General Specification

GS 34M6H11-03E

FA-M3
F3CX04-0N
Temperature Monitoring Module

FA-M3

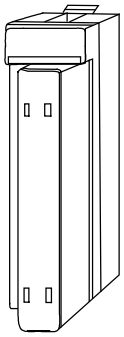
■ General

The F3CX04-0N is a temperature monitoring module for the FA-M3.

- It occupies a single slot but can monitor four channels of temperature inputs.
- It features both high speed and high performance. The input sampling period is 200 ms (for four channels).
  The input conversion accuracy is 0.1% of full scale, and the input resolution is 0.1°C.
- The inputs are of the universal input type. Thermocouple, RTD or DC voltage input signal type may be selected and connected for each channel.
- As input conditions and other data that are needed for temperature monitoring are stored in the module, no parameter setup is required at system startup.
- Individual input channels are isolated from each other, as well as from the internal circuit.

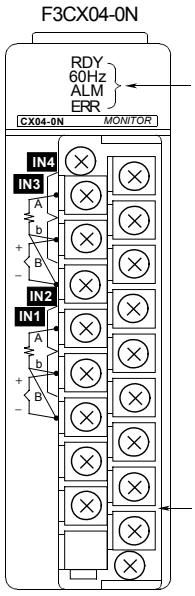
■ Model and Suffix Codes

Model	Suffix Code	Style Code	Option Code	Description
F3CX04	-0N	—	—	4 channels of universal input; single-slot size



■ Components and Functions

Front view



Status Indicators

RDY (green)
Lit when the internal circuit is functioning normally. Turns off when an error occurs in the module.

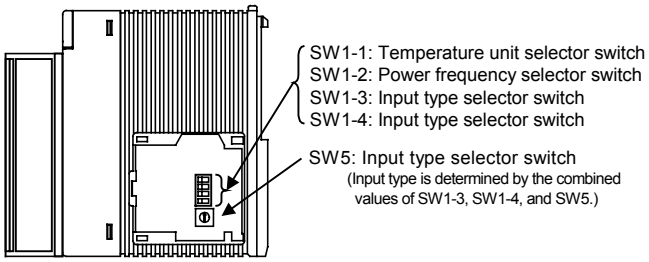
60 Hz (green)
Indicates the frequency of the commercial power supply,
Off: 50Hz; On: 60 Hz.

ALM (orange)
Lit when an alarm occurs in any channel.

ERR (red)
Lit or flashes when a hardware failure is detected or an error is detected in stored data.
Lit when an error is detected in system data, calibration values, ADC, RJC or EERPROM.
Flashes when a monitor, input or parameter error or burnout is detected.

Input terminal block
18-point detachable terminal block with M3.5 screws.

Right side view



Note: This is the right side view of the module with its cover removed.

■ Specifications

General Specifications

Item		Specification
		F3CX04-0N
Number of channels		4
Isolation	Between input terminals and internal circuit	Isolated by photocouplers and transformers (tested for 1500 V AC voltage withstanding)
	Between input terminals	
Alarm types		4 types of alarm: upper and lower limit alarms, with and without waiting.
Number of alarm outputs (input relays)		4 points per channel (output for each channel can be selected from any of the four alarm types above)
Alarm ON-delay function		Yes
Warm-up time		30 minutes min.
Max. allowable ambient temperature change rate*1		10°C/h max.
Mounting position		Horizontal or inverted orientation not allowed
External connection		18-point terminal block with M3.5 screws
External dimensions*2		28.9 (W) x 100 (H) x 106.1 (D) mm
Current consumption		440 mA at 5 V DC
Weight		200 g

*1: The stated accuracy for the reference junction compensation for thermocouple input is not guaranteed if this ambient temperature change rate is exceeded.
*2: Outside dimensions excluding protrusions (for details, see the Extension Dimensions diagram).

