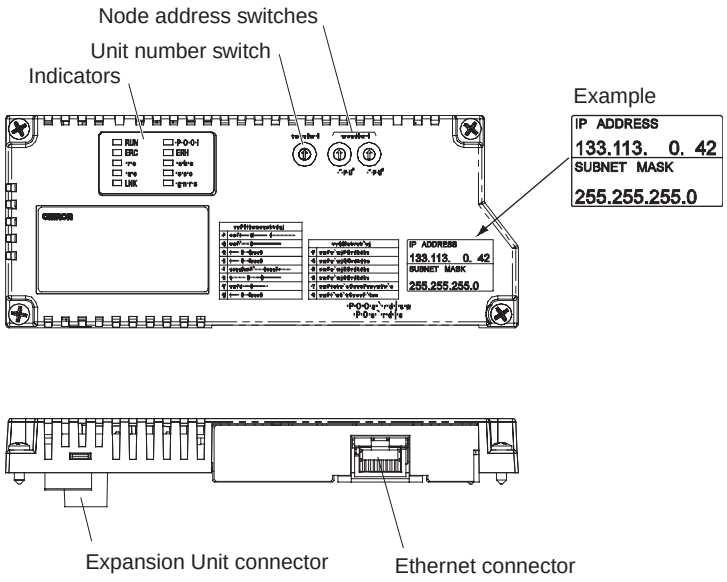
Controller Link Connector

Connect the Controller Link network communications cable (twisted-pair cable). Refer to *5-3-3 Wiring the NSJ Controller Link Unit* for connection methods.

NSJ Ethernet Unit (NSJW-ETN21)

The functionality of the NSJ Ethernet Unit is equivalent to the functionality of the CJ-series Ethernet Unit (CJ1W-ETN21, unit version 1.4). Refer to the *CS/CJ-series Ethernet Units Construction of Networks Operation Manual* (W420) for details.

The NSJ Ethernet Unit also comes with labels that can be attached to the Unit to show the IP address and subnet mask set by the user. Using this label will enable easy confirmation of the IP address and subnet mask.



Indicators The indicators show the status of the Unit.

Unit Number Switch Set the unit number of the NSJ Ethernet Unit as a CPU Bus Unit as a 1-digit hexadecimal value.

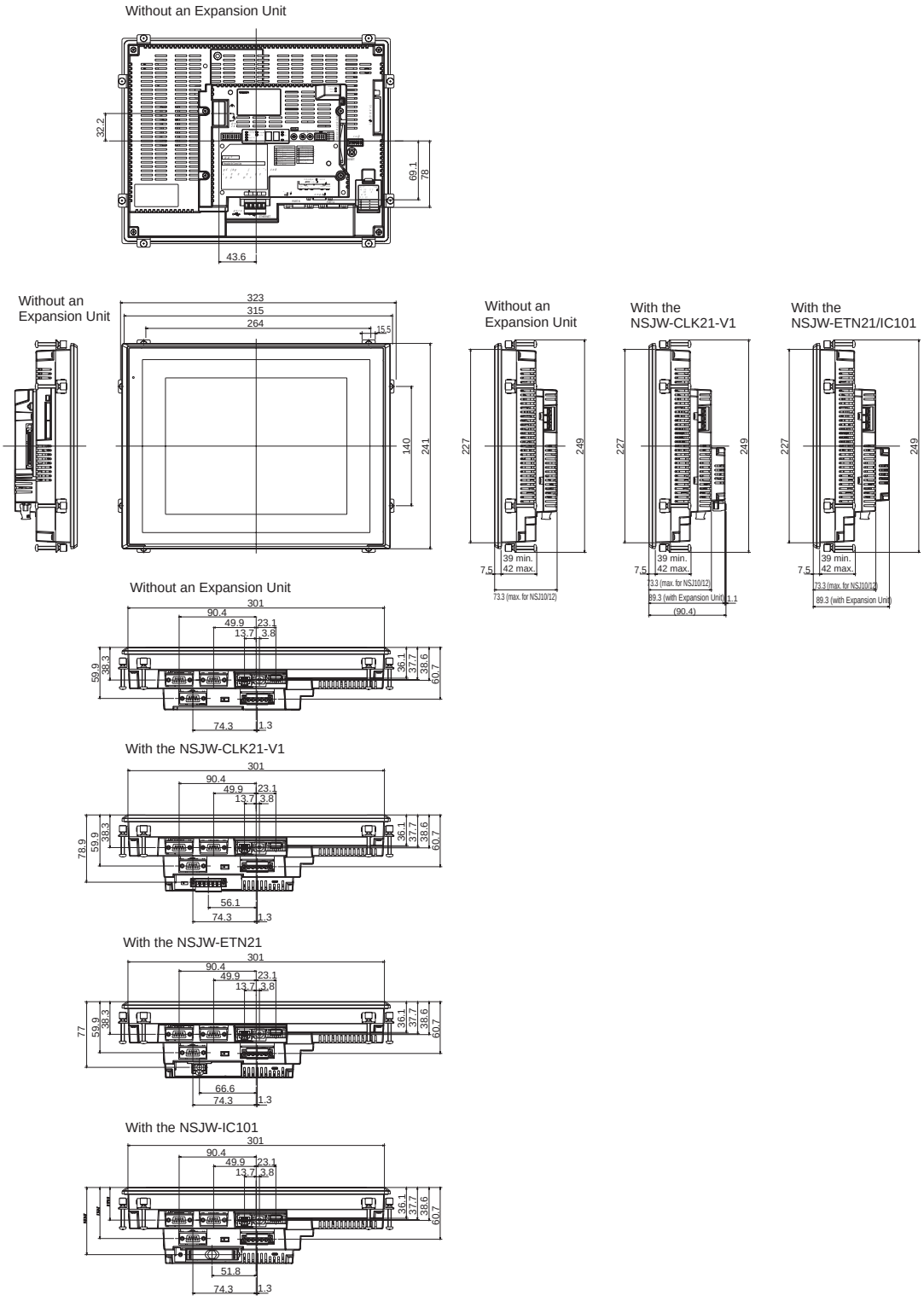
Node Address Switches Set the FINS node address of the NSJ Ethernet Unit as a 2-digit hexadecimal value.

