



## 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\*.

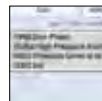


\*Not applicable for all models. Visit [www.IDEC.com/approvals](http://www.IDEC.com/approvals) for details.

## 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



NEW 4-pt. analog output module

## 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.

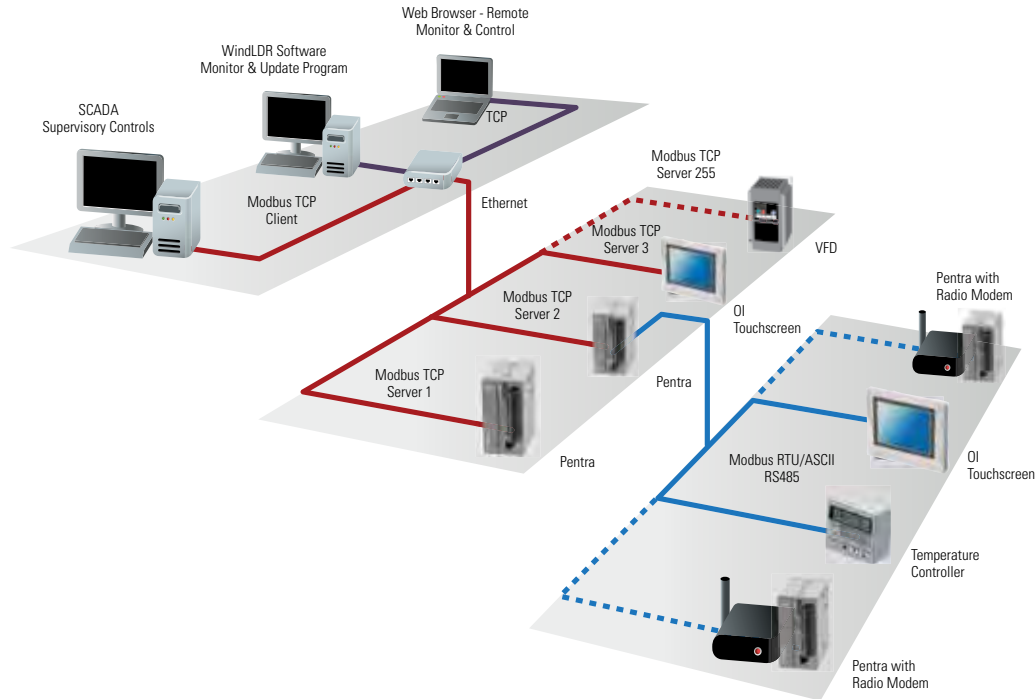
## Embedded USB Maintenance Port



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.

## 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.

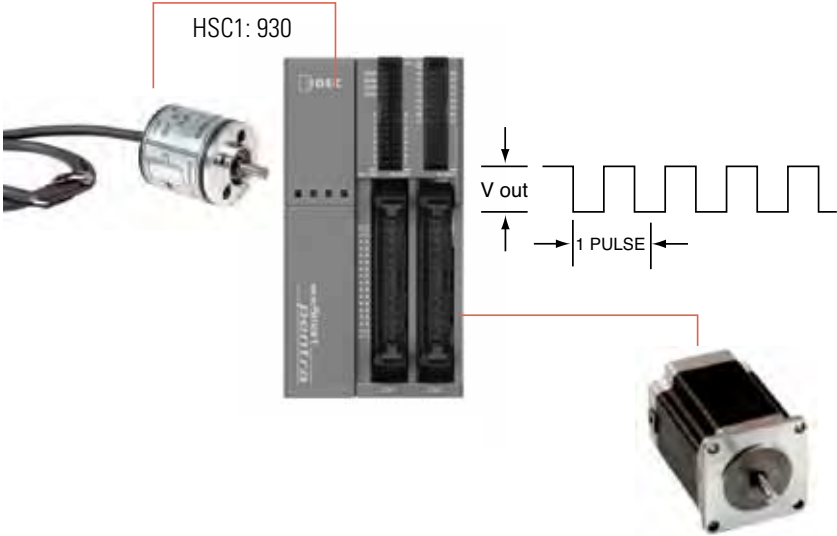
User Web Pages



With IEC 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 IEC 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.



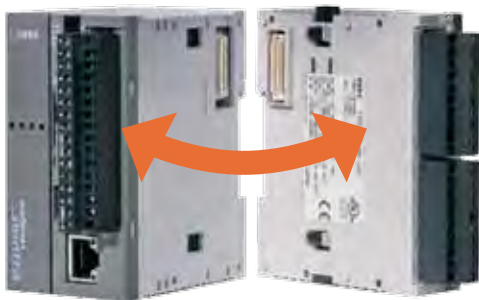
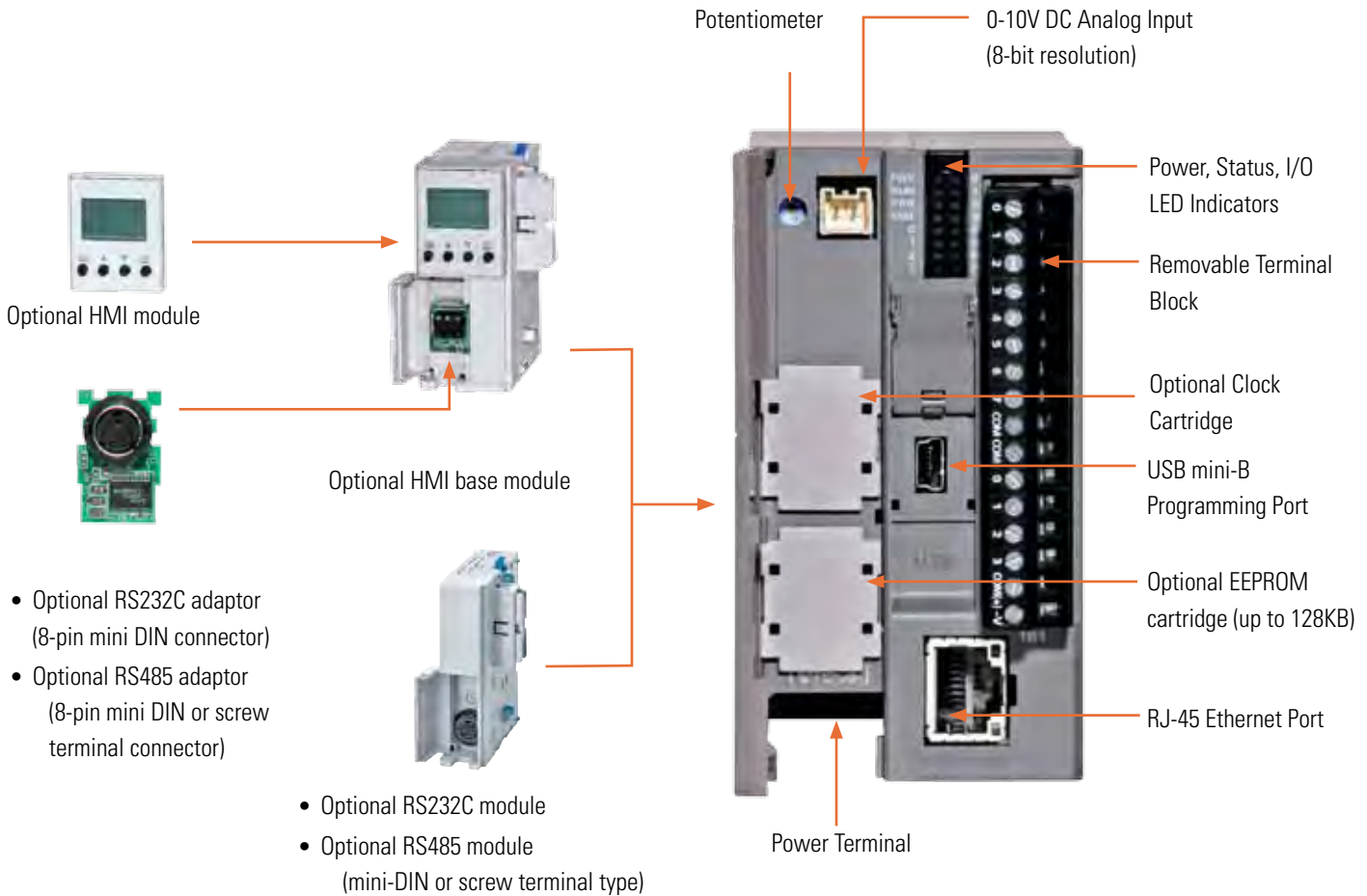
## Maximum 7 Communication Ports



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.

## Choose a CPU for every application

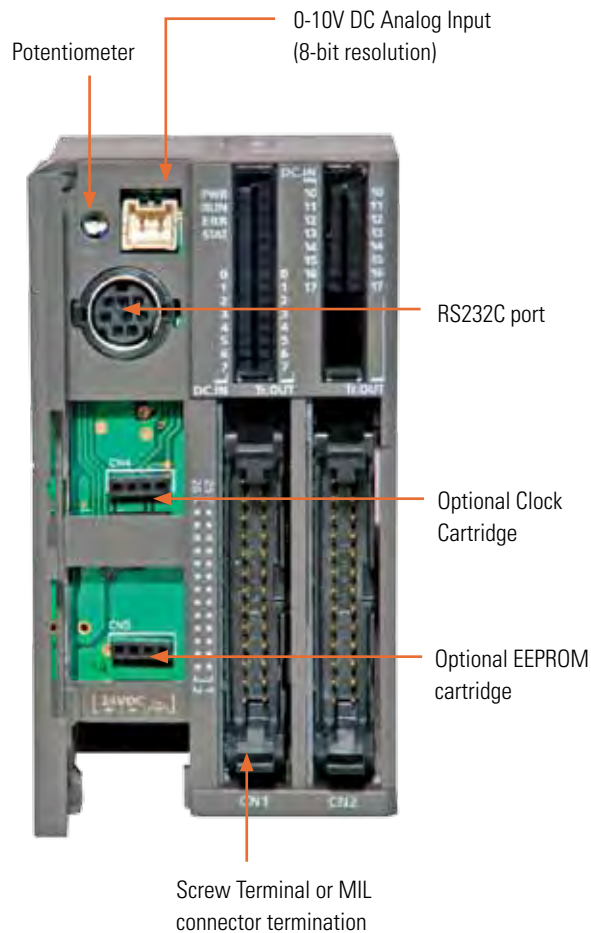
With three controller types to choose from, MicroSmart Pentra PLCs offer the features you need for your applications. Built to allow you the flexibility to expand when you need to, MicroSmart Pentra PLCs are the best way to get everything you need in just one controller.



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.



## 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 | 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 |                                  |

## 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) | 24V DC            | —                   | 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            |                     |        |                                  |

## 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  | —                                |
|                                                                                     | 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) |                      |        | 4 (Maximum 88 digital I/Os)      |
|                                                                                     | FC4A-C24R2  | 100-240V AC |                    |                      |        |                                  |

## 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) |                      | Transistor Sink               | 7 (Maximum 264 digital I/Os)     |  |
|                                                                                     | FC4A-D40S3  |        |                   |                      | Transistor Source             |                                  |  |

OI 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  |             | 32           |                              |

Digital I/O Expansion Modules

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| 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  | Transistor Source | 8             | Removable Screw Terminals    |
|   | FC4A-T16S3  |                   | 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         |

## 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)  |                           |

## 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

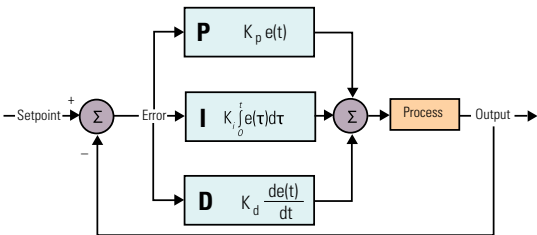
#### Part Numbers

| 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 |

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                           |

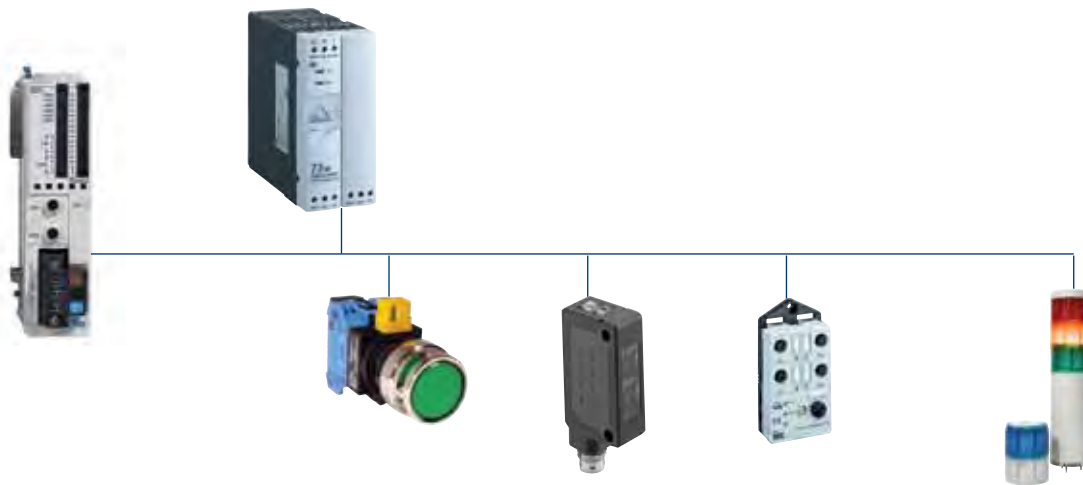


PID Control Module Highlights:

- 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

## Communication Modules

### AS-Interface Module



### AS-Interface Master Module

| Style                                                                              | Part Number | Description                           |
|------------------------------------------------------------------------------------|-------------|---------------------------------------|
|  | FC4A-AS62M  | MicroSmart AS-Interface Master Module |

The Actuator Sensor-interface (AS-Interface) is the simplest and most cost-effective of the PLC-based , industrial-networking protocols. AS-Interface is a truly open, low-cost electromechanical connection system designed to operate over a two-wire cable carrying data and power over a distance of up to 100m. It is especially suitable for lower levels of plant automation where simple - often binary (On/Off) - field devices such as switches, sensors, and actuators need to interoperate in a local area automation network controlled by a PLC. IDEC supports this open technology.

