



Bus Coupler Module
SX8R



Remote I/O System

Develop Robust Remote I/O Systems Using Our
Wide Range of I/O Modules

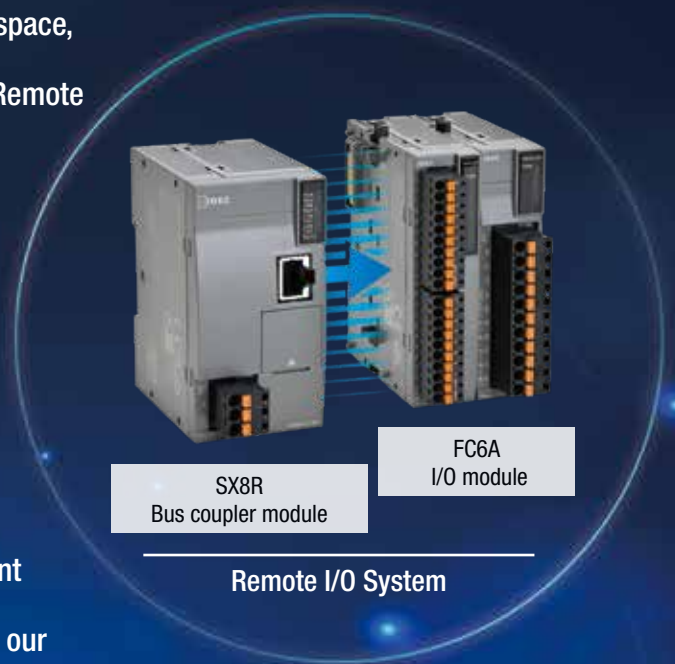


IDEC CORPORATION

In recent years, the trend has been towards designing smaller, decentralized control panels for facilities and equipment. This saves space, simplifies installation, and reduces wiring complexity. Remote I/O systems have been crucial in driving this change.

IDEC was among the pioneers in introducing micro-Programmable Logic Controllers to the market, catering to evolving control automation needs for decades.

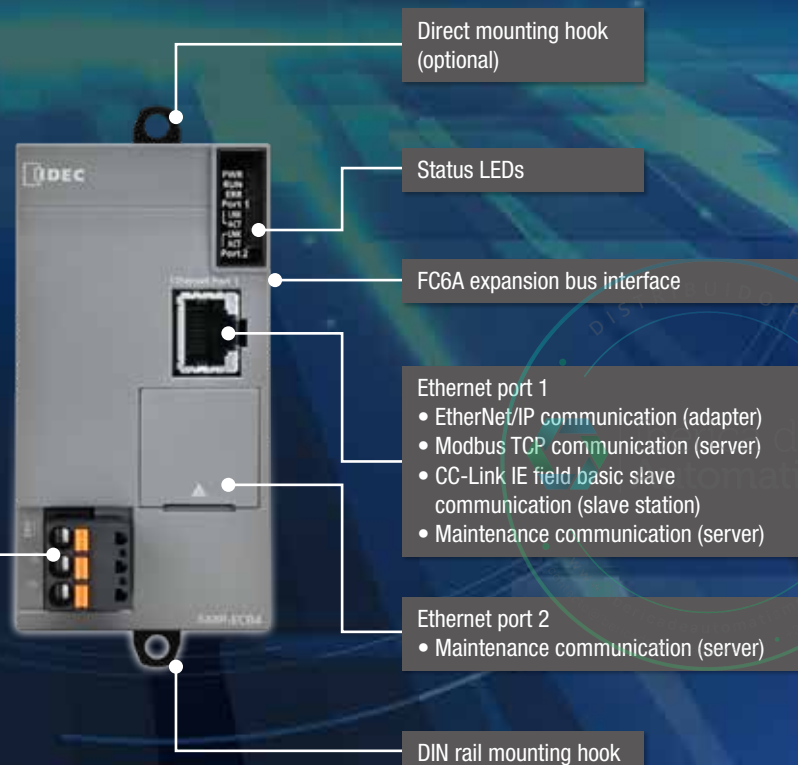
Our powerful SX8R bus coupler module offers significant efficiency enhancements for your systems. Paired with our MicroSmart FC6A I/O modules, it facilitates the seamless creation of a remote I/O system that can redefine your expectations.



SX8R

Bus coupler module

- SX8R-ECB4 (Push-in terminal)
- SX8R-ECB1 (Screw terminal)



Features

The SX8R bus coupler module speeds up the process from model selection to startup. Its compact, space-saving design allows you connect more devices, increasing the value of your equipment.

Compatible with major open networks

- EtherNet/IP (adapter)
- Modbus TCP (server)
- CC-Link IE field basic (slave station)

EtherNet/IP



Modbus TCP

CC-Link IE field Basic

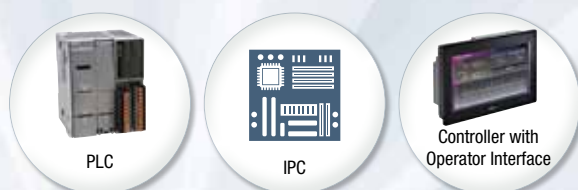
Wide range of I/O modules (48 models)

to build a highly efficient and suitable remote I/O system

- Digital input module (8, 16, 32 points)
- Digital output module (8, 16, 32 points)
- Digital mixed I/O modules (8, 24 points)
- Analog input module (2, 4, 8 points)
- Analog output module (2, 4 points)
- Analog mixed I/O modules (3, 6 points)

Maximum number of input/output points

- Digital input/output: 480 points
- Analog input: 120 points
- Analog output: 60 points



SX8R

Maximum 7 FC6A I/O modules

Max. 8 FC6A I/O modules

Ethernet port 1

Ethernet port 2



Input/Output



Windows PC



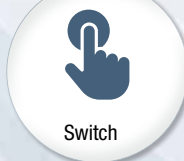
Easy-to-use configuration software

SX8R Configurator

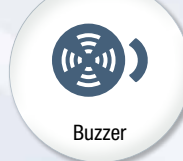
- Operation setting
- Status monitor
- System software update
- Search
- Project file management

Dedicated PC configuration tool

Utilized for configuring communication and module settings, as well as monitoring the status of each module



Switch



Buzzer



Temperature sensor



Inverter

Direct DIN rail mounting significantly reduces installation space, and the communication settings are minimal

Modules with push-in terminals reduces wiring time

(All FC6A I/O module models are available in both push-in terminal and screw terminal type)

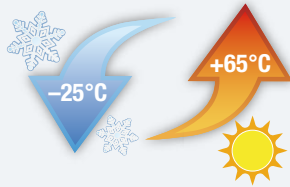


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Features

Wide operating temperature range

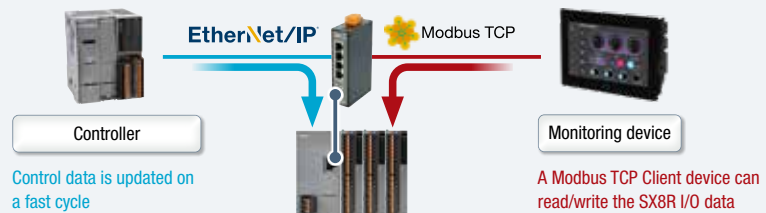
Suitable for use in hot and cold environments ranging from **-25 to +65°C**. (*1)



*1) The temperature range for FC6A-K4A□ and FC6A-L06A□ are from -10 to +55°C.

Simultaneous communication with two master stations

A controller and monitoring device can be connected at the same time, even on different networks. You can build a control and monitoring system with a single bus coupler.



*2) Simultaneous connection of EtherNet/IP and CC-Link IE Field Basic is not possible.

