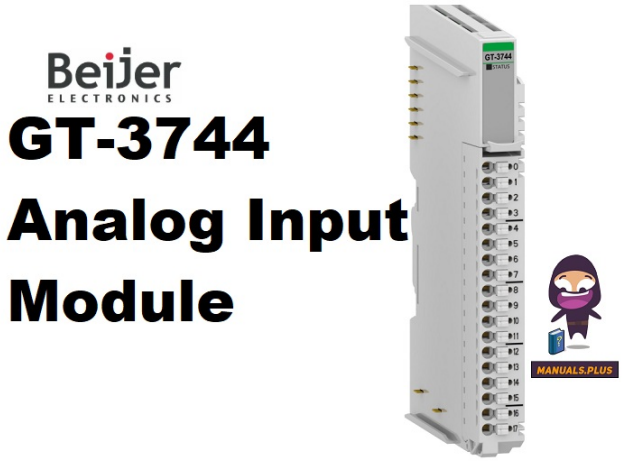

Beijer ELECTRONICS GT-3744 Analog Input Module User Manual

Contents

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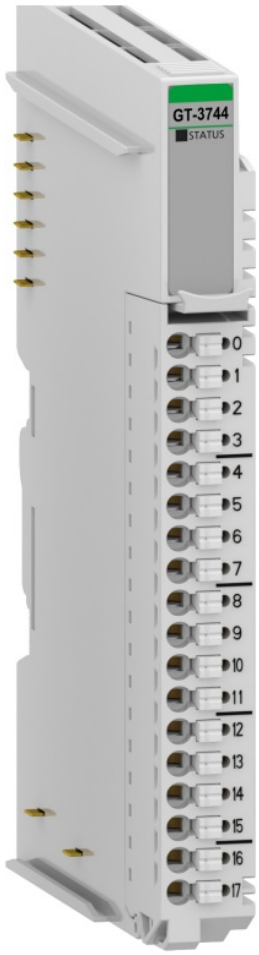
Beijer ELECTRONICS GT-3744 Analog Input Module



Specifications

- **Model:** GT-3744 Analog Input Module
- **Channels:** 4
- **Input Type:** 4-Wire RTD/Resistance
- **Terminal:** 18 pt removable terminal

Product Usage Instructions

Installation

1. Ensure power to the system is off before installation.
2. Connect the analog input module to the appropriate slot in the G-series system.
3. Securely fasten the module in place to prevent any movement.

Setup

1. Refer to the wiring diagram in the user manual to correctly wire the input signals.
2. Check the LED indicators to ensure proper functioning.
3. Configure the system software to recognize and interface with the analog input module.

Usage

1. After installation and setup, provide the necessary input signals to the module.
2. Monitor the data readings from the analog inputs through the system interface.
3. Regularly inspect the module for any signs of damage or malfunction.

About This Manual

- This manual contains information on the software and hardware features of the Beijer Electronics GT-3744 Analog Input Module.
- It provides in-depth specifications and guidance on the installation, setup, and usage of the product.

Symbols Used in This Manual

- This publication includes Warning, Caution, Note and Important icons where appropriate to point out safety-related or other important information.

The corresponding symbols should be interpreted as follows:

WARNING
The Warning icon indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury, and major damage to the product.

CAUTION
The Caution icon indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, and moderate damage to the product.

NOTE
The Note icon alerts the reader to relevant facts and conditions.

IMPORTANT
The Important icon highlights important information.

Safety

- Before using this product, please read this manual and other relevant manuals carefully. Pay full attention to safety instructions!
- In no event will Beijer Electronics be responsible or liable for damages resulting from the use of this product.
- The images, examples and diagrams in this manual are included for illustrative purposes.
- Because of the many variables and requirements associated with any particular installation, Beijer Electronics cannot take responsibility or liability for actual use based on the examples and diagrams.

