

Selection Guide.....	58
MicroSmart Family.....	59
MicroSmart Pentra CPU Part Numbers.....	66
MicroSmart CPU Part Numbers.....	67
Digital I/O Expansion Modules.....	69
Analog I/O Expansion Modules.....	72
Accessories.....	79
Automation Organizer Suite.....	81
Specifications.....	82
Dimensions.....	103
FT1A SmartAxis.....	106
Part Numbers.....	110
Accessories.....	112
Specifications.....	114
Dimensions.....	117
IDEC SmartRelay.....	125
Part Numbers.....	127
WindLGC Software.....	129
Specifications.....	130
Dimensions.....	135



www.IDEC.com/plc



PLCs

Selection Guide
Programmable Logic Controllers

OI Touchscreens

PLCs










Automation Software

Power Supplies

Sensors

Communication

Barriers

Series	MicroSmart Family		SmartAXIS		SmartRelay
	MicroSmart Pentra	MicroSmart	Controller	Touch	
Appearance					
Page Number	59	67	108		125
Rated Voltage	12 VDC, 24 VDC, 100-240 VAC	24 VDC, 100-240 VAC	24 VDC, 100-240 VAC	24 VDC	12-24 VDC, 24 VAC/DC, 100-240 VAC/DC
Max. Digital I/O	512	264	48 (Local) 192 (Remote I/O)	8	40
Max. Analog I/O	56	56	8 (Local) 32 (Remote I/O)	8	10
Base CPU I/O Configuration	Slim style: 12 I/Os with Ethernet, 16, 32 I/Os	Slim style: 20, 40 I/Os	12, 24, 40, 48	12	12 I/O
	Brick style: 10, 16, 24 I/Os	Brick style: 10, 16, 24 I/Os			
Maximum Program Capacity	128K bytes	31.2K bytes	48KB	5 MB	2K bytes
Max. Communication Ports	7	2	4	3	1
Embedded Ethernet	Yes	–	Yes	Yes	–
Modbus TCP	Yes	–	Yes	Yes	–
Web Server	Yes	–	–	–	–
Email and Text Message	Yes	–	–	–	–
User Web Page	Yes	–	–	–	–
USB Maintenance Port	Yes	–	Yes	Yes	–
Networking	Modbus TCP, RTU, ASCII	Yes	–	Yes	–
	AS-interface	Yes	Yes	–	Yes
32-bit Data & Floating Pt. Math	Yes	–	Yes	Yes	–
High Speed I/O Freq.	100 kHz	20 kHz	100 kHz	–	2 kHz
Approvals					
	Class I Division 2 Hazardous Locations	Class I Division 2 Hazardous Locations		Class I Division 2 Hazardous Locations	



**The Power to Control.
Anywhere. Anytime.**

Power, Performance, Connectivity

Maximize efficiency and cut development time! MicroSmart Pentra PLCs combine advanced networking capabilities with unparalleled power, performance and connectivity. Designed to meet all your communication requirements, now and in the future, MicroSmart Pentra PLCs give you the flexibility to expand your system with as many as fifteen modules! Our new Embedded Ethernet PLC with built-in Modbus TCP also lets you remotely monitor status in real-time, receive email alerts and customize your own web page.

Safety

All MicroSmart Pentra PLCs meet the highest standards for safety including: cULus listed for Class 1 Division 2 hazardous locations*, CE compliant, as well as certified for marine use by ABS, DNV, and Lloyd's Registry*.



*Not applicable for all models. Visit www.IDEC.com/approvals for details.

The MicroSmart Pentra PLC Family: Everything you need in a controller



Embedded Ethernet Port



Email and text notifications



Modbus TCP, RTU and ASCII



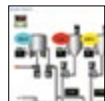
USB programming port



Seven communication ports



NEW Advanced PID control modules



User web page



Battery-less models

OT Touchscreens

PLCs

Automation Software

Power Supplies

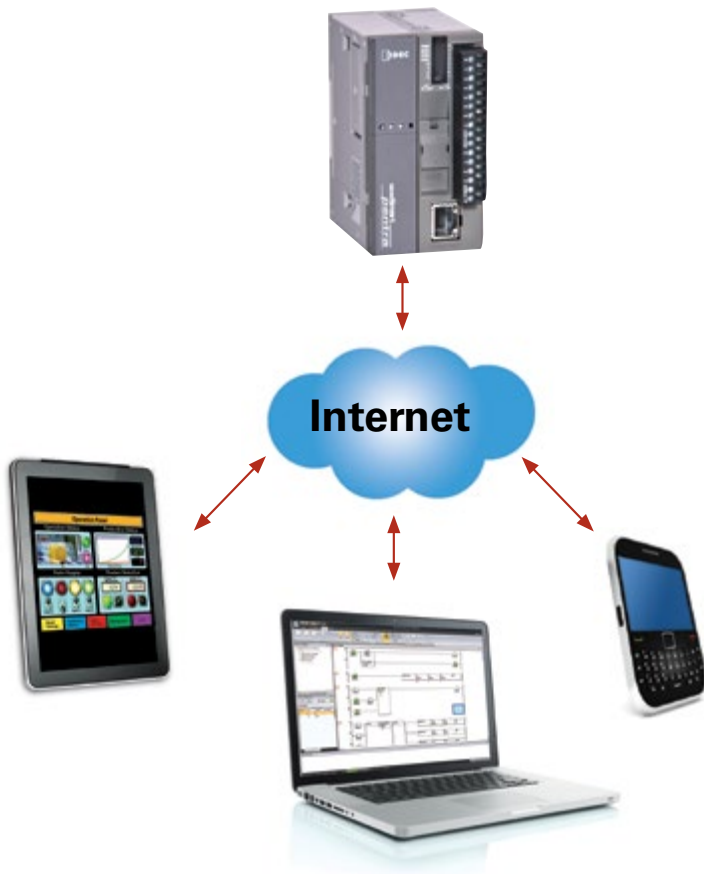
Sensors

Communication

Barriers

MicroSmart Pentra Performance

Embedded Ethernet Port



Remote Access and Control

The new MicroSmart Pentra PLC with an embedded Ethernet port, you can configure the MicroSmart Pentra PLC for remote monitoring and control. Using WindLDR software, you can remotely monitor or update the PLC programs without having to be near the PLC.

Web Server Functions

Using standard web browsers like Internet Explorer or Firefox, you can remotely log-in and access web pages that are stored directly on the MicroSmart Pentra PLC. Up to 1 MB of memory is dedicated for web page storage! Use the built-in web pages or create your own using an HTML editor.

14 Simultaneous Connections

The new embedded Ethernet Pentra supports up to 14 simultaneous connections through its Ethernet port. Through the Ethernet port, the embedded Ethernet Pentra can be configured to communicate to WindLDR for maintenance communications, to an Operator Interface touchscreen, and to VFD using Modbus TCP communications, all simultaneously.

Embedded USB Maintenance Port



The new MicroSmart Pentra PLC with an embedded Ethernet PLC port also has an embedded mini-B USB port for maintenance.

You can now easily connect your PC to this PLC using a standard USB cable.

OI Touchscreens

PLCs

Automation Software

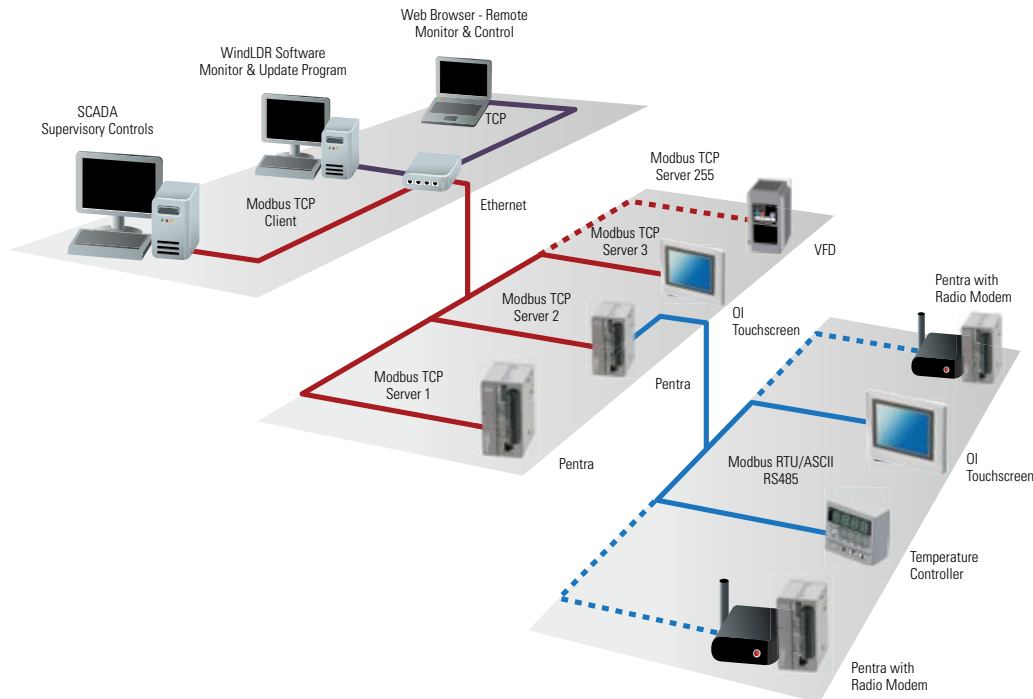
Power Supplies

Sensors

Communication

Barriers

Modbus TCP, RTU and ASCII



Using intuitive WindLDR software, you can configure the MicroSmart Pentra to be a Master or Slave device on a Modbus network. All MicroSmart Pentra PLCs support Modbus RTU/ASCII protocols and our CPU with embedded Ethernet port also supports Modbus TCP protocol.

Email and Text Message



Easily configure the MicroSmart Pentra PLCs to send out system status and alarms to your email or mobile phone. Data registers values in the PLC can also be incorporated in the body of the email. It also supports email login authentication so third party email server like Yahoo can be used. Up to 255 email templates can be configured with multiple recipients can be included.

IO Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

User Web Pages

01 Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

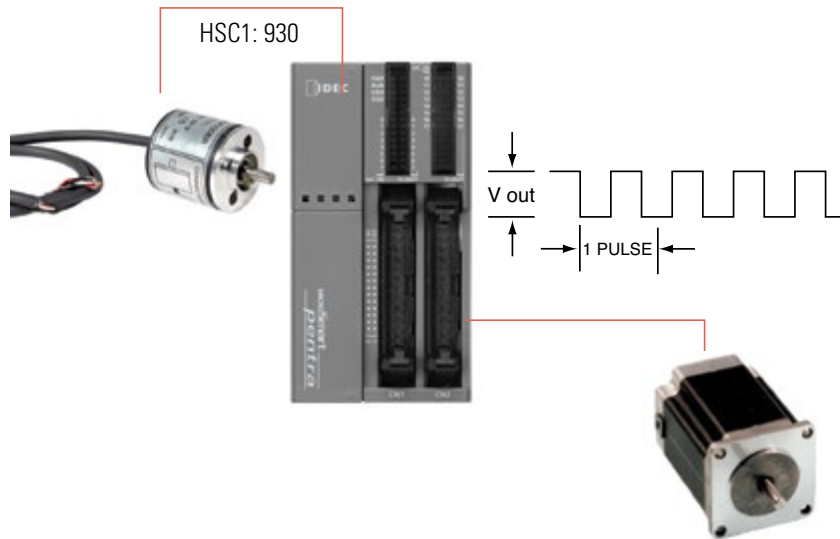
Barriers



With IDEC MicroSmart Pentra, users do not need to know JAVA programming to embed dynamic values and parts on their PLC web pages. Even novice HTML programmer can take full advantage of the integrated IDEC system library of numerical display/input, horizontal and vertical bar graphs, trend chart, ON/OFF pilot lights and pushbuttons. Up to 1MB of memory is reserved for user web pages.

Integrated 100KHz Fast Inputs and Outputs

Configure up to four high-speed inputs from high-speed output devices such as rotary encoders or proximity switches at a maximum frequency of 100KHz, independent of the scan time. Up to three high-speed outputs can be used for simple positioning controls for stepper or servo motors.

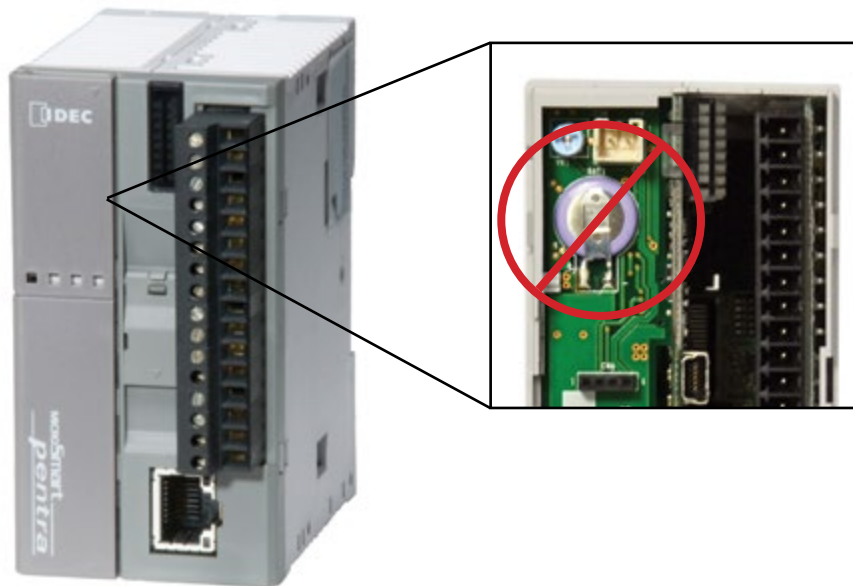


Maximum 7 Communication Ports



With MicroSmart Pentra PLCs, you don't have to worry about limited communication capabilities. It doesn't matter if you're just starting out or a current user expanding your MicroSmart Pentra PLC, you can rest assured that these communication modules will provide reliable and seamless communication. If RS485 modules are used for all six ports, up to 186 RS485 slave devices can be connected with as high as a 115K baud rate available for fast transmission.

Battery-less CPUs



With most PLCs, dynamic values are stored and backed up by a rechargeable lithium battery. In most instances, this battery can only back up data for up to 30 days when the PLC is not powered, otherwise all data will be reset. Not only that, but most lithium battery only last up to 5 years. In that case the battery needs to be replaced or in some cases the entire unit.

Now, thanks to the MRAM memory designed into our new FC5A controllers, these limitations are a thing of the past! Values can be stored permanently to eliminate the hassle and worry of losing dynamic and preloaded data. This makes them ideal for applications that need to retain critical data permanently.

01 Touchscreens

PLCs

Automation Software

Power Supplies

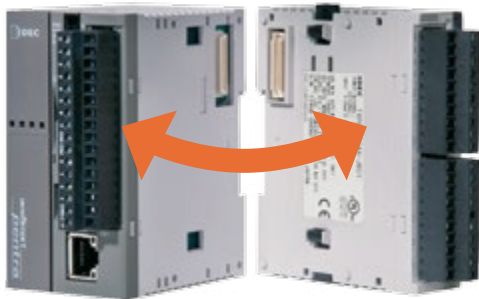
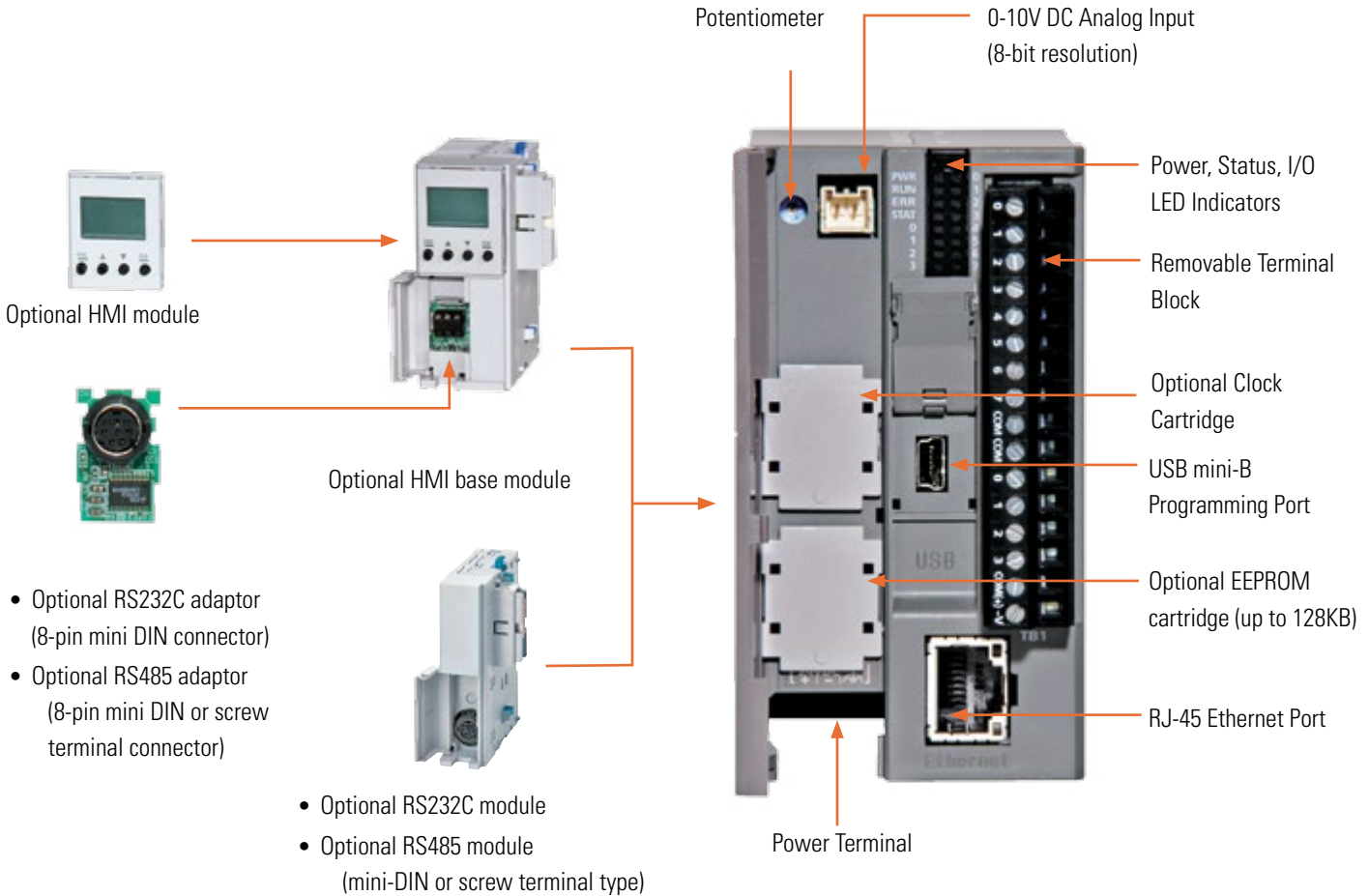
Sensors

Communication

Barriers

Choose a CPU for every application

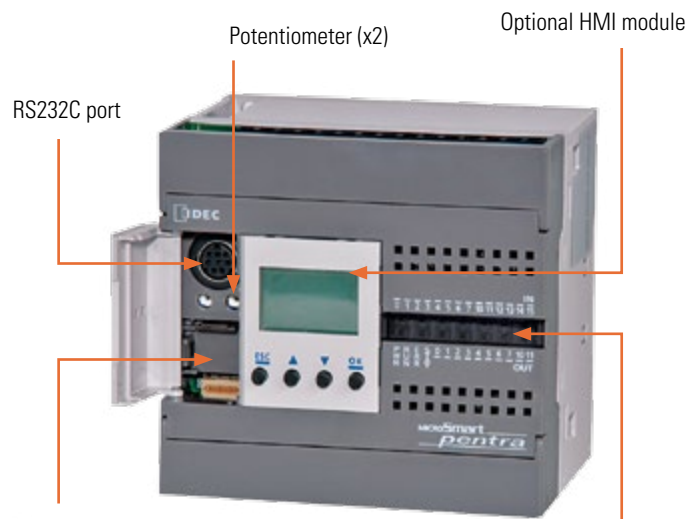
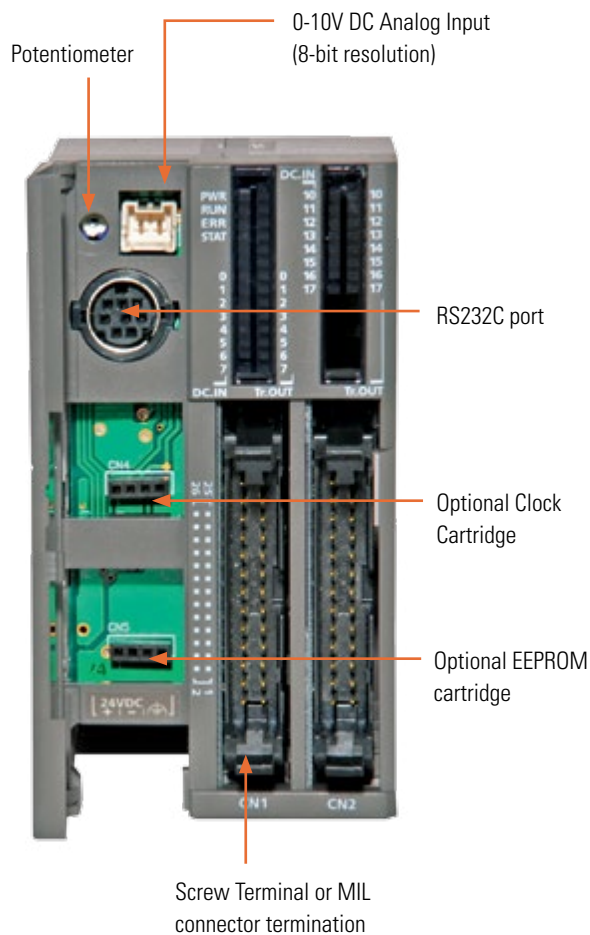
With three controller types to choose from, MicroSmart Pentra PLCs offer the features you need for your applications. Built to allow you the flexibility to expand when you need to, MicroSmart Pentra PLCs are the best way to get everything you need in just one controller.



Modules snap together easily without the need for additional tools.

Slim CPU with Ethernet Port

The perfect design when you need Ethernet capability, this slim CPU with embedded Ethernet port is available with 24V DC power and equipped with eight DC inputs and four transistor outputs (sink or source). Up to seven functional modules, including analog and communication modules can be mounted on the right-hand expansion bus. Using an expansion interface module, an additional eight discrete expansion modules can be mounted.



- Optional RS232C adaptor (8-pin mini DIN connector)
- Optional RS485 adaptor (8-pin mini DIN or screw terminal connector)



- Optional EEPROM cartridge
- Optional Clock Cartridge



Slim CPU


If you don't need Ethernet, but still want a high-performance CPU, the MicroSmart Pentra slim CPU is your best choice! Available with 24V DC power, this controller has all the functionalities you need in 16 and 32 I/O configurations. Each 16 I/O CPU is equipped with eight DC inputs, two transistor outputs (sink or source) and six relay outputs, while the 32 I/O CPU is equipped with 16 DC inputs and 16 transistor outputs (sink or source).

All-in-One CPU



Available with 12V DC, 24V DC and 100-240V AC power, you can choose from 10, 16 and 24 I/O configurations. The 10 I/O CPU is equipped with six DC inputs and four relay outputs, while the 16 I/O CPU is equipped with nine DC inputs and seven relay outputs. The 24 I/O CPU is equipped with 14 DC inputs and ten relay outputs. The 24 I/O CPU (24V DC and 100-240V AC models) can also be expanded with a maximum of four functional or discrete expansion modules.