Input Specifications

Item			Specification
Input sampling period			200 ms per 4 CH, or 100 ms per 2 CH
Input types and ranges*1			Universal input (individual inputs separately configurable by software or collectively by hardware) Thermocouple input: 15 ranges RTD input: 9 ranges DC mV input: 2 ranges DC V input: 4 ranges
Input accuracy			± 0.1% of F.S.*1
Burnout detection			Thermocouples or RTDs are checked for burnout. Selectable as Upscale, Downscale or None.
	Detection current	Thermocouple	100 nA max.
		RTD	100 nA max.
Reference junction compensation	Thermocouple*2		± 2.0°C (0 to 55°C)
Measuring current	RTD		Approx. 270 µA
Allowable input wiring resistance	RTD		10 Ω max. per wire (three wires must have the same resistance)
Allowable signal source resistance	Thermocouple or DC mV input		250 Ω max.
	DC V input		2 kΩ max.
Input insulation resistance			1 MΩ min.
Allowable input voltage range			-20 to 20 V DC
Noise reduction*3	Common mode		120 dB (50/60 Hz)
	Normal mode		40 dB (50/60 Hz)
Effect of ambient temperature			Input stability: ± 0.01%/°C or ± 1µV/°C, whichever is greater

*1: See Table 1, “Instrument Range and Accuracy (for high resolution operation) 1/2”.
*2: This value assumes that all input and output terminals are correctly wired (that is, solderless termination, wiring, and connection are correct).
*3: This value assumes that the power supply frequency is correctly selected.

Table 1 Instrument Range and Accuracy (for high resolution operation with SW1-1 set to OFF) 1/4

Input Category	Input Type[*1]	Instrument Default Range[*2]	Input Type Selector Switch[*3] SW1-3	SW1-4	SW5	Software Setting	Accuracy[*4]	Resolution[*2]
Software setting (factory setting)			OFF	OFF	0	Instrument default ranges may be specified by software using one of the following codes.		
Thermocouple	K[*5]	-200.0 to 1370.0°C	OFF	OFF	1	1 ($01)	± 0.5°C[*5]	0.1°C[*5]
		-200.0 to 1000.0°C			2	2 ($02)	± 0.5°C[*5]	0.1°C[*5]
		-200.0 to 500.0°C			3	3 ($03)	± 0.5°C[*6]	0.1°C[*6]
	J	-200.0 to 1200.0°C			4	4 ($04)	± 0.5°C[*7]	0.1°C[*7]
		-200.0 to 500.0°C			5	5 ($05)	± 0.5°C[*8]	0.1°C[*8]
	T	-270.0 to 400.0°C			6	6 ($06)	± 0.5°C[*9]	0.1°C[*9]
	B[*10]	0.0 to 1600.0°C			7	7 ($07)	± 1.0°C[*10]	0.1°C[*10]
	S[*11]	0.0 to 1600.0°C			8	8 ($08)	± 1.0°C[*11]	0.1°C[*11]
	R[*11]	0.0 to 1600.0°C			9	9 ($09)	± 1.0°C[*11]	0.1°C[*11]
	N	-200.0 to 1300.0°C			A	10 ($0A)	± 0.6°C[*12]	0.1°C[*12]
	E	-270.0 to 1000.0°C			B	11 ($0B)	± 0.5°C[*13]	0.1°C[*13]
	L	-200.0 to 900.0°C			C	12 ($0C)	± 0.6°C	0.1°C
	U	-200.0 to 400.0°C			D	13 ($0D)	± 0.6°C	0.1°C
	W[*14]	0.0 to 1600.0°C			E	14 ($0E)	± 0.8°C[*14]	0.1°C[*14]
	Platinel 2	0.0 to 1390.0°C			F	15 ($0F)	± 0.6°C	0.1°C
RTD	JPt100	-200.0 to 500.0°C	OFF	ON	0	16 ($10)	± 0.4°C	0.1°C
		-200.0 to 200.0°C			1	17 ($11)	± 0.4°C	0.1°C
		0.0 to 300.0°C			2	18 ($12)	± 0.3°C	0.1°C
		0.00 to 150.00°C			3	19 ($13)	± 0.20°C	0.02°C
	Pt100	-200.0 to 850.0°C			4	20 ($14)	± 0.4°C	0.1°C
		-200.0 to 500.0°C			5	21 ($15)	± 0.4°C	0.1°C
		-200.0 to 200.0°C			6	22 ($16)	± 0.4°C	0.1°C
		0.0 to 300.0°C			7	23 ($17)	± 0.3°C	0.1°C
		0.00 to 150.00°C			8	24 ($18)	± 0.20°C	0.02°C
DC voltage	DC mV input[*15]	0 to 10.00 mV DC	— [*16]	ON	9	25 ($19)	± 0.1% of instrument range ± 1 digit[*15]	
		0 to 100.0 mV DC			A	26 ($1A)		
	DC V input[*15]	0.000 to 1.000 V DC			B	27 ($1B)		
		0.000 to 5.000 V DC			D	29 ($1D)		
		1.000 to 5.000 V DC			E	30 ($1E)		
		0.00 to 10.00 V DC			F	31 ($1F)		

