

FnIO G – Series :

GT-3714

GT-3714

(4 Channels, TEMP. Controller, RTD Input, SSR Output)

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Specification

History

Rev	Pages	Remarks	Date	Editor
1.00			2016/07/28	JinHyun, Hong
1.01		Typo error is revised.	2017/07/18	JinHyun, Hong
1.02	10	Add Command Format	2019/10/15	HongSeok, Kim
1.03	5	Add description	2019/12/05	HongSeok, Kim
1.04	9	Add Command Format	2020/01/30	HongSeok, Kim
1.05		Release	2020/04/21	Seokhyun, Jun
1.06	5	Cu10 Accuracy error is revised.	2021/08/05	HongSeok, Kim
1.07	1~12	Specification form update	2023/07/27	HongSeok Kim
1.08	11	Add Lock/Unlock Parameter	2025/05/16	HongSeok Kim
1.09	5	Edit System, Field Power Dissipation	2025/05/30	Suna, Hwang

Specification

1. ENVIRONMENT SPECIFICATION

Environmental specification	
Operation Temperature	-20°C to 50°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, 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

Specification

2. GT-3714 (4 Channels, TEMP. Controller, RTD Input, SSR Output)

2.1. GT-3714 Specification

Items	Specification	
Input Out Specification		
Inputs per module	4 Channels	
Indicators(Logic side)	4 Green Input status	
Sensor Types	RTD Input Range	
	Type	Input Range
	PT 100	-200 ~850°c
	PT 50	-200 ~850°c
	JPT 100	-200 ~640°c
	NI 100	-60 ~250°c
	NI 120	-80~260°c
	CU 10	-200~ 260°c
	Excitation Current	About 1mA
Connection Method	3-Wire	
Data Format	16bits singed Integer (2' complement)	
Module Accuracy	All type Input Range <ul style="list-style-type: none">±0.1% Full Scale @ 25°C Cu10 : ±1% Full Scale @ 25°C	
Resolution of Data	RTD Type : ±0.1°C / F	
Diagnostic	Sensor open or range over, then conversion data = 0x8000(-32768)	
Control Method	P, PI, PD, PID with Auto tuning (Limit Cycle Method), On/Off (PB=0)	
Control Output	1 DC-Sink PWM Output for SSR control (18~26.4Vdc) 1 DC-Sink Alarm Output (18~26.4Vdc)	
PWM Output Accuracy	±0.3% FS @ Operating Temperature	
Calibration	Not Required	
Etc Functions	ARW, MR, Temp. Offset, Hysteresis (On/Off)	
General specification		
Power dissipation	Max. 55mA @ 5Vdc	
Isolation	I/O to Logic : Isolation Field power : Non - Isolation	
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 18~26.4VdC Power Dissipation : 55mA @ 24Vdc	
Wiring	Connector Type, up to AWG22 Module Connector :HIF3BA-20D-2.54DSA	
Weight	60g	
Module Size	12mm x 99mm x 70mm	
Environment Condition	Refer to ‘Environment Specification’	

*GT-3714,3734,3814, 3834, can be connected up to 16 slots per network adapter module.

