

### MicroSmart Performance

**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



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### MicroSmart CPU Part Numbers

**All-in-One**

| Appearance | Part Number | Power       | I/O Points         | Input                | Output | Expandability |  |
|------------|-------------|-------------|--------------------|----------------------|--------|---------------|--|
|            | FC4A-C10R2C | 24V DC      | 10 (6 in/ 4 out)   |                      |        | N/A           |  |
|            | FC4A-C10R2  | 100-240V AC |                    |                      |        |               |  |
|            | FC4A-C16R2C | 24V DC      | 16 (9 in/ 7 out)   | 24V DC (Sink/Source) | Relay  |               |  |
|            | FC4A-C16R2  | 100-240V AC |                    |                      |        |               |  |
|            | FC4A-C24R2C | 24V DC      | 24 (14 in/ 10 out) |                      |        |               | 88 Maximum I/O (up to 4 expansion modules) |
|            | FC4A-C24R2  | 100-240V AC |                    |                      |        |               |  |

MicroSmart CPU Part Numbers

Slim

| Appearance  | Part Number | Power  | I/O Points       | Input                | Output                        | Expandability                               |  |                   |   |
|---|-------------|--------|------------------|----------------------|-------------------------------|---|--|-------------------|---|
|    | FC4A-D20RK1 | 24V DC | 20 (12 in/8 out) | 24V DC (Sink/Source) | 6 Relays, 2 Transistor Sink   | 244 Maximum I/O (up to 7 expansion modules) |  |                   |   |
|   | FC4A-D20RS1 |        |                  |                      | 6 Relays, 2 Transistor Source |   |  |                   |   |
|   | FC4A-D20K3  |        |                  |                      | Transistor Sink               | 148 Maximum I/O (up to 7 expansion modules) |  |                   |   |
|   | FC4A-D20S3  |        |                  |                      | Transistor Source             |   |  |                   |   |
|  | FC4A-D40K3  |        |                  |                      | 40 (24 in/16 out)             |   |  | Transistor Sink   | 264 Maximum I/O (up to 7 expansion modules) |
|   | FC4A-D40S3  |        |                  |                      |                               |   |  | Transistor Source |   |

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### Digital I/O Expansion Modules

**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**

| Appearance  | 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           |                              |

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### Digital I/O Expansion Modules

#### Output Modules

| Appearance  | 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            |                              |

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### Digital I/O Expansion Modules

#### Output Modules (cont.)

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

#### Combination I/O Modules

| Appearance  | 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         |

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## Analog I/O Expansion Modules

**Features:**

- 8 modules
- 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**

| Appearance  | 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)  |                           |

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### Analog I/O Expansion Modules

Modules (cont.)

| Appearance   | 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)  |                           |

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## Communication Modules

### Web Server Module

**Features:**

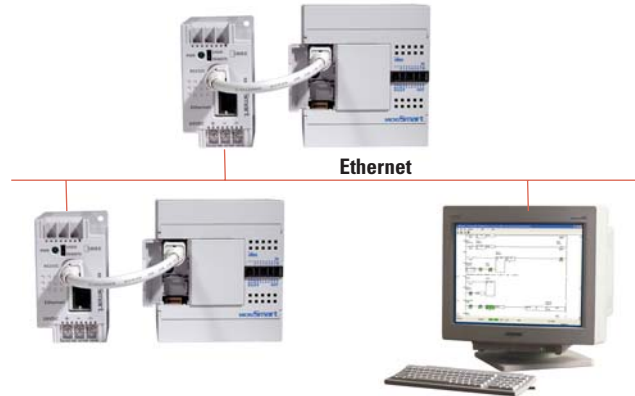
- Easy to configure
- Comes with interface cable and Quick Start Guide

**Part Numbers**

| Appearance   | Part Number  | Description  |
|--|--------------|--|
|   | FC4A-ENET    | Web Server Module (includes cable and Quick Start Guide) |
|  | FC9Y-QS100-0 | Quick Start Guide  |

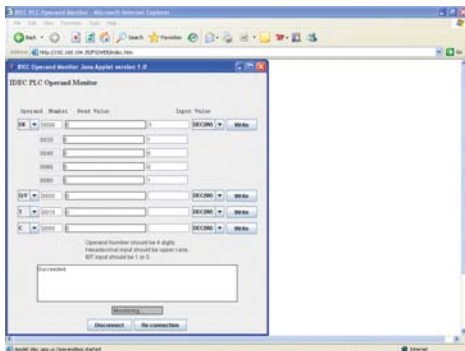
**Remote Maintenance**

- Easily monitor machine conditions, change machine configurations, or upload and download user programs from anywhere, using IDEC WindLDR software over an Ethernet network.
- For a more graphical display and remote data archiving, OPC servers, such as IDEC WindSRV or standard SCADA software, can be used.
- Save time and money:
  - Access system parameters from your desk, conference room or home to check machine status without walking the factory floor.
  - If a machine is down, you no longer need to send someone with their laptop to debug or download a new user program.



**Web Server Functions**

- Machine status can be monitored and controlled from any PC using standard internet browsers, such as Internet Explorer.
- A built-in custom template, which allows you to monitor and change system parameters, is included.
- Get more flexibility and control by creating your own custom webpage.



**Alarm Messaging**

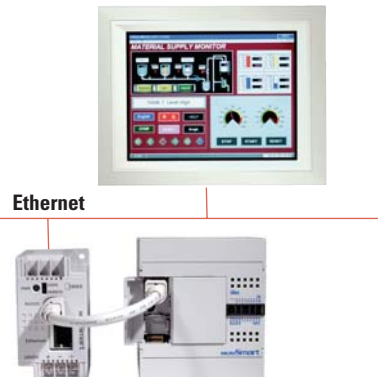
Real-time updates of error status or process conditions can be sent to an email address or cellular phone.

- A maximum of 32 customizable messages can be pre-defined with up to two email addresses each.



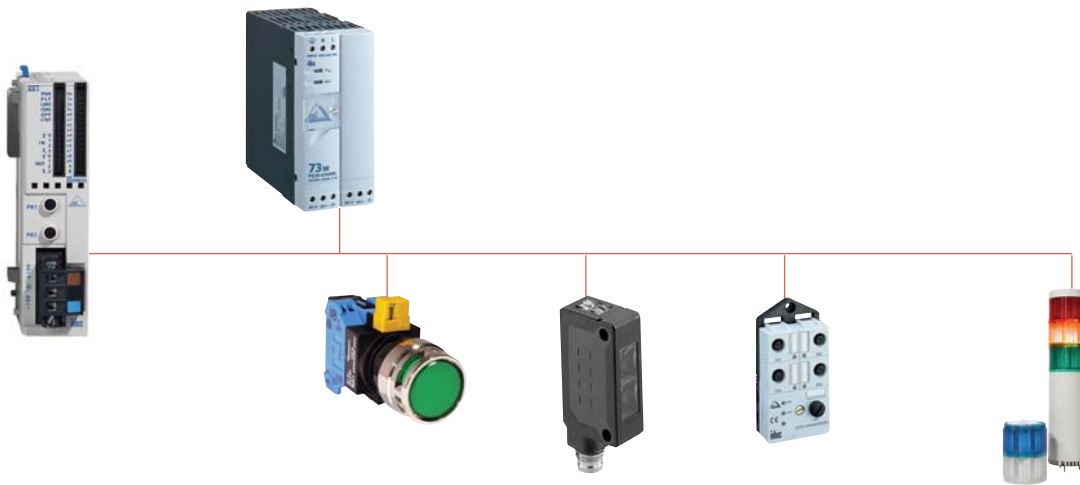
**O/I Connectivity**

- Using the IDEC Web Server Module on an Ethernet network, an IDEC PLC can be configured as a host to an IDEC operator interface. This allows the touchscreen and PLC to be in separate locations.
- No longer hassle with specialized cables and serial connection limitations.






**Communication Modules**  
**AS-Interface Module**



**AS-Interface Master Module**

| Appearance   | 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.

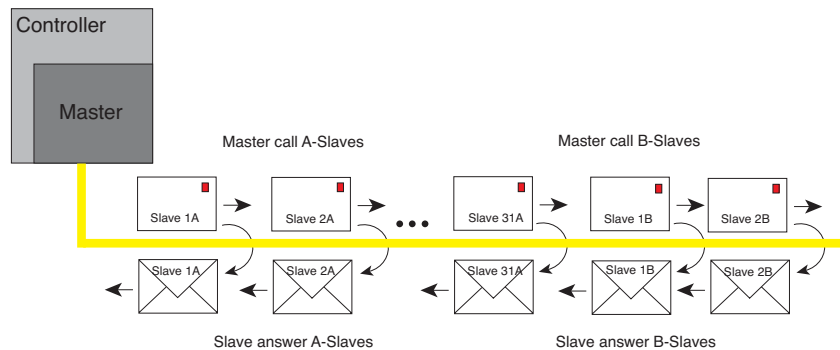
**Master-Slave Principle**

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)



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### Optional Modules

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| Appearance  | 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-PT1    | Clock cartridge         | Real-time clock cartridge   |

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### Communication Ports

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

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### Optional Modules

#### Communication Module — for Slim CPU

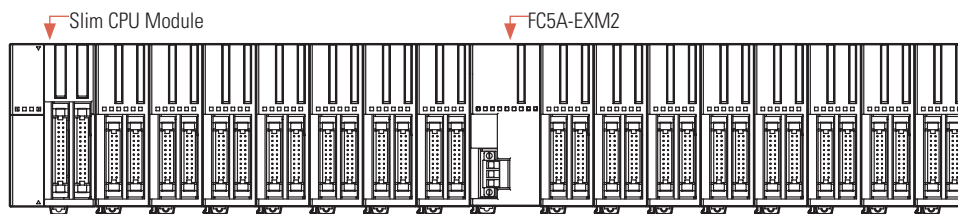
| Appearance | Part Number | Description | Terminal       |
|------------|-------------|-------------|----------------|
|            | FC4A-HPC1   | RS232C      | Mini DIN       |
|            | FC4A-HPC2   | RS485       | Mini DIN       |
|            | FC4A-HPC3   | RS485       | Screw Terminal |