*1: Applicable standard is JIS/IEC/DIN (ITS-90) for thermocouples and RTD.

*2: For thermocouples K, B, S, R, and W, instrument default ranges may be changed to wider ranges (see the notes below). However, if the instrument range exceeds 1600°C, the resolution becomes twice of the indicated value. Furthermore, the actual range for acceptable input is instrument range±5%.

*3: Data stored in the EEPROM is initialized to follow the hardware switch when power is turned on.

*4: This accuracy applies if the ambient temperature is 25 ± 5°C and the input value is within the instrument range. If the input type is thermocouple and reference junction compensation is used, you should also take into consideration the accuracy of the reference junction compensation.

*5: For K-type thermocouples, the instrument range may be set from -270.0 to 1370.0°C. The accuracy and resolution depend on measured temperatures as follows:
-270.0 to -200.0°C : Neither accuracy or resolution is guaranteed.
-200.0 to 0.0°C: ±1.0°C accuracy, 0.2°C resolution

*6: For K-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-200.0 to -180.0°C: ±0.9°C accuracy, 0.2°C resolution
-180.0 to -100.0°C: ±0.6°C accuracy, 0.1°C resolution

*7: For J-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-200.0 to -100.0°C: ±1.0°C accuracy, 0.2°C resolution

*8: For J-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-200.0 to -150.0°C: ±0.6°C accuracy, 0.1°C resolution

*9: For T-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-270.0 to -200.0°C: ±3.5°C accuracy, 0.5°C resolution
-200.0 to -100.0°C: ±1.0°C accuracy, 0.1°C resolution

*10: For B-type thermocouples, the instrument range may be set from 0.0 to 1800.0°C. The accuracy and resolution depend on measured temperatures as follows:
0.0 to 300.0°C: Neither accuracy nor resolution is guaranteed.
300.0 to 900.0°C: ±2.5°C accuracy, 0.3°C resolution

*11: For S-type and R-type thermocouples, the instrument range may be set from 0.0 to 1700.0°C. The accuracy and resolution depend on measured temperatures as follows:
0.0 to 200.0°C: ±1.5°C accuracy, 0.2°C resolution

*12: For N-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-200.0 to 0.0°C: ±1.3°C accuracy, 0.3°C resolution

*13: For E-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-270.0 to -200.0°C: ±6.5°C accuracy, 2.0°C resolution
-200.0 to -100.0°C: ±1.0°C accuracy, 0.2°C resolution

*14: For W-type thermocouples, the instrument range may be set from 0.0 to 2300.0°C. The accuracy and resolution depend on measured temperatures as follows:
0.0 to 100.0°C: ±1.0°C accuracy, 0.2°C resolution

*15: Resolution is determined by the upper and lower limits for the instrument range, as well as the upper and lower scaling limits. It is represented by one digit.

*16: "–" means that the value is ignored.