Ethernet Connector Connect the Ethernet twisted-pair cable. Refer to *5-3-4 Wiring the NSJ Ethernet Unit* for connection methods.

4-2 Dimensions

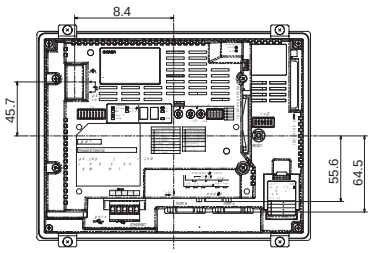
4-2-1 Dimensions

NSJ12-TS0□(B)-G5D and NSJ10-TV0□(B)-G5D

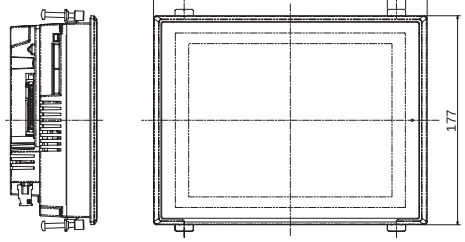


NSJ8-TV0□(B)-□□□

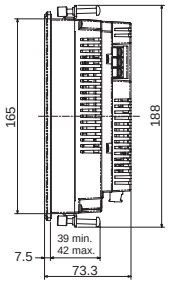
Without an Expansion Unit



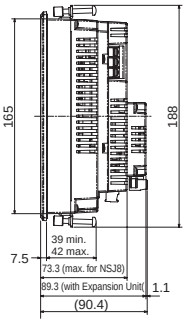
Without an Expansion Unit



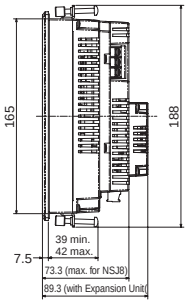
Without an Expansion Unit



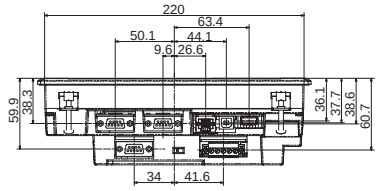
With the NSJW-CLK21-V1



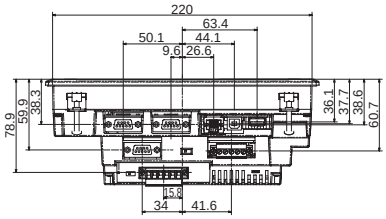
With the NSJW-ETN21/IC101



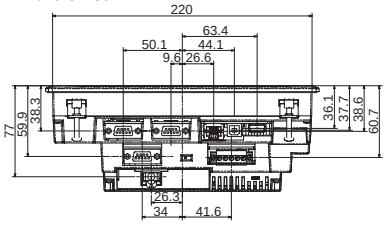
Without an Expansion Unit



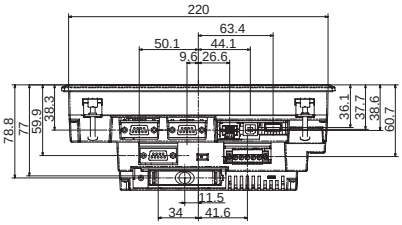
With the NSJW-CLK21-V1



With the NSJW-ETN21

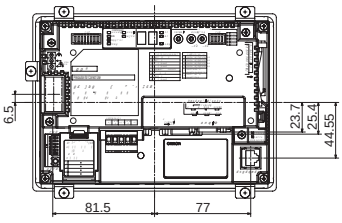


With the NSJW-IC101

