

FnIO G – Series :

GT-3808

GT-3808 (8 Channels, TC/mV INPUT)

Date: 2017.7.18

Specification

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Specification

History

REV.	PAGES	REMARKS	DATE	Editor
Preliminary		Preliminary	Nov 15, 2016	Hong, Jin Hyun
1.01	5	Module Accuracy is revised.	Feb 13, 2017	Hong, Jin Hyun
1.02		Typo error is revised.	July 18, 2017	Hong, Jin Hyun

Specification

1. ENVIRONMENT SPECIFICATION

Environment specification	
Operation Temperature	-40°C to 70°C
Storage Temperature	-40°C to 85°C
Relative Humidity	5% to 95% Non-condensing
Operating Altitude	2,000m
Mounting	DIN Rail
General specification	
Shock Operating	IEC 60068-2-27
Vibration Resistance	Based on IEC 60068-2-6 Sine Vibration <ul style="list-style-type: none"> - 5 ~ 25Hz : ±1.6mm - 25 ~ 300Hz : 4g - Sweep Rate : 1 Oct/min, 20 Sweeps Random Vibration <ul style="list-style-type: none"> - 10 ~ 40 Hz : 0.0125 g²/Hz - 40 ~ 100 Hz : 0.0125 → 0.002 g²/Hz - 100 ~ 500 Hz : 0.002 g²/Hz - 500 ~ 2000 Hz : 0.002 → 1.3 x 10⁻⁴g²/Hz - Test time : 1hrs for each test
Industrial Emissions	EN 61000-6-4/A11 : 2011
Industrial Immunity	EN 61000-6-2 : 2005
Installation Pos. / Protect. Class	Vertical and horizontal installation is available
Product Certifications	CE, UL

2. GT-3808 (8 CHANNELS THERMOCOUPLE/MV INPUT)

2.1. GT-3808 Specification

Items	Specification																																																
Input Specification																																																	
Inputs per module	8 Channels																																																
Indicators(Logic side)	8 Green Input status , 1 Green Input CJ status																																																
Sensor Types	Thermal Couple Input Range <table border="1"> <thead> <tr> <th>Type</th> <th>Maximum Input Range</th> <th>Recommended Input Range</th> </tr> </thead> <tbody> <tr> <td>K</td> <td>-270 ~ 1372°C</td> <td>-200 ~ 1200°C</td> </tr> <tr> <td>J</td> <td>-210 ~ 1200°C</td> <td>-40 ~ 1100°C</td> </tr> <tr> <td>T</td> <td>-270 ~ 400°C</td> <td>-200 ~ 350°C</td> </tr> <tr> <td>B</td> <td>30 ~ 1820°C</td> <td>600 ~ 1700°C</td> </tr> <tr> <td>R</td> <td>-50~1768°C</td> <td>0 ~ 1600°C</td> </tr> <tr> <td>S</td> <td>-50 ~ 1768°C</td> <td>0 ~ 1600°C</td> </tr> <tr> <td>E</td> <td>-270 ~ 1000°C</td> <td>-200 ~ 800°C</td> </tr> <tr> <td>N</td> <td>-270 ~ 1300°C</td> <td>-200 ~ 1250°C</td> </tr> <tr> <td>L</td> <td>-200 ~ 900°C</td> <td>-100 ~ 850°C</td> </tr> <tr> <td>U</td> <td>-200 ~ 600°C</td> <td>-100 ~ 550°C</td> </tr> <tr> <td>C</td> <td>0 ~ 2310°C</td> <td>100 ~ 2100°C</td> </tr> <tr> <td>D</td> <td>0 ~ 2490°C</td> <td>100 ~ 2200°C</td> </tr> <tr> <td>10uV Input</td> <td colspan="2">-81.0 ~ 81.0mV, 10uV/ 1 Count</td> </tr> <tr> <td>1uV Input</td> <td colspan="2">-32.7 ~ 32.7mV, 1uV/ 1 Count</td> </tr> <tr> <td>2uV Input</td> <td colspan="2">-65.5 ~ 65.5mV, 2uV/ 1 Count</td> </tr> </tbody> </table>	Type	Maximum Input Range	Recommended Input Range	K	-270 ~ 1372°C	-200 ~ 1200°C	J	-210 ~ 1200°C	-40 ~ 1100°C	T	-270 ~ 400°C	-200 ~ 350°C	B	30 ~ 1820°C	600 ~ 1700°C	R	-50~1768°C	0 ~ 1600°C	S	-50 ~ 1768°C	0 ~ 1600°C	E	-270 ~ 1000°C	-200 ~ 800°C	N	-270 ~ 1300°C	-200 ~ 1250°C	L	-200 ~ 900°C	-100 ~ 850°C	U	-200 ~ 600°C	-100 ~ 550°C	C	0 ~ 2310°C	100 ~ 2100°C	D	0 ~ 2490°C	100 ~ 2200°C	10uV Input	-81.0 ~ 81.0mV, 10uV/ 1 Count		1uV Input	-32.7 ~ 32.7mV, 1uV/ 1 Count		2uV Input	-65.5 ~ 65.5mV, 2uV/ 1 Count	
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Module Accuracy (Need 20 minute preheating to get enhanced accuracy.)	Recommend Input Range <ul style="list-style-type: none"> ±0.1% Recommended Scale @ 25°C ambient ±0.3% Recommended Scale @ -40°C~70°C T,B,R,S,C,D type Recommend Input Range <ul style="list-style-type: none"> ±0.3% Recommended Scale @ -40°C~70°C External Cold Junction(PT100) <ul style="list-style-type: none"> ±2°C Recommended Scale @ -40°C~70°C 																																																
Connection Method	2-Wire																																																