2.2. GT-3714 Wiring Diagram

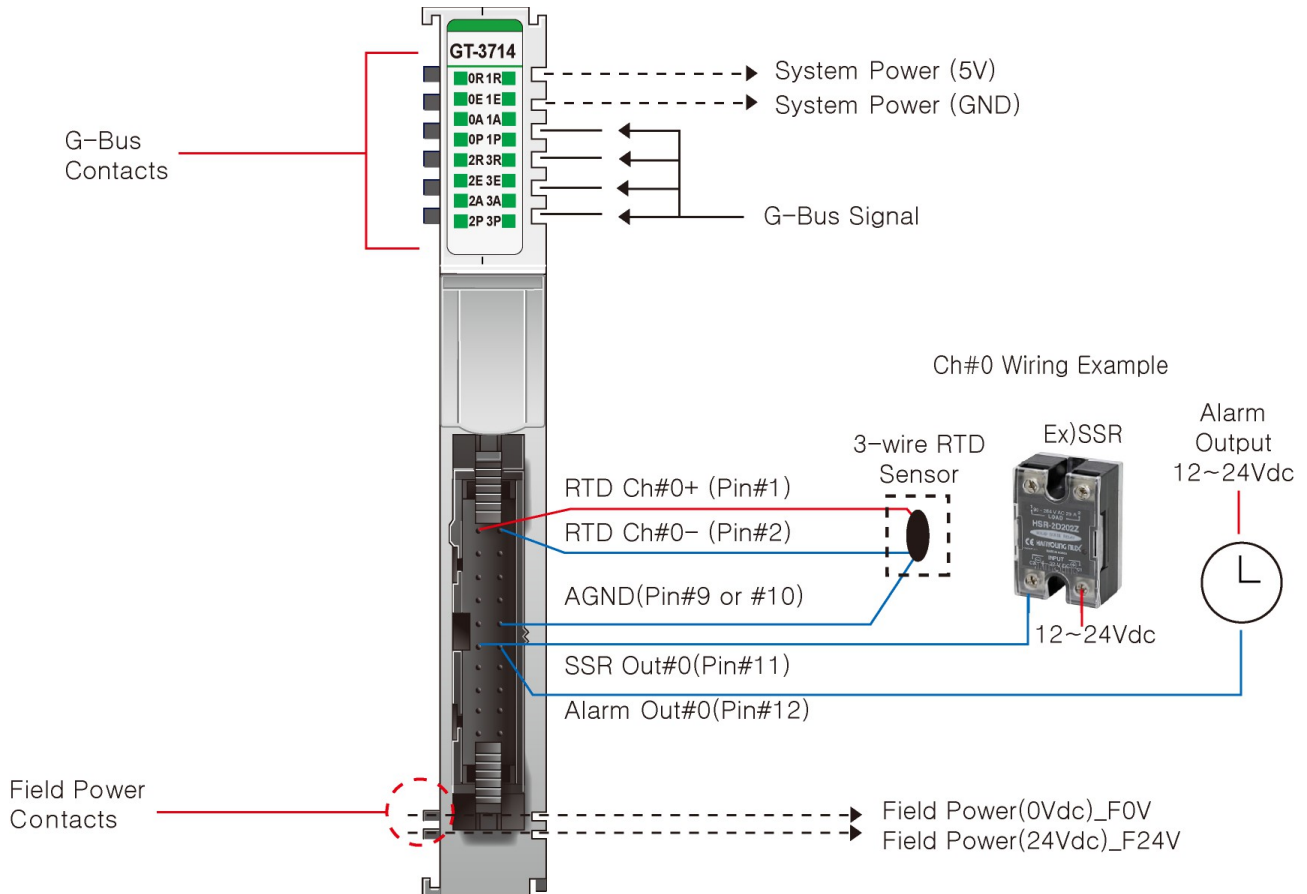


Figure 1. Customer Wiring to Mounting Base

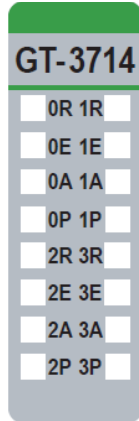
Pin No.	Signal Description	Signal Description	Pin No.
0	RTD Channel 0+	RTD Channel 0-	1
2	RTD Channel 1+	RTD Channel 1-	3
4	RTD Channel 2+	RTD Channel 2-	5

Specification

6	RTD Channel 3+	RTD Channel 3-	7
8	AGND	AGND	9
10	SSR Out Ch#0	Alarm Out Ch#0	11
12	SSR Out Ch#1	Alarm Out Ch#1	13
14	SSR Out Ch#2	Alarm Out Ch#2	15
16	SSR Out Ch#3	Alarm Out Ch#3	17
18	COM	COM	19

