Ethernet Modbus/TCP
Communication Converter

COM-ME-1

[For FZ series/GZ series]

Instruction Manual

RKC® RKC INSTRUMENT INC. IMR02E33-E2

NOTICE

- This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology and communications.
- The figures, diagrams and numeric values used in this manual are only for explanation purpose.
- RKC is not responsible for any damage or injury that is caused as a result of using this instrument, instrument failure or indirect damage.
- RKC is not responsible for any damage and/or injury resulting from the use of instruments made by imitating this instrument.
- Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.
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- Ethernet is a registered trademark of Xerox Corp.
- Modbus is a registered trademark of Schneider Electric.
- The name of each programmable controller (PLC) means the products of each manufacturer.
- Company names and product names used in this manual are the trademarks or registered trademarks of the respective companies.

Safety Precautions

■ Pictorial Symbols (safety symbols)

Various pictorial symbols are used in this manual to ensure safe use of the product, to protect you and other people from harm, and to prevent damage to property. The symbols are described below.
Be sure you thoroughly understand the meaning of the symbols before reading this manual.

⚠ WARNING : This mark indicates precautions that must be taken if there is danger of electric shock, fire, etc., which could result in loss of life or injury.

⚠ CAUTION : This mark indicates that if these precautions and operating procedures are not taken, damage to the instrument may result.

⚠ : This mark indicates that all precautions should be taken for safe usage.

⚠ WARNING

- To prevent injury to persons, damage to the instrument and the equipment, a suitable external protection device shall be required.
- All wiring must be completed before power is turned on to prevent electric shock, fire or damage to the instrument and the equipment.
- This instrument must be used in accordance with the specifications to prevent fire or damage to the instrument and the equipment.
- This instrument is not intended for use in locations subject to flammable or explosive gases.
- Do not touch high-voltage connections such as power supply terminals, etc. to avoid electric shock.
- RKC is not responsible if this instrument is repaired, modified or disassembled by other than factory-approved personnel. Malfunction may occur and warranty is void under these conditions.

⚠ CAUTION

- This product is intended for use with industrial machines, test and measuring equipment. (It is not designed for use with medical equipment and nuclear energy plant.)
- In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take additional measures.
- Provide reinforced insulation between the wire for the input signal and the wires for instrument power supply, source of power and loads.
- Be sure to provide an appropriate surge control circuit respectively for the following:
  - If input/output or signal lines within the building are longer than 30 meters.
  - If input/output or signal lines leave the building, regardless the length.
- This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock to operating personnel.
- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- All wiring must be in accordance with local codes and regulations.
- To prevent instrument damage as a result of failure, protect the power line and the input/output lines from high currents with a suitable overcurrent protection device with adequate breaking capacity such as a fuse, circuit breaker, etc.
- A malfunction in this product may occasionally make control operations impossible or prevent alarm outputs, resulting in a possible hazard. Take appropriate measures in the end use to prevent hazards in the event of malfunction.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
- Tighten each terminal screw to the specified torque found in the manual to avoid electric shock, fire or malfunction.
- For proper operation of this instrument, provide adequate ventilation for heat dissipation.
- Do not connect wires to unused terminals as this will interfere with proper operation of the instrument.
- Turn off the power supply before cleaning the instrument.
- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration may occur. Use a soft, dry cloth to remove stains from the instrument.
- Do not connect modular connectors to telephone line.

For Proper Disposal

When disposing of each part used for this instrument, always follows the procedure for disposing of industrial wastes stipulated by the respective local community.

Symbols

■ Pictorial Symbols (safety symbols)

NOTE : This mark indicates important information on installation, handling and operating procedures.

: This mark indicates supplemental information on installation, handling and operating procedures.

: This mark indicates where additional information may be located.

■ Abbreviation symbols

These abbreviations are used in this manual:

Abbreviation symbols	Name	Abbreviation symbols	Name
PV	Measured value	TC (input)	Thermocouple (input)
SV	Set value	RTD (input)	Resistance temperature detector (input)
MV	Manipulated output value	V (input)	Voltage (input)
AT	Autotuning	I (input)	Current (input)
ST	Startup tuning	HBA	Heater break alarm
OUT	Output	CT	Current transformer
DI	Digital input	LBA	Control loop break alarm
DO	Digital output	LBD	LBA deadband

About This Manual

There are two manuals pertaining to this product. Please be sure to read all manuals specific to your application requirements.

The following manuals can be downloaded from the official RKC website:
https://www.rkcinst.co.jp/english/download-center/

Manual	Manual Number	Remarks
COM-ME-1 [For FZ series/GZ series] Installation Manual	IMR02E32-E□	This manual is enclosed with instrument. This manual explains the mounting and wiring.
COM-ME-1 [For FZ series/GZ series] Instruction Manual	**IMR02E33-E2**	This manual you are reading now. This manual describes mounting, wiring, communication setting, protocol, communication data, troubleshooting and product specification.

Read this manual carefully before operating the instrument. Please place the manual in a convenient location for easy reference.

