Think Automation and beyond...

IDEC

MICROSmart pentra

FC5A
Micro Programmable Logic Controller

New 12V DC Power Type CPU Module for MICROSmart

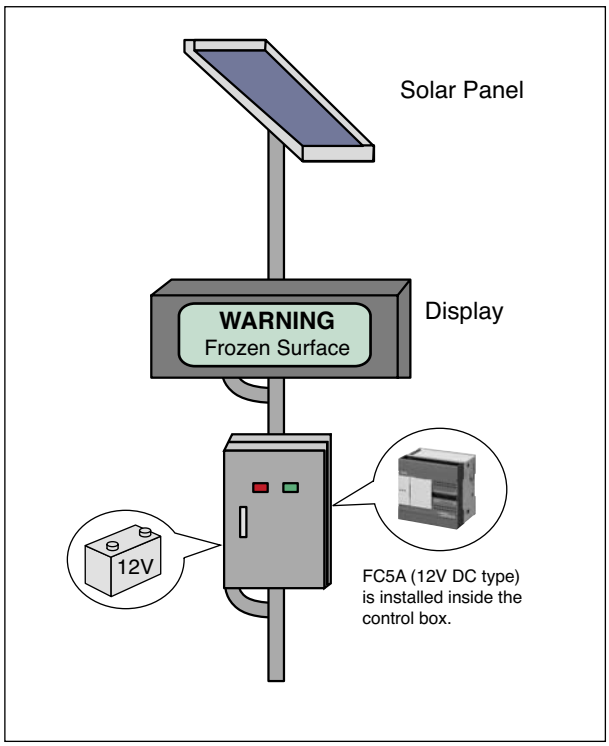
New

CPU can be powered by 12V DC battery.

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

Application Examples

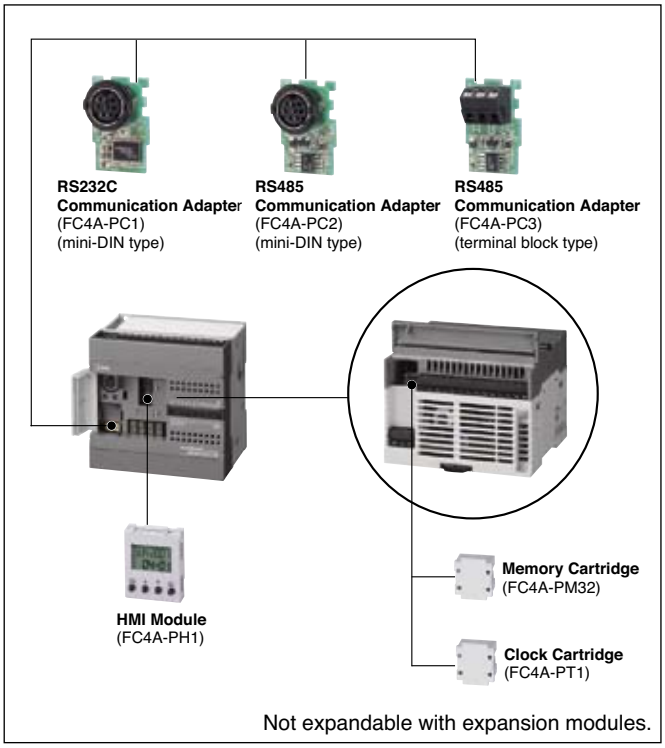
• Powered by Battery



• Other applications

Control battery-driven traffic signals, warning lights, ATM surveillance systems, access alarms at construction sites, etc.

Customize according to your requirements



Not expandable with expansion modules.

Specifications (CPU Modules)

·General Specifications

Type No.	FC5A-C10R2D	FC5A-C16R2D	FC5A-C24R2D
Rated Power Voltage	12V DC		
Allowable Voltage Range	10.2 to 18.0V DC		
Maximum Power Consumption	28W	3.4W	4.2W
Allowable Momentary Power Interruption	10 ms (at rated power voltage)		
Dielectric Strength	Between power and ⏚ terminals: 1,500V AC, 1 minute Between I/O and ⏚ terminals: 1,500V AC, 1 minute		
Insulation Resistance	Between power and ⏚ terminals: 10 MΩ minimum (500V DC megger) Between I/O and ⏚ terminals: 10 MΩ minimum (500V DC megger)		
Noise Resistance	DC power terminals: 1.0 kV, 50 ns to 1 μs I/O terminals (coupling clamp): 1.5 kV, 50 ns to 1 μs		
Inrush Current	20A maximum		
Power Supply Wire	UL1015 AWG22, UL1007 AWG18		
Operating Temperature	0 to +55ºC		
Storage Temperature	–25 to +70ºC (no freezing)		
Relative Humidity	10 to 95% (no condensation)		
Altitude	Operation: 0 to 2,000m, Transport: 0 to 3,000m		
Pollution Degree	2 (IEC60664-1)		
Corrosion Immunity	Free from corrosive gases		
Grounding Wire	UL1007 AWG16		
Vibration Resistance	When mounted on a DIN rail or panel surface: 5 to 9 Hz amplitude 3.5 mm, 9 to 150 Hz acceleration 9.8 m/s^2 (1G), 2 hours per axis on each of three mutually perpendicular axes (IEC61131-2)		
Shock Resistance	147 m/s^2 (15G), 11 ms duration, 3 shocks per axis on three mutually perpendicular axes (IEC61131-2)		
Weight	240g	260g	310g

