

Max. number of control points
60 points

Program capacity
48 k steps

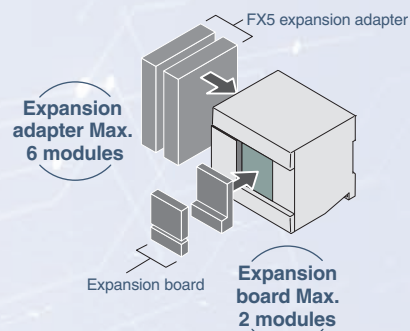
Pulse train
100 kpps Max.
4 axes

High-speed counter function (max. 8 ch)

Positioning function (max. 4 axes)

Ethernet port

USB (Mini-B) connector



Please choose the I/O type of CPU module suited for your equipment.

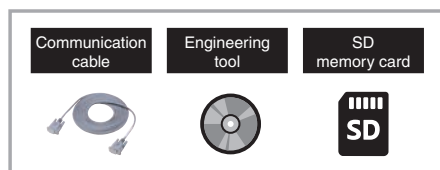
FX5S CPU module

FX5S-30MR/ES	FX5S-40MR/ES	FX5S-60MR/ES
FX5S-30MT/ES	FX5S-40MT/ES	FX5S-60MT/ES
FX5S-30MT/ESS	FX5S-40MT/ESS	FX5S-60MT/ESS
Input: 16 points/Output: 14 points	Input: 24 points/Output: 16 points	Input: 36 points/Output: 24 points

- AC AC power supply
- D2 DC input (sink/source)
- T1 Transistor output (sink)
- T2 Transistor output (source)
- R Relay output

Connector connection

Option For details, refer to P14 [System Configuration (Option)].



*: Depending on the CPU module, system configuration, serial number, etc., the type and number of connectable modules may differ, or separate equipment may be required for connection. For details, please refer to Chapter 1 Lineup Details and Model Selection or use the FA Integrated Selection Tool.

Models with restrictions are marked with symbols such as *A/*B/*C. For details of restrictions, refer to P78 [List of annotations].

Selecting the FX5S model

◇ Product configuration



FX5S

- Control scale: 30 to 60 points
(CPU module: 30/40/60 points)
- Excellent core performance and simple model selection help combine ease of use and simplicity into a single unit.



* For details about the connection positions, refer to the manual.

Type	Details	Connection details, model selection
1 CPU module	PLC with built-in CPU, power supply, input/output and program memory.	Various extension devices can be connected.
2 FX5 expansion board	Board connected to front of CPU module to expand functions.	Up to 1 SD memory card module and 1 communication board (up to 2 modules in total) can be connected to the front of the CPU module. (Expansion adapter can also be used.)
3 FX5 expansion adapter	Adapter connected to left side of CPU module to expand functions.	Up to 2 communication adapters and up to 4 analog adapters* (up to 6 adapters in total) can be connected to the left side of CPU module. When 2 is used, the number of units is restricted.

*: For FX5-4A-ADP with a serial number 223**** or older, up to two modules can be connected in the entire system.

1 CPU module (AC power supply/DC input type)

Model	Function	Input/output points occupied	Power supply capacity	I/O type	No. of input points	No. of output points
			24 V DC service power supply			
FX5S-30MR/ES	CPU module (With built-in 24 V DC service power supply)	30 points	400 mA*	DC input (sink/source)/relay output	16 points	14 points
FX5S-30MT/ES				DC input (sink/source)/transistor (sink)		
FX5S-30MT/ESS				DC input (sink/source)/transistor (source)		
FX5S-40MR/ES		40 points		DC input (sink/source)/relay output	24 points	16 points
FX5S-40MT/ES				DC input (sink/source)/transistor (sink)		
FX5S-40MT/ESS				DC input (sink/source)/transistor (source)		
FX5S-60MR/ES		60 points		DC input (sink/source)/relay output	36 points	24 points
FX5S-60MT/ES				DC input (sink/source)/transistor (sink)		
FX5S-60MT/ESS				DC input (sink/source)/transistor (source)		

*: Use as power supply for input devices. (Cannot be used as an external power supply for expansion adapters.)

2 FX5 expansion board

Model	Function	Number of occupied input/output points	Current consumption	
			5 V DC power supply*1	24 V DC power supply
FX5-232-BD	RS-232C communication	—	— (20 mA)	—
FX5-485-BD	RS-485 communication		— (20 mA*2)	
FX5-422-BD-GOT	RS-422 communication (for GOT connection)		—	
FX5-SDCD	SD memory card module		—	

*1: Current consumption calculation is not required for the FX5S CPU module. Values in parentheses are values stated in the specifications of each product.

