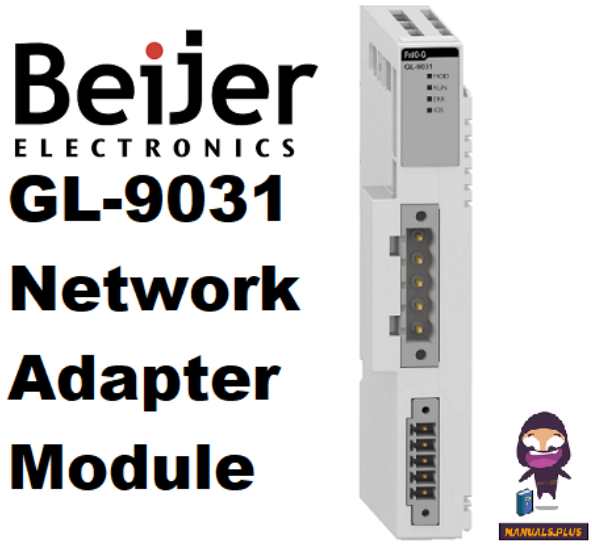

Beijer ELECTRONICS GL-9031 Network Adapter Module User Manual

Contents

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Beijer ELECTRONICS GL-9031 Network Adapter Module

Specifications

- **Product Name:** GL-9031 Network Adapter Module
- **Network Type:** CC-Link
- **Version:** Light
- **Maximum Slices:** 12

Product Information

- The GL-9031 Network Adapter Module is a CC-Link network adapter designed for use in the G-series system by Beijer Electronics. It offers a light version with a maximum capacity of 12 slices, providing seamless integration within the system.

Usage Instructions

Installation

1. Ensure that the power source is disconnected before installation.
2. Align the module with the designated slot in the G-series system.
3. Gently push the module into place until securely connected.

Setup

1. Power on the G-series system and access the configuration settings.
2. Locate the network adapter settings and configure them according to your network requirements.
3. Save the settings and restart the system to apply the changes.

Usage

1. Once installed and set up, the network adapter module will facilitate communication within the CC-Link network.
2. Monitor the LED indicators to ensure proper network connectivity.

About This Manual

This manual contains information on the software and hardware features of the Beijer Electronics GL-9031 Network Adapter Module. It provides in-depth specifications, guidance on 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 product certifications.

