
FnIO G – Series :

GT-3878

GT-3878 (8ch, TC/mV Input, 18RTB – Economic Type)

Date: 2024.7.12

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History

Rev	Pages	Remarks	Date	Editor
1.00	11		2023/08/30	Hongseok, Kim
1.01	1,5		2024/07/12	Hongseok, Kim

Specification

1. ENVIRONMENT SPECIFICATION

Environmental specification	
Operation Temperature	-40°C to 70°C
UL Temperature	-20°C to 60°C
Storage Temperature	-40°C to 85°C
Relative Humidity	5% to 90% Non-condensing
Mounting	DIN Rail
General specification	
Shock Operating	IEC 60068-2-27 : 2008 / 15g, 11ms
Vibration Resistance	Based on IEC 60068-2-6 DNVGL-CG-0039 : Vibration Class B, 4g
Industrial Emissions	EN61000-6-4/All : 2011
Industrial Immunity	EN61000-6-2 : 2005
Installation Position	Vertical and horizontal installation is available
Product Certifications	CE, UL

2. GT-3878 (8 CHANNELS THERMOCOUPLE/MV INPUT)

2.1. GT-3878 Specification

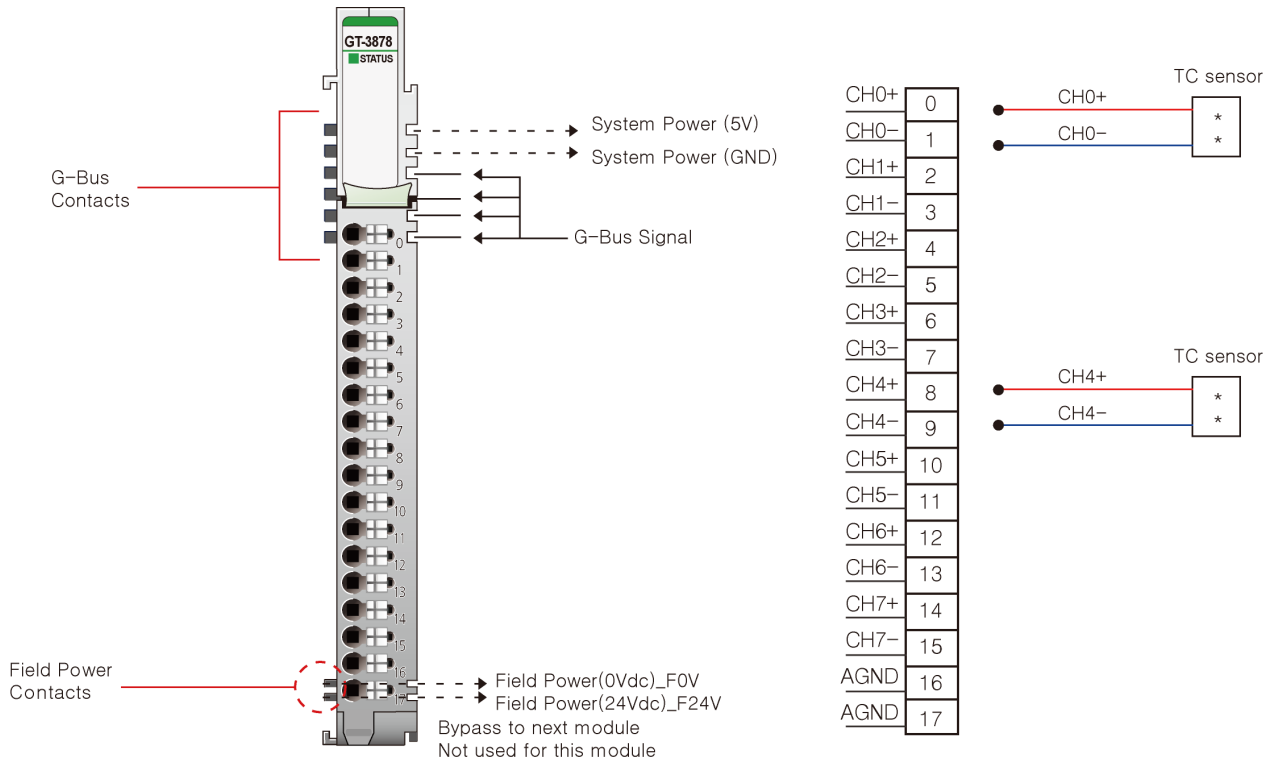
Items	Specification		
Input Specification			
Inputs per module	8 Channels		
Indicators	1 Green G-Bus status		
Sensor Types (Need 20 minute preheating to get enhanced accuracy.)	Thermal Couple Input Range		
	Type	Maximum Input Range	*Recommended Input Range
	K	-270 ~ 1372℃	-200 ~1200℃
	J	-210 ~ 1030℃	-40 ~ 1030℃
	T	-270 ~ 400℃	-200 ~ 350℃
	B	30 ~ 1820℃	600 ~ 1700℃
	R	-50~1768℃	0 ~ 1600℃
	S	-50 ~ 1768℃	0 ~ 1600℃
	E	-190 ~ 790℃	-140 ~ 780℃
	N	-270 ~ 1300℃	-200 ~ 1250℃
	L	-200 ~ 900℃	-100 ~ 850℃
	U	-200 ~ 600℃	-100 ~ 550℃
	C	0 ~ 2310℃	100 ~ 2100℃
	D	0 ~ 2490℃	100 ~ 2200℃
	TXK	-150 ~ 720℃	-150 ~ 720℃
	10uV Input	-7.0 ~ 60.0mV, 10uV/ 1 Count	
	1uV Input	-7.0 ~ 32.7mV, 1uV/ 1 Count	
	2uV Input	-7.0 ~ 60.0mV, 2uV/ 1 Count	
	*Negative temperature increases by ±0.1% compared to existing temperature		
	Cold Junction Module Accuracy (Need 20 minute preheating to get enhanced accuracy.)	T,B,R,S,N,C,D type Recommend Input Range <ul style="list-style-type: none">±0.3% Recommended Scale @ 25℃ ambient±0.5% Recommended Scale @ -40℃~70℃	
All Other types Recommend Input Range <ul style="list-style-type: none">±0.1% Recommended Scale @ 25℃ ambient±0.3% Recommended Scale @ -40℃~70℃			
Connection Method	2-Wire		
Conversion Time	Average Conversion time < 55 ms		
Cold junction temperature	Internal - TMP275AIDGKR : -40℃~125℃		
Data Format	16bits Integer (2' complement)		
Calibration	Not Required		
Diagnostic	Sensor open or range over, then conversion data = 0x8000(-32768)		
General specification			
Power dissipation	Max. 85mA @ 5Vdc		
Isolation	I/O to Logic : Isolation Field power : Not Connected		
Field Power	Not used, Field power bypass to next expansion module		