#### Expansion Power Supply Module

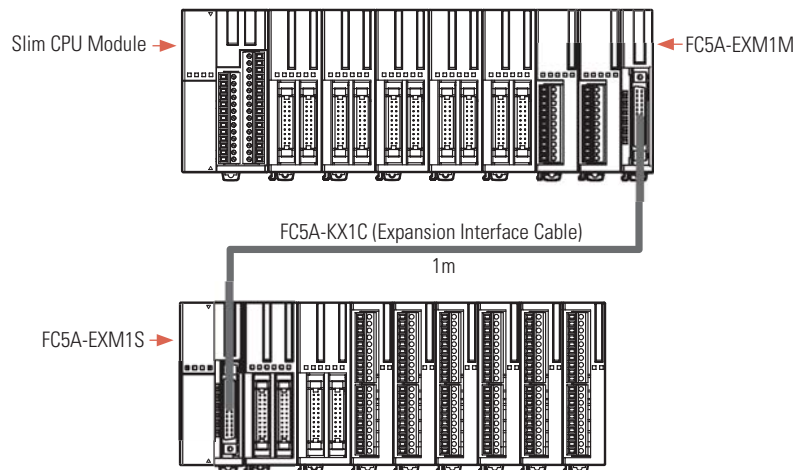
| Appearance | Part Number | Description   |
|------------|-------------|---|
|            | FC5A-EXM1M  | Master Expansion Power Supply For MicroSmart Pentra |
|            | FC5A-EXM1S  | Slave Expansion Power Supply For MicroSmart Pentra  |
|            | FC5A-EXM2   | Expansion Power Supply For MicroSmart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

### Expansion Power Supply System Configuration

#### FC5A-EXM2 (Expansion Interface Module)



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



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## 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 (for use with PC without serial port)      |            | 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. |

### 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  |

### 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 |

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### Accessories

| Part Number     | Use with              | Description   |
|-----------------|-----------------------|---|
| FC4A-PMT13P     | CPU module            | 13-position left-side terminal block for FC4A-D20RK1/-D20RS1 CPU          |
| FC5A-PMT13P     |                       | 13-position left-side terminal block for FC5A-D16RK1/-D16RS1 CPU          |
| FC4A-PMTS16P    |                       | 16-position right-side terminal block for FC4A-D20RS1 and FC5A-D16RS1 CPU |
| FC4A-PMTK16P    |                       | 16-position right-side terminal block for FC4A-D20RK1 and FC5A-D16RK1 CPU |
| FC4A-PMT11P     | I/O expansion modules | 11-position terminal block for 8-pt I/O expansion modules                 |
| FC4A-PMT10P     |                       | 10-position terminal block for 16-pt I/O expansion modules                |
| FC4A-PMC20P     |                       | 20-position connector socket for MIL connector I/O expansion modules      |
| FC4A-PMC26P     |                       | 26-position connector socket for MIL connector CPU modules                |
| FC4A-PSP1P      |                       | Direct mounting strips for mounting on a panel                            |
| FC4A-PMAC2P     |                       | 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                                |
| BNL6            |                       | End clips   |
| BNDN1000        |                       | DIN Rail (1m/3.28' long, 10.5mm height)                                   |
| BAA1000         |                       | DIN Rail (1m/3.28' long, 7.5mm height)                                    |
| FC9Z-SD2        |                       | 2.5mm flathead IDEC screwdriver   |
| FC9Y-B812-0A    |                       | MicroSmart user manual  |
| FC9Y-B927-0     |                       | MicroSmart Pentra user manual   |
| FC9Y-B919       |                       | Web Server Module user manual   |
| FC9Y-B969-0     |                       | FC5A-SIF2 Communication Module user manual                                |
| FC9Y-B902-0     |                       | Analog I/O user manual  |
| FC9Y-LP2CDW     |                       | WindLDR PLC programming software  |

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## Specifications

**All-in-One**

| Part Number                            | AC Power  | FC5A-C10R2  | FC5A-C16R2   | FC5A-C24R2                       | FC4A-C10R2                       | FC4A-C16R2   | FC4A-C24R2  |
|--|---|---|--|----------------------------------|----------------------------------|--|-------------|
|  | DC Power  | FC5A-C10R2C   | FC5A-C16R2C  | FC5A-C24R2C                      | FC4A-C10R2C                      | FC4A-C16R2C  | FC4A-C24R2C |
| Rated Voltage                          | AC power model: 100 to 240V AC, DC power model: 24V DC  |   |  |                                  |                                  |  |             |
| Allowable Voltage Range                | AC power model: 85 to 264V AC, DC power model: 20.4 to 28.8V DC (including ripple)  |   |  |                                  |                                  |  |             |
| Rated Power Frequency                  | AC power model: 50/60 Hz (47 to 63 Hz)  |   |  |                                  |                                  |  |             |
| Maximum Input Current                  | 250mA (85V AC)<br>160mA (24V DC)  | 300mA (85V AC)<br>190mA (24V DC)  | 450mA (85V AC) <sup>1</sup><br>360mA (24V DC) <sup>2</sup> | 250mA (85V AC)<br>160mA (24V DC) | 300mA (85V AC)<br>190mA (24V DC) | 450mA (85V AC) <sup>2</sup><br>360mA (24V DC) <sup>3</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 (264V 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) <sup>4</sup><br>FC5A-C16R2C/FC4A-C16R2C: 4.6W (24V DC) <sup>4</sup><br>FC5A-C24R2C/FC4A-C24R2C: 8.7W (24V DC) <sup>2</sup>   |  |                                  |                                  |  |             |
| Allowable Momentary Power Interruption | 10ms (rated power voltage)  |   |  |                                  |                                  |  |             |
| Dielectric Strength                    | Between power and ⊕ or ⊖ terminals: 1500V AC, 1 minute<br>Between I/O and ⊕ or ⊖ terminals: 1500V 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 1μs<br>DC power terminals: 1.0 kV, 50 ns to 1μs<br>I/O terminals (coupling clamp): 1.5 kV, 50 ns to 1μs  |   |  |                                  |                                  |  |             |
| Inrush Current                         |   | 35A   | 40A  |                                  | 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), 1 to 95% RH (no condensation)   |   |  |                                  |                                  |  |             |
| Altitude                               | Operation: 0 to 2,000m, Transport: 0 to 3,000m  |   |  |                                  |                                  |  |             |
| Pollution Degree                       | 2 (IEC60664-1)  |   |  |                                  |                                  |  |             |
| Corrosion Immunity                     | Free from corrosive gases   |   |  |                                  |                                  |  |             |
| Degree of Protection                   | IP20 (IEC60529)   |   |  |                                  |                                  |  |             |
| Grounding Wire                         | UL1007, AWG16   |   |  |                                  |                                  |  |             |
| Vibration Resistance                   | When mounted on a DIN rail or panel surface:<br>5 to 9 Hz amplitude 3.5 mm, 9 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), 11ms duration, 3 shocks per axis, on three mutually perpendicular axes (IEC61131)   |   |  |                                  |                                  |  |             |
| Weight                                 | AC: 230g<br>DC: 240g  | AC: 250g<br>DC: 260g  | AC: 305g<br>DC: 310g                                       | AC: 230g<br>DC: 240g             | AC: 250g<br>DC: 260g             | AC: 305g<br>DC: 310g                                       |             |

- 1. CPU module (including 250mA sensor power) + 4 I/O modules
- 2. CPU module + 4 I/O modules
- 3. CPU module (including 250mA sensor power)
- 4. CPU module (24V DC)