IDEC offers a plug-in AS-Interface master module (as well as other AS-Interface devices, please see AS-Interface Communication section) that is easy to configure; it can also connect up to 62 slaves. With this technology, you'll reduce the amount of engineering needed, simplify wiring and enhance your operations; requiring less maintenance. With an average cost of savings of 15 to 40% compared with traditional cabling methods, using an IDEC AS-Interface module is the easy choice.

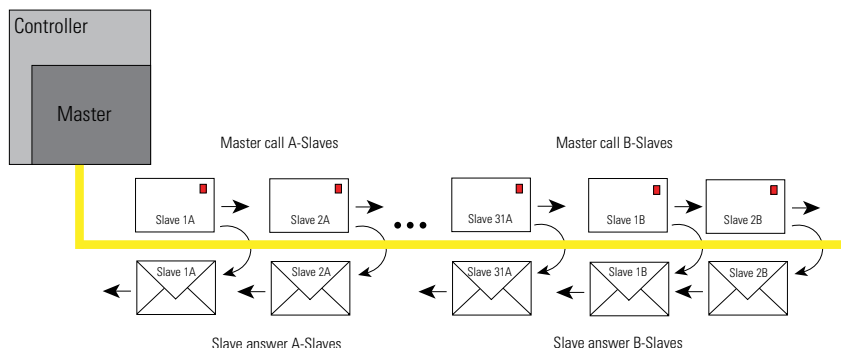
### Master-Slave Principle

The AS-Interface master controls and monitors the status of slave devices connected to the AS-Interface bus. Normally, the AS-Interface master is connected to a PLC (sometimes called 'host') or a gateway.

Various types of slave devices can be connected to the AS-Interface bus, including sensors, actuators, and remote I/O devices. Analog slaves can also be connected to process analog data. Slaves are available in standard slaves and A/B slaves. Standard slaves have an address of 1 through 31 in the standard address

range. A/B slaves have an address of 1A through 31A in the standard address range or 1B through 31B in the expanded address range. Among the A/B slaves, slaves with an address of

1A through 31A are called A slaves, and slaves with an address of 1B through 31B are called B slaves. (see AS-Interface Communication section for more details)



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

| 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 |

01 Touchscreens

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Communication Module — for Slim CPU

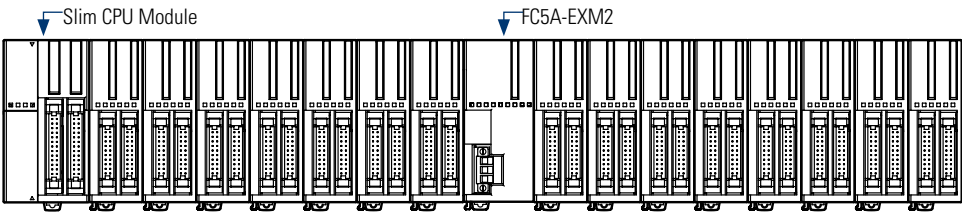
| Style                                                                              | Part Number | Description | Terminal       |
|------------------------------------------------------------------------------------|-------------|-------------|----------------|
|   | FC4A-HPC1   | RS232C      | Mini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

Expansion Power Supply Module

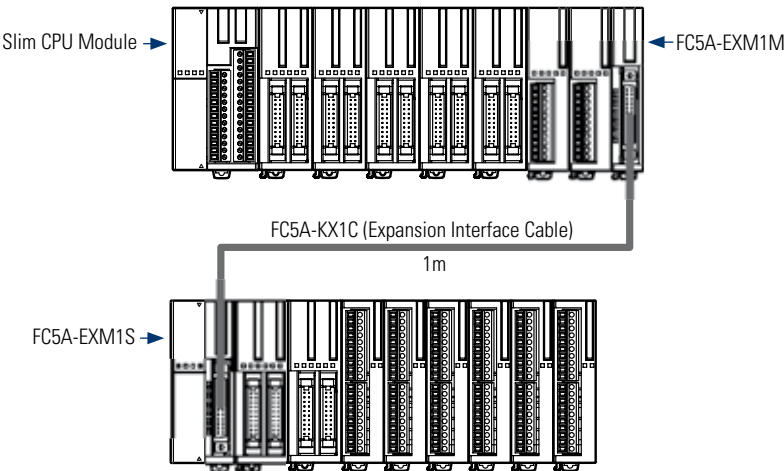
| Style                                                                             | Part Number | Description                                         |
|-----------------------------------------------------------------------------------|-------------|-----------------------------------------------------|
|  | 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

### Communication Cables

| Appearance                                                                         | Part Number | Length          | Expanded Description                                               | Appearance                                                                         | Part Number | Length        | Expanded Description                                                                                                              |
|------------------------------------------------------------------------------------|-------------|-----------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------|
|   | FC4A-KC4CA  | 5ft. (1.53m)    | Programming cable (Maintenance/User Communication Mode selectable) |  | FC2A-KM1C   | 9.84 Ft. (3m) | Modem cable. Used to connect a modem to the MicroSmart RS232C port.                                                               |
|   | FC4A-USB    | 6ft. (1.83m)    | USB to Serial Converter                                            |  | FC2A-KP1C   | 9.84 Ft. (3m) | User communication cable. Used to connect RS232C equipment to the MicroSmart RS232C port.                                         |
|   | FC4A-KC3C   | 0.33ft. (100mm) | Web Server Module interface cable                                  |  | FC5A-KX1C   | 3.28 Ft. (1m) | MicroSmart Pentra expansion power supply interface cable. Used to connect expansion interface master and expansion slave modules. |
|  | HG9Z-XCM2A  | 6ft. (1.83m)    | USB programming cable for embedded Ethernet CPU                    |                                                                                    |             |               |                                                                                                                                   |

### MIL Connector Cables (use with Breakout Modules)

| Use with                                        | Part Number   | Model                      | Length         | Use with                                                   | Part Number   | Model                      | Length         |
|-------------------------------------------------|---------------|----------------------------|----------------|------------------------------------------------------------|---------------|----------------------------|----------------|
| CPU Module (26-wire)<br>BX1D-S26A,<br>BX1D-T26A | FC9Z-H050B26  | Non-shielded               | 1.64ft. (0.5m) | I/O Expansion Modules (20-wire)<br>BX1D-S20A,<br>BX1D-T20A | FC9Z-H050B20  | Non-shielded               | 1.64ft. (0.5m) |
|                                                 | FC9Z-H100B26  |                            | 3.28ft. (1m)   |                                                            | FC9Z-H100B20  |                            | 3.28ft. (1m)   |
|                                                 | FC9Z-H200B26  |                            | 6.56ft. (2m)   |                                                            | FC9Z-H200B20  |                            | 6.56ft. (2m)   |
|                                                 | FC9Z-H300B26  |                            | 9.85ft. (3m)   |                                                            | FC9Z-H300B20  |                            | 9.85ft. (3m)   |
|                                                 | FC9Z-H050A26  | Shielded                   | 1.64ft. (0.5m) |                                                            | FC9Z-H050A20  | Shielded                   | 1.64ft. (0.5m) |
|                                                 | FC9Z-H100A26  |                            | 3.28ft. (1m)   |                                                            | FC9Z-H100A20  |                            | 3.28ft. (1m)   |
|                                                 | FC9Z-H200A26  |                            | 6.56ft. (2m)   |                                                            | FC9Z-H200A20  |                            | 6.56ft. (2m)   |
|                                                 | FC9Z-H300A26  |                            | 9.85ft. (3m)   |                                                            | FC9Z-H300A20  |                            | 9.85ft. (3m)   |
|                                                 | FC9Z-H100C26A | Shielded Single Connectors | 5ft. (1.5m)    |                                                            | FC9Z-H100C20A | Shielded Single Connectors | 5ft. (1.5m)    |

### Breakout Modules

| Use with                                                                                                           | Part Number | Description                                     |
|--------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------|
| 26-wire MIL connector cable<br> | BX1D-S26A   | 26-terminal breakout module                     |
|                                                                                                                    | BX1D-T26A   | 26-terminal touch-down terminal breakout module |
| 20-wire MIL connector cable<br> | BX1D-S20A   | 20-terminal breakout module                     |
|                                                                                                                    | BX1D-T20A   | 20-terminal touch-down terminal breakout module |

OT Touchscreens

PLCs

Automation Software

Power Supplies

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Communication

Barriers

## 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-WIC        |                       | Automation Organizer Software Suite                                       |

## RV8H 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 | Part Number                     |
|--------------|---------------------------------|
| DC           | 6V <b>RV8H-L-D6</b>             |
|              | 9V RV8H-L-D9                    |
|              | 12V <b>RV8H-L-D12</b>           |
|              | 18V RV8H-L-D18                  |
|              | 24V <b>RV8H-L-D24</b>           |
| AC/DC        | 12V <b>RV8H-L-AD12</b>          |
|              | 18V RV8H-L-AD18                 |
|              | 24V <b>RV8H-L-AD24</b>          |
|              | 48V RV8H-L-AD48                 |
|              | 60V RV8H-L-AD60                 |
|              | 110V - 125V <b>RV8H-L-AD110</b> |
|              | 220V - 240V <b>RV8H-L-AD220</b> |



## Accessories

| Item                                    | Color | Part Number |
|-----------------------------------------|-------|-------------|
| Jumper (20 combs) <sup>1</sup>          | Black | SV9Z-J20B   |
|                                         | Gray  | SV9Z-J20W   |
|                                         | Blue  | SV9Z-J20S   |
| Spacer (circuit separator) <sup>2</sup> | -     | 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.

Standard stock models in bold.

## Starter Kits and Solution Packages

### MicroSmart Starter Kits

| Item              |                                                                                   | Part Numbers | Controller                            | Power Supply | Software (Prog. Cables Included)    |
|-------------------|-----------------------------------------------------------------------------------|--------------|---------------------------------------|--------------|-------------------------------------|
| MicroSmart        |  | 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          |                                     |
| MicroSmart Pentra |  | 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



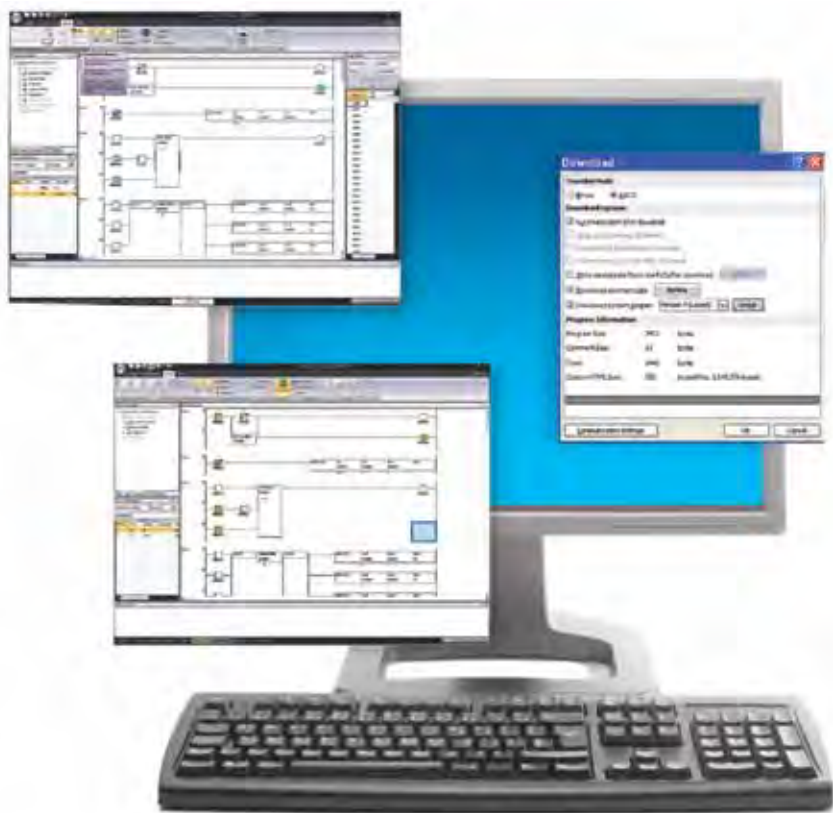
KIT-PENTRA-12-HG3G-AHP shown

| 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.