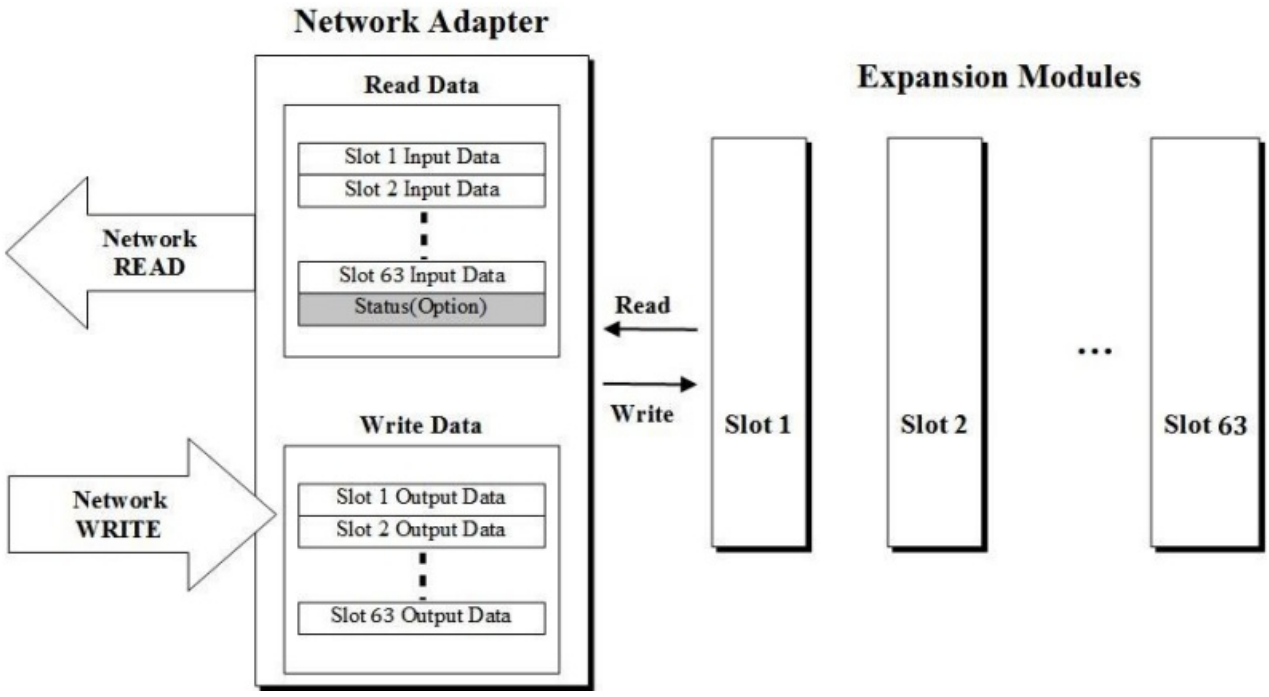
Product Certifications

The product has the following certifications.

General Safety Requirements

- **WARNING:** Do not assemble the products and wires with power connected to the system. Doing so causes an “arc flash”, which can result in unexpected dangerous events (burns, fire, flying objects, blast pressure, sound blast, heat).
- Do not touch terminal blocks or IO modules when the system is running. Doing so may cause an electric shock, short circuit or malfunction of the device.
- Never let external metallic objects touch the product when the system is running. Doing so may cause an electric shock, short circuit or malfunction of the device.
- Do not place the product near inflammable material. Doing so may cause a fire.
- All wiring work should be performed by an electrical engineer.
- When handling the modules, ensure that all persons, the workplace, and the packing are well grounded.
- Avoid touching conductive components, The modules contain electronic components that may be destroyed by electrostatic discharge.
- **CAUTION:** Never use the product in environments with temperatures over 60°C. Avoid placing the product in direct sunlight.
- Never use the product in environments with over 90% humidity.
- Always use the product in environments with pollution degree 1 or 2.
- Use standard cables for wiring.

About the G-series System



System overview

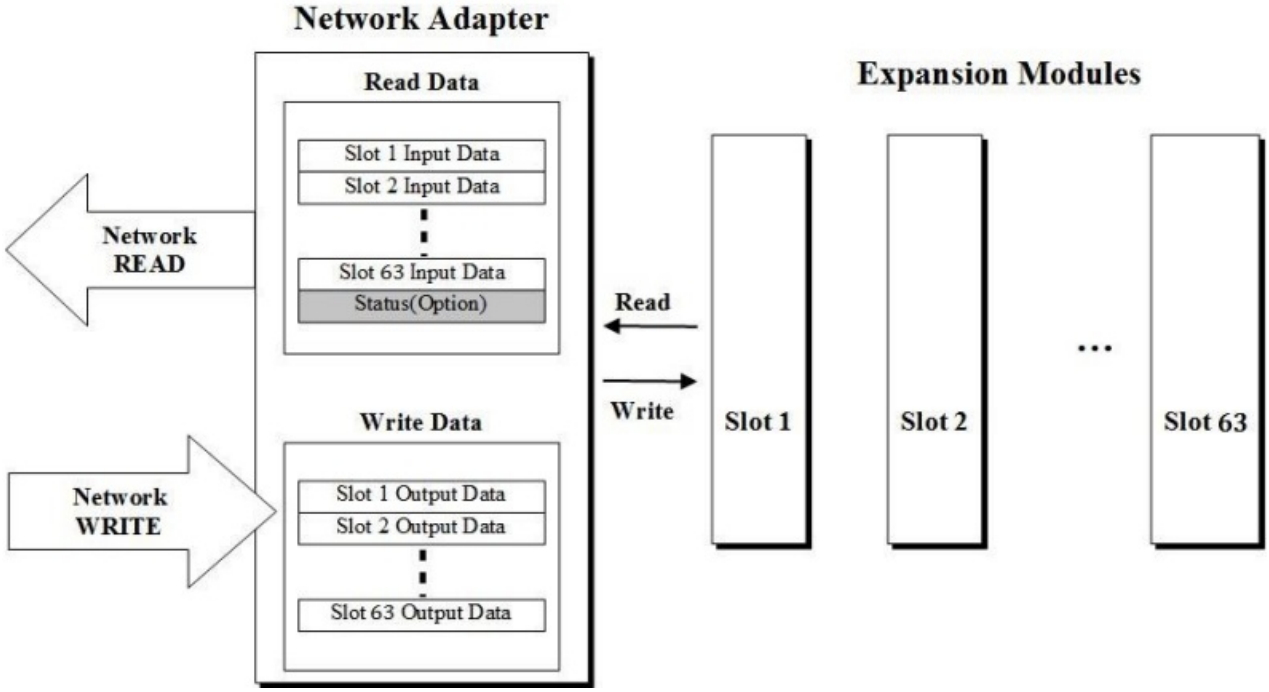
- **Network Adapter Module** – The network adapter module forms the link between the field bus and the field