*2: The current consumption will increase when the 5 V type GOT is connected.

Performance Specifications


FX5S

◇ FX5S CPU module performance specifications

Item		Specification
Control system		Stored-program repetitive operation
Input/output control system		Refresh system (Direct access input/output allowed by specification of direct access input/output [DX, DY])
Programming specifications	Programming language	Ladder diagram (LD), structured text (ST), function block diagram/ladder diagram (FBD/LD)
	Programming expansion function	Function block (FB), function (FUN), label programming (local/global)
	Constant scan	0.5 to 2000 ms (can be set in 0.1 ms increments)
	Fixed cycle interrupt	1 to 60000 ms (can be set in 1 ms increments)
	Timer performance specifications	100 ms, 10 ms, 1 ms
	No. of program executions	32
	No. of FB files	16 (Up to 15 for user)
Operation specifications	Execution type	Standby type, initial execution type, scan execution type, fixed-cycle execution type, event execution type
	Interrupt type	Internal timer interrupt, input interruption, high-speed comparison match interrupt
Command processing time	LD X0	84 ns
	MOV D0 D1	100 ns
Memory capacity	Program capacity	48 k steps (96 kbytes, flash memory)
	SD memory card	Memory card capacity (SD/SDHC memory card: Max. 16 Gbytes)
	Device/label memory	120 kbytes
	Data memory/standard ROM	5 Mbytes
Flash memory (Flash ROM) write count		Maximum 20000 times
File storage capacity	Device/label memory	1
	Data memory	
	P: No. of program files FB: FB: No. of FB files	P: 32, FB: 16
	SD memory card	NZ1MEM-2GBSD: 511*1 NZ1MEM-4GBSD, NZ1MEM-8GBSD, NZ1MEM-16GBSD: 65534*1
Clock function	Display data	Year, month, day, hour, minute, second, day of week (leap year automatic detection)
	Precision	Differences per month ±45 sec./25°C (TYP)
No. of input/output points		60 points or less
Power failure retention (clock data*2)	Retention method	Large-capacity capacitor
	Retention time	15 days (Ambient temperature: 25°C)
Power failure retention (device)		Power failure retention capacity
		Maximum 5k words

*1: The value listed above indicates the number of files stored in the root folder.

*2: Clock data is retained using the power accumulated in a large-capacity capacitor incorporated into the PLC. When voltage of the large-capacity capacitor drops, clock data is no longer accurately retained. The retention period of a fully charged capacitor (electricity is conducted across the PLC for at least 30 minutes) is 15 days (ambient temperature: 25°C). How long the capacitor can hold the data depends on the operating ambient temperature. When the operating ambient temperature is high, the holding period is short.

◇ Number of device points

Item		Base	Max. number of points	
No. of user device points	Input relay (X)	8	1024 points or less	The total number of X and Y assigned to input/output points is up to 60 points.
	Output relay (Y)	8	1024 points or less	
	Internal relay (M)	10	32768 points (can be changed with a parameter)*1	
	Latch relay (L)	10	32768 points (can be changed with a parameter)*1	
	Link relay (B)	16	32768 points (can be changed with a parameter)*1	
	Annunciator (F)	10	32768 points (can be changed with a parameter)*1	
	Link special relay (SB)	16	32768 points (can be changed with a parameter)*1	
	Step relay (S)	10	4096 points (fixed)	
	Timer system	Timer (T)	10	
			1024 points (can be changed with a parameter)*1	
	Accumulation timer system	Accumulation timer (ST)	10	
			1024 points (can be changed with a parameter)*1	
	Counter system	Counter (C)	10	
			1024 points (can be changed with a parameter)*1	
	Data register (D)	Long counter (LC)	10	
			1024 points (can be changed with a parameter)*1	
No. of system device points	Link register (W)	10	8000 points (can be changed with a parameter)*1	
	Link special register (SW)	16	32768 points (can be changed with a parameter)*1	
	Special relay (SM)	10	10000 points (fixed)	
No. of index register points	Special register (SD)	10	12000 points (fixed)	
	Index register (Z)*2	10	24 points	
No. of file register points	Long index register (LZ)*2	10	12 points	
	File register (R)	10	32768 points (can be changed with a parameter)*1	
No. of nesting points	Extended file register (ER)	10	32768 points (are stored in SD memory card)	
	Nesting (N)	10	15 points (fixed)	
No. of pointer points	Pointer (P)	10	4096 points	
	Interrupt pointer (I)	10	32 points	
Others	Decimal constant (K)	Signed	—	16 bits: -32768 to +32767, 32 bits: -2147483648 to +2147483647
		Unsigned	—	16 bits: 0 to 65535, 32 bits: 0 to 4294967295
	Hexadecimal constant (H)	—	—	16 bits: 0 to FFFF, 32 bits: 0 to FFFFFFFF
	Real constant (E)	Single precision	—	E-3.40282347+38 to E-1.17549435-38, 0, E1.17549435-38 to E3.40282347+38
	Character string	—	—	Shift-JIS code max. 255 single-byte characters (256 including NULL) Unicode max. 255 characters (256 including NULL)