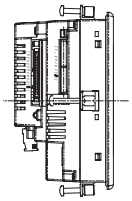


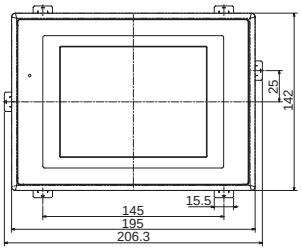
NSJ5-SQ□□(B)-□□□ and NSJ5-TQ□□(B)-□□□

Without an Expansion Unit

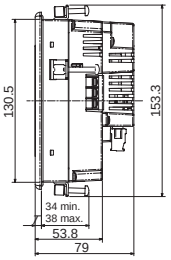


Without an Expansion Unit

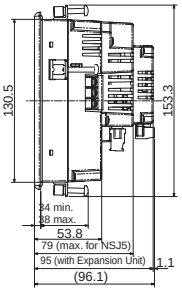




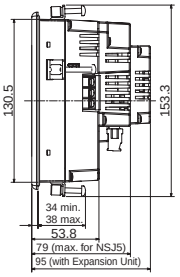
Without an Expansion Unit



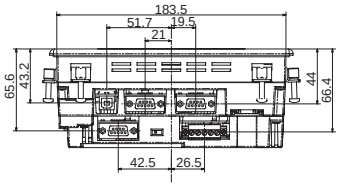
With the NSJW-CLK21-V1



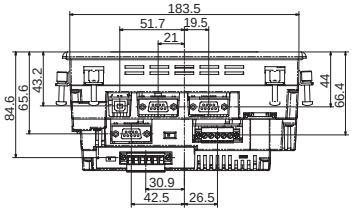
With the NSJW-ETN21/IC101



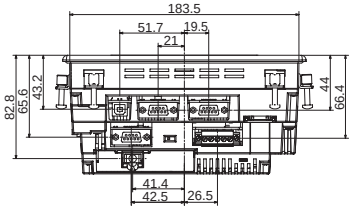
Without an Expansion Unit



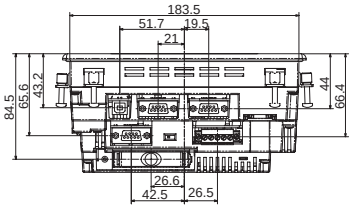
With the NSJW-CLK21-V1



With the NSJW-ETN21

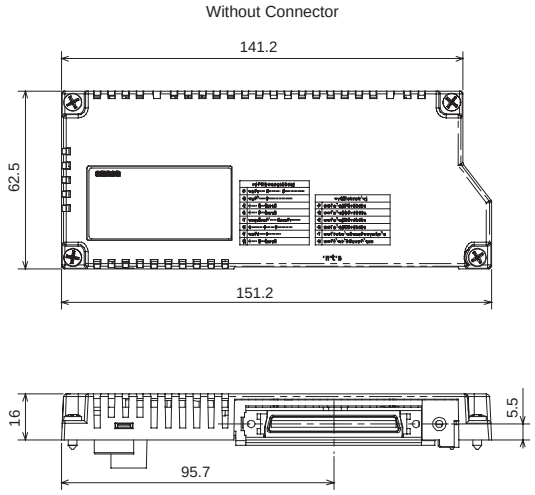


With the NSJW-IC101

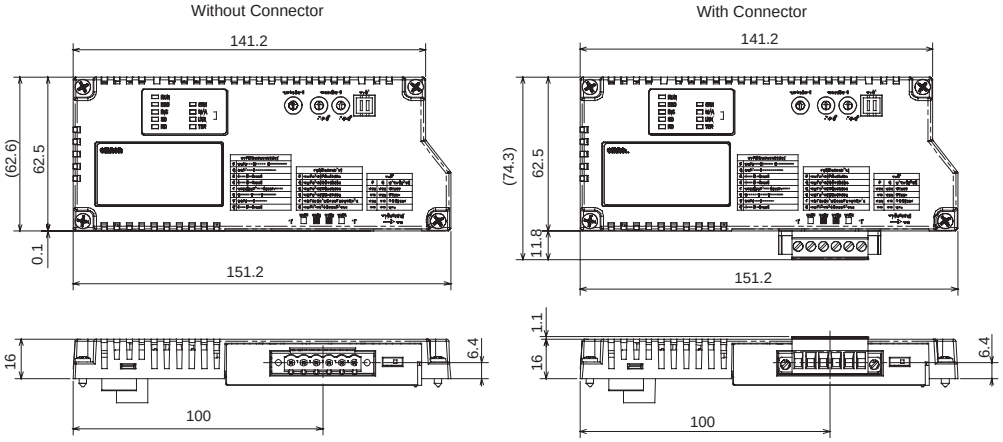


Expansion Units

NSJW-IC101 (NSJ I/O Control Unit)



NSJW-CLK21-V1 (NSJ Controller Link Unit)



NSJW-ETN21 (NSJ Ethernet Unit)