

## Analog I/O Module Specifications

## General Specifications (END Refresh Type)

Type No.	FC4A-L03A1	FC4A-L03AP1	FC4A-J2A1	FC4A-K1A1
Rated Power Voltage	24V DC			
Allowable Voltage Range	20.4 to 28.8V DC			
Terminal Arrangement	See Analog I/O Module Terminal Arrangement on pages 2-64 to 2-67.			
Connector on Mother Board	MC1.5/11-G-3.81BK (Phoenix Contact)			
Connector Insertion/Removal Durability	100 times minimum			
Internal Current Draw	50 mA (5V DC) 0 mA (24V DC)	50 mA (5V DC) 0 mA (24V DC)	50 mA (5V DC) 0 mA (24V DC)	50 mA (5V DC) 0 mA (24V DC)
External Current Draw (Note 1)	50 (45) mA (Note 2) (24V DC)	50 (40) mA (Note 2) (24V DC)	40 (35) mA (Note 2) (24V DC)	40 mA (24V DC)
Weight (Approx.)	100g (85g) (Note 2)			

**Note 1:** The external current draw is the value when all analog inputs are used and the analog output value is at 100%.

**Note 2:** Values in ( ) represent analog I/O modules earlier than version 200. For analog I/O module version, see page 2-56.

## General Specifications (Ladder Refresh Type)

Type No.	FC4A-J4CN1	FC4A-J8C1	FC4A-J8AT1
Rated Power Voltage	24V DC		
Allowable Voltage Range	20.4 to 28.8V DC		
Terminal Arrangement	See Analog I/O Module Terminal Arrangement on pages 2-64 to 2-67.		
Connector on Mother Board	MC1.5/10-G-3.81BK (Phoenix Contact)		
Connector Insertion/Removal Durability	100 times minimum		
Internal Current Draw	50 mA (5V DC) 0 mA (24V DC)	40 mA (5V DC) 0 mA (24V DC)	45 mA (5V DC) 0 mA (24V DC)
External Current Draw (Note)	55 mA (24V DC)	50 mA (24V DC)	55 mA (24V DC)
Weight	140g	140g	125g

Type No.	FC4A-K2C1	FC4A-K4A1
Rated Power Voltage	24V DC	
Allowable Voltage Range	20.4 to 28.8V DC	
Terminal Arrangement	See Analog I/O Module Terminal Arrangement on pages 2-64 to 2-67.	
Connector on Mother Board	MC1.5/10-G-3.81BK (Phoenix Contact)	MC1.5/11-G-3.81BK (Phoenix Contact)
Connector Insertion/Removal Durability	100 times minimum	
Internal Current Draw	60 mA (5V DC) 0 mA (24V DC)	65 mA (5V DC) 0 mA (24V DC)
External Current Draw (Note)	85 mA (24V DC)	130 mA (24V DC)
Weight (Approx.)	110g	100g

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

## 2: MODULE SPECIFICATIONS

### Analog Input Specifications (Ladder Refresh Type)

Type No.	FC4A-J8AT1	
Analog Input Signal Type	NTC Thermistor	PTC Thermistor
Input Range	-50 to 150°C	
Applicable Thermistor	100 kΩ maximum	
Input Detection Current	0.1 mA	
AD Conversion	Sample Duration Time	2 ms maximum
	Sample Repetition Time	2 ms maximum
	Total Input System Transfer Time (Note 1)	10 ms × channels + 1 scan time (Note 1)
	Type of Input	Single-ended input
	Operating Mode	Self-scan
	Conversion Method	Successive approximation register method
Input Error	Maximum Error at 25°C	±0.2% of full scale
	Temperature Coefficient	±0.005% of full scale/°C
	Repeatability after Stabilization Time	±0.5% of full scale
	Non-linearity	No
	Maximum Error	±1% of full scale
Data	Digital Resolution	Approx. 4000 increments (12 bits)
	Input Value of LSB	25Ω
	Data Type in Application Program	Default: 0 to 4000 Optional: -32768 to 32767 (selectable for each channel) (Note 2) Temperature: Celsius, Fahrenheit (NTC only) Resistance: 0 to 10000
	Monotonicity	Yes
	Input Data Out of Range	Detectable (Note 3)
Noise Resistance	Maximum Temporary Deviation during Electrical Noise Tests	±3% maximum (when a 500V clamp voltage is applied to the power supply and I/O lines)
	Input Filter	Software
	Recommended Cable for Noise Immunity	—
	Crosstalk	2 LSB maximum
Isolation	Between input and power circuit: Transformer isolated Between input and internal circuit: Photocoupler-isolated	
Effect of Improper Input Connection	No damage	
Selection of Analog Input Signal Type	Using programming software	
Calibration or Verification to Maintain Rated Accuracy	Not possible	

**Note 1:** Total input system transfer time = Sample repetition time + Internal processing time  
The total input system transfer time increases in proportion to the number of channels used.