·Communication Port (RS232C, port 1)

Standards	EIA RS232C
Maximum Baud Rate	57600 bps (maintenance communication)
Maintenance Communication	Possible
User Communication	Possible
Data Link Communication	Impossible
Cable	FC2A-KC4C, FC2A-KP1C, FC4A-KP1C, FC4A-KC2C
Isolation between Internal Circuit and Communication Port	Not isolated

·Function Specifications

Type No.		FC5A-C10R2D	FC5A-C16R2D	FC5A-C24R2D
Control System		Stored program system		
Instruction Words		42 basic		
		103 advanced	130 advanced	115 advanced
Program Capacity ∗1		13.8 KB (2,300 steps)	27 KB (4,500 steps)	54 KB (9,000 steps)
User Program Storage		EEPROM (10,000 times rewritable)		
Processing Time	Basic Instruction	1.16 ms (1,000 steps)		
	END Processing ∗2	0.64 ms		
Max. I/O Points ∗3	Input	6	9	14
	Output	4	7	10
Internal Relay		2,048 points		
Shift Register		128 points		
Timer		256 points (1-sec, 100-ms, 10-ms, 1-ms)		
Counter		256 points (adding, reversible)		
Data Register		2,000 points		
RAM Backup	Backup Data	Internal relay, shift register, counter, data register		
	Backup Duration	Approx. 30 days (typical) at 25ºC after backup battery fully charged		
	Battery	Lithium secondary battery		
	Charging Time	Approx. 15 hours for charging from 0% to 90% of full charge		
	Battery Life	5 years in cycles of 9-hour charging and 15-hour discharging		
	Replaceability	Not possible to replace battery		
Self-diagnostic Function		Keep data check, user program EPPROM sum check, user program RAM sum check, timer/counter preset value sum check, user program syntax, WDT check, user program writing, power failure, watchdog timer, data link connection		
Input Filter		Without filter, 3 to 15 ms (selectable in increments of 1 ms)		
Catch Input/ Interrupt Input		Four inputs (I2 through I5) Minimum turn on pulse width: 40 μs maximum Minimum turn off pulse width: 150 μs maximum		
High-speed Counter	Maximum Counting Frequency and High-speed Counter Points	Total 4 points Single/two-phase selectable: 50 kHz (1 point) Single-phase: 5 kHz (3 points)		
	Counting Range	0 to 65535 (16 bits)		
	Operation Mode	Rotary encoder mode, adding counter mode		
Analog Potentiometer	Quantity	1 point		2 points
	Data Range	0 to 255		
Port 1		RS232C – maintenance communication, user communication, Modbus slave communication		
Port 2 Communication Adapter (option) ∗4		Possible	Possible	Possible
Clock Cartridge (option)		Possible	Possible	Possible
Memory Cartridge (option)		Possible	Possible	Possible
HMI Module (option)		Possible	Possible	Possible

∗1: 1 step equals 6 bytes.
∗2: Not including clock function processing time, data link processing time, and interrupt processing time.
∗3: Not expandable with expansion I/O modules.
∗4: Maintenance communication, user communication, Modem communication, data link, Modbus master/slave communication.