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) 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**

WindO/I-NV2 software is the programming tool available for all IEC OI touchscreens. 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 121.

## Specifications

### Slim Type

| Model                                  | FC5A-D12K1E<br>FC5A-D12S1E                                                                                                                                                                                        | FC5A-D16RK1<br>FC5A-D16RS1 | FC5A-D32K3<br>FC5A-D32S3 | FC4A-D20K3<br>FC4A-D20S3       | FC4A-D20RK1<br>FC4A-D20RS1     | FC4A-D40K3<br>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) <sup>1</sup>                                                                                                                                                                                    |                            |                          | 560 mA (26.4V DC) <sup>1</sup> | 700 mA (26.4V DC) <sup>1</sup> |                          |
| Maximum Power Consumption              | 19W (26.4V DC) <sup>1</sup>                                                                                                                                                                                       |                            |                          | 14W (26.4V DC) <sup>1</sup>    | 17W (26.4V DC) <sup>1</sup>    |                          |
| Allowable Momentary Power Interruption | 10 ms (at 24V DC)                                                                                                                                                                                                 |                            |                          |                                |                                |                          |
| Dielectric Strength                    | Between power and ⚡ terminals: 500V AC, 1 minute<br>Between I/O and ⚡ terminals: 500V AC, 1 minute                                                                                                                |                            |                          |                                |                                |                          |
| Insulation Resistance                  | Between power and ⚡ terminals: 10 MΩ minimum (500V DC megger)<br>Between I/O and ⚡ terminals: 10 MΩ minimum (500V DC megger)                                                                                      |                            |                          |                                |                                |                          |
| Noise Resistance                       | DC power terminals: 1.0 kV, 50 ns to 1 μs<br>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:<br>5 to 8.4 Hz amplitude 3.5 mm, 8.4 to 150 Hz acceleration 9.8 m/s <sup>2</sup> (1G),<br>2 hours per axis on each of three mutually perpendicular axes (IEC61131-2) |                            |                          |                                |                                |                          |
| Shock Resistance                       | 147 m/s <sup>2</sup> (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

I/O Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

## All-in-One Type

| Model                                  |          | FC5A-C10R2<br>FC5A-C10R2C<br>FC5A-C10R2D                                                                                                                                                                                                                             | FC5A-C16R2<br>FC5A-C16R2C<br>FC5A-C16R2D | FC5A-C24R2<br>FC5A-C24R2C<br>FC5A-C24R2D                     | FC4A-C10R2<br>FC4A-C10R2C          | FC4A-C16R2<br>FC4A-C16R2C          | FC4A-C24R2<br>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)<br>160 mA (24V DC)                                                                                                                                                                                                                                   | 300 mA (85V AC)<br>190 mA (24V DC)       | 450 mA (85V AC) <sup>1</sup><br>360 mA (24V DC) <sup>2</sup> | 250 mA (85V AC)<br>160 mA (24V DC) | 300 mA (85V AC)<br>190 mA (24V DC) | 450 mA (85V AC) <sup>1</sup><br>360 mA (24V DC) <sup>2</sup> |
| Maximum Power Consumption              | AC Power | FC5A-C10R2/FC4A-C10R2: 30VA (264V AC), 20VA (100V AC) <sup>3</sup><br>FC5A-C16R2/FC4A-C16R2: 31VA (264 V AC), 22VA (100V AC) <sup>3</sup><br>FC5A-C24R2/FC4A-C24R2: 40VA (264V AC), 33VA (100V AC) <sup>1</sup>                                                      |                                          |                                                              |                                    |                                    |                                                              |
|                                        | DC Power | FC5A-C10R2C/FC4A-C10R2C: 3.9W (24V DC) *5    FC5A-C10R2D: 2.8W (12V DC) <sup>4</sup><br>FC5A-C16R2C/FC4A-C16R2C: 4.6W (24V DC) *5    FC5A-C16R2D: 3.4W (12V DC) <sup>4</sup><br>FC5A-C24R2C/FC4A-C24R2C: 8.7W (24V DC) *3    FC5A-C24R2D: 4.2W (12V DC) <sup>4</sup> |                                          |                                                              |                                    |                                    |                                                              |
| Allowable Momentary Power Interruption |          | 10 ms (rated power voltage)                                                                                                                                                                                                                                          |                                          |                                                              |                                    |                                    |                                                              |
| Dielectric Strength                    |          | Between power and ⊕ or ⊖ terminals: 1,500V AC, 1 minute<br>Between I/O and ⊕ or ⊖ terminals: 1,500V AC, 1 minute                                                                                                                                                     |                                          |                                                              |                                    |                                    |                                                              |
| Insulation Resistance                  |          | Between power and ⊕ or ⊖ terminals: 10 MΩ minimum (500V DC megger)<br>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<br>DC power terminals: 1.0 kV, 50 ns to 1 μs<br>I/O terminals (coupling clamp): 1.5 kV, 50 ns to 1 μs                                                                                                                      |                                          |                                                              |                                    |                                    |                                                              |
| Inrush Current                         |          | FC5A-C10R2/FC5A-C10R2C/FC5A-C16R2/<br>FC5A-C16R2C: 35A<br>FC5A-C10R2D/FC5A-C16R2D: 20A                                                                                                                                                                               |                                          | FC5A-C24R2/<br>FC5A-C24R2C: 40A<br>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:<br>5 to 8.4 Hz amplitude 3.5 mm, 8.4 to 150 Hz acceleration 9.8 m/s² (1G),<br>2 hours per axis on each of three mutually perpendicular axes (IEC61131-2)                                                                |                                          |                                                              |                                    |                                    |                                                              |
| Shock Resistance                       |          | 147 m/s² (15G), 11 ms duration, 3 shocks per axis on three mutually perpendicular axes (IEC61131-2)                                                                                                                                                                  |                                          |                                                              |                                    |                                    |                                                              |
| Weight                                 |          | AC type: 230g<br>DC type: 240g                                                                                                                                                                                                                                       | AC type: 250g<br>DC type: 260g           | AC type: 305g<br>DC type: 310g                               | AC type: 230g<br>DC type: 240g     | AC type: 250g<br>DC type: 260g     | AC type: 305g<br>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

## Slim Type Function Specifications

| Model                              |                                                          | FC5A-D12K1E<br>FC5A-D12S1E                                                                                                                                                                                                                                                |                 | FC5A-D16RK1<br>FC5A-D16RS1       |                 | FC5A-D32K3<br>FC5A-D32S3 |                 | FC4A-D20K3<br>FC4A-D20S3                                                                                                  |                | FC4A-D20RK1<br>FC4A-D20RS1         |                | FC4A-D40K3<br>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 <sup>1</sup>      |                                                          | 127.8 KB<br>(21,300 steps)                                                                                                                                                                                                                                                |                 | 62.4 KB (10,400 steps)           |                 |                          |                 | 27 KB<br>(4,500 steps)                                                                                                    |                | 31.2 KB (5,200 steps) <sup>2</sup> |                |                          |                |
| 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 <sup>3</sup>                              | 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  | 16                       | Expansion: 224  | 12                                                                                                                        | Expansion: 128 | 12                                 | Expansion: 224 | 24                       | Expansion: 224 |
|                                    | Output                                                   | 4                                                                                                                                                                                                                                                                         | Additional: 256 | 8                                | Additional: 256 | 16                       | Additional: 256 | 8                                                                                                                         |                | 8                                  | Expansion: 224 | 16                       |                |
| Internal Relay                     |                                                          | 2,048 points                                                                                                                                                                                                                                                              |                 |                                  |                 |                          |                 | 1,024 points                                                                                                              |                |                                    |                |                          |                |
| Shift Register                     |                                                          | 256 points                                                                                                                                                                                                                                                                |                 |                                  |                 |                          |                 | 128 points                                                                                                                |                |                                    |                |                          |                |
| Data Register                      |                                                          | 42,000 points                                                                                                                                                                                                                                                             |                 | 42,000 points <sup>4</sup>       |                 |                          |                 | 1,300 points                                                                                                              |                |                                    |                |                          |                |
| Expansion Data Register            |                                                          | 6,000 points                                                                                                                                                                                                                                                              |                 |                                  |                 |                          |                 | —                                                                                                                         |                | 6,000 points                       |                |                          |                |
| Counter                            |                                                          | 256 points                                                                                                                                                                                                                                                                |                 |                                  |                 |                          |                 | 100 points                                                                                                                |                |                                    |                |                          |                |
| Timer (1-sec, 100-ms, 10-ms, 1-ms) |                                                          | 256 points                                                                                                                                                                                                                                                                |                 |                                  |                 |                          |                 | 100 points                                                                                                                |                |                                    |                |                          |                |
| RAM Backup                         | Backup Data                                              | Internal relay, shift register, counter, data register, expansion data register                                                                                                                                                                                           |                 |                                  |                 |                          |                 |                                                                                                                           |                |                                    |                |                          |                |
|                                    | Backup Duration                                          | Approx. 30 days (typical) at 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)<br>Minimum turn on pulse width: 40 μs maximum<br>Minimum turn off pulse width: 150 μs maximum                                                                                                                                                     |                 |                                  |                 |                          |                 | Four inputs (I2 through I5)<br>Minimum turn on pulse width: 40 μs maximum<br>Minimum turn off pulse width: 150 μs maximum |                |                                    |                |                          |                |
|                                    |                                                          | (I3 and I4)<br>Minimum turn on pulse width: 5 μs maximum<br>Minimum turn off pulse width: 5 μs maximum                                                                                                                                                                    |                 |                                  |                 |                          |                 |                                                                                                                           |                |                                    |                |                          |                |
| High-speed Counter                 | Maximum Counting Frequency and High-speed Counter Points | Total 4 points Single/two-phase selectable: 100 kHz (2 points)<br>Single-phase: 100 kHz (2 points)                                                                                                                                                                        |                 |                                  |                 |                          |                 | Total 4 points Single/two-phase selectable: 20 kHz (2 points)<br>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 step equals 6 bytes.
  - Expandable up to 62.4 KB when a memory cartridge is used.
  - Not including expansion I/O service time, clock function processing time, data link processing time, and interrupt processing time.
  - Extra data registers D10000 through D49999 are enabled using WindLDR Function Area Settings, then run-time program download cannot be used.
  - Maintenance communication (change monitor device values, upload/download user programs, download system program)
  - 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<br>FC5A-D12S1E                                                                                                       | FC5A-D16RK1<br>FC5A-D16RS1                                                                                | FC5A-D32K3<br>FC5A-D32S3 | FC4A-D20K3<br>FC4A-D20S3 | FC4A-D20RK1<br>FC4A-D20RS1 | FC4A-D40K3<br>FC4A-D40S3 |
|-----------------------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|----------------------------|--------------------------|
| Ethernet Port                                             | Ethernet Specifications        | Electrical Characteristics:<br>Complies with IEEE802.3<br>Transmission Speed:<br>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<br>Network Layer: UDP, TCP, ICMP<br>Application Layer: SMTP, DHCP, HTTP, NBNS, DNS, SNMP                |                                                                                                           |                          |                          |                            |                          |
|                                                           | Function (see table next page) | Web server, Send email, PING, Maintenance communication server, Modbus TCP server/client, User communication server/client, SNMP |                                                                                                           |                          |                          |                            |                          |
| Port 1                                                    |                                | USB mini-B (CDC class)<br>Maintenance Communication <sup>5</sup>                                                                 | RS232C – maintenance communication, user communications, Modbus slave ASCII/RTU communication (FC5A only) |                          |                          |                            |                          |
| Port 2 Communication Adapter/Module (option) <sup>6</sup> |                                |                                                                                                                                  | 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).