Table 1 Instrument Range and Accuracy (for low resolution operation with SW1-1 set to OFF) 2/4

Input Category	Input Type[*1]	Instrument Default Range	Input Type Selector Switch[*3] SW1-3	SW1-4	SW5	Software Setting	Accuracy[*4]	Resolution[*2]
Software setting			ON	OFF	0	Instrument default ranges may be specified by software using one of the following codes.		
Thermocouple	K[*5]	-200 to1370°C	ON	OFF	1	33 ($21)	± 2°C[*5]	1°C[*5]
		-200 to1000°C			2	34 ($22)	± 2°C[*5]	1°C[*5]
		-200 to500°C			3	35 ($23)	± 2°C	1°C
	J	-200 to 1200°C			4	36 ($24)	± 2°C	1°C
		-200 to 500°C			5	37 ($25)	± 2°C	1°C
	T	-270 to 400°C			6	38 ($26)	± 2°C[*6]	1°C
	B[*7]	0 to 1600°C			7	39 ($27)	± 2°C[*7]	1°C[*7]
	S[*8]	0 to 1600°C			8	40 ($28)	± 2°C	1°C
	R[*9]	0 to 1600°C			9	41 ($29)	± 2°C	1°C
	N	-200 to 1300°C			A	42 ($2A)	± 2°C[*9]	1°C
	E	-270 to 1000°C			B	43 ($2B)	± 2°C[*10]	1°C[*10]
	L	-200 to 900°C			C	44 ($2C)	± 2°C	1°C
	U	-200 to 400°C			D	45 ($2D)	± 2°C	1°C
	W[*11]	0 to 1600°C			E	46 ($2E)	± 2°C	1°C
	Platinel 2	0 to 1390°C			F	47 ($2F)	± 2°C	1°C
RTD	JPt100	-200 to 500°C	ON	ON	0	48 ($30)	± 2°C	1°C
		-200 to 200°C			1	49 ($31)	± 2°C	1°C
		0 to 300°C			2	50 ($32)	± 2°C	1°C
		0.0 to 150.0°C			3	51 ($33)	± 0.3°C	0.1°C
	Pt100	-200 to 850°C			4	52 ($34)	± 2°C	1°C
		-200 to 500°C			5	53 ($35)	± 2°C	1°C
		-200 to 200°C			6	54 ($36)	± 2°C	1°C
		0 to 300°C			7	55 ($37)	± 2°C	1°C
		0.0 to 150.0°C			8	56 ($38)	± 0.3°C	0.1°C

*1: Applicable standard is JIS/IEC/DIN (ITS-90) for thermocouples and RTD.

*2: For thermocouples K, B, S, R, and W, instrument default ranges may be changed to wider ranges (see the notes below). Furthermore, the actual range for acceptable input is instrument range±5%.

*3: Data stored in the EEPROM is initialized to follow the hardware switch when power is turned on.

*4: This accuracy applies if the ambient temperature is 25 ± 5°C and the input value is within the instrument range. If the input type is thermocouple and reference junction compensation is used, you should also take into consideration the accuracy of the reference junction compensation.

*5: For K-type thermocouples, the upper and lower range limits may be set from -270 to 1370°C. The accuracy and resolution depend on measured temperatures as follows:
-270 to -200°C: Neither accuracy nor resolution is guaranteed.

*6: For T-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-270 to -200°C: ±4°C accuracy, 1°C resolution

*7: For B-type thermocouples, the upper and lower range limits may be set from 0 to 1800°C. The accuracy and resolution depend on measured temperatures as follows:
0 to 300°C: Neither accuracy nor resolution is guaranteed.
300 to 900°C: ±3°C accuracy, 1°C resolution

*8: For S-type and R-type thermocouples, the upper and lower range limits may be set from 0 to 1700°C.

*9: For N-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-200 to 0°C: ±3°C accuracy, 1°C resolution

*10: For E-type thermocouples, the detailed accuracy and resolution are as follows:
-270 to -200°C: ±8°C accuracy, 2°C resolution
-200 to 1000°C: ±2°C accuracy, 1°C resolution

*11: For W-type thermocouples, the upper and lower range limits may be set from 0 to 2300°C.