devices with the expansion modules.

- The connection to different field bus systems can be established by each of the corresponding network adapter modules, e.g., for MODBUS TCP, Ethernet IP, EtherCAT, PROFINET, CC-Link IE Field, PROFIBUS, CANopen, DeviceNet, CC-Link, MODBUS/Serial, etc.
- **Expansion Module** – Expansion module types: Digital IO, Analog IO, and Special modules.
- **Messaging** – The system uses two types of messaging: Service messaging and IO messaging.

IO Process Data Mapping

- An expansion module has three types of data: IO data, configuration parameters, and memory registers.
- The data exchange between the network adapter and the expansion modules is made via IO process image data by internal protocol.



- Data flow between network adapter (63 slots) and expansion modules
- The input and output image data depend on the slot position and the data type of the expansion slot. The ordering of input and output process image data is based on the expansion slot position.
- Calculations for this arrangement are included in the manuals for network adapters and programmable IO modules.
- Valid parameter data depends on the modules in use. For example, analog modules have settings of either 0-20 mA or 4-20 mA, and temperature modules have settings such as PT100, PT200, and PT500.
- The documentation for each module describes the parameter data.

Specifications

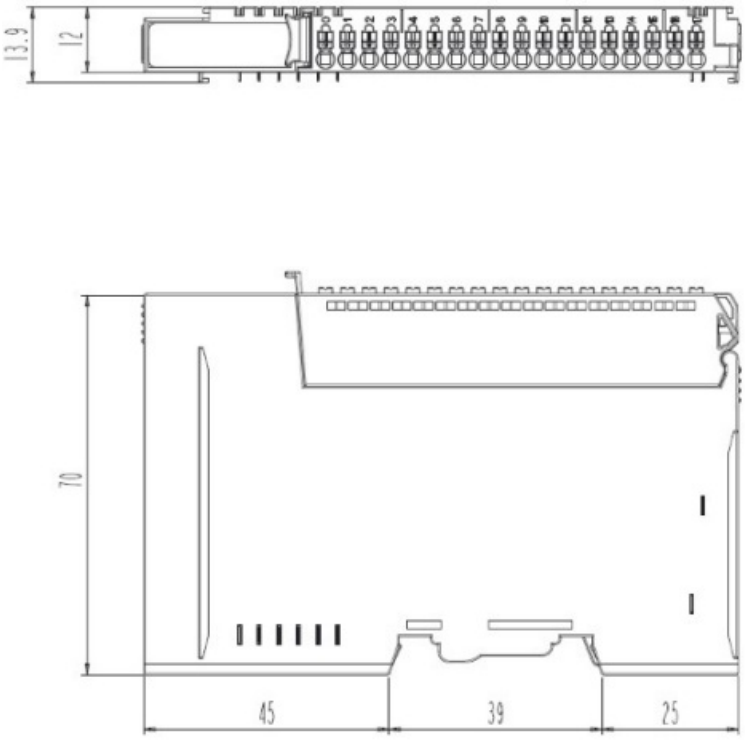
Environmental Specifications

Operating temperature	-20°C – 60°C
UL temperature	-20°C – 60°C
Storage temperature	-40°C – 85°C
Relative humidity	5% – 90% non-condensing
Mounting	DIN rail
Shock operating	IEC 60068-2-27 (15G)
Vibration resistance	IEC 60068-2-6 (4 g)
Industrial emissions	EN 61000-6-4: 2019
Industrial immunity	EN 61000-6-2: 2019
Installation position	Vertical and horizontal
Product certifications	CE, FCC, UL, cUL