SX8R Configurator (PC configuration tool)

• Available for free download from the IDEC website

Module configuration editor for easy setup

Drag and drop functionality allows easy configuration of modules. The user-friendly menu navigation enables simple setup of each module.



Management and utilization of project data

The settings of the SX8R bus coupler module can be saved as a project file. Using a project file from another remote I/O system can significantly reduce startup time and effort.



Status monitor for individual modules

ON/OFF status of digital I/O modules, and current values, set values, and error information of analog I/O modules can be monitored remotely.



Self-diagnostic function & system software update

The SX8R is equipped with a self-diagnostic function that helps identify the location of any failures. If an error occurs in an I/O module, referring to the error details and solutions can help minimize downtime. Additionally, the system software versions of both the SX8R and the connected I/O modules can be upgraded.

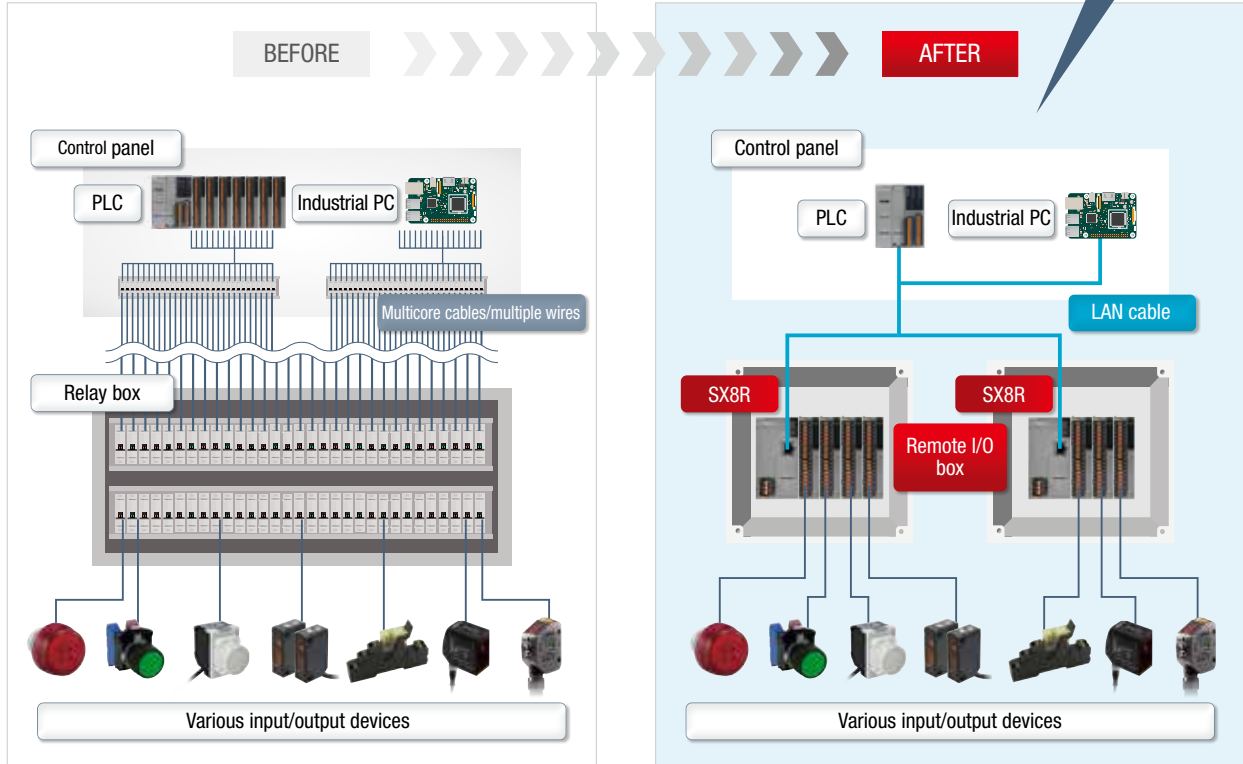


Applications

Remote I/O systems using industrial networks are widely used across various industries and sectors.

Advantages of a remote I/O system

Wiring is simplified with a single cable, reducing time and minimizing noise that was caused by routing wires.



Wastewater treatment



Food / packaging machines



Transportation equipment / conveyors



HVAC (air-conditioning control, chiller market)



Machine tools



Irrigation and agriculture



SX8R Bus Coupler Module

Reliable Remote I/O System with Various I/O Modules for Versatile Applications



• See our website for details on approvals and standards.



SX8R bus coupler module

Quantity: 1

Terminal	Power	Communication protocol		Part No.
		Ethernet port 1	Ethernet port 2	
Push-in	24V DC	Modbus TCP communication (server)	Maintenance communication (server)	SX8R-ECB4
Screw		EtherNet/IP communication (adapter) CC-Link IE field basic slave communication (slave station) Maintenance communication (server)		SX8R-ECB1

Configuration tool

Name	Description	Operating environment
SX8R Configurator	PC configuration tool to program communication and module settings, and monitor the status of each module.	Windows10 or Windows11

Operating environment

Operating temperature		-25 to +65°C (no freezing)
Storage temperature		-25 to +70°C (no freezing)
Operating humidity		10 to 95% (no condensation)
Storage humidity		10 to 95% (no condensation)
Pollution degree		2 (IEC 60664-1)
Degree of protection		IP20 (IEC 60529)
Corrosion immunity		Free from corrosive gas
Altitude or atmospheric pressure		In operation: 1,013 to 795hPa (0 to 2,000m) In transport: 1,013 to 701hPa (0 to 3,000m)
Installation location		Inside cabinet
Device class		Open type apparatus
Vibration resistance	DIN rail mount	5 to 8.4Hz / half amplitude 3.5mm, 8.4 to 150Hz / acceleration 9.8m/s ² (1G)
	Panel mount	2 hours each on three mutually perpendicular axes (IEC/EN61131-2)
Shock resistance		147m/s ² (15G)11ms 3 shocks each on three mutually perpendicular axes (IEC 61131-2)
EMC resistance		Compatible with IEC/EN 61131-2 zone B

Communication port specifications

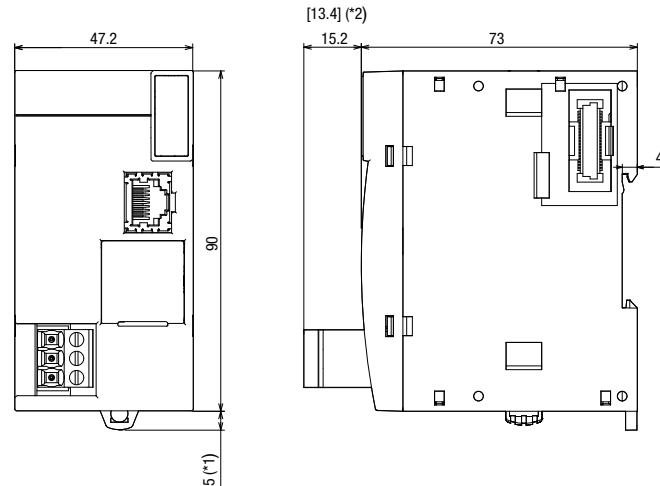
Communication type		IEEE802.3 compliant 10BASE-T, 100BASE-TX (Auto MDI/MDI-X supported)
Communication protocol	Ethernet port 1	Compatible with: EtherNet/IP communication (adapter), Modbus TCP communication (server), CC-Link IE Field Basic communication (slave station), and maintenance communication (server)
	Ethernet port 2	Maintenance communication (server) supported
EtherNet/IP communication specifications		I/O message communication function RPI (communication cycle): 2ms to 10s (in 1ms increments)
Connector		RJ45
Cable		STP, CAT 5 or higher
Maximum cable length		100 m
Isolation between internal circuit		Pulse transformer isolation

