Think Automation and beyond...

IDEC

MICROSmart pentra (FC5A) / MICROSmart (FC4A)

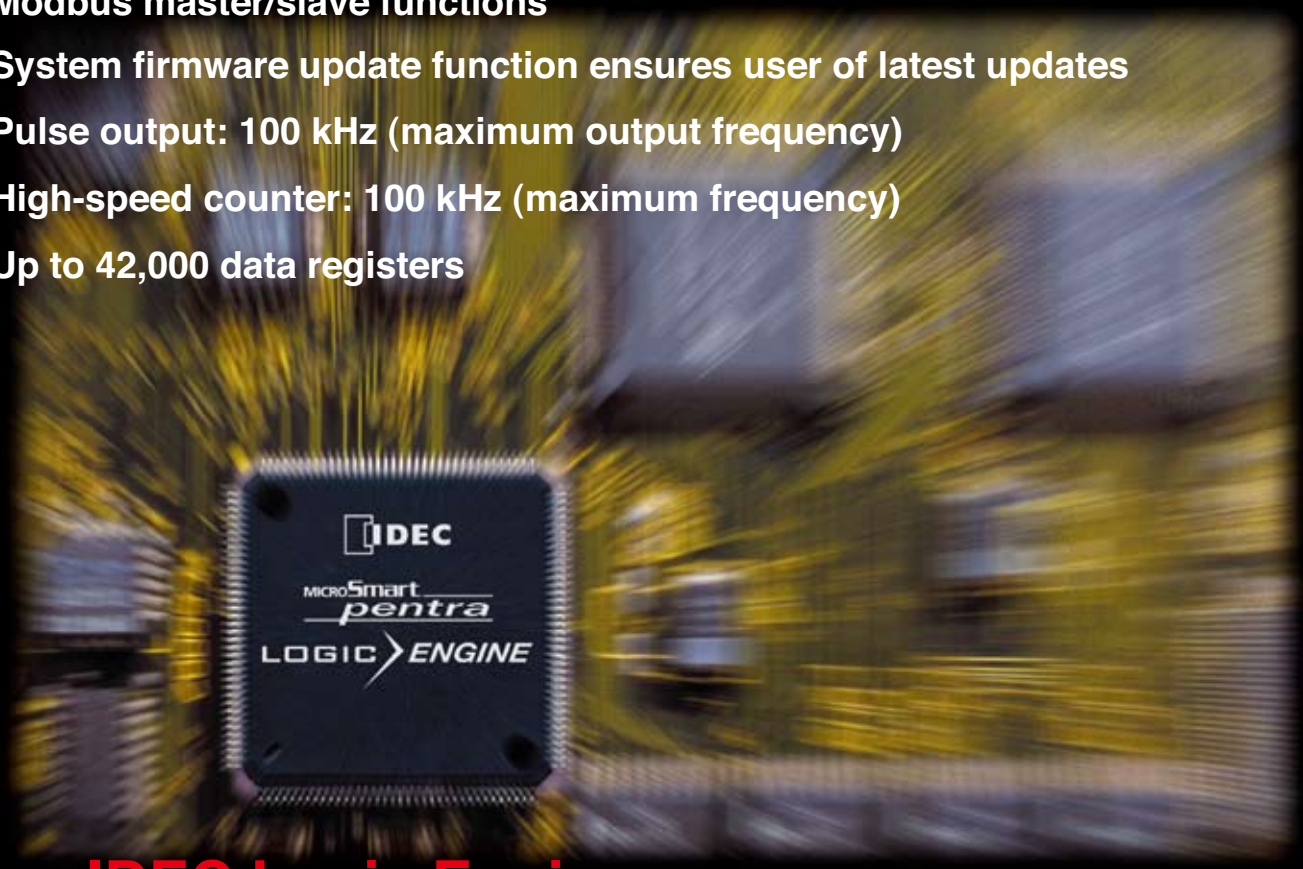
Micro Programmable Logic Controllers

IDEC CORPORATION

(08/02/08)

FC5A achieves world class speed and performance

- Fastest processing speed in its class
- Expandable up to 512 I/O points (with expansion interface modules)
- Double-word instructions
- Floating point math calculations
- PID auto-tuning
- Modbus master/slave functions
- System firmware update function ensures user of latest updates
- Pulse output: 100 kHz (maximum output frequency)
- High-speed counter: 100 kHz (maximum frequency)
- Up to 42,000 data registers



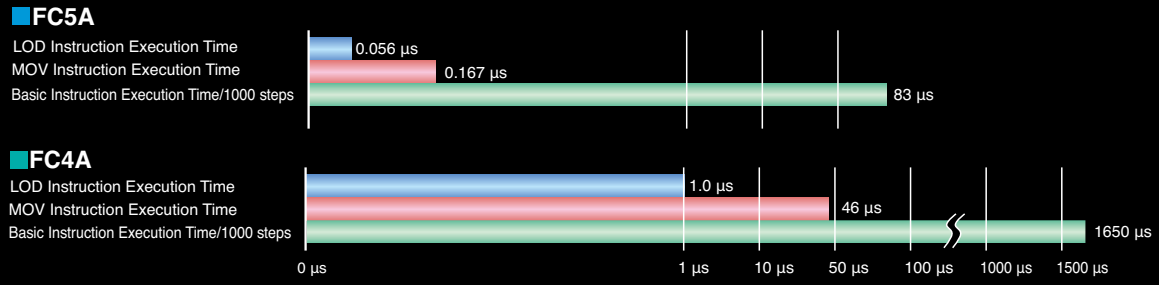
IDEC Logic Engine

*IDEC Logic Engine is a microprocessor exclusively designed for the FC5A.

IDEC Logic engine performance:

Basic instruction execution time—0.056 µs

MOV instruction execution time—0.167 µs



MICROSmart pentra

FC5A Slim Type CPU

- Program capacity: 62.4 KB
- Maximum I/O 512 points
  (with expansion interface modules)
- Instruction execution time
  Basic instruction LOD 0.056 μs
  Advanced instruction MOV 0.167 to 0.278 μs
- Modbus Master/Slave function
- High-speed counter maximum counting frequency
  100 kHz single/two-phase selectable: 2 points
  100 kHz single-phase: 2 points
- Pulse output
  Maximum output frequency: 100 kHz
  2-axis simultaneous control possible (for 1 pulse output)
- Floating point math calculations
- Double-word (32-bit) instruction calculations
- Connect up to two AS-Interface master modules
- User communication functions

FC5A All-in-One Type CPU

- Program capacity: 13.8 KB (10 I/O type)
  27 KB (16 I/O type)
  54 KB (24 I/O type)
- Maximum I/O 88 points
- Instruction execution time
  Basic instruction LOD 0.7 μs
  Advanced instruction MOV 33 μs
- Enhanced communication functions:
  10 I/O type available with port second port
  Modbus Master/Slave function
- High-Speed Counter Maximum counting frequency
  50 kHz, single/two-phase selectable: 1 point
  5 kHz, single-phase: 3 points
- Floating point math calculations
- Double-word (32-bit) instruction calculations
- User communication functions

MicroSmart FC5A/FC4A
Most Versatile Solution for Your Needs

FC5A CPU Modules

Slim Type

16 I/O Points

32 I/O Points

All-in-One Type

10 I/O Points

16 I/O Points

24 I/O Points

Specifications

		Slim Type				All-in-One Type		
Type		16 I/O Points		32 I/O Points		10 I/O Points	16 I/O Points	24 I/O Points
Type No.		FC5A-D16RK1	FC5A-D16RS1	FC5A-D32K3	FC5A-D32S3	FC5A-C10R2 FC5A-C10R2C	FC5A-C16R2 FC5A-C16R2C	FC5A-C24R2 FC5A-C24R2C
Inputs		8		16		6	9	14
Ouput	Transistor (Sink Output)	2	—	16	—	—	—	—
	Transistor (Source Output)	—	2	—	16	—	—	—
	Relay Output	6		—		4	7	10
Max. I/O		496 ∗1		512 ∗1		10	16	88 ∗2
Program Capacity		62.4 KB				13.8 KB	27 KB	54 KB
Instruction Execution Time		Basic instruction: LOD 0.056 μs Advanced instruction: MOV 0.167 to 0.278 μs				Basic instruction: LOD 0.7 μs Advanced instruction: MOV 33 μs		
High-speed Counter		High-speed counter maximum counting frequency 100 kHz, single/two phase-selectable: 2 points 100 kHz, single-phase: 2 points				High-speed counter maximum counting frequency 50 kHz, single/two phase-selectable: 1 points 5 kHz, single-phase: 3 points		
Pulse Output		2 points 100 kHz (2-axis simultaneous control)		3 points 100 kHz		—		
Communication Function Expansion	Maximum Ports	7				2	2	5
	RS232C Built in CPU	1				1	1	1
	RS232C Communication Adapter/Communication Module	1 ∗3				1 ∗3	1 ∗3	1 ∗3
	RS232C Expansion RS232C Communication Module	5				—	—	3
	RS485 Communication Adapter/Communication Module	1 ∗3				1 ∗3	1 ∗3	1 ∗3
	Modbus Function	Master/slave function (standard feature)				Master/slave function (standard feature)		
Option Module Combination	AS-Interface Master Module	Possible to mount 2 AS-Interface master modules				—	—	Possible (2 modules)
	Expansion RS232C Communication Module	Possible				—	—	Possible
	Analog I/O Module	Possible				—	—	Possible
	Analog I/O Module & AS-Interface Master Module	Possible				—		
	Analog I/O Module & Expansion RS232C Communication Module	Possible				—		
	AS-Interface Master Module & Expansion RS232C Communication Module	Possible				—		
	Expansion Interface Module	Possible				—		
	Web Server Module	Possible				Possible		
Width (mm)		47.5				80.0		95.0
Power Voltage		24V DC				FC5A-C□□R2 (AC type): 100V to 240V (50/60 Hz) FC5A-C□□R2C (DC type): 24V DC		

∗1 When using expansion I/O modules and expansion interface module.
∗2 When using expansion I/O modules.
∗3 Only one communication adapter or communication module can be connected to a CPU module.

FC4A CPU Modules

Slim Type

20 I/O Points
(Transistor Output)

20 I/O Points
(Transistor Output and Relay Output)

40 I/O Points

All-in-One Type

10 I/O Points

16 I/O Points

24 I/O Points

Specifications

		Slim Type						All-in-One Type		
Type		20 I/O Points		20 I/O Points		40 I/O Points		10 I/O Points	16 I/O Points	24 I/O Points
Type No.		FC4A-D20K3	FC4A-D20S3	FC4A-D20RK1	FC4A-D20RS1	FC4A-D40K3	FC4A-D40S3	FC4A-C10R2 FC4A-C10R2C	FC4A-C16R2 FC4A-C16R2C	FC4A-C24R2 FC4A-C24R2C
Inputs		12		12		24		6	9	14
Ouput	Transistor (Sink Output)	8	—	2	—	16	—	—	—	—
	Transistor (Source Output)	—	8	—	2	—	16	—	—	—
	Relay Output	—	—	6	6	—	—	4	7	10
Max. I/O		148 ∗1		244 ∗1		264 ∗1		10	16	88 ∗1
Program Capacity		27 KB		31.2 KB				4.8 KB	15 KB	27 KB
Instruction Execution Time		Basic instruction: LOD 1 μs Advanced instruction: MOV 46 μs						Basic instruction: LOD 1 μs Advanced instruction: MOV 46 μs		
High-speed Counter		High-speed counter maximum counting frequency 20 kHz, single/two phase-selectable: 2 points 5 kHz, single-phase: 2 points						High-speed counter maximum counting frequency 20 kHz, single/two phase-selectable: 1 points 5 kHz, single-phase: 3 points		
Pulse Output		2 points (1- or 2-axis control)						—		
Communication Function Expansion	Maximum Ports	2						1	2	2
	RS-232C Built-in CPU	1						1	1	1
	RS-232C Communication Adapter/Communication Module	1 ∗2						—	1 ∗2	1 ∗2
	RS-232C Expansion RS232C Communication Module	—						—		
	RS-485 Communication Adapter/Communication Module	1 ∗2						1 ∗2		
	Modbus Function	—						—		
Option Module Combination	AS-Interface Master Module	—		Possible to mount 1 AS-Interface master module				—		
	Expansion RS232C Communication Module	—						—		
	Analog I/O Module	Possible						—		Possible
	Analog I/O Module & AS-Interface Master Module	—		Possible		Possible		—		
	Analog I/O Module & Expansion RS232C Communication Module	—						—		
	AS-Interface Master Module & Expansion RS232C Communication Module	—						—		
	Expansion Interface Module	—						—		
	Web Server Module	Possible						Possible		
Width (mm)		35.4				47.5		80.0		95.0
Power Voltage		24V DC						FC4A-C□□R2 (AC type): 100V to 240V (50/60 Hz) FC4A-C□□R2C (DC type): 24V DC		

∗1 When using expansion I/O modules.
∗2 Only one communication adapter or communication module can be connected to a CPU module.

A Large Choice of Expansion Modules

Expansion Module Specifications






Web Server Module

Input Modules

Type	FC4A-N08B1	FC4A-N16B1	FC4A-N16B3	FC4A-N32B3	FC4A-N08A11
Input Points	8 (8/1 common)	16 (16/1 common)	16 (16/1 common)	32 (16/1 common)	8 (8/2 common)
Input Type	24V DC sink/source	24V DC sink/source	24V DC sink/source	24V DC sink/source	100 to 120V AC
Terminal	Removable terminal block		MIL connector		Removable terminal block
Width (mm)	23.5	23.5	17.6	29.7	23.5

Output Modules

Type	FC4A-R081	FC4A-R161	FC4A-T08K1	FC4A-T08S1	FC4A-T16K3	FC4A-T16S3	FC4A-T32K3	FC4A-T32S3
Output Points	8 (4/1 common)	16 (8/1 common)	8 (8/1 common)	8 (8/1 common)	16 (16/1 common)	16 (16/1 common)	32 (16/1 common)	32 (16/1 common)
Output Type	NO contact 2A/1 point	NO contact 2A/1 point	24V DC transistor sink output	24V DC transistor source output	24V DC transistor sink output	24V DC transistor source output	24V DC transistor sink output	24V DC transistor source output
Terminal	Removable terminal block				MIL connector			
Width (mm)	23.5	23.5	23.5	23.5	17.6	17.6	29.7	29.7

Mixed I/O Modules

Type	FC4A-M08BR1	FC4A-M24BR2
Input Points	4 (4/1 common)	16 (16/1 common)
Input Type	24V DC sink/source input signal	
Output Points	4 (4/1 common)	8 (4/1 common)
Output Type	NO contact, 2A/1 point 4 points/1 common	NO contact, 2A/1 point 4 points/1 common
Terminal	Removable terminal block	Wire clamp
Width (mm)	23.5	39.1

AS-Interface Master Module

Type	FC4A-AS62M
Maximum Bus Cycle When 1 through 19 slaves are connected: 3ms When 20 through 62 slaves are connected : 0.156 × (1 + N) ms where N is the number of active slaves	5 ms maximum when 31 standard or A/B slaves are connected 10 ms maximum when 62 A/B slaves are connected
Maximum Slaves	Standard slaves: 31 A/B slaves: 62
Maximum I/O Points	Standard slaves: 124 inputs + 124 outputs A/B slaves: 248 inputs + 186 outputs
Width (mm)	23.5

Analog I/O Modules

Type		FC4A-L03A1	FC4A-L03AP1	FC4A-J8C1	FC4A-J8AT1	FC4A-J4CN1	FC4A-J2A1	FC4A-K2C1	FC4A-K1A1
Input	Points	2	2	8	8	4	2	—	—
	Range	Voltage: 0 to 10V Current: 4 to 20mA	Thermocouple Resistance Thermometer	Voltage: 0 to 10V Current: 4 to 20mA	NTC/PTC Thermistor	Voltage: 0 to 10V Current: 4 to 20mA Thermocouple Resistance Thermometer	Voltage: 0 to 10V Current: 4 to 20mA	—	—
Output	Points	1	1	—	—	—	—	2	1
	Range	Voltage: 0 to 10V Current: 4 to 20mA	Voltage: 0 to 10V Current: 4 to 20mA	—	—	—	—	Voltage: -10 to 10V Current: 4 to 20mA	Voltage: 0 to 10V Current: 4 to 20mA
Resolution		12 bits	12 bits	16 bits	12 bits	13 to 16 bits	12 bits	16 bits	12 bits
Terminal		Removable terminal block							
Width (mm)		23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5

Web Server Module

Type	FC4A-SX5ES1E
Language	English
Operating Voltage	24V DC
Communication	RS232C <=> Ethernet conversion function
Connection Method	See page 27

Expansion RS232 Communication Module

Type	FC5A-SIF2
Electrical Characteristics	RS232C, 1 port
Baud Rate (bps)	38400
Synchronization	Start-stop synchronization
Width (mm)	23.5

Expansion Interface Module System Setup (FC5A Slim CPU)

FC5A-EXM1M
Expansion Interface Master Module

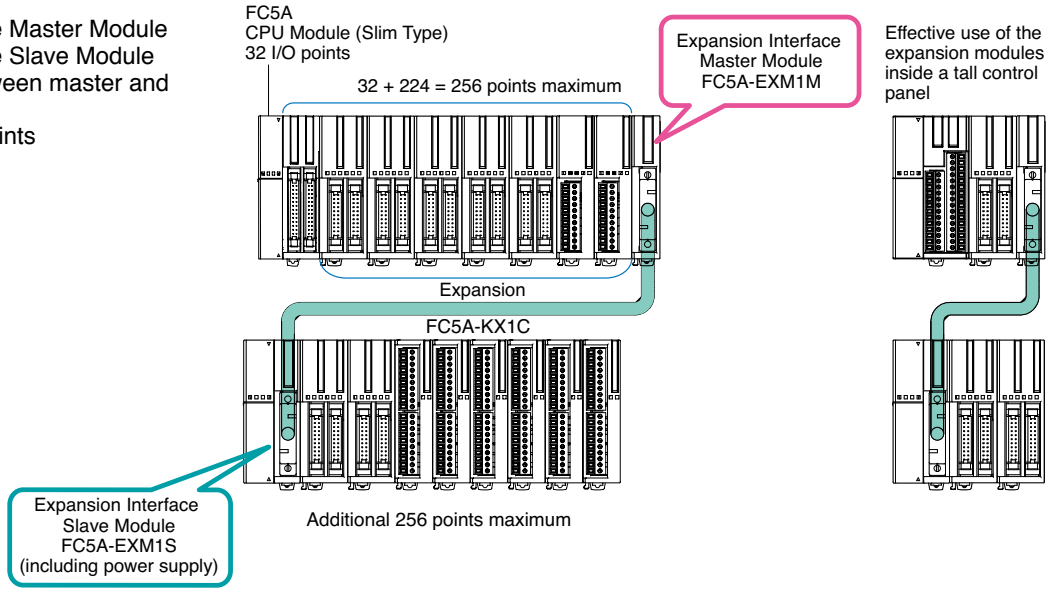
FC5A-EXM1S
Expansion Interface Slave Module

FC5A-EXM2
Expansion Interface Module

FC5A-KX1C
Expansion Interface Cable,1m

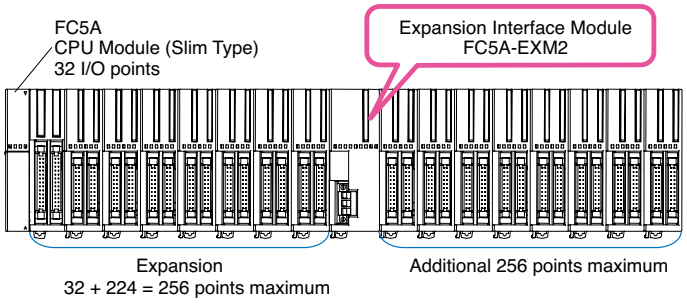
Example 1

Expansion Interface Master Module
Expansion Interface Slave Module
(with 1m cable between master and slave modules)
256 + 256 = 512 points



Example 2

Expansion Interface Module
(without cable)
256 + 256 = 512 points



Notes on connecting expansion interface modules
- Only digital I/O modules (except AC input module) can be connected.
- AC input module, analog I/O modules, AS-Interface master modules cannot be connected to to the right side of the expansion interface module.
- Digital I/O modules can be connected on either side of the expansion interface modules.