## All-in-One Type Function Specifications

| Model                                              |                                                          | FC5A-C10R2<br>FC5A-C10R2C<br>FC5A-C10R2D                                                                                                                                                                                                                                     | FC5A-C16R2<br>FC5A-C16R2C<br>FC5A-C16R2D | FC5A-C24R2<br>FC5A-C24R2C<br>FC5A-C24R2D |                            | FC4A-C10R2<br>FC4A-C10R2C                                                                         | FC4A-C16R2<br>FC4A-C16R2C | FC4A-C24R2<br>FC4A-C24R2C |               |
|----------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------|---------------------------|---------------------------|---------------|
| Control System                                     |                                                          | Stored program system                                                                                                                                                                                                                                                        |                                          |                                          |                            |                                                                                                   |                           |                           |               |
| Instruction Words                                  |                                                          | 42 basic                                                                                                                                                                                                                                                                     |                                          |                                          |                            | 35 basic                                                                                          |                           |                           |               |
|                                                    |                                                          | 103 advanced                                                                                                                                                                                                                                                                 | 103 advanced                             | 115 advanced                             |                            | 38 advanced                                                                                       | 40 advanced               | 48 advanced               |               |
| Program Capacity <sup>1</sup>                      |                                                          | 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 <sup>2</sup>                              | 0.64 ms                                                                                                                                                                                                                                                                      |                                          |                                          |                            | 0.64 ms                                                                                           |                           |                           |               |
| Expandable I/O Module                              |                                                          | —                                                                                                                                                                                                                                                                            |                                          | 4 modules                                |                            | —                                                                                                 |                           | 4 modules                 |               |
| I/O Points                                         | Input                                                    | 6                                                                                                                                                                                                                                                                            | 9                                        | 14                                       | Expansion: 64 <sup>3</sup> | 6                                                                                                 | 9                         | 14                        | Expansion: 64 |
|                                                    | Output                                                   | 4                                                                                                                                                                                                                                                                            | 7                                        | 10                                       |                            | 4                                                                                                 | 7                         | 10                        |               |
| Internal Relay                                     |                                                          | 2,048 points                                                                                                                                                                                                                                                                 |                                          |                                          |                            | 256 points                                                                                        | 1,024 points              |                           |               |
| Shift Register                                     |                                                          | 128 points                                                                                                                                                                                                                                                                   |                                          |                                          |                            | 64 points                                                                                         | 128 points                |                           |               |
| Data Register                                      |                                                          | 2,000 points                                                                                                                                                                                                                                                                 |                                          |                                          |                            | 400 points                                                                                        | 1,300 points              |                           |               |
| Expansion Data Register                            |                                                          | —                                                                                                                                                                                                                                                                            |                                          |                                          |                            | —                                                                                                 |                           |                           |               |
| Counter                                            |                                                          | 256 points                                                                                                                                                                                                                                                                   |                                          |                                          |                            | 32 points                                                                                         | 100 points                |                           |               |
| Timer (1-sec, 100-ms, 10-ms, 1-ms)                 |                                                          | 256 points                                                                                                                                                                                                                                                                   |                                          |                                          |                            | 32 points                                                                                         | 100 points                |                           |               |
| RAM Backup                                         | Backup Data                                              | Internal relay, shift register, counter, data register                                                                                                                                                                                                                       |                                          |                                          |                            |                                                                                                   |                           |                           |               |
|                                                    | Backup Duration                                          | Approx. 30 days (typical) at 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)<br>Minimum turn on pulse width: 40 μs maximum<br>Minimum turn off pulse width: 150 μs maximum                                                                                                                                                    |                                          |                                          |                            |                                                                                                   |                           |                           |               |
| High-speed Counter                                 | Maximum Counting Frequency and High-speed Counter Points | Total 4 points<br>Single/two-phase selectable: 50 kHz (1 point)<br>Single-phase: 5 kHz (3 points)                                                                                                                                                                            |                                          |                                          |                            | Total 4 points<br>Single/two-phase selectable: 20 kHz (1 point)<br>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                                          | —                                                                                                                                                                                                                                                                            |                                          |                                          |                            |                                                                                                   |                           |                           |               |
|                                                    | Data Range                                               |                                                                                                                                                                                                                                                                              |                                          |                                          |                            |                                                                                                   |                           |                           |               |
| Pulse Output                                       | Quantity                                                 |                                                                                                                                                                                                                                                                              |                                          |                                          |                            |                                                                                                   |                           |                           |               |
|                                                    | Max. Frequency                                           | —                                                                                                                                                                                                                                                                            |                                          |                                          |                            |                                                                                                   |                           |                           |               |
| Sensor Power Supply (AC Power Type Only)           | Output Voltage/Current                                   | 24V DC (+10% to –15%), 250 mA                                                                                                                                                                                                                                                |                                          |                                          |                            |                                                                                                   |                           |                           |               |
|                                                    | Overload Detection                                       | Not available                                                                                                                                                                                                                                                                |                                          |                                          |                            |                                                                                                   |                           |                           |               |
|                                                    | Isolation                                                | Isolated from the internal circuit                                                                                                                                                                                                                                           |                                          |                                          |                            |                                                                                                   |                           |                           |               |
| Port 1                                             |                                                          | RS232C – maintenance communication, user communications, Modbus ASCII/RTU slave communication (FC5A only)                                                                                                                                                                    |                                          |                                          |                            |                                                                                                   |                           |                           |               |
| Port 2 Communication Adapter (option) <sup>4</sup> |                                                          | 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)<br>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<br>FC5A-D12S1E                                                                                                                                                                                    | FC4A-D20K3<br>FC4A-D20S3                             | FC5A-D16RK1<br>FC5A-D16RS1                                             | FC4A-D20RK1<br>FC4A-D20RS1 | FC5A-D32K3<br>FC5A-D32S3         | FC4A-D40K3<br>FC4A-D40S3 |
|---------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------|----------------------------|----------------------------------|--------------------------|
| Input Points                          |                      | 8<br>(8/1 common)                                                                                                                                                                                             | 12<br>(12/1 common)                                  | 8<br>(8/1 common)                                                      | 12<br>(12/1 common)        | 16<br>(8/1 common)               | 24<br>(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:<br>I2, I5, I10 to I17:       | 4.5 mA/point (24V DC)<br>7 mA/point (24V DC)                           |                            |                                  |                          |
|                                       |                      | FC4A                                                                                                                                                                                                          | I0, I1, I6, I7:<br>I2 to I5, I10 to I27:             | 5 mA/point (24V DC)<br>7 mA/point (24V DC)                             |                            |                                  |                          |
| Input Impedance                       |                      | FC5A                                                                                                                                                                                                          | I0, I1, I3, I4, I6, I7:<br>I2, I5, I10 to I17:       | 4.9 kΩ<br>3.4 kΩ                                                       |                            |                                  |                          |
|                                       |                      | FC4A                                                                                                                                                                                                          | I0, I1, I6, I7:<br>I2 to I5, I10 to I27:             | 5.7 kΩ<br>3.4 kΩ                                                       |                            |                                  |                          |
| Turn ON Time                          |                      | FC5A                                                                                                                                                                                                          | I0, I1, I3, I4, I6, I7:<br>I2 and I5:<br>I10 to I17: | 5 μs + filter value<br>35 μs + filter value<br>40 μs + filter value    |                            |                                  |                          |
|                                       |                      | FC4A                                                                                                                                                                                                          | I0, I1, I6, I7:<br>I2 to I5:<br>I10 to I27:          | 35 μs + filter value<br>35 μs + filter value<br>40 μs + filter value   |                            |                                  |                          |
| Turn OFF Time                         |                      | FC5A                                                                                                                                                                                                          | I0, I1, I3, I4, I6, I7:<br>I2 and I5:<br>I10 to I17: | 5 μs + filter value<br>150 μs + filter value<br>150 μs + filter value  |                            |                                  |                          |
|                                       |                      | FC4A                                                                                                                                                                                                          | I0, I1, I6, I7:<br>I2 to I5:<br>I10 to I27:          | 45 μs + filter value<br>150 μs + filter value<br>150 μs + filter value |                            |                                  |                          |
| Connector                             | On Mother Board      | MC1.5/16-G-3.81BK<br>(Phoenix Contact)                                                                                                                                                                        | FL26A2MA<br>(Oki Electric Cable)                     | MC1.5/13-G-3.81BK<br>(Phoenix Contact)                                 |                            | FL26A2MA<br>(Oki Electric Cable) |                          |
|                                       | Insertion Durability | 100 times minimum                                                                                                                                                                                             |                                                      |                                                                        |                            |                                  |                          |
| Isolation                             |                      | Between input terminals: Optocoupler isolated<br>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.<br>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<br>FC5A-C10R2C                                                                                                                                                                                     |                                                | FC5A-C16R2<br>FC5A-C16R2C                                              |  | FC5A-C24R2<br>FC5A-C24R2C |  | FC5A-C10R2D                     | FC5A-C16R2D                                   | FC5A-C24R2D         |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------|--|---------------------------|--|---------------------------------|-----------------------------------------------|---------------------|
|                                       | FC4A-C10R2<br>FC4A-C10R2C                                                                                                                                                                                     |                                                | FC4A-C16R2<br>FC4A-C16R2C                                              |  | FC4A-C24R2<br>FC4A-C24R2C |  | —                               | —                                             | —                   |
| Input Points                          | 6<br>(6/1 common)                                                                                                                                                                                             |                                                | 9<br>(9/1 common)                                                      |  | 14<br>(14/1 common)       |  | 6<br>(6/1 common)               | 9<br>(9/1 common)                             | 14<br>(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                                                                                                                                                                                                          | I0 and I1:<br>I2 to I7, I10 to I15:            | 6.4 mA/point<br>7 mA/point (24V DC)                                    |  |                           |  | I0 and I1:                      | 6 mA                                          |                     |
|                                       | FC4A                                                                                                                                                                                                          | I0 and I1:<br>I2 to I7, I10 to I15:            | 11 mA<br>7 mA/point (24V DC)                                           |  |                           |  | I2 to I7, I10 to I15:           | 6 mA                                          |                     |
| Input Impedance                       | FC5A                                                                                                                                                                                                          | I0 and I1:<br>I2 to I7, I10 to I15:            | 3.7 kΩ<br>3.4 kΩ                                                       |  |                           |  | I0 and I1:                      | 1.8 kΩ                                        |                     |
|                                       | FC4A                                                                                                                                                                                                          | I0 and I1:<br>I2 to I7, I10 to I15:            | 2.1 kΩ<br>3.4 kΩ                                                       |  |                           |  | I2 to I7, I10 to I15:           | 2.0 kΩ                                        |                     |
| Turn ON Time                          | FC5A                                                                                                                                                                                                          | I0 and I1:<br>I2 to I5:<br>I6, I7, I10 to I15: | 2 μs + filter value<br>35 μs + filter value<br>40 μs + filter value    |  |                           |  | I0 and I1:<br>I2 to I5:         | 2 μs + filter value<br>35 μs + filter value   |                     |
|                                       | FC4A                                                                                                                                                                                                          | I0 and I1:<br>I2 to I5:<br>I6, I7, I10 to I15: | 35 μs + filter value<br>35 μs + filter value<br>40 μs + filter value   |  |                           |  | I6, I7, I10 to I15:             | 40 μs + filter value                          |                     |
| Turn OFF Time                         | FC5A                                                                                                                                                                                                          | I0 and I1:<br>I2 to I5:<br>I6, I7, I10 to I15: | 16 μs + filter value<br>150 μs + filter value<br>150 μs + filter value |  |                           |  | I0 and I1:<br>I2 to I5:         | 16 μs + filter value<br>150 μs + filter value |                     |
|                                       | FC4A                                                                                                                                                                                                          | I0 and I1:<br>I2 to I5:<br>I6, I7, I10 to I15: | 45 μs + filter value<br>150 μs + filter value<br>150 μs + filter value |  |                           |  | I6, I7, I10 to I15:             | 150 μs + filter value                         |                     |
| Isolation                             | Between input terminals: Optocoupler isolated<br>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.<br>If any input exceeding the rated value is applied, permanent damage may be caused. |                                                |                                                                        |  |                           |  |                                 |                                               |                     |
| Cable Length                          | 3m in compliance with electromagnetic immunity                                                                                                                                                                |                                                |                                                                        |  |                           |  |                                 |                                               |                     |