Table 1 Instrument Range and Accuracy (for high resolution operation with SW1-1 set to ON) 3/4

Input Category	Input Type[*1]	Instrument Default Range[*2]	Input Type Selector Switch[*3] SW1-3	SW1-4	SW5	Software Setting	Accuracy[*4]	Resolution[*2]
Software setting (factory setting)			OFF	OFF	0	Instrument default ranges may be specified by software using one of the following codes.		
Thermocouple	K[*5]	-328.0 to 2498.0°F	OFF	OFF	1	1 ($01)	± 1.0°F[*5]	0.2°F[*5]
		-328.0 to 1832.0°F			2	2 ($02)	± 1.0°F[*5]	0.2°F[*5]
		-328.0 to 932.0°F			3	3 ($03)	± 1.0°F[*6]	0.2°F[*6]
	J	-328.0 to 2192.0°F			4	4 ($04)	± 1.0°F[*7]	0.2°F[*7]
		-328.0 to 932.0°F			5	5 ($05)	± 1.0°F[*8]	0.2°F
	T	-454.0 to 752.0°F			6	6 ($06)	± 1.0°F[*9]	0.2°F[*9]
	B[*10]	32 to 2912°F			7	7 ($07)	± 2°F[*10]	1°F[*10]
	S[*11]	32 to 2912°F			8	8 ($08)	± 2°F[*11]	1°F
	R[*11]	32 to 2912°F			9	9 ($09)	± 2°F[*11]	1°F
	N	-328.0 to 2372.0°F			A	10 ($0A)	± 1.2°F[*12]	0.2°F[*12]
	E	-454.0 to 1832.0°F			B	11 ($0B)	± 1.0°F[*13]	0.2°F[*13]
	L	-328.0 to 1652.0°F			C	12 ($0C)	± 1.2°F	0.2°F
	U	-328.0 to 752.0°F			D	13 ($0D)	± 1.2°F	0.2°F
	W[*14]	32 to 2912°F			E	14 ($0E)	± 2°F	1°F
	Platinel 2	32.0 to 2534.0°F			F	15 ($0F)	± 1.2°F	0.2°F
RTD	JPt100	-328.0 to 932.0°F	OFF	ON	0	16 ($10)	± 0.8°F	0.2°F
		-328.0 to 392.0°F			1	17 ($11)	± 0.8°F	0.2°F
		32.0 to 572.0°F			2	18 ($12)	± 0.6°F	0.2°F
		32.0 to 302.0°F			3	19 ($13)	± 0.4°F	0.2°F
	Pt100	-328.0 to 1562.0°F			4	20 ($14)	± 0.8°F	0.2°F
		-328.0 to 932.0°F			5	21 ($15)	± 0.8°F	0.2°F
		-328.0 to 392.0°F			6	22 ($16)	± 0.8°F	0.2°F
		32.0 to 572.0°F			7	23 ($17)	± 0.6°F	0.2°F
		32.0 to 302.0°F			8	24 ($18)	± 0.4°F	0.2°F
DC voltage	DC mV input[*15]	0 to 10.00 mV DC	— [*16]	ON	9	25 ($19)	± 0.1% of instrument range ± 1 digit[*15]	
		0 to 100.0 mV DC			A	26 ($1A)		
	DC V input[*15]	0.000 to 1.000 V DC			B	27 ($1B)		
		0.000 to 5.000 V DC			D	29 ($1D)		
		1.000 to 5.000 V DC			E	30 ($1E)		
		0.00 to 10.00 V DC			F	31 ($1F)		