MicroSmart Pentra CPU Part Numbers




Slim Base Module with Embedded Ethernet

Style	Part Number	Permanent Data Backup	Embedded I/Os	Operating Voltage	Ethernet & USB Port	Output	Maximum No. of Expansion Modules
	FC5A-D12K1E	—	12 (8in/4out)	24V DC	Yes	Transistor Sink	15 (Maximum 492 digital I/Os)
	FC5A-D12S1E					Transistor Source	
	FC5A-D12K1E-DS0838	Yes				Transistor Sink	
	FC5A-D12S1E-DS0838					Transistor Source	

Slim Base Module

Style	Part Number		Operating Voltage	Ethernet & USB Port	Output	Maximum No. of Expansion Modules
	FC5A-D16RK1	16 (8in/8out)	24V DC	—	6 Relays, 2 Trans. Sink	15 (Maximum 496 digital I/Os)
	FC5A-D16RS1				6 Relays, 2 Trans. Source	
	FC5A-D32K3	32 (16in/16out)			Transistor Sink	15 (Maximum 512 digital I/Os)
	FC5A-D32S3				Transistor Source	

All-in-One Base Module

Style	Part Number		Operating Voltage	Ethernet & USB Port	Output	Maximum No. of Expansion Modules
	FC5A-C10R2	10 (6in/4out)	120-240V AC	—	Relay	—
	FC5A-C10R2C		24V DC			
	FC5A-C10R2D		12V DC			
	FC5A-C16R2	16 (9in/7out)	120-240V AC	—	Relay	—
	FC5A-C16R2C		24V DC			
	FC5A-C16R2D		12V DC			
	FC5A-C24R2	24 (14in/10out)	120-240V AC	—	Relay	4 (Maximum 88 digital I/Os)
	FC5A-C24R2C		24V DC			
	FC5A-C24R2D		12V DC			

01 Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

MicroSmart Performance




Key features:

- Available in 10, 16, 20, 24, and 40 I/O CPUs.
- PID Controls
 - Program up to 14 PID loops
- High Speed I/O
 - Built-in 4 high speed inputs
 - Single or Dual Phase
 - Max. 20KHz frequency
- Built-in 2 High speed outputs (Slim model only)
- Configure up to 264 I/O Points
- Data link up to 32 MicroSmart and Pentra CPUs
- Using RS485 communication module/port, you can create a network of up to 32 CPUs.
- Worldwide Approvals
 - cULus listed, CE marked
 - Class 1 Div. 2 for hazardous locations
 - Lloyds Registered and ABS approved for shipping industry



MicroSmart CPU Part Numbers

All-in-One

Style	Part Number	Power	I/O Points	Input	Output	Maximum No. of Expansion Modules
	FC4A-C10R2C	24V DC	10 (6 in/ 4 out)	24V DC (Sink/Source)	Relay	4 (Maximum 88 digital I/Os)
	FC4A-C10R2	100-240V AC				
	FC4A-C16R2C	24V DC	16 (9 in/ 7 out)			
	FC4A-C16R2	100-240V AC				
	FC4A-C24R2C	24V DC	24 (14 in/ 10 out)			
	FC4A-C24R2	100-240V AC				

I/O Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

MicroSmart CPU Part Numbers

Slim

Style	Part Number	Power	I/O Points	Input	Output	Maximum No. of Expansion Modules
	FC4A-D20RK1	24V DC	20 (12 in/8 out)	24V DC (Sink/Source)	6 Relays, 2 Transistor Sink	7 (Maximum 244 digital I/Os)
	FC4A-D20RS1				6 Relays, 2 Transistor Source	
	FC4A-D20K3				Transistor Sink	7 (Maximum 148 digital I/Os)
	FC4A-D20S3				Transistor Source	
	FC4A-D40K3		40 (24 in/16 out)		7 (Maximum 264 digital I/Os)	
	FC4A-D40S3					Transistor Source

01 Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

Digital I/O Expansion Modules

Key features:

- 15 modules to choose from
- Available with Screw or MIL connectors
- Easy snap-on
- Available 8, 16 or 32 point modules
- Up to 512 I/O can be configured in the Pentra and 264 I/O in the MicroSmart system

Input Modules

Style	Part Number	Input	Input Points	Terminal
	FC4A-N08A11	100-120V AC	8	Removable Screw Terminals
	FC4A-N08B1			
	FC4A-N16B1	24V DC	16	MIL Connector (ribbon cable)
	FC4A-N16B3			
	FC4A-N32B3			

I/O Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

Digital I/O Expansion Modules

OI Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication




Barriers

Output Modules



Style	Part Number	Output	Output Points	Terminal
	FC4A-R081	Relay	8	Removable Screw Terminals
	FC4A-R161		16	
	FC4A-T08K1	Transistor Sink	8	MIL Connector (ribbon cable)
	FC4A-T16K3		16	
	FC4A-T32K3		32	

Digital I/O Expansion Modules

Output Modules (cont.)

Style	Part Number	Output	Output Points	Terminal
	FC4A-T08S1		8	Removable Screw Terminals
	FC4A-T16S3	Transistor Source	16	MIL Connector (ribbon cable)
	FC4A-T32S3		32	

Combination I/O Modules

Style	Part Number	Input	Output	I/O Points	Terminal
	FC4A-M08BR1	24V DC (Sink/Source)	Relay	8 (4 in/4 out)	Removable Screw Terminals
	FC4A-M24BR2			24 (16 in/ 8 out)	Wire Spring Clamp

I/O Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

Analog I/O Expansion Modules

Key features:

- 9 different modules to choose from
- 0-10V, 4-20mA, RTD, Thermocouple, Thermistor inputs, 0-10V DC or -10V DC to 10V DC output
- 12 or 16-bit resolution
- Fast conversion time
- Maximum of 56 I/O can be configured in the MicroSmart Pentra system
- Easy to configure using a Macro instruction in WindLDR

Modules

Style	Part Number	I/O Points	Input	Output	Resolution	Terminal
	FC4A-J8C1	8 (8 inputs)		–	16-bit (0-50000)	
	FC4A-L03A1	3 (2 inputs, 1 output)	0-10V DC, 4-20mA	0-10V DC, 4-20mA	12-bit (0-4095)	
	FC4A-J2A1	2 (2 inputs)		–		Removable Screw Terminals
	FC4A-J4CN1	4 (4 inputs)	0-10V DC, 4-20mA, RTD, Thermocouple	–	16-bit (0-50000)	
	FC4A-L03AP1	3 (2 inputs, 1 output)	RTD, Thermocouple	0-10V DC, 4-20mA	12-bit (0-4095)	

OI Touchscreens

PLCs

Automation Software

Power Supplies




Sensors

Communication

Barriers

Analog I/O Expansion Modules

Modules (cont.)

Style	Part Number	I/O Points	Input	Output	Resolution	Terminal
	FC4A-J8AT1	8 (8 inputs)	Thermistor (NTC/PTC)	–	12-bit (0-4000)	
	FC4A-K2C1	2 (2 outputs)	–	-10 to 10V DC, 4-20mA	16-bit (0-50000)	Removable Screw Terminals
	FC4A-K1A1	1 (1 output)	–	0-10V DC, 4-20mA	12-bit (0-4095)	
	FC4A-K4A1	4 (4 outputs)				


Communication Modules


Web Server Module

Features:

- Easy to configure
- Comes with interface cable and Quick Start Guide

Part Numbers

Style	Part Number	Description
	FC4A-ENET	Web Server Module (includes cable and Quick Start Guide)

Style	Part Number	Description
	FC9Y-QS100-0	Quick Start Guide

I/O Touchscreens

PLCs

Automation Software

Power Supplies

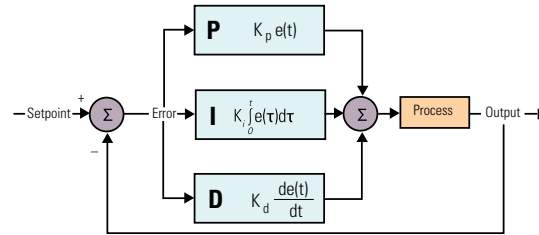
Sensors

Communication

Barriers

Advanced PID for precision control


PID (Proportional Integral Derivative) is the most commonly used feedback control loop in industrial control systems. PID calculates an error value as the difference between a measured process variable and a desired set point. The controller then attempts to minimize the error by adjusting the process control. With MicroSmart Pentra PLCs, PID implementation can be deployed in two ways: integrated PID controls or a dedicated Process Control module, which can be mounted on the MicroSmart Pentra expansion bus.



Advanced PID Control Module

A dedicated PID Control module is available for extreme stability and complex applications. This particular module has more functionalities than you will find in any other controller on the market. Independent of CPU scan time, the PID Control module does the work, reducing PLC scan time without taking up PLC memory space.

Advanced PID Control Module Part Numbers

Style	Part Number	Description
	FC5A-F2M2	PID Control Module with 2x analog inputs and 2x 4-20mA/non-contact voltage for SSR drive
	FC5A-F2MR2	PID Controls Module with 2x analog inputs and 2x Relay Outputs

PID Control Module Highlights:

- Precise, stable and accurate PID control with less than a 0.2% error
- Available in two models:
 - Built-in 2 analog inputs, 2 x 4-20mA/non-contact voltage for SSR drive
 - Built-in 2 analog inputs, 2 x relay outputs
- Each input individually configured to accept different signal types
- Up to seven modules can be mounted on the MicroSmart Pentra
- Maximum 14 PID loops with auto-tuning
- 14-bit resolution
- ARW (anti-reset windup)
- Accepts many different input types including:
 - Type K, J, R, S, B, E, T, C, PL-II and N thermocouples
 - RTD
 - 0-20 mA and 4-20 mA
 - 0-1V, 0-5V, 1-5V, and 0-10V DC
- Numerous control methods including:
 - Cascade
 - External set point
 - Heating and cooling control action
 - Difference input control



OT Touchscreens

PLCs

Automation Software


Power Supplies

Sensors

Communication

Barriers

Communication Module

Style	Part Number	Description
	FC5A-SIF4	RS485 Communication Module for MicroSmart Pentra configure as port 3 to 7
	FC5A-SIF2	RS232 Communication Module for MicroSmart Pentra configure as port 3 to 7

Communicate with up to seven different serial devices

Only IDEC offers communication modules that enable you to configure up to seven serial devices! Now you can connect your operator interface, PC, barcode reader, RFID equipment, printer and more. Just imagine the possibilities.

Using the MicroSmart Pentra slim CPU, you can configure up to seven communication ports. Using the All-in-one MicroSmart Pentra you can communicate with up to five serial devices.



Optional Modules

OI Touchscreens

PLCs

Automation Software

Power Supplies




Sensors

Communication

Barriers

Style	Part Number	Description	Usage
	FC4A-HPH1	HMI Base Module	For mounting HMI module and communication ports with slim model CPU module (HMI module is not included)
	FC4A-PH1	HMI Module	For displaying and changing operands
	FC4A-PM32	EEPROM memory cartridge	32KB EEPROM memory cartridge
	FC4A-PM64	EEPROM memory cartridge	64KB EEPROM memory cartridge
	FC4A-PM128	EEPROM memory cartridge	128KB EEPROM memory cartridge
	FC4A-PT1	Clock cartridge	Real-time clock cartridge

Communication Ports

Style	Part Number	Description	Terminal
	FC4A-PC1	RS232C	Mini DIN
	FC4A-PC2	RS485	Mini DIN
	FC4A-PC3	RS485	Screw Terminal

Communication Module — for Slim CPU

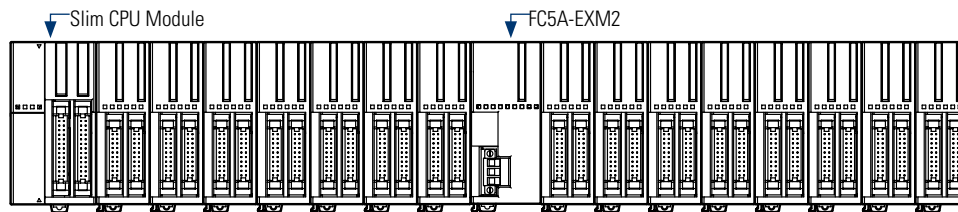
Style	Part Number	Description	Terminal
	FC4A-HPC1	RS232C	Mini DIN
	FC4A-HPC2	RS485	Mini DIN
	FC4A-HPC3	RS485	Screw Terminal

Expansion Power Supply Module

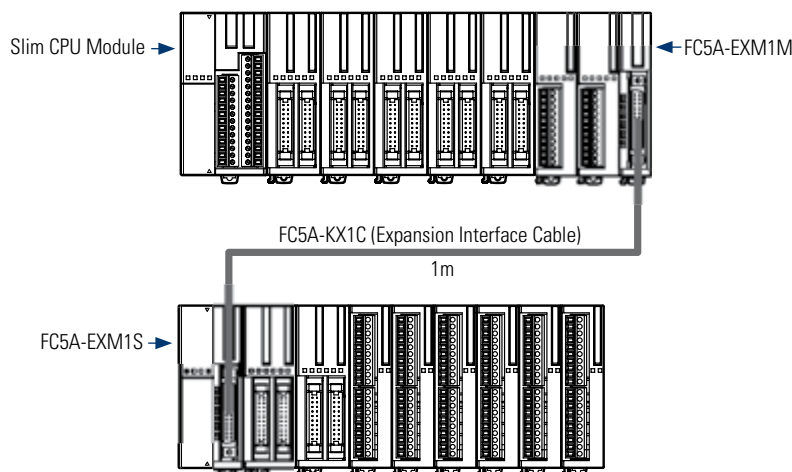
Style	Part Number	Description
	FC5A-EXM1M	Master Expansion Power Supply For MicroSmart Pentra
	FC5A-EXM1S	Slave Expansion Power Supply For MicroSmart Pentra
	FC5A-EXM2	Expansion Power Supply For MicroSmart Pentra

Expansion Power Supply System Configuration

FC5A-EXM2 (Expansion Interface Module)



FC5A-EXM1M and FC5A-EXM1S (Expansion Interface Master & Slave Modules)



Cables

01 Touchscreens

PLCs

Automation Software

Power Supplies




Sensors

Communication

Barriers

Communication Cables

Appearance	Part Number	Length	Expanded Description
	FC4A-KC4CA	5ft. (1.53m)	Programming cable (Maintenance/User Communication Mode selectable)
	FC4A-USB	6ft. (1.83m)	USB to Serial Converter
	FC4A-KC3C	0.33ft. (100mm)	Web Server Module interface cable
	HG9Z-XCM2A	6ft. (1.83m)	USB programming cable for embedded Ethernet CPU



Appearance	Part Number	Length	Expanded Description
	FC2A-KM1C	9.84 Ft. (3m)	Modem cable. Used to connect a modem to the MicroSmart RS232C port.
	FC2A-KP1C	9.84 Ft. (3m)	User communication cable. Used to connect RS232C equipment to the MicroSmart RS232C port.
	FC5A-KX1C	3.28 Ft. (1m)	MicroSmart Pentra expansion power supply interface cable. Used to connect expansion interface master and expansion slave modules.

MIL Connector Cables (use with Breakout Modules)

Use with	Part Number	Model	Length
CPU Module (26-wire) BX1D-S26A, BX1D-T26A	FC9Z-H050B26	Non-shielded	1.64ft. (0.5m)
	FC9Z-H100B26		3.28ft. (1m)
	FC9Z-H200B26		6.56ft (2m)
	FC9Z-H300B26	9.85ft. (3m)	Shielded
	FC9Z-H050A26	1.64ft. (0.5m)	
	FC9Z-H100A26	3.28ft. (1m)	
	FC9Z-H200A26	6.56ft (2m)	
	FC9Z-H300A26	9.85ft. (3m)	
	FC9Z-H100C26A	Shielded Single Connectors	5ft. (1.5m)

Use with	Part Number	Model	Length
I/O Expansion Modules (20-wire) BX1D-S20A, BX1D-T20A	FC9Z-H050B20	Non-shielded	1.64ft. (0.5m)
	FC9Z-H100B20		3.28ft. (1m)
	FC9Z-H200B20		6.56ft (2m)
	FC9Z-H300B20	9.85ft. (3m)	Shielded
	FC9Z-H050A20	1.64ft. (0.5m)	
	FC9Z-H100A20	3.28ft. (1m)	
	FC9Z-H200A20	6.56ft (2m)	
	FC9Z-H300A20	9.85ft. (3m)	
	FC9Z-H100C20A	Shielded Single Connectors	5ft. (1.5m)

Breakout Modules

Use with	Part Number	Description
 26-terminal connector	BX1D-S26A	26-terminal breakout module
	BX1D-T26A	26-terminal touch-down terminal breakout module
 20-terminal connector	BX1D-S20A	20-terminal breakout module
	BX1D-T20A	20-terminal touch-down terminal breakout module

Accessories

Part Number	Use with	Description
FC4A-PMT13	CPU module	13-position left-side terminal block for FC4A-D20RK1/-D20RS1 CPU
FC5A-PMT13		13-position left-side terminal block for FC5A-D16RK1/-D16RS1 CPU
FC4A-PMTS16		16-position right-side terminal block for FC4A-D20RS1 and FC5A-D16RS1 CPU
FC4A-PMTK16		16-position right-side terminal block for FC4A-D20RK1 and FC5A-D16RK1 CPU
FC4A-PMT11	I/O expansion modules	11-position terminal block for 8-pt I/O expansion modules
FC4A-PMT10		10-position terminal block for 16-pt I/O expansion modules
FC4A-PMC20		20-position connector socket for MIL connector I/O expansion modules
FC4A-PMC26		26-position connector socket for MIL connector CPU modules
FC4A-PSP1		Direct mounting strips for mounting on a panel
FC4A-PMAC2		Analog voltage input cable for slim CPU
FC4A-DS824-SW14		14-pt input simulator switch for 24 I/O CPU
FC4A-DS824-SW9		9-pt input simulator switch for 16 I/O CPU
FC4A-DS824-SW6		6-pt input simulator switch for 10 I/O CPU
FC9Y-B812-0A		MicroSmart user manual
FC9Y-B1138-0		MicroSmart Pentra user manual
SW1A-W1C		Automation Organizer Software Suite

RV8 Series 6mm Interface Relays

Key Features

- Space-saving 6mm width
- Only 70mm in height from DIN rail
- Gold-plated contacts
- Pre-assembled relay and DIN mount socket
- Universal screw terminals (flat and Phillips)
- Universal AC/DC socket with built-in surge suppression and green LED
- Lever for easy locking and removal of relay
- Wide input voltage range: 6 to 240V
- High dielectric strength and impulse withstand voltages
- Sensitive coil 170mW
- Reverse Polarity protected
- 400V AC maximum switching voltage
- 1500VA maximum switching power
- RoHS compliant



(when using combination of RV1H relay and SV1H socket)

Part Numbers

Coil Voltage	Electromagnetic	Solid State
DC	6V	RV8H-L-D6 RV8S-L-D6
	9V	RV8H-L-D9 RV8S-L-D9
	12V	RV8H-L-D12 RV8S-L-D12
	18V	RV8H-L-D18 RV8S-L-D18
	24V	RV8H-L-D24 RV8S-L-D24
AC/DC	12V	RV8H-L-AD12 RV8S-L-AD12
	18V	RV8H-L-AD18 RV8S-L-AD18
	24V	RV8H-L-AD24 RV8S-L-AD24
	48V	RV8H-L-AD48 RV8S-L-AD48
	60V	RV8H-L-AD60 RV8S-L-AD60
	110V - 125V	RV8H-L-AD110 RV8S-L-AD110
220V - 240V	RV8H-L-AD220 RV8S-L-AD220	

Standard stock models in bold.

Accessories



Item	Color	Part Number
Jumper (20 combs) ¹	Black	SV9Z-J20B
	Gray	SV9Z-J20W
	Blue	SV9Z-J20S
Spacer (circuit separator) ²	-	SV9Z-SAW
Marking plate (10 pcs)	-	SV9Z-PW10



1. Jumper combs come with 20 points, if shorter lengths are needed simply cut off the excess points.
 2. Width of spacer: 2mm
- Note: When using a cut jumper, please use a spacer on the cut side. For additional information see instruction sheet.

Starter Kits and Solution Packages

MicroSmart Starter Kits

Item	Part Numbers	Controller	Power Supply	Software (Prog. Cables Included)
	MM-SMART-10	10 I/O FC4A-C10R2 CPU	–	Automation Organizer Software Suite
	MM-SMART-16	16 I/O FC4A-C16R2 CPU	–	
	MM-SMART-20	20 I/O FC4A-D20RK1 CPU	15W	
	MM-SMART-24	24 I/O FC4A-C24R2 CPU	–	
	MM-SMART-40	40 I/O FC4A-D40K3 Slim CPU	15W	
	MM-PENTRA-16	16 I/Os FC5A-D16RS1 CPU	30W	
	MM-PENTRA-24	24 I/Os FC5A-C24R2 CPU	–	
	MM-PENTRA-12	12 I/Os FC5A-D12S1E Embedded Ethernet	30W	

MicroSmart Solution Packages



KIT-PENTRA-12-HG3G-AHP shown

Part Numbers	Operator Interface	Controller	Power Supply	Software (Prog. Cables Included)
KIT-PENTRA-24-HG1F	4.6" HG1F Mono	24 I/O FC5A-C24R2C CPU	60W	Automation Organizer Software Suite
KIT-PENTRA-12-HG1F	4.6" HG1F Mono	12 I/O FC5A-D12S1E Embedded Ethernet CPU	60W	
KIT-PENTRA-24-HG2G-M	5.7" HG2G Color TFT LCD	24 I/O FC5A-C24R2C CPU	60W	
KIT-PENTRA-12-HG2G-M	5.7" HG2G Color TFT LCD	12 I/O FC5A-D12S1E Embedded Ethernet CPU	60W	
KIT-PENTRA-24-HG2G-TE	5.7" HG2G Color TFT LCD	24 I/O FC5A-C24R2C CPU	60W	
KIT-PENTRA-12-HG2G-TE	5.7" HG2G Color TFT LCD	12 I/O FC5A-D12S1E Embedded Ethernet CPU	60W	
KIT-PENTRA-24-HG2G-HP	5.7" HG2G Color TFT LCD	24 I/O FC5A-C24R2C CPU	60W	
KIT-PENTRA-16-HG2G-HP	5.7" HG2G Color TFT LCD	16 I/O FC5A-D16RS1 CPU	60W	
KIT-PENTRA-12-HG2G-HP	5.7" HG2G Color TFT LCD	12 I/O FC5A-D12S1E Embedded Ethernet CPU	60W	
KIT-PENTRA-16-HG3G-8HP	8.4" HG3G Color TFT LCD	16 I/O FC5A-D16RS1 CPU	60W	
KIT-PENTRA-12-HG3G-8HP	8.4" HG3G Color TFT LCD	12 I/O FC5A-D12S1E Embedded Ethernet CPU	60W	
KIT-PENTRA-16-HG3G-AHP	10.4" HG3G Color TFT LCD	16 I/O FC5A-D16RS1 CPU	60W	
KIT-PENTRA-12-HG3G-AHP	10.4" HG3G Color TFT LCD	12 I/O FC5A-D12S1E Embedded Ethernet CPU	60W	
KIT-PENTRA-16-HG4G-HP	12.1" HG4G Color TFT LCD	16 I/O FC5A-D16RS1 CPU	60W	
KIT-PENTRA-12-HG4G-HP	12.1" HG4G Color TFT LCD	12 I/O FC5A-D12S1E Embedded Ethernet CPU	60W	



OI Touchscreens have black bezels. All packages come with Automation Organizer software suite and communication cables.

OI Touchscreens

PLCs

Automation Software

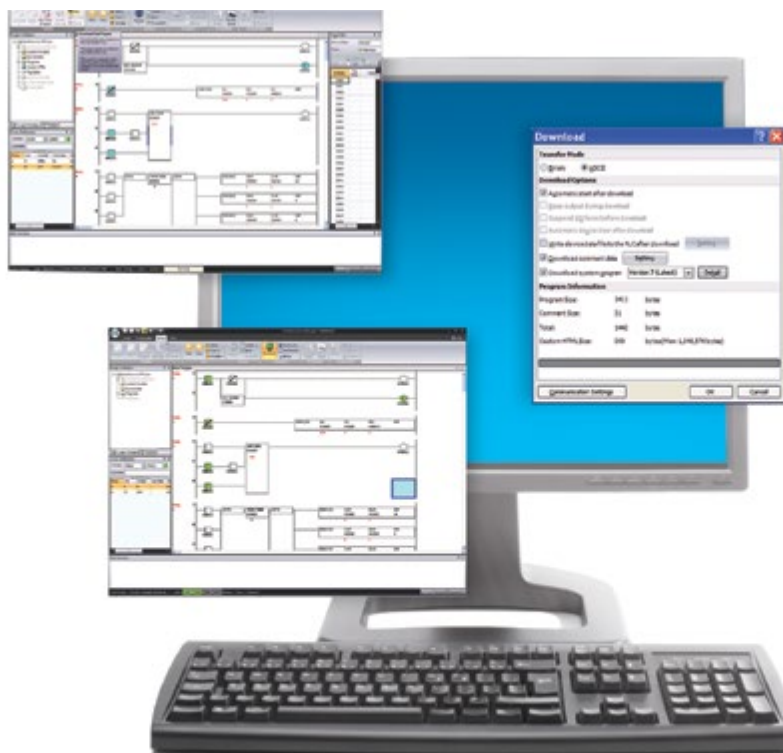
Power Supplies

Sensors

Communication

Barriers

Automation Organizer Suite Programming Software



Automation Organizer (AO) is a powerful software suite containing PLC programming software (WindLDR), OI touchscreen configuration software (WindO/I-NV2/NV3) and system configuration software (WindCFG). AO boasts a completely new graphic user interface and redesigned menu icons. AO is a one-stop automation software package for IEC MicroSmart Pentra PLCs and IEC OI touchscreens, and is compatible with Windows XP, Vista (32 bit) and Windows 7 (32 and 64-bit).

Automation Organizer **WindLDR**

All IEC MicroSmart Pentra PLCs are programmable with WindLDR ladder logic software. This icon-driven programming tool combines logic and intuition with an incredibly easy-to-use interface to allow you to take advantage of MicroSmart features. Even without ladder program experience, you can use the built-in editors, shortcuts and debuggers to configure programs. WindLDR is an excellent, long-term investment for your control solutions.

Simulation Mode

WindLDR allows you to simulate ladder programs with built-in Simulation mode. You can easily test and verify functionality of your ladder program without actual hardware.

Online Editing

Shutting down your PLC for minor changes can be a major hassle, so WindLDR allows you to edit and download programs without interrupting PLC operation. You can write new values to counters, timers and registers at any time without switching between editor mode (for programming) and monitor mode.

Firmware Download

With WindLDR version 6.4 or later, you have the option to upgrade or downgrade your CPU system program. It's as simple as clicking on the checkbox in the Download dialog box. Now you can easily update your PLC system firmware with the click of a button.

Automation Organizer **WindO/I-NV2** Automation Organizer **WindO/I-NV3**

WindO/I-NV2/NV3 software is the programming tool available for all IEC OI touchscreens and FT1A Touch. It is used to create projects or programs that can display information from a PLC, process status, or can be used to input data with virtual switches or keypads to make changes to a process. The objects are extremely easy to configure with the help of step-by-step navigation. It lets you quickly create colorful graphical screens in no time using drop-down menus and intuitive drag and drop functionality for the objects. A workspace is available to help you organize and manage projects, objects and screens.