• Input Specifications

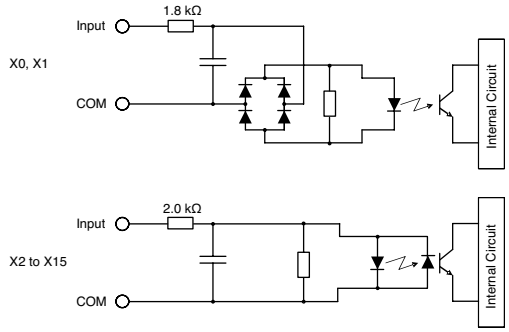
Type No.	FC5A-C10R2D	FC5A-C16R2D	FC5A-C24R2D
Input Points	6 (6/1 common)	9 (9/1 common)	14 (14/1 common)
Rated Input Voltage	12V DC sink/source input signal		
Input Voltage Range	10.2 to 18V DC		
Rated Input Current	I0 and I1: 6 mA I2 to I7, I10 to I15: 6 mA		
Input Impedance	I0 and I1: 1.8 kΩ I2 to I7, I10 to I15: 2.0 kΩ		
Turn ON Time	I0 and I1: 2 μs + filter value I2 to I5: 35 μs + filter value I6, I7, I10 to I15: 40 μs + filter value		
Turn OFF Time	I0 and I1: 16 μs + filter value I2 to I5: 150 μs + filter value I6, I7, I10 to I15: 150 μs + filter value		
Isolation	Between input terminals: Not isolated Internal circuit: Photocoupler isolated		
Input Type	Type 1 (IEC61131-2)		
External Load for I/O Interconnection	Not needed		
Single Determination Method	Static		
Effect of Improper Input Connection	Both sinking and sourcing input signals can be connected. If any input exceeding the rated value is applied, permanent damage may be caused.		
Cable Length	3m in compliance with electromagnetic immunity		

• Relay Output Specifications

Type No.		FC5A-C10R2D	FC5A-C16R2D	FC5A-C24R2D
No. of Outputs		4	7	10
Output Points per Common Line	COM0	3	4	4
	COM1	1	2	4
	COM2	—	1	1
	COM3	—	—	1
Output Type		1NO		
Maximum Load Current		2A per point 8A per common line		
Minimum Switching Load		0.1 mA/0.1V DC (reference value)		
Initial Contact Resistance		30 mΩ maximum		
Electrical Life		100,000 operations minimum (rated load 1,800 operations/hour)		
Mechanical Life		20,000,000 operations minimum (no load 18,000 operations/hour)		
Rated Load		240V AC/2A (resistive load, inductive load cos ø = 0.4) 30V DC/2A (resistive load, inductive load L/R =7 ms)		
Dielectric Strength		Between output and ⏚ terminals: 1,500V AC, 1 minute Between output terminal and internal circuit: 1,500V AC, 1 minute Between output terminals (COMs): 1,500V AC, 1 minute		

For information on communication adapter, HMI module, memory cartridge, and clock cartrige, see catalog No. EP1203.

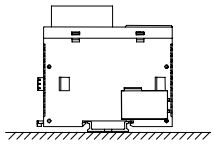
Input Internal Circuit



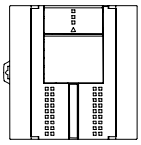
Installation

- When the CPU module is mounted in the standard upright position, all I/O points can be turned on simultaneously at up to 55ºC operating temperature.
- The CPU module can be installed facing upwards when the operating temperature is below 35ºC or sideways when the operating temperature is below 40ºC.

Upwards
Operating temperature below 35ºC

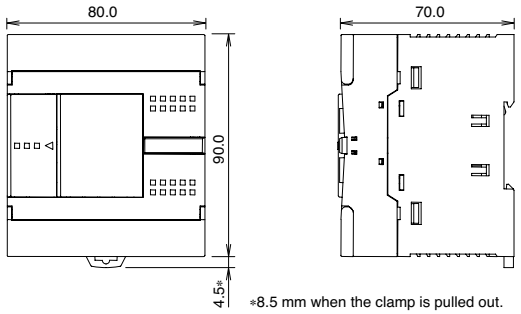


Sideways
Operating temperature below 40ºC



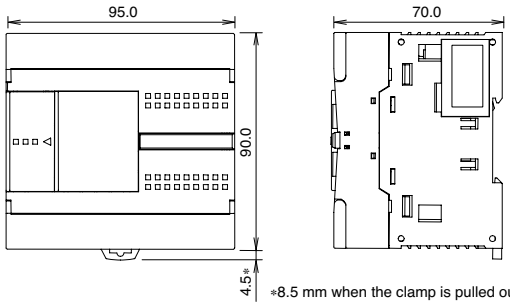
Dimensions

• FC5A-C10R2D, FC5A-C16R2D



*8.5 mm when the clamp is pulled out.

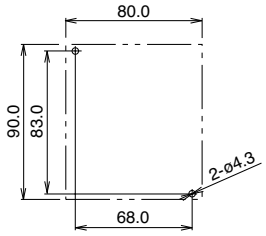
• FC5A-C24R2D



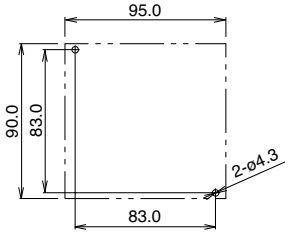
*8.5 mm when the clamp is pulled out.