## Transistor Sink and Source Output Specifications

| Model                                      |                   | FC5A-D12K1E<br>FC5A-D12S1E                                                                                                                         |                       | —                                | FC5A-D16RK1<br>FC5A-D16RS1 |                                        | FC5A-D32K3<br>FC5A-D32S3 |                                  |  |
|--------------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------|----------------------------|----------------------------------------|--------------------------|----------------------------------|--|
|                                            |                   | —                                                                                                                                                  |                       | FC4A-D20RK1<br>FC4A-D20RS1       |                            | —                                      |                          | FC4A-D40K3<br>FC4A-D40S3         |  |
| Transistor Output Points                   |                   | 4 (4/1 common)                                                                                                                                     |                       | 2 (2/1 common)                   |                            | 2 (2/1 common)                         |                          | 16 (8/1 common)                  |  |
| Output Type                                | Transistor Sink   | FC5A-D12K1E/D16RK1/D32K3<br>FC4A-D20K3/D20RK1/D40K3                                                                                                |                       |                                  |                            |                                        |                          |                                  |  |
|                                            | Transistor Source | FC5A-D12S1E/D16RS1/D32S3<br>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)<br>Source output: 100 mA maximum, 24V DC (power voltage at the −V terminal) |                       |                                  |                            |                                        |                          |                                  |  |
| Isolation                                  |                   | Between output terminal and Internal circuit: Photocoupler isolated<br>Between output terminals: Not isolated                                      |                       |                                  |                            |                                        |                          |                                  |  |
| Connector on Mother Board                  |                   | MC1.5/16-G-3.81BK<br>(Phoenix Contact)                                                                                                             |                       | FL26A2MA<br>(Oki Electric Cable) |                            | MC1.5/16-G-3.81BK<br>(Phoenix Contact) |                          | FL26A2MA<br>(Oki Electric Cable) |  |
| Connector Insertion/<br>Removal Durability |                   | 100 times minimum                                                                                                                                  |                       |                                  |                            |                                        |                          |                                  |  |
| Output Delay                               | Turn ON Time      | FC5A                                                                                                                                               | Q0 to Q2:             | 5 μs max.                        |                            |                                        |                          |                                  |  |
|                                            |                   |                                                                                                                                                    | Q3 to Q7, Q10 to Q17: | 300 μs max.                      |                            |                                        |                          |                                  |  |
|                                            | Turn OFF Time     | FC4A                                                                                                                                               | Q0, Q1:               | 5 μs max.                        |                            |                                        |                          |                                  |  |
|                                            |                   |                                                                                                                                                    | Q2 to Q7, Q10 to Q17: | 300 μs max.                      |                            |                                        |                          |                                  |  |
|                                            | Turn ON Time      | FC5A                                                                                                                                               | Q0 to Q2:             | 5 μs max.                        |                            |                                        |                          |                                  |  |
|                                            |                   |                                                                                                                                                    | Q3 to Q7, Q10 to Q17: | 300 μs max.                      |                            |                                        |                          |                                  |  |
|                                            | Turn OFF Time     | FC4A                                                                                                                                               | Q0, Q1:               | 5 μs max.                        |                            |                                        |                          |                                  |  |
|                                            |                   |                                                                                                                                                    | Q2 to Q7, Q10 to Q17: | 300 μs max.                      |                            |                                        |                          |                                  |  |

## Relay Output Specifications

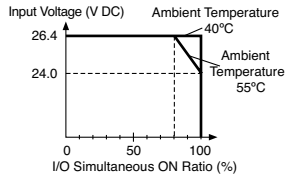
| Model                                      |                                                                                                                 | FC5A-C10R2<br>FC5A-C10R2C<br>FC5A-C10R2D                                                                                    | FC5A-C16R2<br>FC5A-C16R2C<br>FC5A-C16R2D | FC5A-C24R2<br>FC5A-C24R2C<br>FC5A-C24R2D | FC5A-D16RK1<br>FC5A-D16RS1 |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------|----------------------------|
|                                            |                                                                                                                 | FC4A-C10R2<br>FC4A-C10R2C                                                                                                   | FC4A-C16R2<br>FC4A-C16R2C                | FC4A-C24R2<br>FC4A-C24R2C                | FC4A-D20RK1<br>FC4A-D20RS1 |
| Relay Output Points                        |                                                                                                                 | 4                                                                                                                           | 7                                        | 10                                       | 6                          |
| Output Points per<br>Common Line           | COM0                                                                                                            | 3                                                                                                                           | 4                                        | 4                                        | —                          |
|                                            | COM1                                                                                                            | 1                                                                                                                           | 2                                        | 4                                        | 3                          |
|                                            | COM2                                                                                                            | —                                                                                                                           | 1                                        | 1                                        | 2                          |
|                                            | COM3                                                                                                            | —                                                                                                                           | —                                        | 1                                        | 1                          |
| Output Type                                |                                                                                                                 | 1NO                                                                                                                         |                                          |                                          |                            |
| Maximum Load Current                       |                                                                                                                 | 2A per point<br>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 $\cos \theta = 0.4$ )<br>30V DC/2A (resistive load, inductive load $L/R = 7$ ms) |                                          |                                          |                            |
| Dielectric Strength                        | Between output and  terminals: | 1,500V AC, 1 minute                                                                                                         |                                          |                                          |                            |
|                                            | Between output terminal and internal circuit:                                                                   | 1,500V AC, 1 minute                                                                                                         |                                          |                                          |                            |
|                                            | Between output terminals (COMs):                                                                                | 1,500V AC, 1 minute                                                                                                         |                                          |                                          |                            |
| Connector on Mother Board                  |                                                                                                                 | —                                                                                                                           |                                          |                                          | *1                         |
| Connector Insertion/<br>Removal Durability |                                                                                                                 | —                                                                                                                           |                                          |                                          | 100 times minimum          |



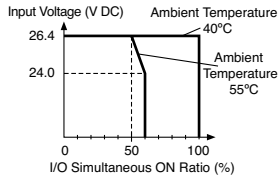
1. MC1.5/16-G-3.81BK (Phoenix Contact)

## Input Usage Limits Slim CPU

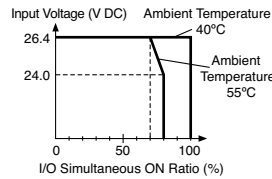
FC5A-D16RK1/D16RS1  
FC5A-D12K1E/D12S1E



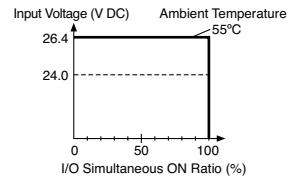
FC5A-D32K3/D32S3  
FC4A-D40K3/D40S3



FC4A-D20K3/D20S3



FC4A-D20RK1/D20RS1



## All-in-One CPU

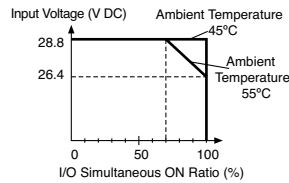
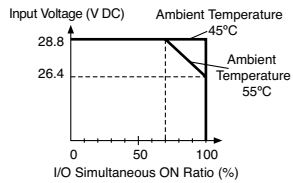
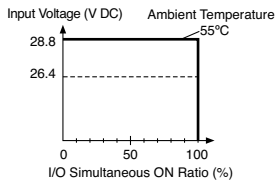
FC5A-C10R2  
FC5A-C10R2C  
FC4A-C10R2  
FC4A-C10R2C

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

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



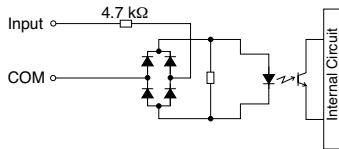
CAUTION: When using at an operating ambient temperature above 40°C, reduce the input voltage or the quantity of I/O points that turn on simultaneously.



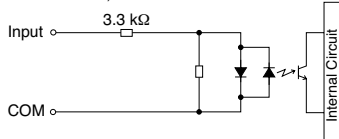
## Input Internal Circuit

### Slim CPU

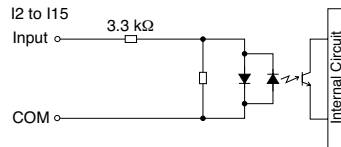
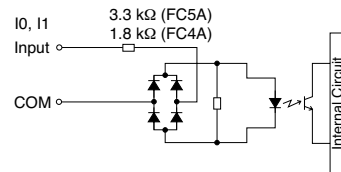
FC5A: I0, I1, I3, I4, I6, I7  
FC4A: I0, I1, I6, I7



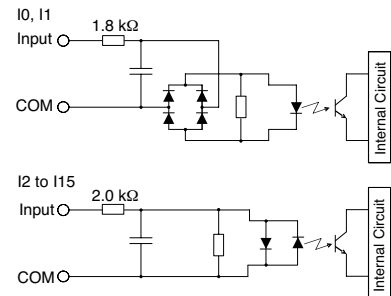
FC5A: I2, I5, I10 to I17  
FC4A: I2 to I5, I10 to I27



### All-in-One CPU



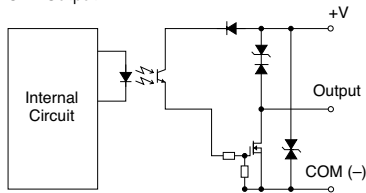
### FC5A All-in-One CPU 12V DC Type



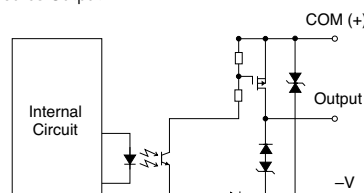
## Output Internal Circuit

### Slim CPU

#### Sink Output



#### Source Output



## Communication Adapter/Module Specifications

| Model                                                     | FC4A-PC1<br>FC4A-HPC1                             | FC4A-PC2<br>FC4A-HPC2                             | FC4A-PC3<br>FC4A-HPC3                                                           |
|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------|
| Standards                                                 | EIA RS232C                                        | EIA RS485                                         | EIA RS485                                                                       |
| Maximum Baud Rate                                         | FC5A: 57,600 bps <sup>1</sup><br>FC4A: 19,200 bps | FC5A: 57,600 bps <sup>1</sup><br>FC4A: 19,200 bps | FC5A: 57,600 bps <sup>1</sup><br>FC4A: 19,200 bps<br>(38,400 bps <sup>2</sup> ) |
| Maintenance Communication                                 | Possible                                          | Possible                                          | Possible                                                                        |
| User Communication                                        | Possible                                          | Possible <sup>3</sup>                             | Possible <sup>3</sup>                                                           |
| Data Link Communication                                   | —                                                 | Possible                                          | Possible                                                                        |
| Half-duplex Communication                                 | —                                                 | Possible                                          | Possible                                                                        |
| Maximum Cable Length                                      | Special cable <sup>4</sup>                        | Special cable <sup>5</sup>                        | 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 <sup>2</sup>     |
|                                                           | 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 <sup>6</sup> | FC4A-PM128 <sup>6</sup> |
|-----------------------------|--------------------------------------------------------|------------------------|-------------------------|
| 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                                      |

OT Touchscreens

PLCs

Automation Software

Power Supplies

Sensors

Communication

Barriers

## 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<br>Dielectric strength: 2,000V AC/min<br>Insulation resistance: 100 MΩ/km |
| Recommended Cable                                             | KIDU-SB 24 AWG×6C<br>(Nihon Electric Wire & Cable)                                                             |
| Connector on Mother Board                                     | MC1.5/10-G-3.81BK (Phoenix Contact)<br>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 <sup>1</sup><br>Slim type CPU module: 5 maximum                   |
| Internal Current Draw                                         | 40 mA (5V/24V DC) <sup>5</sup>                                                                                 |
| 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,<br>FC4A-K1A1, FC4A-J4CN1, FC4A-J8C1,<br>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:<br>22 AWG (0.3 mm <sup>2</sup> x 2P)<br>Conductor Resistance:<br>67 MΩ/km maximum (at 20°C) |
| Connector on Mother Board                                     | MC1.5/10-G-3.81BK (Phoenix Contact)<br>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 <sup>1</sup><br>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 <sup>4</sup> /115,200 <sup>4</sup>    |                |
| Maintenance Communication  | Possible <sup>2</sup>                                                              |                |
| Modbus Communication       | Modbus ASCII master<br>Modbus ASCII slave<br>Modbus RTU master<br>Modbus RTU slave |                |
| Data Link                  | -                                                                                  | 0 <sup>3</sup> |
| 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.