General Safety Requirements

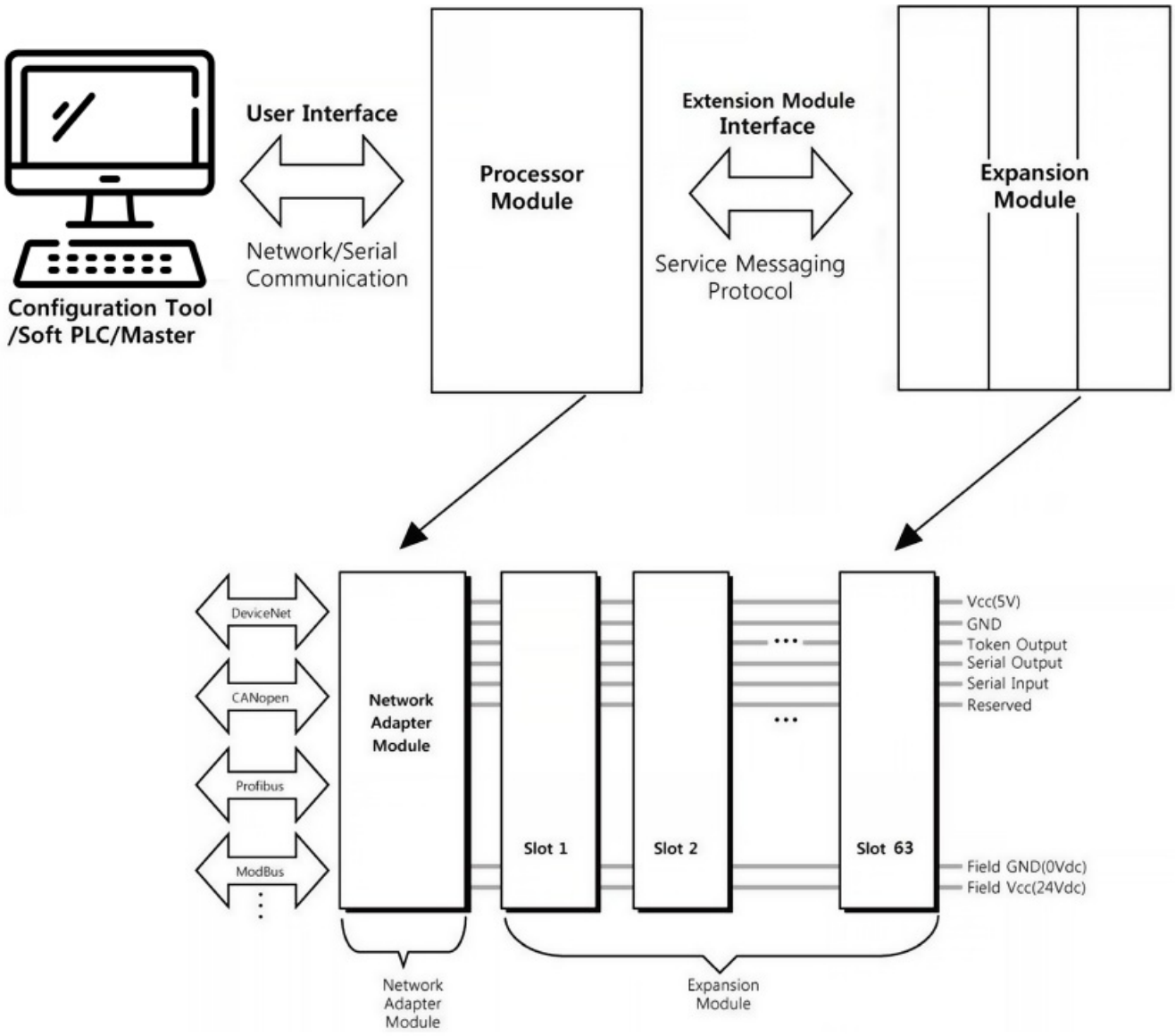
WARNING

- Do not assemble the products and wires with power connected to the system. Doing so cause 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 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 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 temperature 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

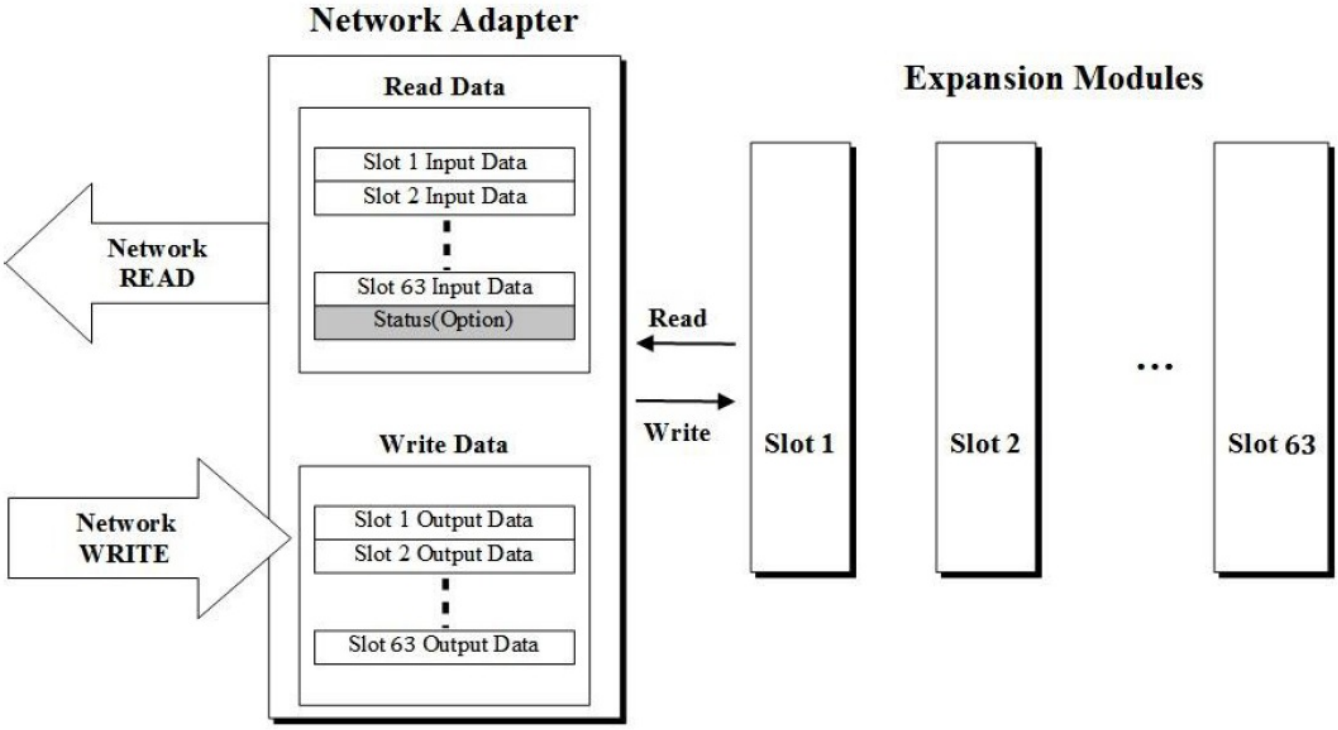


System overview

- **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 module, 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 parameter, and memory register. 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 adapter 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 provides a description of 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 Specifications