Mounting Hole Layout

• FC5A-C10R2D FC5A-C16R2D



• FC5A-C24R2D



All dimensions in mm.

MICROSmart FC5A 12V DC Power Type CPU Module

Types

• FC5A CPU Modules (12V DC Power) Package Quantity: 1

Type	High-speed Counter Pulse Input	Power Voltage	Input Type	Output Type	I/O Points	Type No.
All-in-One	High-speed counter Maximum input frequency: 50 kHz	12V DC	12V DC (sink/source)	Relay output 2A 240V AC, 2A 30V DC, 2A	6/4 points	FC5A-C10R2D
					9/7 points	FC5A-C16R2D
					14/10 points	FC5A-C24R2D

• Web Server Module Package Quantity: 1

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

• HMI Module Package Quantity: 1

Type	Type No.
HMI Module	FC4A-PH1

• Programming Software Package Quantity: 1

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

• Option

Name		Type No.
Communication Adapter	RS232C, Mini DIN	FC4A-PC1
	RS485, Mini DIN	FC4A-PC2
	RS485, Terminal Block	FC4A-PC3
Clock Cartridge		FC4A-PT1
Memory Cartridge	32KB	FC4A-PM32
	64KB	FC4A-PM64
RS232C/RS485 Converter		FC2A-MD1
AC Adapter		PFA-1A31
35-mm-wide DIN Rail	Aluminium (package quantity 10)	BAA1000PN10
	Steel (package quantity 10)	BAP1000PN10
End Clip (package quantity 10)		BNL6PN10
FC5A User's Manual*		FC9Y-B927
Computer Link Cable 4C (3m long)		FC2A-KC4C
Modem Cable 1C (3m long)		FC2A-KM1C
User Communication Cable 1C (2.4m long)		FC2A-KP1C
O/I Communication Cable 1C (5m long) for connecting HG1F to MicroSmart port 1 and 2		FC4A-KC1C
O/I Communication Cable (3m long) for connecting HG1F to MicroSmart port 2		HG9Z-XC183
O/I Communication Cable 2C (5m long) for connecting HG2F/3F4F to MicroSmart port 1 and 2		FC4A-KC2C
O/I Communication Cable (5m long) for connecting HG2F/3F4F to MicroSmart port 2		HG9Z-3C125

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

MICROSmart pentra FC5A MICROSmart FC4A Micro Programmable Logic Controllers

High Performance MicroSmart FC4A/FC5A Solves Various Applications
FC5A with IDEC Logic Engine acheives world class processing speed

Programming and Monitoring Software WindLDR Ver.5.*

See catalog no. EP1203 for details

• CPU Module (FC5A)

Type	Type No.	I/O Points
Slim Type (DC power type)	FC5A-D16RK1	8/8 points
	FC5A-D16RS1	8/8 points
	FC5A-D32K3	16/16 points
	FC5A-D32S3	16/16 points
All-in-One Type (AC power type)	FC5A-C10R2	6/4 points
	FC5A-C16R2	9/7 points
	FC5A-C24R2	14/10 points
All-in-One Type (24V DC power type)	FC5A-C10R2C	6/4 points
	FC5A-C16R2C	9/7 points
	FC5A-C24R2C	14/10 points

(FC4A)

Type	Type No.	I/O Points
Slim Type (DC power type)	FC4A-D20K3	12/8 points
	FC4A-D20S3	12/8 points
	FC4A-D20RK1	12/8 points
	FC4A-D20RS1	12/8 points
	FC4A-D40K3	24/16 points
	FC4A-D40S3	24/16 points
All-in-One Type (AC power type)	FC4A-C10R2	6/4 points
	FC4A-C16R2	9/7 points
	FC4A-C24R2	14/10 points
All-in-One Type (DC power type)	FC4A-C10R2C	6/4 points
	FC4A-C16R2C	9/7 points
	FC4A-C24R2C	14/10 points

• Expansion I/O Module

Module	I/O Points	Variations
Input Modules	8 points	2 types
	16 points	2 types
	32 points	1 types
Output Modules	8 points	3 types
	16 points	3 types
	32 points	2 types
Mixed I/O Modules	4/4 points	1 types
	16/8 points	1 types
Analog Modules	2/1 points	2 types
	2 inputs	1 types
	1 output	1 types
	8 inputs	2 types
	4 inputs	1 types
	2 outputs	1 types

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

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