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Slim

| Part Number  |  | 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                                  |  | 35 basic   |                          |                          |   |                          |                |              |                |    |                |
| Program Capacity <sup>1</sup>                      |  | 88 advanced  | 92 advanced              | 55 advanced              | 72 advanced   |                          |                |              |                |    |                |
| User Program Storage                               |  | EEPROM (10,000 times rewritable)   |                          |                          |   |                          |                |              |                |    |                |
| Processing Time                                    | Basic Instruction  | 83µs (1,000 steps)   |                          |                          | 1.65ms (1,000 steps)  |                          |                |              |                |    |                |
|  | END Processing <sup>3</sup>                              | 0.35ms   |                          |                          | 0.64ms  |                          |                |              |                |    |                |
| Expandable I/O Modules                             |  | 7 modules + additional 8 modules using the expansion power supply module   |                          |                          | 7 modules   |                          |                |              |                |    |                |
| I/O Points   | Input  | 8  | Expansion: 224           | 16                       | Expansion: 224  | 12                       | Expansion: 128 | 12           | Expansion: 224 | 24 | Expansion: 224 |
|  | Output   | 8  | Additional: 256          | 16                       | Additional: 256   | 8                        | Expansion: 128 | 8            | Expansion: 224 | 16 | Expansion: 224 |
| Internal Relay                                     |  | 2,048 points   |                          |                          | 1,024 points  |                          |                |              |                |    |                |
| Shift Register                                     |  | 256 points   |                          |                          | 128 points  |                          |                |              |                |    |                |
| Data Register                                      |  | 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  |                          |                          |   |                          |                |              |                |    |                |
| Replaceability                                     |  | N/A  |                          |                          |   |                          |                |              |                |    |                |
| 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 or 3 to 15ms filter (selectable in increments of 1ms)   |                          |                          |   |                          |                |              |                |    |                |
| Catch Input/Interrupt Input                        |  | Four inputs (I2 through I5)<br>Minimum turn on pulse width: 5µs minimum<br>Minimum turn off pulse width: 5µs minimum   |                          |                          | Four inputs (I2 through I5)<br>Minimum turn on pulse width: 40µs minimum<br>Minimum turn off pulse width: 150µs minimum |                          |                |              |                |    |                |
| High-speed Counter                                 | Maximum Counting Frequency and High-speed Counter Points | Total 4 points<br>Single/two-phase selectable: 100 KHz (2 points)<br>Single-phase: 100 KHz (2 points)  |                          |                          | Total 4 points<br>Single/two-phase selectable: 20 KHz (2 points)<br>Single-phase: 5 KHz (2 points)                      |                          |                |              |                |    |                |
|  | Counting Range   | 0 to 4294967295 (32 bits)  |                          |                          | 0 to 65535 (16 bits)  |                          |                |              |                |    |                |
|  | Operation Mode   | Rotary encoder mode and adding counter mode  |                          |                          |   |                          |                |              |                |    |                |
| Analog Potentiometer                               | Number   | 1 point  |                          |                          |   |                          |                |              |                |    |                |
|  | Data Range   | 0 to 255   |                          |                          |   |                          |                |              |                |    |                |
| Analog Voltage Input                               | Number   | 1 point  |                          |                          |   |                          |                |              |                |    |                |
|  | Input Voltage Range                                      | 0 to 10V DC  |                          |                          |   |                          |                |              |                |    |                |
|  | Input Impedance  | Approx. 100kΩ  |                          |                          |   |                          |                |              |                |    |                |
|  | Data Range   | 0 to 255 (8 bits)  |                          |                          |   |                          |                |              |                |    |                |
| Pulse Output                                       | Number   | 2 points   | 3 points                 | 2 points                 |   |                          |                |              |                |    |                |
|  | Maximum Frequency  | 100KHz   |                          |                          | 20KHz   |                          |                |              |                |    |                |
| Sensor Power Supply                                | Output Voltage Current                                   | —  |                          |                          |   |                          |                |              |                |    |                |
|  | Isolation  | —  |                          |                          |   |                          |                |              |                |    |                |
| Port 1   |  | RS232C (maintenance communication, user communications)  |                          |                          |   |                          |                |              |                |    |                |
| Port 2 Communication Adapter (option) <sup>5</sup> |  | Possible   | Possible                 | Possible                 | Possible  | Possible                 |                |              |                |    |                |
| Clock Cartridge (option)                           |  | Possible   | Possible                 | Possible                 | Possible  | Possible                 |                |              |                |    |                |
| Memory Cartridge (option)                          |  | Possible   | Possible                 | Possible                 | Possible  | Possible                 |                |              |                |    |                |
| HMI Module (option)                                |  | Possible   | Possible                 | Possible                 | Possible  | Possible                 |                |              |                |    |                |



- 1 step equals 6 bytes.
- Expandable up to 64 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, user communication, Modem communication, data link, Modbus master/slave communication (FC5A only).
- Note: The maximum number of relay outputs that can be turned on simultaneously is 54 including those on the CPU module.

PLCs

Operator Interfaces

Automation Software

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Communication & Networking

**All-in-One**

| Part Number  |  | FC5A-C10R2<br>FC5A-C10R2C  | FC5A-C16R2<br>FC5A-C16R2C | FC5A-C24R2<br>FC5A-C24R2C | FC4A-C10R2<br>FC4A-C10R2C   | FC4A-C16R2<br>FC4A-C16R2C | FC4A-C24R2<br>FC4A-C24R2C |
|--|--|--|---------------------------|---------------------------|---|---------------------------|---------------------------|
| Control System                                     |  | Stored program system  |                           |                           |   |                           |                           |
| Instruction Words                                  |  | 35 basic   |                           |                           |   |                           |                           |
| 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  | 1.16ms (1,000 steps)   |                           |                           | 1.65ms (1,000 steps)  |                           |                           |
|  | END Processing <sup>2</sup>                              | 0.64ms   |                           |                           | 0.64ms  |                           |                           |
| Expandable I/O Module                              |  | —  |                           | 4 modules                 |   | —                         |                           |
| I/O Points   | Input  | 6  | 9                         | 14                        | Expansion:<br>64  | 6                         | 9                         |
|  | Output   | 4  | 7                         | 10                        |   | 4                         | 7                         |
| 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              |                           |
| Extra 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  |                           |                           |   |                           |                           |
|  | Replaceability   | N/A  |                           |                           |   |                           |                           |
| 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 or 3 to 15ms filter (selectable in increments of 1ms)   |                           |                           |   |                           |                           |
| Catch Input/Interrupt Input                        |  | Four inputs (I2 through I5)<br>Minimum turn on pulse width: 40µs minimum<br>Minimum turn off pulse width: 150µs minimum  |                           |                           |   |                           |                           |
| High-speed Counter                                 | Maximum Counting Frequency and High-speed Counter Points | Total 4 points<br>Single/two-phase selectable: 50KHz (1 point)<br>Single-phase: 5KHz (3 points)  |                           |                           | Total 4 points<br>Single/two-phase selectable: 20KHz (1 point)<br>Single-phase: 5KHz (3 points) |                           |                           |
|  | Counting Range   | 0 to 65535 (16 bits)   |                           |                           |   |                           |                           |
|  | Operation Mode   | Rotary encoder mode and adding counter mode  |                           |                           |   |                           |                           |
| Analog Potentiometer                               | Number   | 1 point  |                           | 2 points                  |   | 1 point                   |                           |
|  | Data Range   | 0 to 255   |                           |                           |   |                           |                           |
| Analog Voltage Input                               | Number   | —  |                           |                           |   |                           |                           |
|  | Input Voltage Range                                      | —  |                           |                           |   |                           |                           |
|  | Input Impedance  | —  |                           |                           |   |                           |                           |
| Pulse Output                                       | Data Range   | —  |                           |                           |   |                           |                           |
|  | Number   | —  |                           |                           |   |                           |                           |
| Sensor Power Supply (AC Power Only)                | Max. Frequency   | —  |                           |                           |   |                           |                           |
|  | Output Voltage Current                                   | 24V DC (+10% to -15%), 250mA   |                           |                           |   |                           |                           |
|  | Overload Detection                                       | N/A  |                           |                           |   |                           |                           |
| Isolation  |  | Isolated from the internal circuit   |                           |                           |   |                           |                           |
| Port 1   |  | RS232C (maintenance communication, user communication)   |                           |                           |   |                           |                           |
| Port 2 Communication Adapter (option) <sup>3</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. Maintenance communication, user communication, Modem communication, datalink, Modbus 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.

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Communication Port (RS232C Port 1)

| Model   | Slim CPU   | All-in-One CPU |
|---|--|----------------|
| Standards   | EIA RS232C   |                |
| Maximum Baud Rate   | FC5A: 57,600 bps (maintenance communication)<br>FC4A: 19,200 bps (maintenance communication) |                |
| Maintenance Communication                                 | Possible   |                |
| User Communication  | Possible   |                |
| Modem Communication                                       | N/A  |                |
| Data Link   | N/A  |                |
| Cable   | Special cable (FC2A-KC4C, FC2A-KP1C, FC4A-KC1C, FC4A-KC2C)                                   |                |
| Isolation between Internal Circuit and Communication Port | Not isolated   |                |