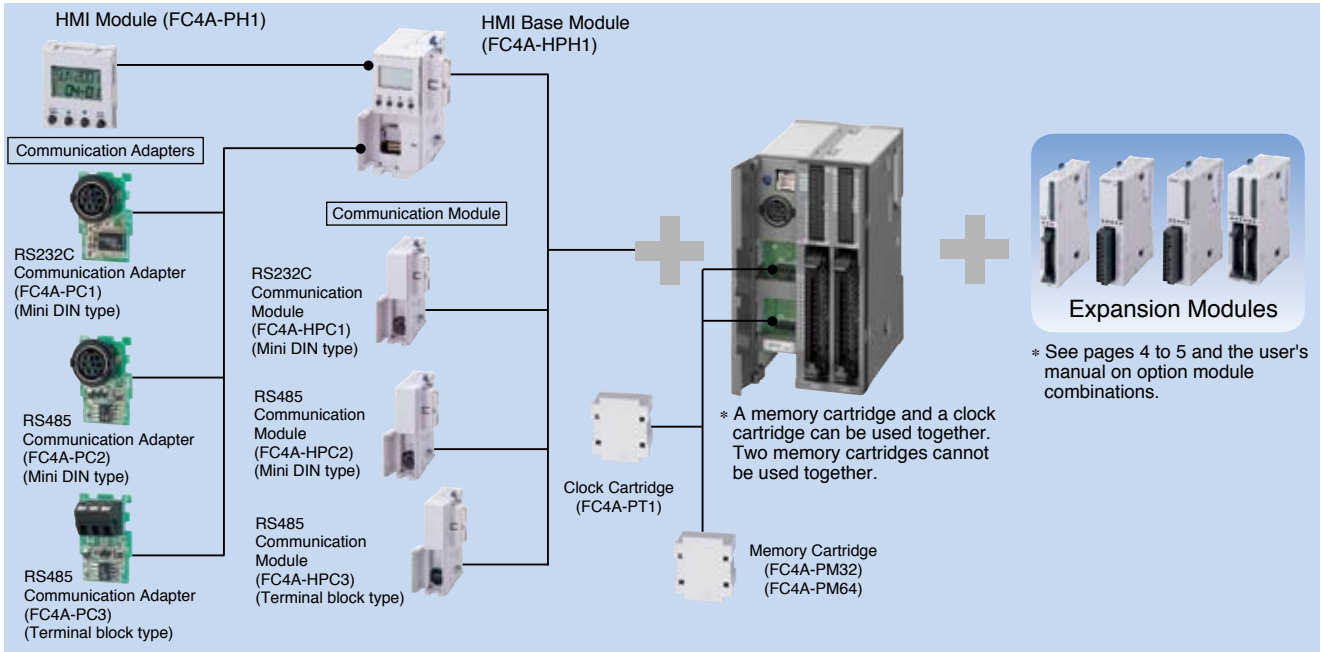
Expansion Interface Modules

Type No.	FC5A-EXM1M	FC5A-EXM1S	FC5A-EXM2
Type	Expansion interface master module	Expansion interface slave module	Expansion interface module
Operating Voltage	—	24V DC	24V DC
Isolation between Internal Circuit and Communication Port	Only communication interface part is isolated.		Not isolated
Cable Length	1m		—
Width (mm)	17.6	35.4	39.1

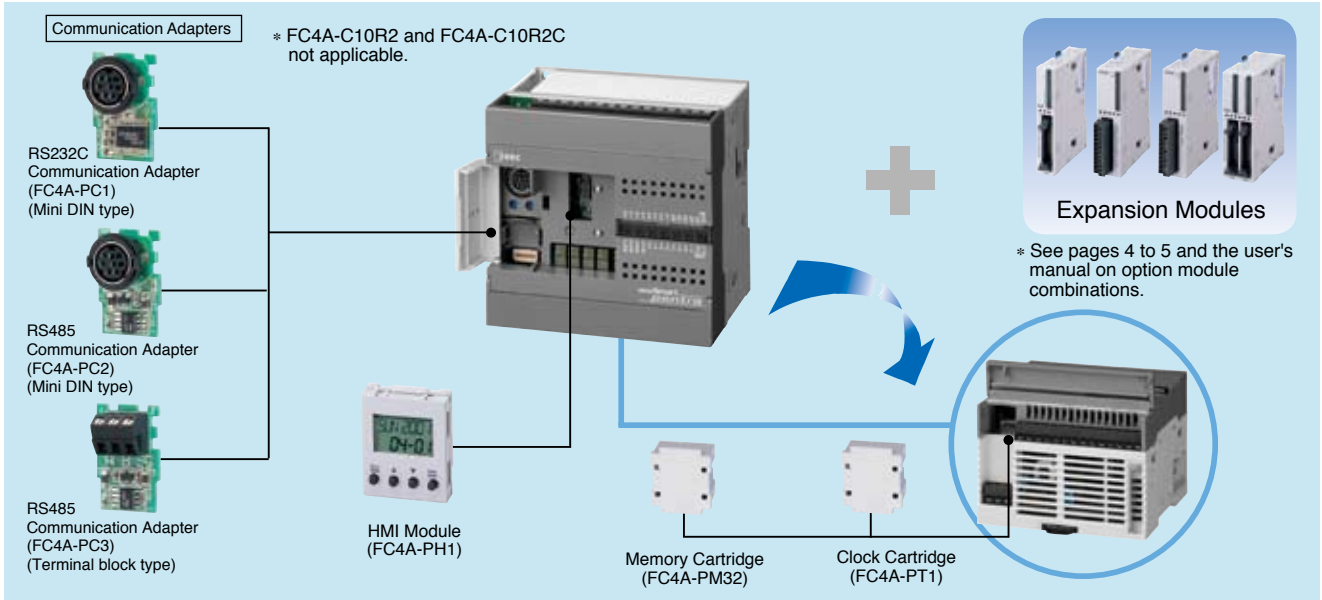
A Wide Variety of Optional Modules to Suit Almost All Applications

Optional Modules

Slim CPU



All-in-One CPU



HMI Module

Monitor and change the status and setup of timers and counters. Display and change operands without using a personal computer.

Functions include:

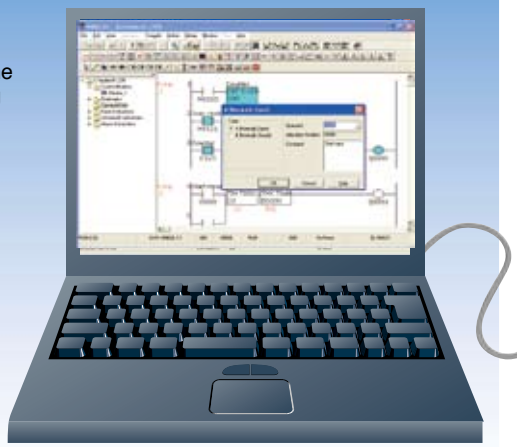
- Display timer/counter current values and change timer/counter preset values
- Display and change data register values
- Setting and resetting bit operand statuses, such as inputs, outputs, internal relays, and shift register bits
- Display and clear errors
- Start and stop the CPU module
- Display and change calendar/clock data (only when using the clock cartridge)
- Confirm changed timer/counter preset values

Programming Software — WindLDR

Applicable on Windows Vista

Online Edit

WindLDR allows you to edit and download a user program while the PLC is running. Online monitoring does not have to be shut down during programming.



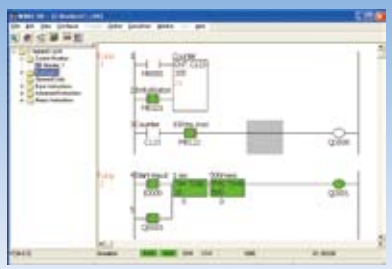
Basic Instructions: 42
Advanced Instructions: 130

∗Applicable instructions depend on the CPU module. Refer to pages 27 and 29 for details.

Forced I/O

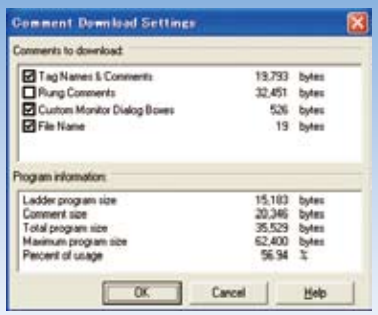
While the FC5A CPU module is running, I/Os of the PLC can be turned on and off in a forced I/O list for simulation, enabling user-friendly programming and providing an easy debugging environment.

Simulation



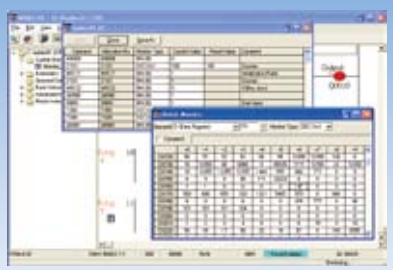
The operation of ladder programs can be confirmed easily on the WindLDR screen without connecting the PLC.

Comment Download



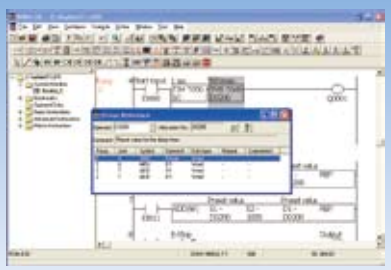
A user program can be downloaded with rung comments and tag names to the PLC. The original programmers and other engineers can maintain a user program.

Online Monitor



Multiple consecutive operands can be monitored by using the batch monitor function. Most frequently monitored operands can be saved in a file using the custom monitoring function.

Cross Reference



A list of cross references for operands can be displayed, making searching easy for replacing operands and cross referencing in ladder programs. Maintenance is significantly improved.

System Requirements

- OS: Windows Vista (32 bits)
  Windows XP
  Windows 2000
  Windows 98
  Windows 95
  NT4.0 (Service Pack 3 or later)
- CPU: Pentium II or later
- Memory: 64 MB
- Hard Disk: 40 MB of available hard disk space

Note: IDEC does not guarantee that all operations will function on all personal computers satisfying the above conditions.
WindLDR modem communication function cannot be used on Windows 95.
WindLDR Ver. 5.2 or higher can be used on Windows Vista.

For update information, visit http://smart.idec.com

Enhanced Functions of the MicroSmart Find a Wide Range of Applications

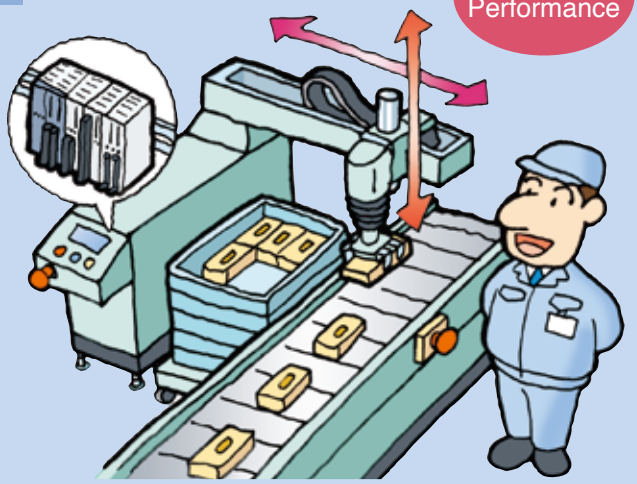
Trapezoidal/Pulse Output Function | Slim CPU

High Performance

Create a flexible program for placing items from a palette onto a conveyor belt.

Independent dual-axis control is performed using two pulse outputs. Locational values can be easily defined for precise position (trapezoidal) control.

- Pulse output instruction
- PWM instruction (Pulse width modulation control)

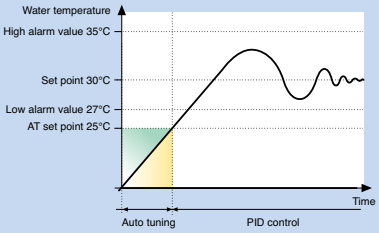


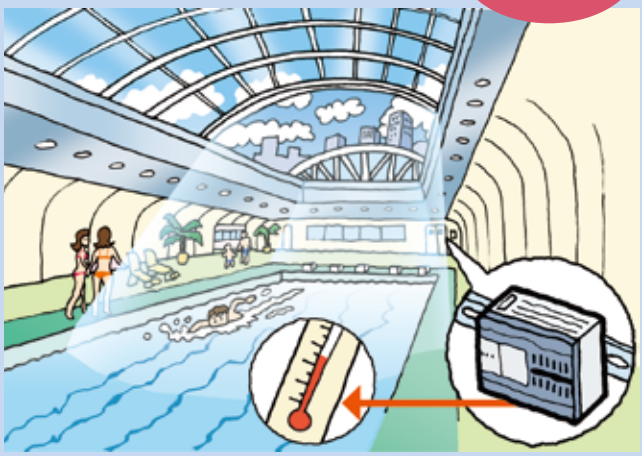
PID Control | Slim CPU | All-in-One 24-I/O CPU + Analog Module

High Performance

Maintain a constant water temperature of a swimming pool with a retractable dome roof, regardless of the ambient temperature

To automatically maintain predetermined water temperature using PID control, sampling is performed by the auto-tuning function. Based on the determined PID parameters, PID control is executed automatically.





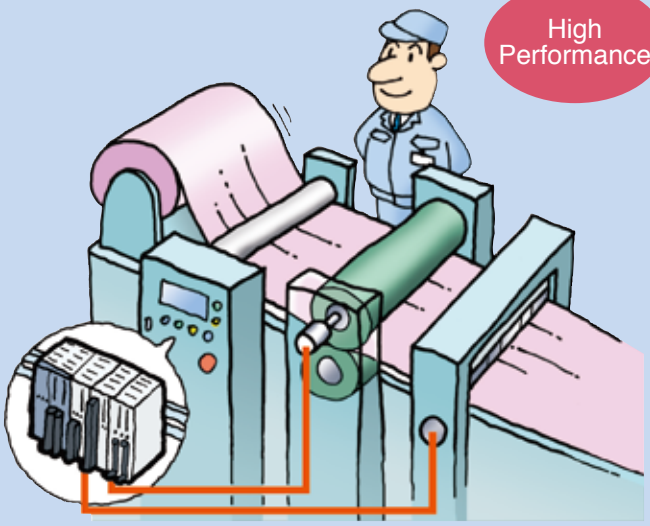
High-Speed Counter | Standard Function

High Performance

Cut a roll of fabric into equal lengths

A maximum of four high-speed counters can be used as either a two-phase or single-phase high-speed counter at a maximum count input frequency of 100 kHz (FC5A).

The high-speed counters can be used for counting high-speed pulses which cannot be counted by the normal user program processing.



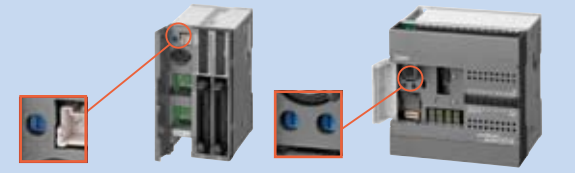
Analog Potentiometer | Standard Function

Increased Efficiency

Simplify on-site adjustments of output values for timer and other settings during system startup.

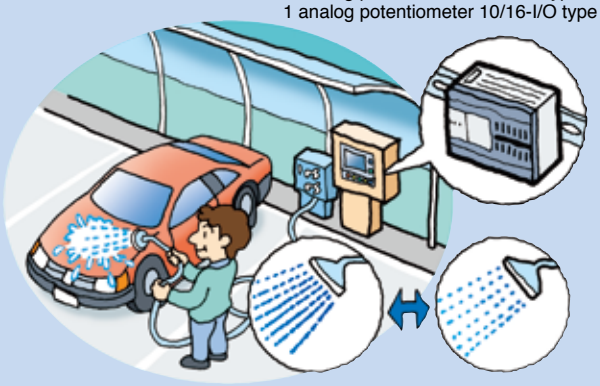
The analog potentiometer built into the CPU module enables settings to be adjusted without any special tools.

- Slim Type
- All-in-One Type



All models

2 analog potentiometers 24-I/O type
1 analog potentiometer 10/16-I/O type



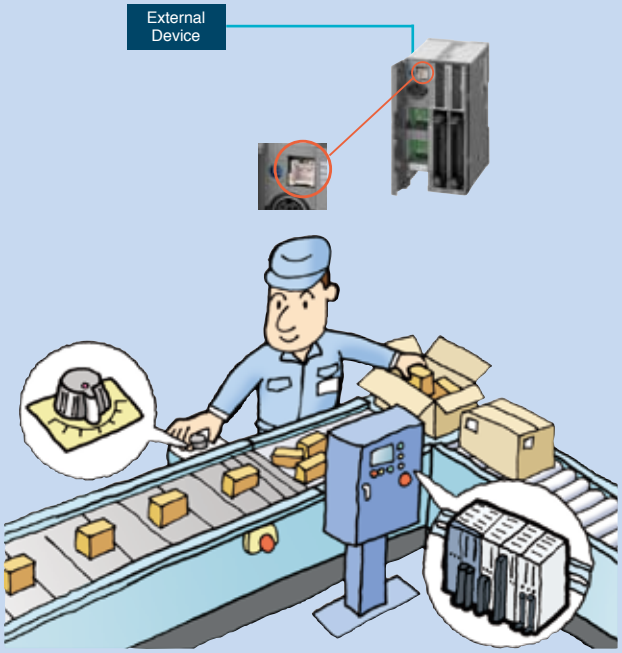
Minute adjustments of the flow rate can be performed with ease at a customer's site by adjusting the analog potentiometer inside the hinged lid. The analog potentiometer can be used to change settings after installation.