Electrical specifications

Part No.		SX8R-ECB1	SX8R-ECB4
Rated power voltage		External power supply: 24V DC	
Allowable voltage range		20.4 to 28.8V DC (including ripple)	
Current draw	Internal power supply	—	
	External power supply	When connected with max. load: 0.85A (24V DC)	
Allowable momentary power interruption		10ms maximum (at the rated power voltage)	
Isolation between internal circuit		Not isolated	
Dielectric strength		Power supply terminal - FE: 500V AC, 1 minute	
Insulation resistance		Power supply terminal - FE: 10MΩ min. (500V DC megger)	
Inrush current		35A maximum	
Grounding		Class D grounding (class 3 grounding)	
Grounding wire		UL 1007 AWG16	
Power supply wire		UL 1007 AWG24 to 16, UL 2464 AWG24 to 16, UL 1015 AWG20 to 16	
Power supply connector insertion/removal durability		100 times minimum	
Effect of improper power supply connection		Reverse polarity: No operation, no damage Improper voltage: Permanent damage may occur Improper wiring connection: Permanent damage may occur	
Weight		Approx. 165g	

Dimensions

All dimensions in mm.

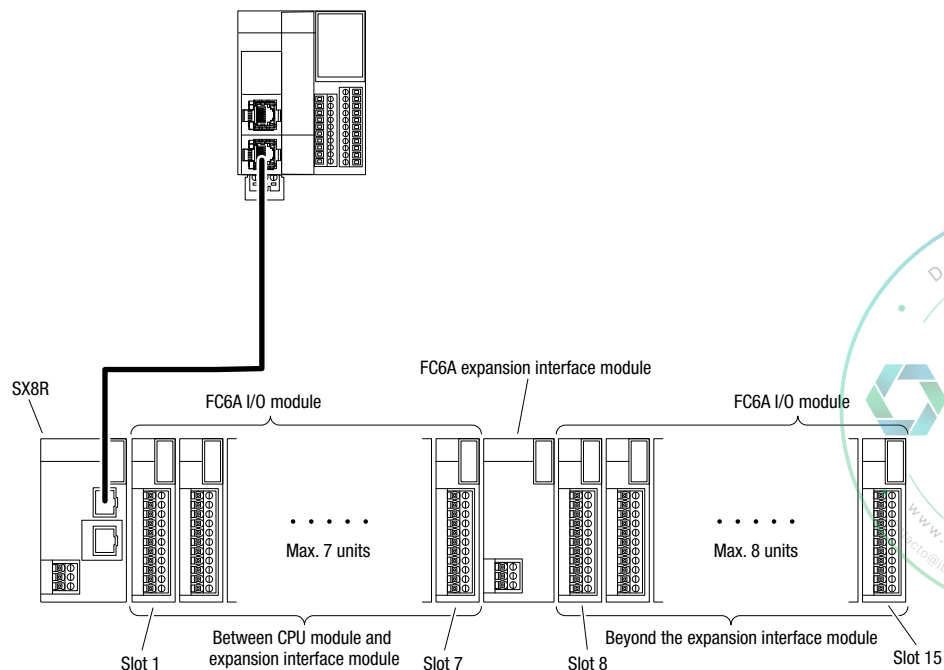


*1) When the hook is pulled out: 9.3mm.

*2) Screw terminal type. Dimension in [] is for the push-in terminal type.

System configuration

- A maximum of seven I/O modules can be connected on the right side (between CPU module and expansion interface module) of the SX8R. When using an expansion interface module, additional eight I/O modules can be connected on the right side (beyond the expansion interface module) of the expansion interface module. Slot numbers (1 - 15) are allocated in order of connection, from the I/O modules connected to the SX8R.



FC6A I/O Modules

Maximum of 15 of the following IDEC FC6A I/O modules can be connected to the SX8R Bus coupler module.

Digital I/O module

Digital input module

Quantity: 1

Type	Terminal specifications			Part No.
8 point DC input	Detachable	5.08mm pitch	11-pin, screw connector	FC6A-N08B1
	Detachable	5.08mm pitch	11-pin, push-in connector	FC6A-N08B4
16 point DC input	Detachable	3.81mm pitch	10-pin, screw connector	FC6A-N16B1
	Detachable	3.81mm pitch	10-pin, push-in connector	FC6A-N16B4
16 point DC input	20-pin MIL connector			FC6A-N16B3
32 point DC input				FC6A-N32B3
8 point AC input	Detachable	5.08mm pitch	11-pin, screw connector	FC6A-N08A11
	Detachable	5.08mm pitch	11-pin, push-in connector	FC6A-N08A14

Digital output module

Quantity: 1

Type	Terminal specifications			Part No.
8 point relay output	Detachable	5.08mm pitch	11-pin, screw connector	FC6A-R081
	Detachable	5.08mm pitch	11-pin, push-in connector	FC6A-R084
16 point relay output	Detachable	3.81mm pitch	10-pin, screw connector	FC6A-R161
	Detachable	3.81mm pitch	10-pin, push-in connector	FC6A-R164
8 point transistor sink output	Detachable	5.08mm pitch	11-pin, screw connector	FC6A-T08K1
	Detachable	5.08mm pitch	11-pin, push-in connector	FC6A-T08K4
8 point transistor source output	Detachable	5.08mm pitch	11-pin, screw connector	FC6A-T08P1
	Detachable	5.08mm pitch	11-pin, push-in connector	FC6A-T08P4
16 point transistor sink output	Detachable	3.81mm pitch	10-pin, screw connector	FC6A-T16K1
	20-pin MIL connector			FC6A-T16K3
	Detachable	3.81mm pitch	10-pin, push-in connector	FC6A-T16K4
16 point transistor source output	Detachable	3.81mm pitch	10-pin, screw connector	FC6A-T16P1
	20-pin MIL connector			FC6A-T16P3
	Detachable	3.81mm pitch	10-pin, push-in connector	FC6A-T16P4
32 point transistor sink output	20-pin MIL connector			FC6A-T32K3
32 point transistor source output	20-pin MIL connector			FC6A-T32P3

Digital mixed I/O modules

Type	Input	Output	Terminal specifications	Part No.
8 point mixed I/O	4 point DC input sink/source	4 point relay output 240V AC, 2A 30V DC, 2A	Detachable 5.08mm pitch 11-pin, screw connector	FC6A-M08BR1
			Detachable 5.08mm pitch 11-pin, push-in connector	FC6A-M08BR4
24 point mixed I/O	16 point DC input sink/source	8 point relay output 240V AC, 2A 30V DC, 2A	Detachable 3.81mm pitch 17-pin, screw connector	FC6A-M24BR1
			Detachable 3.81mm pitch 11-pin, screw connector	
			Detachable 3.81mm pitch 17-pin, push-in connector	FC6A-M24BR4
			Detachable 3.81mm pitch 11-pin, push-in connector	