Input Specifications

| Part Number                           | —  | FC5A-D16RK1<br>FC5A-D16RS1       | —                                      | FC5A-D32K3<br>FC5A-D32S3         | —                        | FC5A-C10R2<br>FC5A-C10R2C  | FC5A-C16R2<br>FC5A-C16R2C | FC5A-C24R2<br>FC5A-C24R2C |
|---------------------------------------|--|----------------------------------|--|----------------------------------|--------------------------|--|---------------------------|---------------------------|
|                                       | FC4A-D20K3<br>FC4A-D20S3   | —                                | FC4A-D20RK1<br>FC4A-D20RS1             | —                                | FC4A-D40K3<br>FC4A-D40S3 | FC4A-C10R2<br>FC4A-C10R2C  | FC4A-C16R2<br>FC4A-C16R2C | FC4A-C24R2<br>FC4A-C24R2C |
| Input Points                          | 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)      | 6<br>(6/1 common)  | 9<br>(9/1 common)         | 14<br>(14/1 common)       |
| Input Voltage                         | 24V DC sink/source input signal  |                                  |  |                                  |                          |  |                           |                           |
| Input Voltage Range                   | 20.4 to 26.4V DC   |                                  |  |                                  |                          | 20.4 to 28.8V DC   |                           |                           |
| Input Current                         | FC5A I0, I1, I3, I4, I6, I7: 4.5mA/point (24V DC)<br>I2, I5, I10 to I17: 7mA/point (24V DC)<br>FC4A I0, I1, I6, I7: 5mA/point (24V DC)<br>I2 to I5, I10 to I27: 7mA/point (24V DC)   |                                  |  |                                  |                          | FC5A I0 and I1: 6.4mA/point<br>I2 to I7, I10 to I15: 7mA/point (24V DC)<br>FC4A I0 and I1: 11mA<br>I2 to I7, I10 to I15: 7mA/point (24V DC)  |                           |                           |
| Input Impedance                       | FC5A I0, I1, I3, I4, I6, I7: 4.9kΩ<br>I2 to I5, I10 to I17: 3.4kΩ<br>FC4A I0, I1, I6, I7: 5.7kΩ<br>I2 to I5, I10 to I17: 3.4kΩ   |                                  |  |                                  |                          | FC5A I0 and I1: 3.7kΩ<br>I2 to I7, I10 to I15: 3.4kΩ<br>FC4A I0 and I1: 2.1kΩ<br>I2 to I7, I10 to I15: 3.4kΩ   |                           |                           |
| Turn ON Time                          | FC5A I0, I1, I3, I4, I6, I7: 5μs + filter value<br>I2 and I5: 35μs + filter value<br>I10 to I17: 40μs + filter value<br>FC4A I0, I1, I6, I7: 35μs + filter value<br>I2 to I5: 35μs + filter value<br>I10 to I27: 40μs + filter value     |                                  |  |                                  |                          | FC5A I0 and I1: 2μs + filter value<br>I2 to I7: 35μs + filter value<br>I6, I7, I10 to I15: 40μs + filter value<br>FC4A I0 and I1: 35μs + filter value<br>I2 to I5: 35μs + filter value<br>I6, I7, I10 to I15: 40μs + filter value      |                           |                           |
| Turn OFF Time                         | FC5A I0, I1, I3, I4, I6, I7: 5μs + filter value<br>I2 and I5: 150μs + filter value<br>I10 to I17: 150μs + filter value<br>FC4A I0, I1, I6, I7: 45μs + filter value<br>I2 to I5: 150μs + filter value<br>I10 to I27: 150μs + filter value |                                  |  |                                  |                          | FC5A I0 and I1: 16μs + filter value<br>I2 to I7: 150μs + filter value<br>I6, I7, I10 to I15: 150μs + filter value<br>FC4A I0 and I1: 45μs + filter value<br>I2 to I5: 150μs + filter value<br>I6, I7, I10 to I15: 150μs + filter value |                           |                           |
| Connector                             | On Mother Board  | FL26A2MA<br>(Oki Electric Cable) | MC1.5/18-G-3.81BK<br>(Phoenix Contact) | FL26A2MA<br>(Oki Electric Cable) | —                        |  |                           |                           |
|                                       | Insertion Durability   | 100 times minimum                |  |                                  |                          |  | —                         |                           |
| Isolation                             | Between input terminals: Photocoupler isolated<br>Internal circuit: Not isolated   |                                  |  |                                  |                          |  |                           |                           |
| Input                                 | 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.<br>If any input exceeding the rated value is applied, permanent damage may be caused.  |                                  |  |                                  |                          |  |                           |                           |
| Cable Length                          | 3 m in compliance with electromagnetic immunity  |                                  |  |                                  |                          |  |                           |                           |

**Transistor Sink and Source Output**

| Part Number                            | —  | FC5A-D16RK1<br>FC5A-D16RS1   | FC5A-D32K3<br>FC5A-D32S3         |
|--|--|--|----------------------------------|
|  | FC4A-D20RK1<br>FC4A-D20RS1   | —  | FC4A-D40K3<br>FC4A-D40S3         |
| Output Points                          | 2 (2/1 common)   | 2 (2/1 common)   | 16 (8/1 common)                  |
| Output                                 | Transistor Sink  | FC5A-D16K1/D32K3<br>FC4A-D20K3/D20RK1/D40K3  |                                  |
|  | Transistor Source  | FC5A-D16RS1/D32S3<br>FC4A-D20S3/D20RS1/D40S3   |                                  |
| Load Voltage                           | 24V DC   |  |                                  |
| Operating Load Voltage Range           | 20.4 to 28.8V DC   |  |                                  |
| 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                        | 0.1mA maximum  |  |                                  |
| Clamping Voltage                       | 39V±1V   |  |                                  |
| Maximum Lamp Load                      | 8W   |  |                                  |
| Inductive Load                         | L/R = 10ms (28.8V DC, 1 Hz)  |  |                                  |
| External Current Draw                  | Sink output: 100mA maximum, 24V DC (power voltage at the +V terminal)<br>Source output: 100mA 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              | FL26A2MA<br>(Oki Electric Cable)   | MC1.5/16-G-3.81BK<br>(Phoenix Contact)   | FL26A2MA<br>(Oki Electric Cable) |
| Connector Insertion/Removal Durability | 100 times minimum  |  |                                  |
| Output Delay                           | Turn ON Time   | FC5A Q0 to Q2: 5µs max.<br>Q3 to Q7, Q10 to Q17: 300µs max.<br>FC4A Q0, Q1: 5µs max.<br>Q2 to Q7, Q10 to Q17: 300µs max. |                                  |
|  | Turn OFF Time  | FC5A Q0 to Q2: 5µs max.<br>Q3 to Q7, Q10 to Q17: 300µs max.<br>FC4A Q0, Q1: 5µs max.<br>Q2 to Q7, Q10 to Q17: 300µs max. |                                  |

**Relay Output**

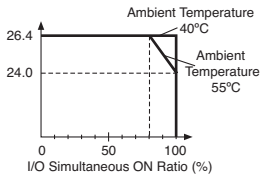
| Part Number                            | FC5A-C10R2<br>FC5A-C10R2C  | FC5A-C16R2<br>FC5A-C16R2C | FC5A-C24R2<br>FC5A-C24R2C | FC5A-D16RK1<br>FC5A-D16RS1 |                          |
|--|--|---------------------------|---------------------------|----------------------------|--------------------------|
|  | FC4A-C10R2<br>FC4A-C10R2C  | FC4A-C16R2<br>FC4A-C16R2C | FC4A-C24R2<br>FC4A-C24R2C | FC4A-D20RK1<br>FC4A-D20RS1 |                          |
| No. of Outputs                         | 4  | 7                         | 10                        | 8                          |                          |
| Output Points per Common Line          | COM0   | 3                         | 4                         | 4                          | 2<br>(Transistor output) |
|  | COM1   | 1                         | 2                         | 4                          | 3                        |
|  | COM2   | —                         | 1                         | 1                          | 2                        |
|  | COM3   | —                         | —                         | 1                          | 1                        |
| Output                                 | 1 NO form A  |                           |                           |                            |                          |
| Maximum Load Current                   | 2A per point<br>8A per common line   |                           |                           |                            |                          |
| Minimum Switching Load                 | 0.1mA/0.1V DC (reference value)  |                           |                           |                            |                          |
| Initial Contact Resistance             | 30 mΩ maximum  |                           |                           |                            |                          |
| Electrical Life                        | 100,000 operations minimum<br>(rated load 1,800 operations/hour)   |                           |                           |                            |                          |
| Mechanical Life                        | 20,000,000 operations minimum<br>(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 = 7ms)  |                           |                           |                            |                          |
| Dielectric Strength                    | Between output and 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              | —  |                           |                           | *                          |                          |
| Connector Insertion/Removal Durability | —  |                           |                           | 100 times minimum          |                          |



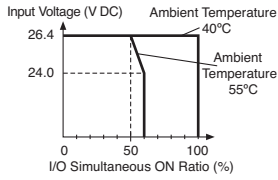
\*MC1.5/16-G-3.81BK (Phoenix Contact)

Input Usage Limits

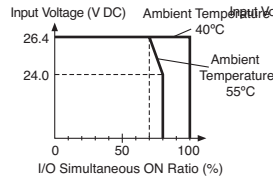
FC5A-D16R1/D16RS1



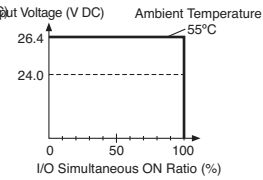
FC5A-D32K3/D32S3  
FC4A-D40K3/D40S3



FC4A-D20K3/D20S3

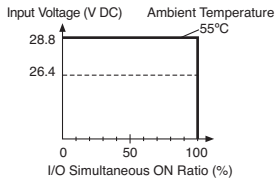


FC4A-D20R1/D20RS1

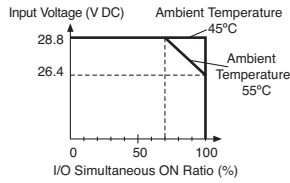


All-in-One CPU

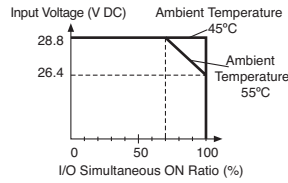
FC5A-C10R2  
FC5A-C10R2C  
FC4A-C10R2  
FC4A-C10R2C



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



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

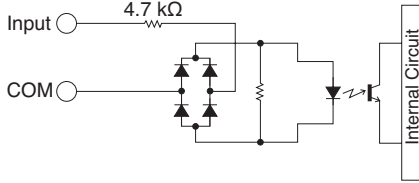


CAUTION: When using at an operating ambient temperature above 40°C, reduce the input voltage or the quantity of I/O points that turn on simultaneously.