Automation Organizer **WindCFG**

WindCFG is a system layout and configuration tool for IEC PLCs and OI touchscreens. Using WindCFG, you can create a visual layout of the system design and basic configuration of your PLC and OI touchscreens.

FREE Upgrades

The Automation Organizer suite comes with free lifetime upgrades. Once you make the initial purchase, upgrades are absolutely free.

Part Number

Part Number	Description
SW1A-W1C	Automation Organizer software suite

For more information, see page 137.

Specifications

Slim Type

Model	FC5A-D12K1E-DS0838 FC5A-D12S1E-DS0838	FC5A-D12K1E FC5A-D12S1E	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: 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 55°C						
Storage Temperature	-25 to +70°C (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 8.4 Hz amplitude 3.5 mm, 8.4 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	200g	230g	190g	140g	185g	180g	



1. CPU module + 7 I/O modules

OI Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

All-in-One Type

Model	FC5A-C10R2 FC5A-C10R2C FC5A-C10R2D	FC5A-C16R2 FC5A-C16R2C FC5A-C16R2D	FC5A-C24R2 FC5A-C24R2C FC5A-C24R2D	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, 12V DC					
Allowable Voltage Range	AC power type: 85 to 264V AC, 24V DC power type: 20.4 to 28.8V DC (including ripple), 12V DC type: 10.2 to 18.0V DC					
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) ¹ 360 mA (24V DC) ²	250 mA (85V AC) 160 mA (24V DC)	300 mA (85V AC) 190 mA (24V DC)	450 mA (85V AC) ¹ 360 mA (24V DC) ²
Maximum Power Consumption	AC Power FC5A-C10R2/FC4A-C10R2: 30VA (264V AC), 20VA (100V AC) ³ FC5A-C16R2/FC4A-C16R2: 31VA (264 V AC), 22VA (100V AC) ³ FC5A-C24R2/FC4A-C24R2: 40VA (264V AC), 33VA (100V AC) ¹					
	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 FC5A-C10R2D: 2.8W (12V DC) ⁴ FC5A-C16R2D: 3.4W (12V DC) ⁴ FC5A-C24R2D: 4.2W (12V DC) ⁴					
Allowable Momentary Power Interruption	10 ms (rated power voltage)					
Dielectric Strength	Between power and ⊕ or ⊖ terminals: 1,500V AC, 1 minute Between I/O and ⊕ or ⊖ terminals: 1,500V 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	FC5A-C10R2/FC5A-C10R2C/FC5A-C16R2/ FC5A-C16R2C: 35A FC5A-C10R2D/FC5A-C16R2D: 20A		FC5A-C24R2/ FC5A-C24R2C: 40A FC5A-C24R2D: 20A	35A		40A
Power Supply Wire	UL1015 AWG22, UL1007 AWG18					
Operating Temperature	0 to 55°C					
Storage Temperature	-25 to +70°C (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)					
Ground	Ground resistance 100Ω (max.)					
Grounding Wire	UL1007, AWG16					
Vibration Resistance	When mounted on a DIN rail or panel surface: 5 to 8.4 Hz amplitude 3.5 mm, 8.4 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



1. CPU module (including 250 mA sensor power) + 4 I/O modules
2. CPU module + 4 I/O modules
3. CPU module (including 250 mA sensor power)
4. CPU module

I/O Touchscreens

PLCs

Automation Software

Power Supplies


Sensors

Communication

Barriers


Slim Type Function Specifications

Model		FC5A-D12K1E-DS0838 FC5A-D12S1E-DS0838	FC5A-D12K1E FC5A-D12S1E	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							
		152 advanced		126 advanced	130 advanced	53 advanced	72 advanced						
Program Capacity ¹		127.8 KB (21,300 steps)		62.4 KB (10,400 steps)		27 KB (4,500 steps)	31.2 KB (5,200 steps) ²						
User Program Storage		Flash ROM (10,000 times rewritable)			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	8	Expansion: 224	8	Expansion: 224	12	Expansion: 128	12	Expansion: 224	24	Expansion: 224
	Output	4	Additional: 256	4	Additional: 256	8	Additional: 256	16	Additional: 256	8	Additional: 256	16	Additional: 256
Internal Relay		2,048 points					1,024 points						
Shift Register		256 points					128 points						
Data Register		42,000 points				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 Method	Non-volatile memory (MRAM)					Battery						
	Backup Retention	Approx. 10 yrs without Backup Cycle					Approx. 30 days (typical) at 25°C 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 ROM 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 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 4,294,967,295 (32 bits)					0 to 65,535 (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	3 points		2 points		3 points		2 points					
	Maximum Frequency	100 kHz					20 kHz						

-  Note: The maximum number of relay outputs that can be turned on simultaneously is 54 including those on the CPU module. Modem communication not possible on FC5A-D12K1E/D12S1E modules.
1. 1 step equals 6 bytes.
 2. Expandable up to 62.4 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 (change monitor device values, upload/download user programs, download system program)
 6. Maintenance communication, user communication, modem communication, data link, Modbus ASCII/RTU master/slave communication (FC5A only).

Slim Type Function Specifications (con't)

Model		FC5A-D12K1E-DS0838 FC5A-D12S1E-DS0838	FC5A-D12K1E FC5A-D12S1E	FC5A-D16RK1 FC5A-D16RS1	FC5A-D32K3 FC5A-D32S3	FC4A-D20K3 FC4A-D20S3	FC4A-D20RK1 FC4A-D20RS1	FC4A-D40K3 FC4A-D40S3
Ethernet Port	Ethernet Specifications	Electrical Characteristics: Complies with IEEE802.3 Transmission Speed: 10BASE-T/100BASE-TX						
	Ethernet Interface	RJ45						
	User Web Page Area	1 MB						
	Compliant Browser	Internet Explorer 7 and 8, Firefox 3						
	Protocol	Data Link Layer: IP, ARP Network Layer: UDP, TCP, ICMP Application Layer: SMTP, DHCP, HTTP, NBNS, DNS, SNTP						
	Function (see table next page)	Web server, Send email, PING, Maintenance communication server, Modbus TCP server/client, User communication server/client, SNTP						
Port 1		USB mini-B (CDC class) Maintenance Communication ⁵		RS232C – maintenance communication, user communications, Modbus slave ASCII/RTU communication (FC5A only)				
Port 2 Communication Adapter/Module (option) ⁶				Possible				
Clock Cartridge (option)				Possible				
Memory Cartridge (option)				Possible				
HMI Module (option)				Possible				

-  Note: The maximum number of relay outputs that can be turned on simultaneously is 54 including those on the CPU module. Modem communication not possible on FC5A-D12K1E/D12S1E modules.
1. 1 step equals 6 bytes.
 2. Expandable up to 62.4 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 (change monitor device values, upload/download user programs, download system program)
 6. Maintenance communication, user communication, modem communication, data link, Modbus ASCII/RTU master/slave communication (FC5A only).

I/O Touchscreens

PLCs

Automation Software

Power Supplies


Sensors

Communication

Barriers

All-in-One Type Function Specifications

Model	FC5A-C10R2 FC5A-C10R2C FC5A-C10R2D	FC5A-C16R2 FC5A-C16R2C FC5A-C16R2D	FC5A-C24R2 FC5A-C24R2C FC5A-C24R2D	FC4A-C10R2 FC4A-C10R2C	FC4A-C16R2 FC4A-C16R2C	FC4A-C24R2 FC4A-C24R2C		
Control System	Stored program system							
Instruction Words	42 basic			35 basic				
Program Capacity ¹	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: 6	9	14	Expansion: 64
	Output	4	7	10	Expansion: 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 25°C 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 EEPROM 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 65,535 (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	—						
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 ASCII/RTU slave communication (FC5A only)							
Port 2 Communication Adapter (option) ⁴	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. Expansion modules cannot be connected to FC5A-C24R2D.
 4. Maintenance communication, user communication, Modem communication, data link, Modbus ASCII/RTU master/slave communication (FC5A only).
 Note: The maximum number of relay outputs that can be turned on simultaneously is 33 including those on the CPU module.

Communication Port (Port 1) Specifications

CPU Module	FC5A-D12K1E/D12S1E	Slim CPU	All-in-One CPU
Standards	USB 2.0	EIA RS232C	
Maximum Baud Rate	USB 2.0	FC5A: 57,600 bps (maintenance communication) FC4A: 19,200 bps (maintenance communication)	
Cable	HG9Z-XCM2A	FC2A-KC4C, FC2A-KP1C, FC4A-KC1C, FC4A-KC2C	
Isolation between Internal Circuit and Communication Port	Not isolated	Not isolated	

Slim Type Input Specifications

Model	FC5A-D12K1E-DS0838	FC5A-D12K1E	FC4A-D20K3	FC5A-D16RK1	FC4A-D20RK1	FC5A-D32K3	FC4A-D40K3
	FC5A-D12S1E-DS0838	FC5A-D12S1E	FC4A-D20S3	FC5A-D16RS1	FC4A-D20RS1	FC5A-D32S3	FC4A-D40S3
Input Points	8 (8/1 common)	8 (8/1 common)	12 (12/1 common)	8 (8/1 common)	12 (12/1 common)	16 (8/1 common)	24 (12/1 common)
Rated Input Voltage	24V DC sink/source input signal						
Input Voltage Range	20.4 to 26.4V DC						
Rated Input Current	FC5A		I0, I1, I3, I4, I6, I7: I2, I5, I10 to I17:	4.5 mA/point (24V DC) 7 mA/point (24V DC)			
	FC4A		I0, I1, I6, I7: I2 to I5, I10 to I27:	5 mA/point (24V DC) 7 mA/point (24V DC)			
Input Impedance	FC5A		I0, I1, I3, I4, I6, I7: I2, I5, I10 to I17:	4.9 kΩ 3.4 kΩ			
	FC4A		I0, I1, I6, I7: I2 to I5, I10 to I27:	5.7 kΩ 3.4 kΩ			
Turn ON Time	FC5A		I0, I1, I3, I4, I6, I7: I2 and I5: I10 to I17:	5 μs + filter value 35 μs + filter value 40 μs + filter value			
	FC4A		I0, I1, I6, I7: I2 to I5: I10 to I27:	35 μs + filter value 35 μs + filter value 40 μs + filter value			
Turn OFF Time	FC5A		I0, I1, I3, I4, I6, I7: I2 and I5: I10 to I17:	5 μs + filter value 150 μs + filter value 150 μs + filter value			
	FC4A		I0, I1, I6, I7: I2 to I5: I10 to I27:	45 μs + filter value 150 μs + filter value 150 μs + filter value			
Connector	On Mother Board	MC1.5/16-G-3.81BK (Phoenix Contact)		FL26A2MA (Oki Electric Cable)	MC1.5/13-G-3.81BK (Phoenix Contact)		FL26A2MA (Oki Electric Cable)
	Insertion Durability	100 times minimum					
Isolation	Between input terminals: Optocoupler 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, therefore reverse connection does not cause permanent damage. If any input exceeding the rated value is applied, permanent damage may be caused.						
Cable Length	3m in compliance with electromagnetic immunity						

All-in-One Type Input Specifications

Model	FC5A-C10R2 FC5A-C10R2C	FC5A-C16R2 FC5A-C16R2C	FC5A-C24R2 FC5A-C24R2C	FC5A-C10R2D	FC5A-C16R2D	FC5A-C24R2D
	FC4A-C10R2 FC4A-C10R2C	FC4A-C16R2 FC4A-C16R2C	FC4A-C24R2 FC4A-C24R2C	—	—	—
Input Points	6 (6/1 common)	9 (9/1 common)	14 (14/1 common)	6 (6/1 common)	9 (9/1 common)	14 (14/1 common)
Rated Input Voltage	24V DC sink/source input signal			12V DC sink/source input signal		
Input Voltage Range	20.4 to 28.8V DC			10.2 to 18.0V DC		
Rated Input Current	FC5A FC4A	I0 and I1: I2 to I7, I10 to I15: I0 and I1: I2 to I7, I10 to I15:	6.4 mA/point 7 mA/point (24V DC) 11 mA 7 mA/point (24V DC)	I0 and I1: I2 to I7, I10 to I15:	6 mA 6 mA	
Input Impedance	FC5A FC4A	I0 and I1: I2 to I7, I10 to I15: I0 and I1: I2 to I7, I10 to I15:	3.7 kΩ 3.4 kΩ 2.1 kΩ 3.4 kΩ	I0 and I1: I2 to I7, I10 to I15:	1.8 kΩ 2.0 kΩ	
Turn ON Time	FC5A FC4A	I0 and I1: I2 to I5: I6, I7, I10 to I15: I0 and I1: I2 to I5: I6, I7, I10 to I15:	2 μs + filter value 35 μs + filter value 40 μs + filter value 35 μs + filter value 35 μs + filter value 40 μs + filter value	I0 and I1: I2 to I5: I6, I7, I10 to I15:	2 μs + filter value 35 μs + filter value 40 μs + filter value	
Turn OFF Time	FC5A FC4A	I0 and I1: I2 to I5: I6, I7, I10 to I15: I0 and I1: I2 to I5: I6, I7, I10 to I15:	16 μs + filter value 150 μs + filter value 150 μs + filter value 45 μs + filter value 150 μs + filter value 150 μs + filter value	I0 and I1: I2 to I5: I6, I7, I10 to I15:	16 μs + filter value 150 μs + filter value 150 μs + filter value	
Isolation	Between input terminals: Optocoupler 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, therefore reverse connection does not cause permanent damage. If any input exceeding the rated value is applied, permanent damage may be caused.					
Cable Length	3m in compliance with electromagnetic immunity					

01 Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

Transistor Sink and Source Output Specifications

Model		FC5A-D12K1E-DS0838 FC5A-D12S1E-DS0838	FC5A-D12K1E FC5A-D12S1E	—	FC5A-D16RK1 FC5A-D16RS1	FC5A-D32K3 FC5A-D32S3
			—	FC4A-D20RK1 FC4A-D20RS1	—	FC4A-D40K3 FC4A-D40S3
Transistor Output Points		4 (4/1 common)	4 (4/1 common)	2 (2/1 common)	2 (2/1 common)	16 (8/1 common)
Output Type	Transistor Sink	FC5A-D12K1E/D16RK1/D32K3 FC4A-D20K3/D20RK1/D40K3				
	Transistor Source	FC5A-D12S1E/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		MC1.5/16-G-3.81BK (Phoenix Contact)		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: Q3 to Q7, Q10 to Q17:	5 µs max. 300 µs max.		
		FC4A	Q0, Q1: Q2 to Q7, Q10 to Q17:	5 µs max. 300 µs max.		
Output Delay	Turn OFF Time	FC5A	Q0 to Q2: Q3 to Q7, Q10 to Q17:	5 µs max. 300 µs max.		
		FC4A	Q0, Q1: Q2 to Q7, Q10 to Q17:	5 µs max. 300 µs max.		

OT Touchscreens

PLCs

Automation Software

Power Supplies


Sensors

Communication

Barriers

Relay Output Specifications

Model	FC5A-C10R2 FC5A-C10R2C FC5A-C10R2D	FC5A-C16R2 FC5A-C16R2C FC5A-C16R2D	FC5A-C24R2 FC5A-C24R2C FC5A-C24R2D	FC5A-D16RK1 FC5A-D16RS1
	FC4A-C10R2 FC4A-C10R2C	FC4A-C16R2 FC4A-C16R2C	FC4A-C24R2 FC4A-C24R2C	FC4A-D20RK1 FC4A-D20RS1
Relay Output Points	4	7	10	6
Output Points per Common Line	COM0	3	4	—
	COM1	1	2	3
	COM2	—	1	2
	COM3	—	—	1
Output Type	1NO			
Maximum Load Current	2A per point 8A per common line			
Minimum Switching Load	1 mA/ 5V 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 φ = 0.4) 30V DC/2A (resistive load, inductive load L/R =7 ms)			
Dielectric Strength	Between output and ⚡ terminals: Between output terminal and internal circuit: Between output terminals (COMs):		1,500V AC, 1 minute 1,500V AC, 1 minute 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)

OI Touchscreens

PLCs

Automation Software

Power Supplies

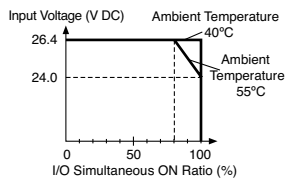
Sensors

Communication

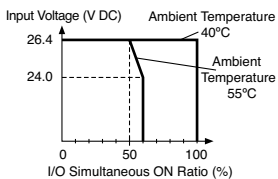
Barriers

Input Usage Limits Slim CPU

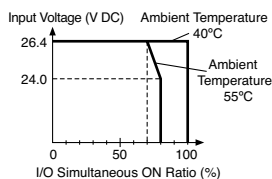
FC5A-D16RK1/D16RS1
FC5A-D12K1E/D12S1E



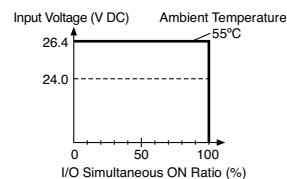
FC5A-D32K3/D32S3
FC4A-D40K3/D40S3



FC4A-D20K3/D20S3



FC4A-D20RK1/D20RS1



All-in-One CPU

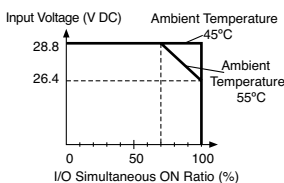
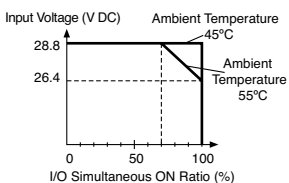
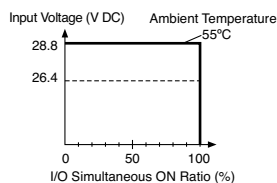
FC5A-C10R2
FC5A-C10R2C
FC4A-C10R2
FC4A-C10R2C

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

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

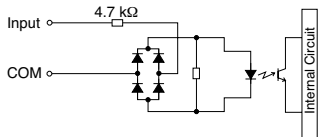


CAUTION: When using at an operating ambient temperature above 40°C, reduce the input voltage or the quantity of I/O points that turn on simultaneously.

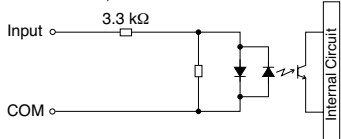


Input Internal Circuit Slim CPU

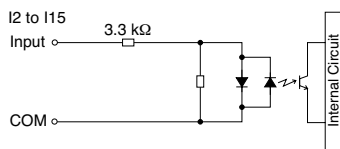
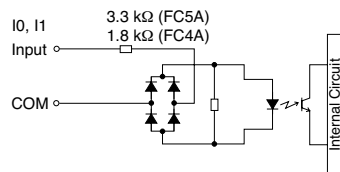
FC5A: I0, I1, I3, I4, I6, I7
FC4A: I0, I1, I6, I7



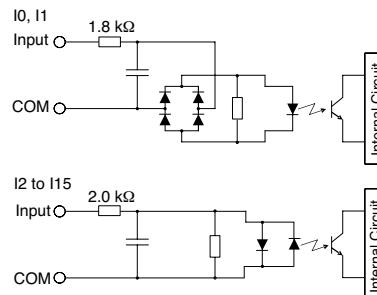
FC5A: I2, I5, I10 to I17
FC4A: I2 to I5, I10 to I27



All-in-One CPU



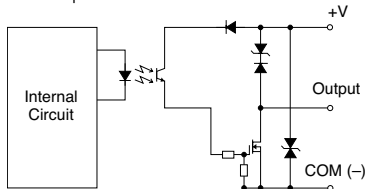
FC5A All-in-One CPU 12V DC Type



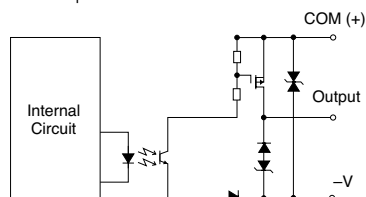
Output Internal Circuit

Slim CPU

Sink Output



Source Output



01 Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

Communication Adapter/Module Specifications

Model	FC4A-PC1 FC4A-HPC1	FC4A-PC2 FC4A-HPC2	FC4A-PC3 FC4A-HPC3
Standards	EIA RS232C	EIA RS485	EIA RS485
Maximum Baud Rate	FC5A: 57,600 bps ¹ FC4A: 19,200 bps	FC5A: 57,600 bps ¹ FC4A: 19,200 bps	FC5A: 57,600 bps ¹ FC4A: 19,200 bps (38,400 bps ²)
Maintenance Communication	Possible	Possible	Possible
User Communication	Possible	Possible ³	Possible ³
Data Link Communication	—	Possible	Possible
Half-duplex Communication	—	Possible	Possible
Maximum Cable Length	Special cable ⁴	Special cable ⁵	200m
Quantity of Slave Stations	—	31	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 is 115,200 bps for FC5A-D12*1E.
- 2. Maximum speed when data link is used.
- 3. FC5A (all types), FC4A-D20RK1, FC4A-D20RS1, FC4A-D40K3, FC4A-D40S3
- 4. FC2A-KC4C, FC2A-KM1C, FC4A-KC1C, FC4A-KC2C, FC2A-KP1C
- 5. FC2A-KP1C

HMI Module Specifications

Model	FC4A-PH1
Power Voltage	5V DC (supplied from the CPU module)
Weight	20g

Memory Cartridge Specifications

Model	FC4A-PM32	FC4A-PM64 ⁶	FC4A-PM128 ⁶
Memory Type	EEPROM		
Accessible Memory Capacity	32 KB	64 KB	128 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		


- 6. 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

Model	FC4A-PT1
Accuracy	±30 sec/month (typical) at 25°C
Backup Duration	Approx. 30 days (typical) at 25°C 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

Expansion Serial Communication Module
General Specifications
(Expansion RS232C Communication Module)

Model	FC5A-SIF2
No. of Port	1
Synchronization	Synchronization Start-stop synchronization
Electrical Characteristics	Electrical Characteristics EIA RS232C compliant
Maximum Delay in One Scan	Approx. 4 ms
Operating Temperature	0 to 55°C
Relative Humidity	10 to 95% (no condensation)
Recommended Cable Specifications	Shielded multi-core cable: 24AWG x 6 Dielectric strength: 2,000V AC/min Insulation resistance: 100 MΩ/km
Recommended Cable	KIDU-SB 24 AWG×6C (Nihon Electric Wire & Cable)
Connector on Mother Board	MC1.5/10-G-3.81BK (Phoenix Contact) Applicable terminal block: FC4A-PMT10P
Connector Insertion/Removal Durability	100 times minimum
Isolation from Internal Circuit	Transformer isolated
Quantity of Applicable Expansion RS232C Communication Modules	All-in-One 24-I/O type CPU module: 3 maximum ¹ Slim type CPU module: 5 maximum
Internal Current Draw	40 mA (5V/24V DC) ⁵
Weight	100g

 Note: FC5A-SIF2 cannot be connected to FC4A CPU modules.
 1. FC5A All-in-One 24-I/O CPU module cannot use the FC5A-SIF2/SIF4 module in combination with the function modules listed in the table on the left. When using these modules in combination with the FC5A-SIF2/SIF4 module, use the slim type CPU module.

Function Modules	Type No.
Analog Modules	FC4A-L03A1, FC4A-L03AP1, FC4A-J2A1, FC4A-K1A1, FC4A-J4CN1, FC4A-J8C1, FC4A-J8AT1, FC4A-K2C1, FC4A-K4A1
AS-Interface Master Module	FC4A-AS62M

5. 85 mA (5V DC), 0 mA (24V DC) when the communication module version is lower than V200.


(Expansion RS485 Communication Module)

Model	FC5A-SIF4
No. of Port	1
Synchronization	Synchronization Start-stop synchronization
Electrical Characteristics	Electrical Characteristics EIA RS485 compliant
Maximum Baud Rate	115,200 bps
Operating Temperature	0 to 55°C
Relative Humidity	10 to 95% (no condensation)
Recommended Cable Specifications	Shielded twisted pair cable: 22 AWG (0.3 mm ² x 2P) Conductor Resistance: 67 MΩ/km maximum (at 20°C)
Connector on Mother Board	MC1.5/10-G-3.81BK (Phoenix Contact) Applicable terminal block: FC4A-PMT10P
Connector Insertion/Removal Durability	100 times minimum
Isolation from Internal Circuit	Transformer isolated
Quantity of Applicable Expansion RS485C Communication Modules	All-in-One 24-I/O type CPU module: 3 maximum ¹ Slim type CPU module: 5 maximum
Internal Current Draw	40 mA (5V/24V DC)
Weight	100g

Note: FC5A-SIF4 cannot be connected to FC4A CPU modules.

Communication Specifications

Model	FC5A-SIF2	FC5A-SIF4
Maximum Baud Rate	1,200/2,400/4,800/9,600/19,200/38,400/57,600 ⁴ /115,200 ⁴	
Maintenance Communication	Possible ²	
Modbus Communication	Modbus ASCII master Modbus ASCII slave Modbus RTU master Modbus RTU slave	
Data Link	-	0 ³
Max Cable Length	10m	1,200m
Quantity of Slave Stations	1	31

 2. Run-time program download is not possible.
 3. Data Link can be used only on one of the communication ports.
 4. Can be used when the communication module is version V200 or higher.