Specification

Conversion Time	Average Conversion time < 330 ms
Cold junction temperature	Internal - TMP275AIDGKR : -40°C~125°C External - PT100 : -45°C~95°C
Data Format	16bits Integer (2' complement)
Calibration	Not Required
Diagnostic	
Power dissipation	Max. 150mA @ 5.0Vdc
Isolation	I/O to Logic : Isolation Field power : Not Connected
Field Power	Not used, Field power bypass to next expansion module
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	60g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to 'Environment Specification'

2.2. GT-3808 Wiring Diagram

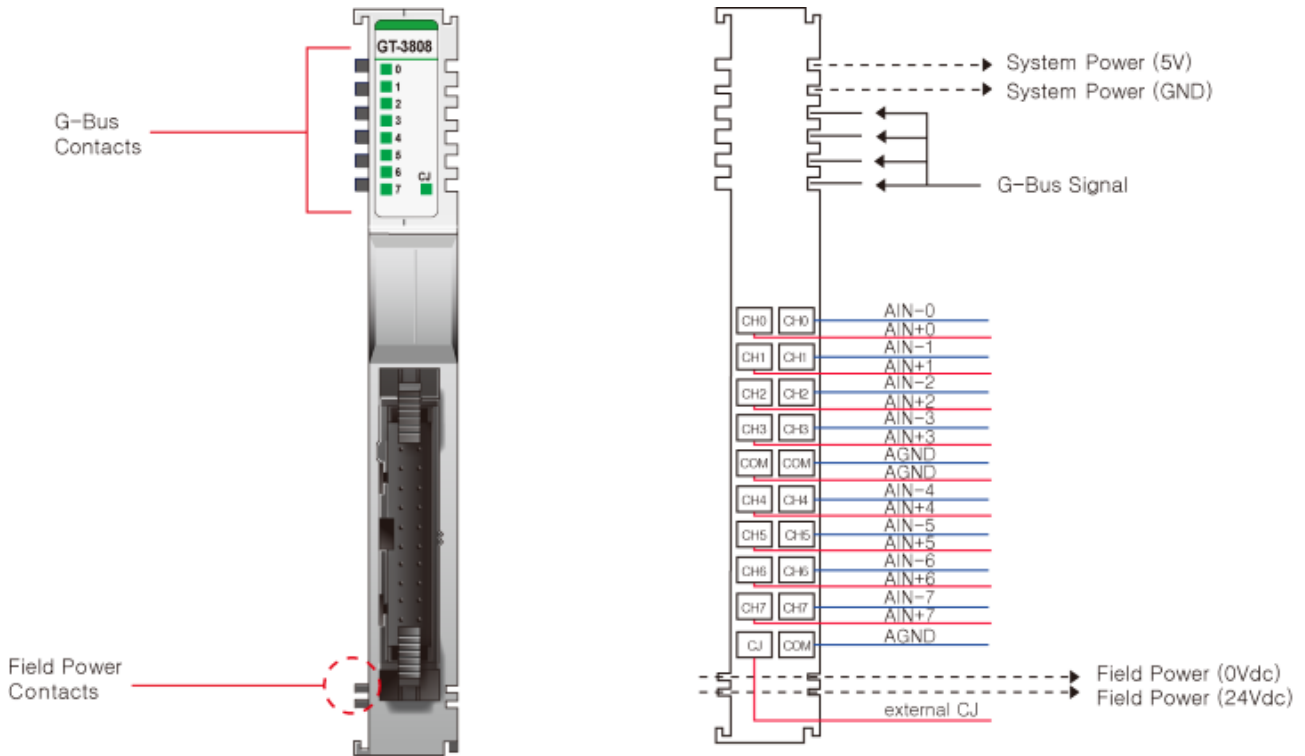
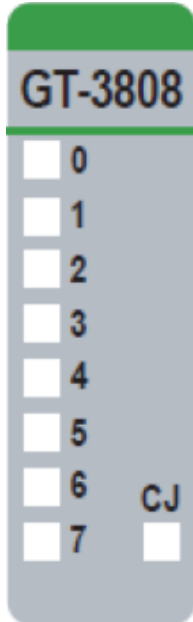


Figure 1. Customer Wiring to Mounting Base

Pin No.	Signal Description	Signal Description	Pin No.
0	TC Channel 0+	TC Channel 0-	1
2	TC Channel 1+	TC Channel 1-	3
4	TC Channel 2+	TC Channel 2-	5
6	TC Channel 3+	TC Channel 3-	7
8	AGND	AGND	9
10	TC Channel 4+	TC Channel 4-	11
12	TC Channel 5+	TC Channel 5-	13
14	TC Channel 6+	TC Channel 6-	15
16	TC Channel 7+	TC Channel 7-	17