*1: Applicable standard is JIS/IEC/DIN (ITS-90) for thermocouples and RTD.
*2: For thermocouples K, B, S, R, and W, instrument default ranges may be changed to wider ranges (see the notes below). Furthermore, the actual range for acceptable input is instrument range±5%.
*3: Data stored in the EEPROM is initialized to follow the hardware switch when power is turned on.
*4: This accuracy applies if the ambient temperature is 77°F±9°F and the input value is within the instrument range. If the input type is thermocouple and reference junction compensation is used, you should also take into consideration the accuracy of the reference junction compensation.
*5: For K-type thermocouples, the instrument range may be set from -454.0 to 2498.0°F. The accuracy and resolution depend on measured temperatures as follows:
-454.0 to -328.0°F: Neither accuracy or resolution is guaranteed.
-328.0 to 32.0°F: ±2.0°F accuracy, 0.4°F resolution
*6: For K-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-328.0 to -292.0°F: ±2.0°F accuracy, 0.4°F resolution
-292.0 to -148.0°F: ±1.2°F accuracy, 0.2°F resolution
*7: For J-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-328.0 to -148.0°F: ±2.0°F accuracy, 0.4°F resolution
*8: For J-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-328.0 to -238.0°F: ±1.2°F accuracy, 0.2°F resolution
*9: For T-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-454.0 to -328.0°F: ±6.5°F accuracy, 1.0°F resolution
-328.0 to -148.0°F: ±2.0°F accuracy, 0.2°F resolution
*10: For B-type thermocouples, the instrument range may be set from 32 to 3272°F. The accuracy and resolution depend on measured temperatures as follows:
32 to 572°F: Neither accuracy nor resolution is guaranteed.
572 to 1652°F: ±5°F accuracy, 1°F resolution
*11: For S-type and R-type thermocouples, the instrument range may be set from 32 to 3092°F. The accuracy and resolution depend on measured temperatures as follows:
32 to 3092°F: ±3°F accuracy, 1°F resolution
*12: For N-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-328.0 to 32.0°F: ±2.5°F accuracy, 0.6°F resolution
*13: For E-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-454.0 to -328.0°F: ±12.0°F accuracy, 4.0°F resolution
-328.0 to -148.0°F: ±2.0°F accuracy, 0.4°F resolution
*14: For W-type thermocouples, the instrument range may be set from 32 to 4172°F.
*15: Resolution is determined by the upper and lower limits for the instrument range, as well as the upper and lower scaling limits. It is represented by one digit.
*16: "–" means that the value is ignored.

Table 1 Instrument Range and Accuracy (for low resolution operation with SW1-1 set to ON) 4/4

Input Category	Input Type[*1]	Instrument Default Range	Input Type Selector Switch[*3]			Software Setting	Accuracy[*4]	Resolution[*2]
			SW1-3	SW1-4	SW5			
Software setting			ON	OFF	0	Instrument default ranges may be specified by software using one of the following codes.		
Thermocouple	K[*5]	-328 to 2498°F	ON	OFF	1	33 ($21)	± 2°F[*5]	1°F[*5]
		-328 to 1832°F			2	34 ($22)	± 2°F[*5]	1°F[*5]
		-328 to 932°F			3	35 ($23)	± 2°F	1°F
	J	-328 to 2192°F			4	36 ($24)	± 2°F	1°F
		-328 to 932°F			5	37 ($25)	± 2°F	1°F
	T	-454 to 752°F			6	38 ($26)	± 2°F[*6]	1°F
	B[*7]	32 to 2912°F			7	39 ($27)	± 2°F[*7]	1°F[*7]
	S[*8]	32 to 2912 °F			8	40 ($28)	± 2°F	1°F
	R[*9]	32 to 2912°F			9	41 ($29)	± 2°F	1°F
	N	-328 to 2372°F			A	42 ($2A)	± 2°F[*9]	1°F
	E	-454 to 1832°F			B	43 ($2B)	± 2°F[*10]	1°F[*10]
	L	-328 to 1652°F			C	44 ($2C)	± 2°F	1°F
	U	-328 to 752°F			D	45 ($2D)	± 2°F	1°F
	W[*11]	32 to 2912°F			E	46 ($2E)	± 2°F	1°F
	Platinel 2	32 to 2534°F			F	47 ($2F)	± 2°F	1°F
RTD	JPt100	-328 to 932°F	ON	ON	0	48 ($30)	± 2°F	1°F
		-328 to 392°F			1	49 ($31)	± 2°F	1°F
		32 to 572°F			2	50 ($32)	± 2°F	1°F
		32 to 302°F			3	51 ($33)	± 2°F	1°F
	Pt100	-328 to 1562°F			4	52 ($34)	± 2°F	1°F
		-328 to 932°F			5	53 ($35)	± 2°F	1°F
		-328 to 392°F			6	54 ($36)	± 2°F	1°F
		32 to 572°F			7	55 ($37)	± 2°F	1°F
		32 to 302°F			8	56 ($38)	± 2°F	1°F

*1: Applicable standard is JIS/IEC/DIN (ITS-90) for thermocouples and RTD.