OT Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

Specifications (I/O Modules)

Input Module Specifications

Model	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 (Phoenix Contact) 2-wire: AI-TWIN 2×0.5-8 WH (Phoenix Contact)		—		—	
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	

OI Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

Mixed I/O Module Specifications

Model		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	
	Output Specifications	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 Points		4 (4/1 common)	8 (4/1 common)
Output Type		1NO	
Maximum Load Current		2A per point 7A per common	
Minimum Switching Load		1 mA/ 5V 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 φ = 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: Between output terminals (COMs):	1,500V AC, 1 minute 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	
Applicable Ferrule	1-wire: AI 0.5-8 WH (Phoenix Contact), 2-wire: AI-TWIN 2x0.5-8 WH (Phoenix Contact)		
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	

I/O Touchscreens

PLCs

Automation Software

Power Supplies

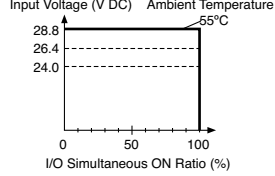
Sensors

Communication

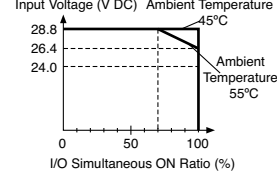
Barriers

Input Usage Limits

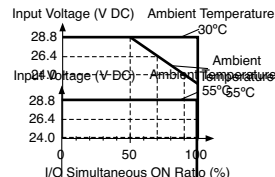
FC4A-N08B1



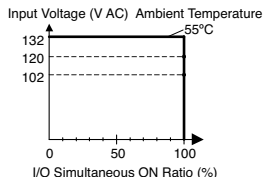
FC4A-N16B1



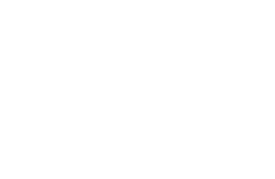
FC4A-N16B3/N32B3



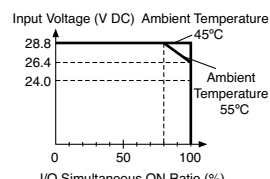
FC4A-N08A11



FC4A-M08BR1



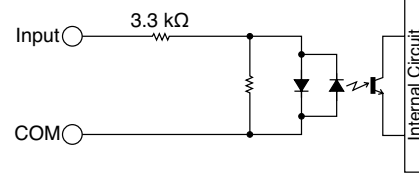
FC4A-M24BR2



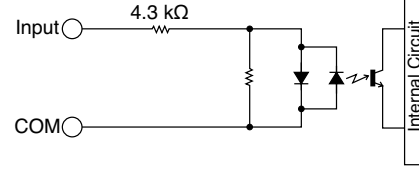
When using at an operating ambient temperature above 40°C, reduce the input voltage or the quantity of I/O points that turn on simultaneously.

Input Internal Circuit

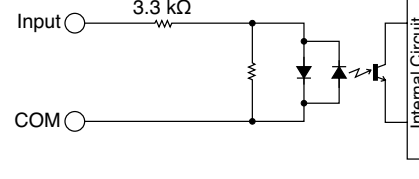
FC4A-N08B1, FC4A-N16B1



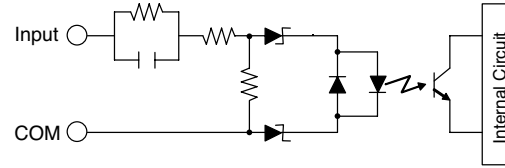
FC4A-N16B3, FC4A-N32B3



FC4A-M08BR1, FC4A-M24BR2

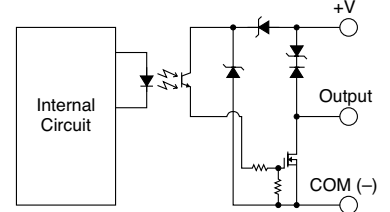


FC4A-N08A11

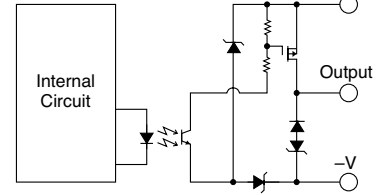


Output Internal Circuit

FC4A-T08K1, FC4A-T16K3, FC4A-T32K3




FC4A-T08S1, FC4A-T16S3, FC4A-T32S3



Specifications (Analog I/O Modules)

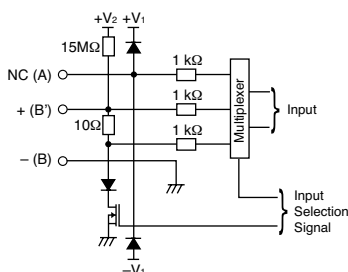
Analog I/O Module Specifications

Model	FC4A-L03A1	FC4A-L03AP1	FC4A-J2A1	FC4A-J4CN1	FC4A-J8C1	FC4A-J8AT1	FC4A-K4A1	FC4A-K1A1	FC4A-K2C1
Input Points	2	2	2	4	8	8	—	—	—
Output Points	1	1	—	—	—	—	4	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	130 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								
Applicable Ferrule	1-wire: AI 0.5-8 WH (Phoenix Contact), 2-wire: AI-TWIN 2x0.5-8 WH (Phoenix Contact)								
Internal Power Consumption (5V DC)	50 mA	50 mA	50 mA	50 mA	40 mA	45 mA	65 mA	50 mA	60 mA
Internal Power Consumption (at 24V DC while all I/Os are ON)	0.34W	0.34W	0.34W	0.34W	0.27W	0.30W	0.44W	0.34W	0.40W
Weight	85g	85g	85g	140g	140g	125g	100g	85g	110g

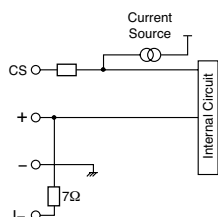
 * The external current draw is the value when all the analog inputs are used and the analog output value is at 100%.

Input Circuit

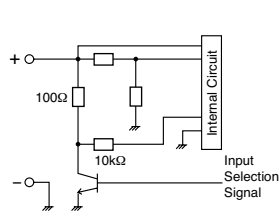
FC4A-L03A1, FC4A-L03AP1
FC4A-J2A1



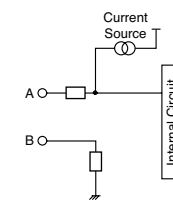
FC4A-J4CN1



FC4A-J8C1




FC4A-J8AT1




Analog Input Specifications (1)

Model		FC4A-L03A1, FC4A-J2A1		FC4A-L03AP1	
Input Signal Type		Voltage Input 0 to 10V DC	Current Input 4 to 20 mA	Resistance Thermometer Pt100 3-wire type (-100 to 500°C)	Thermocouple Type K (0 to 1,300°C) Type J (0 to 1,200°C) Type T (0 to 400°C)
Input Impedance		1 MΩ minimum	10Ω	1 MΩ minimum	1 MΩ minimum
Input Detection Current		—	—	1.0 mA maximum	—
AD Conversion	Sampling Duration Time	10 ms maximum		20 ms maximum	10 ms maximum
	Sampling Repetition Time	20 ms maximum		40 ms maximum	20 ms maximum
	Total Input System Transfer Time	60 ms + 1 scan time		80 ms + 1 scan time	60 ms + 1 scan time
	Type of Input	Single-ended input	Differential input		
	Operating Mode	Self-scan			
	Conversion Method	Σ Δ type ADC			
Input Error	Maximum Error at 25°C	±0.2% of full scale			±0.2% of full scale plus cold junction compensation error (±4°C maximum)
	Temperature Coefficient	±0.006% of full scale /°C			
	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)		6,000 increments (14 bits)	Type K: 13,000 increments (14 bits) Type J: 12,000 increments (14 bits) Type T: 4,000 increments (14 bits)
	Input Value of LSB	2.5 mV	4 μA	0.1°C	Type K: 0.1°C Type J: 0.1°C Type T: 0.1°C
	Data Type in Application Program	Default: 0 to 4,095 Optional: -32,768 to 32,767 (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 ³			
	Input Filter	No			
	Recommended Cable for Noise Immunity	Twisted pair shielded 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)	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 -32,768 and 32,767. The optional range designation, and analog I/O data minimum and maximum values can be selected using data registers allocated to analog I/O modules.
 2: When an error is detected, a corresponding error code is stored to a data register allocated to analog I/O operating status.
 3: The accuracy of the thermocouple input is not guaranteed when noise is applied.

Analog Input Specifications (2)

Model	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 1,300°C) Type J (0 to 1,200°C) Type T (0 to 400°C)	Pt100, Pt1000 3-wire type (-100 to 500°C) Ni100, Ni1000 3-wire type (-60 to 180°C)	-50 to 150°C		
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		30 ms maximum	10 ms maximum	2 ms × channels	
		FC4A-J8C1: 2 ms maximum					
	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	Σ Δ type ADC (FC4A-J4CN1), Successive approximation register method (FC4A-J8C1, FC4A-J8AT1)						
Input Error	Maximum Error at 25°C	±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	—	—	±3°C maximum	—	—	
	Temperature Coefficient	±0.005% of full scale/°C					
	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	50,000 increments (16 bits)		Type K: Approx. 24,000 increments (15 bits) Type J: Approx. 33,000 increments (15 bits) Type T: Approx. 10,000 increments (14 bits)	Pt100: Approx. 6,400 increments (13 bits) Pt1000: Approx. 64,000 increments (16 bits) Ni100: Approx. 4,700 increments (13 bits) Ni1000: Approx. 47,000 increments (16 bits)	Approx. 4,000 increments (12 bits)	
	Input Value of LSB	0.2 mV	0.32 μA	Type K: 0.058°C Type J: 0.038°C Type T: 0.042°C	Pt100: 0.086°C Pt1000: 0.0086°C Ni100: 0.037°C Ni1000: 0.0037°C	0.05°C	
	Data Type in Application Program	Default: 0 to 50,000 Optional: -32,768 to 32,767 (selectable for each channel) ¹				Default: 0 to 4,000 Optional: -32,768 to 32,767 (selectable for each channel) ¹ Resistance: 0 to 10,000 Temperature: °C, °F	
	Monotonicity	Yes					
	Input Data Out of Range	Detectable ²					

 1: The data processed in the analog I/O module can be linear-converted to a value between -32,768 and 32,767. 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.

Analog Input Specifications (2) con't on next page.

Analog Input Specifications (2), con't

Model	FC4A-J4CN1, FC4A-J8C1		FC4A-J4CN1	FC4A-J8AT1
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	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:	Optocoupler-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			

Analog Output Specifications

Model	FC4A-K4A1	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: 1 kΩ minimum Current output: 300Ω maximum				
	Load Type	Resistive load				
DA Conversion	Settling Time	2 ms/ch	10 ms	10 ms	10 ms	
	Total Output System Transfer Time	2 ms/ch + 1 scan time	10 ms + 1 scan time	10 ms + 1 scan time	10 ms + 1 scan time	
Output Error	Maximum Error at 25°C	±0.2% of full scale				
	Temperature Coefficient	±0.015% of full scale/°C			±0.005% of full scale/°C	
	Repeatability after Stabilization Time	±0.5% of full scale				
	Output Voltage Drop	±1% of full scale				
	Non-linearity	±0.2% of full scale				
	Output Ripple	20 mV maximum			±0.1% of full scale	
	Overshoot	0%				
Total Error	±1% of full scale					
Data	Digital Resolution	4096 increments (12 bits)			50,000 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 4,095 (voltage, current)			-25,000 to 25,000 (voltage) 0 to 50,000 (current)	
		Optional: -32,768 to 32,767 (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	2LSB maximum	None		2 LSB maximum	

¹: The data processed in the analog I/O module can be linear-converted to a value between -32,768 and 32,767. 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.

Analog Input Specifications con't on next page.

Analog Output Specifications, con't

Model	FC4A-K4A1	FC4A-L03A1	FC4A-L03AP1	FC4A-K1A1	FC4A-K2C1
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				

PID Module Specifications

Model	FC5A-F2MR2	FC5A-F2M2
Control Mode	Independent PID Control	Possible
	Heating/Cooling Control	Possible (overlapping deadband settings available) *
	Difference Input Temperature Control	Possible *
	Cascade Control	Possible *
Input Points	2ch	2ch
Types of Inputs	Thermocouple	K, J, R, S, B, E, T, N, PL-II, C (W/Re5-26) External resistance: 100Ω maximum However, external resistance of B input: 40Ω maximum
	Resistance Thermometer	Pt100, JPt100, 3-wire type Allowable conductor resistance (per wire): 10Ω maximum
	Current Input	0 to 20 mA DC, 4 to 20 mA DC Input impedance: 50Ω Maximum permanent allowed overload (no damage): 50 mA maximum
	Voltage Input	0 to 1V DC Input impedance: 1MΩ minimum Maximum permanent allowed overload (No damage): 5V DC Allowable output impedance: 2 kΩ 0 to 5V DC, 1 to 5V DC, 0 to 10V DC Input impedance: 100kΩ minimum Maximum permanent allowed overload (No damage): 15V DC maximum Allowable output impedance: 100Ω maximum
AD Conversion	Sampling Duration Time	100 ms
	Sampling Repetition Time	125 ms
	Type of Input	Differential input
	Conversion Method	Σ Δ type ADC
Maximum Error at 25°C	Thermocouple Input	±0.2% of full scale or ±2°C (4°F), whichever is greater However, R, S inputs: 0 to 200°C (0 to 400°F): ±6°C (12°F) B input: 0 to 300°C (0 to 600°F) Accuracy is not guaranteed. K, J, E, T, N inputs: Less than 0°C (32°F): ±0.4% of full scale
	Resistance Thermometer Input	±0.1% of full scale or ±1°C (2°F), whichever is greater
	Voltage/Current Inputs	±0.2% of full scale
Input Accuracy (at 0 to 55°C)	Thermocouple Input	±0.7% of full scale However, R, S input: 0 to 200°C (0 to 400°F): ±6°C (12°F) B input: 0 to 300°C (0 to 600°F) Accuracy is not guaranteed. K, J, E, T, N inputs: Less than 0°C (32°F): ±0.9% of full scale
	Resistance Thermometer Input	±0.6% of full scale
	Voltage/Current Inputs	±0.7% of full scale
	Maximum Temporary Deviation during Electrical Noise Tests	Voltage input, current input ±3% maximum when a 500V clamp voltage is applied to the power supply and I/O lines Thermocouple, Resistance Thermometer Not assured
Noise Resistance	Input Filter	None
	Recommended Cable for Noise Immunity	Twisted pair cable
	Cross Talk	None



*Dual channel input is required for one loop circuit.

PID Module Specifications con't on next page.

OT Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

PID Module Specifications, con't

Model		FC5A-F2MR2	FC5A-F2M2
Isolation		Between input and power circuit: Transformer Isolated Between input and internal circuit: Optocoupler isolated	
Data Accuracy		Maximum error at 25°C±Minimum digital resolution of each input range	
Cold Junction Temperature Compensation Accuracy		±1°C at 0 to 55°C	
Sampling Period		125 ms	
Output Points		2ch	
Output		Relay output 1NO Rated load 5A 250V AC/30V DC (resistive load) 3A 250V AC (inductive load cos φ=0.4) Minimum open/closed load: 10 mA 5V DC Electrical life: 100,000 cycles (at the maximum rating of resistive load)	Non-contact voltage output (for SSR drive) 12V DC±15% Maximum 40 mA (short circuit protected) Leakage current: 0.3 mA maximum Analog current output 4 to 20 mA DC Maximum Error: ±0.5% Full Scale at 25°C ±1.0% Full Scale at 55°C Load resistance: 550Ω maximum Analog output digital resolution: 1,000 LSB input value: 0.016 mA
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
	Recommended Cable for Noise Immunity	—	Twisted pair cable
	Cross Talk	—	None
Isolation		Between output and power circuit: Transformer Isolated	Between output and power circuit: Transformer Isolated Between output and internal circuit: Optocoupler isolated
Power Voltage		24V DC (External power), 5V DC (Internal power)	
Allowable Voltage Range		20.4 to 28.8V DC	
External Power Consumption		Approx. 3.5W maximum	
Internal Power Consumption (at 24V DC while all I/Os are on)		65mA (5V DC)	
Connector on Mother Board		Input: F6018-17P (Fujicon)	Output: F6018-11P (Fujicon)
Weight (approx.)		140g	

Input Range

Input	Input Range (Digital Resolution)		Input Value of LSB
K	-200 to 1,370°C	-328 to 2,498°F	1°C (°F)
	-200.0 to 400.0°C	-328.0 to 752.0°F	0.1°C (°F)
J	-200 to 1,000°C	-328 to 1,832°F	1°C (°F)
R	0 to 1,760°C	32 to 3,200°F	1°C (°F)
S	0 to 1,760°C	32 to 3,200°F	1°C (°F)
B	0 to 1,820°C	32 to 3,308°F	1°C (°F)
E	-200 to 800°C	-328 to 1,472°F	1°C (°F)
T	-200.0 to 400.0°C	-328.0 to 752.0°F	0.1°C (°F)
N	-200 to 1,300°C	-328 to 2,372°F	1°C (°F)
PL-II	0 to 1,390°C	32 to 2,534°F	1°C (°F)
	0 to 2,315°C	32 to 4,199°F	1°C (°F)
Pt100	-200.0 to 850.0°C	-328.0 to 1,562.0°F	0.1°C (°F)
	-200 to 850°C	-328 to 1,562°F	1°C (°F)
JPt100	-200.0 to 500.0°C	-328.0 to 932.0°F	0.1°C (°F)
	-200 to 500°C	-328 to 932°F	1°C (°F)
4 to 20mA DC	-2,000 to 10,000 (12,000 increments)		1.333 μA
0 to 20mA DC	-2,000 to 10,000 (12,000 increments)		1.666 μA
0 to 1V DC	-2,000 to 10,000 (12,000 increments)		0.083 mA
0 to 5V DC	-2,000 to 10,000 (12,000 increments)		0.416 mA
1 to 5V DC	-2,000 to 10,000 (12,000 increments)		0.333 mA
0 to 10V DC	-2,000 to 10,000 (12,000 increments)		0.833 mA

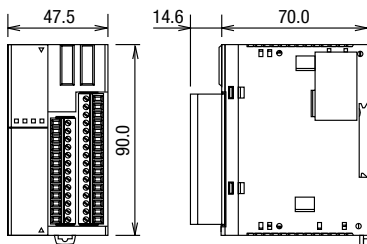
Expansion Interface Module Specifications

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/External Power)	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/D12K1E/D12S1E 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)
	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

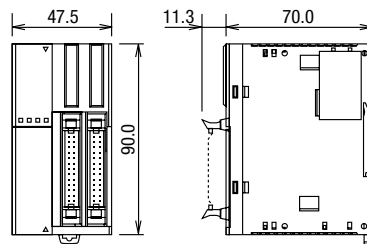
- 1: Power consumption by the expansion interface module and eight I/O modules.
- 2: The maximum number of relay outputs that can be turned on simultaneously is 54 points.
- 3: Maximum I/O refresh time of the expansion interface module. D8252 stores the refresh time.

Dimensions (mm)

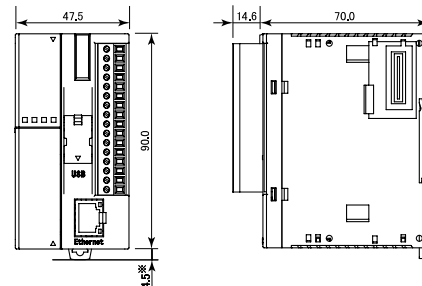
FC5A-D16RK1, FC5A-D16RS1,
FC4A-D20RK1, FC4A-D20RS1



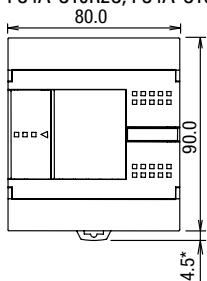
FC5A-D32K3, FC5A-D32S3, FC4A-D40K3,
FC4A-D40S3



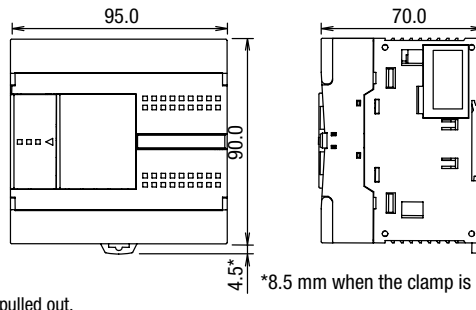
FC5A-D12K1E, FC5A-D12S1E



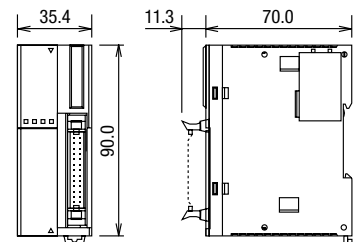
FC5A-C10R2, FC5A-C16R2,
FC5A-C10R2C, FC5A-C16R2C,
FC5A-C10R2D, FC5A-C16R2D,
FC4A-C10R2, FC4A-C16R2,
FC4A-C10R2C, FC4A-C16R2C



FC5A-C24R2, FC5A-C24R2C, FC5A-C24R2D,
FC4A-C24R2, FC4A-C24R2C



FC4A-D20K3, FC4A-D20S3



*8.5 mm when the clamp is pulled out.

*8.5 mm when the clamp is pulled out.

I/O Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

Dimensions cont. (mm)

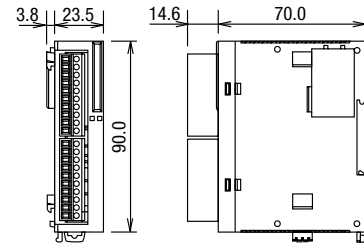
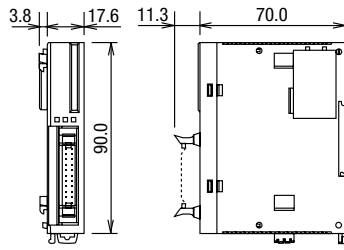
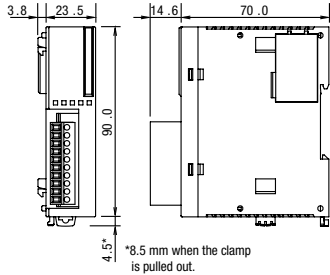
01 Touchscreens

FC5A-SIF2, FC5A-SIF4,
FC4A-AS62M, FC4A-N08A11,
FC4A-J2A1, FC4A-N08B1,
FC4A-K1A1, FC4A-R081,
FC4A-K2C1, FC4A-T08K1,
FC4A-L03A1, FC4A-T08S1,
FC4A-L03AP1, FC4A-K4A1,
FC4A-M08BR1

FC4A-N16B3, FC4A-T16K3, FC4A-T16S3

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

PLCs

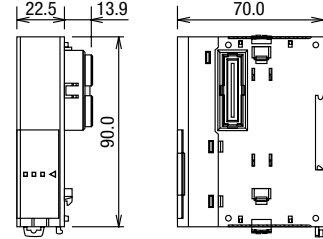
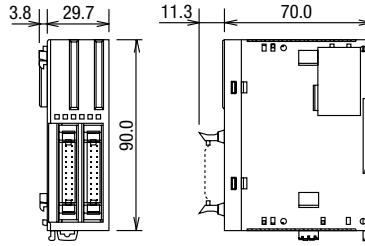
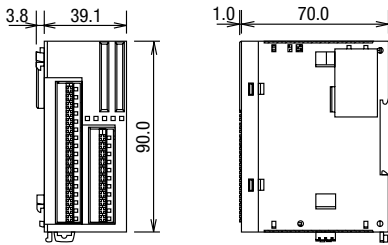


Automation Software

FC5A-F2MR2, FC5A-F2M2, FC4A-M24BR2

FC4A-N32B3, FC4A-T32K3, FC4A-T32S3

FC4A-HPC1, FC4A-HPC2, FC4A-HPC3

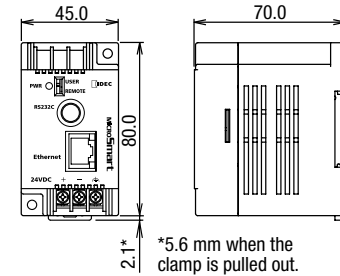
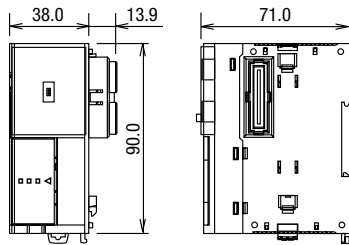
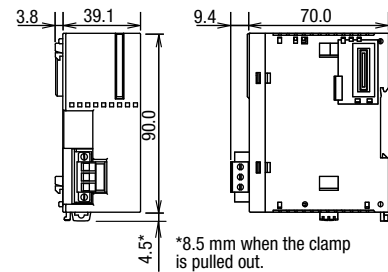


Power Supplies

FC5A-EXM2

FC4A-HPH1

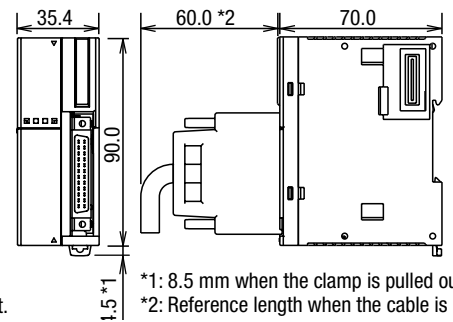
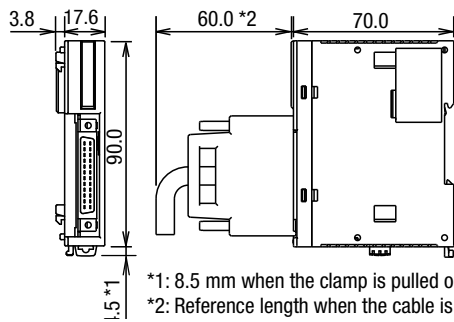
FC4A-SX5ES1E



Sensors

FC5A-EXM1M

FC5A-EXM1S

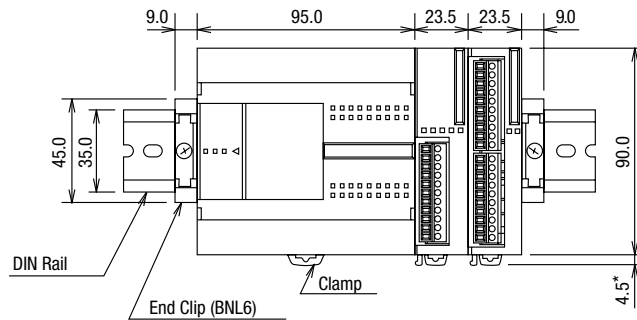


Communication

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.