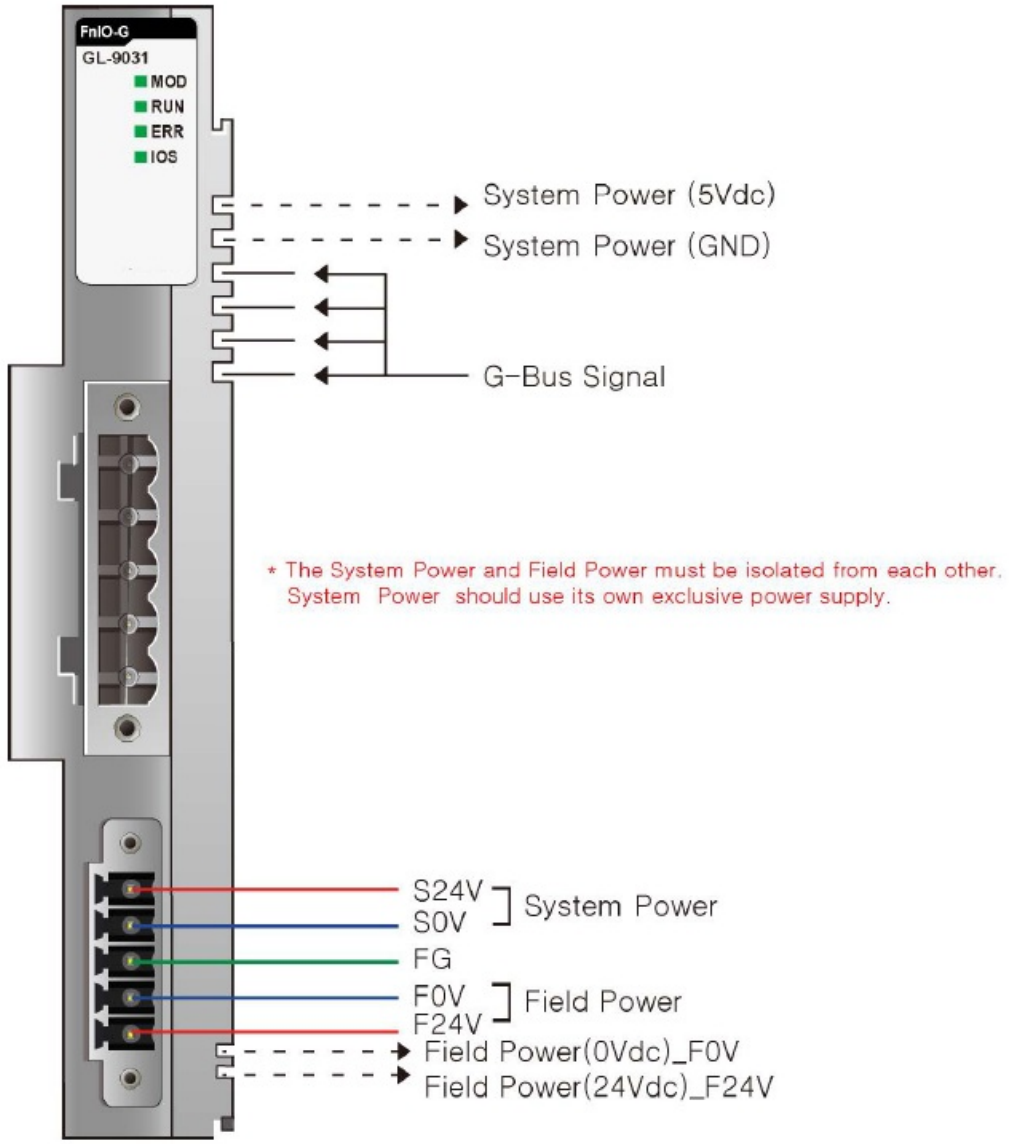
UL system power	Supply voltage: 24 VDC nominal, class 2
System power	Supply voltage: 24 VDC nominal Supply voltage range: 15 – 28.8 VDC Reverse polarity protection
Power dissipation	35 mA typical @ 24 VDC
Current for IO module	1.0 A @ 5 VDC
Isolation	System power to internal logic: Non-isolation System power IO driver: Isolation
UL field power	Supply voltage: 24 VDC nominal, class 2
Field power	Supply voltage: 24 VDC typical (max. 28.8 VDC) **NOTE! The field power range depends on the IO module series. Refer to t he IO module specification for specific details.**
Max. current field power con tact	Max. DC 8 A
Wiring	IO cable max. 2.0 mm2 (AWG 14)
Weight	71 g
Dimensions	22 mm x 109 mm x 70 mm

Communication Interface Specification

Adapter type	Slave node (CC-Link Version 1)
Max. expansion slot	12 slots

IO data size	System area: 16 points RX/RY: 112 points (4staion occupied) RWr/RWw: 16 points (4station occupied)
Maximum number of stations per master station	42
The number of device station	1 – 64
Baud rate	156 / 625 / 2500 / 5000 / 10000 Kbps
Interface connector	5 Pin open connector
LED indicators	**4 status LEDs:** Module status (MOD) – Green/Red Current runnin g status (NET) – Green Error status (ERR) – Gree n Expansion module status (IOS) – Green/Red
Module location	Starter module left side of G-series system
Station class	Remote device station

Wiring Diagram

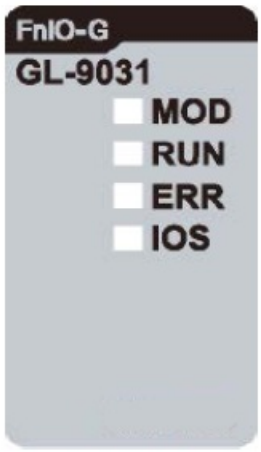


Pin no.	Signal description
1	System power, 24 V
2	System power, ground
3	Frame ground
4	Field power, ground
5	Field power, 24 V

WARNING

- Never connect system power to field power! Use separate power supplies.

