

FnIO G – Series :

GT-3778

GT-3778 (8ch, 3-Wire RTD/Resistance Input, 18RTB – Economic Type)

Date: 2024.7.12

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History

REV.	PAGES	REMARKS	DATE	Editor
1.00	11		July 21, 2023	Hongseok Kim
1.01	1,5	Description, Conversion Time change	July 12, 2024	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 95% Non-condensing
Operating Altitude	2,000m
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-3778 (8 CHANNELS RTD/RESISTANCE INPUT)

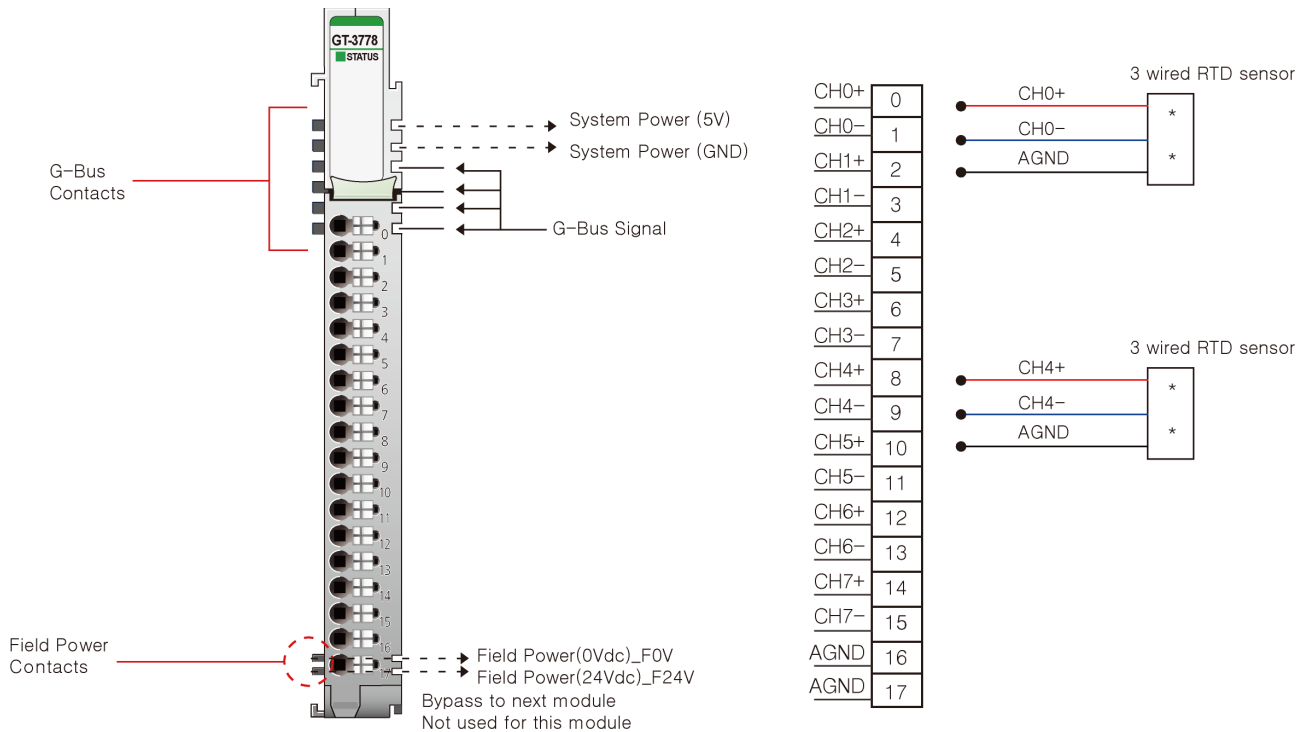
2.1. GT-3778 Specification

Items																															
Input Specification																															
Inputs per module	8 Channels																														
Indicators	1 Green G-BUS status																														
Sensor Types	<div>RTD Input Range</div> <table> <tr> <th>RTD Input</th><th>Input Range</th></tr> <tr> <td>PT50, PT100, PT200, PT500,</td><td>-200~850°C</td></tr> <tr> <td>JPT50, JPT100, JPT200, JPT500,</td><td>-200~640°C</td></tr> <tr> <td>PT1000, JPT1000</td><td>-200~250°C</td></tr> <tr> <td>NI100, NI200, NI500</td><td>-60~250°C</td></tr> <tr> <td>NI1000</td><td>-60~150°C</td></tr> <tr> <td>NI120</td><td>-80~260°C</td></tr> <tr> <td>Cu10,Cu100</td><td>-100~260°C</td></tr> <tr> <td>NI1000LG</td><td>-50~120°C</td></tr> <tr> <th>Resistance Input</th><th>Input Range</th></tr> <tr> <td>1Ω/bit</td><td>0~2000Ω</td></tr> <tr> <td>100mΩ/bit</td><td>0~2000Ω</td></tr> <tr> <td>10mΩ/bit</td><td>0~327Ω</td></tr> <tr> <td>20mΩ/bit</td><td>0~620Ω</td></tr> <tr> <td>50mΩ/bit</td><td>0~1200Ω</td></tr> </table>	RTD Input	Input Range	PT50, PT100, PT200, PT500,	-200~850°C	JPT50, JPT100, JPT200, JPT500,	-200~640°C	PT1000, JPT1000	-200~250°C	NI100, NI200, NI500	-60~250°C	NI1000	-60~150°C	NI120	-80~260°C	Cu10,Cu100	-100~260°C	NI1000LG	-50~120°C	Resistance Input	Input Range	1Ω/bit	0~2000Ω	100mΩ/bit	0~2000Ω	10mΩ/bit	0~327Ω	20mΩ/bit	0~620Ω	50mΩ/bit	0~1200Ω
RTD Input	Input Range																														
PT50, PT100, PT200, PT500,	-200~850°C																														