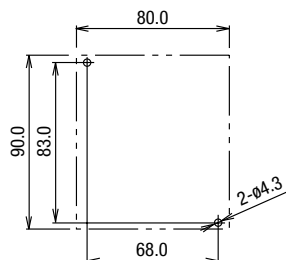
Barriers



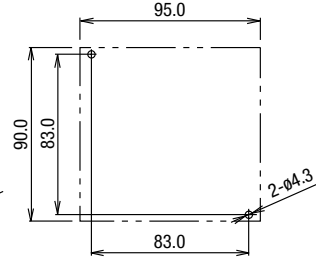
*8.5 mm when the clamp is pulled out.

Mounting Hole Layouts

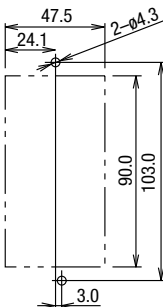
FC5A-C10R2, FC5A-C10R2C,
FC5A-C10R2D, FC5A-C16R2,
FC5A-C16R2C, FC5A-C16R2D
FC4A-C10R2, FC4A-C10R2C
FC4A-C16R2, FC4A-C16R2C



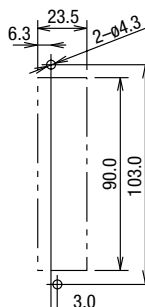
FC5A-C24R2
FC5A-C24R2C
FC5A-C24R2D
FC4A-C24R2
FC4A-C24R2C



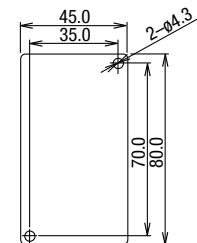
FC5A-D12K1E, FC5A-D12S1E
FC5A-D16RK1, FC5A-D16RS1
FC5A-D32K3, FC5A-D32S3
FC4A-D20RK1, FC4A-D20RS1
FC4A-D40K3, FC4A-D40S3



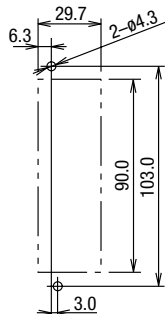
FC5A-SIF2, FC5A-SIF4
FC4A-AS62M, FC4A-N08A11,
FC4A-J2A1, FC4A-N08B1,
FC4A-J4CN1, FC4A-N16B1,
FC4A-J8AT1, FC4A-R081, FC4A-
J8C1, FC4A-R161, FC4A-K1A1,
FC4A-T08K1, FC4A-K2C1, FC4A-
T08S1, FC4A-L03A1, FC4A-K4A1,
FC4A-L03AP1, FC4A-M08BR1



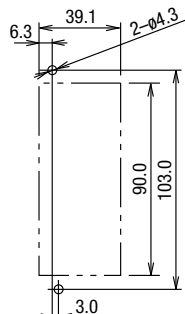
FC4A-SX5ES1E



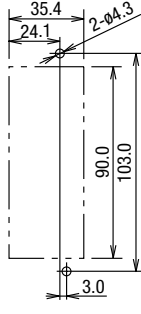
FC4A-N32B3
FC4A-T32K3
FC4A-T32S3



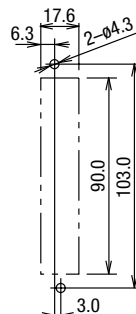
FC5A-F2MR2
FC5A-F2M2
FC5A-EXM2
FC4A-M24BR2



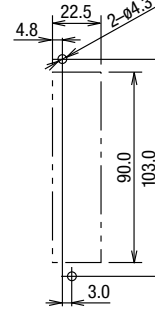
FC5A-EXM1S
FC4A-D20K3
FC4A-D20S3



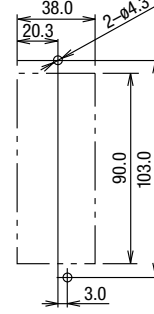
FC5A-EXM1M
FC4A-N16B3
FC4A-T16K3
FC4A-T16S3



FC4A-HPC1
FC4A-HPC2
FC4A-HPC3

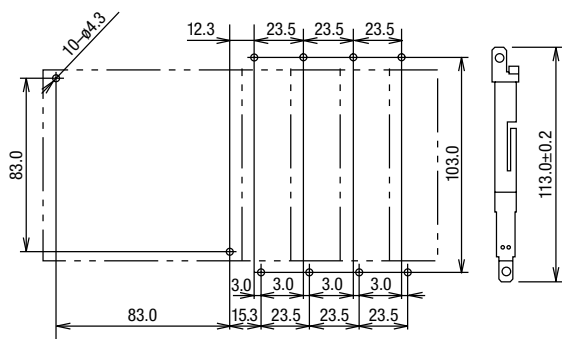


FC4A-HPH1



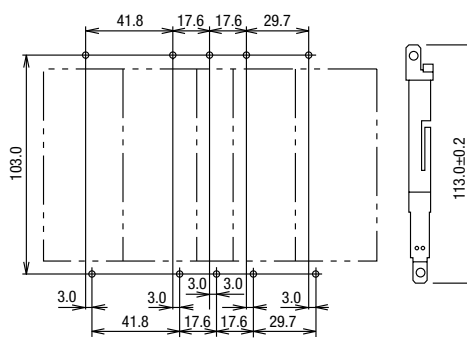
Example

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



Example

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



All dimensions in mm.

FT1A Touch HMI + PLC

A Breed of Its Own

The perfect combination of PLC processing and HMI monitoring and control, the 3.8-inch FT1A Touch is an all-in-one touchscreen interface and logic controller. With a compact body and full complement of features, FT1A Touch is perfect for small systems that require a graphical user interface along with versatile I/O controls at a truly affordable price.

USB-A Port

Embedded USB-A port for data logging and recipe data, as well as for performing program updates.

Analog Expansion Cartridges (Transistor Output Models)

- Up to 2 analog expansion adapters can be configured on the FT1A Touch with 12-bit resolution.
- Maximum combination of 2in/6out, 4in/4out, or 6in/2out analog I/O can be configured.

RS232C and RS485 ports

- Built-in RS232C, RS422/485 interface for serial communication.
- Communication with IDEC or other PLCs also supported through this serial port.

Relay or Transistor Outputs

- Relay output type equipped with 10A contact, so no interposing relays required.
- Transistor output type equipped with 300mA per channel.

Analog Outputs (Transistor Output Models)

2 built-in 0-10VDC, 4-20mA analog outputs.

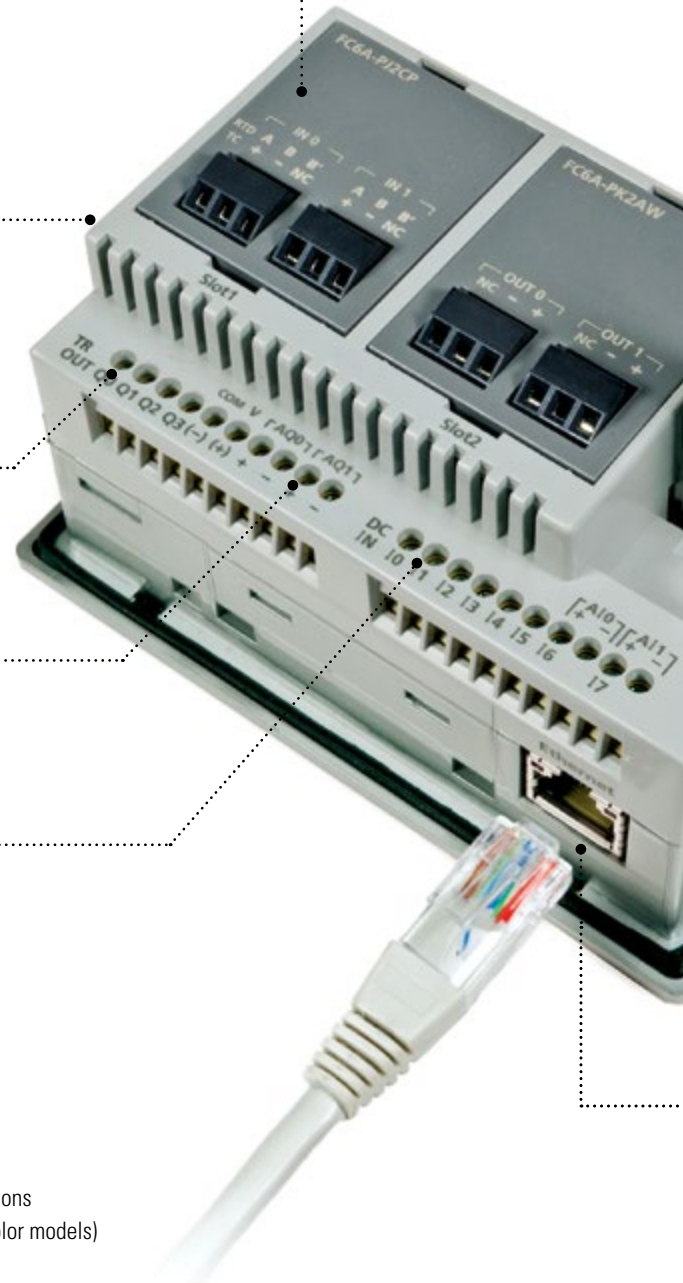
Digital, Analog and High-speed Inputs

8 built-in DC inputs

- 2 inputs (I6 and I7) can be configured as 0-10V DC or 4-20mA analog inputs (transistor output models)
 - 10-bit resolution
- 4 high-speed counters
 - Up to 10kHz

Harsh Environments

- Class I, Division 2 for hazardous locations
- -20 to 55°C operating temperature (color models)



USB Mini-B
Embedded USB mini-B port for programming.

3 Bezel Colors
Available in silver, light gray and dark gray bezel.

STN Monochrome or 65K TFT Color

- 400cd/m² color
- 740cd/m² monochrome



Actual Size

IP66f (water and oil tight),
NEMA 4X (indoor) and 13

5MB Screen Editing Memory
Provides users with more flexibility and stress-free programming.

RJ45 Ethernet Port

- Supports remote Ethernet communication and Modbus TCP.
- Communication with IDEC or other PLCs also supported through the Ethernet port.

800.262.4332

www.IDEC.com/FT1A

FT1A Controllers

FT1A controllers are designed for a range of applications that demand powerful and abundant features. Available with 12, 24, 40 and 48 I/O with and without embedded LCD/keypad, these controllers enable engineers to design cost-effective solutions.

Smart LCD Screen

The display (24 digits x 4 lines) can provide visual feedback of system status, I/O status, user configurable messages with dynamic data, bar graph, and ladder program monitor and controls.

Non-LCD Model

FT1A controllers are also available without embedded LCD/keypad. It's a cost-effective, tamper-proof solution.

USB mini-B

With the USB mini-B port, communication with FT1A controllers is extremely convenient as standard USB Type A to mini-B cables can be used.

Note: Features available on specific models. See page 14 for selection guide.

Universal Voltages

24V DC or 100-240V AC



Actual Size

Memory Cartridge

The optional memory cartridge can be used to easily transfer programs from the internal ROM memory of FT1A controllers to a memory cartridge or vice versa. It's a convenient method to update the PLC program in the field.

800.262.4332

www.IDEC.com/FT1A

Digital, Analog and High-speed Inputs

Inputs on the 24V DC power models can be configured as digital, 0-10V DC analog or high-speed counters. Up to 8 analog inputs with 10-bit resolution and up to 6 HSC 100kHz can be configured.



RJ45 Ethernet Port

The embedded Ethernet port on the FT1A controllers provides users with easy access for remote maintenance and communication. It also supports industry standard Modbus TCP protocol. With Ethernet Remote I/O capability, the FT1A controller's I/O can be easily expanded.

Real-Time Clock

Every FT1A controller is equipped with an embedded real-time clock for time-controlled applications. With the built-in, real-time clock, log data can also be tracked and, with just a click, daylight savings time can easily be setup.

RS232C and RS485 Ports

Up to two RS232C and/or RS485 communication cartridges can be plugged into the FT1A controllers to allow the PLC to communicate with other serial devices. It also supports industry standard Modbus RTU protocol.

Large Programming Memory

With up to 47.4KB (11,850 steps) of programming memory, FT1A controllers have enough memory for even complex PLC programming.

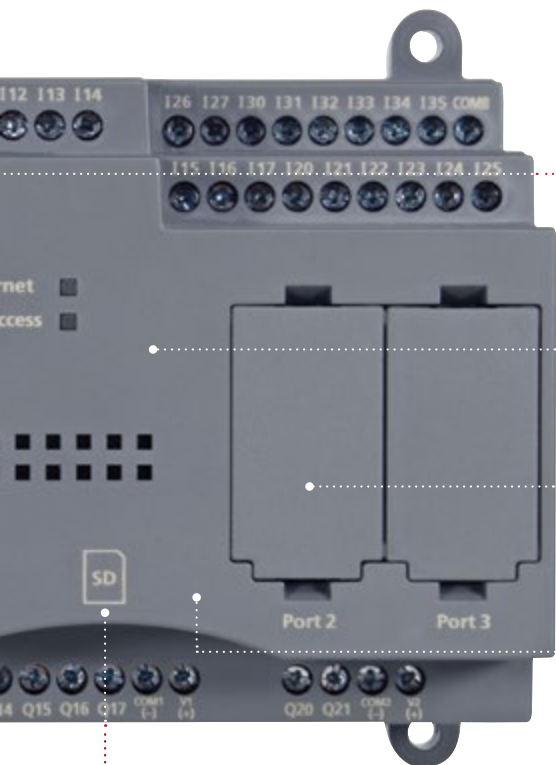
SD Memory Card

With the embedded SD memory slot, critical data can be easily logged and retrieved over Ethernet connections or simply remove the SD card and plug it into your PC.



10A Relay and High-speed Outputs

The FT1A controller with relay outputs is equipped with four 10A relay contacts. The transistor outputs model is also equipped with two 100kHz high-speed outputs for simple positioning controls. With remote I/O capability, additional outputs can easily be added.







Part Numbers

01 Touchscreens

PLCs

Automation Software


Touch	Part Number	Screen Type	Total I/O	Input Type	Embedded Analog Inputs	Embedded Analog Outputs	Output Type	Analog Expansion Cartridges	Power Voltage	Remote I/O Master		
	FT1A-M14KA-W	3.7" STN Monochrome (8 shades)	14 I/O (8 in, 6 out)	Source	2pt (0-10VDC, 4-20mA, 10-bit Resolution)	2pt (0-10VDC, 4-20mA, 10-bit Resolution)	Transistor Sink	Yes, up to 2 cartridges - see page 69 for part number.	24V DC	Yes		
	FT1A-M14KA-B			Sink			Transistor Source					
	FT1A-M14KA-S						Source				Transistor Sink	
	FT1A-M14SA-W										Sink	Transistor Source
	FT1A-M14SA-B						3.8" TFT 65,536 colors					Transistor Sink
	FT1A-M14SA-S			Transistor Source								
		FT1A-C14KA-W	3.8" TFT 65,536 colors	14 I/O (8 in, 6 out)	Source	2pt (0-10VDC, 4-20mA, 10-bit Resolution)	2pt (0-10VDC, 4-20mA, 10-bit Resolution)	Transistor Sink	Yes, up to 2 cartridges - see page 69 for part number.	24V DC	Yes	
		FT1A-C14KA-B			Sink			Transistor Source				
		FT1A-C14KA-S						Source				Transistor Sink
		FT1A-C14SA-W										Sink
FT1A-C14SA-B		3.7" STN Monochrome (8 shades)						Transistor Sink				
FT1A-C14SA-S					Transistor Source							
		FT1A-M12RA-W	3.7" STN Monochrome (8 shades)	12 I/O (8 in, 4 out)	Sink	2pt (0-10VDC, 10-bit Resolution)	-	Relay	-	-	-	
		FT1A-M12RA-B										
		FT1A-M12RA-S										
			FT1A-C12RA-W	3.8" TFT 65,536 colors	12 I/O (8 in, 4 out)	Sink	2pt (0-10VDC, 10-bit Resolution)	-	Relay	-	-	-
	FT1A-C12RA-B											
	FT1A-C12RA-S											


Power Supplies

Sensors






Communication

Barriers

12 I/O CPU	Part Number	Power Voltage	Total I/O	Input Type	Output Type	Ethernet Port	Screen Type	Embedded Analog Inputs	High-Speed Counter	SD Memory Slot	RS232C, RS485 Port
	FT1A-H12RC	100-240V AC	12 I/O (8 in, 4 out)	Contact	Relay	-	2.1" Monochrome	-	-	-	-
	FT1A-H12RA	24V DC		Sink				2pt, 0-10VDC, 10-bit	4 x 100kHz		
		FT1A-B12RC		100-240V AC			Contact	-	-		
		FT1A-B12RA		24V DC			Sink	2pt, 0-10VDC, 10-bit	4 x 100kHz		
24 I/O CPU											
	FT1A-H24RC	100-240V AC	24 I/O (16 in, 8 out)	Sink/Source	Relay	Yes	2.1" Monochrome	-	-	-	Optional Adapter
	FT1A-H24RA	24V DC		Sink				4pt, 0-10VDC, 10-bit	6 x 100kHz		
		FT1A-B24RC		100-240V AC			Sink/Source	-	-		
		FT1A-B24RA		24V DC			Sink	4pt, 0-10VDC, 10-bit	6 x 100kHz		
40 I/O CPU											
	FT1A-H40RC	100-240V AC	40 I/O (24 in, 16 out)	Sink/Source	Relay	Yes	2.1" Monochrome	-	-	Yes	Optional Adapters (x2)
	FT1A-H40RKA	24V DC		Source	Relay/Trans. Sink			6pt, 0-10VDC, 10-bit	6 x 100kHz		
	FT1A-H40RSA			Sink	Relay/Trans. Source						
		FT1A-B40RC		100-240V AC	Sink/Source		Relay	-	-		
		FT1A-B40RKA		24V DC	Source		Relay/Trans. Sink	6pt, 0-10VDC, 10-bit	6 x 100kHz		
		FT1A-B40RSA			Sink		Relay/Trans. Source				

48 I/O CPU	Part Number	Power Voltage	Total I/O	Input Type	Output Type	Ethernet Port	Screen Type	Embedded Analog Inputs	High-Speed Counter	SD Memory Slot	RS232C, RS485 Port
	FT1A-H48SC	100-240V AC	48 I/O (30 in, 18 out)	Sink/Source	Transistor Source	Yes	2.1" Monochrome	—	—	Yes	Optional Adapters (x2)
	FT1A-H48SA	24V DC		Sink				8pt, 0-10VDC, 10-bit	6 x 100kHz		
	FT1A-H48KC	100-240V AC		Sink/Source	Transistor Sink			—	—		
	FT1A-H48KA	24V DC		Source				8pt, 0-10VDC, 10-bit	6 x 100kHz		
	FT1A-B48SC	100-240V AC		Sink/Source	Transistor Source			—	—		
	FT1A-B48SA	24V DC		Sink				8pt, 0-10VDC, 10-bit	6 x 100kHz		
	FT1A-B48KC	100-240V AC		Sink/Source	Transistor Sink			—	—		
	FT1A-B48KA	24V DC		Source				8pt, 0-10VDC, 10-bit	6 x 100kHz		

Starter Kits

Type	Part Number	Description
	KIT-TOUCH-□KW	FT1A Touch Starter Kit, Transistor sink output type, Light bezel, USB cable, 30W PS and software
	KIT-TOUCH-□KB	FT1A Touch Starter Kit, Transistor sink output type, Dark bezel, USB cable, 30W PS and software
	KIT-TOUCH-□KS	FT1A Touch Starter Kit, Transistor sink output type, Silver bezel, USB cable, 30W PS and software
	KIT-TOUCH-□SW	FT1A Touch Starter Kit, Transistor source output type, Light bezel, USB cable, 30W PS and software
	KIT-TOUCH-□SB	FT1A Touch Starter Kit, Transistor source output type, Dark bezel, USB cable, 30W PS and software
	KIT-TOUCH-□SS	FT1A Touch Starter Kit, Transistor source output type, Silver bezel, USB cable, 30W PS and software
	KIT-TOUCH-□W	FT1A Touch Starter Kit, Relay output type, Light bezel, USB cable, 30W PS and software
	KIT-TOUCH-□B	FT1A Touch Starter Kit, Relay output type, Dark bezel, USB cable, 30W PS and software
	KIT-TOUCH-□S	FT1A Touch Starter Kit, Relay output type, Silver bezel, USB cable, 30W PS and software
	KIT-TOUCH-□W	SmartAXIS Touch Starter Kit, Light bezel, USB cable, 30W PS and software
	KIT-TOUCH-□B	SmartAXIS Touch Starter Kit, Dark bezel, USB cable, 30W PS and software
KIT-TOUCH-□S	SmartAXIS Touch Starter Kit, Silver bezel, USB cable, 30W PS and software	
	12 I/O CPU	KIT-SMART-12-□AC SmartAXIS Starter Kit, 12 I/O AC, USB cable and software
	KIT-SMART-12-□DC	SmartAXIS Starter Kit, 12 I/O DC, USB cable, 30W PS and software
	24 I/O CPU	KIT-SMART-24-□AC SmartAXIS Starter Kit, 24 I/O AC, USB cable and software
	KIT-SMART-24-□DC	SmartAXIS Starter Kit, 24 I/O DC, USB cable, 30W PS and software
	40 I/O CPU	KIT-SMART-40-□AC-R SmartAXIS Starter Kit, 40 I/O AC, USB cable and software
	KIT-SMART-40-□DC-RK	SmartAXIS Starter Kit, 40 I/O DC, Sink, USB cable, 30W PS and software
	KIT-SMART-40-□DC-RS	SmartAXIS Starter Kit, 40 I/O DC, Source, USB cable, 30W PS and software
	48 I/O CPU	KIT-SMART-48-□AC-K SmartAXIS Starter Kit, 48 I/O AC, Sink, USB cable and software
	KIT-SMART-48-□AC-S	SmartAXIS Starter Kit, 48 I/O AC, Source, USB cable and software
	KIT-SMART-48-□DC-K	SmartAXIS Starter Kit, 48 I/O DC, Sink, USB cable, 30W PS and software
	KIT-SMART-48-□DC-S	SmartAXIS Starter Kit, 48 I/O DC, Source, USB cable, 30W PS and software

In place of □ insert code: H = includes display/keypad, B = without display/keypad

OI Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

OI Touchscreens

Touch Accessories

Part Number	Description
FC6A-PJ2A	2-pt 0-10V, 4-20mA Analog input cartridge
FC6A-PJ2CP	2-pt RTD, Thermocouple cartridge
FC6A-PK2AV	2-pt 0-10V Analog output cartridge
FC6A-PK2AW	2-pt 4-20mA Analog output cartridge
FT9Z-1D3PN05	FT1A Touch screen protective sheet (5 per pack)
FT9Z-1E3PN05	FT1A Touch protective cover (5 per pack)
FT9Z-1A01	FT1A Touch rear mount adapter
FT9Z-1T09	FT1A Touch extra communication terminal block
FT9Z-1X03	FT1A Touch extra power supply terminal block
HG9Z-4K2PN04	FT1A Touch extra mounting brackets (4 per pack)
HG9Z-XU1PN05	USB cable lock-in (5 per pack)
HG9Z-XCM2A	USB programming cable
SW1A-W1C	Automation Organizer Software Suite

PLCs

Controller Accessories

Part Number	Description
FT1A-PC1	RS232C communication adapter, mini-DIN type
FT1A-PC2	RS485 communication adapter, mini-DIN type
FT1A-PC3	RS485 communication adapter, screw terminal type
FT1A-PM1	Optional memory cartridge
FT9Z-PSP1PN05	Extra direct mounting hook (5 per pack)
SW1A-W1C	Automation Organizer Software Suite
HG9Z-XCM2A	USB programming cable

Automation Software

General Specifications

Part No.	FT1A-*12RA-*	FT1A-*14KA-* / FT1A-*14SA-*
Output	Relay output	Transistor output
Rated Power Voltage/ Power Supply Isolation	24V DC/Not isolated	
Allowable Voltage Range	20.4 to 28.8V DC (including ripple)	
Power Consumption	9.2 W maximum	11W maximum
Allowable Momentary Power Interruption	10 ms maximum	
Dielectric Strength	Between power terminal and FE terminal: 500V AC, 5 mA, 1 minute Between power terminal and output terminal: 2,300V AC, 5 mA, 1 minute	Between power terminal and FE terminal: 500V AC, 5 mA, 1 minute Between power terminal and output terminal: 500V AC, 5 mA, 1 minute
EMC Immunity	IEC/EN 61131-2:2007 compliant	
Inrush Current	50A maximum (5ms maximum)	
Operating Temperature	Color display: -20 to +55°C, Monochrome display: 0 to +55°C (Note 1) (Note 2)	
Storage Temperature	-20 to +60°C (no freezing)	
Relative Humidity	10 to 95% RH (no condensation)	
Pollution Degree	2 (IEC 60664-1)	
Corrosion Immunity	Atmosphere free from corrosive gases	
Degree of Protection	IP66F TYPE 4X TYPE 13 (Panel front) (Note 3), IP20 (Rear)	
Ground	Functional grounding	
Protective grounding conductor	UL1007 AWG16	
Vibration Resistance	5 to 8.4 Hz half amplitude 3.5 mm, 8.4 to 150 Hz, acceleration 9.8 m/s ² (1G), 2 hours per axis on each of three mutually perpendicular axis (IEC 61131-2)	
Shock Resistance	147 m/s ² , 11 ms, X, Y, Z directions 3 times (IEC 61131-2)	
Mounting Structure	Panel mount	
Weight (approx.)	300g	250g

Power Supplies

Sensors

Communication

Note 1: FT1A-*12RA-* hardware version V130 (indicated on hardware) and earlier is UL, c-UL listed at 50°C (maximum operating temperature).
 Note 2: See SmartAXIS Touch User's Manual FT9Y-B1390(2) for I/O derating.
 Note 3: Operation not guaranteed when used with certain types of oils.