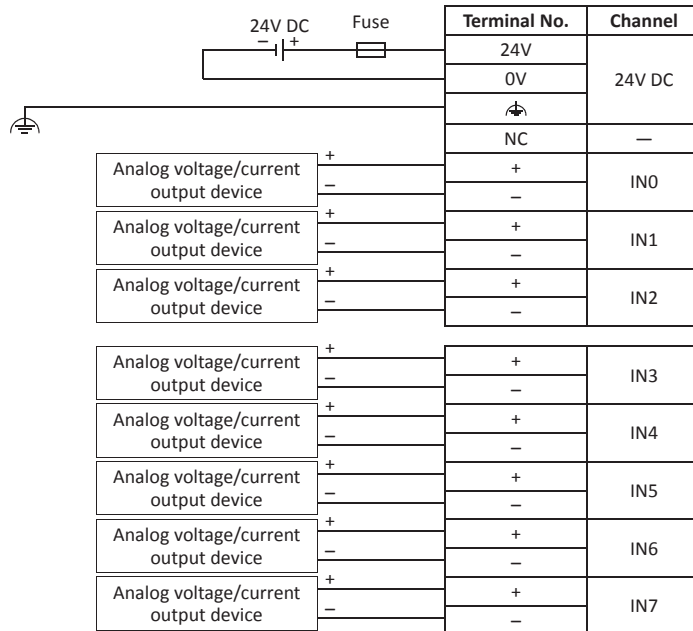
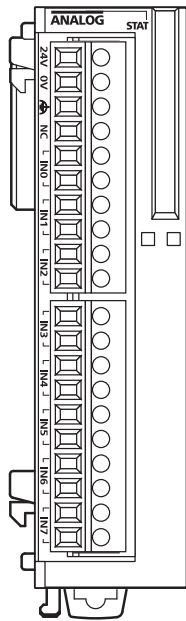
**Note 2:** The data processed in the analog I/O module can be linear-converted to a value between -32768 and 32767. The optional range designation, and analog I/O data minimum and maximum values can be selected using data registers allocated to analog I/O modules. See page 9-13.

**Note 3:** When an error is detected, a corresponding error code is stored to a data register allocated to analog I/O operating status. See page 9-7.

## 2: MODULE SPECIFICATIONS

### FC4A-J8C1 (Analog Input Module) — Screw Terminal Type

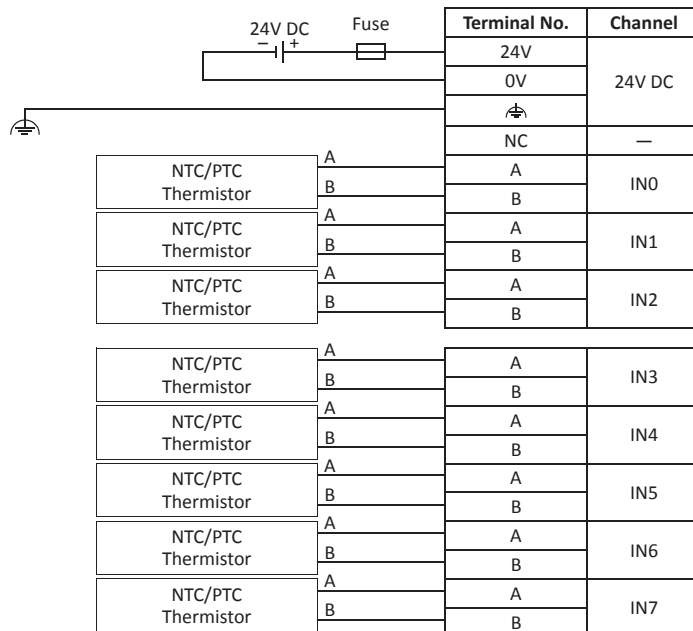
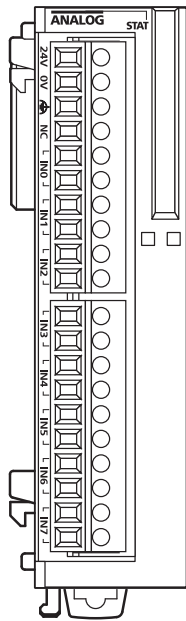
Applicable Terminal Block: **FC4A-PMT10P (supplied with the analog input module)**



- Connect a fuse appropriate for the applied voltage and current draw, at the position shown in the diagram. This is required when equipment containing the MicroSmart is destined for Europe.
- Do not connect any wiring to unused terminals.
- – terminals of input channels IN0 through IN7 are interconnected.
- When the analog I/O module may malfunction due to noise, use the shielded cable for the analog input and output and connect both ends of the shield to a ground.

### FC4A-J8AT1 (Analog Input Module) — Screw Terminal Type

Applicable Terminal Block: **FC4A-PMT10P (supplied with the analog input module)**



- Connect a fuse appropriate for the applied voltage and current draw, at the position shown in the diagram. This is required when equipment containing the MicroSmart is destined for Europe.
- Do not connect any wiring to unused terminals.
- When the analog I/O module may malfunction due to noise, use the shielded cable for the analog input and output and connect both ends of the shield to a ground.