FC6A I/O Modules

Analog I/O module

Analog input module

Quantity: 1

Input type	Output type	I/O points	Terminal specifications	Part No.
Voltage input (0 to 10V, -10 to +10V) Current input (0 to 20mA, 4 to 20mA)	—	2 point analog input	Detachable 5.08mm pitch 11-pin, screw connector	FC6A-J2C1
			Detachable 5.08mm pitch 11-pin, push-in connector	FC6A-J2C4
	—	4 point analog input	Detachable 3.81mm pitch 10-pin, screw connector	FC6A-J4A1
			Detachable 3.81mm pitch 10-pin, push-in connector	FC6A-J4A4
	—	8 point analog input	Detachable 3.81mm pitch 10-pin, screw connector	FC6A-J8A1
			Detachable 3.81mm pitch 10-pin, push-in connector	FC6A-J8A4
Voltage input (0 to 10V, -10 to +10V) Current input (0 to 20mA, 4 to 20mA) Thermocouple (K, J, R, S, B, E, T, N, C) RTDs (Ni100, Ni1000, PT100, PT1000)	—	4 point analog input	Detachable 3.81mm pitch 10-pin, screw connector	FC6A-J4CN1
			Detachable 3.81mm pitch 10-pin, push-in connector	FC6A-J4CN4
Thermocouple (K, J, R, S, B, E, T, N, C)	—	Insulation type between channels 4 point analog input	Detachable 3.81mm pitch 10-pin, screw connector	FC6A-J4CH1Y
			Detachable 3.81mm pitch 10-pin, push-in connector	FC6A-J4CH4Y
Thermocouple (K, J, R, S, B, E, T, N, C) NTC/PTC thermistor input	—	8 point analog input	Detachable 3.81mm pitch 10-pin, screw connector	FC6A-J8CU1
			Detachable 3.81mm pitch 10-pin, push-in connector	FC6A-J8CU4

Analog output module

Quantity: 1

Input type	Output type	I/O points	Terminal specifications	Part No.
—	Voltage output (0 to 10V, -10 to +10V) Current output (0 to 20mA, 4 to 20mA)	2 point analog output	Detachable 5.08mm pitch 11-pin, screw connector	FC6A-K2A1
			Detachable 5.08mm pitch 11-pin, push-in connector	FC6A-K2A4
		4 point analog output	Detachable 5.08mm pitch 11-pin, screw connector	FC6A-K4A1
			Detachable 5.08mm pitch 11-pin, push-in connector	FC6A-K4A4

Analog mixed I/O modules

Quantity: 1

Input type	Output type	I/O points	Terminal specifications	Part No.
Voltage input (0 to 10V, -10 to +10V) Current input (0 to 20mA, 4 to 20mA)	Voltage output (0 to 10V, -10 to +10V) Current output (0 to 20mA, 4 to 20mA)	4 point analog input/ 2 point analog output	Detachable 3.81mm pitch 10-pin, screw connector	FC6A-L06A1
Detachable 3.81mm pitch 10-pin, push-in connector			FC6A-L06A4	
Voltage input (0 to 10V, -10 to +10V) Current input (0 to 20mA, 4 to 20mA) Thermocouple (K, J, R, S, B, E, T, N, C) RTDs (Ni100, Ni1000, PT100, PT1000)		2 point analog input/ 1 point analog output	Detachable 5.08mm pitch 11-pin, screw connector	FC6A-L03CN1
			Detachable 5.08mm pitch 11-pin, push-in connector	FC6A-L03CN4

FC6A Expansion Interface Modules

Quantity: 1

Type	Terminal specifications	Part No.
Expansion interface module	Detachable 5.08mm pitch, screw connector	FC6A-EXM2
	Detachable 5.08mm pitch, push-in connector	FC6A-EXM24

Accessories

Name		Specification		Part No.
Terminal block connector for expansion module (qty: 2)		5.08mm pitch	11-pin, screw terminal	FC6A-PMTB11PN02
		5.08mm pitch	11-pin, push-in terminal	FC6A-PMSB11PN02
		3.81mm pitch	10-pin, screw terminal	FC6A-PMTC10PN02
		3.81mm pitch	11-pin, screw terminal	FC6A-PMTC11PN02
		3.81mm pitch	17-pin, screw terminal	FC6A-PMTC17PN02
		3.81mm pitch	10-pin, push-in terminal	FC6A-PMSC10PN02
		3.81mm pitch	11-pin, push-in terminal	FC6A-PMSC11PN02
		3.81mm pitch	17-pin, push-in terminal	FC6A-PMSC17PN02
Power terminal block connector for SX8R and FC6A-EXM2 expansion interface module (qty: 2)		5.08mm pitch	3-pin, screw terminal	FC6A-PMTB03PN02
		5.08mm pitch	3-pin, push-in terminal	FC6A-PMSB03PN02
Direct mounting hook for FC6A expansion module (qty: 5)		Also compatible with FC6A expansion Interface modules		FC6A-PSP2PN05
35mm wide DIN rail (qty: 10)		Aluminum, 1m		BAA1000PN10
End clip (qty: 10)		—		BNL6PN10
I/O terminal cable	20-pole	Shielded Wire: UL758 style 20276 compliant MIL connector plastic: UL94-V0 compliant	0.5 m	FC9Z-H050A20
			1 m	FC9Z-H100A20
			2 m	FC9Z-H200A20
			3 m	FC9Z-H300A20
		Not shielded Wire: UL758 style 2651 compliant MIL connector plastic: UL94-V0 compliant	0.5 m	FC9Z-H050B20
			1 m	FC9Z-H100B20
			2 m	FC9Z-H200B20
			3 m	FC9Z-H300B20

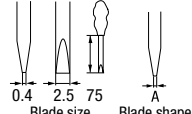
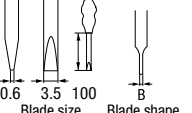
Recommended Ferrules

Item	Wire size (stranded wire)		Color	Part No.	Wire strip length	Quantity
	AWG	mm ²				
Recommended ferrule With insulation cover Standard package 	24	0.25	Light blue	S3TL-H025-12WJ	10 to 11 mm	500
	22	0.34	Turquoise	S3TL-H034-12WT	10 to 11 mm	
	20	0.50	Orange	S3TL-H05-14WA	10 to 11 mm	
	18	0.75	White	S3TL-H075-14WW	10 to 11 mm	
	18	1.00	Yellow	S3TL-H10-14WY	10 to 11 mm	
	16	1.50	Gray	S3TL-H40-20DC	10 to 11 mm	

- Other insulation cover colors available. For details, see catalog EP1747.
- Recommended ferrules differ for each equipment. For details, see the user's manual.



Tools

Name / Shape	Part No.	Quantity	Remarks
Auto-adjust stripping tool 	S3TL-ST06	1	PVC-insulated thin stranded and solid wires 0.08 to 6mm ² (28AWG to 10AWG)
Crimping tool (for ferrules) 	S3TL-CR04T	1	Crimping range 0.5 to 4mm ² /30AWG to 12AWG 
Crimping tool (for ferrules) 	S3TL-CR06D	1	Crimping range 0.25 to 6mm ² /24AWG to 10AWG 
Insulated screwdriver 	S3TL-D04-25-75	1	Blade size (unit: mm), for 3.81mm pitch terminal block connectors 
	S3TL-D06-35-100	1	Blade size (unit: mm), for 5.08mm pitch terminal block connectors 

Operating Environment (FC6A I/O Modules and FC6A Expansion Interface Modules)

Operating temperature	-10 to +55°C (no freezing)
Expanded operating temperature	-25 to -10°C, +55 to +65°C (*1) (no freezing)
Storage temperature	-25 to +70°C (no freezing)
Operating humidity	10 to 95% (no condensation)
Storage humidity	10 to 95% (no condensation)
Pollution degree	2 (IEC 60664-1)
Degree of protection	IP20 (IEC 60529)
Corrosion immunity	Free from corrosive gas
Altitude or atmospheric pressure	During operation: 1,013 to 795hPa (0 to 2,000m); During transportation: 1,013 to 701hPa (0 to 3,000m)
Installation location	Inside panel
Device class	Open type apparatus
Overvoltage category	II
Vibration resistance	DIN rail mount Panel mount
Shock resistance	147m/s ² (15G) 11ms axes, 6 directions, 3 times each (IEC 61131-2)
EMC resistance	IEC/EN61131-2, Zone B compatibility

*1) The expanded ambient operating temperatures are applicable to the following versions or higher.