Barriers

General Specifications

Part Number		12-I/O Type H12RC H12RA B12RC B12RA	24-I/O Type H24RC H24RA B24RC B24RA	40-I/O Type H40RC H40RKA H40RSA B40RC B40RKA B40RSA	48-I/O Type H48KC H48SC H48KA H48SA B48KC B48SC B48KA B48SA
Rated Power Voltage		AC power: 100 to 240V AC, DC power: 24V DC			
Allowable Voltage Range		AC power: 85 to 264V AC, DC power: 20.4 to 28.8V DC (including ripple)			
Rated Power Frequency		AC power: 50 to 60Hz (47 to 63Hz)			
Power Consumption	AC Power	12-I/O: 18VA maximum, 24-I/O: 41VA maximum, 40-I/O: 48VA maximum, 48-I/O: 43VA maximum			
	DC Power	12-I/O: 4.3W maximum, 24-I/O: 4.8W maximum, 40-I/O: 7.9W maximum, 48-I/O: 6.0W maximum			
Allowable Momentary Power Interruption		AC power: 20ms maximum; DC power: 10ms maximum			
Dielectric Strength		AC power type: Between power/input and PE terminals: 1,500V AC, 1 minute Between transistor output and PE terminals: 1,500V AC, 1 minute Between relay output and PE terminals: 2,300V AC, 1 minute Between power and input terminals: 1,500V AC, 1 minute Between power/input and transistor output terminals: 1,500V AC, 1 minute Between power/input and relay output terminals: 2,300V AC, 1 minute DC power type: Between power/input and FE terminals: 500V AC, 1 minute Between transistor output and FE terminals: 500V AC, 1 minute Between relay output and FE terminals: 2,300V AC, 1 minute Between power/input and transistor output terminals: 500V AC, 1 minute Between power/input and relay output terminals: 2,300V AC, 1 minute			
EMC Immunity		IEC/EN 61131-2:2007 compliant			
Inrush Current		AC power: 35A maximum (Cold start with Ta=25°C, 200V AC); DC power: 30A maximum (5ms maximum)			
Operating Temperature		0 to +55°C ^{Note 1}			
Storage Temperature		-25 to +70°C (no freezing)			
Relative Humidity		10 to 95% RH (no condensation)			
Pollution Degree		2 (IEC 60664-1)			
Corrosion Immunity		Atmosphere free from corrosive gases			
Degree of Protection		IP20 (IEC 60529)			
Ground		D-type ground (Class 3 ground)			
Protective Grounding Conductor		UL1007 AWG16			
Vibration Resistance		5 to 8.4Hz half amplitude 3.5mm, 8.4 to 150Hz, Acceleration 9.8m/s ² (1G) 2 hours per axis on each of three mutually perpendicular axis (IEC 61131-2)			
Shock Resistance		147m/s ² , 11ms, X, Y, Z directions 3 times (IEC 61131-2)			
Mounting Structure		DIN rail or direct mount			
Weight (approx.)	AC Power	12-I/O: 230g, 24-I/O: 400g, 40-I/O: 580g, 48-I/O: 540g			
	DC Power	12-I/O: 190g, 24-I/O: 310g, 40-I/O: 420g, 48-I/O: 380g			

1. FT1A Version V110 are UL, c-UL Listed at 0 to +55°C.

OT Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

Function Specifications

OI Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

			FT1A-*12RA-*	FT1A-*14KA-*	FT1A-*14SA-*
Control System			Stored program system		
Ladder Program	Instruction Words	Basic Instructions	42 types		
		Advanced Instructions	98 types	99 types	
	Program Capacity	Program size: 47.4 kB, Configuration memory capacity: 5 MB			
Processing Time	Basic Instruction	1850µs/1,000 steps			
	END Processing	5 msec minimum			
FBD	FB	37 types			
	Program Capacity	Program size: 38kB, Configuration memory capacity: 5MB			
	No. of FB	FB (Note 1)	1,000		
		Timer (T)	200		
		Counter (C)	200		
Processing Time	Basic Instruction	4ms/100			
	END Processing	5ms minimum			
User Program Storage			Flash ROM (100,000 times)		
I/O Points	Inputs	8 (V3.90 or above: 90 max. can be added with remote I/O master function)	8 (90 additional can be added with remote I/O master function)		
	Outputs	4 (V3.90 or above: 54 max. can be added with remote I/O master function)	4 (54 additional can be added with remote I/O master function)		
Analog Input			2 (V3.90 or above: 24 max. can be added with remote I/O master function)	2 (4 additional can be added with analog cartridge, and 24 max. can be added with remote master function)	
Analog Output			—	2 (4 additional can be added with analog cartridge)	
Internal Relays			1,024		
Shift Registers			128		
Data Registers			2000		
Special Data Registers			200		
Counters			200		
Timer (1ms, 10 ms, 100 ms, 1s)			200		
Clock			Precision: ±30 seconds/month (25°C, typical)		
RAM Backup	Backup Data	Internal relays, shift registers, counters, data registers, clock data			
	Backup Duration	Approximately 30 days (typical) at 25°C after backup battery is fully charged			
	Battery	Lithium secondary battery			
	Charging Time	Approximately 15 hours required to charge from 0 to 90%			
Replaceability			Not possible		
Self-Diagnostic Functions			Keep data check, power failure check, watchdog timer check, timer/counter preset value change error check, user program syntax check, user program execution check.		
Input Filter			No filter, 3 to 15 ms (selectable in increments of 1 ms)		
Catch Input/Interrupt Input			4/4		
High-speed Counter	Maximum Counting Frequency and Points	Single/two-phase selectable	1 (5 kHz, multiple 2/4, single-phase cannot be used)		
		Single-phase	4 (x 10 kHz)		
	Counting Range	0 to 4,294,967,295 (32 bits)			
Operation Mode			Rotary encoder mode and adding counter mode		
Analog Voltage Inputs	Built-in Points		2		
	Input Range	0 to 10V DC	0 to 10V DC (voltage input) /4 to 20 mA (current input)		
	Input Impedance	78 kΩ	78 kΩ (voltage input) / 250 Ω (current input)		
	Digital Resolution	0 to 1,000 (10 bits)			
Number of Relay Outputs			10A relay: 4	—	
Number of Transistor Outputs			—	4 (sink)	4 (source)
Analog Output	Built-in Points		2		
	Output Range	0 to 10V DC (voltage output) /4 to 20 mA (current output)			
	Digital Resolution	0 to 1,000 (10 bits)			
USB-mini B (Note 2)			×		
USB-A (Note 2)			×		
RS232C (Note 2)			×		
RS485/422 (Note 2)			×		
Ethernet			×		
Expansion Communication Ports		Port 2	—		
		Port 3	—		
Memory Cartridge			—		
SD Memory Card			—		
Analog Cartridge Interface	Number of Ports		2		
	Connectable Cards		4 (FC6A-PJ2A, FC6A-PK2AV, FC6A-PK2AW, FC6A-PJ2CP)		

Note 1: Except for timer, counter, input FB, and output FB.

Note 2: Not isolated from internal circuits.

Function Specifications

Part Number		H12RA B12RA	H12RC B12RC	H24RA B24RA	H24RC B24RC	H40RKA H40RSA B40RKA B40RSA	H40RC B40RC	H48KA H48SA B48KA B48SA	H48KC H48SC B48KC B48SC
Control System		Stored program system							
Instruction Words	Basic Instructions								
	Advanced Instructions	99 types		107 types		DC power type: 125 types, AC power type: 111 types			
Program Capacity		12KB		48KB					
User Program Storage		Built-in Flash ROM (10,000 times rewritable)							
Processing Time	Basic Instruction	950µs/1000 steps							
	END Processing	2 ms (Pro)/640 µs (Lite)							
I/O Points	Inputs	8		16		24		30	
	Outputs	4		8		16		18	
Internal Relays		256		1024					
Shift Registers		128		128					
Data Registers		400		2000					
Special Data Registers		200		200					
Adding/Reversible Counters		100		200					
Timer (1ms, 10ms, 10ms, 1s)		100		200					
Clock									
RAM Backup	Backup Data	Internal relays, shift registers, counters, data registers, clock data							
	Backup Duration	Approximately 30 days (typical) at 25°C after backup battery is fully charged							
	Battery	Lithium secondary battery							
	Charging Time	Approximately 15 hours required to charge from 0 to 90%							
	Replaceability	Not possible							
Self-Diagnostic Functions		Keep data check, power failure check, clock error check, watchdog timer check, timer/counter preset value change error check, user program syntax check, user program execution check, system error check, memory cartridge transfer error check (Pro/Lite only)							
Input Filter		No filter, 3 to 15ms (selectable in increments of 1ms)							
Catch Input/Interrupt Input		4/4		6/6					
High-speed Counter	Maximum Counting Frequency & Points	2 (100kHz /50kHz) ^{Note 1}		2 (100kHz /50kHz) ^{Note 1}		2 (100kHz /50kHz) ^{Note 1}		2 (100kHz /50kHz) ^{Note 1}	
	Counting Range	2 (x 100kHz)		4 (x 100kHz)		4 (x 100kHz)		4 (x 100kHz)	
	Operation Mode	0 to 4,294,967,295 (32 bits) Rotary encoder mode and adding counter mode							
Analog Voltage Inputs	Points	2	None	4	None	6	None	8	None
	Input Range	0 to 10V DC							
	Input Impedance	78 kΩ							
	Digital Resolution	10-bit (0 to 1000)							
Pulse Outputs	100 kHz	No. of Outputs	—		—		2		2
		Function	—		—		PULS, PWM, RAMP, ARAMP, ZRN		PULS, PWM, RAMP, ARAMP, ZRN
	5 kHz	No. of Outputs	—		—		2		2
		Function	—		—		PULS, PWM		PULS, PWM
External Output Power Supply for Sensor	Output Voltage	—		24V DC (+10%, -15%)		—		24V DC (+10%, -15%)	
	Output Current	—		250mA		—		300mA	
	Overload Detection	—		Not Available		—		Not Available	
	Insulation	—		Internal Circuit		—		Internal Circuit	
USB-mini B		X		X		X		X	
USB-A		—		—		—		—	
RS232C		—		X ^{Note 2}		X ^{Note 2}		X ^{Note 2}	
RS485/422		—		X ^{Note 2}		X ^{Note 2}		X ^{Note 2}	
Ethernet		—		X		X		X	
Expansion Communication Ports	Port 2	—		X		X		X	
	Port 3	—		—		X		X	
Memory Cartridge		X		X		X		X	
SD Memory Card		—		—		X ^{Note 3}		X ^{Note 3}	

I/O Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

Display Specifications

	Touch		Pro (Built-in LCD)
Display Element	TFT color LCD	STN monochrome LCD	STN monochrome LCD
Colors/Shades	65,536 colors	Monochrome 8 shades	Monochrome
Effective Display Area	88.92 W x 37.05 H mm	87.59 W x 35.49 H mm	47.98 W x 18.22 H mm
Display Resolution	240 W x 100 H pixels		192 W x 64 H pixels
View Angle	Left/right 40°, top 20°, bottom 60°	Left/right/top/bottom: 45°	Left/right 30°, top 20°, bottom 40°
Contrast Adjustment	Not Available	32 levels	Not Available
Backlight	LED	LED (white, red, pink)	LED (green)
Backlight Life	50,000 hours ^{Note 1}		—
Brightness	400cd/m ² ^{Note 2}	740cd/m ² ^{Note 2}	45cd/m ² ^{Note 2}
Brightness Adjustment	32 levels		Not Available
Backlight Control	On/off		
Backlight Replacement	Not Available		
Display Character Size	1/4 Size	8 x 8 pixels (Japanese Katakana, JIS 8-bit code, ISO 8859-1 [Latin 1], ANSI 1250 [Central Europe]), ANSI 1257 (Baltic), ANSI 1251 (Cyrillic)	—
	1/2 Size	8 x 16 pixels (Japanese Katakana, JIS 8-bit code, ISO 8859-1 [Latin 1], ANSI 1250 [Central Europe]), ANSI 1257 (Baltic), ANSI 1251 (Cyrillic)	8 x 16 pixels Japanese Katakana, JIS 8-bit code, ISO 8859-1 (Latin 1), ANSI 1251 (Cyrillic)
		16 x 32 pixels, 24 x 48 pixels, 32 x 64 pixels (Western European languages: ISO 8859-1)	—
	Full Size	16 x 16 pixels (Japanese JIS first and second level characters, simplified Chinese, traditional Chinese, Korean)	16 x 16 pixels (Japanese JIS first level characters, Chinese)
Double Size	32 x 32 pixels (Japanese JIS first level characters, Mincho font)		—
No. of Characters	1/4 Size	30 characters x 12 lines/screen	
	1/2 Size	30 characters x 6 lines/screen	
	Full Size	15 characters x 6 lines/screen	
	Double Size	7 characters x 3 lines/screen	
Character Magnification	0.5x, 1x, 2x, 3x, 4x, 5x, 6x, 7x, 8x, vertically and horizontally		—
Character Attributes	Blink, reverse, bold, shadowed (blink is 1 or 0.5sec)		Blink, reverse
Graphics	Line, polyline, polygon, rectangle, circle, ellipse, arc, pie, equilateral polygons (3, 4, 5, 6, 8), fill, picture		—
Window Display	3 pop-up screens + 1 system screen		—

1. The backlight life refers to the time until the brightness reduces by half after use at 25°C.
 2. Brightness of LCD only (monochrome LCD: when lit white).

Note 1: The backlight life refers to the time until the brightness reduces by half after use at 25°C.
 Note 2: Brightness of LCD only (monochrome LCD: when lit white).

Operation Specifications

Switching Element	Analog resistive membrane (touch panel)
Operating Force	0.2 to 2.5N
Mechanical Life	1 million operations
Acknowledgment Sound	Electric Buzzer
Multiple Press	Not possible

HMI Function Specifications

Functions	Drawings, bit button, word button, goto screen button, key button, multi-button, keypad, selector switch, potentiometer, numerical input, character input, pilot lamp, picture display, message display, message switching display, alarm list display, alarm log display, numerical display, bar chart, line chart, pie chart, meter, calendar, bit write command, word write command, goto screen command, timer, script command, multi-command, system area, start time, Auto Backlight OFF, O/I Link, user communication, maintenance communication, DM Link Communication, PLC Link Communication, alarm log, data log, operation log, data storage area, preventive maintenance, recipe, text group, global script, user account, project data transfer using external memory, downloading logged data in external memory, USB auto-run function
-----------	--

Input Specifications

		12RA-	*14KA-*	*14SA-*	H12RA B12RA	H12RC B12RA	H24RA B24RA	H24RC B24RC	H40RKA B40RKA	H40RSA B40RSA	H40RC B40RC	H48KA B48KA	H48SA B48SA	H48KC B48KC	H48SC B48SC	
Digital Input	Input Points	6			6	8	12	16	18		24	22		30		
	Input Type	Sink	Source	Sink	Sink	No-voltage (with contact)	Sink	Sink/ Source	Source	Sink	Sink/ Source	Source	Sink	Sink/Source		
	Input Voltage Range	0 to 28.8V DC														
	Rated Input Current	4.4 mA	5.2 mA	4.4 mA	No-voltage type and sink/source type: 5.3 mA, sink type: 4.4 mA, source type: 5.2 mA											
	Input Impedance	5.5 kΩ	4.7 kΩ	5.5 kΩ	No-voltage type and sink/source type: 4.3 kΩ, sink type: 5.5 kΩ, source type: 4.7 kΩ											
	Input Delay Time	OFF -ON	2.5 μs + soft filter setting			40 μs + filter value (high-speed input section: 2.5 μs + soft filter value)										
		ON - OFF	5 μs + soft filter setting			150 μs + filter value (high-speed input section: 5 μs + soft filter value)										
	Isolation	Between input terminals	Not isolated			Not isolated										
		Internal circuit	Not isolated			No-voltage type and sink/source type: photocoupler isolated, sink type and source type: not isolated										
	Input Type	Type 1 (IEC 61131-2)														
External Load for I/O Interconnection	Not needed															
Operating Level	OFF voltage	Sink type: 5V DC max. Source type: 15V DC min.			No-voltage type: 18 kΩ min., sink/source type and sink type: 5 VDC max., source type: 15 VDC min.											
	ON voltage	Sink type: 15V DC min. Source type: 5V DC max.			No-voltage type: 2 kΩ max., sink/source type and sink type: 15 VDC min., source type: 5 VDC max.											
	OFF current	Sink type: 0.9 mA max. Source type: -1.0 mA min.			No-voltage type and sink/source type: 1.1 mA max., sink type: 0.9 mA max., source type: -1.0 mA min.											
	ON current	Sink type: 2.7 mA min. Source type: -3.0 mA max.			No-voltage type and sink/source type: 3.0 mA min., sink type: 2.7 mA min., source type: -3.0 mA max.											

		12RA-	*14KA-*	*14SA-*	H12RA B12RA	H12RC B12RA	H24RA B24RA	H24RC B24RC	H40RKA B40RKA	H40RSA B40RSA	H48KA B48KA	H48SA B48SA	H48KC B48KC	H48SC B48SC		
Analog Input	Input Points	2			2	4		6		8			8			
	Input Type	Voltage input	Voltage/Current input		Voltage input	Voltage input		Voltage input		Voltage input			Voltage input			
	Input Range	0 to 10.0 VDC	0 to 10.0 VDC / 4 to 20 mA		0 to 10.0V DC	0 to 10.0V DC		0 to 10.0V DC		0 to 10.0V DC			0 to 10.0V DC			
	Sampling Duration Time	2 ms maximum				2 ms maximum	2 ms maximum		2 ms maximum		2 ms maximum			2 ms maximum		
	Total Input System Transfer Time	3 ms + sampling time + scan time	3 ms + sampling time + scan time (voltage input) 12 ms + sampling time + scan time (current input)		2 ms + filtering time + scan time	2 ms + filtering time + scan time		2 ms + filtering time + scan time		2 ms + filtering time + scan time			2 ms + filtering time + scan time			
	Digital Resolution	0 to 1,000 (10 bits)			0 to 1,000 (10 bits)	0 to 1,000 (10 bits)		0 to 1,000 (10 bits)		0 to 1,000 (10 bits)			0 to 1,000 (10 bits)			
	Input Error	25°C	±3% of full scale		±1.5% of full scale	±1.5% of full scale		±1.5% of full scale		±1.5% of full scale			±1.5% of full scale			
		Total	±5% of full scale		±5% of full scale	±5% of full scale		±5% of full scale		±5% of full scale			±5% of full scale			
	Isolation	Between input terminals	Not isolated		Not isolated	Not isolated		Not isolated		Not isolated			Not isolated			
		Internal circuit	Not isolated		Not isolated	Not isolated		Not isolated		Not isolated			Not isolated			
When used as digital input	Digital I/O	Type 1 (not conforming to IEC 61131-2 digital I/O type)														
	Operation Level	OFF voltage: 5V maximum														
		ON voltage: 15V minimum														
		OFF current: 0.06 mA maximum														
ON current: 0.20 mA minimum																
External Power for Input	Input Voltage Range	—			—	—		20.4 to 26.4V DC	—		20.4 to 26.4V DC	—			20.4 to 26.4V DC	
	Output Current Capacity	—			—	—		250 mA	—		300 mA	—			300 mA	

IO Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

Output Specifications

01 Touchscreens
PLCs
Automation Software
Power Supplies
Sensors
Communication
Barriers

Part Number		*12RA-*	*14KA-*	*14SA-*	
Transistor Output	Output Points	Transistor Sink Output	4	—	
		Transistor Source Output	—	4	
	Rated Load Voltage		24V DC		
	Input Voltage Range		20.4 to 28.8V DC		
	Maximum Load Current	1 point	0.3A maximum		
		1 common	1A maximum		
	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		8 W maximum		
	Inductive Load		L/R = 10 ms (28.8V DC, 1 Hz)		
	External Current Draw		100 mA maximum, 24V DC		
	Isolation	Between output terminal and internal circuit	Photocoupler isolated		
		Between output terminals	Not isolated		
Output Delay	OFF □ ON	100µS max.			
	ON □ OFF	200µS max.			
Relay Output Common	Electrical Life		100,000 operations minimum (resistive load 1,800 operations/h)	—	
	Mechanical Life		20 million operations minimum (no load 18,000 operations/h)	—	
	Dielectric Strength	Between output terminal and internal circuit	2,300V AC, 1 minute	—	—
Between output terminals (between COMs)		2,300V AC, 1 minute	—	—	
Analog Output	Output Points		2		
	Analog Output Signal Type		Voltage/Current output (Selectable)		
	Analog Output Range		0 to 10V DC / 4 to 20mA		
	Load Impedance		2kΩ min (voltage input) / 500 Ω max (current input)		
	Applicable Load Type		Resistive Load		
	Maximum Deviation at 25°C		±0.3% of full scale		
	Temperature Coefficient		±0.02%/°C of full scale		
	Repeatability After Stabilization Time		±0.4% of full scale		
	Non-linearity		±0.01% of full scale		
	Output Ripple		30mV max. (spike noise not included)		
	Overshoot		0% (Note 2)		
	Total Error		±1.0% of full scale including ripple		
	Effect of Improper Output Connection		No damage		
	Digital Resolution		0 to 1,000 (10 bits)		
	Output Value of LSB		10mV (0-10V) / 16µA (4-20mA)		
Monotonicity		Yes			
Current loop open		Not detectable			

Note 1: High-speed output terminal (100 kHz pulse output terminal): 5 µs max. Normal output terminal (including 5kHz pulse output terminal): 100 µs max.
 Note 2: Overshoot may occur under light load conditions. Overshoot can be suppressed by inserting a damping resistor. Damping resistor value: approx. 150Ω including the input impedance.