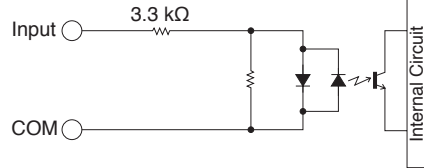
Input Internal Circuit

Slim CPU

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

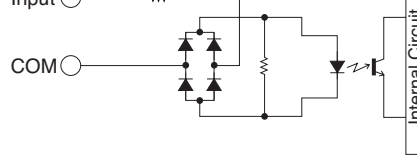


FC5A: I2, I5, I10 to I17  
FC4A: I2 to I5, I10 to I27

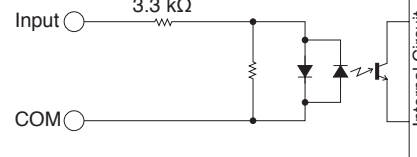


All-in-One CPU

I0, I1  
3.3 kΩ (FC5A)  
1.8 kΩ (FC4A)



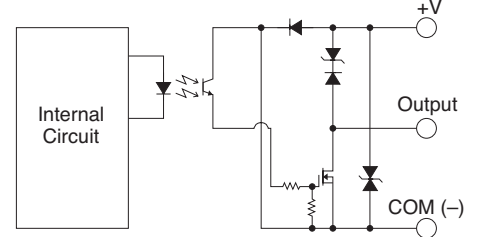
I2 to I15



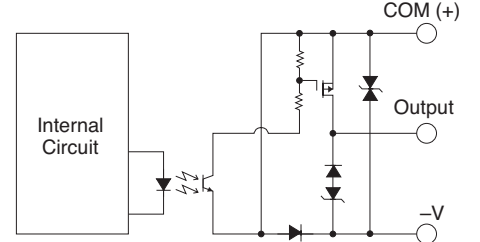
Output Internal Circuit

Slim CPU

Sink Output



Source Output



**Communication Adapter/Module**

| Part Number   | 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: 57600bps<br>FC4A: 19200bps | FC5A: 57600bps<br>FC4A: 19200bps | FC5A: 57600bps<br>FC4A: 19200bps<br>(38400 bps <sup>1</sup> )               |
| Maintenance Communication                                 | Possible                         | Possible                         | Possible  |
| User Communication  | Possible                         | —                                | Possible <sup>2</sup>   |
| Data Link Communication                                   | —                                | —                                | Possible  |
| Half-duplex Communication                                 | —                                | —                                | Possible  |
| Maximum Cable Length                                      | Special cable <sup>3</sup>       | Special cable <sup>4</sup>       | 200 m   |
| Quantity of Slave Stations                                | —                                | —                                | 31  |
| Isolation between Internal Circuit and Communication Port | Not isolated                     |                                  |   |
| Recommended Cable for RS485                               | —                                |                                  | Twisted-pair shielded cable with a minimum core wire of 0.3 mm <sup>2</sup> |
| Conductor Resistance                                      | —                                |                                  | 85Ω/km maximum  |
| Shield Resistance   | —                                |                                  | 20Ω/km maximum  |



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

**HMI Module (Optional)**

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

**Memory Cartridge Specifications (Optional)**

| Part Number                 | FC4A-PM32  | FC4A-PM64 |
|-----------------------------|--|-----------|
| Memory                      | EEPROM   |           |
| Accessible Memory Capacity  | 32 KB  | 64 KB     |
| Hardware for Storing Data   | CPU Module   |           |
| Software for Storing Data   | WindLDR  |           |
| Quantity of Stored Programs | One user program can be stored on one memory cartridge |           |

**Clock Cartridge (Optional)**

| Part Number     | 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  | N/A  |

### I/O Modules Specifications

#### Input Module

| Part Number  | 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)   |                            |
| 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  |                            |
| Input Current  | 7mA/point (24V DC)  |                  | 5mA/point (24V DC)            |                  | 17mA/point (120V AC, 60 Hz)  |                            |
| Input Impedance  | 3.4kΩ   |                  | 4.4kΩ                         |                  | 0.8kΩ (60 Hz)  |                            |
| ON Voltage   | 15V minimum   |                  |                               |                  | 9V minimum   |                            |
| OFF Voltage  | 5V maximum  |                  |                               |                  | 20V maximum  |                            |
| ON Current   | 4.2mA minimum (at 15V DC)   |                  | 3.2mA minimum (at 15V DC)     |                  | —  |                            |
| OFF Current  | 1.2mA maximum   |                  | 0.9mA maximum                 |                  | —  |                            |
| Turn ON Time   | 4ms   |                  |                               |                  | 25ms   |                            |
| Turn OFF Time  | 4ms   |                  |                               |                  | 30ms   |                            |
| 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)   |                  | FL26A2MA (Oki Electric Cable) |                  | MC1.5/10-G-3.81BK (Phoenix Contact)  |                            |
| Connector Insertion/Removal Durability                     | 100 times minimum   |                  |                               |                  |  |                            |
| Applicable Ferrule   | 1-wire: A1 0.5-8 WH<br>2-wire: A1-TWIN 2x0.5-8 WH   |                  | —                             |                  | —  |                            |
| Internal Current Draw                                      | All Inputs ON   | 25mA (5V DC)     | 40mA (5V DC)                  | 35mA (5V DC)     | 65mA (5V DC)   | 60mA (5V DC), 0mA (24V DC) |
|  | All Inputs OFF  | 5mA (5V DC)      | 5mA (5V DC)                   | 5mA (5V DC)      | 10mA (5V DC)   | 30mA (5V DC), 0mA (24V DC) |
| Internal Power Consumption (at 24V DC while all inputs ON) | 0.17W   |                  | 0.27W                         |                  | 0.24W  | 0.44W                      |
| Weight   | 85g   | 100g             | 65g                           | 100g             | 80g  |                            |

#### Transistor Output Modules

| Part Number                  | 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                       | FC4A-T@K@: Transistor sink output<br>FC4A-T@S@: Transistor source output   |                          |                          |
| 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 = 10ms (28.8V DC)  |                          |                          |
| External Current Draw        | FC4A-T@K@: 100mA maximum,<br>24V DC (power voltage at the +V terminal)<br>FC4A-T@S@: 100mA 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                                 |                          |                          |

| Part Number   | FC4A-T08K1<br>FC4A-T08S1                          | FC4A-T16K3<br>FC4A-T16S3      | FC4A-T32K3<br>FC4A-T32S3      |                               |
|---|---|-------------------------------|-------------------------------|-------------------------------|
| Connector on Mother Board                                   | MC1.5/10-G-3.81BK (Phoenix Contact)               | FL26A2MA (Oki Electric Cable) |                               |                               |
| Connector Insertion/Removal Durability                      | 100 times minimum                                 |                               |                               |                               |
| Applicable Ferrule  | 1-wire: A1 0.5-8 WH<br>2-wire: A1-TWIN 2x0.5-8 WH |                               |                               |                               |
| Internal Current Draw                                       | All outputs ON                                    | 10mA (5V DC)<br>20mA (24V DC) | 10mA (5V DC)<br>40mA (24V DC) | 20mA (5V DC)<br>70mA (24V DC) |
|   | All outputs OFF                                   | 5mA (5V DC)<br>0mA (24V DC)   | 5mA (5V DC)<br>0mA (24V DC)   | 10mA (5V DC)<br>0mA (24V DC)  |
| Internal Power Consumption (at 24V DC while all outputs ON) | 0.55W   | 1.03W                         | 1.82W                         |                               |
| Output Delay  | Turn ON Time                                      | 300μs maximum                 |                               |                               |
|   | Turn OFF Time                                     | 300μs maximum                 |                               |                               |
| Weight  | 85g   | 70g                           | 105g                          |                               |

PLCs

Operator Interfaces

Automation Software

Power Supplies

Sensors

Communication & Networking

**Relay Output Module Specifications**

| Part Number   |                 | FC4A-R081  | FC4A-R161                              |
|---|-----------------|--|--|
| Output Points   |                 | 8 (4/1 common)   | 16 (8/1 common)                        |
| Output  |                 | 1NO (form A)   |  |
| Maximum Load Current  |                 | 2A per point   |  |
|   |                 | 7A per common  | 8A per common                          |
| Minimum Switching Load                                      |                 | 0.1mA/0.1V DC (reference value)  |  |
| Initial Contact Resistance                                  |                 | 30mΩ maximum   |  |
| Electrical Life   |                 | 100,000 operations minimum<br>(rated load 1,800 operations/hour)   |  |
| Mechanical Life   |                 | 20,000,000 operations minimum<br>(no load 1,8000 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 = 7ms)  |  |
| 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<br>(Phoenix Contact)   | MC1.5/10-G-3.81BK<br>(Phoenix Contact) |
| Connector Insertion/<br>Removal Durability                  |                 | 100 times minimum  |  |
| Applicable Ferrule  |                 | 1-wire: A1 0.5-8 WH<br>2-wire: A1-TWIN 2×0.5-8 WH  |  |
| Internal Current Draw                                       | All outputs ON  | 30mA (5V DC)<br>40mA (24V DC)  | 45mA (5V DC)<br>75mA (24V DC)          |
|   | All outputs OFF | 5mA (5V DC)<br>0mA (24V DC)  | 5mA (5V DC)<br>0mA (24V DC)            |
| Internal Power Consumption (at 24V DC while all outputs ON) |                 | 1.16W  | 2.10W                                  |
| Weight  |                 | 110g   | 145g                                   |

**Combination I/O Module Specifications**

| Part Number                           |  | FC4A-M08BR1   | FC4A-M24BR2      |
|---------------------------------------|--|---|------------------|
| Input Points                          |  | 4 (4/1 common)  | 16 (16/1 common) |
| Input Voltage                         |  | 24V DC sink/source input signal   |                  |
| Input Voltage Range                   |  | 20.4 to 28.8V DC  |                  |
| Input Current                         |  | 7mA/point (24V DC)  |                  |
| Input Impedance                       |  | 3.4kΩ   |                  |
| ON Voltage                            |  | 15V minimum   |                  |
| OFF Voltage                           |  | 5V maximum  |                  |
| ON Current                            |  | 4.2mA minimum (at 15V DC)   |                  |
| OFF Current                           |  | 1.2mA maximum   |                  |
| Turn ON Time                          |  | 4ms (24V DC)  |                  |
| Turn OFF Time                         |  | 4ms (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  |                  |

| Part Number  |                            | FC4A-M08BR1   | FC4A-M24BR2   |
|--|----------------------------|---|---|
| Output Specifications  | Output Points              | 4 (4/1 common)  | 8 (4/1 common)  |
|  | Output                     | 1NO (form A)  |   |
|  | Maximum Load Current       | 2A per point<br>7A per common   |   |
|  | Minimum Switching Load     | 0.1mA/0.1V DC (reference value)   |   |
|  | Initial Contact Resistance | 30 mΩ maximum   |   |
|  | Electrical Life            | 100,000 operations minimum (rated load 1,800 operations/hour)   |   |
|  | Mechanical Life            | 20,000,000 operations minimum (no load 18,000 operations/hour)  |   |
|  | Rated Load                 | 240V AC/2A (resistive load, inductive load cos φ = 0.4)<br>30V DC/2A (resistive load, inductive load L/R = 7ms)   |   |
|  | 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)   | Input: F6018-17P (Fujicon)<br>Output: F6018-11P (Fujicon) |
| Connector Insertion/Removal Durability                       |                            | 100 times minimum   | Not removable   |
| Internal Current Draw  | All I/Os ON                | 25mA (5V DC), 20mA (24V DC)   | 65mA (5V DC), 45mA (24V DC)                               |
|  | All I/Os OFF               | 5mA (5V DC), 0mA (24V DC)   | 10mA (5V DC), 0mA (24V DC)                                |
| Internal Power Consumption (at 24V DC while all I/Os are ON) |                            | 0.65W   | 1.52W   |
| Weight   |                            | 95g   | 140g  |