LED Indicator



LED	LED function / description	LED color
MOD	Module status	Green/Red
RUN	Communication status	Green
ERR	Error status	Green
IOS	Expansion module status	Green/Red

MOD (Module Status)

Status	LED	Indicates
Not powered	OFF	Power is not supplied to the unit.
Normal, operational	Green	The unit is operating in normal condition.
Device in standby	Red	EEPROM parameter is not initialized yet. Serial number is zero value (0x00000000).

RUN (Network Status)

Status	LED	Indicates
Init / No communication	Red	No communication / Communication disconnection.
Communication	Green	Normal communication.
Communication error	OFF	Communication error / Token passing

ERR (Error Status)

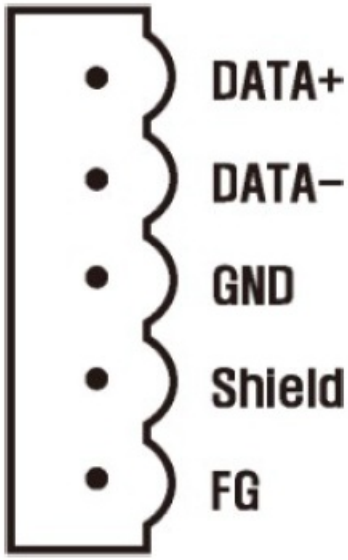
Status	LED	Indicates
No error	OFF	No error.
Invalid configuration	Red	Exceeded number range of device station.

IOS (Expansion Module Status)

Status	LED	Indicates
Not powered, no expansion m odule	OFF	Device has no expansion module or is not powered.
No expansion module	Flashing red	Adapter has no expansion module.

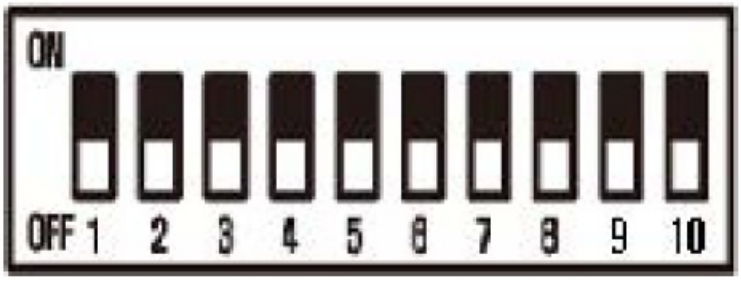
Status	LED	Indicates
Internal bus connection, run e xchanging IO data	Green	Exchanging IO data.
Expansion configuration failed	Red	Failed to initialize expansion module. • Detect invalid expansion module ID. • Overflowed input/output size. • Too many expansion modules. • Initialization failure. • Communication error. • Changed expansion module configuration. • Mismatch vendor code between adapter and expansion m odule.

5-Pin Open Connector



Connector no.	Signal name	Description
1	DATA+	Transceiver data high
2	DATA-	Transceiver data low
3	GND	Signal common
4	Shield	Shield
5	FG	Frame Ground. Internally shorted with shield.

Dip Switches



Pole#	Description	
1	Node address setting	Node address set-up is dip switch. Max. node Address is 64. See Node address setting examples bel ow.
2		
3		
4		
5		
6		
7		
8	Baud rate #1	156 Kbps: 8 OFF, 9 OFF, 10 OFF
9	Baud rate #2	625 Kbps: 8 ON, 9 OFF, 10 OFF
10	Baud rate #3	2.5 Mbps: 8 OFF, 9 ON, 10 OFF
		5 Mbps: 8 ON, 9 ON, 10 OFF
		10 Mbps: 8 OFF, 9 OFF, 10 ON
		Default baud rate: 156 Kbps

Node address pole setting examples

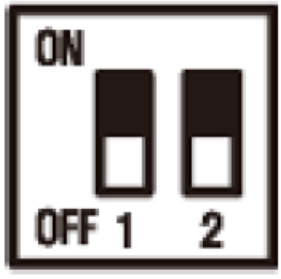
	#1(1)	#2(2)	#3(4)	#4(8)	#5(10)	#6(20)	#7(40)	#8	#9	#10
ID = 0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	–	–	–
ID = 1	ON	OFF	OFF	OFF	OFF	OFF	OFF	–	–	–
ID = 10	OFF	OFF	OFF	OFF	ON	OFF	OFF	–	–	–
ID = 42	OFF	ON	OFF	OFF	OFF	OFF	ON	–	–	–
ID = 64	OFF	OFF	ON	OFF	OFF	ON	ON	–	–	–

4 Pole Switch

Pole#	Description	
1	Fixed station	OFF: Auto addressable. ON: 4station occupied.