2.3. GT-3714 LED Indicator

2.3.1. LED Indicator



LED No.	LED Function / Description	Color
0	Ch#0 Ready	Green
1	Ch#0 Error	Green
2	Ch#0 Alarm	Green
3	Ch#0 Output	Green
4	Ch#2 Ready	Green
5	Ch#2 Error	Green
6	Ch#2 Alarm	Green
7	Ch#2 Output	Green
8	Ch#1 Ready	Green
9	Ch#1 Error	Green
10	Ch#1 Alarm	Green
11	Ch#1 Output	Green
12	Ch#3 Ready	Green
13	Ch#3 Error	Green
14	Ch#3 Alarm	Green
15	Ch#3 Output	Green

2.3.2. Channel Status LED

Status	LED	Cause	To indicate
Ready (R)	Green	Module Ready	Normal Operation
	Flashing Green	Auto Tunning in progress	Searching PID Gain
	Off	Not connection	Checking the connection
Error (E)	Green	Module Error.	Sensor open or error occurred.
	Off	Normal status.	Normal Operation
Alarm Output (A)	Green	Output status when alarm is set	Normal Operation (when the alarm is set)
	Off	Not setting the alarm	Make sure the alarm setting
Process Output (P)	Green	Current output state	Normal Operation (when the current output is set)
	Off	Not setting the current output	Make sure the current output state

Specification

2.4. Mapping data into the image table

● Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	0	0	0	Ch#0 Auto Tuning	Ch#0 Process Out(P)	Ch#0 Alarm (A)	Ch#0 Sensor Err (E)	Ch#0 Ready (R)
Byte 1	0	0	0	Ch#1 Auto Tuning	Ch#1 Process Out(P)	Ch#1 Alarm (A)	Ch#1 Sensor Err (E)	Ch#1 Ready (R)
Byte 2	0	0	0	Ch#2 Auto Tuning	Ch#2 Process Out(P)	Ch#2 Alarm (A)	Ch#2 Sensor Err (E)	Ch#2 Ready (R)
Byte 3	0	0	0	Ch#3 Auto Tuning	Ch#3 Process Out(P)	Ch#3 Alarm (A)	Ch#3 Sensor Err (E)	Ch#3 Ready (R)
Byte 4	Ch#0 Temperature(PV), 16bit signed, Little Endian, Unit=0.1C							
Byte 5								
Byte 6	Ch#1 Temperature(PV), 16bit signed, Little Endian, Unit=0.1C							
Byte 7								
Byte 8	Ch#2 Temperature(PV), 16bit signed, Little Endian, Unit=0.1C							
Byte 9								
Byte 10	Ch#3 Temperature(PV), 16bit signed, Little Endian, Unit=0.1C							
Byte 11								
Byte 12	Ch#0 Temperature(SV,CV), 16bit signed, Little Endian, Unit=0.1C							
Byte 13								
Byte 14	Ch#1 Temperature(SV,CV), 16bit signed, Little Endian, Unit=0.1C							
Byte 15								
Byte 16	Ch#2 Temperature(SV,CV), 16bit signed, Little Endian, Unit=0.1C							
Byte 17								
Byte 18	Ch#3 Temperature(SV,CV), 16bit signed, Little Endian, Unit=0.1C							
Byte 19								

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

● Output Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Ch#0 Command							
Byte 1	Ch#1 Command							
Byte 2	Ch#2 Command							
Byte 3	Ch#3 Command							
Byte 4	Ch#0 Value for update							
Byte 5								
Byte 6	Ch#1 Value for update							
Byte 7								
Byte 8	Ch#2 Value for update							
Byte 9								
Byte 10	Ch#3 Value for update							
Byte 11								

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

Specification

CH#0,1,2,3 COMMAND FORMAT

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
	=00 : Write Release =01 : Read =10 : Write =11: PID		-----	=0_0000 : PV(READ ONLY),PID(STOP) =0_0001 : SV(READ/WRITE),PID(RUN) =0_0002 : CV(READ ONLY) =0_0009 : PID P_0.1C(READ/WRITE) =0_000A: PID I_1S(READ/WRITE) =0_000B: PID D_1S(READ/WRITE) =0_000C: OP LIMIT 0.1%(READ/WRITE)				