Built-in Analog Input | Slim CPU

Increased Efficiency

Change the value of analog data at a remote site away from the control system.

Ready for connecting 0 to 10V DC from an external device directly to the built-in analog voltage input connector incorporated in the slim type CPU module.



Frequency Measurement | Standard Function

The pulse frequency of input signals to input terminals can be counted and the results can be stored in a special data register.

High Performance

Interrupt Input | Standard Function

High Performance

When a quick response to an external input is required, such as positioning control, the interrupt input can call a subroutine to execute an interrupt routine.

Stop/Reset using External Signals | Standard Function

Any input terminal on the CPU module can be designated as a stop or reset input, enabling control from external signals.

Operability

Timer Interrupt Functions

FC5A (all models), FC4A-D20RK1, FC4A-D20RS1, FC4A-D40K3, FC4A-D40S3

When a repetitive operation is required, the timer interrupt can be used to call a subroutine repeatedly at predetermined intervals.

User-friendly

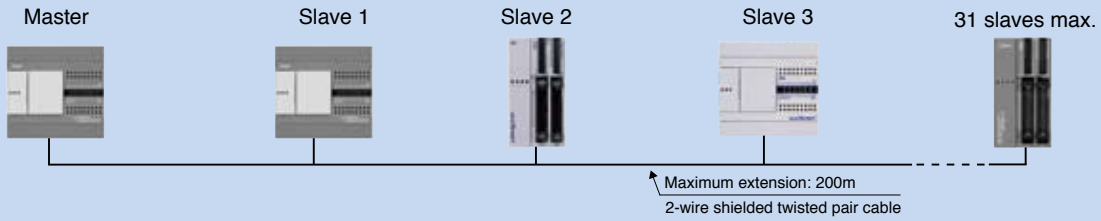
Powerful, High-speed Communication Capabilities

System Setup Examples

Data Link System

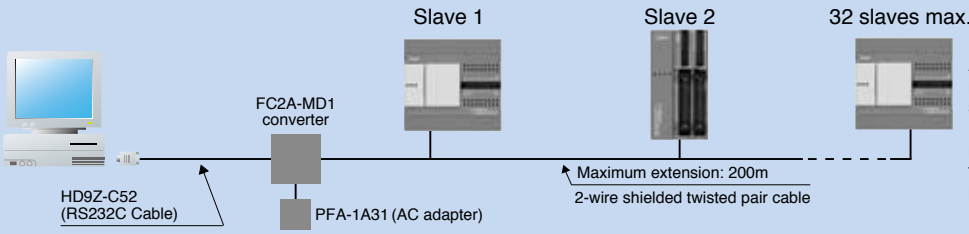
MICROSmart (master) + MICROSmart (slave)

Construct a communication system with just MicroSmart CPU modules, without using any host program.



Computer Link System (1:N)

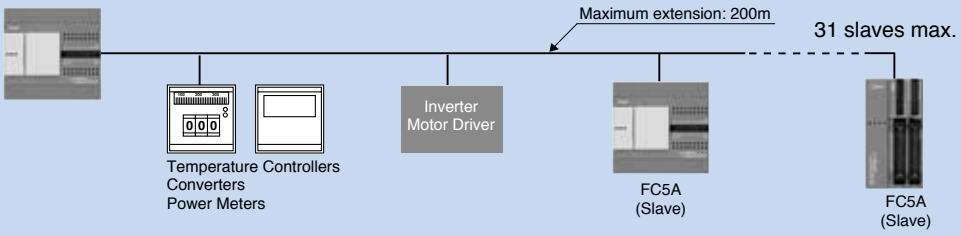
Monitor the operation status of a production line simply by connecting a single personal computer with up to 32 MicroSmart CPU modules. User programs can be downloaded and operand values can be changed easily and quickly.



All slim CPU modules as well as all-in-one 16- and 24-I/O CPU modules support the data link system. The FC4A-PC3 communication adapter is required for all-in-one types, while the FC4A-HPC3 communication module is required for slim types.

Modbus Master/Slave System

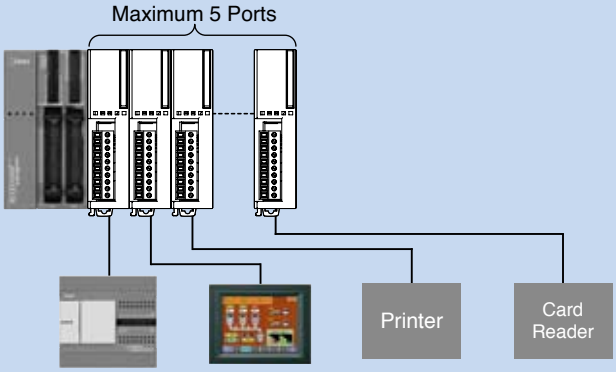
All MicroSmart CPU modules can be used as a Modbus master or slave, and can be connected to other Modbus devices such as temperature controllers, power meters, and motor drivers.



Compatible Protocols:
Modbus ASCII
Modbus RTU
Modbus TCP

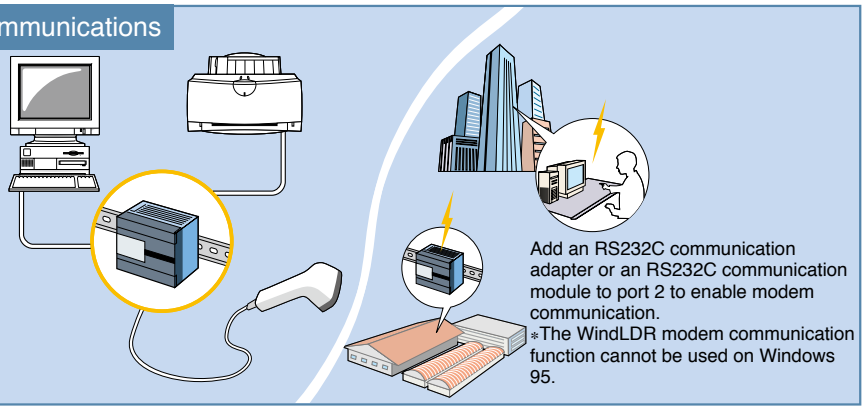
RS232C Serial Communication

- FC5A slim type modules have the largest number of connection ports among PLCs of its size.
- Up to five RS232C communication modules can be added to each slim type CPU module and three modules to each all-in-one 24-I/O type CPU module.
- User communication function enables communication with a wide range of communication protocols. Connect to printers, barcode readers, RFIDs, coin mechanisms, bill changer machines, vending machines, audio-visual control systems, and computers.



User Communication and Modem Communications

An RS232C port comes standard and another RS232C/RS485 port can be added, enabling connection with external devices, such as computers, printers, barcode readers, and temperature controllers. A modem communication function enables you to remotely monitor the operating status of production lines.



Add an RS232C communication adapter or an RS232C communication module to port 2 to enable modem communication.
*The WindLDR modem communication function cannot be used on Windows 95.

Connection with Operator Interfaces

Communication between the MicroSmart and IDEC HG series operator interfaces monitors real-time operating statuses of the MicroSmart.

The FC4A-KC1C (for HG1F) and FC4A-KC2C (for HG2F/3F/4F) cables can be connected to either port 1 or port 2 on the MicroSmart.

When connecting to port 2, the HG9Z-XC183 (3m) cable can also be used for the HG1F, and HG9Z-3C125 (5m) cable can also be used for the HG2F/HG3F/HG4F.

HG1F

HG2F

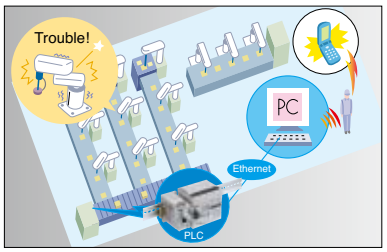
HG3F/HG4F

Web Server Module Functions

Alarm Message Transmission

Alarm messages can be sent by email to mobile phones and PCs to alert the user.

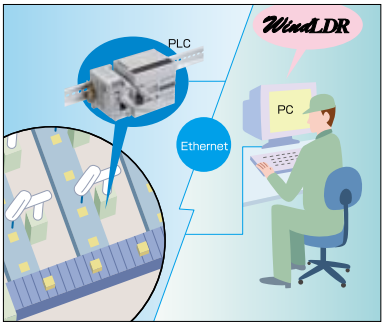
The MicroSmart is programmed to detect abnormal conditions of machines. When an error occurs, an email message is sent to the addresses of mobile phones and personal computers registered within the web server module.



Remote Maintenance

Operating conditions of machines can be monitored and changed from remote locations.

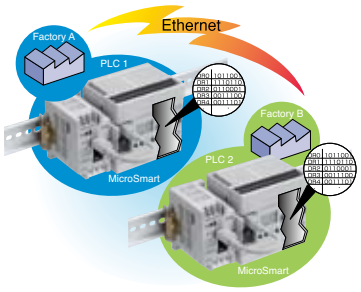
Maintenance workers and design engineers in the central control room can monitor operating conditions and change settings of machines on the production floor.



Ethernet User Communications

Data can be exchanged between several MicroSmart units using user communication functions.

A web server modules connected to a MicroSmart automatically communicates to external devices.



Web Server Function

Web pages can be stored in the web server module, eliminating the need to add any extra software to configure the MicroSmart.

Connectable to Operator Interfaces

The MicroSmart can be connected to an operator interface via Ethernet.

Security using Passwords

Unauthorized access can be rejected via password protection.

Optional Product Information

- Computer Link Cable 4C (3m) FC2A-KC4C
- Modem Cable 1C (3m) FC2A-KM1C
- User Communication Cable 1C (2.4m) FC2A-KP1C
- O/I Communication Cable 1C (5m) FC4A-KC1C
- O/I Communication Cable 2C (5m) FC4A-KC2C

FC2A-KC4C

- 20-wire Shielded I/O Cable FC9Z-H∗∗∗A20
- 26-wire Shielded I/O Cable FC9Z-H∗∗∗A26
- Analog Voltage Input Cable (2 pcs) FC9Z-PMAC2PN02

∗∗∗Cable length
0.5m: 050, 1m: 100, 2m: 200, 3m: 300

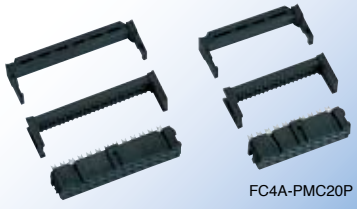
FC9Z-H∗∗∗A20

- 20-wire Non-Shielded I/O Cable FC9Z-H∗∗∗A20
- 26-wire Non-shielded I/O Cable FC9Z-H∗∗∗A26

∗∗∗Cable length
0.5m: 050, 1m: 100, 2m: 200, 3m: 300

FC9Z-H∗∗∗B20

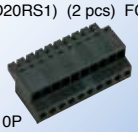
- 26-position Connector Socket (2 pcs) FC4A-PMC26PN02
- 26-position Connector Socket (2 pcs) FC4A-PMC20PN02



FC4A-PMC20P

FC4A-PMC26P

- 10-position Terminal Blocks for I/O modules (2 pcs) FC4A-PMT10PN02
- 11-position Terminal Blocks for I/O modules (2 pcs) FC4A-PMT11PN02
- 13-position Terminal Blocks for CPU modules (FC5A-D16R∗) (2 pcs) FC5A-PMT13PN02
- 13-position Terminal Blocks for CPU modules (FC4A-D20R∗1) (2 pcs) FC4A-PMT13PN02
- 16-position Terminal Blocks for CPU modules (FC5A-D16RK1/FC4A-D20RK1) (2 pcs) FC4A-PMTK16PN02
- 16-position Terminal Blocks for CPU modules (FC5A-D16RS1/FC4A-D20RS1) (2 pcs) FC4A-PMTS16PN02



FC4A-PMT10P

- RS232C/RS485 Converter FC2A-MD1

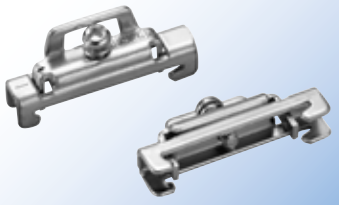
- Direct Mounting Strips (5 pcs) FC4A-PSP1PN05

For mounting of slim type CPU or I/O modules on a panel.

- DIN Rails (1m long, aluminum) (10 pcs) BAA1000PN10
- DIN Rails (1m long, steel) (10 pcs) BAP1000PN10

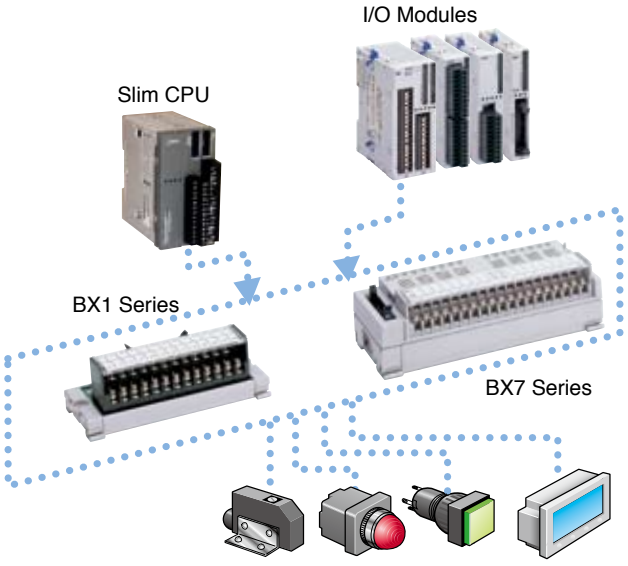
BAA1000

- End Clips (10 pcs) BNL6PN10



Recommended Peripherals for the MicroSmart

BX1 Series I/O Terminal
BX7 Series I/O Relay Terminal



Programmable Controller Type No.		Cable Type No.	I/O Terminal Type No.	Connector
CPU	FC5A-D32K3 FC5A-D32S3 FC4A-D20K3 FC4A-D20S3 FC4A-D40K3 FC4A-D40S3	FC9Z-H∗∗∗A26 FC9Z-H∗∗∗B26	BX1D-∗26A BX1F-∗26A	26-position MIL connector
Input	FC4A-N16B3 FC4A-N32B3	FC9Z-H∗∗∗A20 FC9Z-H∗∗∗B20	BX1D-∗20A BX1F-∗20A BX7D-BT16A1T (16-pt relay output)	20-position MIL connector
Output	FC4A-T16K3 FC4A-T16S3 FC4A-T32K3 FC4A-T32S3			

Note 1: Specify a cable length code in place of ∗∗∗ in the Cable Type No.
050: 0.5m, 100: 1m, 200: 2m, 300: 3m

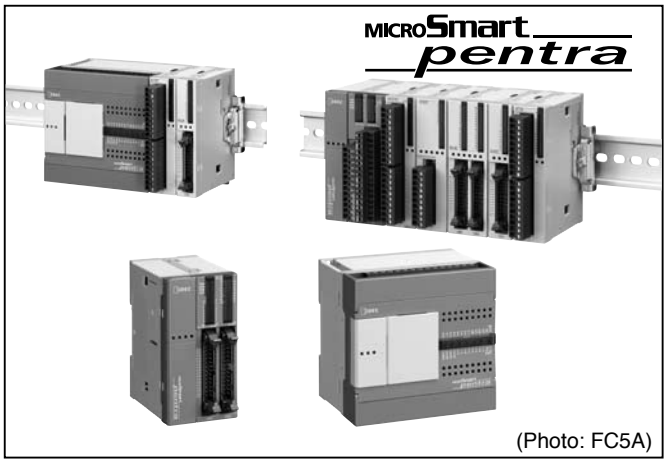
Note 2: A in the Cable Type No. represents shielded cable.
B represents non-shielded cable.

Note 3: Specify T or S in place of ∗ in the I/O Terminal Type No.
T: Touch-down terminal, S: Screw terminal

High-performance quality programmable logic controller with world-class processing speed. Compact body packed with outstanding features. Two types of CPU modules are available to meet a variety of demands.

- World-class processing speed. (FC5A)
- Logic Engine performance:
  Basic instruction LOD 0.056 μs
  Advanced instruction MOV 0.167 μs
  (FC5A slim type only)
- Equipped with Modbus master/slave function
- FC5A slim type expandable up to 512 I/O points (when expansion interface modules are used)
- Easy-to-use PID auto-tuning function

c UL us LISTED TÜV (Except FC5A) CE



(Photo: FC5A)

Types

• FC5A CPU Modules

Type	High-speed Counter Pulse Output	Power	Input Type	Output Type	High-speed Transistor Output	I/O Points	Type No.
Slim	• High-speed counter Maximum input frequency: 100 kHz • Pulse output Maximum output frequency: 100 kHz	24V DC	24V DC (Sink/Source)	Relay Output 2A 240V AC, 2A 30V DC, 2A	Sink Output 0.3A	8/8 points (Note) 496 points max.	FC5A-D16RK1
					Source Output 0.3A		FC5A-D16RS1
				Transistor Sink Output 0.3A		16/16 points 512 points max.	FC5A-D32K3
				Transistor Source Output 0.3A			FC5A-D32S3
All-in-One	• High-speed counter Maximum input frequency: 50 kHz	100V to 240V AC (50/60 Hz)	24V DC (Sink/Source)	Relay Output 2A 240V AC, 2A 30V DC, 2A	—	6/4 points	FC5A-C10R2
						9/7 points	FC5A-C16R2
						14/10 points 88 points max.	FC5A-C24R2
		24V DC				6/4 points	FC5A-C10R2C
						9/7 points	FC5A-C16R2C
						14/10 points 88 points max.	FC5A-C24R2C

Note: Two points are transistor output and six points are relay outputs.