Pole#	Description	
2	Mode	Mode switch is ON, the IO size will be increased 2 bytes more res pectively.
3	STOP action	OFF: Master value dependent. ON: Output clear.
4	Reserved	

2 Pole Switch



Pole#	Description	
1	Terminator resistor	1 ON, 2 ON: Terminator resistor set. Other: Terminator resistor not set.
2		

Hardware Setup

CAUTION

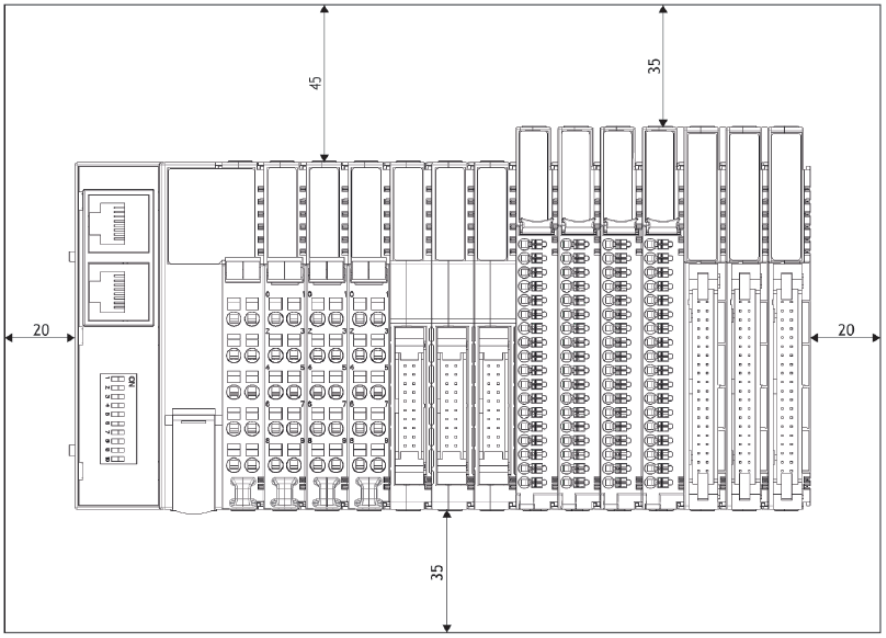
- Always read this chapter before installing the module!
- Hot surface! The surface of the housing can become hot during operation. If the device is used in high ambient temperatures, always let the device cool down before touching it.
- Working on energized devices can damage the equipment! Always turn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

Space Requirements

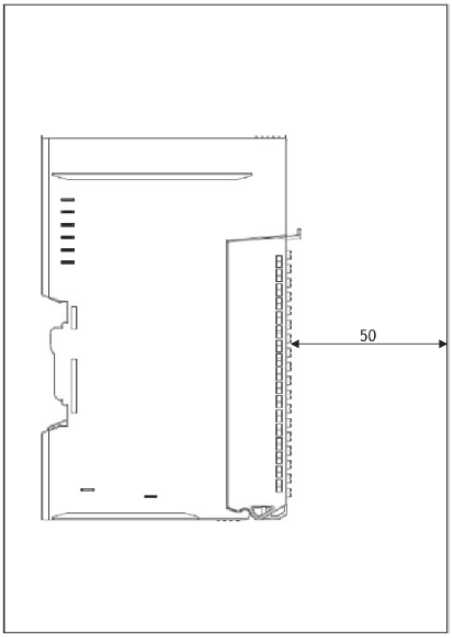
The following drawings show the space requirements when installing the G-series modules. The spacing creates space for ventilation, and prevents conducted electromagnetic interference from influencing the operation. Installation position is valid vertical and horizontal. The drawings are illustrative 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

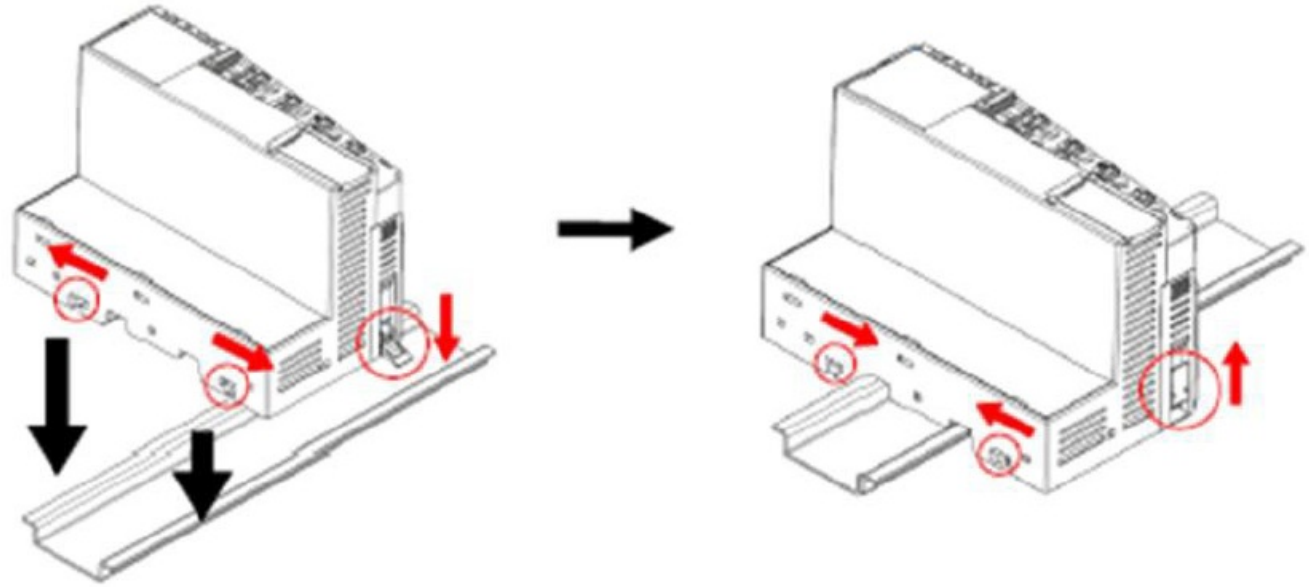
GN-9XXX modules have three locking levers, one at the bottom and two on the side. For mounting instructions, refer to Mount GN-9XXX Module.