General Specification

Power dissipation	Max. 120 mA @ 5 VDC
Isolation	I/O to logic: Isolation Field power: Not connected
Field power	Not used, bypass to next expansion module
Wiring	I/O cable max. 0.823 mm2 (AWG 18)
Weight	64 g
Module size	12 mm x 109 mm x 70 mm

Dimensions



Module dimensions (mm)

Input Specification

Inputs per module	4 channels
Indicators (logic side)	4 green input status

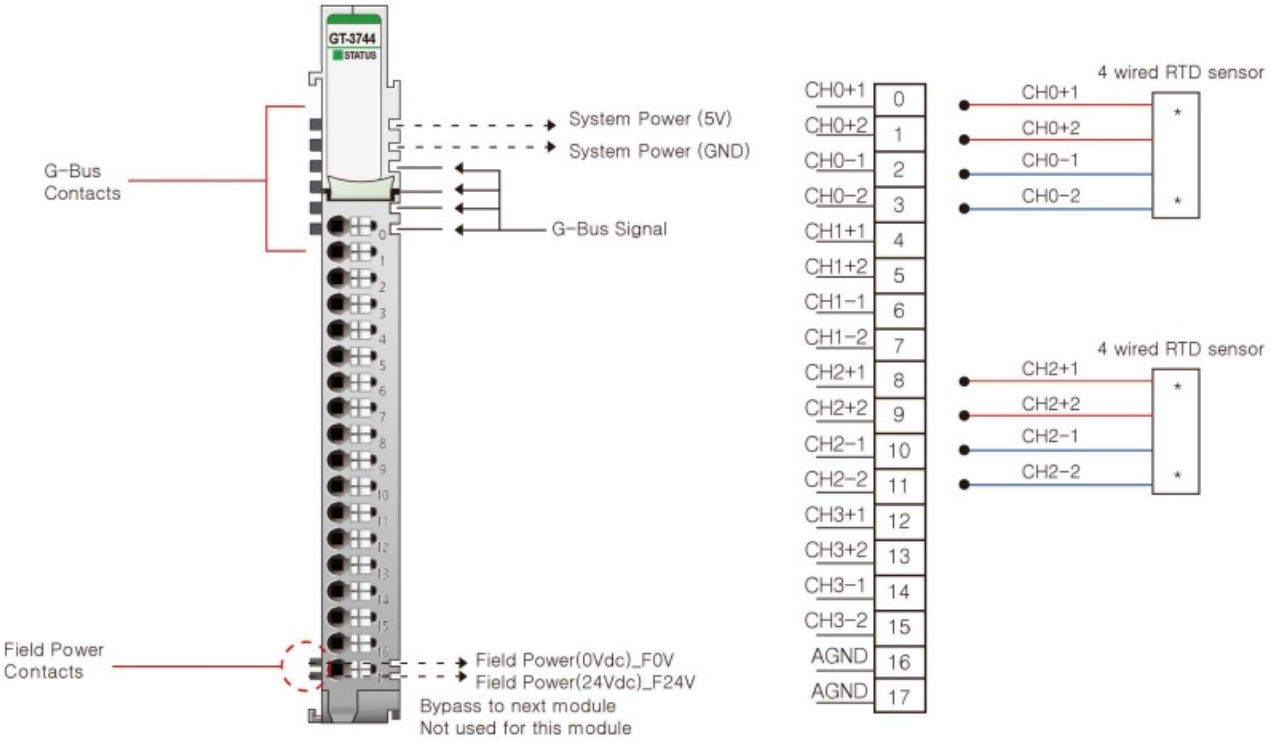
Inputs per module	4 channels
Sensor types	**RTD input range**

RTD input	**Input range**
PT50, PT100, PT200, PT500, PT1000	-200 – 850 °C
JPT50, JPT100, JPT200, JPT500, JPT1000	-200 – 640 °C
NI100, NI200, NI500, NI1000	-60 – 250 °C
NI120	-80 – 260 °C
Cu10, Cu100	-100 – 260 °C
NI1000LG	-50 – 120 °C