• FC4A CPU Modules

Type	High-speed counter Pulse Output	Power	Input Type	Output Type	High-speed Transistor Output	I/O Points	Type No.
Slim	• High-speed counter Maximum input frequency: 20 kHz • Pulse output Maximum output frequency: 20 kHz	24V DC	24V DC (Sink/Source)	Transistor Sink Output 0.3A		12/8 points 148 points max.	FC4A-D20K3
				Transistor Source Output 0.3A			FC4A-D20S3
				Relay Output 2A 240V AC, 2A 30V DC, 2A	Sink Output 0.3A	12/8 points (Note) 244 points max.	FC4A-D20RK1
					Source Output 0.3A		FC4A-D20RS1
				Transistor Sink Output 0.3A		24/16 points 264 points max.	FC4A-D40K3
				Transistor Source Output 0.3A			FC4A-D40S3
All-in-One	• High-speed counter Maximum input frequency: 20 kHz	100V to 240V AC (50/60 Hz)	24V DC (Sink/Source)	Relay Output 2A 240V AC, 2A 30V DC, 2A	—	6/4 points	FC4A-C10R2
						9/7 points	FC4A-C16R2
						14/10 points 88 points max.	FC4A-C24R2
		24V DC				6/4 points	FC4A-C10R2C
						9/7 points	FC4A-C16RC2
						14/10 points 88 points max.	FC4A-C24R2C

Note: Two points are transistor output and six points are relay outputs.

• Input Modules

Input Type	Input Points	Terminal	Type No.
24V DC (Sink/Source)	8 points	Removable Terminal Block	FC4A-N08B1
	16 points		FC4A-N16B1
	16 points	MIL Connector	FC4A-N16B3
	32 points		FC4A-N32B3
100 to 120V AC (50/60Hz)	8 points	Removable Terminal Block	FC4A-N08A11

• Output Modules

Output Type	Output Points	Terminal	Type No.
Relay Output 240V AC/30V DC	8 points	Removable Terminal Block	FC4A-R081
	16 points		FC4A-R161
Transistor Sink Output 0.3A	8 points		FC4A-T08K1
Transistor Source Output 0.3A			FC4A-T08S1
Transistor Sink Output 0.1A	16 points	MIL Connector	FC4A-T16K3
Transistor Source Output 0.1A			FC4A-T16S3
Transistor Sink Output 0.1A	32 points		FC4A-T32K3
Transistor Source Output 0.1A			FC4A-T32S3

• Mixed I/O Modules

Input Type	Output Type	I/O Points	Terminal	Type No.
24V DC (Sink/Source)	Relay Output 240V DC/30V DC, 2A	8 (4 in/4 out)	Removable Terminal Block	FC4A-M08BR1
		24 (16 in/8 out)	Non-removable Terminal Block	FC4A-M24BR2

·Analog I/O Modules

Name	Input Type	Output Type	I/O Points	Terminal	Type No.
Analog I/O Module	Voltage (0 to 10V DC) Current (4 to 20mA)	Voltage (0 to 10V DC) Current (4 to 20mA)	2 inputs 1 output	Removal Terminal Block	FC4A-L03A1
	Thermocouple Resistance Thermometer				FC4A-L03AP1
Analog Input Module	Voltage (0 to 10V DC) Current (4 to 20mA)	–	2 inputs		FC4A-J2A1
	Voltage (0 to 10V DC) Current (4 to 20mA) Thermocouple Resistance Thermometer	–	4 inputs		FC4A-J4CN1
	Voltage (0 to 10V DC) Current (4 to 20mA)	–	8 inputs		FC4A-J8C1
	Thermistor (NTC, PTC)	–	8 intputs		FC4A-J8AT1
Analog Output Module	–	Voltage (0 to 10V DC) Current (4 to 20mA)	1 output		FC4A-K1A1
	–	Voltage (–10 to +10V DC) Current (4 to 20mA)	2 outputs		FC4A-K2C1

·AS-Interface Master Modules

Name	Terminal	Type No.
AS-interface Master Module	Removable Terminal Block	FC4A-AS62M

·Web Server Module

Name	Type No.
Web Server Module	FC4A-SX5ES1E
Web Server Cable	FC4A-KC3C
User's Manual	FC9Y-B919

·Expansion Interface Modules (For FC5A only)

Name	Type No.
Expansion Interface Master Module	FC5A-EXM1M
Expansion Interface Slave Module	FC5A-EXM1S
Expansion Interface Module	FC5A-EXM2
Expansion Interface Cable	FC5A-KX1C

·HMI Module

Name		Type No.
HMI Module	For displaying and changing required operands	FC4A-PH1
HMI Base Module	For mounting HMI module with slim type CPU module	FC4A-HPH1

·Expansion RS232C Communication Module (For FC5A only)

Name	Type No.
RS232C, 1 Port	FC5A-SIF2

·Communication Modules (For Slim CPU)

Name		Type No.
RS232C Communication Module	Mini DIN Connector Type	FC4A-HPC1
RS485 Communication Module	Mini DIN Connector Type	FC4A-HPC2
	Terminal Block Type	FC4A-HPC3

·User's Manuals

Name	Type No.
MicroSmart User's Manual (FC5A)	FC9Y-B927
MicroSmart User's Manual (FC4A)	FC9Y-B812
AS-Interface Master Module User's Manual	FC9Y-B644

·Programming Software

Name	Type No.
Programming and Monitoring Software WindLDR Ver. 5.*	FC9Y-LP2CDW

·Option

Name		Type No.
RS232C Communication Adapter	Mini DIN Connector Type	FC4A-PC1
RS485 Communication Adapter	Mini DIN Connector Type	FC4A-PC2
RS485 Communication Adapter	Terminal Block Type	FC4A-PC3
Clock Cartridge		FC4A-PT1
Memory Cartridge	32 KB	FC4A-PM32
	64 KB	FC4A-PM64
RS232C/RS485 Converter		FC2A-MD1

·Option

Name		Type No.
26-position Connector Socket	MIL connector for slim type CPU modules (package quantity 2)	FC4A-PMC26PN02
20-position Connector Socket	MIL connector for I/O modules (package quantity 2)	FC4A-PMC20PN02
10-position Terminal Block	For I/O modules (package quantity 2)	FC4A-PMT10PN02
11-position Terminal Block	For I/O modules (package quantity 2)	FC4A-PMT11PN02
13-position Terminal Block	For slim CPU modules FC5A-D16R*1 (package quantity 2)	FC5A-PMT13PN02
	For slim CPU modules FC4A-D20R*1 (package quantity 2)	FC4A-PMT13PN02
16-position Terminal Block	For slim CPU modules FC5A-D16RK1/FC4A-D20RK1 (package quantity 2)	FC4A-PMTK16PN02
	For slim CPU modules FC5A-D16RS1/FC4A-D20RS1 (package quantity 2)	FC4A-PMTS16PN02
Analog Voltage Input Cable (1m long) (package quantity 2)		FC4A-PMAC2PN02
Direct Mounting Strip (package quantity 5)		FC4A-PSP1PN05
35-mm-wide DIN Rail (1m long)	Aluminium (package quantity 10)	BAA1000PN10
	Steel (package quantity 10)	BAP1000PN10
End Clip (package quantity 10)		BNL6PN10
Computer Link Cable 4C (3m long)		FC2A-KC4C
Modem Cable 1C (3m long)		FC2A-KM1C
User Communication Cable 1C (2.4m long)		FC2A-KP1C
O/I Communication Cable 1C (5m long) for connecting HG1F to MicroSmart port 1 and 2		FC4A-KC1C
O/I Communication Cable (3m long) for connecting HG1F to MicroSmart port 2		HG9Z-XC183
O/I Communication Cable 2C (5m long) for connecting HG2F/3F/4F to MicroSmart port 1 and 2		FC4A-KC2C
O/I Communication Cable (5m long) for connecting HG2F/3F/4F to MicroSmart port 2		HG9Z-3C125

I/O Terminal Cable	20-wire	Shielded	0.5m	FC9Z-H050A20
			1m	FC9Z-H100A20
			2m	FC9Z-H200A20
			3m	FC9Z-H300A20
		Non-shielded	0.5m	FC9Z-H050B20
			1m	FC9Z-H100B20
			2m	FC9Z-H200B20
			3m	FC9Z-H300B20
	26-wire	Shielded	0.5m	FC9Z-H050A26
			1m	FC9Z-H100A26
			2m	FC9Z-H200A26
			3m	FC9Z-H300A26
		Non-shielded	0.5m	FC9Z-H050B26
			1m	FC9Z-H100B26
			2m	FC9Z-H200B26
			3m	FC9Z-H300B26

Specifications (CPU Modules)

• Slim Type

Type No.	FC5A-D16RK1 FC5A-D16RS1	FC5A-D32K3 FC5A-D32S3	FC4A-D20K3 FC4A-D20S3	FC4A-D20RK1 FC4A-D20RS1	FC4A-D40K3 FC4A-D40S3
Rated Power Voltage	24V DC				
Allowable Voltage Range	20.4 to 26.4V DC (including ripple)				
Maximum Input Current	700 mA (26.4V DC) ∗1		560 mA (26.4V DC) ∗1	700 mA (26.4V DC) ∗1	
Maximum Power Consumption	19W (26.4V DC) ∗1		14W (26.4V DC) ∗1	17W (26.4V DC) ∗1	
Allowable Momentary Power Interruption	10 ms (at 24V DC)				
Dielectric Strength	Between power and ⏚ terminals: 500V AC, 1 minute Between I/O and ⏚ terminals: 1,500V AC, 1 minute				
Insulation Resistance	Between power and ⏚ terminals: 10 MΩ minimum (500V DC megger) Between I/O and ⏚ terminals: 10 MΩ minimum (500V DC megger)				
Noise Resistance	DC power terminals: 1.0 kV, 50 ns to 1 μs I/O terminals (coupling clamp): 1.5 kV, 50 ns to 1 μs				
Inrush Current	50A maximum (24V DC)				
Power Supply Wire	UL1015, AWG22, UL1007 AWG18				
Operating Temperature	0 to 55ºC				
Storage Temperature	–25 to +70ºC (no freezing)				
Relative Humidity	Level RH1 (IEC61131-2), 10 to 95% (no condensation)				
Altitude	Operation: 0 to 2,000m, Transport: 0 to 3,000m				
Pollution Degree	2 (IEC60664-1)				
Corrosion Immunity	Free from corrosive gases				
Degree of Protection	IP20 (IEC60529)				
Grounding Wire	UL1015, AWG22, UL1007, AWG18				
Vibration Resistance	When mounted on a DIN rail or panel surface: 5 to 9 Hz amplitude 3.5 mm, 9 to 150 Hz acceleration 9.8 m/s^2 (1G), 2 hours per axis on each of three mutually perpendicular axes (IEC61131-2)				
Shock Resistance	147 m/s^2 (15G), 11 ms duration, 3 shocks per axis on three mutually perpendicular axes (IEC61131-2)				
Weight	230g	190g	140g	185g	180g

∗1: CPU module + 7 I/O modules

• All-in-One Type

Type No.		FC5A-C10R2 FC5A-C10R2C	FC5A-C16R2 FC5A-C16R2C	FC5A-C24R2 FC5A-C24R2C	FC4A-C10R2 FC4A-C10R2C	FC4A-C16R2 FC4A-C16R2C	FC4A-C24R2 FC4A-C24R2C
Rated Power Voltage		AC power type: 100 to 240V AC, DC power type: 24V DC					
Allowable Voltage Range		AC power type: 85 to 264V AC, DC power type: 20.4 to 28.8V DC (including ripple)					
Rated Power Frequency		AC power type: 50/60 Hz (47 to 63 Hz)					
Maximum Input Current		250 mA (85V AC) 160 mA (24V DC)	300 mA (85V AC) 190 mA (24V DC)	450 mA (85V AC) ∗2 360 mA (24V DC) ∗3	250 mA (85V AC) 160 mA (24V DC)	300 mA (85V AC) 190 mA (24V DC)	450 mA (85V AC) ∗2 360 mA (24V DC) ∗3
Maximum Power Consumption	AC Power	FC5A-C10R2/FC4A-C10R2: 30VA (264V AC), 20VA (100V AC) ∗4 FC4A-C16R2/FC4A-C16R2: 31VA (264 V AC), 22VA (100V AC) ∗4 FC4A-C24R2/FC4A-C24R2: 40VA (264V AC), 33VA (100V AC) ∗2					
	DC Power	FC5A-C10R2C/FC4A-C10R2C: 3.9W (24V DC) ∗5 FC5A-C16R2C/FC4A-C16R2C: 4.6W (24V DC) ∗5 FC5A-C24R2C/FC4A-C24R2C: 8.7W (24V DC) ∗3					
Allowable Momentary Power Interruption		10 ms (rated power voltage)					
Dielectric Strength		Between power and ⏚ or ⏚ terminals: 1500V AC, 1 minute Between I/O and ⏚ or ⏚ terminals: 1500V AC, 1 minute					
Insulation Resistance		Between power and ⏚ or ⏚ terminals: 10 MΩ minimum (500V DC megger) Between I/O and ⏚ or ⏚ terminals: 10 MΩ minimum (500V DC megger)					
Noise Resistance		AC power terminals: 1.5 kV, 50 ns to 1 μs DC power terminals: 1.0 kV, 50 ns to 1 μs I/O terminals (coupling clamp): 1.5 kV, 50 ns to 1 μs					
Inrush Current		35A		40A	35A		40A
Power Supply Wire		UL1015 AWG22, UL1007 AWG18					
Operating Temperature		0 to 55ºC					
Storage Temperature		–25 to +70ºC (no freezing)					
Relative Humidity		Level RH1 (IEC61131-2), 10 to 95% (no condensation)					
Altitude		Operation: 0 to 2,000m, Transport: 0 to 3,000m					
Pollution Degree		2 (IEC60664-1)					
Corrosion Immunity		Free from corrosive gases					
Degree of Protection		IP20 (IEC60529)					
Grounding Wire		UL1007, AWG16					
Vibration Resistance		When mounted on a DIN rail or panel surface: 5 to 9 Hz amplitude 3.5 mm, 9 to 150 Hz acceleration 9.8 m/s^2 (1G), 2 hours per axis on each of three mutually perpendicular axes (IEC61131-2)					
Shock Resistance		147 m/s^2 (15G), 11 ms duration, 3 shocks per axis on three mutually perpendicular axes (IEC61131-2)					
Weight		AC type: 230g DC type: 240g	AC type: 250g DC type: 260g	AC type: 305g DC type: 310g	AC type: 230g DC type: 240g	AC type: 250g DC type: 260g	AC type: 305g DC type: 310g

∗2: CPU module (including 250 mA sensor power) + 4 I/O modules
∗3: CPU module + 4 I/O modules
∗4: CPU module (including 250 mA sensor power)
∗5: CPU module (24V DC)

·Slim Type Function Specifications

Type No.			FC5A-D16RK1 FC5A-D16RS1	FC5A-D32K3 FC5A-D32S3	FC4A-D20K3 FC4A-D20S3	FC4A-D20RK1 FC4A-D20RS1	FC4A-D40K3 FC4A-D40S3
Control System			Stored program system				
Instruction Words			42 basic		35 basic		
			126 advanced	130 advanced	53 advanced	72 advanced	
Program Capacity ∗1			62.4 KB (10,400 steps)		27 KB (4,500 steps)	31.2 KB (5,200 steps) ∗2	
User Program Storage			EEPROM (10,000 times rewritable)				
Processing Time	Basic Instruction		83 μs (1,000 steps)		1.65 ms (1,000 steps)		
	END Processing ∗3		0.35 ms		0.64 ms		
Expandable I/O Modules			7 modules + additional 8 modules using the expansion interface module		7 modules		
I/O Points	Input	8	Expansion: 224 Additional: 256	16	Expansion: 224 Additional: 256	12	Expansion: 128	12	Expansion: 224	24	Expansion: 224
	Output	8		16		8		8		16	
Internal Relay			2,048 points		1,024 points		
Shift Register			256 points		128 points		
Data Register			42,000 points ∗4		1,300 points		
Expansion Data Register			6,000 points		—	6,000 points	
Counter			256 points		100 points		
Timer (1-sec, 100-ms, 10-ms, 1-ms)			256 points		100 points		
RAM Backup	Backup Data		Internal relay, shift register, counter, data register, expansion data register				
	Backup Duration		Approx. 30 days (typical) at 25ºC after backup battery fully charged				
	Battery		Lithium secondary battery				
	Charging Time		Approx. 15 hours for charging from 0% to 90% of full charge				
	Battery Life		5 years in cycles of 9-hour charging and 15-hour discharging				
	Replaceability		Not possible to replace battery				
Self-diagnostic Function			Power failure, watchdog timer, data link connection, user program EPPROM sum check, timer/counter preset value sum check, user program RAM sum check, keep data, user program syntax, user program writing, CPU module, clock IC, I/O bus initialize, user program execution				
Input Filter			Without filter, 3 to 15 ms (selectable in increments of 1 ms)				
Catch Input/Interrupt Input			(I2 and I5) Minimum turn on pulse width: 40 μs maximum Minimum turn off pulse width: 150 μs maximum (I3 and I4) Minimum turn on pulse width: 5 μs maximum Minimum turn off pulse width: 5 μs maximum		Four inputs (I2 through I5) Minimum turn on pulse width: 40 μs maximum Minimum turn off pulse width: 150 μs maximum		
High-speed Counter	Maximum Counting Frequency and High-speed Counter Points		Total 4 points Single/two-phase selectable: 100 kHz (2 points) Single-phase: 100 kHz (2 points)		Total 4 points Single/two-phase selectable: 20 kHz (2 points) Single-phase: 5 kHz (2 points)		
	Counting Range		0 to 4294967295 (32 bits)		0 to 65535 (16 bits)		
	Operation Mode		Rotary encoder mode and adding counter mode				
Analog Potentiometer	Quantity		1 point				
	Data Range		0 to 255				
Analog Voltage Input	Quantity		1 point				
	Input Voltage Range		0 to 10V DC				
	Input Impedance		Approx. 100 kΩ				
	Data Range		0 to 255 (8 bits)				
Pulse Output	Quantity		2 points	3 points	2 points		
	Maximum Frequency		100 kHz		20 kHz		
Sensor Power Supply	Output Voltage Current		—				
	Overload Detection						
	Isolation						
Port 1			RS232C – maintenance communication, user communications, Modbus slave communication (FC5A only)				
Port 2 Communication Adapter/ Module (option) ∗5			Possible	Possible	Possible	Possible	Possible
Clock Cartridge (option)			Possible	Possible	Possible	Possible	Possible
Memory Cartridge (option)			Possible	Possible	Possible	Possible	Possible
HMI Module (option)			Possible	Possible	Possible	Possible	Possible

∗1: 1 step equals 6 bytes.
∗2: Expandable up to 64 KB when a memory cartridge is used.
∗3: Not including expansion I/O service time, clock function processing time, data link processing time, and interrupt processing time.
∗4: Extra data registers D10000 through D49999 are enabled using WindLDR Function Area Settings, then run-time program download cannot be used.
∗5: Maintenance communication, user communication, Modem communication, data link, Modbus master/slave communication (FC5A only).
Note: The maximum number of relay outputs that can be turned on simulatneously is 54 including those on the CPU module.