Example) PID Control On/Off

0ch PID Control On =C1 00 00 00 00 00 00 00 00 00 00 00

0ch PID Control OFF =C0 00 00 00 00 00 00 00 00 00 00

Example) Update Ch#0's SV = 150℃, then Ch#0's SV=250℃

IO Output Data = 00 00 00 00 00 00 00 00 00 00 00

IO Output Data = 81 00 00 00 DC 05 00 00 00 00 00 00 //Ch#0's SV=150℃, 0x05DC=1500d

IO Output Data = 00 00 00 00 C4 09 00 00 00 00 00 00 //Write Command Release

IO Output Data = 81 00 00 00 C4 09 00 00 00 00 00 00 //Ch#0's SV=250℃, 0x09C4=2500d

Example) Read ch#0's CV Data

IO Output Data = 42 00 00 00 00 00 00 00 00 00 00 //Ch#0's Read CV Data

* 12 ~ 13byte data of input image is changed from SV data to CV data.

2.5. Temp. Channel Object

► DeviceNet

- Class Code: 81HEX(129_{DEC})
 - Common Service

Service Code	Implemented for		Service Name
	Class	Instance	
0x0E	Yes	Yes	Get Attribute Single
0x10	No	Yes	Set Attribute Single

- Class Attribute

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
0	0	Get	Object Revision	UINT Array	
	1	Get/Set	Sv,Set Value	INT Array	0.1°C