Resistance input	**Input range**

	<table><tr><td colspan="2"></td></tr><tr><td>1 Ω/bit</td><td>0 – 4000 Ω</td></tr><tr><td>100 mΩ/bit</td><td>0 – 2000 Ω</td></tr><tr><td>10 mΩ/bit</td><td>0 – 327 Ω</td></tr><tr><td>20 mΩ/bit</td><td>0 – 620 Ω</td></tr><tr><td>50 mΩ/bit</td><td>0 – 1200 Ω</td></tr></table>
Excitation current	About 0.5 mA
Connection method	4-wire
Conversion time	< 60 ms / all channels
Data format	16-bit signed integer (2′ complement)
Module accuracy	PT50, JPT50, NI100, NI120 : ±0.3% full scale @ 25 °C PT50, JPT50, NI100, NI120 : ±0.5% full scale @ -40,70 °C PT1000: ±0.3 °C at 50 – 150 °C @ 25 °C ambient PT1000: ±0.5 °C at 50 – 150 °C @ -40, 70 °C ambient PT1000: ±0.5 °C at -200 – 250 °C @ 25 °C ambient Cu10: ±2 % full scale @ 25 °C ambient Cu10: ±4 % full scale @ -40, 70 °C ambient Cu100: ±0.3 % full scale @ 25 °C ambient Cu100: ±0.5 % full scale @ -40, 70 °C ambient **All type input range:** • ±0.1 % full scale @ 25 °C ambient • ±0.3 % full scale @ -40 – 70 °C
Resolution of data	RTD Type : ±0.1 °C / F , Resistance type: 1 Ω, 100 mΩ, 10 mΩ, 20 mΩ, 50 mΩ
Calibration	Not required
Diagnostic	Sensor open or range over, then conversion data = 0x8000(-32768)

Wiring Diagram


GT-3744
STATUS
System Power (5V)
System Power (GND)
G-Bus
Contacts
G-Bus Signal
Field Power
Contacts
Field Power(0Vdc)_F0V
Field Power(24Vdc)_F24V
Bypass to next module
Not used for this module
CH0+1 0
CH0+2 1
CH0-1 2
CH0-2 3
CH1+1 4
CH1+2 5
CH1-1 6
CH1-2 7
CH2+1 8
CH2+2 9
CH2-1 10
CH2-2 11
CH3+1 12
CH3+2 13
CH3-1 14
CH3-2 15
AGND 16
AGND 17
4 wired RTD sensor
CH0+1
CH0+2
CH0-1
CH0-2
*
*
4 wired RTD sensor
CH2+1
CH2+2
CH2-1
CH2-2
*
*

Pin no.	Signal description
0	RTD channel 0 R+1
1	RTD channel 0 R+2
2	RTD channel 0 R-1
3	RTD channel 0 R-2
4	RTD channel 1 R+1
5	RTD channel 1 R+2
6	RTD channel 1 R-1
7	RTD channel 1 R-2
8	RTD channel 2 R+1
9	RTD channel 2 R+2
10	RTD channel 2 R-1
11	RTD channel 2 R-2
12	RTD channel 3 R+1
13	RTD channel 3 R+2
14	RTD channel 3 R-1
15	RTD channel 3 R-2
16	AGND
17	AGND

LED Indicator

LED no.	LED function/description	LED color
Status	G-Bus status	Green

LED Channel Status

Status	LED	Indication
G-Bus status	OFF	Disconnection
	Green	Connection

Mapping Data into the Image Table

Input Module Data

Analog input Ch 0
Analog input Ch 1
Analog input Ch 2
Analog input Ch 3

Input Image Value

Bit no.	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	Analog input Ch 0 low byte							
Byte 1	Analog input Ch 0 high byte							
Byte 2	Analog input Ch 1 low byte							
Byte 3	Analog input Ch 1 high byte							
Byte 4	Analog input Ch 2 low byte							
Byte 5	Analog input Ch 2 high byte							
Byte 6	Analog input Ch 3 low byte							
Byte 7	Analog input Ch 3 high byte							

- **NOTE:** If the input of the channel is open or over-ranged, its conversion data will be 0x800032678.

Configuration Parameter 10 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 – 850 °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 – 640 °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 – 250 °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 – 2000 Ω, 100 mΩ /1count =81h: Resistance Input, 1 – 327 Ω, 10 mΩ /1count =82h: Resistance Input, 1 – 620 Ω, 20 mΩ /1count =83h: Resistance Input, 1 – 1200 Ω, 50 mΩ/1count =84h: Resistance Input, 1 – 4000 Ω, 1 Ω/1count =Others: Reserved	0: PT100
1	00	Temperature type: 0: Celsius (°C) 1: Fahrenheit (°F)	00: Celsius (°C)
	01	Reserved	0
	02 – 03	Data resolution: 00: 0.1 °C, °F/bit 01: 1 °C, °F/bit 10: 0.01 °C, °F/bit * 11: Reserved	0

Byte	Decimal bit	Description	Default value
	04	Filter type: 0: Normal filter 1: Enhanced filter	0: Normal filter
	05-06	SW filter: 0: Normal filter (filter time = 20) 1: Fast filter (filter time = 3) ** 2: Enhanced filter (filter time = 40) 3: More enhanced filter (filter time = 80)	0
	07	Reserved	0
2-3		CH0 offset value	0
4-5		CH1 offset value	0
6-7		CH2 offset value	0
8-9		CH3 offset value	0

- Data exceeding 32767 cannot be displayed.
- If the fast filter is set, the specification accuracy may not be met.