PLCs

Operator Interfaces

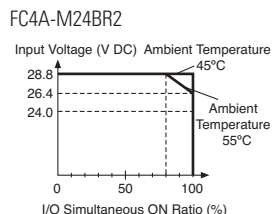
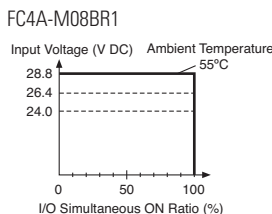
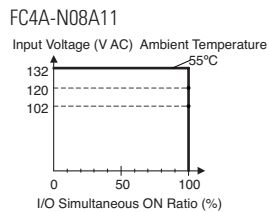
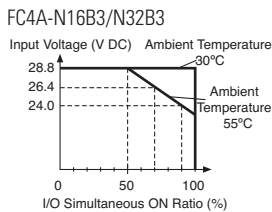
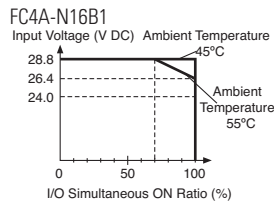
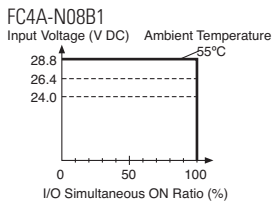
Automation Software

Power Supplies

Sensors

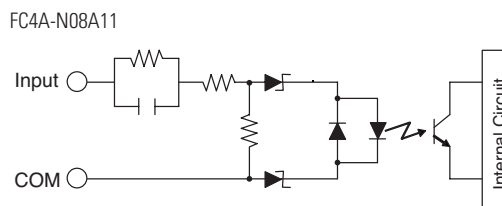
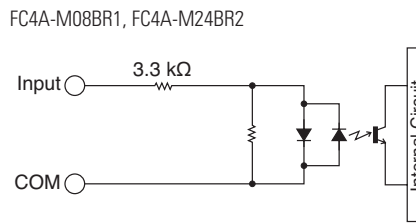
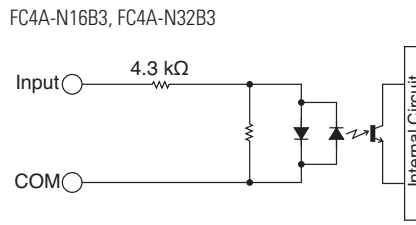
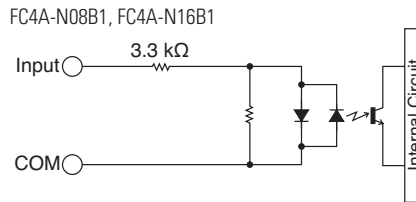
Communication & Networking

Input Usage Limits

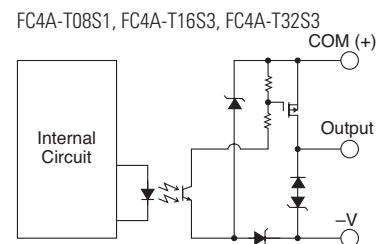
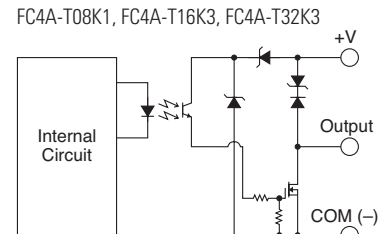


When using at an operating ambient temperature above 40°C, reduce the input voltage or the quantity of I/O points that turn on simultaneously.

Input Internal Circuit



Output Internal Circuit

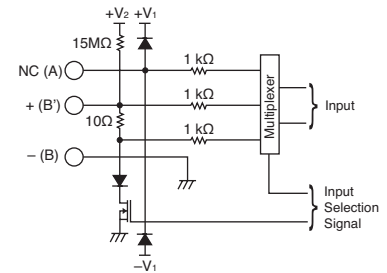


### Analog I/O Modules Specifications

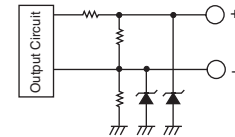
#### Analog I/O Module Specifications

| Part Number                            | FC4A-L03A1   | FC4A-L03AP1  | FC4A-J2A1  | FC4A-K1A1  |
|--|--|--|--|--|
| Input Points                           | 2  | 2  | 2  | —  |
| Input Signal                           | Voltage input (0 to 10V DC)<br>Current input (4 to 20mA)   | Thermocouple<br>Resistance<br>thermometer                  | Voltage input (0 to 10V DC)<br>Current input (4 to 20mA) | —  |
| Output Points                          | 1  | 1  | —  | 1  |
| Output Signal                          | Voltage output (0 to 10V DC)<br>Current output (4 to 20mA) | Voltage output (0 to 10V DC)<br>Current output (4 to 20mA) | —  | Voltage output (0 to 10V DC)<br>Current output (4 to 20mA) |
| Power Voltage                          | 24V DC   |  |  |  |
| Allowable Voltage Range                | 20.4 to 28.8V DC   |  |  |  |
| External Current Draw *                | 45mA (24V DC)  | 40mA (24V DC)  | 35mA (24V DC)  | 40mA (24V DC)  |
| Connector on Mother Board              | MC1.5/11-G-3.81BK (Phoenix Contact)                        |  |  |  |
| Connector Insertion/Removal Durability | 100 times minimum  |  |  |  |
| Applicable Ferrule                     | 1 terminal: A1 0.5-8 WH, 2 terminals: A1-TWIN 2x0.5-8 WH   |  |  |  |
| Internal Current Draw                  | 50mA (5V DC)   |  |  |  |
| Internal Power Consumption             | 0.34W (at 24V DC while all I/Os are ON)                    |  |  |  |
| Weight                                 | 85g  |  |  |  |

Input Circuit



Output Circuit



| Part Number                            | FC4A-J4CN1                          | FC4A-J8C1     | FC4A-J8AT1    | FC4A-K2C1     |
|--|-------------------------------------|---------------|---------------|---------------|
| I/O Points                             | 4 inputs                            | 8 inputs      | 8 inputs      | 2 outputs     |
| Power Voltage                          | 24V DC                              |               |               |               |
| Allowable Voltage Range                | 20.4 to 28.8V DC                    |               |               |               |
| Connector on Mother Board              | MC1.5/11-G-3.81BK (Phoenix Contact) |               |               |               |
| Connector Insertion/Removal Durability | 100 times minimum                   |               |               |               |
| Internal Current Draw                  | 5V DC                               | 30mA          | 30mA          | 30mA          |
|  | 24V DC                              | 0mA           |               |               |
| External Current Draw *                | 50mA (24V DC)                       | 40mA (24V DC) | 25mA (24V DC) | 75mA (24V DC) |
| Weight                                 | 140g                                | 140g          | 125g          | 110g          |

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



Analog Input Specifications (1)

| Part Number  |   | FC4A-L03A1, FC4A-J2A1   |                            | FC4A-L03AP1   |   |
|--|---|---|----------------------------|---|---|
| Input Signal   |   | Voltage Input<br>0 to 10V   | Current Input<br>4 to 20mA | Thermocouple<br>Type K (0 to 1300°C)<br>Type J (0 to 1200°C)<br>Type T (0 to 400°C) | Resistance<br>Thermometer<br>Pt100 3-wire type<br>(-100 to 500°C) |
| Input Impedance  |   | 1 MΩ minimum  | 10Ω                        | 1 MΩ minimum  | 1 MΩ minimum  |
| Allowable Conductor Resistance (per wire)              |   | —   | —                          | —   | 200Ω maximum  |
| Input Detection Current                                |   | —   | —                          | —   | 1.0mA maximum   |
| Sampling Duration Time                                 |   | 20ms maximum  |                            | 20ms maximum  |   |
| Sampling Repetition Time                               |   | 20ms maximum  |                            | 20ms maximum  |   |
| Total Input System Transfer Time                       |   | 105ms + 1 scan time   |                            | 200ms + 1 scan time   |   |
| Input  |   | Single-ended  | Differential               |   |   |
| 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 reference junction compensation accuracy (±4°C maximum)    | ±0.2% of full scale   |
|  | 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   |                            |   |   |
| Digital Resolution                                     |   | 4096 increments (12 bits)   |                            |   |   |
| Output Value of LSB                                    |   | 2.5mV   | 4μA                        | Type K: 0.325°C<br>Type J: 0.300°C<br>Type T: 0.100°C                               | 0.15°C  |
| Data Type in Application Program                       |   | Default: 0 to 4095 (12-bit data)<br>Optional: -32768 to 32767 (optional range designation) <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 and I/O wiring                            |                            |   | Accuracy is not assured when noise is applied.                    |
|  | Input Filter  | No  |                            |   |   |
|  | Cable   | Twisted pair shielded cable is recommended for improved noise immunity                                  |                            | —   |   |
|  | Crosstalk   | 2 LSB maximum   |                            |   |   |
| Dielectric Strength                                    |   | 500V (between input and power circuit)  |                            |   |   |
| Type of Protection                                     |   | Photocoupler-isolated (between input and internal circuit)  |                            |   |   |
| Effect of Improper Input Connection                    |   | No damage   |                            |   |   |
| Maximum Permanent Allowed Overload (No Damage)         |   | 13V DC  | 40mA                       | —   |   |
| Selection of Analog Input Signal                       |   | Using software programming  |                            |   |   |
| Calibration or Verification to Maintain Rated Accuracy |   | N/A   |                            |   |   |

1: The 12-bit data (0 to 4095) processed in the analog I/O module can be linear-converted to a value between -32768 and 32767. The optional range designation, and analog I/O data minimum and maximum values can be selected using data registers allocated to analog I/O modules.  
2: When an error is detected, a corresponding error code is stored to a data register allocated to analog I/O operating status.