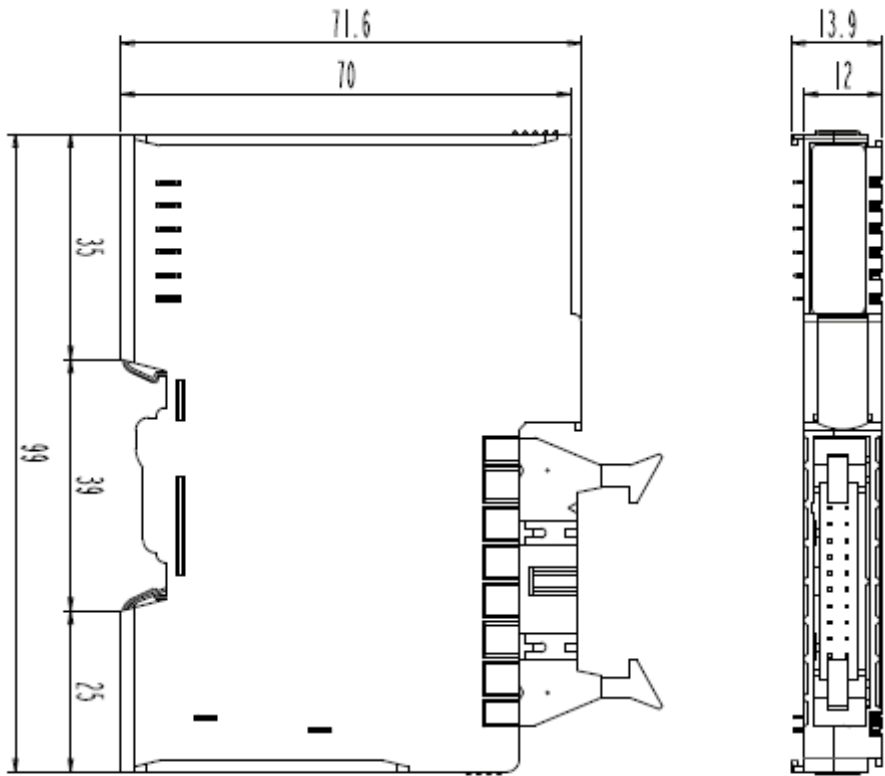
- Instance Attribute

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
1~64	0x00(0)	Get	Object Revision	UINT	
	0x01(1)	Get/Set	SV, Set Value	INT	Rev = 0.1°C, Range : 0°C ~ 2500.0°C
	0x02(2)	Get/Set	PB, Proportional Band	INT	Rev = 0.1, Range : 0°C ~ 1000.0°C
	0x03(3)	Get/Set	Ti, Integral Time	INT	Rev = 1sec, Range : 0 ~ 3600sec
	0x04(4)	Get/Set	Td, Derivative Time	INT	Rev = 1sec, Range : 0 ~ 3600sec
	0x05(5)	Get/Set	Tc, Control Cycle time	UINT	Rev = 1sec, Range : 1 ~ 60sec
	0x07(7)	Get/Set	MR, Manual Reset	INT	Rev = 0.1% Range = 0.0~100.0%
	0x08(8)	Get/Set	HYST, Hysteresis	UINT	Rev = 0.1, Range : 1.0°C ~ 1000.0°C
	0x09(9)	Get/Set	Alarm Low	INT	Rev = 0.1, Range : 0°C ~ 1300.0°C
	0x0A(10)	Get/Set	Alarm High	INT	Rev = 0.1, Range : 0°C ~ 1300.0°C
	0x0B(11)	Get/Set	Alarm Deviation	UINT	Rev = 0.1°C, Range : 0°C ~ 100.0°C
	0x0C(12)	Get/Set	Alarm Function	UINT	Various Functions (Value : 0~13)
	0x0D(13)	Get/Set	Alarm Option	UINT	Various Functions (Value : 0~3, 128~131)
	0x10(16)	Get/Set	All Parameter	INT*7	SV,PB,Ti,Td,Tc,MR,HYST
	0x11(17)	Get/Set	All Alarm	INT*6	Alarm Low, Alarm High, Alram Dev, Alarm Function, Alarm Option
	0x20(32)	Get	Status	UINT	Same as Channel's Status 1 Byte
	0x21(33)	Get	PV, Present Value	INT	Rev = 0.1, Range : -3276.7°C ~ 3276.7°C
	0x22(34)	Get	CV, Control Value	INT	Rev = 0.1% Range = 0.0~100.0%
	0x23(35)	Get	Status, PV	INT*2	Status, PV
	0x24(36)	Get	Alarm	UINT	Single Channel Alarm Status(ON/OFF)
	0x27(39)	Get	PV, CV	INT*2	Rev = 0.01°C
	0x28(40)	Get	Cold Junction	INT*2	Cold Junction(Rev = 0.1°C), Ohm(Rev = 0.01)
	0x29(41)	Get/Set	Temp. Offset	INT	Rev = 0.1°C, Range : -100°C ~ 100.0°C
	0x30(48)	Get	All Status	INT*4	Status, PV, CV, 0x0000
	0x31(49)	Get	SV, PV, CV, Status	INT*4	SV, PV, CV, Status
	0x40(64)	Get/Set	Auto Tuning	Bool	0: Stop Auto Tuning 1: Run Auto Tuning
	0x41(65)	Get/Set	Select Auto Tuning Point	UINT	0 : SV's 100%, 1: SV's 80%
	0x42(66)	Get/Set	Select Auto Tuning PID	UINT	0 : PID, 1 : P, 2 : PI, 3 : PD
	0x44(68)	Get/Set	Sensor Type	UINT	Type Value

Specification

					<table><tr><td>PT 100</td><td>0</td></tr><tr><td>PT 50</td><td>1</td></tr><tr><td>JPT 100</td><td>2</td></tr><tr><td>NI 100</td><td>3</td></tr><tr><td>NI 120</td><td>4</td></tr><tr><td>CU 10</td><td>5</td></tr></table>	PT 100	0	PT 50	1	JPT 100	2	NI 100	3	NI 120	4	CU 10	5
PT 100	0																
PT 50	1																
JPT 100	2																
NI 100	3																
NI 120	4																
CU 10	5																
0x45(69)	Get/Set	Temp Type	UINT	<table><tr><td></td><td>Normal</td><td>2X Filter</td></tr><tr><td>Celsius</td><td>0x00</td><td>0x10</td></tr><tr><td>Fahrenheit</td><td>0x01</td><td>0x11</td></tr></table>		Normal	2X Filter	Celsius	0x00	0x10	Fahrenheit	0x01	0x11				
	Normal	2X Filter															
Celsius	0x00	0x10															
Fahrenheit	0x01	0x11															
0xF8(248)	Get/Set	Lock/Unlock Parameter	BOOL	0 : Unlock 1 : Lock													

3. Dimension



(unit : mm)