Data Value

Resistance temperature detector input range

Type	Input range
PT100	-200 – 850°C
PT200	-200 – 850°C
PT500	-200 – 850°C
PT1000	-200 – 850°C
PT50	-200 – 850°C
JPT100	-200 – 640 °C
JPT200	-200 – 640 °C
JPT500	-200 – 640 °C
JPT1000	-200 – 640 °C
JPT50	-200 – 640 °C
NI100	-60 – 250°C
NI200	-60 – 250°C
NI500	-60 – 250°C
NI1000	-60 – 250°C
NI120	-80 – 260°C
Cu10	-100 – 260°C
Cu100	-100 – 260°C
NI1000LG	-50 – 120°C

Resistance input range

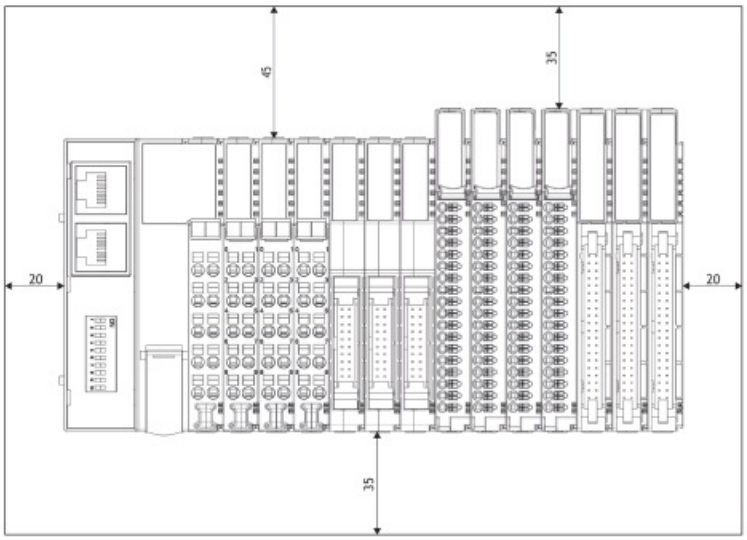
Type	Input range
1 Ω/bit	0 – 4000 Ω
100 mΩ/bit	0 – 2000 Ω
10 mΩ/bit	0 – 327 Ω
20 mΩ/bit	0 – 620 Ω
50 mΩ/bit	0 – 1200 Ω

Hardware Setup

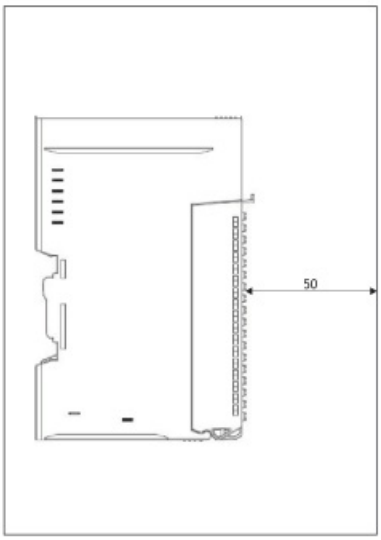
- **CAUTION** Always read this chapter before installing the module!
- Hot surface! The surface of the housing can become hot during operation. If the device is used in high ambient temperatures, always let the device cool down before touching it.
- Working on energized devices can damage the equipment! Always turn off the power supply before working on the device.

Space Requirements

- The following drawings show the space requirements when installing the G-series modules.
- The spacing creates space for ventilation and prevents conducted electromagnetic interference from influencing the operation.
- The installation position is valid vertically and horizontally. The drawings are illustrative and may be out of proportion.
- **CAUTION:** NOT following the space requirements may result in damaging the product.



Vertical and horizontal space requirements



Required distance to door

Mount Module to DIN Rail

- The following chapters describe how to mount the module to the DIN rail.
- **CAUTION** The module must be fixed to the DIN rail with the locking levers.

Mount GL-9XXX or GT-XXXX Module

- The following instructions apply to these module types.
- GL-9XXX
- GT-1XXX
- GT-2XXX
- GT-3XXX
- GT-4XXX
- GT-5XXX
- GT-7XXX

- **GN-9XXX** modules have three locking levers: one at the bottom and two on the side. For mounting instructions, refer to Mount GN-9XXX Module.