*1: Can be changed with parameters within the capacity range of the CPU built-in memory.

*2: The sum of index register (Z) and long index register (LZ) is 24 words.

General, Power Supply, Input/Output Specifications

◇ General specifications

Item	Specifications				
	FX5S/FX5UJ		FX5U/FX5UC		
Operating ambient temperature*1	0 to 55°C (32 to 131°F), non-freezing		-20 to 55°C (-4 to 131°F), non-freezing*2*3*4		
Storage ambient temperature	-25 to 75°C (-13 to 167°F), non-freezing				
Operating ambient humidity	5 to 95%RH, non-condensation*5				
Storage ambient humidity	5 to 95%RH, non-condensation				
Vibration resistance*6*7		Frequency	Acceleration	Half amplitude	Sweep count
	Installed on DIN rail	5 to 8.4 Hz	—	1.75 mm	10 times each in X, Y, Z directions (80 min in each direction)
		8.4 to 150 Hz	4.9 m/s ²	—	
	Direct installing*8	5 to 8.4 Hz	—	3.5 mm	
		8.4 to 150 Hz	9.8 m/s ²	—	
Shock resistance*6	147 m/s ² , Action time: 11 ms, 3 times by half-sine pulse in each direction X, Y, and Z				
Noise durability*9	By noise simulator at noise voltage of 1000 Vp-p, noise width of 1 ms and period of 30 to 100 Hz				
Grounding	Class D grounding (grounding resistance: 100 Ω or less) <Common grounding with a heavy electrical system is not allowed.> *10				
Working atmosphere	Free from corrosive or flammable gas and excessive conductive dust				
Operating altitude*11	0 to 2000 m				
Installation location	Inside a control panel*12				
Overvoltage category*13	II or less				
Pollution degree*14	2 or less				

*1 : The simultaneous ON ratio of available PLC inputs or outputs changes with respect to the ambient temperature. For details, refer to the manual.

*2 : 0 to 55°C for products manufactured before June 2016. For intelligent function modules, refer to the manual of each product.

The following products cannot be used when the ambient temperature is less than 0°C:

FX5-40SSC-S, FX5-80SSC-S, FX5-CNV-BUS, FX5-CNV-BUSC, battery (FX3U-32BL), SD memory cards (NZ1MEM-2GBSD, NZ1MEM-4GBSD, NZ1MEM-8GBSD, NZ1MEM-16GBSD, L1MEM-2GBSD and L1MEM-4GBSD), FX3 extension modules, terminal blocks and I/O cables (FX-16E-500CAB-S, FX-16E-□CAB and FX-16E-□CAB-R)

*3 : The specifications are different in the use at less than 0°C. For details, refer to the manual.

*4 : When using the FX5-CCLGN-MS manufactured in December 2020 or earlier, the operating ambient temperature is -20 to 50°C.

*5 : When used in a low-temperature environment, use in an environment with no sudden temperature changes. If there are sudden temperature changes because of opening/closing of the control panel or other reasons, condensation may occur, which may cause a fire, fault, or malfunction. Furthermore, use an air conditioner in dehumidifier mode to prevent condensation.

*6 : The criterion is shown in IEC61131-2.

*7 : When the system has equipment which specification values are lower than above mentioned vibration resistance specification values, the vibration resistance specification of the whole system is corresponding to the lower specification.

*8 : Direct installation of FX5UC is not possible.

*9 : When using the FX5 safety extension modules under the severe noise environment, implement external noise countermeasures with a surge absorber and ferrite core.

*10 : For grounding, refer to manuals of each product.

*11 : The PLC cannot be used at a pressure higher than the atmospheric pressure to avoid damage.

*12 : The programmable controller is assumed to be installed in an environment equivalent to indoor.

*13 : This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300 V is 2500 V.