Digital I/O modules : V300 or higher

Analog I/O modules (FC6A-J2C□, -J4A□, -J8A□, -L03CN□, -J4CN□) : V300 or higher

Analog I/O modules (FC6A-K2A□, -J8CU□, -J4CH□Y) : V200 or higher

Expansion interface modules : V200 or higher

The expanded ambient operating temperatures are not applicable to FC6A-K4A□, -L06A□ analog modules.

• Specify the type of terminal in place of □ in the Part No. 1: Screw 4: Push-in



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Specifications (FC6A I/O Modules)

Digital I/O module

Digital input modules

Part No.		FC6A-N08B□	FC6A-N16B□	FC6A-N16B3	FC6A-N32B3	FC6A-N08A1□
Input points		8 (8/1 common)	16 (16/1 common)		32 (16/1 common)	8 (4/1 common)
Rated input voltage		12/24V DC sink/source (24V DC for products lower than V400)				100 to 120V AC
Operating input voltage range		0 to 28.8V DC				0 to 132V AC (50/60Hz)
Rated input current		7mA/1 point (at 24V DC), 3.5mA/1 point (at 12V DC)		5mA/1 point (at 24V DC), 2.5mA/1 point (at 12V DC)		15mA/1 point (at 120V AC, 60Hz)
Input impedance		3.4kΩ		4.4kΩ		8kΩ (at 60Hz)
Operating level	OFF voltage	5V maximum				20V maximum
	ON voltage	10.2V minimum (15V or more for products lower than V400)				79V minimum
	OFF current	1.2mA maximum		0.9mA maximum		—
	ON current	2.8mA minimum (4.2mA minimum for products lower than V400)		2.2mA minimum (3.2mA minimum for products lower than V400)		—
Input delay time (24V DC)	OFF - > ON	4.1ms				25ms
	ON - > OFF	4.1ms				30ms
Isolation		Between channels: not isolated Internal Circuit: photocoupler-isolated				Between same common channels: not isolated Between 2 common channels: isolated Between input and internal circuit: photocoupler-isolated
External load for I/O interconnection		Not required				
Signal determination method		Static				
Effect of improper input connection		Both sink and source can be connected. If any input exceeding the rated value is applied, permanent damage may be caused.				If any input exceeding the rated value is applied, permanent damage may be caused.
Cable length		3m in compliance with electromagnetic immunity				—
Internal current draw	All ON	30mA (5V DC) 0mA (24V DC)	40mA (5V DC) 0mA (24V DC)	40mA (5V DC) 0mA (24V DC)	65mA (5V DC) 0mA (24V DC)	40mA (5V DC) 0mA (24V DC)
	All OFF	20mA (5V DC) 0mA (24V DC)	20mA (5V DC) 0mA (24V DC)	20mA (5V DC) 0mA (24V DC)	20mA (5V DC) 0mA (24V DC)	20mA (5V DC) 0mA (24V DC)
Internal power consumption: (at 24V DC while all I/Os are ON)		0.20W	0.27W	0.27W	0.44W	0.27W
Connector	Insertion/ removal durability	100 times				
Weight (approx.)		FC6A-N08B1: 110g FC6A-N08B4: 95g	FC6A-N16B1: 105g FC6A-N16B4: 95g	75g	110g	FC6A-N08A11: 110g FC6A-N08A14: 95g

- Specify the type of terminal in place of □ in the Part No. 1: Screw 4: Push-in
- Note: See page 11 for operating conditions.



Specifications (FC6A I/O Modules)

Digital I/O module

Relay output modules

Part No.		FC6A-R08□	FC6A-R16□
Output points		8 (4/1 common)	16 (8/1 common)
Output type		1NO contact	
Load current	1 point	2A maximum	
	1 common	7A maximum	8A maximum
Minimum switching load		1mA/5V DC (reference value)	
Initial contact resistance		30mΩ maximum	
Electrical life		100,000 times min. (rated resistance load: 1,800 operations/hour)	
Mechanical life		20 million times min. (no load: 18,000 operations/hour)	
Rated load current		Resistive load: 240V AC 2A, 30V DC 2A Inductive load: 240V AC 2A (cosφ = 0.4), 30V DC 2A (L / R = 7ms)	
Dielectric strength		Between output and ground terminals: 2,300V AC, 1 minute Between output terminal and internal circuit: 2,300V AC, 1 minute Between output terminals (between COMs): 2,300V AC, 1 minute	
Internal current draw	All ON	35mA (5V DC) 50mA (24V DC)	50mA (5V DC) 100mA (24V DC)
	All OFF	20mA (5V DC) 0mA (24V DC)	20mA (5V DC) 0mA (24V DC)
Internal power consumption: (at 24V DC while all I/Os are ON)		1.44W	2.74W
Connector	Insertion/removal durability	100 times	
Weight (approx.)		FC6A-R081: 130g FC6A-R084: 115g	FC6A-R161: 140g FC6A-R164: 130g

- Specify the type of terminal in place of □ in the Part No. 1: Screw 4: Push-in
- Note: See page 11 for operating conditions.

Transistor output modules

Part No.		FC6A-T08K□	FC6A-T08P□	FC6A-T16K□	FC6A-T16P□	FC6A-T16K3	FC6A-T16P3	FC6A-T32K3	FC6A-T32P3
Number of output		8 (8/1 common)			16 (16/1 common)			32 (16/1 common)	
Output type		FC6A-T□K□: transistor sink output FC6A-T□P□: transistor source output							
Rated load voltage		12V/24V DC	24V DC	12V/24V DC	24V DC	12V/24V DC	24V DC	12V/24V DC	24V DC
Input voltage range		10.2 to 28.8V DC	20.4 to 28.8V DC	10.2 to 28.8V DC	20.4 to 28.8V DC	10.2 to 28.8V DC	20.4 to 28.8V DC	10.2 to 28.8V DC	20.4 to 28.8V DC
Load current	1 point	0.5A maximum				0.1A maximum			
	1 common	3A maximum				1A maximum			
Output delay time	OFF - > ON	450μs maximum							
	ON - > OFF	450μs maximum							
Isolation		Between output terminal and internal circuit: Photocoupler-isolated Between output terminals: Not isolated							
Voltage drop (ON voltage)		0.4V maximum: voltage between COM and output terminal when output is on							
Allowable inrush current		1A maximum							
Leakage current		0.1mA maximum							
Clamp voltage		Approx. 50V							
Clamp load		12W maximum				2.4W maximum			
Inductive load		L / R = 10ms (28.8V DC, 1Hz)							
External current draw		FC6A-T□K□: 100mA maximum, 12/24V DC (+V terminal power supply) FC6A-T□P□: 100mA maximum, 24V DC (-V terminal power supply)							
Overcurrent Protection	Transistor sink output	Not available							
	Transistor source output	Available							
Internal current draw	All ON	25mA (5V DC) 15mA (24V DC)		30mA (5V DC) 25mA (24V DC)			45mA (5V DC) 50mA (24V DC)		
	All OFF	20mA (5V DC) 0mA (24V DC)		20mA (5V DC) 0mA (24V DC)			20mA (5V DC) 0mA (24V DC)		
Internal power consumption: (at 24V DC while all I/Os are ON)		0.53W		0.80W			1.50W		
Connector	Insertion/removal durability	100 times							
Weight (approx.)		FC6A-T08K1/ FC6A-T08P1: 110g		FC6A-T16K1/ FC6A-T16P1: 105g		75g		115g	
		FC6A-T08K4/ FC6A-T08P4: 95g		FC6A-T16K4/ FC6A-T16P4: 95g					

- Specify the type of terminal in place of □ in the Part No. 1: Screw 4: Push-in
- Note: See page 11 for operating environment.