Output Specifications

			H12RA B12RA	H12RC B12RC	H24RA B24RA	H24RC B24RC	H40RKA B40RKA	H40RSA B40RSA	H40RC B40RC	H48KC B48KC	H48SC B48SC	H48KA B48KA	H48SA B48SA
Transistor Output	Output Points	Transistor Sink Output	—	—	—	—	4	—	—	18	—	18	—
		Transistor Source Output					—	4		—	18	—	18
	Rated Load Voltage						24V DC						
	Input Voltage Range						20.4 to 28.8V DC						
	Maximum Load Current	1 point					0.3A maximum						
		1 common					1A maximum						
	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						8 W maximum						
	Inductive Load						L/R = 10 ms (28.8V DC, 1 Hz)						
	External Current Draw						100 mA maximum, 24V DC (V terminal supply power)						
	Isolation	Between output terminal and internal circuit					Photocoupler isolated						
		Between output terminals					Same common line: Not isolated Separate common line: isolated						
Output Delay	OFF → ON	(Note)											
	ON → OFF	(Note)											
10A relay	Output Points		4										
	Output Type		1a contact										
	Rated Load Current		240V AC 10A, 30V DC 10A										
	Minimum Switching Load		10 mA/5V DC (reference value)										
	Initial Contact Resistance		100 mΩ maximum (1A, at 6V DC)										
2A relay	Output Points		4	4	8	8	12						
	Output Points per Common Line	COM4	4	4	4	4	4						
		COM5	—	—	4	4	4						
		COM6	—	—	—	—	4						
	Output Type		1a contact										
	Maximum Load Current	1 point	240V AC 2A, 30V DC 2A										
		1 common	8A maximum										
Minimum Switching Load		1 mA/5 VDC (reference value)											
Initial Contact Resistance		30 mΩ maximum (1A, at 6V DC)											
Relay Output Common	Electrical Life		100,000 operations minimum (resistive load 1,800 operations/h)										
	Mechanical Life		20 million operations minimum (no load 18,000 operations/h)										
	Dielectric Strength	Between output terminal and internal circuit	2,300V AC, 1 minute										
Between output terminals (between COMs)		2,300V AC, 1 minute											

OT Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

Analog Expansion Cartridge Specifications (FC6A-P)

General Specifications

Part No.	FC6A-PJ2A	FC6A-PJ2CP	FC6A-PK2AV	FC6A-PK2AW
Type	Voltage/Current Input		Voltage Output	Current Output
Number of Input/Output	2		2	2
Rated Voltage	5.0V, 3.3V (supplied from the Touch)			
Consumption Current	5.0V: – 3.3V: 30mA		5.0V: 70mA 3.3V: 30mA	5.0V: 185mA 3.3V: 30mA
Weight	15g			

Output Specifications

Part Number		FC6A-PK2AV	FC6A-PK2AW
		Voltage Output	Current Output
Output Type	Voltage Output	0 to 10V DC	—
	Current Output	—	4 to 20mA DC
Load	Impedance	2kΩ min.	500 kΩ max.
	Load Type	Resistance Load	
D/A Conversion	Cycle Time	20ms	
	Settling Time	40ms max.	20ms max.
	Total Output System Transfer Type	60ms+1 scan	40ms+1 scan
Output error	Maximum Error at 25°C	±0.3% of full scale	
	Temperature Coefficient	±0.02%/°C of full scale	
	Reproducibility after Stabilization Time	±0.4% of full scale	
	Non-linearity	±0.01% of full scale	
	Output Ripple	30mV max.	
	Overshoot	0%	
	Maximum Error	±1.0% of full scale	
Effect of Improper Output Terminal Connection	No damage		
Data	Digital Resolution	4096 (12 bits)	
	LSB Output Value	2.44mV (0 to 10V)	3.91µA (4 to 20mA)
	Data Format in Application	0 to 4095 (0 to 10V)	0 to 4095 (4 to 20mA)
	Monotonicity	Yes	
	Open Current Loop	—	Cannot be detected
Noise Resistance	Maximum Temporary Deviation during Electrical Noise Tests	±4.0 of full scale	
	Recommended Cable	Shielded twisted pair	
	Crosstalk	1 LSB max.	
Isolation	None		
Calibration to Maintain Rated Accuracy	Impossible		
Selection of Output Signal Type	Voltage output only		Current output only

01 Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

Input Specifications

Part No.		FC6A-PJ2A		FC6A-PJ2CP	
Input Type		Voltage Input	Current Input	Resistance Thermometer	Thermocouple
Input Range		0 to 10V DC	4 to 20mA DC 0 to 20mA DC	Pt100: -200 to +850°C Pt1000: -200 to +600°C Ni100: -60 to +180°C Ni1000: -60 to +180°C 3-wire RTD	K: -200 to 1300°C J: -200 to 1000°C R: 0 to 1760°C S: 0 to 1760°C B: 0 to 1820°C E: -200 to 800°C T: -200 to 400°C N: -200 to 1300°C C: 0 to 2315°C
Input Impedance		1MΩ min.	250Ω max.	1MΩ min.	
Allowable Conductor Resistance		—		10Ω max.	—
Input Detection Current		—		Typ: 0.2mA, 1.0mA max.	—
AD Conversion	Sample Duration Time	10ms		250ms	
	Sample Interval	20ms		500ms	
	Total Input System Transfer Time	20ms + 1 scan		500ms + 1 scan	
	Type of Input	Single-ended input			
	Operating Mode	Self-scan			
	Conversion Method	SAR			
Input Error	Maximum Error at 25°C	±0.1% of full scale		±0.1% of full scale	±0.1% of full scale Cold junction compensation accuracy ±4.0°C or less Exceptions R, S thermocouple error: ±6.0°C (0 to 200 °C range only) B thermocouple error: Not guaranteed (0 to 300 °C range only) K, J, E, T, N thermocouple error: ±0.4% of full scale (0°C or lower range only)
	Temperature Coefficient	±0.02%/°C of full scale			
	Reproducibility After Stabilization Time	±0.5% of full scale			
	Non-linearity	±0.01% of full scale			
	Maximum Error	±1.0% of full scale			
Data	Digital Resolution	4096 (12 bits)		Pt100: 10,500 (14 bits) Pt1000: 8000 (13 bits) Ni100: 2400 (12 bits) Ni1000: 2400 (12 bits)	K: 15,000 (14 bits) J: 12,000 (14 bits) R: 17,600 (15 bits) S: 17,600 (15 bits) B: 18,200 (15 bits) E: 10,000 (14 bits) T: 6,000 (13 bits) N: 15,000 (14 bits) C: 23,150 (15 bits)
Noise Resistance	LSB Input Value	2.44mV (0 to 10V DC)	4.88μA (DC0 to 20mA) 3.91μA (DC4 to 20mA)	0.1°C 0.18°F	
	Data Format in Application	Can be arbitrarily set for each channel in the range of -32,768 to 32,773			
	Monotonicity	Yes			
	Maximum Temporary Deviation during Electrical Noise Tests	±4.0% of full scale			
	Recommended Cable	Shielded twisted pair		Twisted pair	
Crosstalk		1LSB max.			
Isolation		None			
Effect When Input is Incorrectly Wired		No damage			
Maximum Allowable Constant Load (non-destructive)		13V DC	40mA	13V DC	
Input Type Modification		Software programming			
Calibration to Maintain Rated Accuracy		Impossible			

OT Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

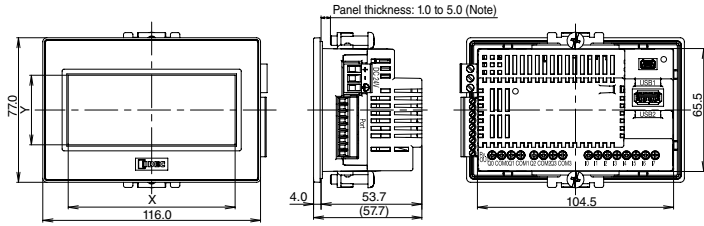
Communication

Barriers

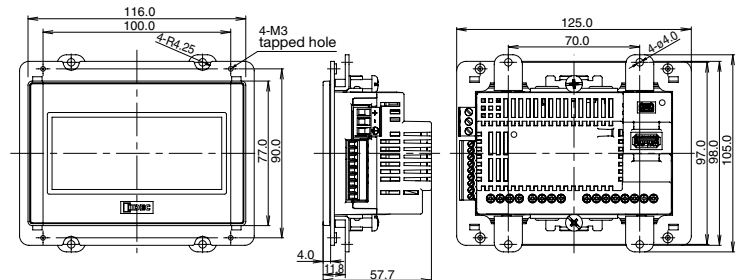
Dimensions (mm)

Touch

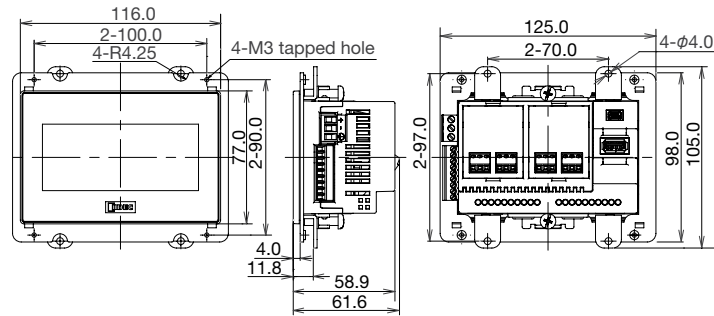
Relay Output Model When using mounting bracket (HG9Z-4K2PN04)



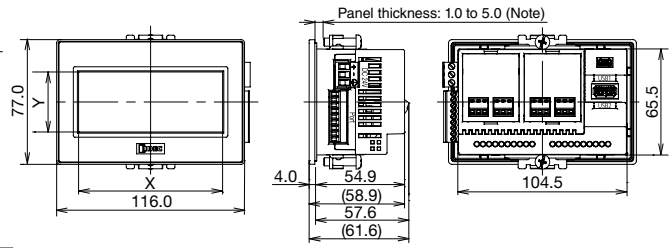
Relay Output Model When using rear mount adapter (FT9Z-1A01)



Transistor Output Model When using mounting bracket HG9Z-4K2PN04



Transistor Output Model When using rear mount adapter (FT9Z-1A01)



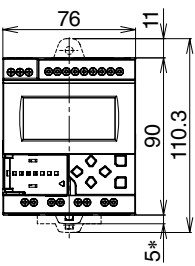
LCD Active Area

LCD Type	X	Y
TFT	88.92	37.05
STN	87.59	35.49

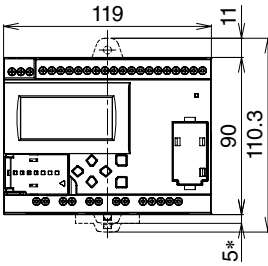
Note: Waterproof characteristics depend on panel material and size.

With LCD

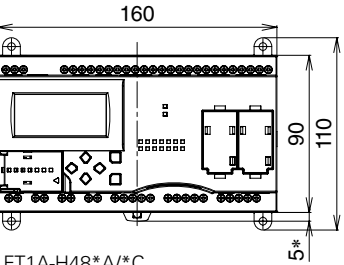
FT1A-H12*A/*C



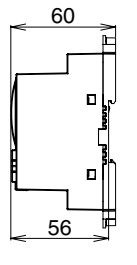
FT1A-H24*A/*C



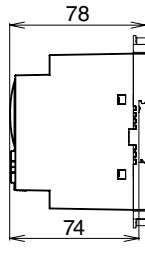
FT1A-H40*A/*C



FT1A-H**A

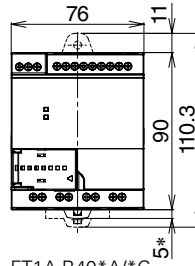


FT1A-H***C

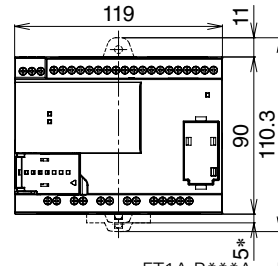


Without LCD

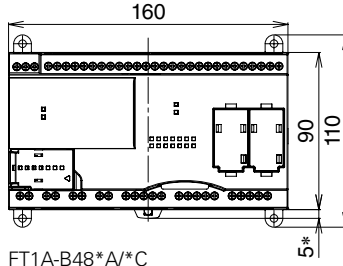
FT1A-B12*A/*C



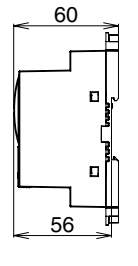
FT1A-B24*A/*C



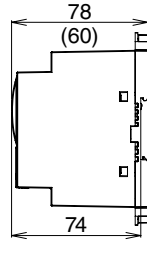
FT1A-B40*A/*C



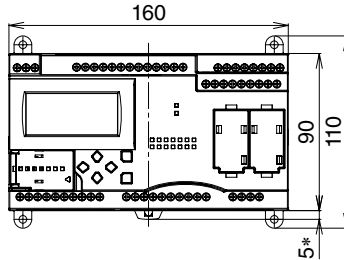
FT1A-B**A



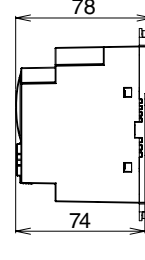
FT1A-B***C



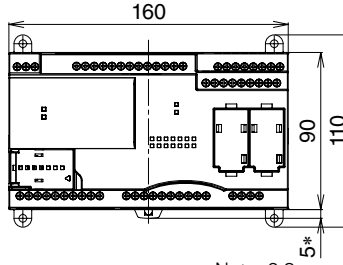
FT1A-H48*A/*C



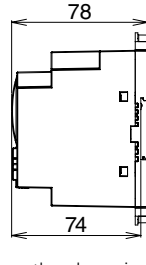
FT1A-H***A



FT1A-B48*A/*C



FT1A-B***A



Note: 9.3 mm when the clamp is pulled out.

Note: 9.3 mm when the clamp is pulled out.

01 Touchscreens

PLCs

Automation Software

Power Supplies

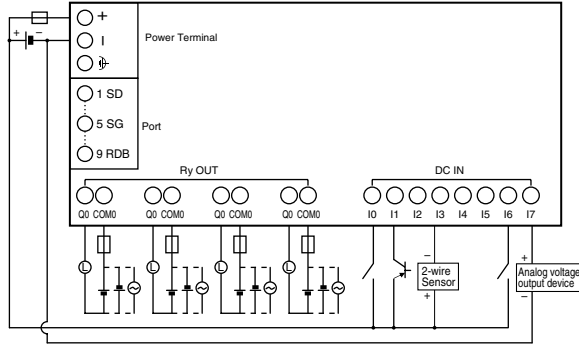
Sensors

Communication

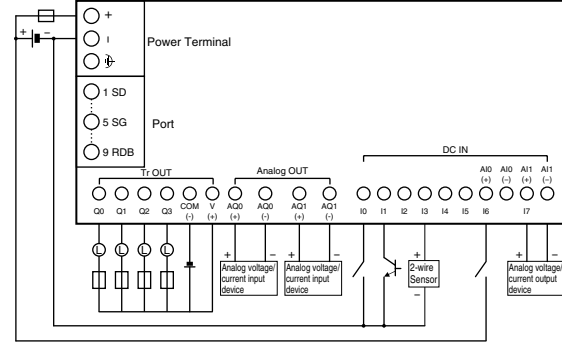
Barriers

Terminal Arrangement and I/O Wiring Diagram Examples

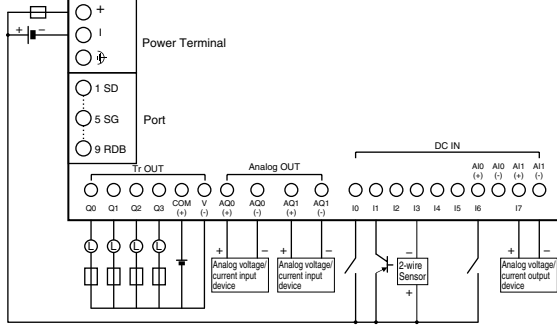
FT1A-*12RA-*



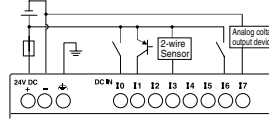
FT1A-*14KA-*



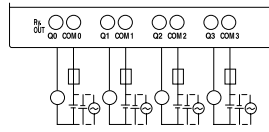
FT1A-*14SA-*



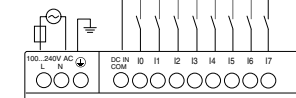
FT1A-*12RA
Input Side



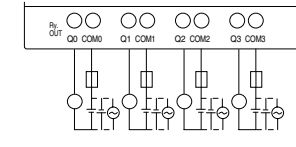
Output Side



FT1A-*12RC
Input Side

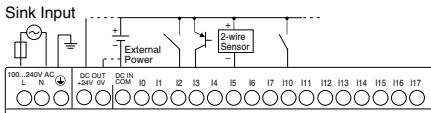
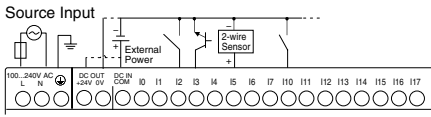


Output Side

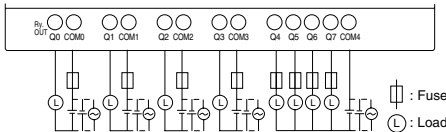


FT1A-*24RC-①

Input Side (sink/source)



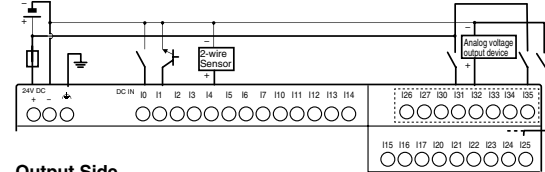
Output Side



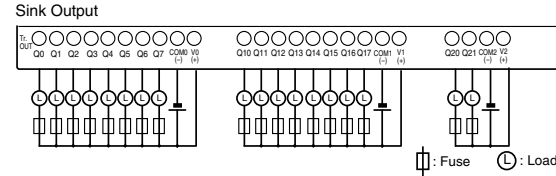
FT1A-*48SA-②

Input Side

Source Input (Analog/Digital Shared Input : is Sink Input)



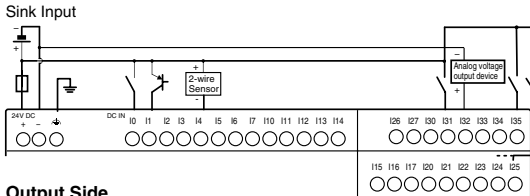
Output Side



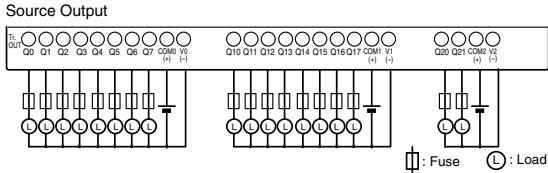
See ① for FT1A-*40RC, ① and ② for FT1A-*40RSA, and ① and ③ for FT1A-*40RKA.

FT1A-*48KA-③

Input Side



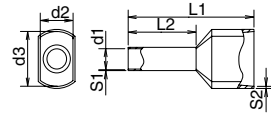
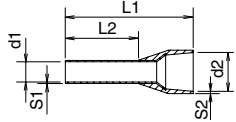
Output Side



Recommended Ferrules

For 1-wire connection

For 2-wire connection



OI Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

	Cross Section (mm ²)	AWG	Phoenix Contact Part No.	Touch				Pro/Lite		L1	L2	d1	S1	d2	d3	S2	
				Power Supply	Serial Interface	I/O		Power Supply	I/O								
						Relay Output Model	Transistor Output Model										
1-wire connection	0.25	24	AI0.25-8YE			—		×		12.5	8.0	0.8	0.15	1.8		0.25	
	0.34	22	AI0.34-8TQ	×	×	×	×			12.5	8.0	0.8	0.15	2.0		0.25	
	0.5	20	AI0.5-8WH	×	×	×	×	—		14.0	8.0	1.1	0.15	2.5		0.25	
	0.75	18	AI0.75-8GY	×	—	×	—			14.0	8.0	1.3	0.15	2.8	—	0.25	
	1.0		AI1-8RD	×		—		×	—	×	14.0	8.0	1.5	0.15	3.0		0.3
			AI1-10RD	—		—		×	—	—	16.0	10.0	1.5	0.15	3.0		0.3
		1.5	16	AI1.5-8BK	×	—	—	—	×		14.0	8.0	1.8	0.15	3.4		0.3
			AI1.5-10BK	—	×		—		—	18.0	10.0	1.8	0.15	3.4		0.3	
2-wire connection	0.5	20	AI-TWIN2×0.5-8WH	×	×	—	×	—		15.0	8.0	1.5	0.15	2.5	4.6	0.25	
	0.75	18	AI-TWIN2×0.75-8GY	×	—	—	—	×		15.0	8.0	1.8	0.15	2.8	5.2	0.25	
			AI-TWIN2×0.75-10GY	—		×	—	—	17.0	10.0	1.8	0.15	2.8	5.2	0.25		
Screwdriver			SZS 0.6×3.5	×	—	×	—	×									
			SZS 0.4×2.5	—	×	—	×	—									

Note: Crimping pliers - Phoenix Contact part number CRIMPFOX ZA3 (12101882)

IDEC SmartRelay – The Intelligent Choice



Increase your versatility with a new remote display

Look around. IDEC SmartRelays are in everything from lighting controls to ice-making machines and grocery store misters. Proving reliable time after time, these intelligent logic modules are the ideal controller for simple automation tasks. A new fifth-generation of SmartRelays offer functions to give you even more flexibility and convenience. Advances include extended memory, a brighter display with higher LCD contrast, improved analog and high-speed inputs, an external text display, and upgraded programming software.

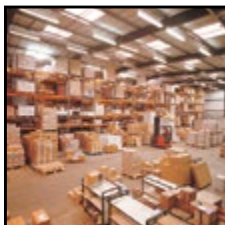
With an ever changing market and tough competition, you need an edge to stay on top. SmartRelay has a new HMI text display panel to do just that! This economical interface lets you make quick adjustments, while at the same time making it easy to spot and troubleshoot failures using built-in operator functions and diagnostics. So why wait? Make the smart choice, IDEC SmartRelay!

Industrial Facility Systems



- Conveyor systems
- Elevator controls
- Exhaust and filtering systems
- Automatic food dispensing machines
- Water treatment and irrigation systems
- Motor, pump and valve controls

Housing and Building Management



- Lighting controls (outside and inside)
- Door and gate controls
- Heating and cooling systems
- Shutter, sun blind and awning controls
- Water and sprinkler systems
- Ventilation systems

Unique Solutions



- Solar-electric systems
- Marine systems
- Extreme environmental conditions
- Display panels and traffic light controls
- Energy management

Monitoring Systems



- Access controls
- Alarm systems
- Limit level monitoring
- Parking Lot monitoring
- Baggage control

www.IDEC.com/smartrelay

New Faster Inputs

FL1E can support up to four 5KHz high-speed inputs. You have the option of configuring inputs I3, I4, I5 and I6 as fast counter inputs to give you even more flexibility.

Universal Voltages

Available in 12/24V DC for solar and vehicle applications, and 24V AC/DC for building automation, as well as 100-240V AC/DC, SmartRelay can be used for a wide variety of applications.

DIN Rail or Surface Mountable**New Controllable Backlit LCD Display**

FL1E SmartRelays have a built-in LCD display with a brighter, higher contrast screen you can adjust to your own preference. System status — input, output, analog values, timers and counters — can be monitored through the 4x12 LCD screen or you can display a predefined message with up to 48 characters (chosen from 103 special character types). Non-LCD versions are also available.

EEPROM Memory

With IDEC SmartRelays, your program is stored in a non-volatile EEPROM Memory.

New Extended Retentive Data Memory

Extended memory gives you up to 250 bytes of retentive data memory. More than 4 times that of FL1D!

New Arithmetic Functions

Analog Math function blocks allow basic arithmetic operations such as addition, subtraction, multiplication, and division.

Password Protection

Concerned about your program being copied or altered? IDEC SmartRelays keep you safe with a unique password protection scheme allowing end users to access certain parameters without seeing or modifying the actual program.

New Built-in Analog Inputs

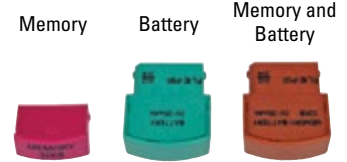
Each SmartRelay is equipped with 8 digital inputs that can be used for your applications. New in the FL1E 12/24VDC and 24VDC models are four built-in analog inputs. Inputs I1, I2, I7, and I8 can now be configured to accept 0-10V analog signals. Using expansion modules, you can utilize a maximum of 24 digital and 8 analog inputs.

**New 50% More Memory**

FL1E SmartRelays offer an expanded program memory of 200 function blocks! This is a 50% increase compared to the existing FL1D series.

New Memory Cartridges

Three memory cartridges are now available for FL1E: Violet, Green and Brown! Violet is a 32K high-capacity, removable program memory card. Green is a battery card that supports a Real Time Clock power supply for up to two years. Brown is a combined memory/battery card.

**Operational Control Buttons**

Program with just the push of a button! SmartRelay control buttons can be used to program, modify and change preset parameters. The four cursor keys can also be configured as inputs as needed.

Digital Outputs

IDEC SmartRelays are equipped with four relay outputs rated at 10A/pt. Using digital expansion modules; you can configure a maximum of sixteen outputs.

Additional text display

For the first time ever, you can connect an external text display to your SmartRelay, making it easy for you to monitor, view and troubleshoot from outside your panel. Turn to page 7 to learn more!


Quality

IDEC has built a reputation based on providing high-quality, dependable products you can trust, and our SmartRelays are no exception. Each model is cULus listed, CE certified, EMC compliant, FM approved for Class 1 Div 2 hazardous locations, C-tick compliant, Lloyds Registered and ABS approved.




Part Numbers


Base Modules – with LCD

Style	Part Number	Voltage	Input Signal	Input	Output	With Clock
	FL1E-H12RCE	12/24V DC	DC I1, I2, I7 and I8 are used for digital/analog	PNP	Relay	Yes
	FL1E-H12SND	24V DC			Transistor Source	
	FL1E-H12RCA	24V AC/DC	AC/DC	PNP/NPN	Relay	Yes
	FL1E-H12RCC	100-240V AC/DC				

Base Modules – without LCD


Style	Part Number	Voltage	Input Signal	Input	Output	With Clock
	FL1E-B12RCE	12/24V DC	DC I1, I2, I7 and I8 are used for digital/analog	PNP	Relay	Yes
	FL1E-B12RCA	24V AC/DC				
	FL1E-B12RCC	100-240V AC/DC	AC/DC	PNP	Relay	Yes

Text Message Display

Style	Part Number	Rated Voltage	Description
	FL1E-RD1	12 VDC, 24 VAC/DC	FL1E Text Display Panel

Digital I/O Expansion Modules

- 8-pt expansion module (4 in/4 out)
- Max. 4 digital expansion modules

Style	Part Number	Total I/O	Input Power	Input	Output
	FL1B-M08B2R2	8 (4 in/ 4 out)	12/24V DC	DC	Relay
	FL1B-M08B1S2		24V DC		Transistor Sink
	FL1B-M08C2R2		100-240V AC/DC	AC/DC	Relay
	FL1B-M08D2R2		24V AC/DC		

I/O Touchscreens

PLCs

Automation Software

Power Supplies

Sensors


Communication

Barriers

01 Touchscreens

Analog I/O Expansion Modules


- 2-pt Analog input module
- 2-pt Analog output module
- 10-bit resolution
- Max. 4 analog input modules and 1 analog output module

Style	Part Number	Total I/O	Input Power	Input	Output
	FL1B-J2B2	2 (2 in/0 Out)	12/24V DC	0-10V, 4-20mA	—
	FL1D-K2BM2	2 (0 in/2 Out)	24V DC	—	0-10V, 4-20mA

PLCs

AS-Interface Communication Module

- The AS-Interface communication module provides optimum solutions for decentralized controls and savings in installation space and wiring
- Virtual I/O points: 4 inputs, 4 outputs

Style	Part Number	Module	Input Power	Total I/O
	FL1B-CAS2	AS-Interface Communication Module	30V DC	Input: 4 points Output: 4 points

Automation Software

Power Supplies

Starter Kits

IDEC SmartRelay Starter Kit is an economical and ideal solution for first time IDEC SmartRelay users

- Package includes a base module, WindLGC programming software, USB programming cable, simulator switch (DC models only) and a user's manual

Sensors



Starter Kits

Part Number	Description
SMARTSTART-BAC-E	FL1E-B12RCC, WindLGC software and programming cable
SMARTSTART-BDC-E	FL1E-B12RCE, WindLGC software, programming cable, and simulator switch
SMARTSTART-HAC-E	FL1E-H12RCC, WindLGC software and programming cable
SMARTSTART-HDC-E	FL1E-H12RCE, WindLGC software, programming cable, and simulator switch

Communication



WindLGC Software
FL9Y-LP1CDW

Accessories

Part Number	Description
FL9Y-LP1CDW	WindLGC 6.0 programming software
FL1E-PC2	SmartRelay USB programming cable
FL1E-PM4	FL1E SmartRelay memory cartridge
FL1E-PB1	FL1E SmartRelay battery cartridge
FL1E-PG1	FL1E SmartRelay memory and battery combination cartridge
FL9Y-B1090-0	FL1E SmartRelay user's manual
FL1B-Y1371-SW8	8-pt simulator switch, used with 12-24VDC, 24VDC base module only

Barriers

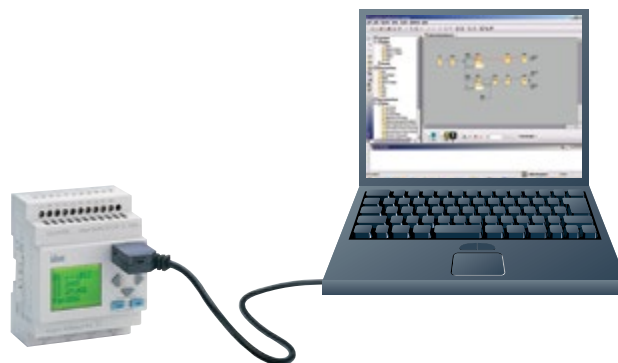
WindLGC Programming Software

WindLGC is the exclusive programming software for the IDEC SmartRelay using Windows®. Edit, save, and print out your programs.