Mount to DIN rail

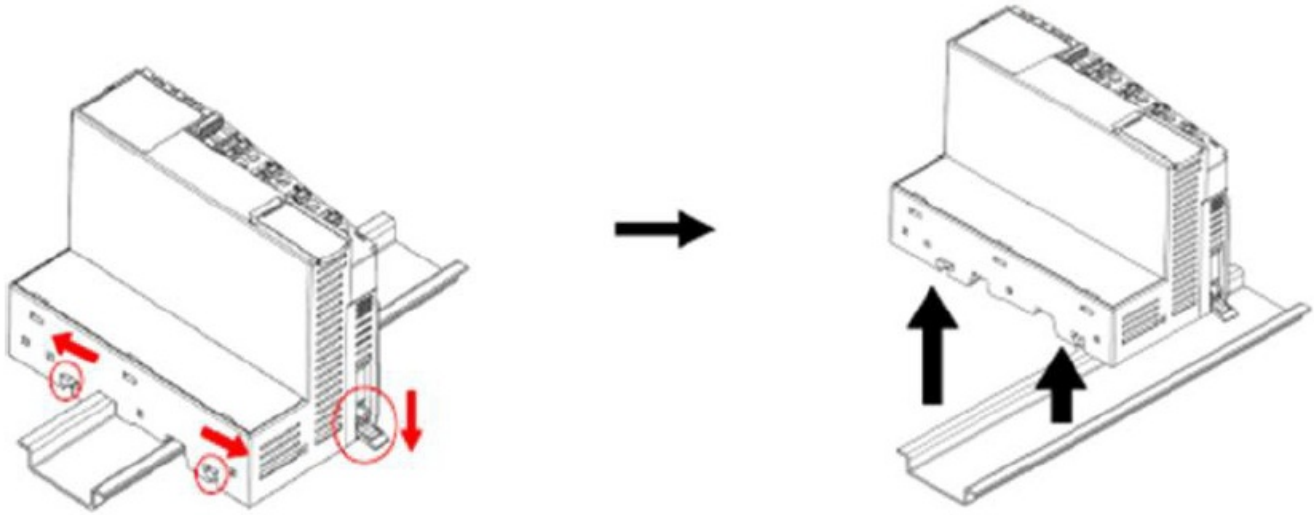
Dismount from DIN rail

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



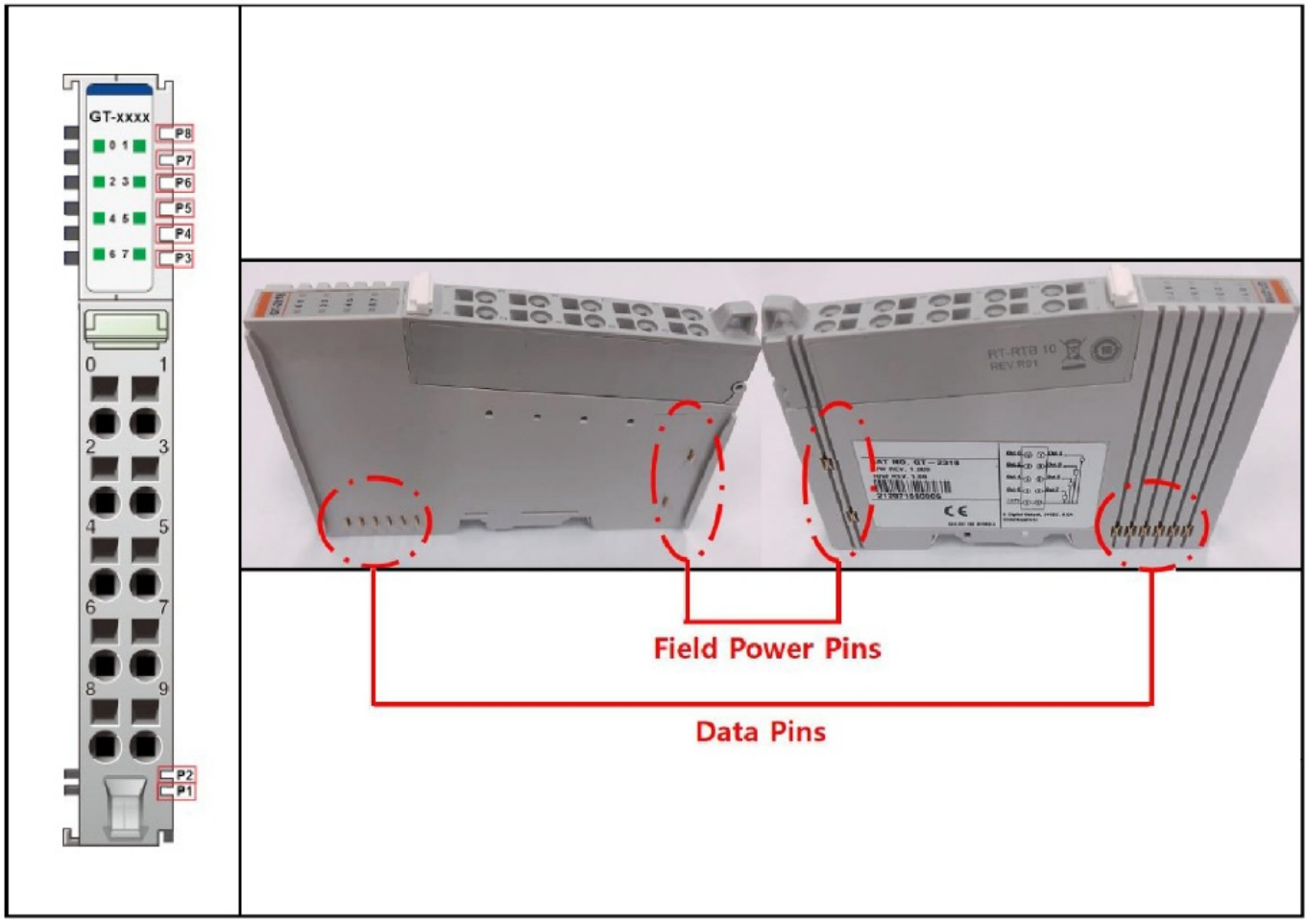
Dismount from DIN rail

Field Power and Data Pins

Communication between the G-series network adapter and the expansion module, as well as 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)

Process Image

Remote Input Area

No. of occupied station	Size	Signal name
1 station: 16 points	2 bytes	Discrete input
2 stations: 48 points	6 bytes	
3 stations: 80 points	10 bytes	
4 stations: 112 points	14 bytes	
System area	2 bytes	System

NOTE

When Mode switch is ON, the IO size will be increased 2 bytes more respectively.

Remote Output Area

No. of occupied station	Size	Signal name
1 station: 16 points	2 bytes	Discrete input
2 stations: 48 points	6 bytes	
3 stations: 80 points	10 bytes	
4 stations: 112 points	14 bytes	
System area	2 bytes	System

NOTE

When Mode switch is ON, the IO size will be increased 2 bytes more respectively.

RWr / RWw Area

Analog in / Special module

Address	Configuration	Size
RWr0 – RWr3	1 station	4 words
RWr4 – RWr7	2 stations	8 words
RWr8 – RWr11	3 stations	12 words
RWr12 – RWr27	4 stations	16 words

Analog out / Special module

Address	Configuration	Size
RWw0 – RWw3	1 station	4 words

Address	Configuration	Size
RWw4 – RWw7	2 stations	8 words
RWw8 – RWw11	3 stations	12 words
RWw12 – RWw27	4 stations	16 words