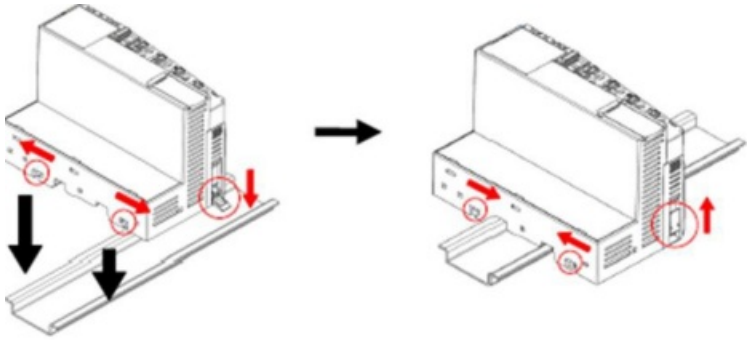
- Mount to DIN rail

- Dismount from DIN rail

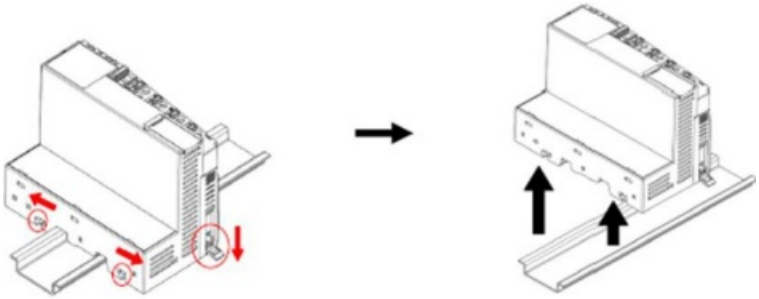
Mount GN-9XXX Module

- To mount or dismount a network adapter or programmable IO module with the product name GN-9XXX, for example GN-9251 or GN-9371, see the following instructions.

- Mount to DIN rail

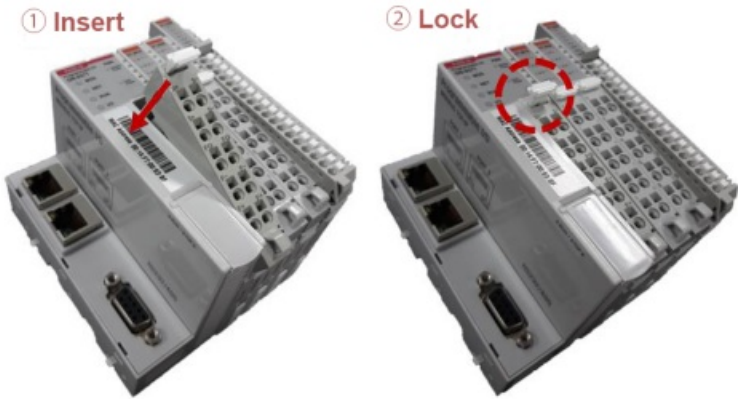


- Dismount from DIN rail

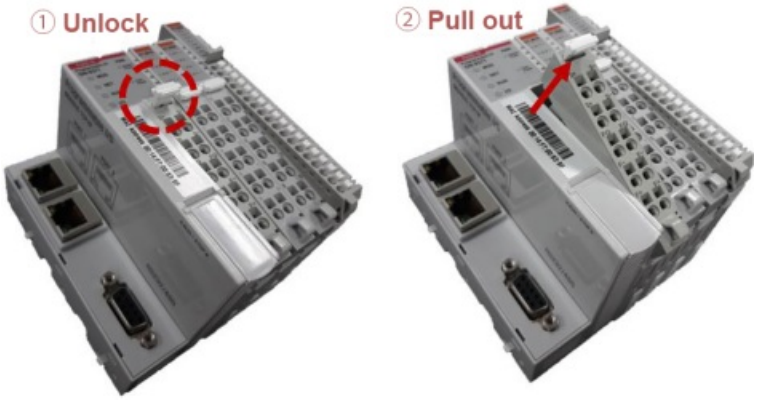


Mount Removable Terminal Block

- To mount or dismount a removable terminal block (RTB), see the instructions below.