Specifications (FC6A I/O Modules)

Digital I/O module

Mixed I/O modules

Part No.		FC6A-M08BR□	FC6A-M24BR□
Input specifications	Input points	4 (4/1 common)	16 (16/1 common)
	Rated input voltage	12/24V DC sink/source (24V DC for products lower than V400)	
	Operating input voltage range	0 to 28.8V DC	
	Input current	7mA/1 point (at 24V DC), 3.5mA/1 point (at 12V DC)	
	Input impedance	3.4kΩ	
	Operating level	OFF voltage	5V maximum
		ON voltage	10.2V minimum (15V minimum for products lower than V400)
		OFF current	1.2mA maximum
		ON current	2.8mA minimum (4.2mA minimum for products lower than V400)
	Input delay time (24V DC)	OFF -> ON	4.1ms
		ON -> OFF	4.1ms
	Isolation	Between channels: Not isolated Internal circuit: Photocoupler-isolated	
	External load for I/O interconnection	Not required	
	Signal determination method	Static	
	Effect of improper input connection	Both sink and source input signals can be connected. If any input exceeding the rated value is applied, permanent damage may be caused.	
	Cable length	3m in compliance with electromagnetic immunity	
Output specifications	Number of output	4 (4/1 common)	8 (4/1 common)
	Output type	1NO	
	Load current	1 point	2A maximum
		1 common	7A maximum
	Minimum switching load	1mA/5V DC (reference value)	
	Initial contact resistance	30mΩ maximum	
	Electrical life	100,000 times min. (rated resistance load: 1,800 operations/hour)	
	Mechanical life	20 million times min. (no load: 18,000 operations/hour)	
	Rated load current	Resistive load: 240V AC 2A, 30V DC 2A Inductive load: 240V AC 2A ($\cos\phi = 0.4$), 30V DC 2A (L / R = 7ms)	
	Dielectric strength	Between output and ground terminals: 2,300V AC, 1 minute Between output terminal and internal circuit: 2,300V AC, 1 minute Between output terminals (COMs): 2,300V AC, 1 minute	
	Internal current draw	All ON	30mA (5V DC) 25mA (24V DC)
		All OFF	20mA (5V DC) 0mA (24V DC)
	Internal power consumption: (at 24V DC while all I/Os are ON)	0.80W	
	Connector	Insertion/removal durability	
	Weight (approx.)	FC6A-M08BR1: 120g FC6A-M08BR4: 100g	FC6A-M24BR1: 165g FC6A-M24BR4: 155g

• Specify a terminal type code in place of □ in the Part No. 1: Screw, 4: Push-in

Note: See page 11 for operating environment.



Specifications (FC6A I/O Modules)

Analog I/O module

Performance Specifications

Part No.	FC6A-J2C□	FC6A-J4A□	FC6A-J8A□	FC6A-L06A□ (*2)	FC6A-L03CN□ (*3)	FC6A-J4CN□	FC6A-J4CH□Y	FC6A-J8CU□	FC6A-K2A□	FC6A-K4A□ (*2)
Input points	2	4	8	4	2	4	4	8	—	—
Input type	Voltage input (0 to 10V) Voltage input (-10 to +10V) Current input (0 to 20mA) Current input (4 to 20mA)				Voltage input (0 to 10V) Voltage input (-10 to +10V) Current input (0 to 20mA) Current input (4 to 20mA) Thermocouple RTD		Thermocouple	Thermocouple NTC/PTC thermistor resistors	—	—
Output points	—	—	—	2	1	—	—	—	2	4
Output type	—	—	—	Voltage output (0 to 10V) Voltage output (-10 to +10V) Current output (0 to 20mA) Current output (4 to 20mA)	—	—	—	—	Voltage output (0 to 10V) Voltage output (-10 to +10V) Current output (0 to 20mA) Current output (4 to 20mA)	—
External power supply	Rated power voltage: 12V/24V DC; Allowable voltage range: 10.2 to 28.8V DC (24V DC and 20.4 to 28.8V DC for FC6A-L06A□ and K4A□)									
External current draw (*1)	50mA (12V DC) 25mA (24V DC)	60mA (12V DC) 30mA (24V DC)	80mA (12V DC) 40mA (24V DC)	100mA (12V DC) (24V DC)	160mA (12V DC) 80mA (24V DC)	80mA (12V DC) 40mA (24V DC)	80mA (12V DC) 40mA (24V DC)	60mA (12V DC) 30mA (24V DC)	140mA (12V DC) 70mA (24V DC)	125mA (24V DC)
Internal current draw (5V DC)	40mA max.	45mA max.	40mA max.	55mA max.	60mA max.	50mA max.	50mA max.	45mA max.	40mA max.	50mA max.
Internal power consumption (at 24V DC)	0.27W	0.30W	0.27W	0.37W	0.37W	0.34W	0.34W	0.30W	0.27W	0.34W
Connector	Insertion/removal durability: 100 times									
Weight (approx.)	FC6A-J2C1: 115g FC6A-J2C4: 100g	FC6A-J4A1: 110g FC6A-J4A4: 100g	FC6A-J8A1: 110g FC6A-J8A4: 100g	FC6A-L06A1: 110g FC6A-L06A4: 100g	FC6A-L03CN1: 115g FC6A-L03CN4: 100g	FC6A-J4CN1: 110g FC6A-J4CN4: 100g	FC6A-J4CH1Y: 110g FC6A-J4CH4Y: 100g	FC6A-J8CU1: 110g FC6A-J8CU4: 100g	FC6A-K2A1: 115g FC6A-K2A4: 100g	FC6A-K4A1: 115g FC6A-K4A4: 100g

- Specify the type of terminal in place of □ in the Part No. 1: Screw 4: Push-in
- *1) The external current draw is the value when all the analog inputs are used and the analog output value is at 100%.
- *2) FC6A-K4A□ and -L06A□ cannot be used under the expanded ambient operating temperature (-25 to -10°C, +55 to +65°C).
- *3) Do not use FC6A-L03CN□ analog voltage output in an environment exceeding ambient temperature 55°C.
- Note: See page 11 for operating environment.