• All-in-One Type Function Specifications

Type No.		FC5A-C10R2 FC5A-C10R2C	FC5A-C16R2 FC5A-C16R2C	FC5A-C24R2 FC5A-C24RC2	FC4A-C10R2 FC4A-C10R2C	FC4A-C16R2 FC4A-C16R2C	FC4A-C24R2 FC4A-C24R2C
Control System		Stored program system					
Instruction Words		42 basic			35 basic		
		103 advanced	103 advanced	115 advanced	38 advanced	40 advanced	48 advanced
Program Capacity ∗1		13.8 KB (2,300 steps)	27 KB (4,500 steps)	54 KB (9,000 steps)	4.8 KB (800 steps)	15 KB (2,500 steps)	27 KB (4,500 steps)
User Program Storage		EEPROM (10,000 times rewritable)					
Processing Time	Basic Instruction	1.16 ms (1,000 steps)			1.65 ms (1,000 steps)		
	END Processing ∗2	0.64 ms			0.64 ms		
Expandable I/O Module		—		4 modules	—		4 modules
I/O Points	Input	6	9	14 (Expansion: 64)	6	9	14 (Expansion: 64)
	Output	4	7	10	4	7	10
Internal Relay		2,048 points			256 points	1,024 points	
Shift Register		128 points			64 points	128 points	
Data Register		2,000 points			400 points	1,300 points	
Expansion Data Register		—			—		
Counter		256 points			32 points	100 points	
Timer (1-sec, 100-ms, 10-ms, 1-ms)		256 points			32 points	100 points	
RAM Backup	Backup Data	Internal relay, shift register, counter, data register					
	Backup Duration	Approx. 30 days (typical) at 25ºC after backup battery fully charged					
	Battery	Lithium secondary battery					
	Charging Time	Approx. 15 hours for charging from 0% to 90% of full charge					
	Battery Life	5 years in cycles of 9-hours charging and 15-hours discharging					
	Replaceability	Not possible to replace battery					
Self-diagnostic Function		Power failure, watchdog timer, data link connection, user program EPPROM sum check, timer/counter preset value sum check, user program RAM sum check, keep data, user program syntax, user program writing, CPU module, clock IC, I/O bus initialize, user program execution					
Input Filter		Without filter, 3 to 15 ms (selectable in increments of 1 ms)					
Catch Input/Interrupt Input		Four inputs (I2 through I5) Minimum turn on pulse width: 40 μs maximum Minimum turn off pulse width: 150 μs maximum					
High-speed Counter	Maximum Counting Frequency and High-speed Counter Points	Total 4 points Single/two-phase selectable: 50 kHz (1 point) Single-phase: 5 kHz (3 points)			Total 4 points Single/two-phase selectable: 20 kHz (1 point) Single-phase: 5 kHz (3 points)		
	Counting Range	0 to 65535 (16 bits)					
	Operation Mode	Rotary encoder mode and adding counter mode					
Analog Potentiometer	Quantity	1 point		2 points	1 point		2 points
	Data Range	0 to 255					
Analog Voltage Input	Quantity	—					
	Input Voltage Range						
	Input Impedance						
	Data Range						
Pulse Output	Quantity	—					
	Max. Frequency						
Sensor Power Supply (AC Power Type Only)	Output Voltage/ Current	24V DC (+10% to –15%), 250 mA					
	Overload Detection	Not available					
	Isolation	Isolated from the internal circuit					
Port 1		RS232C – maintenance communication, user communications, Modbus slave communication (FC5A only)					
Port 2 Communication Adapter (option) ∗3		Possible	Possible	Possible	—	Possible	Possible
Clock Cartridge (option)		Possible	Possible	Possible	Possible	Possible	Possible
Memory Cartridge (option)		Possible	Possible	Possible	Possible	Possible	Possible
HMI Module (option)		Possible	Possible	Possible	Possible	Possible	Possible

∗1: 1 step equals 6 bytes.
∗2: Not including expansion I/O service time, clock function processing time, data link processing time, and interrupt processing time.
∗3: Maintenance communication, user communication, Modem communication, data link, Modbus master/slave communication (FC5A only).
Note: The maximum number of relay outputs that can be turned on simulatneously is 33 including those on the CPU module.

• Communication Port (RS232C Port 1) Specifications

CPU Module	Slim CPU	All-in-One CPU
Standards	EIA RS232C	
Maximum Baud Rate	FC5A: 57600 bps (maintenance communication) FC4A: 19,200 bps (maintenance communication)	
Maintenance Communication	Possible	
User Communication	Possible	
Modem Communication	Impossible	
Data Link	Impossible	
Cable	Special cable (FC2A-KC4C, FC2A-KP1C, FC4A-KC1C, FC4A-KC2C)	
Isolation between Internal Circuit and Communication Port	Not isolated	

•Input Specifications

Type No.		–	FC5A-D16RK1 FC5A-D16RS1	–	FC5A-D32K3 FC5A-D32S3	–	FC5A-C10R2 FC5A-C10R2C	FC5A-C16R2 FC5A-C16R2C	FC5A-C24R2 FC5A-C24R2C
		FC4A-D20K3 FC4A-D20S3	–	FC4A-D20RK1 FC4A-D20RS1	–	FC4A-D40K3 FC4A-D40S3	FC4A-C10R2 FC4A-C10R2C	FC4A-C16R2 FC4A-C16R2C	FC4A-C24R2 FC4A-C24R2C
Input Points		12 (12/1 common)	8 (8/1 common)	12 (12/1 common)	16 (8/1 common)	24 (12/1 common)	6 (6/1 common)	9 (9/1 common)	14 (14/1 common)
Rated Input Voltage		24V DC sink/source input signal							
Input Voltage Range		20.4 to 26.4V DC					20.4 to 28.8V DC		
Rated Input Current		FC5A I0, I1, I3, I4, I6, I7: 4.5 mA/point (24V DC) I2, I5, I10 to I17: 7 mA/point (24V DC) FC4A I0, I1, I6, I7: 5 mA/point (24V DC) I2 to I5, I10 to I27: 7 mA/point (24V DC)					FC5A I0 and I1: 6.4 mA/point I2 to I7, I10 to I15: 7 mA/point (24V DC) FC4A I0 and I1: 11 mA I2 to I7, I10 to I15: 7 mA/point (24V DC)		
Input Impedance		FC5A I0, I1, I3, I4, I6, I7: 4.9 kΩ I2, I5, I10 to I17: 3.4 kΩ FC4A I0, I1, I6, I7: 5.7 kΩ I2 to I5, I10 to I27: 3.4 kΩ					FC5A I0 and I1: 3.7 kΩ I2 to I7, I10 to I15: 3.4 kΩ FC4A I0 and I1: 2.1 kΩ I2 to I7, I10 to I15: 3.4 kΩ		
Turn ON Time		FC5A I0, I1, I3, I4, I6, I7: 5 μs + filter value I2 and I5: 35 μs + filter value I10 to I17: 40 μs + filter value FC4A I0, I1, I6, I7: 35 μs + filter value I2 to I5: 35 μs + filter value I10 to I27: 40 μs + filter value					FC5A I0 and I1: 2 μs + filter value I2 to I5: 35 μs + filter value I6, I7, I10 to I15: 40 μs + filter value FC4A I0 and I1: 35 μs + filter value I2 to I5: 35 μs + filter value I6, I7, I10 to I15: 40 μs + filter value		
Turn OFF Time		FC5A I0, I1, I3, I4, I6, I7: 5 μs + filter value I2 and I5: 150 μs + filter value I10 to I17: 150 μs + filter value FC4A I0, I1, I6, I7: 45 μs + filter value I2 to I5: 150 μs + filter value I10 to I27: 150 μs + filter value					FC5A I0 and I1: 16 μs + filter value I2 to I5: 150 μs + filter value I6, I7, I10 to I15: 150 μs + filter value FC4A I0 and I1: 45 μs + filter value I2 to I5: 150 μs + filter value I6, I7, I10 to I15: 150 μs + filter value		
Connector	On Mother Board	FL26A2MA (Oki Electric Cable)	MC1.5/18-G-3.81BK (Phoenix Contact)		FL26A2MA (Oki Electric Cable)		–		
	Insertion Durability	100 times minimum					–		
Isolation		Between input terminals: Photocoupler isolated Internal circuit: Not isolated							
Input Type		Type 1 (IEC61131-2)							
External Load for I/O Interconnection		Not needed							
Single Determination Method		Static							
Effect of Improper Input Connection		Both sinking and sourcing 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							

•Transistor Sink and Source Output Specifications

Type No.		–	FC5A-D16RK1 FC5A-D16RS1	FC5A-D32K3 FC5A-D32S3
		FC4A-D20RK1 FC4A-D20RS1	–	FC4A-D40K3 FC4A-D40S3
Output Points		2 (2/1 common)	2 (2/1 common)	16 (8/1 common)
Output Type	Transistor Sink	FC5A-D16K1/D32K3 FC4A-D20K3/D20RK1/D40K3		
	Transistor Source	FC5A-D16RS1/D32S3 FC4A-D20S3/D20RS1/D40S3		
Rated Load Voltage		24V DC		
Operating Load Voltage Range		20.4 to 28.8V DC		
Rated Load Current		0.3A per output point		
Maximum Load Current		1A per common		
Voltage Drop (ON Voltage)		1V maximum (voltage between COM and output terminals when output is on)		
Inrush Current		1A		
Leakage Current		0.1 mA maximum		
Clamping Voltage		39V±1V		
Maximum Lamp Load		8W		
Inductive Load		L/R = 10 ms (28.8V DC, 1 Hz)		
External Current Draw		Sink output: 100 mA maximum, 24V DC (power voltage at the +V terminal) Source output: 100 mA maximum, 24V DC (power voltage at the –V terminal)		
Isolation		Between output terminal and Internal circuit: Photocoupler isolated Between output terminals: Not isolated		
Connector on Mother Board		FL26A2MA (Oki Electric Cable)	MC1.5/16-G-3.81BK (Phoenix Contact)	FL26A2MA (Oki Electric Cable)
Connector Insertion/ Removal Durability		100 times minimum		
Output Delay	Turn ON Time	FC5A Q0 to Q2: 5 μs max. Q3 to Q7, Q10 to Q17: 300 μs max. FC4A Q0, Q1: 5 μs max. Q2 to Q7, Q10 to Q17: 300 μs max.		
	Turn OFF Time	FC5A Q0 to Q2: 5 μs max. Q3 to Q7, Q10 to Q17: 300 μs max. FC4A Q0, Q1: 5 μs max. Q2 to Q7, Q10 to Q17: 300 μs max.		

•Relay Output Specifications

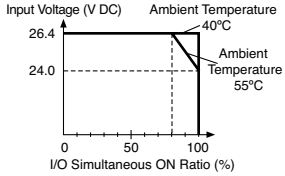
Type No.		FC5A-C10R2 FC5A-C10R2C	FC5A-C16R2 FC5A-C16R2C	FC5A-C24R2 FC5A-C24R2C	FC5A-D16RK1 FC5A-D16RS1
		FC4A-C10R2 FC4A-C10R2C	FC4A-C16R2 FC4A-C16R2C	FC4A-C24R2 FC4A-C24R2C	FC4A-D20RK1 FC4A-D20RS1
No. of Outputs		4	7	10	8
Output Points per Common Line	COM0	3	4	4	2 (Transistor output)
	COM1	1	2	4	3
	COM2	–	1	1	2
	COM3	–	–	1	1
Output Type		1NO			
Maximum Load Current		2A per point 8A per common line			
Minimum Switching Load		0.1 mA/0.1V DC (reference value)			
Initial Contact Resistance		30 mΩ maximum			
Electrical Life		100,000 operations minimum (rated load 1,800 operations/hour)			
Mechanical Life		20,000,000 operations minimum (no load 18,000 operations/hour)			
Rated Load		240V AC/2A (resistive load, inductive load cos ø = 0.4) 30V DC/2A (resistive load, inductive load L/R =7 ms)			
Dielectric Strength		Between output and ⏚ terminals: 1,500V AC, 1 minute Between output terminal and internal circuit: 1,500V AC, 1 minute Between output terminals (COMs): 1,500V AC, 1 minute			
Connector on Mother Board		–			∗1
Connector Insertion/ Removal Durability		–			100 times minimum

∗1: MC1.5/16-G-3.81BK (Phoenix Contact)

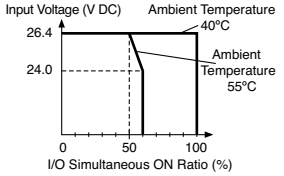
• Input Usage Limits

Slim CPU

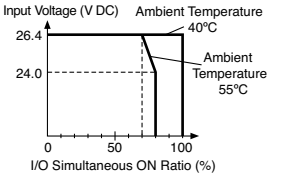
• FC5A-D16RK1/D16RS1



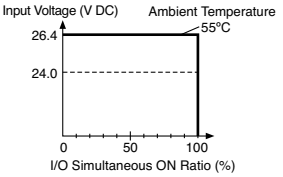
• FC5A-D32K3/D32S3
• FC4A-D40K3/D40S3



• FC4A-D20K3/D20S3

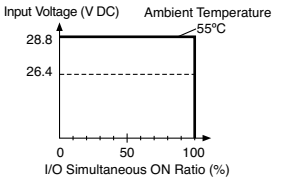


• FC4A-D20RK1/D20RS1

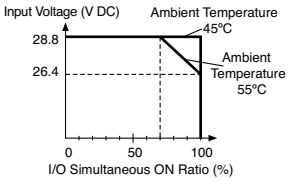


All-in-One CPU

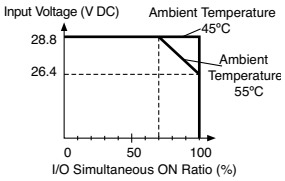
• FC5A-C10R2
• FC5A-C10R2C
• FC4A-C10R2
• FC4A-C10R2C



• FC5A-C16R2
• FC5A-C16R2C
• FC4A-C16R2
• FC4A-C16R2C



• FC5A-C24R2
• FC5A-C24R2C
• FC4A-C24R2
• FC4A-C24R2C



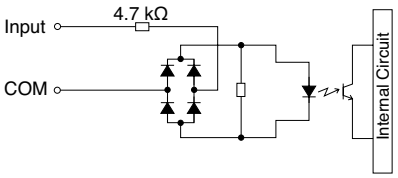
Caution

When using at an operating ambient temperature above 40ºC, reduce the input voltage or the quantity of I/O points that turn on simultaneously.

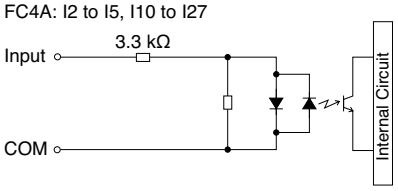
• Input Internal Circuit

Slim CPU

FC5A: I0, I1, I3, I4, I6, I7
FC4A: I0, I1, I6, I7

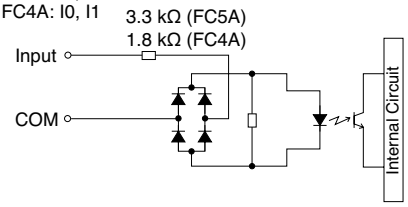


FC5A: I2, I5, I10 to I17
FC4A: I2 to I5, I10 to I27

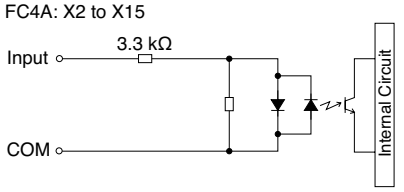


All-in-One CPU

FC5A: I0, I1
FC4A: I0, I1



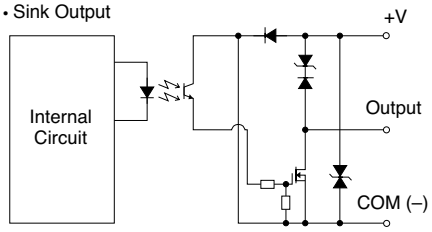
FC5A: X2 to X15
FC4A: X2 to X15



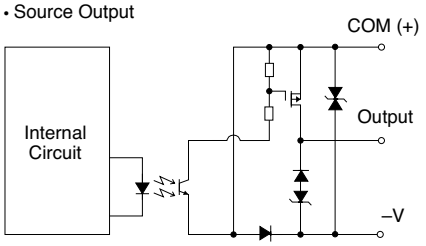
• Output Internal Circuit

Slim CPU

• Sink Output



• Source Output



• Communication Adapter/Module Specifications

Type No.		FC4A-PC1 FC4A-HPC1	FC4A-PC2 FC4A-HPC2	FC4A-PC3 FC4A-HPC3
Standards		EIA RS232C	EIA RS485	EIA RS485
Maximum Baud Rate		FC5A: 57600 bps FC4A: 19200 bps	FC5A: 57600 bps FC4A: 19200 bps	FC5A: 57600 bps FC4A: 19200 bps (38400 bps ∗1)
Maintenance Communication		Possible	Possible	Possible
User Communication		Possible	—	Possible ∗2
Data Link Communication		—	—	Possible
Half-duplex Communication		—	Possible	Possible
Maximum Cable Length		Special cable ∗3	Special cable ∗4	200m
Quantity of Slave Stations		—	—	31
Isolation between Internal Circuit and Communication Port		Not isolated		
RS485 Cable	Cable	—		Twisted-pair shielded cable with a minimum core wire of 0.3 mm^2
	Conductor Resistance			85 Ω/km maximum
	Shield Resistance			20 Ω/km maximum

∗1: Maximum speed when data link is used.
∗2: FC5A (all types), FC4A-D20RK1, FC4A-D20RS1, FC4A-D40K3, FC4A-D40S3
∗3: FC2A-KC4C, FC2A-KM1C, FC4A-KC1C, FC4A-KC2C, FC2A-KP1C
∗4: FC2A-KP1C

• HMI Module Specifications

Type No.	FC4A-PH1
Power Voltage	5V DC (supplied from the CPU module)
Weight	20g

• Memory Cartridge Specifications

Type No.	FC4A-PM32	FC4A-PM64 ∗5
Memory Type	EEPROM	
Accessible Memory Capacity	32 KB	64 KB
Hardware for Storing Data	CPU Module	
Software for Storing Data	WindLDR	
Quantity of Stored Programs	One user program can be stored on one memory cartridge	

∗5: Even when using a large-capacity memory cartridge, the program capacity of the CPU module takes effect, except when using FC4A-D20RK1, FC4A-D20RS1, FC4A-D40K3, and FC4A-D40S3 CPU modules, the program capacity expands to 64KB.