*2: For thermocouples K, B, S, R, and W, instrument default ranges may be changed to wider ranges (see the notes below). Furthermore, the actual range for acceptable input is instrument range±5%.

*3: Data stored in the EEPROM is initialized to follow the hardware switch when power is turned on.

*4: This accuracy applies if the ambient temperature is 77°F±9°F and the input value is within the instrument range. If the input type is thermocouple and reference junction compensation is used, you should also take into consideration the accuracy of the reference junction compensation.

*5: For K-type thermocouples, the upper and lower range limits may be set from -454 to 2498°F. The accuracy and resolution depend on measured temperatures as follows:
-454 to 328°F: Neither accuracy nor resolution is guaranteed.

*6: For T-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-454 to -328°F: ±7°F accuracy, 1°F resolution

*7: For B-type thermocouples, the upper and lower range limits may be set from 32 to 3272°F. The accuracy and resolution depend on measured temperatures as follows:
32 to 572°F: Neither accuracy nor resolution is guaranteed.
572 to 1652°F: ±5°F accuracy, 1°F resolution

*8: For S-type and R-type thermocouples, the upper and lower range limits may be set from 32 to 3092°F. The accuracy and resolution depend on measured temperatures as follows:
32 to 3092°F: ±3°F accuracy, 1°F resolution

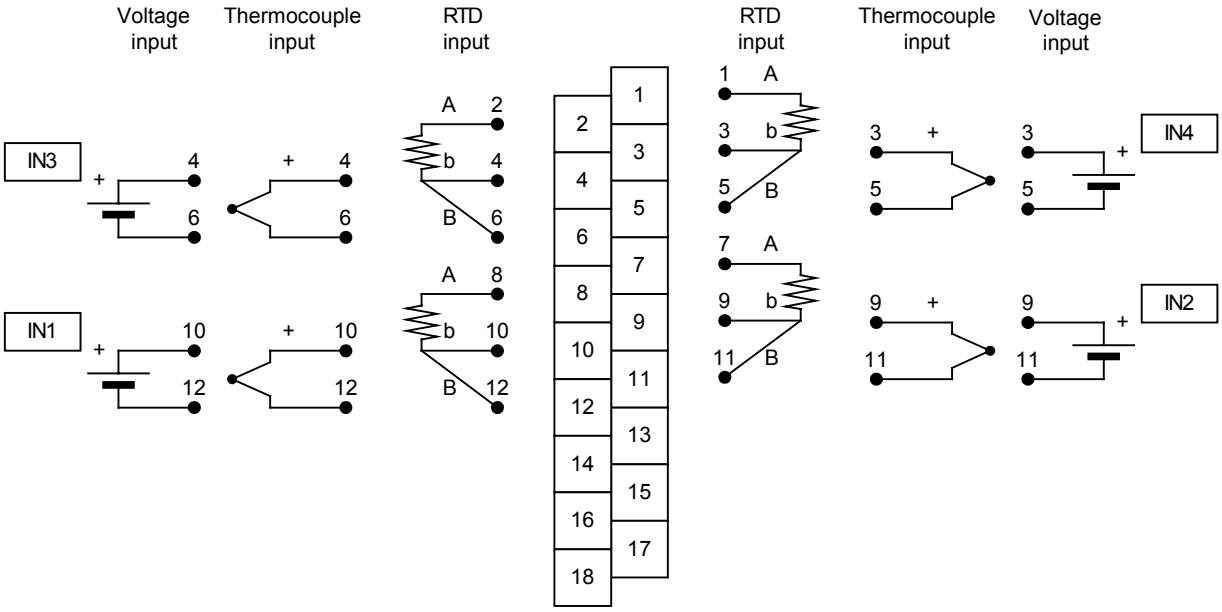
*9: For N-type thermocouples, the accuracy and resolution depend on measured temperatures as follows:
-328 to 32°F: ±4°F accuracy, 1°F resolution

*10: For E-type thermocouples, the detailed accuracy and resolution are as follows:
-454 to 328°F: ±12°F accuracy, 4°F resolution
-328 to 148°F: ±3°F accuracy, 1°F resolution

*11: For W-type thermocouples, the upper and lower range limits may be set from 32 to 4172°F.