**Analog Input Specifications (2)**

| Part Number                      | FC4A-J4CN1, FC4A-J8C1  |  | FC4A-J4CN1   |  | FC4A-J8AT1  |  |  |
|----------------------------------|--|--|--|--|---|--|--|
| Input Signal                     | Voltage Input  | Current Input  | Thermocouple   | Resistance Thermometer   | NTC Thermistor  | PTC Thermistor   |  |
| Input Range                      | 0 to 10V   | 4 to 20mA  | Type K (0 to 1300°C)<br>Type J (0 to 1200°C)<br>Type T (0 to 400°C)  | Pt100, Pt1000 3-wire type (–100 to 500°C)<br>Ni100, Ni1000 3-wire type (–60 to 180°C)  | –50 to +150°C   |  |  |
| Input Impedance                  | 1 MΩ minimum   | 12 Ω (FC4A-J4CN1)<br>100Ω (FC4A-J8C1)                                  | 0.9 MΩ minimum   | —  | —   |  |  |
| Input Detection Current          | —  | —  | —  | 0.1mA  | 0.1mA   |  |  |
| Sampling Duration Time           | FC4A-J4CN1: 5ms maximum  |  | FC4A-J8C1: 1ms maximum   |  | FC4A-J8AT1: 1ms maximum   |  |  |
| Sampling Repetition Time         | FC4A-J4CN1: 5ms maximum  |  | FC4A-J8C1: 1ms maximum   |  | FC4A-J8AT1: 10ms × channels   |  |  |
| Total Input System Transfer Time | FC4A-J4CN1: 40ms/ch + 1 scan time  |  | FC4A-J8C1: 6ms/ch + 1 scan time  |  | FC4A-J8AT1: 10ms/ch + 1 scan time   |  |  |
| 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  | —  |  | ±0.005% of full scale /°C  |   |  |  |
|                                  | Plus Reference Junction Compensation Accuracy  | —  | —  | —  | ±2°C maximum  |  |  |
|                                  | Temperature Coefficient  | ±0.005% of full scale/°C   |  |  |   |  |  |
|                                  | Repeatability after Stabilization Time   | ±0.5% of full scale  |  |  |   | ±0.5% of full scale /°C  |  |
|                                  | Non-linearity  | ±0.04% of full scale   |  |  |   | Non-linear   |  |
|                                  | Maximum Error  | ±1% of full scale  |  |  |   | ±1% of full scale  |  |
| Digital Resolution               | 50000 increments (16 bits)   |  | Type K: Approx. 24000 increments (15 bits)<br>Type J: Approx. 33000 increments (15 bits)<br>Type T: Approx. 10000 increments (14 bits) | Pt100: Approx. 6400 increments (13 bits)<br>Pt1000: Approx. 64000 increments (16 bits)<br>Ni100: Approx. 4700 increments (13 bits)<br>Ni1000: Approx. 47000 increments (16 bits) | Approx. 4000 increments (12 bits)   |  |  |
| Output Value of LSB              | 0.2mV  | 0.32μA   | 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   | 30Ω   |  |  |
| Data Type in Application Program | Default: 0 to 50000<br>Optional: –32768 to 32767 (optional range designation) <sup>2</sup>             |  |  |  | Default: 0 to 4000<br>Optional: –32768 to 32767 (optional range designation) <sup>1</sup> |  |  |
|                                  | —  |  | Temperature: °C, °F  |  | Temperature: C, °F  | —  |  |
| Monotonicity                     | Yes  |  |  |  |   |  |  |
| Input Data Out of Range          | Detectable   |  |  |  |   |  |  |
| Noise Resistance                 | Maximum Temporary Deviation during Electrical Noise Tests  | Accuracy is not assured when noise is applied.                         |  |  |   |  |  |
|                                  | Input Filter   | Software selectable  |  |  |   |  |  |
|                                  | Cable  | Twisted pair shielded cable is recommended for improved noise immunity |  | —  |   | Twisted pair shielded cable is recommended for improved noise immunity |  |
|                                  | Crosstalk  | 2 LSB maximum  |  |  |   |  |  |
| Isolation                        | Between input and power circuit: Isolated<br>Between input and internal circuit: Photocoupler-isolated |  |  |  |   |  |  |

**PLCs**
**Operator Interfaces**
**Automation Software**
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|  |                            |         |   |   |
|--|----------------------------|---------|---|---|
| Effect of Improper Input Connection                    | No damage                  |         |   |   |
| Maximum Permanent Allowed Overload (No Damage)         | 11V DC                     | 22mA DC | — | — |
| Selection of Analog Input Signal                       | Using software programming |         |   |   |
| Calibration or Verification to Maintain Rated Accuracy | N/A                        |         |   |   |

- 1: The 16-bit data (0 to 50000) processed in the analog I/O module can be linear-converted to a value between -32768 and 32767. The optional range designation, and analog I/O data minimum and maximum values can be selected using data registers allocated to analog I/O modules.
- 2: When an error is detected, a corresponding error code is stored to a data register allocated to analog I/O operating status.

**Analog Output Specifications**

| Part Number  | FC4A-L03A1  | FC4A-L03AP1  | FC4A-K1A1          | FC4A-K2C1                   |
|--|---|--|--------------------|-----------------------------|
| Output Voltage   | 0 to 10V DC   |  |                    | -10 to +10V DC              |
| Output Range   | 4 to 20mA   |  |                    |                             |
| Load Impedance   | Voltage Output: 2kΩ minimum<br>Current Output: 300kΩ maximum        |  |                    |                             |
| Load   | Resistive load  |  |                    |                             |
| Settling Time  | 50ms  | 130ms  | 50ms               | 1ms/ch                      |
| Total Output Transfer Time                             | 50ms + 1 scan time  | 130ms + 1 scan time  | 50ms + 1 scan time | 1ms × channels+ 1 scan time |
| Output Error   | Maximum Error at 25× C  | ±0.2% of full scale  |                    |                             |
|  | Temperature Coefficient   | ±0.015% 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   | 1 LSB maximum  |                    |                             |
|  | Overshoot   | 0%   |                    |                             |
|  | Total Error   | ±1% of full scale  |                    |                             |
| Digital Resolution                                     | 4096 increments (12 bits)   |  |                    | 50000 increments (16 bits)  |
| Output Value of LSB                                    | Voltage   | 2.5mV  |                    | 0.4mV                       |
|  | Current   | 4μA  |                    | 0.32μA                      |
| Data Type in Application Program                       | Default: 0 to 4095 (standard)                                       |  |                    | -25000 to 25000 (voltage)   |
|  | Optional: -32768 to 32767 (optional range designation) <sup>1</sup> |  |                    |                             |
| Monotonicity   | Yes   |  |                    |                             |
| Current Loop Open                                      | Undetectable  |  |                    |                             |
| Noise Resistance                                       | Maximum Temporary Deviation during Electrical Noise Tests           | ±3% maximum when a 500V clamp voltage is applied to the power and I/O wiring |                    | Not assured                 |
|  | Cable   | Twisted pair shielded cable is recommended for improved noise immunity       |                    | Twisted pair cable          |
|  | Crosstalk   | None   |                    | 2 LSB maximum               |
| Isolation  | Between output and power circuit                                    | 500V   |                    | Isolated                    |
|  | Between output and internal circuit                                 | Photocoupler-isolated  |                    |                             |
| Effect of Improper Output Connection                   | No damage   |  |                    |                             |
| Selection of Analog Output Signal                      | Using software programming  |  |                    |                             |
| Calibration or Verification to Maintain Rated Accuracy | N/A   |  |                    |                             |

- 1: The 12-bit data (0 to 4095) processed in the analog I/O module can be linear-converted to a value between -32768 and 32767. The optional range designation, and analog I/O data minimum and maximum values can be selected using data registers allocated to analog I/O modules.

