IDEC

MicroSmart Pentra 12V DC CPU Module

New 12V DC Model

Features

- 3 CPUs to choose from
  -10 I/O, 16 I/O, 24 I/O
- Fast processing speed
- Built-in Modbus RTU, ASCII and TCP/IP
- Support 32-bit and floating point math
- Four built-in high speed inputs
  -1pt: 50kHz single/dual phase
  -3pts: 5kHz single phase
- Field upgradeable firmware

Applications

- Solar industry
  -solar traffic control & lighting
  -remote solar pumping stations (oil & gas industry)
  -remote solar injection systems (oil & gas industry)
  -solar water pumping stations
  -solar trackers
- Vehicle/automotive
  -handicap lifts, garbage trucks, bus/train lighting & signage, cement truck mixers

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Specifications

General Specifications

Part Number	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, port1)

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-KC2CA
Isolation between Internal Circuit and Communication Port	Not isolated

Notes:
1. Port 1 is modbus slave.
2. Port 2 is modbus master/slave.
3. **12V DC CPUs are not expandable.**

Function Specifications

Part Number		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

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Input Specifications

Part Number	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

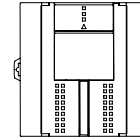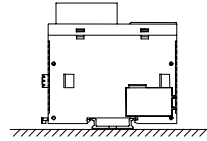| Part Number		FC5A-C10R2D	FC5A-C16R2D	FC5A-C24R2D
No. of Outputs		4	7	10
Output Points per Common Line	COM0	3	4	4
	COM1	1	2	4
	COM2	—	1	1
	COM3	—	—	1
Output Type		1NO		
Maximum Load Current		2A per point 8A per common line		
Minimum Switching Load		0.1 mA/0.1V DC (reference value)		
Initial Contact 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		

Input Internal Circuit
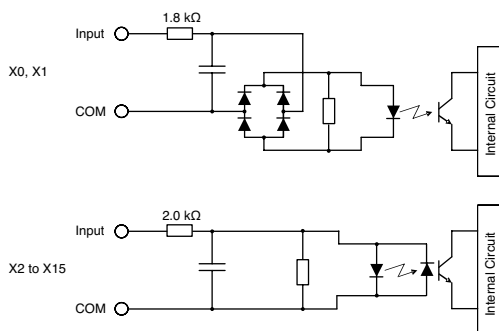
Installation

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.
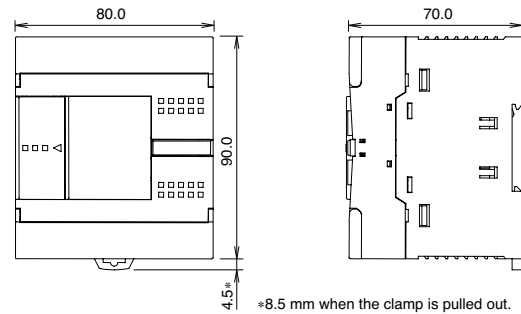
Mounting CPU Facing Up
Operating temperature below 35ºC

Mounting CPU Sideways
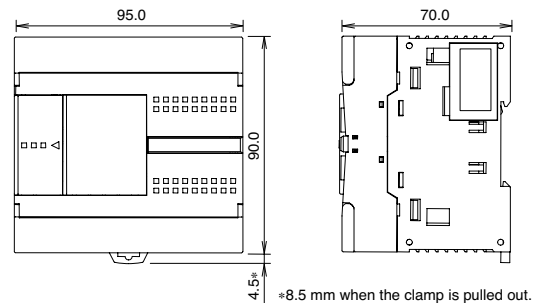Operating temperature below 40ºC
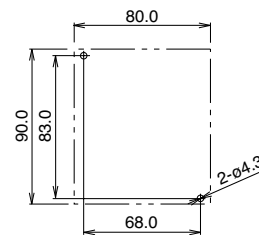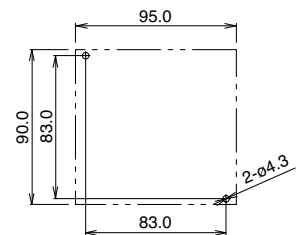

Dimensions

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.

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