*14 : This index indicates the degree to which conductive material is generated in the environment in which the equipment is used. Pollution level 2 is when only non-conductive pollution occurs. Temporary conductivity caused by condensation must be expected occasionally.

◇ Power supply specifications

● Power supply specifications (FX5S CPU module)

Item	Specifications		
	FX5S-30M□	FX5S-40M□	FX5S-60M□
Rated voltage	100 to 240 V AC		
Voltage fluctuation range	-15%, +10%		
Frequency rating	50/60 Hz		
Allowable instantaneous power failure time	Operation can be continued upon occurrence of instantaneous power failure for 10 ms or less.		
Power fuse	250 V, 3.15 A Time-lag fuse		
Rush current	Max. 30 A 5 ms or less/100 V AC Max. 50 A 5 ms or less/200 V AC		
Power consumption*1	28 W	30 W	33 W
24 V DC service power supply capacity*2	Supply capacity when 24 V DC service power supply is used for input circuit of the CPU module	400 mA	
	Supply capacity when external power supply is used for input circuit of the CPU module		

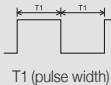
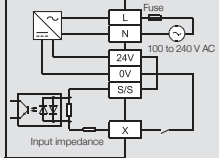
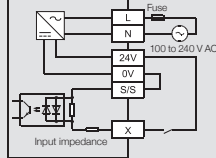
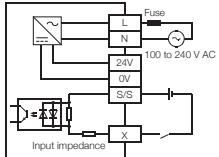
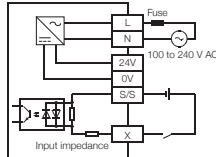
*1 : The values show the state where the service power of 24 V DC is consumed to the maximum level in case that its configuration has the max. number of connections provided to CPU module. (Including the current in the input circuit)

*2 : Use as power supply for input devices. (Cannot be used as an external power supply for expansion adapters.)

General, Power Supply, Input/Output Specifications

◆ Input specifications

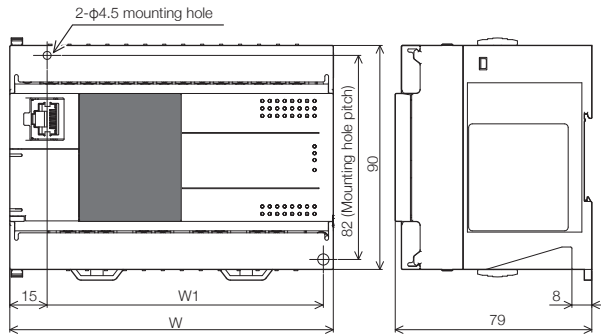
● Input specifications (FX5S CPU module)

Item		Specifications		
		FX5S-30M□	FX5S-40M□	FX5S-60M□
Number of input points		16 points	24 points	36 points
Connection type		Non-removable terminal block (M3 screws)		
Input type		Sink/source		
Input signal voltage		24 V DC +20%, -15%		
Input signal current	X0 to X7	5.1 mA/24 V DC		
	X10 and subsequent	4.0 mA/24 V DC		
Input impedance	X0 to X7	4.3 kΩ		
	X10 and subsequent	5.6 kΩ		
ON input sensitivity current	X0 to X7	3.5 mA or more		
	X10 and subsequent	3.0 mA or more		
OFF input sensitivity current		1.5 mA or less		
Input response frequency	X0, X1, X3, X4	100 kHz When capturing pulses of a response frequency of 50 to 100 kHz, refer to the manual.		
	X2, X5, X6, X7	10 kHz		
Pulse waveform	Waveform	 T1 (pulse width)		
	X0, X1, X3, X4	5 μs or more		
	X2, X5, X6, X7	50 μs or more		
	Waveform	 T2 (rise/fall time)		
	X0, X1, X3, X4	2.5 μs or less		
	X2, X5, X6, X7	25 μs or less		
Input response time (H/W filter delay)	X0, X1, X3, X4	ON: 5 μs or less OFF: 5 μs or less		
	X2, X5, X6, X7	ON: 30 μs or less OFF: 50 μs or less		
	X10 to X17	ON: 50 μs or less OFF: 150 μs or less		
	X20 and subsequent	ON: Approx. 10 ms OFF: Approx. 10 ms		
	X0 to X17	None, 10 μs, 50 μs, 0.1 ms, 0.2 ms, 0.4 ms, 0.6 ms, 1 ms, 5 ms, 10 ms (initial values), 20 ms, 70 ms When using this product in an environment with much noise, set the digital filter.		
Input signal format		No-voltage contact input Sink: NPN open collector transistor Source: PNP open collector transistor		
Input circuit insulation		Photocoupler		
Indication of input operation		LED is lit when input is on		
Input circuit configuration	AC power supply type	• When the 24 V DC service power supply is used Sink input wiring  Source input wiring 		
		• When an external power supply is used Sink input wiring  Source input wiring 		