## 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<br>Internal circuit: Photocoupler isolated                                                        |                  |                               |                  | Between input terminals in the same common: Not isolated<br>Between input terminals in different commons: Isolated<br>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/<br>Removal Durability                 |                | 100 times minimum                                                                                                                       |                  |                               |                  |                                                                                                                                                                                            |
| Applicable Ferrule                                         |                | 1-wire: AI 0.5-8 WH (Phoenix Contact)<br>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                                                                                                                                                                                        |

OT Touchscreens

PLCs

Automation Software

Power Supplies

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Communication

Barriers

## Transistor Output Module Specifications

| Model                                                          |                 | FC4A-T08K1<br>FC4A-T08S1                                                                                                                           | FC4A-T16K3<br>FC4A-T16S3        | FC4A-T32K3<br>FC4A-T32S3        |
|----------------------------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|
| Output Points                                                  |                 | 8 (8/1 common)                                                                                                                                     | 16 (16/1 common)                | 32 (16/1 common)                |
| Output Type                                                    |                 | FC4A-T□K□: Transistor sink output<br>FC4A-T□S□: Transistor source output                                                                           |                                 |                                 |
| Rated Load Voltage                                             |                 | 24V DC                                                                                                                                             |                                 |                                 |
| Operating Load Voltage Range                                   |                 | 20.4 to 28.8V DC                                                                                                                                   |                                 |                                 |
| Maximum Load Current                                           |                 | 0.3A per point                                                                                                                                     | 0.1A per point                  |                                 |
|                                                                |                 | 3A per common                                                                                                                                      | 1A per common                   |                                 |
| Voltage Drop (ON Voltage)                                      |                 | 1V maximum (voltage between COM and output terminals when output is on)                                                                            |                                 |                                 |
| Inrush Current                                                 |                 | 1A maximum                                                                                                                                         |                                 |                                 |
| Clamping Voltage                                               |                 | 39V±1V                                                                                                                                             |                                 |                                 |
| Maximum Lamp Load                                              |                 | 8W                                                                                                                                                 |                                 |                                 |
| Inductive Load                                                 |                 | L/R = 10 ms (28.8V DC, 1 Hz)                                                                                                                       |                                 |                                 |
| External Current Draw                                          |                 | FC4A-T□K□: 100 mA maximum,<br>24V DC (power voltage at the +V terminal)<br>FC4A-T□S□: 100 mA maximum,<br>24V DC (power voltage at the −V terminal) |                                 |                                 |
| Isolation                                                      |                 | Between output terminal and internal circuit:<br>Photocoupler isolated<br>Between output terminals: Not isolated                                   |                                 |                                 |
| Connector on Mother Board                                      |                 | MC1.5/10-G-3.81BK<br>(Phoenix Contact)                                                                                                             | FL20A2MA (Oki Electric Cable)   |                                 |
| Connector Insertion/<br>Removal Durability                     |                 | 100 times minimum                                                                                                                                  |                                 |                                 |
| Applicable Ferrule                                             |                 | 1-wire: AI 0.5-8 WH<br>(Phoenix Contact)<br>2-wire: AI-TWIN<br>2×0.5-8 WH (Phoenix Contact)                                                        | —                               |                                 |
| Internal Current Draw                                          | All outputs ON  | 10 mA (5V DC)<br>20 mA (24V DC)                                                                                                                    | 10 mA (5V DC)<br>40 mA (24V DC) | 20 mA (5V DC)<br>70 mA (24V DC) |
|                                                                | All outputs OFF | 5 mA (5V DC)<br>0 mA (24V DC)                                                                                                                      | 5 mA (5V DC)<br>0 mA (24V DC)   | 10 mA (5V DC)<br>0 mA (24V DC)  |
| Internal Power Consumption<br>(at 24V DC while all outputs ON) |                 | 0.55W                                                                                                                                              | 1.03W                           | 1.82W                           |
| Output Delay                                                   | Turn ON Time    | 300 μs maximum                                                                                                                                     |                                 |                                 |
|                                                                | Turn OFF Time   | 300 μs maximum                                                                                                                                     |                                 |                                 |
| Weight                                                         |                 | 85g                                                                                                                                                | 70g                             | 105g                            |

## Relay Output Module Specifications

| Model                                                       |                 | FC4A-R081                                                                                                                                                                             | FC4A-R161                           |
|-------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Output Points                                               |                 | 8 (4/1 common)                                                                                                                                                                        | 16 (8/1 common)                     |
| Output Type                                                 |                 | 1NO                                                                                                                                                                                   |                                     |
| Maximum Load Current                                        |                 | 2A per point                                                                                                                                                                          |                                     |
|                                                             |                 | 7A per common                                                                                                                                                                         | 8A per common                       |
| Minimum Switching Load                                      |                 | 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)<br>30V DC/2A (resistive load, inductive load L/R = 7 ms)                                                                      |                                     |
| Dielectric Strength                                         |                 | Between output and ⊕ or ⊖ terminals: 1,500V AC, 1 minute<br>Between output terminal and internal circuit: 1,500V AC, 1 minute<br>Between output terminals (COMs): 1,500V AC, 1 minute |                                     |
| Connector On Mother Board                                   |                 | MC1.5/11-G-3.81BK (Phoenix Contact)                                                                                                                                                   | MC1.5/10-G-3.81BK (Phoenix Contact) |
| Connector Insertion/Removal Durability                      |                 | 100 times minimum                                                                                                                                                                     |                                     |
| Applicable Ferrule                                          |                 | 1-wire: AI 0.5-8 WH (Phoenix Contact)<br>2-wire: AI-TWIN 2×0.5-8 WH (Phoenix Contact)                                                                                                 |                                     |
| Internal Current Draw                                       | All outputs ON  | 30 mA (5V DC)<br>40 mA (24V DC)                                                                                                                                                       | 45 mA (5V DC)<br>75 mA (24V DC)     |
|                                                             | All outputs OFF | 5 mA (5V DC)<br>0 mA (24V DC)                                                                                                                                                         | 5 mA (5V DC)<br>0 mA (24V DC)       |
| Internal Power Consumption (at 24V DC while all outputs ON) |                 | 1.16W                                                                                                                                                                                 | 2.10W                               |
| Weight                                                      |                 | 110g                                                                                                                                                                                  | 145g                                |

## Mixed I/O Module Specifications

| 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<br>Internal circuit: Photocoupler isolated                                                                |                                                                   |
|                                                                 | External Load for I/O Interconnection | Not needed                                                                                                                                      |                                                                   |
|                                                                 | Signal Determination Method           | Static                                                                                                                                          |                                                                   |
|                                                                 | Effect of Improper Input Connection   | Both sinking and sourcing input signals can be connected.<br>If any input exceeding the rated value is applied, permanent damage may be caused. |                                                                   |
|                                                                 | Cable Length                          | 3m in compliance with electromagnetic immunity                                                                                                  |                                                                   |
| Output Specifications                                           | Output Points                         | 4 (4/1 common)                                                                                                                                  | 8 (4/1 common)                                                    |
|                                                                 | Output Type                           | 1NO                                                                                                                                             |                                                                   |
|                                                                 | Maximum Load Current                  | 2A per point<br>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)<br>30V DC/2A (resistive load, inductive load L/R = 7 ms)                                |                                                                   |
|                                                                 | Dielectric Strength                   | Between output and ⊕ or ⊖ terminals:<br>Between output terminal and internal circuit:<br>Between output terminals (COMs):                       | 1,500V AC, 1 minute<br>1,500V AC, 1 minute<br>1,500V AC, 1 minute |
| Connector on Mother Board                                       |                                       | MC1.5/11-G-3.81BK<br>(Phoenix Contact)                                                                                                          | Input: F6018-17P (Fujicon)<br>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 2×0.5-8 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<br>(at 24V DC while all I/Os are ON) |                                       | 0.65W                                                                                                                                           | 1.52W                                                             |
| Weight                                                          |                                       | 95g                                                                                                                                             | 140g                                                              |

O Touchscreens

PLCs

Automation Software

Power Supplies

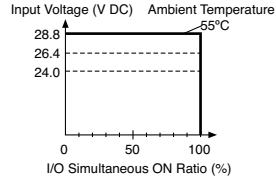
Sensors

Communication

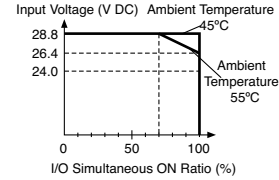
Barriers

## Input Usage Limits

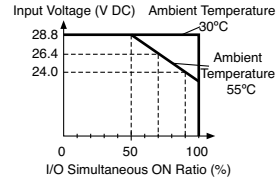
FC4A-N08B1



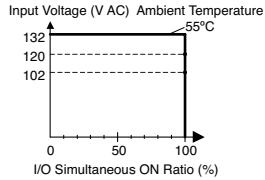
FC4A-N16B1



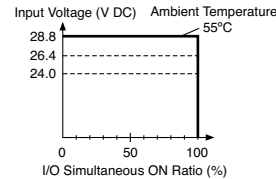
FC4A-N16B3/N32B3



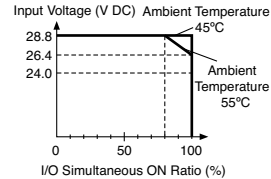
FC4A-N08A11



FC4A-M08BR1



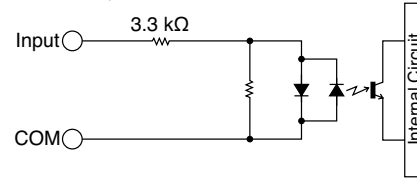
FC4A-M24BR2



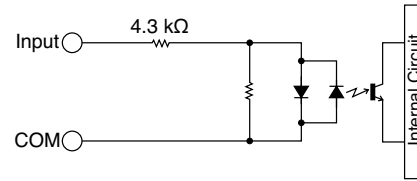
When using at an operating ambient temperature above 40°C, reduce the input voltage or the quantity of I/O points that turn on simultaneously.

## Input Internal Circuit

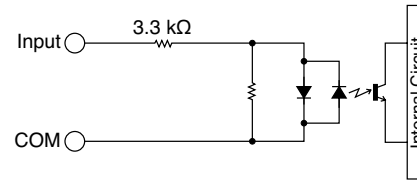
FC4A-N08B1, FC4A-N16B1



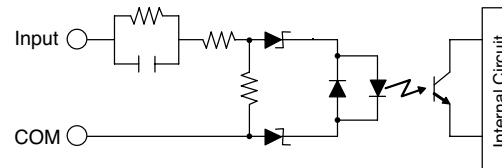
FC4A-N16B3, FC4A-N32B3



FC4A-M08BR1, FC4A-M24BR2

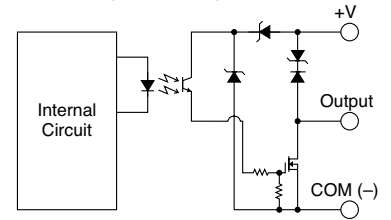


FC4A-N08A11

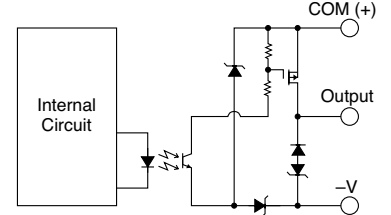


## Output Internal Circuit

FC4A-T08K1, FC4A-T16K3, FC4A-T32K3



FC4A-T08S1, FC4A-T16S3, FC4A-T32S3



## Specifications (Analog I/O Modules)

### Analog I/O Module Specifications

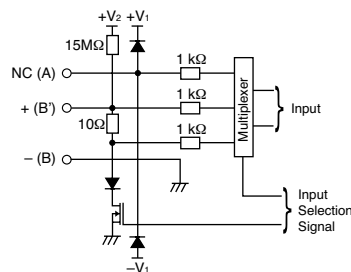
| Model                                                        | FC4A-L03A1                                                                          | FC4A-L03AP1 | FC4A-J2A1 | FC4A-J4CN1                          | FC4A-J8C1 | FC4A-J8AT1 | FC4A-K4A1                           | FC4A-K1A1 | FC4A-K2C1                           |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------|-----------|-------------------------------------|-----------|------------|-------------------------------------|-----------|-------------------------------------|
| 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 2×0.5-8 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                                |



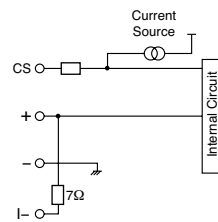
\* The external current draw is the value when all the analog inputs are used and the analog output value is at 100%.