JPT50, JPT100, JPT200, JPT500,	-200~640°C																														
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Resistance Input	Input Range																														
1Ω/bit	0~2000Ω																														
100mΩ/bit	0~2000Ω																														
10mΩ/bit	0~327Ω																														
20mΩ/bit	0~620Ω																														
50mΩ/bit	0~1200Ω																														
Excitation Current	About 0.25mA																														
Connection Method	3-Wire																														
Conversion Time	135msec / All channel																														
Data Format	16bits signed Integer (2' complement)																														
Module Accuracy	PT50, JPT50, NI100, NI120 : ±0.3% Full Scale @ 25°C ambient PT50, JPT50, NI100, NI120 : ±0.5% Full Scale @ -40,70°C ambient PT1000 : ±0.3°C at 50~150°C @ 25°C ambient Cu10 : ±2% Full Scale @ 25°C ambient																														

Specification

	Cu10 : $\pm 4\%$ Full Scale @ $-40, 70^{\circ}\text{C}$ ambient Cu100 : $\pm 0.3\%$ Full Scale @ 25°C ambient Cu100 : $\pm 0.5\%$ Full Scale @ $-40, 70^{\circ}\text{C}$ ambient All Other types Input Range <ul style="list-style-type: none"> $\pm 0.1\%$ Full Scale @ 25°C ambient $\pm 0.3\%$ Full Scale @ $-40^{\circ}\text{C} \sim 70^{\circ}\text{C}$
Resolution of Data	RTD Type : $\pm 0.1^{\circ}\text{C}$ / F , Resistance Type : 1Ω , $100\text{m}\Omega$, $10\text{m}\Omega$, $20\text{m}\Omega$, $50\text{m}\Omega$
Calibration	Not Required
Diagnostic	Sensor open or range over, then conversion data = $0\text{x}8000(-32768)$
General specification	
Power dissipation	Max. 60mA @ 5Vdc
Isolation	I/O to Logic : Isolation Field power : Not Connected
UL Field Power	Supply voltage : 24Vdc nominal, Class2
Field Power	Not used, Field power bypass to next expansion module
Wiring	I/O Cable Max. 0.75mm^2 (AWG 18)
Weight	64g
Module Size	$12\text{mm} \times 109\text{mm} \times 70\text{mm}$
Environment Condition	Refer to 'Environment Specification'