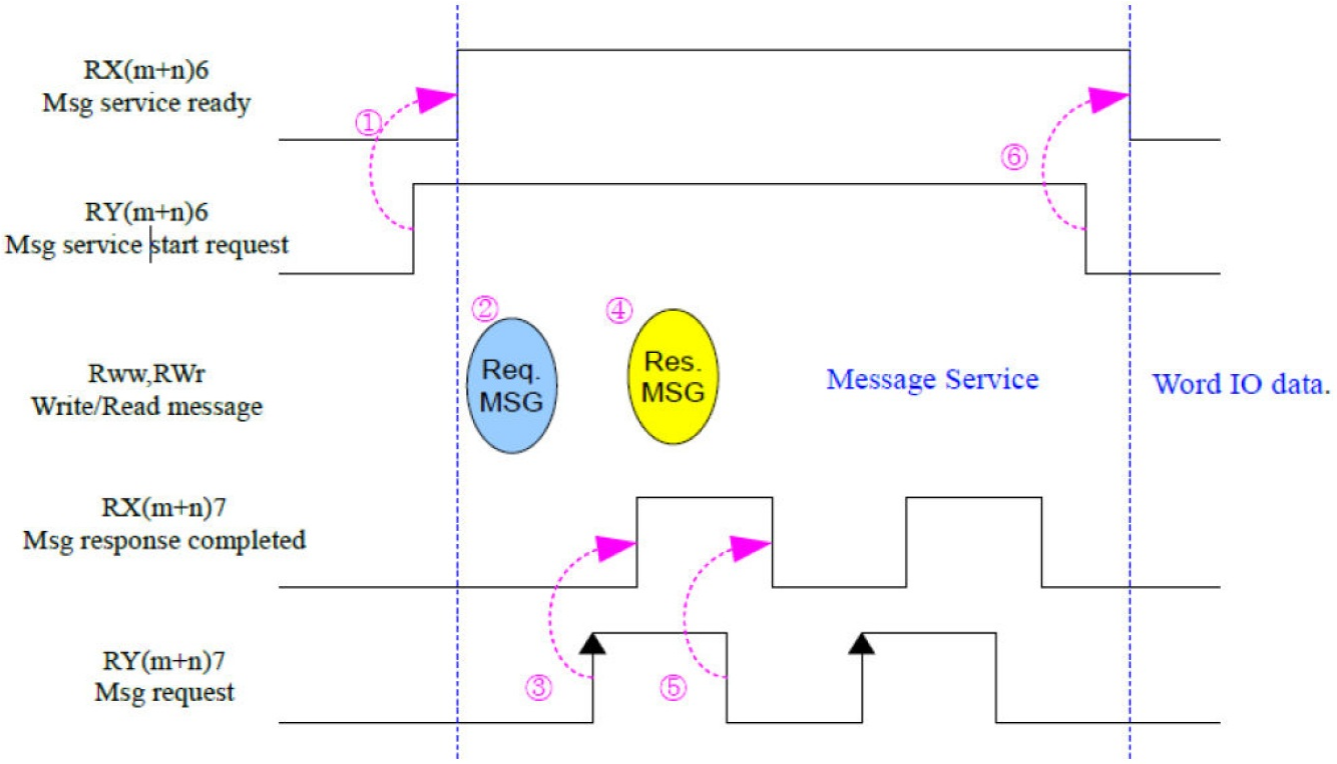
System Area

Input	Description	Output	Description
RX0	Reaction on network error	**RY0**	Reaction on network error
RX1	Reaction on network error	**RY1**	Reaction on network error
RX2	Reserved	**RY2**	Reserved
RX3	Reserved	**RY3**	Reserved
RX4	Reserved	**RY4**	Reserved
RX5	Reserved	**RY5**	Reserved
RX6	Msg service ready	**RY6**	Msg service start request
RX7	Msg response completed	**RY7**	Msg request
RX8	Reserved	**RY8**	Reserved
RX9	Reserved	**RY9**	Reserved
RXA	Error status flag	**RYA**	Reserved
RXB	Remote station ready	**RYB**	Reserved
RXC	Reserved	**RYC**	Reserved
RXD	Reserved	**RYD**	Reserved
RXE	Reserved	**RYE**	Reserved
RXF	Reserved	**RYF**	Reserved

Reaction on Network Error

RY1	RY0	Description
0	0	Hold last value
0	1	Clear output to zero
1	0	Stop bus
1	1	Not used (internally switched to 10)

Service Message



Service Message Request

Address	High byte	Low byte	Station
RWw[0]	Slot number	Service code: • Read Parameter: 2 • Write Parameter: 3	1
RWw[1]	Offset		
RWw[2]	User data length		
RWw[3]	User data 1	User data 0	
RWw[4]	User data 3	User data 2	2
RWw[5]	User data 5	User data 4	
RWw[6]	User data 7	User data 6	
RWw[7]	User data 9	User data 8	
RWw[8]	User data 11	User data 10	3
RWw[9]	User data 13	User data 12	
RWw[10]	User data 15	User data 14	
RWw[11]	User data 17	User data 16	
RWw[12]	User data 19	User data 18	4
RWw[13]	User data 21	User data 20	
RWw[14]	User data 23	User data 22	
RWw[15]	User data 25	User data 24	

Service Message Response

Address	High byte	Low byte	Station
RWw[0]	Slot number	Service code: • Read Parameter: 2 • Write Parameter: 3	1
RWw[1]	Offset		
RWw[2]	User data length		
RWw[3]	User data 1	User data 0	
RWw[4]	User data 3	User data 2	2
RWw[5]	User data 5	User data 4	
RWw[6]	User data 7	User data 6	
RWw[7]	User data 9	User data 8	
RWw[8]	User data 11	User data 10	3
RWw[9]	User data 13	User data 12	
RWw[10]	User data 15	User data 14	
RWw[11]	User data 17	User data 16	
RWw[12]	User data 19	User data 18	4
RWw[13]	User data 21	User data 20	
RWw[14]	User data 23	User data 22	
RWw[15]	User data 25	User data 24	

More Info

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FAQ

- **Q: What should I do if the LED indicators show no network connectivity?**
  - A: Check the network adapter settings and cables for any issues. Restart the system and verify the configuration.

Documents / Resources

	Beijer ELECTRONICS GL-9031 Network Adapter Module [pdf] User Manual GL-9031 Network Adapter Module, GL-9031, Network Adapter Module, Adapter Module, Module

References

- User Manual