External Dimensions

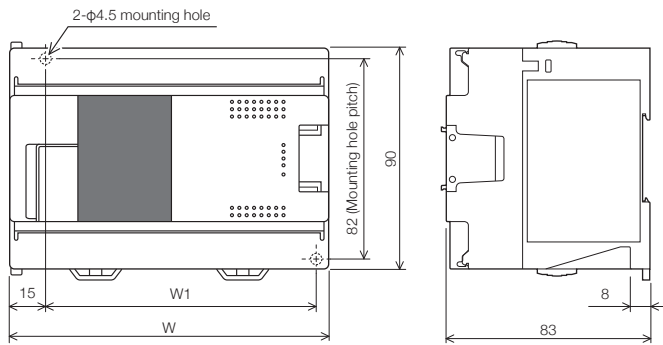
Unit: mm

CPU module



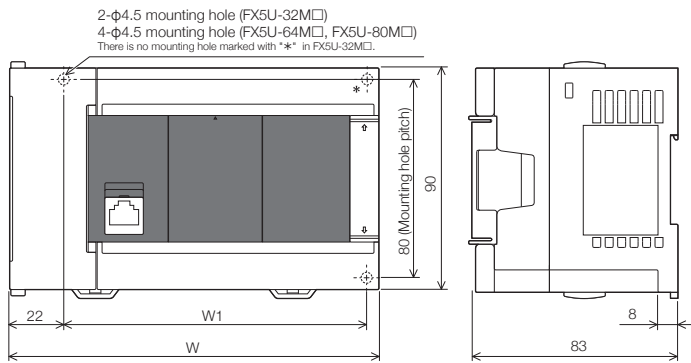
- External color: Main body, Munsell 0.6B7.6/0.2

Model	W: mm	W1: mm Mounting hole pitches	MASS (Weight): kg
FX5S-30M□	100	81	Approx. 0.45
FX5S-40M□	130	111	Approx. 0.55
FX5S-60M□	175	156	Approx. 0.65



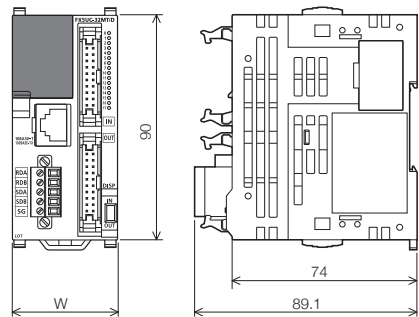
- External color: Main body, Munsell 0.6B7.6/0.2

Model	W: mm	W1: mm Mounting hole pitches	MASS (Weight): kg
FX5UJ-24M□	95	76	Approx. 0.55
FX5UJ-40M□	130	111	Approx. 0.65
FX5UJ-60M□	175	156	Approx. 0.80



- External color: Main body, Munsell 0.6B7.6/0.2

Model	W: mm	W1: mm Mounting hole pitches	MASS (Weight): kg
FX5U-32MR/ES, FX5U-32MT/ES, FX5U-32MT/ESS FX5U-32MR/DS, FX5U-32MT/DS, FX5U-32MT/DSS	150	123	Approx. 0.7
FX5U-64MR/ES, FX5U-64MT/ES, FX5U-64MT/ESS FX5U-64MR/DS, FX5U-64MT/DS, FX5U-64MT/DSS	220	193	Approx. 1.0
FX5U-80MR/ES, FX5U-80MT/ES, FX5U-80MT/ESS FX5U-80MR/DS, FX5U-80MT/DS, FX5U-80MT/DSS	285	258	Approx. 1.2



- External color: Main body, Munsell 0.6B7.6/0.2
- Accessories: FX2NC-100MPCB type power cable
FX2NC-100BPCB type power cable (FX5UC-□MT/D only)

Model	W: mm	MASS (Weight): kg
FX5UC-32MT/D, FX5UC-32MT/DSS	42.1	Approx. 0.2
FX5UC-64MT/D, FX5UC-64MT/DSS	62.2	Approx. 0.3
FX5UC-96MT/D, FX5UC-96MT/DSS	82.3	Approx. 0.35