18	Cold Junction Sensor	AGND	19

2.3. GT-3808 LED Indicator

2.3.1. LED Indicator



LED No.	LED Function / Description	LED Color
0	INPUT Channel 0	Green
1	INPUT Channel 1	Green
2	INPUT Channel 2	Green
3	INPUT Channel 3	Green
4	INPUT Channel 4	Green
5	INPUT Channel 5	Green
6	INPUT Channel 6	Green
7	INPUT Channel 7	Green
CJ	INPUT Channel CJ	Green

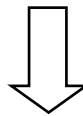
2.3.2. Channel Status LED

Status	LED	To indicate
No Signal, Normal Operation	Channel LED Off, CJ LED Off	Input Sensor Open or Input Range Over Normal Operation
On Signal Normal Operation	Channel LED Off, CJ LED Off	Sensor Connected and Input Range Valid Normal Operation
On Signal Normal Operation Connected External CJC	Channel LED Off, CJ LED On	Sensor Connected and Input Range Valid Normal Operation, External CJ enable

2.4. Mapping data into the image table

- **Input Module Data**

Analog Input Ch0
Analog Input Ch1
Analog Input Ch2
Analog Input Ch3
Analog Input Ch4
Analog Input Ch5
Analog Input Ch6
Analog Input Ch7