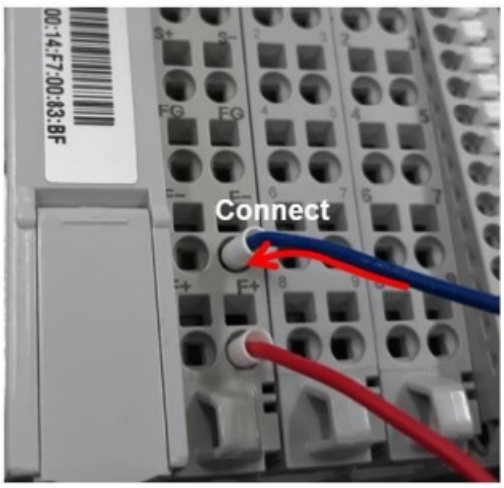
- Mount a removable terminal block



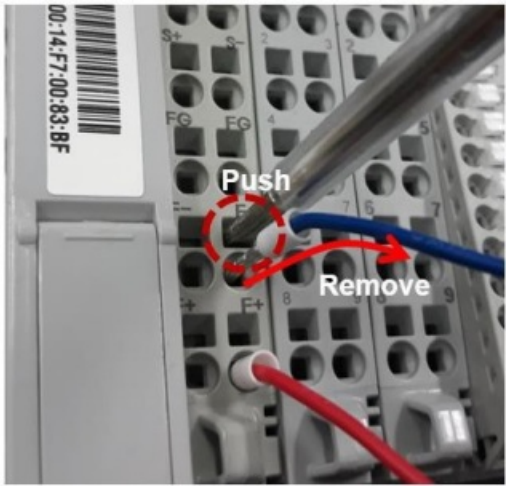
- Dismount a removable terminal block

Connect Cables to Removable Terminal Block

- To connect/disconnect cables to/from the removable terminal block (RTB), see the instructions below.
- **WARNING:** Always use the recommended supply voltage and frequency to prevent damage to the equipment and ensure optimal performance.



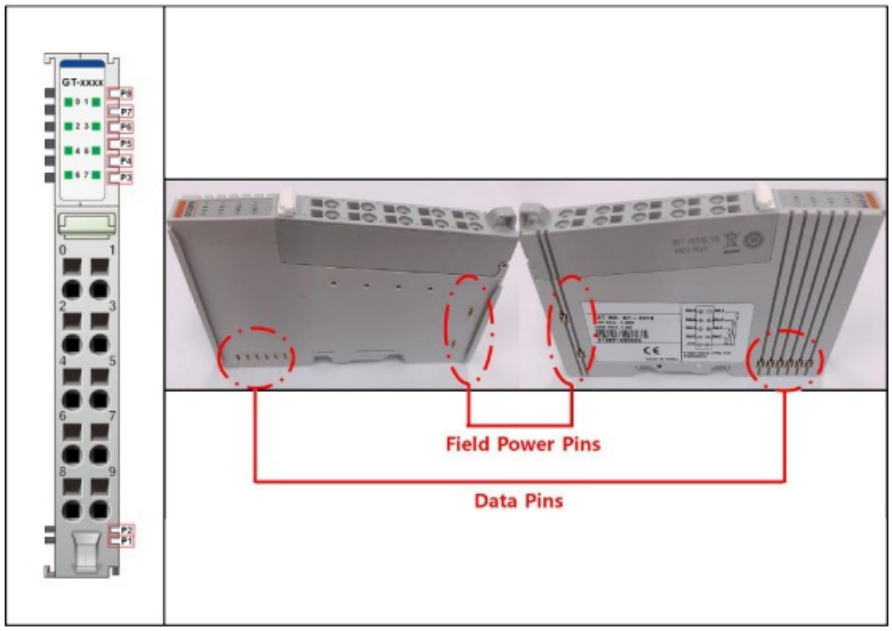
- Connect cable



- Disconnect cable

Field Power and Data Pins

- Communication between the G-series network adapter and the expansion module, as well as the system /field power supply of the bus modules, is carried out via the internal bus. It is comprised of 2 Field Power Pins and 6 Data Pins.
- **WARNING:** Do not touch the data and field power pins! Touching can result in soiling and damage by ESD noise.



Pin no.	Name	Description
P1	System VCC	System supply voltage (5 VDC)
P2	System GND	System ground
P3	Token output	Token output port of processor module
P4	Serial output	Transmitter output port of processor module
P5	Serial input	Receiver input port of processor module
P6	Reserved	Reserved for bypass token
P7	Field GND	Field ground
P8	Field VCC	Field supply voltage (24 VDC)

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FAQ

- **Q: What do the LED indicators on the module signify?**
  - **A:** The LED indicators show the status of the module's input signals.
  - Refer to the user manual for detailed information on interpreting the LED signals.
- **Q: Can I use the GT-3744 Analog Input Module with other systems?**
  - **A:** The GT-3744 Analog Input Module is designed specifically for use with the G-series system.
  - Compatibility with other systems may vary, so it is recommended to consult with technical support before integrating it with a different system.

Documents / Resources

	Beijer ELECTRONICS GT-3744 Analog Input Module [pdf] User Manual GT-3744 Analog Input Module, GT-3744, Analog Input Module, Input Module, Module

References

- User Manual