Input performance specifications by range

Part No.		FC6A-J2C□		FC6A-J8A□		FC6A-J4A□/FC6A-L06A□	
Input type		Voltage input	Current input	Voltage input	Current input	Voltage input	Current input
Input range		0 to 10V -10 to +10V	0 to 20mA 4 to 20mA	0 to 10V -10 to +10V	0 to 20mA 4 to 20mA	0 to 10V -10 to +10V	0 to 20mA 4 to 20mA
Input impedance		1MΩ minimum	50Ω minimum	1MΩ minimum	50Ω minimum	1MΩ minimum	50Ω minimum
Input detection current		—	—	—	—	—	—
AD conversion	Sampling duration time	1ms		1ms or 10ms (selected in the SX8R Configurator)		1ms or 10ms (selected in the SX8R Configurator)	
	Sampling interval	Sampling duration time x number of active input channels					
	Total input delay time	Sampling duration time + sampling interval + 1 scan time					
	Type of input	Single-ended input					
	Operation mode	Self-scan					
	Conversion method	ΣΔ type ADC					
Input error	Maximum error at 25°C	±0.1% of full scale		±0.2% of full scale		±0.2% of full scale	
	Cold junction compensation accuracy	—	—	—	—	—	—
	Temperature coefficient	±0.006%/°C of full scale		±0.01%/°C of full scale		±0.01%/°C of full scale	
Data	Digital resolution	65,536 increments (16 bit)		65,536 increments (16 bit) (* 1)		4,096 increments (12 bit)	
	Input value of LSB	0 to 10V: 0.15mV -10 to +10V: 0.30mV	0 to 20mA: 0.30μA 4 to 20mA: 0.244μA	0 to 10V: 0.15mV -10 to +10V: 0.30mV	0 to 20mA: 0.30μA 4 to 20mA: 0.244μA	0 to 10V: 2.44mV -10 to +10V:4.88mV	0 to 20mA: 4.88μA 4 to 20mA: 3.91μA
	Data type in application program	Optional : -32,768 to +32,767 (selectable for each channel) (*2)					
	Monotonicity	Yes					
	Input data out of range	Detectable (*3)					
Noise Resistance	Input filter	Soft filter (0 to 50 sec, at 0.05 sec intervals) (selectable with SX8R Configurator)					
	Recommended cable	Shielded pair cable					
	Crosstalk	1LSB maximum					
Isolation	Between input and power circuit	Transformer-isolated					
	Between input and internal circuit	Photocoupler-isolated					
Effect of improper input connection		No damage					
Maximum permanent allowed overload (No damage)		30V DC (*4)	160mA (*5)	30V DC	160mA (*5)	30V DC	160mA (*5)
Change input type and range		Use SX8R Configurator					
Calibration or verification to maintain rated accuracy		Not possible					

- Specify the type of terminal in place of □ in the Part No. 1: Screw 4: Push-in
- *1) FC6A-J8A□ (Versions earlier than 200) supports 4096 (12 bit) digital resolution. The input values per increment are as follows:
Voltage: 2.44mV (0 to 10 V), 4.88mV (-10 to +10 V) Current: 4.88μA (0 to 20mA), 3.91μA (4 to 20mA)
When using FC6A-J8A□ (Version 200 or later), the digital resolution can be selected from 12 bits or 16 bits in analog I/O module configuration parameter setting of the SX8R configurator.
- *2) The data processed in the analog I/O module can be linear-converted to a value between -32768 and 32767. The optional range designation, and analog I/O data minimum and maximum values can be selected using data registers allocated to analog I/O modules
- *3) Input data out of range is reflected in the status of the analog I/O module.
- *4) FC6A Ver. 200 and later: voltage input 13V DC, current input 40mA DC
- *5) If current of more than 160mA is applied at 25°C, a protect function works to protect the input circuit by reducing current. However, when a current is applied at a voltage of more than 30V DC, the circuit will be damaged.

Specifications (FC6A I/O Modules)

Analog I/O module

Input performance specifications by range

Part No.		FC6A-L03CN□/FC6A-J4CN□				FC6A-J4CH□Y		FC6A-J8CU□	
Input type		Voltage input	Current input	Resistance thermometer	Thermocouple	Thermocouple	Thermocouple	NTC thermistor	PTC thermistor
Input range		0 to 10V -10 to +10V	0 to 20mA 4 to 20mA	Pt100 (-200 to +850°C) Pt1000 (-200 to +600°C) (3-wire) Ni100 (-60 to +180°C) Ni1000 (-60 to +180°C) (3-wire)	K type (-200 to +1,300°C) J type (-200 to +1,000°C) R type (0 to 1,760°C) S type (0 to 1,760°C) B type (0 to 1,820°C) E type (-200 to +800°C) T type (-200 to +400°C) N type (-200 to +1,300°C) C type (0 to 2,315°C)			-90 to +150°C	100 to 10,000Ω
Input impedance		1MΩ min.	50Ω max.	1MΩ min.	1MΩ min.	2MΩ min.	1MΩ min.	1MΩ min.	
Input detection current		—		0.1mA maximum	0.1mA maximum	0.1mA maximum	0.1mA maximum	0.1mA maximum	
AD conversion	Sampling duration time	10ms, 100ms (Selectable with SX8R Configurator)			104ms	30ms, 120ms (Selectable in SX8R Configurator)	104ms		
	Sampling intervals	Sampling duration time x number of active input channels							
	Total delay time	Sampling duration time + sampling interval + 1 scan time							
	Input type	Single end					Differential input	Single end	
	Operation mode	Self-scan							
	Conversion method	ΣΔ type ADC							
Input error	Maximum error at 25°C	±0.1% of full scale			FC6A-L03CN□: ±0.1% of full scale + cold junction compensation accuracy FC6A-J4CN□: ±0.2% of full scale + cold junction compensation accuracy (*3)		±0.2% of full scale + cold junction compensation accuracy (*3)	±0.2% of full scale + cold junction compensation accuracy (*3)	±0.2% of full scale
	Cold junction compensation accuracy	—	—	—	±4°C max.	±4°C max.	±4°C max.		
	Temperature coefficient	FC6A-L03CN□: ±0.006% of full scale/°C FC6A-J4CN□: ±0.01% of full scale/°C					±0.01% of full scale/°C	±0.01% of full scale/°C	
Data	Digital resolution	65,536 increments (16 bit)		Pt100: approx. 10,500 increments (14 bits) Pt1000: approx. 8,000 increments (13 bits) Ni100: approx. 2,400 increments (12 bits) Ni1000: approx. 2,400 increments (12 bits)	K type: approx. 15,000 increments (14 bits) J type: approx. 12,000 increments (14 bits) R type: approx. 17,600 increments (15 bits) S type: approx. 17,600 increments (15 bits) B type: approx. 18,200 increments (15 bits) E type: approx. 10,000 increments (14 bits) T type: approx. 6,000 increments (13 bits) N type: approx. 15,000 increments (14 bits) C type: approx. 23,150 increments (15 bits)			NTC: approx. 2,400 increments (12 bits) PTC: approx. 9,900 increments (14 bits)	
	Input values per increment	0 to 10V: 0.15mV -10 to +10V: 0.30mV	0 to 20mA: 0.30μA 4 to 20mA: 0.244μA	0.1°C	0.1°C	0.1°C	0.1°C	0.1°C	1Ω
	Data type in application program	Optional: -32,768 to +32,767 (selectable for each channel) (*1)							
	Monotonicity	Yes							
	Input data out of range	Detectable (*2)							
Noise immunity	Input filter	Soft filter (0 to 50 sec, at 0.05 sec intervals) (selectable with SX8R Configurator)							
	Recommended cable for noise immunity	Shielded pair cable			Non shielded pair cable				
	Crosstalk	1LSB maximum							
Isolation	Between input and power circuit	Transformer-isolated							
	Between input and internal circuit	Photocoupler-isolated							
	Between inputs	Not isolated					Photocoupler-isolated	Not isolated	
Effect of improper input connection		No damage							
Maximum permanent allowed overload (No damage)		30V DC (*4)	160mA (*5)	13V DC					
Change input type and range		Use SX8R Configurator							
Calibration or verification to maintain rated accuracy		Not possible							

• Specify a terminal type code in place of □ in the Part No. 1: Screw terminal, 4: push-in type.

*1) The data processed in the analog I/O module can be linear-converted to a value between -32768 and 32767. The optional range designation, and analog I/O data minimum and maximum values can be selected using data registers allocated to analog I/O modules

*2) When an error is detected, a corresponding error code is stored to a data register allocated to analog I/O operating status.