PLCs

Operator Interfaces

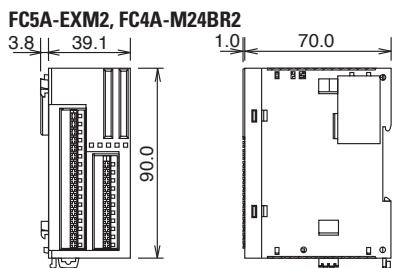
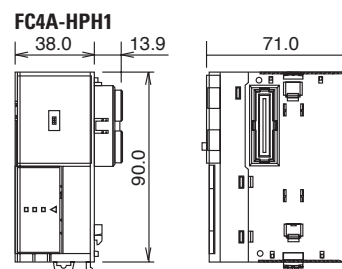
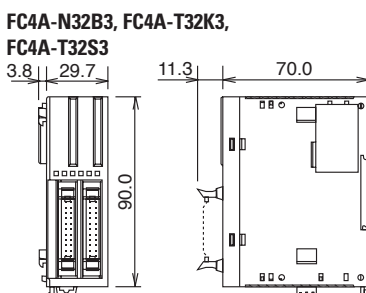
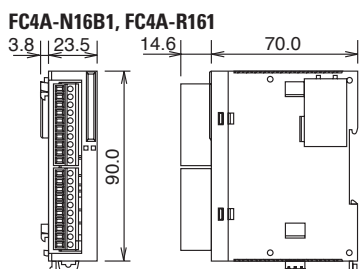
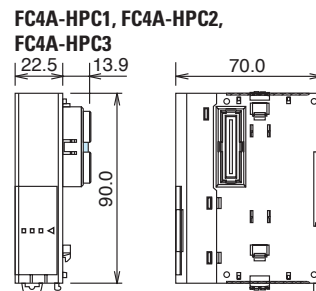
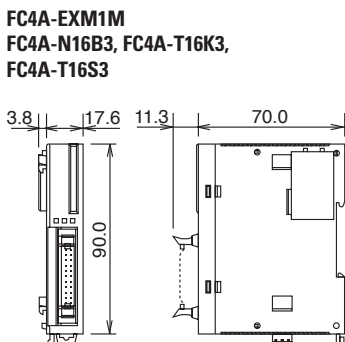
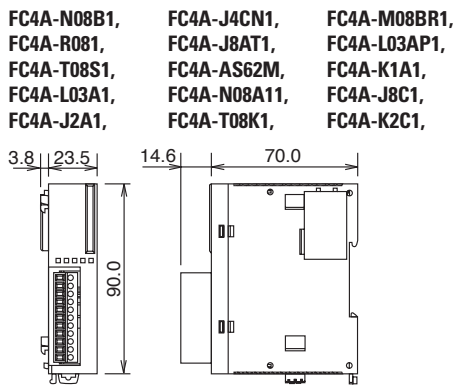
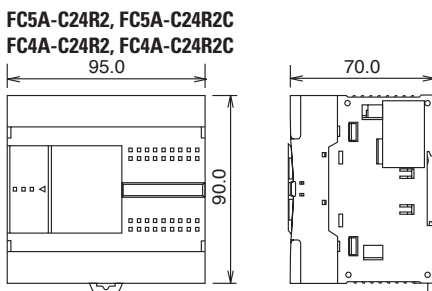
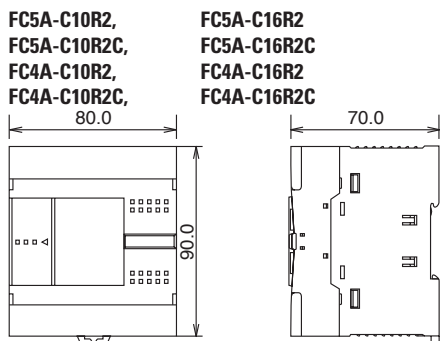
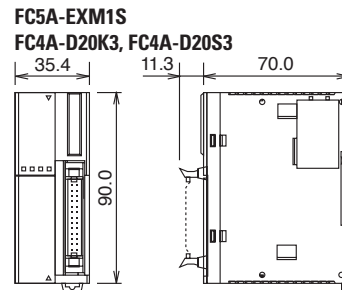
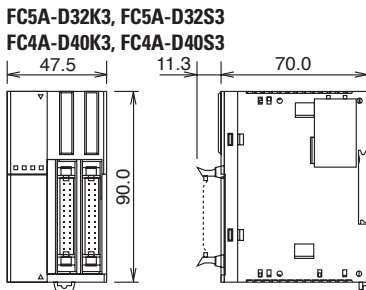
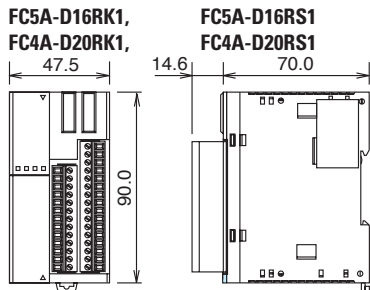
Automation Software

Power Supplies

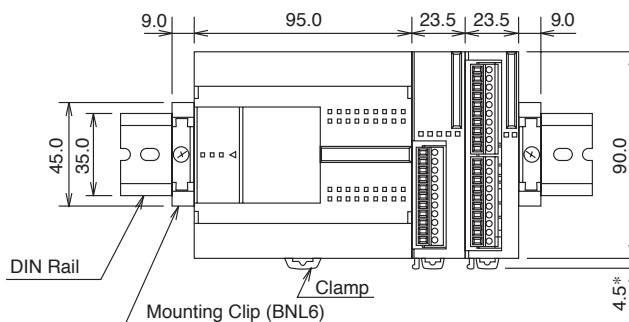
Sensors

Communication & Networking

Dimensions (mm)



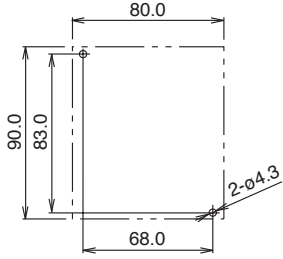
Example



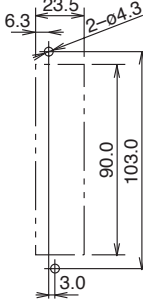
The figure illustrates a system setup consisting of the all-in-one 24-I/O CPU module, an 8-point relay output module, and a 16-point DC input module mounted on a 35-mm-wide-DIN rail using BNL6 mounting clips.

Mounting Hole Layout (mm)

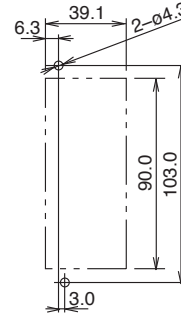
FC5A-C10R2, FC5A-C16R2  
 FC5A-C10R2C, FC5A-C16R2C  
 FC4A-C10R2, FC4A-C16R2  
 FC4A-C10R2C, FC4A-C16R2C



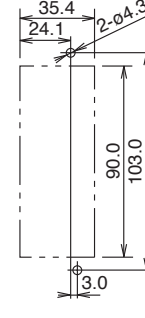
FC4A-N08A11, FC4A-R081  
 FC4A-R161, FC4A-T08K1  
 FC4A-T08S1, FC4A-M08BR1  
 FC4A-L03A1, FC4A-L03AP1  
 FC4A-J2A1, FC4A-K1A1  
 FC4A-J4CN1, FC4A-T8C1  
 FC4A-J8AT1, FC4A-K2C1



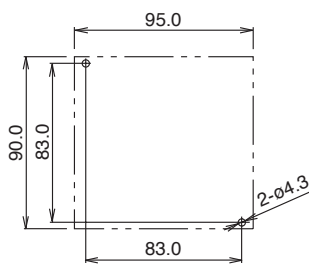
FC5A-EXM2  
 FC4A-M24BR2



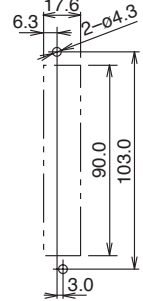
FC5A-EXM1S, FC4A-D20K3  
 FC4A-D20S3



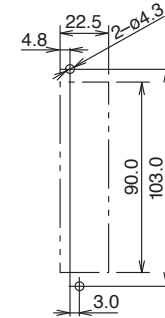
FC5A-C24R2, FC4A-C24R2C  
 FC4A-C24R2, FC4A-C24R2C



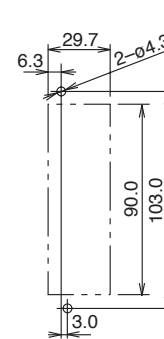
FC5A-EXM1M  
 FC4A-N16B3, FC4A-T16K3,  
 FC4A-T16S3



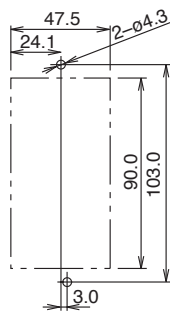
FC4A-HPC1 FC4A-HPC2  
 FC4A-HPC3



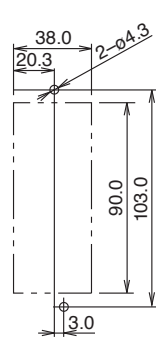
FC4A-N32B3, FC4A-T32K3,  
 FC4A-T32S3



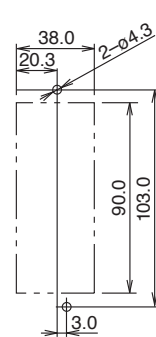
FC5A-D16RK1  
 FC5A-D16RS1  
 FC5A-D32K3  
 FC5A-D32S3  
 FC4A-D20RK1  
 FC4A-D20RS1  
 FC4A-D40K3  
 FC4A-D40S3



FC4A-HPH1

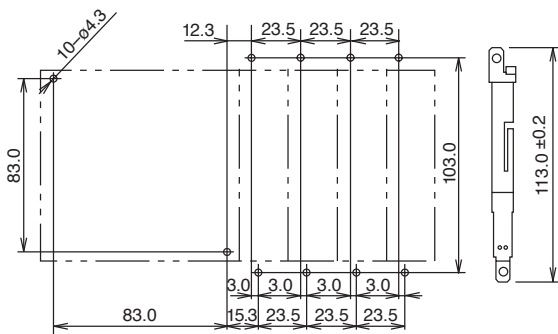


FC4A-HPH1



Examples

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



Mounting hole layout from left, FC4A-HPH1, FC4A-D20K3, FC4A-N16B3, FC4A-N32B3, and FC4A-M24BR2 modules