### Input Circuit

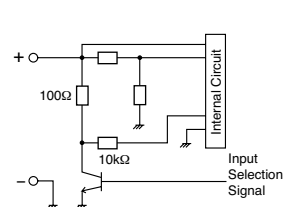
FC4A-L03A1, FC4A-L03AP1  
FC4A-J2A1



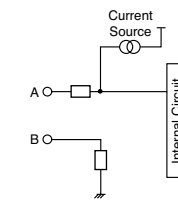
FC4A-J4CN1



FC4A-J8C1



FC4A-J8AT1



## Analog Input Specifications (1)

| Model                                                  |                                                           | FC4A-L03A1, FC4A-J2A1                                                                           |                                   | FC4A-L03AP1                                                       |                                                                                                                  |
|--------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Input Signal Type                                      |                                                           | Voltage Input<br>0 to 10V DC                                                                    | Current Input<br>4 to 20 mA       | Resistance<br>Thermometer<br>Pt100 3-wire type<br>(−100 to 500°C) | Thermocouple<br>Type K (0 to 1,300°C)<br>Type J (0 to 1,200°C)<br>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)<br>Type J: 12,000 increments (14 bits)<br>Type T: 4,000 increments (14 bits) |
|                                                        | Input Value of LSB                                        | 2.5 mV                                                                                          | 4 μA                              | 0.1°C                                                             | Type K: 0.1°C<br>Type J: 0.1°C<br>Type T: 0.1°C                                                                  |
|                                                        | Data Type in Application Program                          | Default: 0 to 4,095<br>Optional: −32,768 to 32,767 (selectable for each channel) <sup>1</sup>   |                                   |                                                                   |                                                                                                                  |
|                                                        | Monotonicity                                              | Yes                                                                                             |                                   |                                                                   |                                                                                                                  |
|                                                        | Input Data Out of Range                                   | Detectable <sup>2</sup>                                                                         |                                   |                                                                   |                                                                                                                  |
| 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 <sup>3</sup> |                                   |                                                                   |                                                                                                                  |
|                                                        | Input Filter                                              | No                                                                                              |                                   |                                                                   |                                                                                                                  |
|                                                        | Recommended Cable for Noise Immunity                      | Twisted pair shielded cable                                                                     |                                   | —                                                                 |                                                                                                                  |
|                                                        | Crosstalk                                                 | 2 LSB maximum                                                                                   |                                   |                                                                   |                                                                                                                  |
| Isolation                                              |                                                           | Between input and power circuit:<br>Between input and internal circuit:                         | Isolated<br>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)<br>Type J (0 to 1,200°C)<br>Type T (0 to 400°C)                                                                     |                                                                          | Pt100, Pt1000 3-wire type<br>(−100 to 500°C)<br>Ni100, Ni1000 3-wire type<br>(−60 to 180°C)                                                                                          | −50 to 150°C                                                                                                                                    |                                    |  |
| Input Impedance         |                                        | 1 MΩ                                                                                           | 7 Ω (FC4A-J4CN1)<br>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<br>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<br>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)<br>Type J: Approx. 33,000 increments (15 bits)<br>Type T: Approx. 10,000 increments (14 bits) |                                                                          | Pt100: Approx. 6,400 increments (13 bits)<br>Pt1000: Approx. 64,000 increments (16 bits)<br>Ni100: Approx. 4,700 increments (13 bits)<br>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<br>Type J: 0.038°C<br>Type T: 0.042°C                                                                                     | Pt100: 0.086°C<br>Pt1000: 0.0086°C<br>Ni100: 0.037°C<br>Ni1000: 0.0037°C |                                                                                                                                                                                      | 0.05°C                                                                                                                                          |                                    |  |
|                         | Data Type in Application Program       | Default: 0 to 50,000<br>Optional: −32,768 to 32,767 (selectable for each channel) <sup>1</sup> |                                      |                                                                                                                                           |                                                                          |                                                                                                                                                                                      | Default: 0 to 4,000<br>Optional: −32,768 to 32,767 (selectable for each channel) <sup>1</sup><br>Resistance: 0 to 10,000<br>Temperature: °C, °F |                                    |  |
|                         | Monotonicity                           | Yes                                                                                            |                                      |                                                                                                                                           |                                                                          |                                                                                                                                                                                      |                                                                                                                                                 |                                    |  |
|                         | Input Data Out of Range                | Detectable <sup>2</sup>                                                                        |                                      |                                                                                                                                           |                                                                          |                                                                                                                                                                                      |                                                                                                                                                 |                                    |  |



<sup>1</sup>: 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 | ±3% maximum (when a 500V clamp voltage is applied to the power supply and I/O lines) |
|                                                        | Input Filter                                              | Software                                                                             |           |            |             |                                                                                      |
|                                                        | Recommended Cable for Noise Immunity                      | Twisted pair cable                                                                   |           | —          |             |                                                                                      |
|                                                        | Crosstalk                                                 | 2 LSB maximum                                                                        |           |            |             |                                                                                      |
| Isolation                                              |                                                           | Between input and power circuit:                                                     | Isolated  |            |             | Optocoupler-isolated                                                                 |
| Effect of Improper Input Connection                    |                                                           | Between input and internal circuit:                                                  | 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<br>Current output: 300Ω maximum         |                     |                     |                     |                                                      |
|               | Load Type                              |         | Resistive load                                                       |                     |                     |                     |                                                      |
| DA Conversion | Settling Time                          |         | 2 ms/ch                                                              | 10 ms               | 10 ms               | 10 ms               | 1 ms/ch                                              |
|               | 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 | 1 ms × channels + 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%                                                                   |                     |                     |                     |                                                      |
| Data          | Total Error                            |         | ±1% of full scale                                                    |                     |                     |                     |                                                      |
|               | 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)<br>0 to 50,000 (current) |
|               |                                        |         | Optional: −32,768 to 32,767 (selected for each channel) <sup>1</sup> |                     |                     |                     |                                                      |
|               | Monotonicity                           |         | Yes                                                                  |                     |                     |                     |                                                      |
|               | Current Loop Open                      |         | Undetectable                                                         |                     |                     |                     |                                                      |



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          |
|--------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------|------------|-------------|-----------|--------------------|
| 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      |
| 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)<br>External resistance: 100Ω maximum<br>However, external resistance of B input: 40Ω maximum                                                                                                                                                                                       |           |
|                                                 | Resistance Thermometer                                    | Pt100, JPt100, 3-wire type<br>Allowable conductor resistance (per wire): 10Ω maximum                                                                                                                                                                                                                                           |           |
|                                                 | Current Input                                             | 0 to 20 mA DC, 4 to 20 mA DC<br>Input impedance: 50Ω<br>Maximum permanent allowed overload (no damage): 50 mA maximum                                                                                                                                                                                                          |           |
|                                                 | Voltage Input                                             | 0 to 1V DC<br>Input impedance: 1MΩ minimum<br>Maximum permanent allowed overload (No damage): 5V DC<br>Allowable output impedance: 2 kΩ<br>0 to 5V DC, 1 to 5V DC, 0 to 10V DC<br>Input impedance: 100kΩ minimum<br>Maximum permanent allowed overload (No damage): 15V DC maximum<br>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<br>However, R, S inputs: 0 to 200°C (0 to 400°F): ±6°C (12°F)<br>B input: 0 to 300°C (0 to 600°F) Accuracy is not guaranteed.<br>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<br>However, R, S input: 0 to 200°C (0 to 400°F): ±6°C (12°F)<br>B input: 0 to 300°C (0 to 600°F) Accuracy is not guaranteed.<br>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                                                                                                                                                                                                                                                                                                            |           |
| Noise Resistance                                | 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<br>Thermocouple, Resistance Thermometer<br>Not assured                                                                                                                                                         |           |
|                                                 | Input Filter                                              | None                                                                                                                                                                                                                                                                                                                           |           |
|                                                 | Recommended Cable for Noise Immunity                      | Twisted pair cable                                                                                                                                                                                                                                                                                                             |           |
|                                                 | Cross Talk                                                | None                                                                                                                                                                                                                                                                                                                           |           |
| Isolation                                       |                                                           | Between input and power circuit: Transformer Isolated<br>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                                                                                                                                                                                                                                                                                                                            |           |



\*Dual channel input is required for one loop circuit.

PID Module Specifications can't on next page.

## PID Module Specifications, con't

| Model                                                        |                                                           | FC5A-F2MR2                                                                                                                                                                                                                             | FC5A-F2M2                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output                                                       |                                                           | Relay output 1NO<br>Rated load 5A 250V AC/30V DC (resistive load)<br>3A 250V AC (inductive load cos $\phi=0.4$ )<br>Minimum open/closed load: 10 mA 5V DC<br>Electrical life: 100,000 cycles (at the maximum rating of resistive load) | Non-contact voltage output (for SSR drive) 12V DC $\pm 15\%$<br>Maximum 40 mA (short circuit protected)<br>Leakage current: 0.3 mA maximum<br>Analog current output<br>4 to 20 mA DC<br>Maximum Error: $\pm 0.5\%$ Full Scale at 25°C<br>$\pm 1.0\%$ Full Scale at 55°C<br>Load resistance: 550 $\Omega$ maximum<br>Analog output digital resolution: 1,000<br>LSB input value: 0.016 mA |
| Noise Resistance                                             | Maximum Temporary Deviation during Electrical Noise Tests | —                                                                                                                                                                                                                                      | $\pm 3\%$ 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<br>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 |
|------------|--------------|--------------------------------------|---------------------|--------------------|
| Input Type | 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)           |
|            | C (W/Re5-26) | 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 $\mu$ A      |
|            | 0 to 20mA DC | -2,000 to 10,000 (12,000 increments) |                     | 1.666 $\mu$ A      |
|            | 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<br>(Expansion Interface Master Module)                                                                                                                                                                                                                                                                      | FC5A-EXM1S<br>(Expansion Interface Slave Module)                                                                                                     | FC5A-EXM2<br>(Expansion Interface Module)                                                                                                             |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rated Power Voltage                                                | —                                                                                                                                                                                                                                                                                                                      | 24V DC<br>(supplied from external power)                                                                                                             | 24V DC<br>(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<br>(Internal Power/External Power)                    | Internal power<br>(supplied from CPU module):<br>90 mA (5V DC)<br>0 mA (24V DC)                                                                                                                                                                                                                                        | Internal power<br>(supplied from CPU module):<br>0 mA (5V DC)<br>0 mA (24V DC)<br>External power: With I/O modules<br>750 mA (26.4V DC) <sup>1</sup> | Internal power<br>(supplied from CPU module):<br>50 mA (5V DC)<br>0 mA (24V DC)<br>External power: With I/O modules<br>750 mA (26.4V DC) <sup>1</sup> |
| Maximum Power Consumption (External Power) <sup>1</sup>            | —                                                                                                                                                                                                                                                                                                                      | 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<br>Connectable CPU modules: FC5A-D16RK1/D16RS1/D32K3/D32S3/D12K1E/D12S1E<br>Connectable I/O modules: 7 maximum<br>Beyond the expansion interface module<br>Connectable I/O modules: 8 digital I/O modules maximum (AC input modules are not applicable) <sup>2</sup> |                                                                                                                                                      |                                                                                                                                                       |
| Maximum I/O Refresh Time <sup>3</sup>                              | 3.6 ms                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                      | 2.8 ms                                                                                                                                                |
| Communication between CPU Module and<br>Expansion Interface Module | Asynchronous communication<br>(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<br>Connector                                          | Connector on Mother<br>Board                                                                                                                                                                                                                                                                                           | —                                                                                                                                                    | MKDSN1.5/3-5.08-BK<br>(Phoenix Contact)                                                                                                               |
|                                                                    | Connector Insertion/Re-<br>moval Durability                                                                                                                                                                                                                                                                            | —                                                                                                                                                    | 100 times minimum                                                                                                                                     |
| Expansion Cable<br>Connector                                       | Connector on Mother<br>Board                                                                                                                                                                                                                                                                                           | FCN-365P024-AU<br>(Fujitsu Component)                                                                                                                |                                                                                                                                                       |
|                                                                    | Connector Insertion/Re-<br>moval Durability                                                                                                                                                                                                                                                                            | 100 times minimum                                                                                                                                    |                                                                                                                                                       |
| Weight                                                             | 70g                                                                                                                                                                                                                                                                                                                    | 135g                                                                                                                                                 | 140g                                                                                                                                                  |



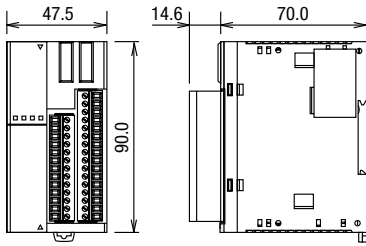
1: Power consumption by the expansion interface module and eight I/O modules.

2: The maximum number of relay outputs that can be turned on simultaneously is 54 points.

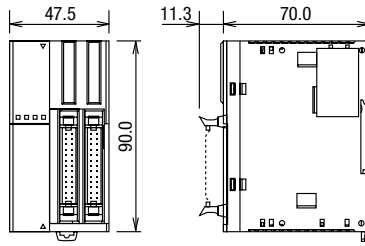
3: Maximum I/O refresh time of the expansion interface module. D8252 stores the refresh time.