Key features:

- Ladder programming
- Online Monitor
- Program Comparison
- Time Simulation
- Simplified connection of the functions
- Programs can be saved in PDF or JPG format

Just click the function blocks you need and link function blocks for easy wiring. Devise complicated circuits using the convenient functions of WindLGC.



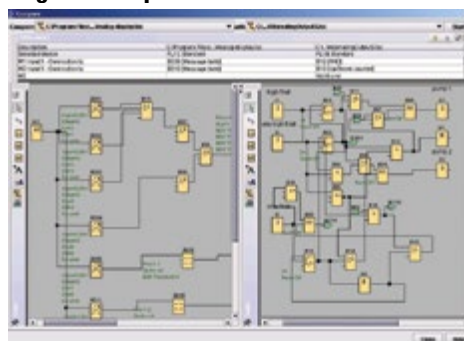
Part Number

Part Number	Description
FL9Y-LP1CDW	WindLGC programming software for IDEC SmartRelay

WindLGC system requirements:

- OS: Windows95/98/ME/NT/2000/XP/Vista and Windows 7
- CPU recommendation: Pentium 266MHz or higher
- Memory: 64MB or more
- RAM recommendation: 128MB
- Hard disk space: 90MB or more for installing WindLGC software.
- Monitor Recommendation: Display more than 800 x 600 dots and 256 colors
- Free download service, if upgrading from WindLGC Version 3.0 to Version 5.0, available at www.idec.com/usa

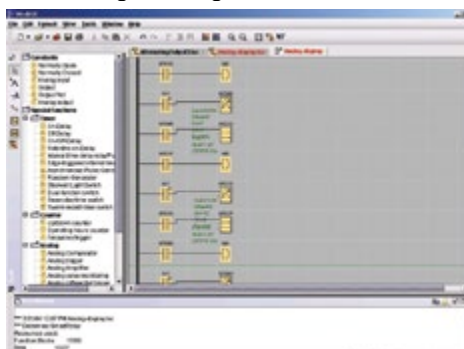
Program Comparison



Simulation Mode/Online Monitor



Ladder Programming



For more information, see the Automation Software section.
Visit www.IDEC.com/downloads for free upgrades or a free demo version.

Specifications


Base Modules

Style	with LCD Display	FL1E-H12SND	FL1E-H12RCE	FL1E-H12RCA	FL1E-H12RCC	
	without Display	—	FL1E-B12RCE	FL1E-B12RCA	FL1E-B12RCC	
Power Supply	Rated Power Voltage	24V DC	12/24V DC	24V AC/DC	100 to 240V AC/DC	
	Allowable Voltage Range	20.4 to 28.8V DC	10.8 to 28.8V DC	20.4 to 26.4V AC, 20.4 to 28.8V DC	85 to 265V AC, 100 to 253V DC	
	Rated Frequency	—	—	47 to 63Hz	47 to 63Hz	
	Current Draw	40 to 75mA (24V DC)	60 to 175mA (12V DC) 40 to 100mA (24V DC)	76 to 182mA (24V AC) 40 to 100mA (24V DC)	25 to 40mA (100V AC), 20 to 30mA (240V AC) 10 to 25mA (100V DC), 6 to 15mA (240V DC)	
	Allowable Momentary Power Interruption	—	2ms (Typ.) (12V DC) 5ms (Typ.) (24V DC)	5ms (Typ.) (24V AC/DC)	10ms (Typ.) (100V AC/DC) 20ms (Typ.) (240V AC/DC)	
	Power Consumption	0.7 to 1.3W (24V DC)	0.3 to 1.7W (12V DC) 0.4 to 1.8W (24V DC)	0.9 to 2.7VA (24V AC) 0.4 to 1.8W (24V DC)	1.1 to 4.6VA (100V AC), 2.4 to 6.0VA (240V AC) 0.5 to 2.9W (100V DC), 1.2 to 3.6W (240V DC)	
	Reverse Polarity Protection	Yes	Yes	—	—	
Clock	Backup Duration	—	80 hours (25°C) ¹	80 hours (25°C) ¹	80 hours (25°C) ¹	
	Clock Accuracy	—	±2 sec/day maximum	±2 sec/day maximum	±2 sec/day maximum	
Input	Input Signal	DC		AC/DC	AC/DC	
	Input Points	8 (I1 to I8)		8 (I1 to I8)	8 (I1 to I8)	
	Analog Input Points	4 (I1, I2, I7, I8)		—	—	
	High-speed Input ²	4 (I3, I4, I5, I6), 5KHz maximum		—	—	
	Analog	Input Range	0 to 10V DC (max. rated input: 28.8V DC)		—	—
		Input Error	±1.5 (of full scale)		—	—
		Input Resolution	10 bits (0 to 1000)		—	—
		Allowable Voltage Range	0 to 28.8V DC		—	—
	Input Impedance	Digital Input	3.5kΩ		4.8kΩ	840kΩ
		Analog Input	72kΩ		—	—
Isolation	—	—	—	—		
Operating Range	OFF Voltage	< 5V DC		< 5V AC/DC	< 40V AC, < 30V DC	
	ON Voltage	≥ 12V DC		≥ 12V AC/DC	≥ 79V AC, ≥ 79V DC	
	OFF Current	< 0.85mA (I1 to I6), < 0.05mA (I1, I2, I7, I8)		< 1.0mA	< 0.03mA	
	ON Current	≥ 2mA (I3 to I6) ≥ 0.15mA (I1, I2, I7, I8)	≥ 1.5mA (I3 to I6) ≥ 0.1mA (I1, I2, I7, I8)	≥ 2.5mA	≥ 0.08mA, 100V AC: 50ms (Typ.)	
Turn ON Time	1.5ms (Typ.) ≤ 1.0ms (I3, I6)		1.5ms (Typ.)	100V AC: 50ms (Typ.), 240V AC: 30ms (Typ.) 100V DC: 25ms (Typ.) 240V DC: 15ms (Typ.)		
Turn OFF Time	1.5ms (Typ.) ≤ 1.0ms (I3, I6)		15ms (Typ.)	100V AC: 65ms (Typ.), 240V AC: 105ms (Typ.) 100V DC: 95ms (Typ.), 240V DC: 125ms (Typ.)		
Wire Length	100m ³		100m ³	100m		

-  1. Two year backup duration (typ.) when battery cartridge or memory/battery cartridge used.
 2. When selecting frequency trigger function and up/down counter function.
 3. 10m when connected to analog input (twisted pair cable).
- Specifications can't on next page.

Specifications con't

Style	with LCD Display	FL1E-H12SND	FL1E-H12RCE	FL1E-H12RCA	FL1E-H12RCC
	without Display	—	FL1E-B12RCE	FL1E-B12RCA	FL1E-B12RCC
Output	Output	Transistor source	Relay		
	Output Points/ Contact Configuration	4 points (separate)	4NO contacts		
	Isolation	—	Isolated		
	Dielectric Strength (between power/input terminals and output terminals)	—	2500V AC, 1 minute, 500V DC, 1 minute		
	Output Voltage	External power voltage	—		
	Maximum Load Current	0.3A	Resistive load: 10A at 12/24V AC/DC, 10A at 100/120V AC, 10A at 230/240V AC Inductive load: 2A at 12/24V AC/DC, 3A at 100/120V AC, 3A at 230/240V AC		
	Surge Current	—	30A maximum		
	Short-circuit Protection	Built-in current limiting resistor: Approx. 1A	External fuse required: 16A maximum		
	Minimum Switching Load	—	10mA, 2V DC	10mA, 12V DC	
	Initial Contact Resistance	—	100 mΩ maximum (at 1A, 24V DC)		
	Mechanical Life	—	10 million operations (no load, 10Hz)		
Electrical Life	—	100,000 operations (rated resistive load) 1800 operations/hour			
Switching Rate	Mechanical Load	—	10Hz		
	Electrical Load	10Hz	—		
	Resistive Load/Lamp Load ¹	10Hz	2Hz		
	Inductive Load	0.5Hz	0.5Hz		

 1. For fluorescent lamps, if the inrush current exceeds the allowable value, use an appropriate relay.

General

Style	Specification	Standard
Operating Temperature	Horizontal Mounting	0 to 55°C
	Vertical Mounting	0 to 55°C
Storage/Transportation Temperature	-40 to +70°C (no freezing)	—
Relative Humidity	10 to 95% RH (no condensation)	IEC60068-2-30
Atmospheric Pressure	795 to 1080 hPa	—
Operating Condition	No corrosive gas	—
Degree of Protection	IP20	—
Vibration Resistance	5 to 8.4Hz, amplitude 3.5mm 8.4 to 150Hz, acceleration 9.8m/s ²	IEC60068-2-6
Shock Resistance	147m/s ²	IEC60068-2-27
Drop Test	0.3m	IEC60068-2-31
Drop Test (packaged)	1m	IEC60068-2-32
Emission	Class B Group 1 ¹	EN55011
Electrostatic Discharge	8kV air discharge, 6kV contact discharge ²	IEC61000-4-2
Radiation Field Immunity	Field Strength: 1V/m and 10V/m	IEC61000-4-3
Burst Pulses	2kV (power line), 1kV (I/O signal line) ³	IEC61000-4-4
Energy Carriers Single Pulse (Surge) ⁴ (FL1E-H12RCC, FL1E-B12RCC only)	1kV (power line) normal 2kV (power line) common	IEC61000-4-5
Communication Cable	0.5 to 2.5mm ² (one wire), 0.5 to 1.5mm ² (two wires)	—
Terminal Style	Finger-safe type ⁵	—



- Class A for AS-Interface communication module.
- 8kV (air discharge), 4kV (contact discharge) for AS-Interface communication module.
- 1kV (criteria A), 2kV (criteria B) for AS-Interface communication module.
- For protection against surge noise on DC power supply types (FL1E-H12RCE/B12RCE, FL1E-H12SND, FL1E-H12RCA/B12RCA), use surge absorbers, noise cut transformers, or noise filters. Use of surge protection device (DEHN + SOHNE GmbH + Co. VWT AD 24 Part No. 918 402) is recommended.
- Tightening torque 0.4 to 0.5 N-m.

Text Display

Part Number	FL1E-RD1	
Keyboard Display	Membrane keypad with 10 keys, FSTN-Graphic Display with 128 x 64 (columns x rows), LED backlight	
Power Supply	Input Voltage	24V AC/DC, 12V DC
	Allowable Voltage Range	20.4 to 26.4V AC, 10.2 to 28.8V DC
	Rated Frequency	47 to 63Hz
	Current Draw	30 to 55mA (24V DC)
	Power Consumption	12V DC
24V DC		40mA
24V AC		90mA
Data Transmission Rate	19200 baud	
LCD Display	Backlight lifetime ¹	20,000 hours
	Display lifetime ²	50,000 hours
Weight	220g	



Connect the text display and the base module using the text display cable (2.5m). The text display cable can be extended up to 10m using an extension cable (D-sub 9-pin).

- Backlight durability is the number of hours it takes for the light to become 50% of the original brightness.
- Display durability is calculated under ordinary operating and storage conditions: room temperature, normal humidity below 65% RH, and not subjected to direct sunlight.

Expansion I/O Module

Expansion I/O Module Model Number		FL1B-M08B1S2	FL1B-M08B2R2	FL1B-M08D2R2	FL1B-M08C2R2	FL1B-J2B2	FL1D-K2BM2	
Power Supply	Rated Power Voltage	24V DC	12/24V DC	24V AC/DC	100 to 240V AC/DC	12/24V DC	24V DC	
	Allowable Voltage Range	20.4 to 28.8V DC	10.8 to 28.8V DC	20.4 to 26.4V AC 20.4 to 28.8V DC	85 to 265V AC 100 to 253V DC	10.8 to 28.8V DC	20.4 to 28.8V DC	
	Rated Frequency	—	—	50/60Hz (47 to 63Hz)	50/60Hz (47 to 63Hz)	—	—	
	Current Draw	30 to 45mA	30 to 140mA (12V DC) 20 to 75mA (24V DC)	40 to 110mA (24V AC) 20 to 75mA (24V DC)	10 to 30mA (100V AC) 10 to 20mA (240V AC) 5 to 15mA (100V DC) 5 to 10mA (240V DC)	25 to 50mA	25 to 50mA	
	Allowable Momentary Power Interruption	—	2ms (Typ.) (12V DC) 5ms (Typ.) (24V DC)	5ms (Typ.) (24V AC/DC)	10ms (Typ.) (100V AC/DC) 20ms (Typ.) (240V AC/DC)	2ms (Typ.) (12V AC/DC) 5ms (Typ.) (24V AC/DC)	5ms (Typ.)	
	Power Consumption	0.8 to 1.1W	0.3 to 1.7W (12V DC) 0.4 to 1.8W (24V DC)	0.9 to 2.7VA (24V AC) 0.4 to 1.8W (24V DC)	1.1 to 3.5VA (100V AC) 2.4 to 4.8VA (240V AC) 0.5 to 1.8W (100V DC) 1.2 to 2.4W (240V DC)	0.3 to 0.6W (12V DC) 0.6 to 1.2W (24V DC)	0.6 to 1.2W (24V DC)	
	Reverse Polarity Protection	Yes	Yes	—	—	Yes	Yes	
Input	Input Signal	DC input	DC input	AC/DC input	AC/DC input	Analog input	—	
	Input Points	4	4	4	4	—	—	
	Isolation	—	—	—	—	—	—	
	Allowable Voltage Range	0 to 28.8V DC	0 to 28.8V DC	0 to 26.4V AC 0 to 28.8V DC	0 to 265V AC 0 to 253V DC	—	—	
	Operating Range	OFF Voltage	< 5V DC	< 5V DC	< 5V AC/DC	< 40V AC < 30V DC	—	—
		ON Voltage	≥ 12V DC	≥ 8.5V DC	≥ 12V AC/DC	≥ 79V AC ≥ 79V DC	—	—
		OFF Current	< 0.85mA	< 0.85mA	< 1.0mA	< 0.03mA	—	—
		ON Current	≥ 2mA	≥ 1.5mA	≥ 2.5mA	≥ 0.08mA	—	—
	Turn ON Time	1.5ms (Typ.)	1.5ms (Typ.)	1.5ms (Typ.)	100V AC: 50ms (Typ.) 240V AC: 30ms (Typ.) 100V DC: 25ms (Typ.) 240V DC: 15ms (Typ.)	—	—	
	Turn OFF Time	1.5ms (Typ.)	1.5ms (Typ.)	1.5ms (Typ.)	100V AC: 65ms (Typ.) 240V AC: 105ms (Typ.) 100V DC: 95ms (Typ.) 240V DC: 125ms (Typ.)	—	—	
Analog Input Points	—	—	—	—	2	—		
Analog Input Range	—	—	—	—	0 to 10V (max. rated input: 28.8V) 0 to 20mA (max. rated input: 40mA)	—		
Digital Resolution	—	—	—	—	10 bits (0 to 1000)	—		
Input Error	—	—	—	—	±1.5% (of full scale)	—		
Input Impedance	—	—	—	—	76kΩ (0 to 10V) 155 to 250Ω (0 to 20mA)	—		
Sampling Cycle	—	—	—	—	50ms	—		

Expansion I/O Module Specifications can't on next page.

Expansion I/O Module, con't

Expansion I/O Module Model Number		FL1B-M08B1S2	FL1B-M08B2R2	FL1B-M08D2R2	FL1B-M08C2R2	FL1B-J2B2	FL1D-K2BM2
Output	Wire Length	100 m	100 m	100 m	100 m	10 m (twisted-pair shielded cable)	—
	Output	Transistor source	Relay	Relay	Relay	—	Analog
	Output Points/Contact Configuration	4 points (separate)	4NO contacts	4NO contacts	4NO contacts	—	—
	Isolation	—	Isolated	Isolated	Isolated	—	—
	Dielectric Strength (between power/input terminals and output terminals)	—	2500V AC, 1 minute 500V DC, 1 minute	2500V AC, 1 minute 500V DC, 1 minute	2500V AC, 1 minute 500V DC, 1 minute	—	—
	Output Voltage	External power voltage (20.4 to 28.8V DC)	—	—	—	—	—
	Maximum Load Current	0.3A	Resistive load 5A at 12/24V AC/DC 5A at 100/120V AC 5A at 230/240V AC Inductive load 2A at 12/24V AC/DC 3A at 100/120V AC 3A at 230/240V AC	Resistive load 5A at 12/24V AC/DC 5A at 100/120V AC 5A at 230/240V AC Inductive load 2A at 12/24V AC/DC 3A at 100/120V AC 3A at 230/240V AC	Resistive load 5A at 12/24V AC/DC 5A at 100/120V AC 5A at 230/240V AC Inductive load 2A at 12/24V AC/DC 3A at 100/120V AC 3A at 230/240V AC	—	—
	Short-circuit Protection	Built-in current limiting resistor: Approx. 1A	External fuse required: 16A maximum	External fuse required: 16A maximum	External fuse required: 16A maximum	—	Yes
	Minimum Switching Load	—	10mA, 12V DC	10mA, 12V DC	10mA, 12V DC	—	—
	Initial Contact Resistance	—	100 mΩ maximum (at 1A, 24V DC)	100 mΩ maximum (at 1A, 24V DC)	100 mΩ maximum (at 1A, 24V DC)	—	—
	Mechanical Life	—	10 million operations (no load, 10Hz)	10 million operations (no load, 10Hz)	10 million operations (no load, 10Hz)	—	—
	Electrical Life	—	100,000 operations (rated resistive load) 1800 operations/hour	100,000 operations (rated resistive load) 1800 operations/hour	100,000 operations (rated resistive load) 1800 operations/hour	—	—
	Analog Output Points	—	—	—	—	—	2
	Analog Output Range	—	—	—	—	—	0 to 10V, 4-20mA
	Digital Resolution	—	—	—	—	—	10 bits (0 to 1000V)
	Output Error	—	—	—	—	—	±2.5% (of full scale)
Output Impedance	—	—	—	—	—	5kΩ	
Analog Value Conversion Interval	—	—	—	—	—	50ms	
Wire Length	—	—	—	—	—	10 m (twisted-pair shielded cable)	
Switching Rate	Mechanical Load	—	10Hz	10Hz	10Hz	—	—
	Electrical Load	10Hz	—	—	—	—	—
	Resistive Load/Lamp Load	10Hz	2Hz	2Hz	2Hz	—	—
	Inductive Load	0.5Hz	0.5Hz	0.5Hz	0.5Hz	—	—

OT Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

General

Item	Specification	Standard
Operating Temperature	Horizontal Mounting	0 to 55°C
	Vertical Mounting	0 to 55°C
Storage/Transportation Temperature	-40 to +70°C ¹	—
Relative Humidity	10 to 95% RH ²	IEC60068-2-30
Atmospheric Pressure	795 to 1080 hPa	—
Operating Condition	No corrosive gas	—
Degree of Protection	IP20	—
Vibration Resistance	5 to 9Hz, amplitude 3.5mm 9 to 150Hz, acceleration 9.8m/s ² (1G)	IEC60068-2-6
Shock Resistance	147m/s ² (15G)	IEC60068-2-27
Drop Test	50mm	IEC60068-2-31
Drop Test (packaged)	1m	IEC60068-2-32
Emission	Class B Group 1 ³	EN55011
Electrostatic Discharge	8kV air discharge 6kV contact discharge ⁴	IEC61000-4-2
Electromagnetic Fields	10V/m	IEC61000-4-3
Burst Pulses	2kV (power line) 1kV (I/O signal line) ⁵	IEC61000-4-4
Energy Carriers Single Pulse (Surge) ⁶ (FL1B-H12RCC, FL1B-B12RCC only)	1kV (power line) normal 2kV (power line) common	IEC61000-4-5
Communication Cable	0.5 to 2.5mm ² (one wire) 0.5 to 1.5mm ² (two wires)	—
Terminal Style	Finger-safe type ⁷	—



1. No freezing
2. No condensation
3. Class A for AS-Interface communication module
4. 8kV (air discharge), 4kV (contact discharge) for AS-Interface communication module
5. 1kV (criteria A), 2kV (criteria B) for AS-Interface communication module
6. For protection against surge noise on DC power supply types (FL1D-H12RCE/B12RCE, FL1D-H12SND, FL1D-H12RCA/B12RCA), use surge absorbers, noise cut transformers, or noise filters.
7. Tightening torque 0.4 to 0.5 N·m

AS-Interface Communication Module

Specifications

Module Type	AS-Interface slave module
Slave Type	Standard
	I/O code: 7
Profile	ID code: F
	ID2 code: F
Input/Output	Virtual input: 4
	Virtual output: 4
AS-Interface Voltage	30V DC (26.5 to 31.6V DC)
Current Draw	70 mA maximum (AS-Interface)

I/O Allocation

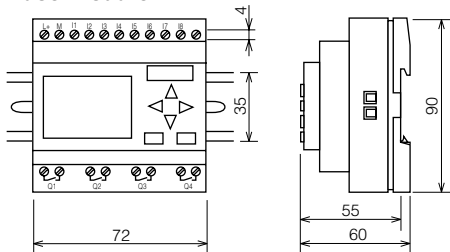
Input		Output	
AS-Interface	SmartRelay	SmartRelay	AS-Interface
Output Data Bit D0	Input In	Output Qm	Input Data Bit D0
Output Data Bit D1	Input In+1	Output Qm+1	Input Data Bit D1
Output Data Bit D2	Input In+2	Output Qm+2	Input Data Bit D2
Output Data Bit D3	Input In+3	Output Qm+3	Input Data Bit D3



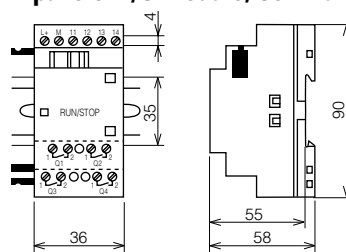
1. I/O point numbers "n" and "m" of the SmartRelay are automatically allocated by the base module according to the mounted position of the AS-Interface communication module.
2. AS-Interface communication module is IP20 terminal type.
3. AS-Interface cable is connected to the terminal block.

Dimensions (mm)

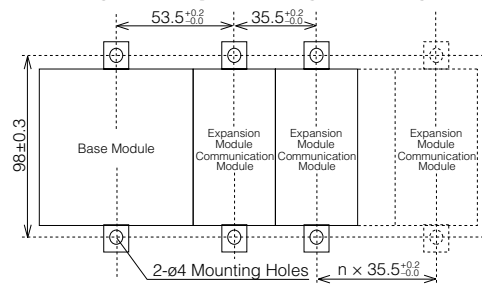
Base Module



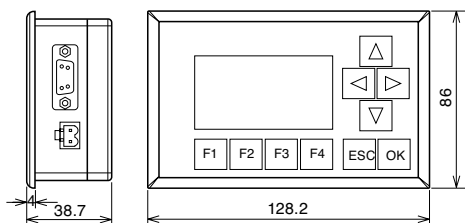
Expansion I/O Module, Communication Module



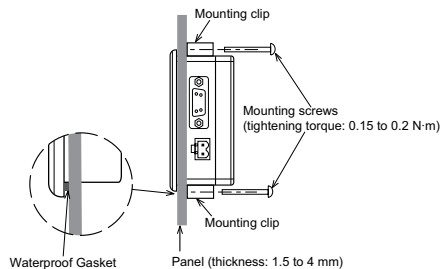
Mounting Hole Layout (Using Mounting Slides)



Text Display



Installation



Mounting Hole Layout