■ External Connection Diagram

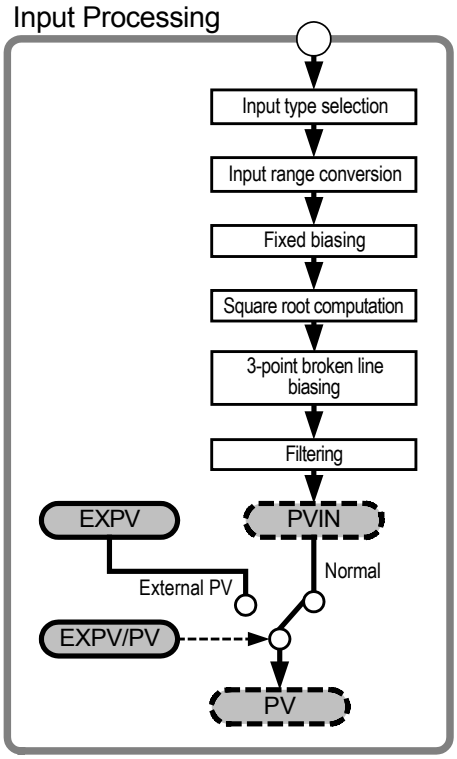
Front View



■ Functions List

Category	Functions		Description
Monitoring	Input sampling period		Sets the input sampling period (limits the number of available channels).
	Monitoring mode selection		Specifies monitoring mode for each of 2 channels.
	Monitoring mode	Single input mode	Basic function for independent operation
		Two input changeover	Switches between two measured inputs (e.g. using a register or measured value range) and handles them as one measured input (using a pair of 2 channels).
		Disabled	Channels specified as 'disabled' are not used.
Input processing	Input type selection		Sets input type using switches (for all channels) or software (for individual channels).
	Power supply frequency specification		Specifies the power supply frequency. An appropriate setting value will reduce common mode noise.
	Input range setting		Sets input ranges.
	PV range setting		Sets PV range for two-input changeover mode.
	Burnout selection		Selectable from Up-scale, Down-scale, or OFF (no burnout detection) for thermocouple or RTD input open-circuit detection.
	Reference junction compensation		Sets thermocouple reference junction compensation to either On or Fixed Value.
	Input operation functions	Broken-line biasing	Specifies any temperature and its bias value. A compensation value based on the linear interpolation of the specified bias values is automatically added to a measured input. This function is particularly useful for a deteriorated sensor, for which input compensation is desirable.
		Fixed biasing	Specifies a fixed bias value to be automatically added to measured input values. This function is useful when a measured input suffers a fixed deviation due to a known physical problem with a sensor, or when fine adjustment of measured input is desirable for better consistency with values indicated by other equipment, even though data deviation is within tolerance.
		Input filtering	Filtering can be used to remove high frequency noise from measured inputs such as flow rate and pressure. Filtering is a first order delay numerical operation.
		Square root extraction	Performs square root extraction on measured inputs. This function is useful for converting differential pressure signals (of orifice, nozzle, or other types of restriction flowmeter) to flow rate signals.
	Two-input changeover		Sets the two-input changeover mode to perform changeover based on temperature range, preset temperature value, or register value.
Alarm	Alarm setup		Sets four alarms for each channel.
	Waiting		Suppresses alarm during the startup period after powering on until the operation stabilizes.
	Delay timer		Reports an alarm only if an alarm condition persists for a minimum duration.
Backup function (Storing of preset values)			Stores parameters to the EEPROM, which is writeable up to 1,000,000 times.

■ F3CX04 Function Block Diagram



■ Operating Environment

There is no restriction on the type of CPU modules that can be used with this module.

■ External Dimensions