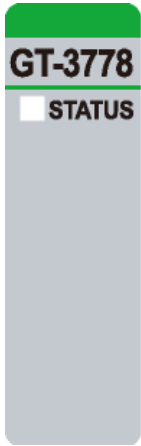
2.2. GT-3778 Wiring Diagram



Pin No.	Signal Description	Signal Description	Pin No.
0	RTD Channel 0+	RTD Channel 0-	1
2	RTD Channel 1+	RTD Channel 1-	3
4	RTD Channel 2+	RTD Channel 2-	5
6	RTD Channel 3+	RTD Channel 3-	7
8	RTD Channel 4+	RTD Channel 4-	9
10	RTD Channel 5+	RTD Channel 5-	11
12	RTD Channel 6+	RTD Channel 6-	13
14	RTD Channel 7+	RTD Channel 7-	15
16	AGND	AGND	17

2.3. GT-3778 LED Indicator

2.3.1. LED Indicator



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

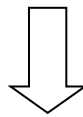
2.3.2. Channel Status LED

Status	LED	To indicate
G-Bus Status	Off	Disconnection
	Green	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 – 18 byte

Byte	Decimal Bit	Description	Default Value
0	00-07	The selection Sensor Type =00h:PT100, 0.00385, -200~850°C, 0.1°C/count =01h:PT200, 0.00385, -200~850°C, 0.1°C/count =02h:PT500, 0.00385, -200~850°C, 0.1°C/count =03h:PT1000, 0.00385, -200~250°C, 0.1°C/count =04h:PT50, 0.00385, -200~850°C, 0.1°C/count =10h:JPT100, 0.003916, -200~640°C, 0.1°C/count =11h:JPT200, 0.003916, -200~640°C, 0.1°C/count =12h:JPT500, 0.003916, -200~640°C, 0.1°C/count =13h:JPT1000, 0.003916, -200~250°C, 0.1°C/count =14h:JPT50, 0.003916, -200~640°C, 0.1°C/count =20h:NI100, 0.00618, -60~250°C, 0.1°C/count =21h:NI200, 0.00618, -60~250°C, 0.1°C/count =22h:NI500, 0.00618, -60~250°C, 0.1°C/count =23h:NI1000, 0.00618, -60~150°C, 0.1°C/count =30h:NI120, 0.00672, -80~260°C, 0.1°C/count =40h:Cu10, 0.00427, -100~260°C, 0.1°C/count =41h:Cu100, 0.00427, -100~260°C, 0.1°C/count =53h:NI1000LG, 0.00500, -50~120°C, 0.1°C/count =80h:Resistance Input, 1~2000Ω, 100mΩ/1count =81h:Resistance Input, 1~327Ω, 10mΩ/1count =82h:Resistance Input, 1~620Ω, 20mΩ/1count =83h: Resistance Input, 1~1200Ω, 50mΩ/1count =84h:Resistance Input, 1~2000Ω, 1Ω/1count =Others: Reserved	0: PT100
1	00	Temperature Type 0: Celsius(°C), 1: Fahrenheit(°F)	00 : Celsius(°C) 0.1°C SW Filter Off
	01	Reserved	
	02-03	Data Resolution 00: 0.1°C, °F/bit 01: 1°C, °F/bit 10: *0.01°C, °F/bit 11: 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	
2~3		CH0 Offset value	0
4~5		CH1 Offset value	0
6~7		CH2 Offset value	0
8~9		CH3 Offset value	0
10~11		CH4 Offset value	0
12~13		CH5 Offset value	0
14~15		CH6 Offset value	0
16~17		CH7 Offset value	0

- *Data exceeding 32767 cannot be displayed.

Specification

2.6. Data Value

Resistance Temperature Detector Input Range	
Type	Input Range
PT100	-200 ~ 850 °C
PT200	-200 ~ 850 °C
PT500	-200 ~ 850 °C
PT1000	-200 ~ 250 °C
PT50	-200 ~ 850 °C
JPT100	-200 ~ 640 °C
JPT200	-200 ~ 640 °C
JPT500	-200 ~ 640 °C
JPT1000	-200 ~ 250 °C
JPT50	-200 ~ 640 °C
NI100	-60 ~ 250 °C
NI200	-60 ~ 250 °C
NI500	-60 ~ 250 °C
NI1000	-60 ~ 150 °C
NI120	-80 ~ 260 °C
Cu10	-100 ~ 260 °C
Cu100	-100 ~ 260 °C
NI1000LG	-50 ~ 120 °C
Resistance Input Range	
Type	Input Range
1Ω/bit	0~2000Ω
100mΩ/bit	0~2000Ω
10mΩ/bit	0~327Ω
20mΩ/bit	0~620Ω
50mΩ/bit	0~1200Ω