*3) R, S: ±6 (0 to 200°C) B: no compensation K, J, E, T, N: ±0.4% of full scale (0°C maximum)

*4) For modules of version 200 or earlier, the maximum permanent allowed overload is when the voltage input is set at 13V DC and the current input is set at 40mA.

*5) If current of more than 160mA is applied at 25°C, a protect function works to protect the input circuit by reducing current. However, when a current is applied at a voltage of more than 30V DC, the circuit will be damaged.

Specifications (FC6A I/O Modules)

Analog I/O module

Output performance specifications by range

Part No.		FC6A-K2A□/FC6A-L03CN□		FC6A-K4A□/FC6A-L06A□	
Output type Output range	Voltage	0 to 10V DC -10 to +10V DC			
	Current	0 to 20mA 4 to 20mA			
Load	Impedance	1kΩ minimum (voltage), 300Ω maximum (current)			
	Load type	Resistive load			
DA conversion	DA conversion time	1ms			
	Output update intervals	1ms			
	Total output system transfer time	DA conversion time + output update interval + 1 scan time			
Output error	Maximum error at 25°C	±0.1% of full scale		±0.2% of full scale	
	Temperature coefficient	±0.006%/°C of full scale		±0.01%/°C of full scale	
	Repeatability after stabilization time	±0.4% of full scale			
	Output voltage drop	No damage			
	Non-linearity	±0.01% of full scale		±0.2% of full scale	
	Output ripple	Max. 20mV			
	Overshoot	0%			
	Total error	±1% of full scale			
Data	Digital resolution		4,096 increments (12 bit)		
	Output value of LSB	Voltage	0 to 10V DC: 2.44mV -10 to +10V DC: 4.88mV		
		Current	0 to 20mA: 4.88μA 4 to 20mA: 3.91μA		
	Data type in application program		Optional : -32,768 to +32,767 (selectable for each channel)		
	Monotonicity		Yes		
	Current loop open		Undetectable		
Noise Immunity	Recommended cable for noise immunity		Shielded pair cable		
	Crosstalk		1LSB		
Isolation	Between output and power circuit		Trans isolation		
	Between output and internal circuit		Photocoupler-isolated		
Effects of improper output connection		Non-destructive			
Change output type		Use SX8R Configurator			
Calibration or verification to maintain rated accuracy		Not possible			

• Specify the type of terminal in place of □ in the Part No. 1: Screw 4: Push-in

Note: See page 11 for operating environment.

Specifications (FC6A Expansion Interface Modules)

Expansion interface module

Unibody

Part No.		FC6A-EXM2□
I/O expansion	Between CPU module and expansion interface module	Connectable I/O modules: 7 maximum (224 I/Os maximum)
	Beyond the expansion interface module	Connectable I/O modules: 8 maximum (256 I/Os maximum)
Rated power voltage		24V DC
Allowable voltage range		20.4 to 28.8V DC
Power consumption	Internal power	Internal power (supplied from CPU module): 20mA (5V DC), 0mA (24V DC)
	External power	With I/O modules (*1) 750mA (26.4V DC)
Maximum power consumption (*1) (external power)		0.5W (24V DC)
Allowable momentary power interruption		10ms maximum (24V DC)
Isolation between internal circuit		Not isolated
No. of connectable CPU		1
Connector	Insertion/removal durability	100 times
Weight (approx.)		150g

• Specify the type of terminal in place of □ in the Part No. 1: Screw 4: Push-in

*1) Power consumption by the expansion interface module and eight I/O modules.

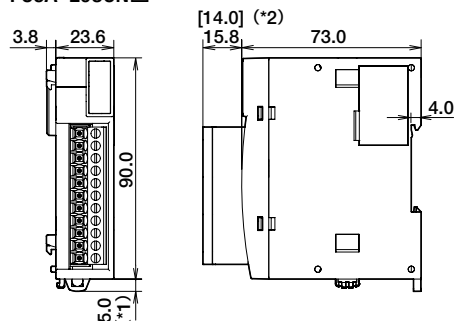
Note: See page 11 for operating environment.

External Dimensions (FC6A I/O Modules and FC6A Expansion Interface Modules)

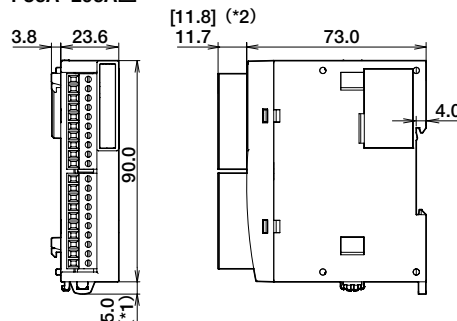
All dimensions in mm

I/O modules

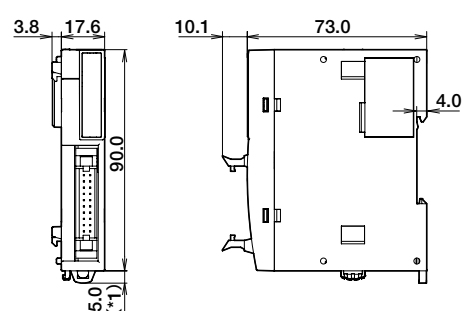
FC6A-N08B□ / FC6A-N08A1□ / FC6A-R08□
 FC6A-T08K□ / FC6A-T08P□ / FC6A-M08BR□
 FC6A-J2C□ / FC6A-K2A□ / FC6A-K4A□
 FC6A-L03CN□



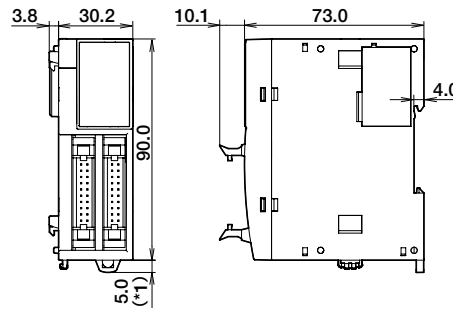
FC6A-N16B□ / FC6A-R16□ / FC6A-T16K□
 FC6A-T16P□ / FC6A-J4A□ / FC6A-J8A□
 FC6A-J4CN□ / FC6A-J4CH□Y / FC6A-J8CU□
 FC6A-L06A□



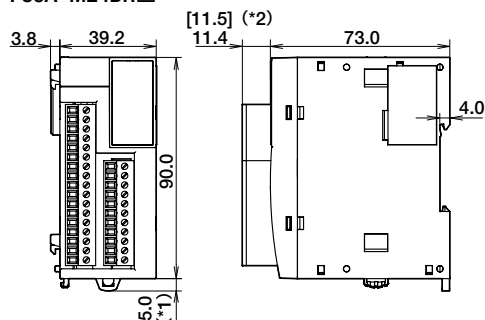
FC6A-N16B3/FC6A-T16K3
 FC6A-T16P3



FC6A-N32B3/FC6A-T32K3
 FC6A-T32P3



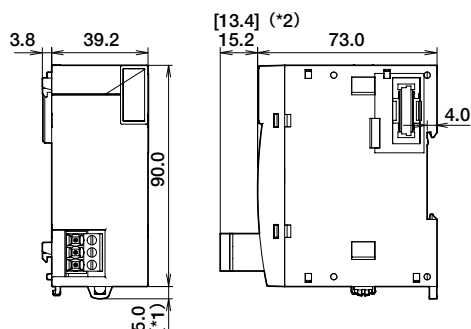
FC6A-M24BR□



Expansion interface modules

Unibody

FC6A-EXM2□



Note: Specify a terminal type code in place of □ in the Part No. (blank: screw fastened type, 4: Push-in type)

*1) 9.3 mm when the clamp is pulled out.

*2) [] indicates a dimension for Push-in type.