- **Input Image Value**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Analog Input Ch0 Low byte							
Byte 1	Analog Input Ch0 High byte							
Byte 2	Analog Input Ch1 Low byte							
Byte 3	Analog Input Ch1 High byte							
Byte 4	Analog Input Ch2 Low byte							
Byte 5	Analog Input Ch2 High byte							
Byte 6	Analog Input Ch3 Low byte							
Byte 7	Analog Input Ch3 High byte							
Byte 8	Analog Input Ch4 Low byte							
Byte 9	Analog Input Ch4 High byte							
Byte 10	Analog Input Ch5 Low byte							
Byte 11	Analog Input Ch5 High byte							
Byte 12	Analog Input Ch6 Low byte							
Byte 13	Analog Input Ch6 High byte							
Byte 14	Analog Input Ch7 Low byte							
Byte 15	Analog Input Ch7 High byte							

- If the input of channel is open or over-ranged, its conversion data will be 0x8000(-32678)

Specification

2.5. Configuration Parameter – 8byte

Byte	Decimal Bit	Description	Default Value
0	00-07	The selection Sensor Type =00h: Type K, 0.1°C/count =01h: Type J, 0.1°C/count =02h: Type T, 0.1°C/count =03h: Type B, 0.1°C/count =04h: Type R, 0.1°C/count =05h: Type S, 0.1°C/count =06h: Type E, 0.1°C/count =07h: Type N, 0.1°C/count =08h: Type L, 0.1°C/count =09h: Type U, 0.1°C/count =0Ah: Type C, 0.1°C/count =0Bh: Type D, 0.1°C/count =80h: 10uV Input, -81.0~81.0mV, 10uV / 1count =81h: 1uV Input, -32.7~32.7mV, 1uV / 1count =82h: 2uV Input, -65.5~65.5mV, 2uV / 1count =Others: Reserved	00 : Type K
1	00	Temperature Type 0: Celsius(°C), 1: Fahrenheit(°F)	00 : Celsius(°C) Cold Junction Compensation 0.1°C Normal Filter
	01*	0: Cold Junction Compensation 1: Disable Cold Junction Compensation	
	02	Data Resolution 0: 0.1°C, °F/bit, 1: 1°C, °F/bit	
	03	Reserved	
	04	Filter Type 0: Normal Filter, 1: Enhanced Filter	
	05-07	Reserved	
2	00-07	Internal Cold Junction[1] Offset Data Low Byte	0000
3	00-07	Internal Cold Junction[1] Offset Data High Byte	
4	00-07	Internal Cold Junction[2] Offset Data Low Byte	0000
5	00-07	Internal Cold Junction[2] Offset Data High Byte	
6	00-07	External Cold Junction Offset Data Low Byte	0000
7	00-07	External Cold Junction Offset Data High Byte	

- Unit of Cold Junction Temperature is 0.1°C/°F. Value 254 means 25.4°C or 25.4°F
- *0: Compensation Cold Junction Temperature = Cold Junction Temperature – Cold Junction Temperature Offset
- *1: Compensation Cold Junction Temperature = Cold Junction Temperature Offset

Specification

2.6. Data Value

Thermocouple Input Range		
Type	Maximum Input Range	Recommended Input Range
Type K	-270 ~ 1372 °C	-200 ~ 1200 °C
Type J	-210 ~ 1200 °C	-40 ~ 1100 °C
Type T	-270 ~ 400 °C	-200 ~ 350 °C
Type B	30 ~ 1820 °C	600 ~ 1700 °C
Type R	-50 ~ 1768 °C	0 ~ 1600 °C
Type S	-50 ~ 1768 °C	0 ~ 1600 °C
Type E	-270 ~ 1000 °C	-200 ~ 800 °C
Type N	-270 ~ 1300 °C	-200 ~ 1250 °C
Type L	-200 ~ 900 °C	-100 ~ 850 °C
Type U	-200 ~ 600 °C	-100 ~ 550 °C
Type C	0 ~ 2310 °C	100 ~ 2100 °C
Type D	0 ~ 2490 °C	100 ~ 2200 °C
10uV	-81.0 ~ 81.0mV, 10uV/ 1 Count	
1uV	-32.7 ~ 32.7mV, 1uV/ 1 Count	
2uV	-65.5 ~ 65.5mV, 2uV/ 1 Count	

- °F = 1.8°C+32