Specification

Wiring	I/O Cable Max. 0.823mm ² (AWG 18)
Weight	63g
Module Size	12mm x 109mm x 70mm
Environment Condition	Refer to 'Environment Specification'

* When more than five modules are used together, the error rate may increase in the input range of about -200 to -100 degrees.

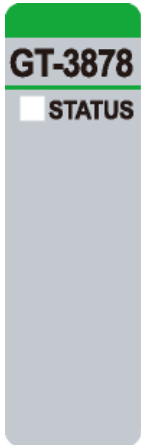
2.2. GT-3878 Wiring Diagram



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	TC Channel 4+	TC Channel 4-	9
10	TC Channel 5+	TC Channel 5-	11
12	TC Channel 6+	TC Channel 6-	13
14	TC Channel 7+	TC Channel 7-	15
17	AGND1	AGND2	17

2.3. GT-3878 LED Indicator

2.3.1. LED Indicator



LED No.	LED Function / Description	LED Color
Status	G-Bus Status	Green

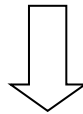
2.3.2. Channel Status LED

Status	LED	To indicate
G-Bus Status	Off Green	Disconnection Connection

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 – 6byte

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 =0Ch: Type TXK, 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 SW Filter Off
	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	Reserved	
	05-06	SW Filter 0:SW Filter Off(Filter Time = 1) 1:Nomal Filter(Filter Time = 5) 2: Enhanced Filter(Filter Time = 10) 3: More Enhanced Filter(Filter Time = 20)	
	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	

- 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 ~ 1030 °C	-40 ~ 1030 °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	-190 ~ 790 °C	-140 ~ 780 °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
Type TXK	-150 ~ 720 °C	-150 ~ 720 °C
10uV	-7.0 ~ 60.0mV, 10uV/ 1 Count	
1uV	-7.0 ~ 32.7mV, 1uV/ 1 Count	
2uV	-7.0 ~ 60.0mV, 2uV/ 1 Count	

— °F = 1.8°C+32