• Clock Cartridge Specifications

Type No.	FC4A-PT1
Accuracy	±30 sec/month (typical) at 25ºC
Backup Duration	Approx. 30 days (typical) at 25ºC after backup battery fully charged
Battery	Lithium secondary battery
Charging Time	Approx. 10 hours for charging from 0% to 90% of full charge
Replaceability	Not possible to replace battery

Specifications (I/O Modules)

• Input Module Specifications

Type No.		FC4A-N08B1	FC4A-N16B1	FC4A-N16B3	FC4A-N32B3	FC4A-N08A11
Input Points		8 (8/1 common)	16 (16/1 common)		32 (16/1 common)	8 (4/1 common)
Rated Input Voltage		24V DC sink/source input signal				100 to 120V AC (50/60 Hz)
Input Voltage Range		20.4 to 28.8V DC				85 to 132V AC
Rated Input Current		7 mA/point (24V DC)		5 mA/point (24V DC)		17 mA/point (120V AC, 60 Hz)
Input Impedance		3.4 kΩ		4.4 kΩ		0.8 kΩ (60 Hz)
ON Voltage		15V minimum				79V minimum
OFF Voltage		5V maximum				20V maximum
ON Current		4.2 mA minimum (at 15V DC)		3.2 mA minimum (at 15V DC)		—
OFF Current		1.2 mA maximum		0.9 mA maximum		—
Turn ON Time		4 ms				25 ms
Turn OFF Time		4 ms				30 ms
Isolation		Between input terminals: Not isolated Internal circuit: Photocoupler isolated				Between input terminals in the same common: Not isolated Between input terminals in different commons: Isolated Between input terminals and internal circuits: Photocoupler isolated
External Load for I/O Interconnection		Not needed				Not needed
Single Determination Method		Static				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.				If any input exceeding the rated value is applied, permanent damage may be caused.
Cable Length		3m in compliance with electromagnetic immunity				—
Connector on Mother Board		MC1.5/10-G-3.81BK (Phoenix Contact)		FL20A2MA (Oki Electric Cable)		MC1.5/11-G-3.81BK (Phoenix Contact)
Connector Insertion/ Removal Durability		100 times minimum				
Applicable Ferrule		1-wire: AI 0,5-8 WH 2-wire: AI-TWIN 2×0,5-8 WH		—		—
Internal Current Draw	All Inputs ON	25 mA (5V DC)	40 mA (5V DC)	35 mA (5V DC)	65 mA (5V DC)	60 mA (5V DC), 0 mA (24V DC)
	All Inputs OFF	5 mA (5V DC)	5 mA (5V DC)	5 mA (5V DC)	10 mA (5V DC)	30 mA (5V DC), 0 mA (24V DC)
Internal Power Consumption (at 24V DC while all inputs ON)		0.17W	0.27W	0.24W	0.44W	—
Weight		85g	100g	65g	100g	80g

• Transistor Output Module Specifications

Type No.		FC4A-T08K1 FC4A-T08S1	FC4A-T16K3 FC4A-T16S3	FC4A-T32K3 FC4A-T32S3
Output Points		8 (8/1 common)	16 (16/1 common)	32 (16/1 common)
Output Type		FC4A-T□K□: Transistor sink output FC4A-T□S□: Transistor source output		
Rated Load Voltage		24V DC		
Operating Load Voltage Range		20.4 to 28.8V DC		
Maximum Load Current		0.3A per point	0.1A per point	
		3A per common	1A per common	
Voltage Drop (ON Voltage)		1V maximum (voltage between COM and output terminals when output is on)		
Inrush Current		1A maximum		
Clamping Voltage		39V±1V		
Maximum Lamp Load		8W		
Inductive Load		L/R = 10 ms (28.8V DC, 1 Hz)		
External Current Draw		FC4A-T□K□: 100 mA maximum, 24V DC (power voltage at the +V terminal) FC4A-T□S□: 100 mA maximum, 24V DC (power voltage at the –V terminal)		
Isolation		Between output terminal and internal circuit: Photocoupler isolated Between output terminals: Not isolated		
Connector on Mother Board		MC1.5/10-G-3.81BK (Phoenix Contact)	FL20A2MA (Oki Electric Cable)	
Connector Insertion/ Removal Durability		100 times minimum		
Applicable Ferrule		1-wire: AI 0,5-8 WH 2-wire: AI-TWIN 2×0,5-8 WH	—	
Internal Current Draw	All outputs ON	10 mA (5V DC) 20 mA (24V DC)	10 mA (5V DC) 40 mA (24V DC)	20 mA (5V DC) 70 mA (24V DC)
	All outputs OFF	5 mA (5V DC) 0 mA (24V DC)	5 mA (5V DC) 0 mA (24V DC)	10 mA (5V DC) 0 mA (24V DC)
Internal Power Consumption (at 24V DC while all outputs ON)		0.55W	1.03W	1.82W
Output Delay	Turn ON Time	300 μs maximum		
	Turn OFF Time	300 μs maximum		
Weight		85g	70g	105g

• Relay Output Module Specifications

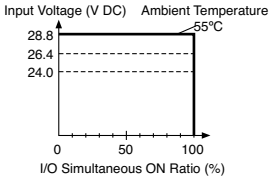
Type No.		FC4A-R081	FC4A-R161
Output Points		8 (4/1 common)	16 (8/1 common)
Output Type		1NO	
Maximum Load Current		2A per point	
		7A per common	8A per common
Minimum Switching Load		0.1 mA/0.1V DC (reference value)	
Initial Contact Resistance		30 mΩ maximum	
Electrical Life		100,000 operations minimum (rated load 1,800 operations/hour)	
Mechanical Life		20,000,000 operations minimum (no load 18,000 operations/hour)	
Rated Load		240V AC/2A (resistive load, inductive load cos ø = 0.4) 30V DC/2A (resistive load, inductive load L/R = 7 ms)	
Dielectric Strength		Between output and ⏚ or ⏚ terminals: 1,500V AC, 1 minute Between output terminal and internal circuit: 1,500V AC, 1 minute Between output terminals (COMs): 1,500V AC, 1 minute	
Connector On Mother Board		MC1.5/11-G-3.81BK (Phoenix Contact)	MC1.5/10-G-3.81BK (Phoenix Contact)
Connector Insertion/ Removal Durability		100 times minimum	
Applicable Ferrule		1-wire: AI 0,5-8 WH 2-wire: AI-TWIN 2×0,5-8 WH	
Internal Current Draw	All outputs ON	30 mA (5V DC) 40 mA (24V DC)	45 mA (5V DC) 75 mA (24V DC)
	All outputs OFF	5 mA (5V DC) 0 mA (24V DC)	5 mA (5V DC) 0 mA (24V DC)
Internal Power Consumption (at 24V DC while all outputs ON)		1.16W	2.10W
Weight		110g	145g

• Mixed I/O Module Specifications

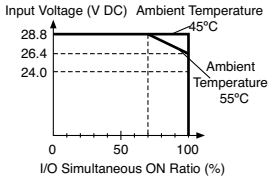
Type No.		FC4A-M08BR1	FC4A-M24BR2
Input Specifications	Input Points	4 (4/1 common)	16 (16/1 common)
	Rated Input Voltage	24V DC sink/source input signal	
	Input Voltage Range	20.4 to 28.8V DC	
	Rated Input Current	7 mA/point (24V DC)	
	Input Impedance	3.4 kΩ	
	ON Voltage	15V minimum	
	OFF Voltage	5V maximum	
	ON Current	4.2 mA minimum (at 15V DC)	
	OFF Current	1.2 mA maximum	
	Turn ON Time	4 ms (24V DC)	
	Turn OFF Time	4 ms (24V DC)	
	Isolation	Between input terminals: Not isolated Internal circuit: Photocoupler isolated	
	External Load for I/O Interconnection	Not needed	
	Signal Determination Method	Static	
	Effect of Improper Input Connection	Both sinking and sourcing 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	Output Points	4 (4/1 common)	8 (4/1 common)
	Output Type	1NO	
	Maximum Load Current	2A per point 7A per common	
	Minimum Switching Load	0.1 mA/0.1V DC (reference value)	
	Initial Contact Resistance	30 mΩ maximum	
	Electrical Life	100,000 operations minimum (rated load 1,800 operations/hour)	
	Mechanical Life	20,000,000 operations minimum (no load 18,000 operations/hour)	
	Rated Load	240V AC/2A (resistive load, inductive load cos ø = 0.4) 30V DC/2A (resistive load, inductive load L/R = 7 ms)	
	Dielectric Strength	Between output and ⏚ or ⏚ terminals: 1,500V AC, 1 minute Between output terminal and internal circuit: 1,500V AC, 1 minute Between output terminals (COMs): 1,500V AC, 1 minute	
Connector on Mother Board		MC1.5/11-G-3.81BK (Phoenix Contact)	Input: F6018-17P (Fujicon) Output: F6018-11P (Fujicon)
Connector Insertion/Removal Durability		100 times minimum	Not removable
Internal Current Draw	All I/Os ON	25 mA (5V DC), 20 mA (24V DC)	65 mA (5V DC), 45 mA (24V DC)
	All I/Os OFF	5 mA (5V DC), 0 mA (24V DC)	10 mA (5V DC), 0 mA (24V DC)
Internal Power Consumption (at 24V DC while all I/Os are ON)		0.65W	1.52W
Weight		95g	140g

• Input Usage Limits

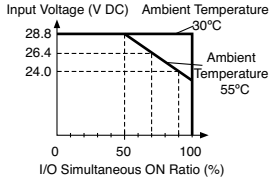
• FC4A-N08B1



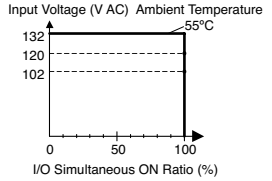
• FC4A-N16B1



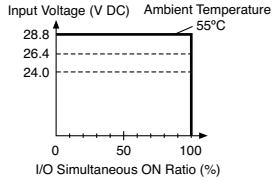
• FC4A-N16B3/N32B3



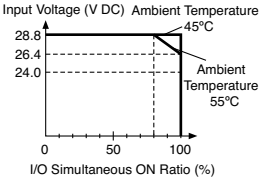
• FC4A-N08A11



• FC4A-M08BR1



• FC4A-M24BR2

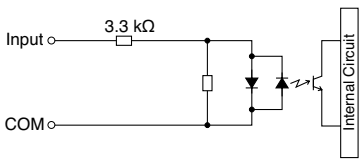


⚠ Caution

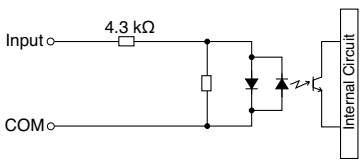
- When using at an operating ambient temperature above 40°C, reduce the input voltage or the quantity of I/O points that turn on simultaneously.

• Input Internal Circuit

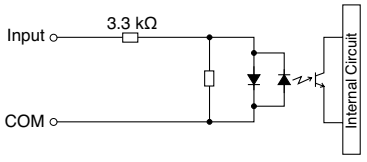
• FC4A-N08B1, FC4A-N16B1



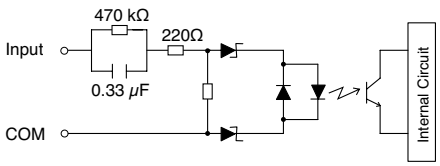
• FC4A-N16B3, FC4A-N32B3



• FC4A-M08BR1, FC4A-M24BR2

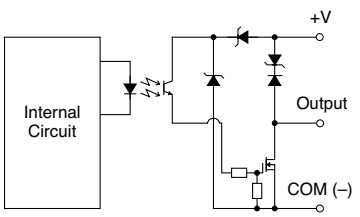


• FC4A-N08A11

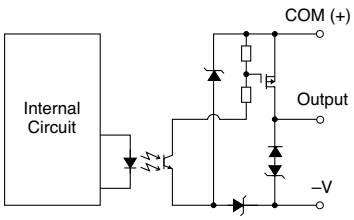


• Output Internal Circuit

• FC4A-T08K1, FC4A-T16K3, FC4A-T32K3



• FC4A-T08S1, FC4A-T16S3, FC4A-T32S3



Specifications (Analog I/O Modules)

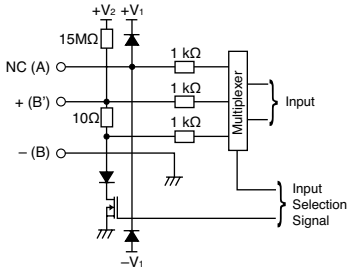
• Analog I/O Module Specifications

Type No.	FC4A-L03A1	FC4A-L03AP1	FC4A-J2A1	FC4A-J4CN1	FC4A-J8C1	FC4A-J8AT1	FC4A-K1A1	FC4A-K2C1
Input Points	2	2	2	4	8	8	—	—
Output Points	1	1	—	—	—	—	1	2
Power Voltage	24V DC							
Allowable Voltage Range	20.4 to 28.8V DC							
External Current Draw ∗ (24V DC)	45 mA	40 mA	35 mA	55 mA	50 mA	55 mA	40 mA	85 mA
Connector on Mother Board	MC1.5/11-G-3.81BK (Phoenix Contact)			MC1.5/10-G-3.81BK (Phoenix Contact)			MC1.5/11-G-3.81BK (Phoenix Contact)	MC1.5/10-G-3.81BK (Phoenix Contact
Connector Insertion/ Removal Durability	100 times minimum							
Crimping Ferrule	1-wire: AI 0.5-8 WH, 2-wire: AI-TWIN 2×0.5-8 WH							
Internal Power Consumption (5V DC)	50 mA	50 mA	50 mA	50 mA	40 mA	45 mA	50 mA	60 mA
Internal Power Consumption (at 24V DC while all I/Os are ON)	0.34W	0.34W	0.34W	0.40W	0.27W	0.30W	0.34W	0.40W
Weight	85g	85g	85g	140g	140g	125g	85g	110g

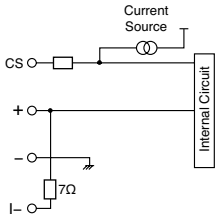
∗ The external current draw is the value when all the analog inputs are used and the analog output value is at 100%.

• Input Circuit

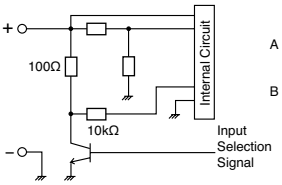
FC4A-L03A1, FC4A-L03AP1
FC4A-J2A1



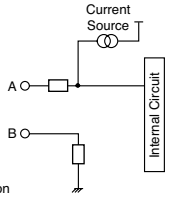
FC4A-J4CN1



FC4A-J8C1

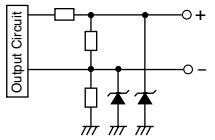


FC4A-J8AT1

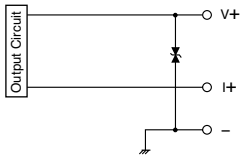


• Output Circuit

FC4A-L03A1, FC4A-L03AP1,
FC4A-K1A1



FC4A-K2C1



• Analog Input Specifications (1)

Type No.		FC4A-L03A1, FC4A-J2A1		FC4A-L03AP1	
Input Signal Type		Voltage Input 0 to 10V DC	Current Input 4 to 20 mA	Thermocouple Type K (0 to 1300ºC) Type J (0 to 1200ºC) Type T (0 to 400ºC)	Resistance Thermometer Pt100 3-wire type (–100 to 500ºC)
Input Impedance		1 MΩ minimum	10Ω	1 MΩ minimum	1 MΩ minimum
Allowable Conductor Resistance (per wire)		—	—	—	200Ω maximum
Input Detection Current		—	—	—	1.0 mA maximum
AD Conversion	Sampling Duration Time	20 ms maximum			
	Sampling Repetition Time	20 ms maximum			
	Total Input System Transfer Time	105 ms + 1 scan time		200 ms + 1 scan time	
	Type of Input	Single-ended input	Differential input		
	Operating Mode	Self-scan			
	Conversion Method	∑ Δ type ADC			
Input Error	Maximum Error at 25ºC	±0.2% of full scale		±0.2% of full scale plus cold junction compensation error (±4ºC maximum)	±0.2% of full scale
	Temperature Coefficient	±0.006% of full scale /ºC			
	Repeatability after Stabilization Time	±0.5% of full scale			
	Non-linearity	±0.2% of full scale			
	Maximum Error	±1% of full scale			
Data	Digital Resolution	4096 increments (12 bits)			
	Input Value of LSB	2.5 mV	4 μA	Type K: 0.325ºC Type J: 0.300ºC Type T: 0.100ºC	0.15ºC
	Data Type in Application Program	Default: 0 to 4095 Optional: –32768 to 32767 (selectable for each channel) ∗1			
	Monotonicity	Yes			
	Input Data Out of Range	Detectable ∗2			
Noise Resistance	Maximum Temporary Deviation during Electrical Noise Tests	±3% maximum when a 500V clamp voltage is applied to the power supply and I/O lines			Not assured
	Input Filter	No			
	Recommended Cable for Noise Immunity	Twisted pair shielded cable		—	
	Crosstalk	2 LSB maximum			

• Analog Input Specifications (1) (Continued)

Type No.	FC4A-L03A1, FC4A-J2A1		FC4A-L03AP1
Isolation	Between input and power circuit: Isolated Between input and internal circuit: Photocoupler-isolated		
Effect of Improper Input Connection	No damage		
Maximum Permanent Allowed Overload (No Damage)	13V DC	40 mA	—
Selection of Analog Input Signal Type	Using programming software		
Calibration or Verification to Maintain Rated Accuracy	Impossible		

∗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.