## Dimensions (mm)

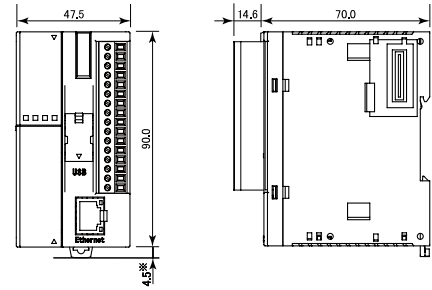
FC5A-D16RK1, FC5A-D16RS1,  
FC4A-D20RK1, FC4A-D20RS1



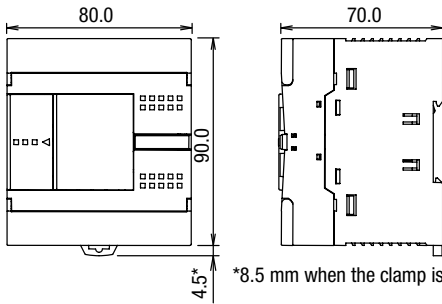
FC5A-D32K3, FC5A-D32S3, FC4A-D40K3,  
FC4A-D40S3



FC5A-D12K1E, FC5A-D12S1E

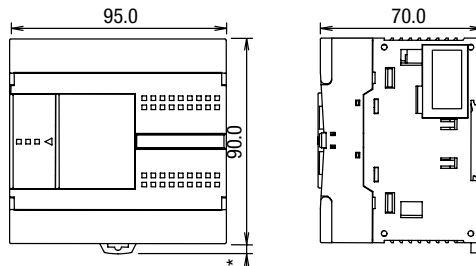


FC5A-C10R2, FC5A-C16R2,  
FC5A-C10R2C, FC5A-C16R2C,  
FC5A-C10R2D, FC5A-C16R2D,  
FC4A-C10R2, FC4A-C16R2,  
FC4A-C10R2C, FC4A-C16R2C



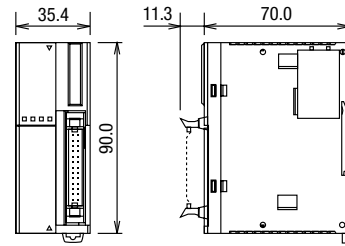
\*8.5 mm when the clamp is pulled out.

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

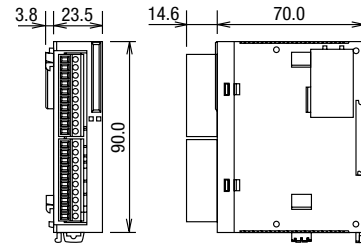


\*8.5 mm when the clamp is pulled out.

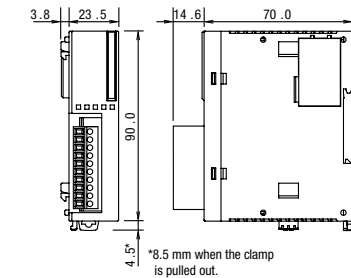
FC4A-D20K3, FC4A-D20S3



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

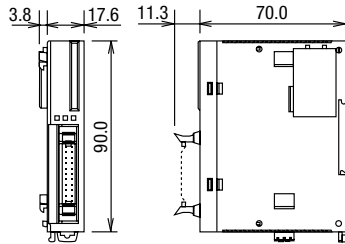


FC5A-SIF2, FC5A-SIF4,  
FC4A-AS62M, FC4A-N08A11,  
FC4A-J2A1, FC4A-N08B1,  
FC4A-K1A1, FC4A-R081,  
FC4A-K2C1, FC4A-T08K1,  
FC4A-L03A1, FC4A-T08S1,  
FC4A-L03AP1, FC4A-K4A1,  
FC4A-M08BR1

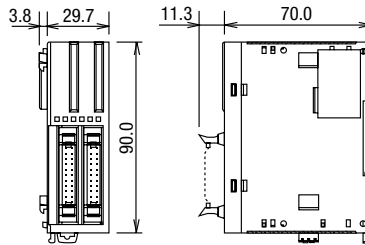


\*8.5 mm when the clamp is pulled out.

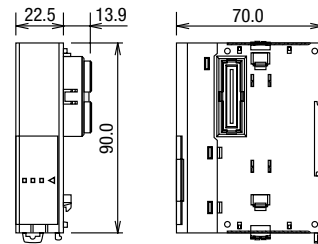
FC4A-N16B3, FC4A-T16K3, FC4A-T16S3



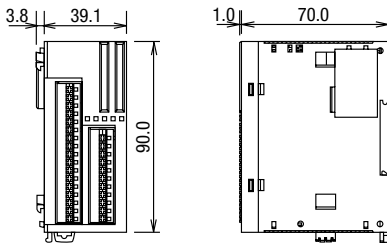
FC4A-N32B3, FC4A-T32K3, FC4A-T32S3



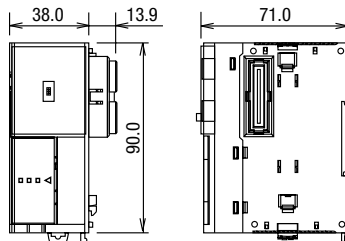
FC4A-HPC1, FC4A-HPC2, FC4A-HPC3



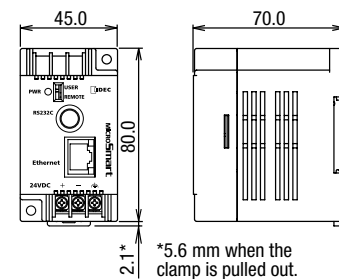
FC5A-F2MR2, FC5A-F2M2, FC4A-M24BR2



FC4A-HPH1

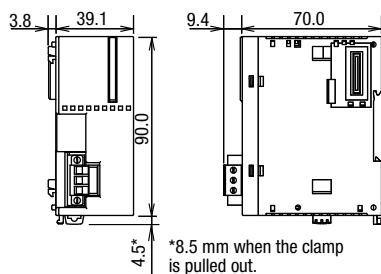


FC4A-SX5ES1E

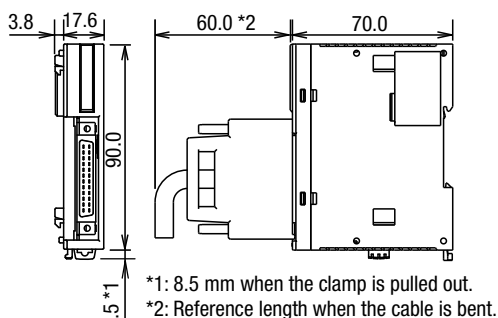


\*5.6 mm when the clamp is pulled out.

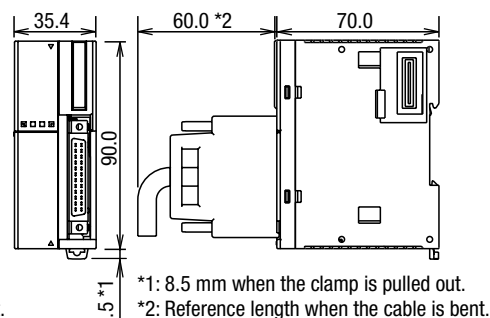
FC5A-EXM2



FC5A-EXM1M

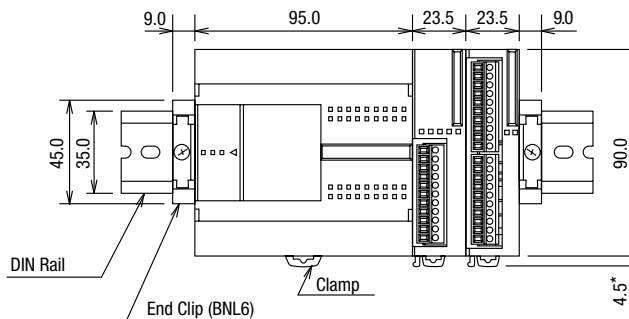


FC5A-EXM1S



### Example

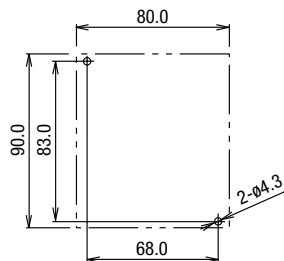
The following figure illustrates a system setup consisting of the all-in-one 24-I/O type CPU module, an 8-point relay output module, and a 16-point DC input module mounted on a 35-mm-wide-DIN rail using BNL6 end clips.



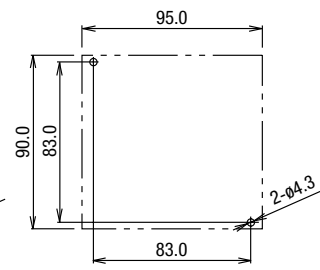
\*8.5 mm when the clamp is pulled out.

### Mounting Hole Layouts

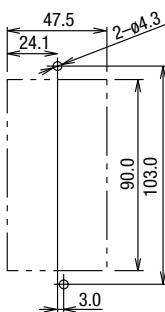
FC5A-C10R2, FC5A-C10R2C,  
FC5A-C10R2D, FC5A-C16R2,  
FC5A-C16R2C, FC5A-C16R2D  
FC4A-C10R2, FC4A-C10R2C  
FC4A-C16R2, FC4A-C16R2C



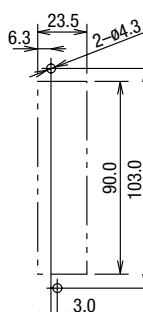
FC5A-C24R2  
FC5A-C24R2C  
FC5A-C24R2D  
FC4A-C24R2  
FC4A-C24R2C



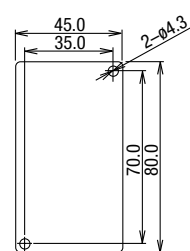
FC5A-D12K1E, FC5A-D12S1E  
FC5A-D16RK1, FC5A-D16RS1  
FC5A-D32K3, FC5A-D32S3  
FC4A-D20RK1, FC4A-D20RS1  
FC4A-D40K3, FC4A-D40S3



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

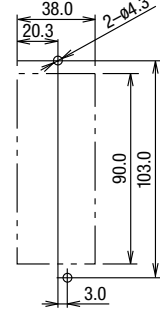
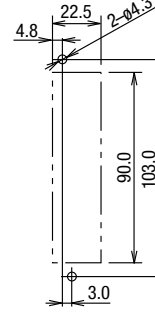
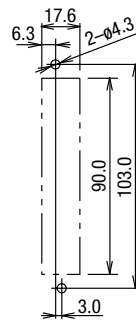
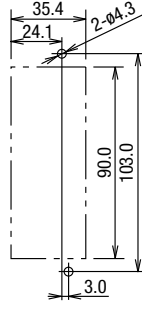
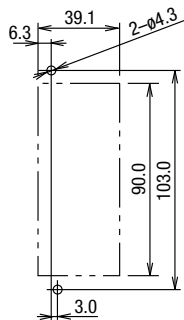
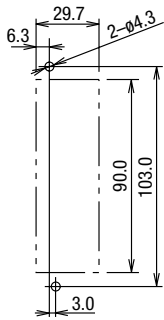
FC5A-F2MR2  
FC5A-F2M2  
FC5A-EXM2  
FC4A-M24BR2

FC5A-EXM1S  
FC4A-D20K3  
FC4A-D20S3

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

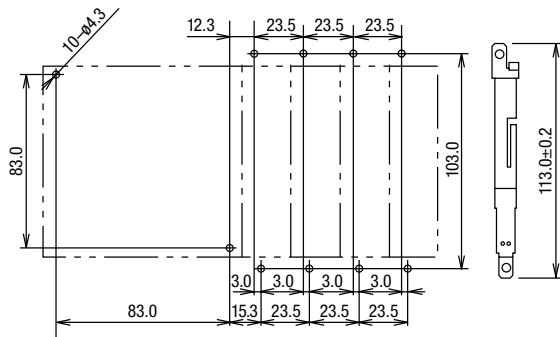
FC4A-HPC1  
FC4A-HPC2  
FC4A-HPC3

FC4A-HPH1



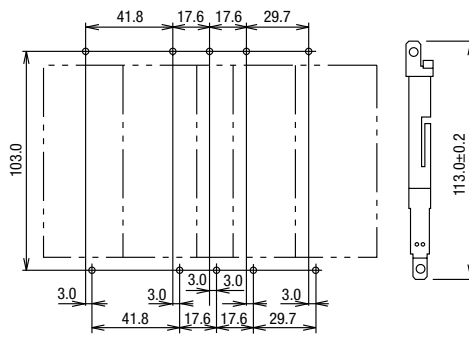
## Example

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.