• Analog Input Specifications (2)

Type No.		FC4A-J4CN1, FC4A-J8C1		FC4A-J4CN1		FC4A-J8AT1	
Input Signal Type		Voltage Input	Current Input	Thermocouple	Resistance Thermometer	NTC Thermistor	PTC Thermistor
Input Range		0 to 10V DC	4 to 20 mA	Type K (0 to 1300ºC) Type J (0 to 1200ºC) Type T (0 to 400ºC)	Pt100, Pt1000 3-wire type (–100 to 500ºC) Ni100, Ni1000 3-wire type (–60 to 180ºC)	–50 to 150ºC	
Input Impedance		1 MΩ	7 Ω (FC4A-J4CN1) 100Ω (FC4A-J8C1)	1 MΩ	—	—	
Input Detection Current		—	—	—	0.1 mA	0.1 mA	
AD Conversion	Sampling Duration Time	2 ms maximum					
	Sampling Repetition Time	FC4A-J4CN1: 10 ms maximum FC4A-J8C1: 2 ms maximum		30 ms maximum	10 ms maximum	2 ms × channels	
	Total Input System Transfer Time	FC4A-J4CN1: 50 ms × channels + 1 scan time FC4A-J8C1: 8 ms × channels + 1 scan time		85 ms × channels + 1 scan time	50 ms × channels + 1 scan time	10 ms × channels + 1 scan time	
	Type of Input	Single-ended input					
	Operating Mode	Self-scan					
	Conversion Method	∑ Δ type ADC (FC4A-J4CN1), Successive approximation register method (FC4A-J8C1, FC4A-J8AT1)					
Input Error	Maximum Error at 25ºC	±0.2% of full scale		±0.2% of full scale +cold junction compensation error (±3°C maximum)	Pt100, Ni100: ±0.4% of full scale Pt1000, Ni1000: ±0.2% of full scale	±0.2% of full scale	
	Cold Junction Compensation Error	—	—	±3ºC maximum	—	—	
	Temperature Coefficient	±0.005% of full scale/ºC					
	Repeatability after Stabilization Time	±0.5% of full scale					
	Non-linearity	±0.04% of full scale				Non-linear	
	Maximum Error	±1% of full scale					
Data	Digital Resolution	50000 increments (16 bits)		Type K: Approx. 24000 increments (15 bits) Type J: Approx. 33000 increments (15 bits) Type T: Approx. 10000 increments (14 bits)	Pt100: Approx. 6400 increments (13 bits) Pt1000: Approx. 64000 increments (16 bits) Ni100: Approx. 4700 increments (13 bits) Ni1000: Approx. 47000 increments (16 bits)	Approx. 4000 increments (12 bits)	
	Input Value of LSB	0.2 mV	0.32 μA	Type K: 0.058ºC Type J: 0.038ºC Type T: 0.042ºC	Pt100: 0.086ºC Pt1000: 0.0086ºC Ni100: 0.037ºC Ni1000: 0.0037ºC	0.05ºC	
	Data Type in Application Program	Default: 0 to 50000 Optional: –32768 to 32767 (selectable for each channel) ∗1				Default: 0 to 4000 Optional: –32768 to 32767 (selectable for each channel) ∗1 Resistance: 0 to 10000	
						Temperature: ºC, ºF	—
	Monotonicity	Yes					
	Input Data Out of Range	Detectable ∗2					
Noise Resistance	Maximum Temporary Deviation during Electrical Noise Tests	±3% maximum (when a 500V clamp voltage is applied to the power supply and I/O lines)			Not assured	±3% maximum (when a 500V clamp voltage is applied to the power supply and I/O lines)	
	Input Filter	Software					
	Recommended Cable for Noise Immunity	Twisted pair cable		—			
	Crosstalk	2 LSB maximum					
Isolation		Between input and power circuit: Isolated Between input and internal circuit: Photocoupler-isolated					
Effect of Improper Input Connection		No damage					
Maximum Permanent Allowed Overload (No Damage)		11V DC	22 mA DC	—			
Selection of Analog Input Signal Type		Using programming software					
Calibration or Verification to Maintain Rated Accuracy		Impossible					

∗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.

• Analog Output Specifications

Type No.			FC4A-L03A1	FC4A-L03AP1	FC4A-K1A1	FC4A-K2C1
Output Range		Voltage	0 to 10V DC			–10 to 10V DC
		Current	4 to 20 mA			
Load	Impedance		Voltage output: 2 kΩ minimum Current output: 300 kΩ maximum			
	Load Type		Resistive load			
DA Conversion	Settling Time		50 ms	130 ms	50 ms	1 ms/ch
	Total Output System Transfer Time		50 ms + 1 scan time	130 ms + 1 scan time	50 ms + 1 scan time	1 ms × channels + 1 scan time
Output Error	Maximum Error at 25ºC		±0.2% of full scale			
	Temperature Coefficient		±0.015% of full scale/ºC			±0.005% of full scale/ºC
	Repeatability after Stabilization Time		±0.5% of full scale			
	Output Voltage Drop		±1% of full scale			
	Non-lineality		±0.2% of full scale			
	Output Ripple		1 LSB maximum			±0.1% of full scale
	Overshoot		0%			
	Total Error		±1% of full scale			
Data	Digital Resolution		4096 increments (12 bits)			50000 increments (16 bits)
	Output Value of LSB	Voltage	2.5 mV			0.4 mV
		Current	4 μA			0.32 μA
	Data Type in Application Program		Default: 0 to 4095 (voltage, current)			–25000 to 25000 (voltage) 0 to 50000 (current)
			Optional: –32768 to 32767 (selected for each channel) ∗1			
	Monotonicity		Yes			
	Current Loop Open		Undetectable			
Noise Resistance	Maximum Temporary Deviation during Electrical Noise Tests		±3% maximum when a 500V clamp voltage is applied to the power and I/O lines			
	Recommended Cable for Noise Immunity		Twisted pair shielded cable			Twisted pair cable
	Crosstalk		None			2 LSB maximum
Isolation	Between output and power circuit		Isolated			
	Between output and internal circuit		Photocoupler-isolated			
Effect of Improper Output Connection			No damage			
Selection of Analog Output Signal Type			Using software programming			
Calibration or Verification to Maintain Rated Accuracy			Impossible			

∗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.

• Expansion Interface Module Specifications

Type No.		FC5A-EXM1M (Expansion Interface Master Module)	FC5A-EXM1S (Expansion Interface Slave Module)	FC5A-EXM2 (Expansion Interface Module)
Rated Power Voltage		—	24V DC (supplied from external power)	24V DC (supplied from external power)
Allowable Voltage Range		—	20.4 to 26.4V DC (including ripple)	20.4 to 26.4V DC (including ripple)
Current Draw		Internal power (supplied from CPU module): 90 mA (5V DC) 0 mA (24V DC)	Internal power (supplied from CPU module): 0 mA (5V DC) 0 mA (24V DC) External power: With I/O modules 750 mA (26.4V DC) ∗1	Internal power (supplied from CPU module): 50 mA (5V DC) 0 mA (24V DC) External power: With I/O modules 750 mA (26.4V DC) ∗1
Maximum Power Consumption (External Power) ∗1		—	19W (26.4V DC)	19W (26.4V DC)
Allowable Momentary Power Interruption		—	10 ms minimum (24V DC)	10 ms minimum (24V DC)
I/O Expansion		Between CPU module and expansion interface module Connectable CPU modules: FC5A-D16RK1/D16RS1/D32K3/D32S3 Connectable I/O modules: 7 maximum Beyond the expansion interface module Connectable I/O modules: 8 digital I/O modules maximum (AC input modules are not applicable) ∗2		
Maximum I/O Refresh Time ∗3		3.6 ms		2.8 ms
Communication between CPU Module and Expansion Interface Module		Asynchronous communication (I/O refresh of I/O modules on both sides of the expansion interface module is asynchronous.)		
Isolation from Internal Circuit		Only communication interface part is isolated		Not isolated
EMC Compliant Cable Length		1m (FC5A-KX1C)		—
Power Supply Connector	Connector on Mother Board	—	MKDSN1.5/3-5.08-BK (Phoenix Contact)	MSTB2.5/3-GF-5.08BK (Phoenix Contact)
	Connector Insertion/Removal Durability	—	—	100 times minimum
Expansion Cable Connector	Connector on Mother Board	FCN-365P024-AU (Fujitsu Component)		—
	Connector Insertion/Removal Durability	100 times minimum		—
Weight		70g	135g	140g

∗1: Power consumption by the expansion interface module and eight I/O modules.
∗2: The maximum number of relay outputs that can be turned on simultaneously is 54 points.
∗3: Maximum I/O refresh time of the expansion interface module. D8252 stores the refresh time.

Web Server Module

• Type Number

Product Name	Type No.	Quantity
Web Server Module	FC4A-SX5ES1E	1
Web Server Cable	FC4A-KC3C	1
35mm DIN Rail (aluminium, 1m)	BAA1000PN10	10
End Clip	BNL6PN10	10
Manual	FC9Y-B919	1

• General Specifications

Rated Power Voltage	24V DC
Allowable Voltage Range	20.4 to 26.4V DC
Current Draw	70 mA
Allowable Momentary Power Interruption	10 ms maximum
Dielectric Strength	500V AC, 1 minute
Insulation Resistance	10 MΩ minimum (500V DC megger)
Noise Resistance	DC power terminal: 1.0 kV, 50 ns to 1 μs Ethernet cable: 0.5 kV, 50 ns to 1 μs (coupling clamp)
Inrush Current	4A maximum
Operating Temperature	0 to 55°C
Storage Temperature	–40 to +70°C (no freezing)
Relative Humidity	10 to 95% (no condensation)
Pollution Degree	2 (IEC 60664-1)
Corrosion Immunity	Free from corrosive gases
Degree of Protection	IP20 (IEC60529)
Vibration Resistance	When mounted on a DIN rail: 5 to 9 Hz amplitude 3.5 mm 9 to 150 Hz accelaration 9.8 m/s^2 (1G) 2 hours in each of 3 axes
Shock Resistance	147 m/s^2 (15G), 3 shocks each in 3 axes
Weight (approx.)	150g

• Interface Specifications

Communication	RS232C <=> Ethernet conversion function
Ethernet Specifications	Electrical characteristics: Complies with IEEE802.3 Transmission speed: 10BASE-T/100BASE-TX (Not CE compliant) Communication protocol: IP/ICMP/ARP Ethernet protocol: TCP/SMTP/HTTP/Telnet No. of TCP connections: 1
Serial Interface Specifications	Electrical characteristics: EIA RS232C Transmission speed: 9600 to 115200 bps Synchronization: Asynchronous Communication protocol: Full duplex Transmission control: RTS/CTS, XON/OFF, None
Connection Method	Ethernet interface: RJ45 Serial interface: Mini DIN 8-pin connector Cable Type No.: FC4A-KC3C
Major Functions	Remote maintenance: Uploading, downloading and monitoring using WindLDR via Ethernet
	Web server: Configure the web server module using Internet Explorer etc. Reading and writing PLC operands using Java applet. Web file area: 512 KB Compliant browser: Internet Explorer 6.0 Netscape Navigator 7.2
	Ethernet user communication: User communication using Ethernet Message transmission: Registered outgoing message 32 message types 63 characters maximum per message 2 email addresses 64 address characters maximum
Option	Utility CD: Configuration file, PLC operand monitor sample programs, sample program configuration instructions, instruction manual (English/German/Spanish/Japanese/Chinese)

• Connectable Devices

Programmable Controllers: FC5A, FC4A, FC3A
Operator Interfaces: (RS232C communication with PLC through Ethernet) HG2F, HG2S, HG1F

Instructions

• Basic Instructions

Symbol	Function	Qty of Bytes		
		FC5A Slim Type	FC5A All-in-One Type	FC4A
AND	Series connection of NO contact	4	4	4
AND LOD	Series connection of circuit blocks	4	5	5
ANDN	Series connection of NC contact	4	4	4
BPP	Restores the result of bit logical operation which was saved temporarily	4	2	2
BPS	Saves the result of bit logical operation temporarily	4	5	5
BRD	Reads the result of bit logical operation which was saved temporarily	4	3	3
CC=	Equal to comparison of counter current value	10 to 12	7	7
CC≥	Greater than or equal to comparison of counter current value	10 to 12	7	7
CDP	Dual pulse reversible counter (0 to 65,535)	12 to 14	4	4
CDPD	Double-word dual pulse reversible counter (0 to 4,294,967,295)	12 to 14	4	—
CNT	Adding counter (0 to 65,535)	12 to 14	4	4
CNTD	Double-word adding counter (0 to 4,294,967,295)	12 to 14	4	—
CUD	Up/down selection reversible counter (0 to 65,535)	12 to 14	4	4
CUDD	Double-word up/down selection reversible counter (0 to 4,294,967,295)	12 to 14	4	—
DC=	Equal to comparison of data register value	10 to 14	8	8
DC≥	Greater than or equal to comparison of data register value	10 to 14	8	8
END	Ends a program	4	2	2
JEND	Ends a jump instruction	4	4	4
JMP	Jumps a designated program area	6	4	4
LOD	Stores intermediate results and reads contact status	4	6	6
LODN	Stores intermediate results and reads inverted contact status	4	6	6
MCR	Ends a master control	4	4	4
MCS	Starts a master control	4	4	4
OR	Parallel connection of NO contact	4	4	4
OR LOD	Parallel connection of circuit blocks	4	5	5
ORN	Parallel connection of NC contact	4	4	4
OUT	Outputs the result of bit logical operation	4	6	6
OUTN	Output the inverted result of bit logical operation	4	6	6
RST	Resets output, internal relay, or shift register bit	4	6	6
SET	Sets output, internal relay, or shift register bit	4	6	6
SFR	Forward shift register	10	6	6
SFRN	Reverse shift register	10	6	6
SOTD	Falling-edge differentiation output	4	5	5
SOTU	Rising-edge differentiation output	4	5	5

• Basic Instructions (continued)

Symbol	Function	Qty of Bytes		
		FC5A Slim Type	FC5A All-in-One Type	FC4A
TIM	Subtracting 100-ms timer (0 to 6553.5 sec)	12 to 14	4	4
TIMO	Subtracting 100-ms off-delay timer (0 to 6553.5 sec)	12 to 14	4	—
TMH	Subtracting 10-ms timer (0 to 655.35 sec)	12 to 14	4	4
TMHO	Subtracting 10-ms off-delay timer (0 to 655.35 sec)	12 to 14	4	—
TML	Subtracting 1-sec timer (0 to 65535 sec)	12 to 14	4	4
TMLO	Subtracting 1-sec off-delay timer (0 to 65535 sec)	12 to 14	4	—
TMS	Subtracting 1-ms timer (0 to 65.535 sec)	12 to 14	4	4
TMSO	Subtracting 1-ms off-delay timer (0 to 65.535 sec)	12 to 14	4	—

• Advanced Instructions

Symbol	Function	Slim Type		All-in-One Type		
		—	FC5A -D16RK1, -D16RS1, -D32K3, -D32S3	FC5A -C10R2, C10R2C	FC5A -C16R2, C16R2C	FC5A -C24R2, C24R2C
		FC4A -D20K3, -D20S3	FC4A -D20RK1, -D20RS1, -D40K3, -D40S3	FC4A -C10R2, -C10R2C	FC4A -C16R2, -C16R2C	FC4A -C24R2, -C24R2C
NOP	No Operation	×	×	×	×	×
MOV	Move	×	×	×	×	×
MOVN	Move Not	×	×	×	×	×
IMOV	Indirect Move	×	×	×	×	×
IMOVN	Indirect Move Not	×	×	×	×	×
BMOV	Block Move	—	×	*	*	*
IBMV	Indirect Bit Move	—	×	*	*	*
IBMVN	Indirect Bit Move Not	—	×	*	*	*
NSET	N Data Set	—	*	*	*	*
NRS	N Data Repeat Set	—	*	*	*	*
XCHG	Exchange	—	*	*	*	*
TCCST	Timer/Counter Current Value Store	—	*	*	*	*
CMP=	Compare Equal To	×	×	×	×	×
CMP< >	Compare Unequal To	×	×	×	×	×
CMP<	Compare Less Than	×	×	×	×	×
CMP>	Compare Greater Than	×	×	×	×	×
CMP<=	Compare Less Than or Equal To	×	×	×	×	×
CMP>=	Compare Greater Than or Equal To	×	×	×	×	×
ICMP>=	Interval Compare Greater Than or Equal to	—	×	*	*	*
LC=	Load Compare Equal To	—	*	*	*	*
LC< >	Load Compare Unequal To	—	*	*	*	*
LC<	Load Compare Less Than	—	*	*	*	*
LC>	Load Compare Greater Than	—	*	*	*	*
LC<=	Load Compare Less Than or Equal To	—	*	*	*	*
LC>=	Load Compare Greater Than or Equal To	—	*	*	*	*
ADD	Addition	×	×	×	×	×
SUB	Subtraction	×	×	×	×	×
MUL	Multiplication	×	×	×	×	×
DIV	Division	×	×	×	×	×
INC	Increment	—	*	*	*	*
DEC	Decrement	—	*	*	*	*
ROOT	Root	×	×	×	×	×
SUM	Sum	—	*	*	*	*
RNDM	Random	—	*	*	*	*
ANDW	AND Word	×	×	×	×	×
ORW	OR Word	×	×	×	×	×
XORW	Exclusive OR Word	×	×	×	×	×
SFTL	Shift Left	×	×	×	×	×
SFTR	Shift Right	×	×	×	×	×
BCDLS	BCD Left Shift	—	×	*	*	*
WSFT	Word Shift	—	×	*	*	*
ROTL	Rotate Left	×	×	×	×	×
ROTR	Rotate Right	×	×	×	×	×
HTOB	Hex to BCD	×	×	×	×	×
BTOH	BCD to Hex	×	×	×	×	×
HTOA	Hex to ASCII	×	×	×	×	×
ATOH	ASCII to Hex	×	×	×	×	×
BTOA	BCD to ASCII	×	×	×	×	×
ATOB	ASCII to BCD	×	×	×	×	×
ENCO	Encode	—	×	*	*	*
DECO	Decode	—	×	*	*	*
BCNT	Bit Count	—	×	*	*	*
ALT	Alternate Output	—	×	*	*	*
CVDT	Convert Data Type	—	*	*	*	*
DTDV	Data Divide	—	*	*	*	*
DTCB	Data Combine	—	*	*	*	*
SWAP	Data Swap	—	*	*	*	*
WKTIM	Week Timer	×	×	×	×	×
WKTBL	Week Table	×	×	×	×	×
DISP	Display	×	×	—	—	×
DGRD	Digital Read	×	×	—	—	×

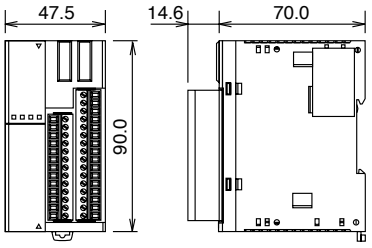
• Advanced Instructions (continued)

Symbol	Function	Slim Type		All-in-One Type		
		–	FC5A -D16RK1, -D16RS1, -D32K3, -D32S3	FC5A -C10R2, C10R2C	FC5A -C16R2, C16R2C	FC5A -C24R2, C24R2C
		FC4A -D20K3, -D20S3	FC4A -D20RK1, -D20RS1, -D40K3, -D40S3	FC4A -C10R2, -C10R2C	FC4A -C16R2, -C16R2C	FC4A -C24R2, -C24R2C
TXD1	Transmit 1	×	×	×	×	×
TXD2	Transmit 2	×	×	*	×	×
TXD3	Transmit 3	—	*	—	—	*
TXD4	Transmit 4	—	*	—	—	*
TXD5	Transmit 5	—	*	—	—	*
TXD6	Transmit 6	—	*	—	—	—
TXD7	Transmit 7	—	*	—	—	—
RXD1	Receive 1	×	×	×	×	×
RXD2	Receive 2	×	×	*	×	×
RXD3	Receive 3	—	*	—	—	*
RXD4	Receive 4	—	*	—	—	*
RXD5	Receive 5	—	*	—	—	*
RXD6	Receive 6	—	*	—	—	—
RXD7	Receive 7	—	*	—	—	—
LABEL	Label	×	×	×	×	×
LJMP	Label Jump	×	×	×	×	×
LCAL	Label Call	×	×	×	×	×
LRET	Label Return	×	×	×	×	×
DJNZ	Decrement Jump Non-zero	—	*	*	*	*
DI	Disable Interrupt	—	×	*	*	*
EI	Enable Interrupt	—	×	*	*	*
IOREF	I/O Refresh	×	×	×	×	×
HSCRF	High-speed Counter Refresh	—	*	*	*	*
FRQRF	Frequency Measurement Refresh	—	*	*	*	*
COMRF	Communication Refresh	—	*	—	—	*
XYFS	XY Format Set	×	×	*	*	×
CVXTY	Convert X to Y	×	×	*	*	×
CVYTX	Convert Y to X	×	×	*	*	×
AVRG	Average	—	*	*	*	*
PULS1	Pulse Output 1	×	×	—	—	—
PULS2	Pulse Output 2	×	×	—	—	—
PULS3	Pulse Output 3	—	○	—	—	—
PWM1	Pulse Width Modulation 1	×	×	—	—	—
PWM2	Pulse Width Modulation 2	×	×	—	—	—
PWM3	Pulse Width Modulation 3	—	○	—	—	—
RAMP1	Ramp Pulse Output 1	×	×	—	—	—
RAMP2	Ramp Pulse Output 2	—	○	—	—	—
ZRN1	Zero Return 1	—	×	—	—	—
ZRN2	Zero Return 2	—	×	—	—	—
ZRN3	Zero Return 3	—	○	—	—	—
PID	PID Control	×	×	—	—	×
DTML	1-sec Dual Timer	—	×	*	*	*
DTIM	100-ms Dual Timer	—	×	*	*	*
DTMH	10-ms Dual Timer	—	×	*	*	*
DTMS	1-ms Dual Timer	—	×	*	*	*
TTIM	Teaching Timer	—	×	*	*	*
RUNA	Run Access	—	×	—	—	*
STPA	Stop Access	—	×	—	—	*
RAD	Degree to Radian	—	*	*	*	*
DEG	Radian to Degree	—	*	*	*	*
SIN	Sine	—	*	*	*	*
COS	Cosine	—	*	*	*	*
TAN	Tangent	—	*	*	*	*
ASIN	Arc Sine	—	*	*	*	*
ACOS	Arc Cosine	—	*	*	*	*
ATAN	Arc Tangent	—	*	*	*	*
LOGE	Natural Logarithm	—	*	*	*	*
LOG10	Common Logarithm	—	*	*	*	*
EXP	Exponent	—	*	*	*	*
POW	Power	—	*	*	*	*
FIFOF	FIFO Format	—	*	*	*	*
FIEX	First-In Execute	—	*	*	*	*
FOEX	First-Out Execute	—	*	*	*	*
NDSRC	N Data Search	—	*	*	*	*
TADD	Time Addition	—	*	*	*	*
TSUB	Time Subtraction	—	*	*	*	*
HTOS	HMS to Sec	—	*	*	*	*
STOH	Sec to HMS	—	*	*	*	*
HOUR	Hour Meter	—	*	*	*	*

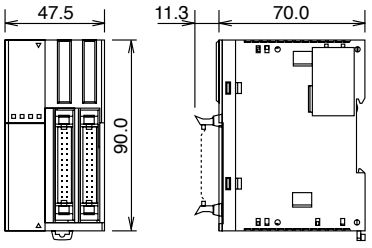
×: Available *: Available on the FC5A only ○: Available on the FC5A-D32K3 and FC5A-D32S3 only

Dimensions

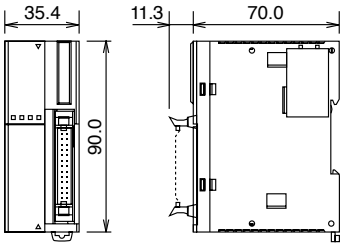
• FC5A-D16RK1, FC5A-D16RS1
• FC4A-D20RK1, FC4A-D20RS1



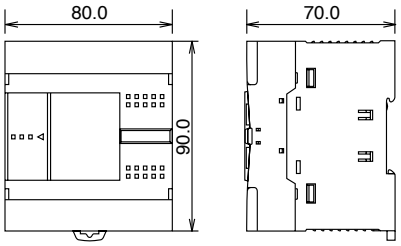
• FC5A-D32K3, FC5A-D32S3
• FC4A-D40K3, FC4A-D40S3



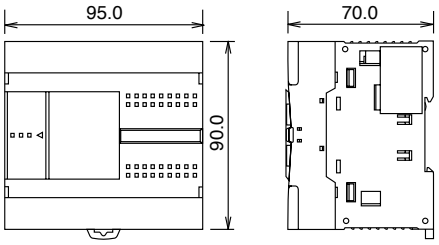
• FC4A-D20K3, FC4A-D20S3



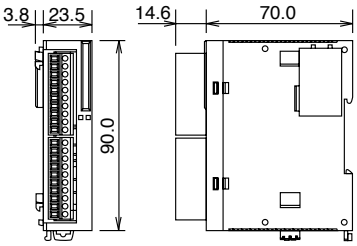
• FC5A-C10R2, FC5A-C16R2
FC5A-C10R2C, FC5A-C16R2C
• FC4A-C10R2, FC4A-C16R2
FC4A-C10R2C, FC4A-C16R2C



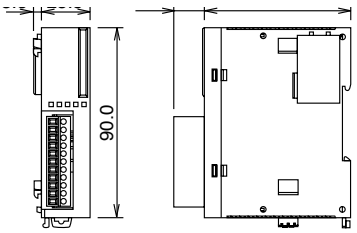
• FC5A-C24R2, FC5A-C24R2C
• FC4A-C24R2, FC4A-C24R2C



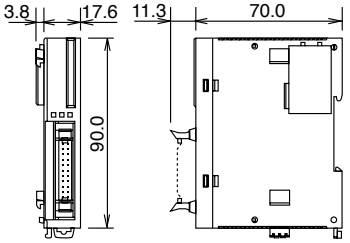
• FC4A-N16B1, FC4A-R161
FC4A-J4CN1, FC4A-J8C1
FC4A-J8AT1



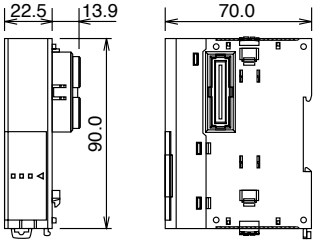
• FC4A-N08B1, FC4A-N08A11
FC4A-R081, FC4A-T08K1
FC4A-T08S1, FC4A-M08BR1
FC4A-L03A1, FC4A-L03AP1
FC4A-J2A1, FC4A-K1A1
FC4A-K2C1, FC4A-SIF2



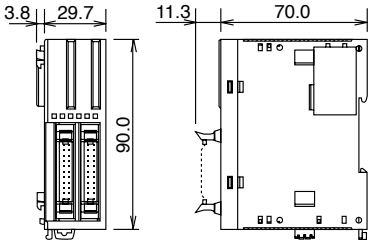
• FC4A-N16B3, FC4A-T16K3, FC4A-T16S3



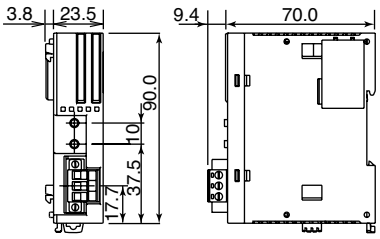
• FC4A-HPC1, FC4A-HPC2, FC4A-HPC3



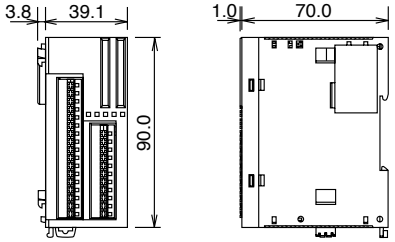
• FC4A-N32B3, FC4A-T32K3, FC4A-T32S3



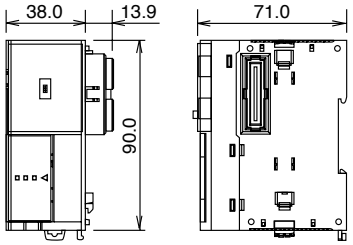
• FC4A-AS62M



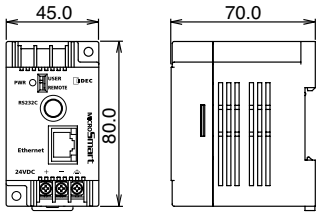
• FC4A-M24BR2



• FC4A-HPH1



• FC4A-SX5ES1E



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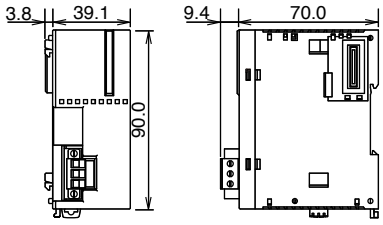
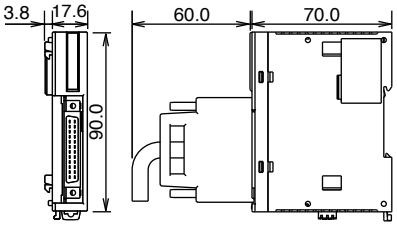
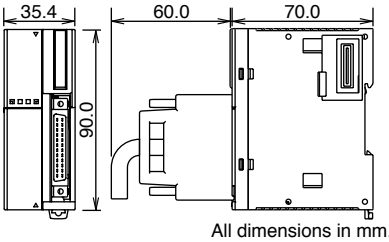


• FC5A-EXM1M



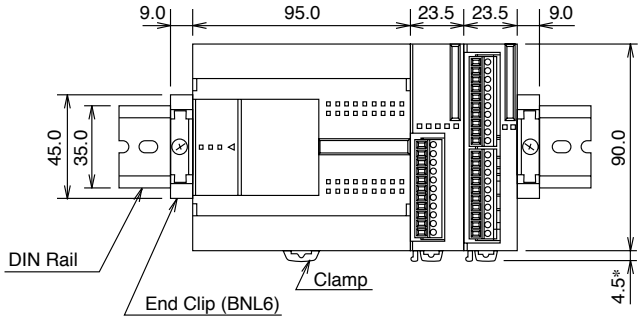
• FC5A-EXM1S



All dimensions in mm.

Example

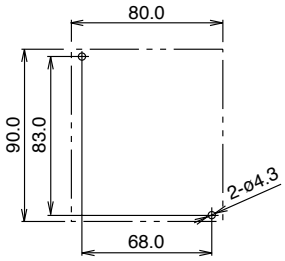
The following figure illustrates a system setup consisting of the all-in-one 24-I/O type CPU module, an 8-point relay output module, and a 16-point DC input module mounted on a 35-mm-wide-DIN rail using BNL6 end clips.



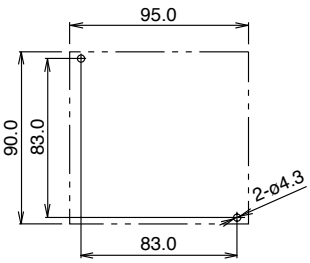
*8.5 mm when the clamp is pulled out.

Mounting Hole Layout

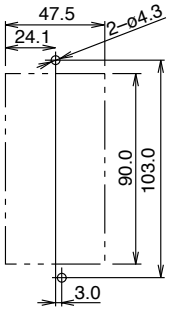
- FC5A-C10R2
  FC5A-C10R2C
  FC5A-C16R2
  FC5A-C16R2C
- FC4A-C10R2
  FC4A-C10R2C
  FC4A-C16R2
  FC4A-C16R2C



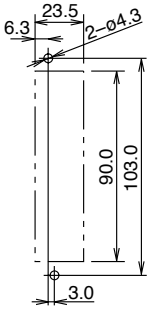
- FC5A-C24R2
  FC5A-C24R2C
- FC4A-C24R2
  FC4A-C24R2C



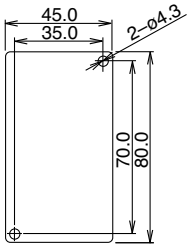
- FC5A-D16RK1
  FC5A-D16RS1
  FC5A-D32K3
  FC5A-D32S3
- FC4A-D20RK1
  FC4A-D20RS1
  FC4A-D40K3
  FC4A-D40S3



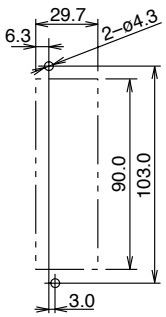
- FC4A-N08B1, FC4A-N16B1
  FC4A-N08A11, FC4A-R081
  FC4A-R161, FC4A-T08K1
  FC4A-T08S1, FC4A-M08BR1
  FC4A-L03A1, FC4A-L03AP1
  FC4A-J2A1, FC4A-J4CN1
  FC4A-J8C1, FC4A-J8AT1
  FC4A-K1A1, FC4A-K2C1
  FC4A-SIF2, FC4A-AS62M



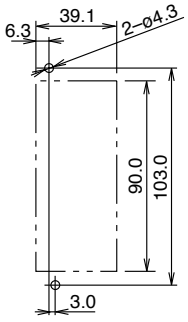
- FC4A-SX5ES1E



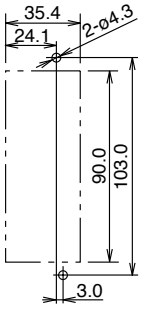
- FC4A-N32B3
  FC4A-T32K3
  FC4A-T32S3



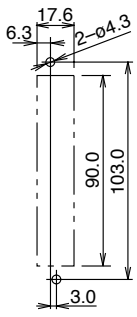
- FC5A-EXM2
- FC4A-M24BR2



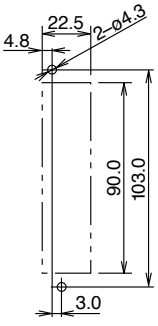
- FC5A-EXM1S
- FC4A-D20K3
  FC4A-D20S3



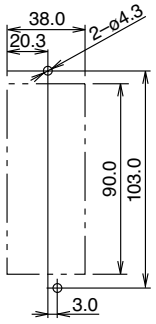
- FC5A-EXM1M
- FC4A-N16B3
  FC4A-T16K3
  FC4A-T16S3



- FC4A-HPC
  FC4A-HPC2
  FC4A-HPC3

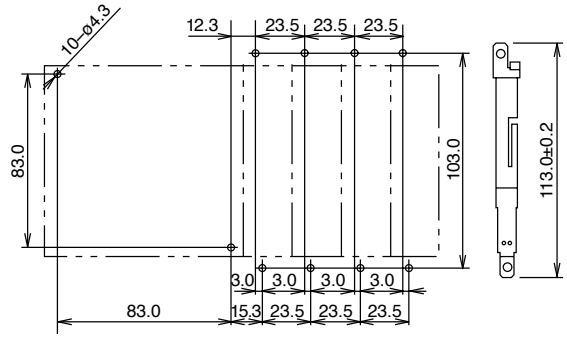


- FC4A-HPH1

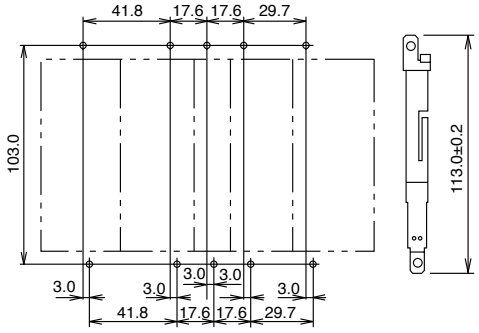


Example

Mounting hole layout for FC5A-C24R2 or FC4A-C24R2 and four 23.5mm-wide I/O modules



Mounting hole layout from left, FC4A-HPH1, FC4A-D20K3, FC4A-N16B3, FC4A-N32B3, and FC4A-M24R2 modules



All dimensions in mm.

FL1D IDEC SmartRelay

Compact CPU and expansion modules.
Upgraded memory size and increased scan speed for smart solutions in wider application fields.

Programming Software [Wind LGC]

Memory Cartridge

Communication Cable

See FL1D catalog for details.

Maximum expansion I/O points:
Digital input: 24 points, digital output: 16 points
Analog input: 8 points, analog output: 2 points

The FL1D contains various functions such as timers, counters, and calendar. No more complicated wiring is required. Just use the buttons and the LCD panel to edit programs. Programming software WindLGC is available for easy programming.

• Base Module

Rated Voltage	Input Signal	Output Signal	w/Display	I/O Points	Type No.
12/24V DC	DC	Relay Output	Yes	8/4 points	FL1D-H12RCE
			—		FL1D-B12RCE
24V DC		Transistor Output	Yes	8/4 points	FL1D-H12SND
24V AC/DC	AC/DC	Relay Output	Yes	8/4 points	FL1D-H12RCA
			—		FL1D-B12RCA
100 to 240V AC/DC	AC/DC		Yes	8/4 points	FL1D-H12RCC
			—		FL1D-B12RCC

FC3A Series OpenNet Controller

Communicates easily with some of the major world standard open networks

Programming Software [Wind LDR Ver.5]

• CPU Module

CPU Module Types		Type No.	Note
3-port Type CPU Module	High-speed Counter Sink Output Type	FC3A-CP2K	–
	High-speed Counter Source Output Type	FC3A-CP2S	

• Option

Input Module	5 types
Analog Module	2 types
Output Module	7 types
Expansion Power Supply Module	1 type
OpenNet Remote I/O Master Module	1 type

Safety Precautions

- All MicroSmart modules are manufactured under IDEC's rigorous quality control system, but users must add a backup or fail-safe provision to the control system using the MicroSmart in applications where heavy damage or personal injury may be caused in case the MicroSmart should fail.
- Turn off the power to the MicroSmart before installation, removal, wiring, maintenance, and inspection of the MicroSmart. Failure to turn power off may cause electrical shock or fire hazard.
- Special expertise is required to install, wire, program, and operate the MicroSmart. People without such expertise must not use the MicroSmart.
- Read the safety precautions described in the user's manual to make sure of correct operation of the MicroSmart.

Specifications and other descriptions in this catalog are subject to change without notice.

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