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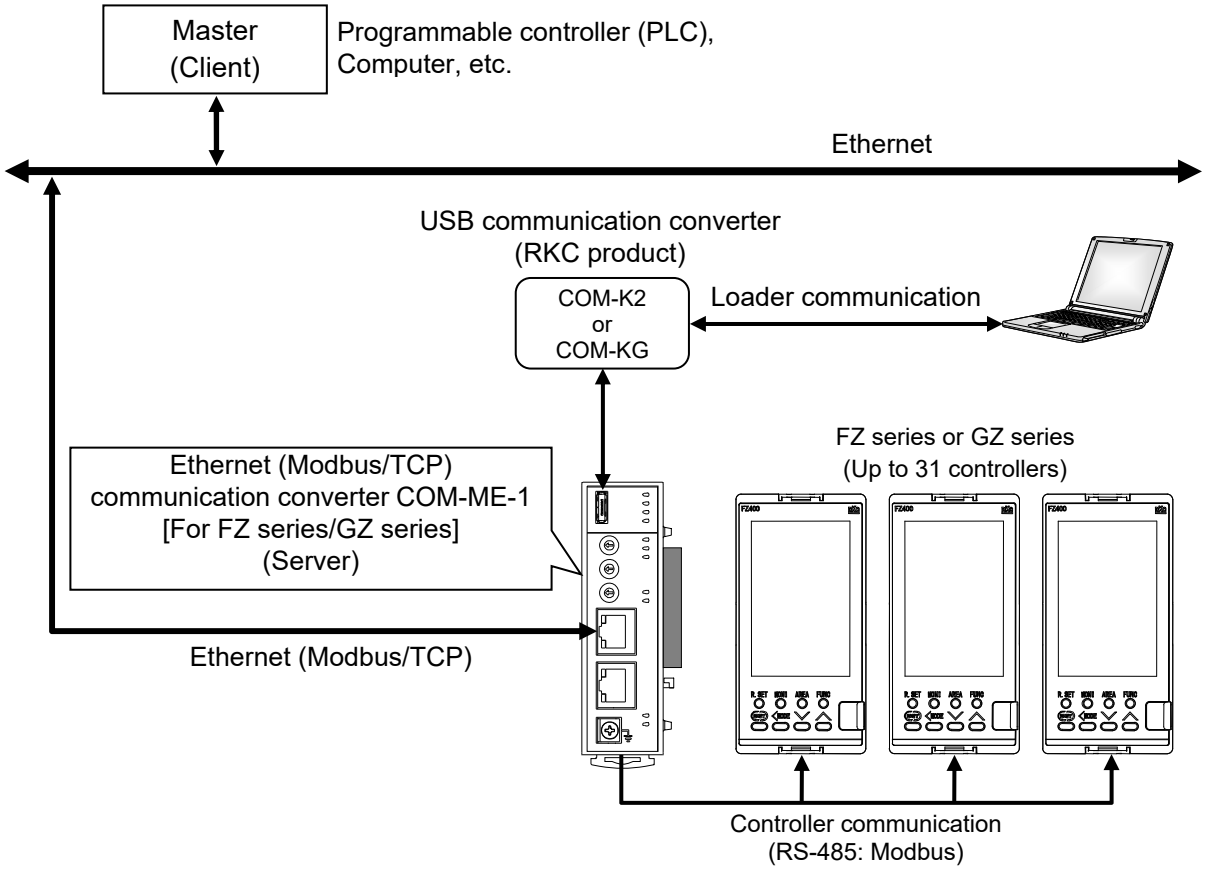
MEMO

1. OUTLINE

Ethernet Modbus/TCP communication converter COM-ME-1 [For FZ series/GZ series] (hereafter called COM-ME) is communication converter to connect the RKC digital controllers FZ110/400/900 or GZ400/900 to the Ethernet [Modbus/TCP].
This chapter describes features, package contents, model code, system configuration, etc.

- Ethernet [Modbus/TCP]
  Modbus/TCP is an open field network provided with the Modbus protocol on the TCP/IP protocol of Ethernet. The data request side is called "client" (such as computer) and the data response (supply) side is called "server" (COM-ME).
- Loader communication
  A PC and the COM-ME can be connected via our USB communication converter COM-KG or COM-K2 to check and set the communication data of the COM-ME. Our communication tool PROTEM2 can be used to check and set the communication data.
- Controller communication (FZ110/400/900 or GZ400/900)
  Up to 31 FZ or GZ controllers (hereinafter referred to as a controller) can be connected to one COM-ME. Different models in the same series can be used together.



Example of System Configuration

1.1 Checking the Product

Before using this product, check each of the following:

- Model code
- Check that there are no scratches or breakages in external appearance (case, front panel, or terminal, etc.)
- Check that all of the items delivered are complete. (Refer to below)

Name	Q'TY	Remarks
☐ COM-ME-1 [For FZ series/GZ series] Installation Manual (IMR02E32-E☐)	1	Enclosed with instrument
☐ Joint connector cover KSRZ-517A	2	Enclosed with instrument
☐ Power terminal cover KSRZ-518A	1	Enclosed with instrument
☐ COM-ME-1 [For FZ series/GZ series] Instruction Manual (IMR02E33-E2)	1	This manual (sold separately) This manual can be downloaded from the official RKC website.

If any of the products are missing, damaged, or if your manual is incomplete, please contact RKC sales office or the agent.

■ Accessories (sold separately)

Name	Q'TY	Remarks
☐ End plate DEP-01	2	Secures the COM-ME on the DIN rail
☐ Communication converter COM-K2-1	1	For loader communication (Option: with loader communication cable)
☐ Communication converter COM-KG-1N	1	

1.2 Model Code

Check whether the delivered product is as specified by referring to the following model code list.
If the product is not identical to the specifications, please contact RKC sales office or the agent.

COM- ME - 1 5 ∗ 07
(1) (2) (3)

(1) Network communication

1: Modbus/TCP

(2) Controller communication

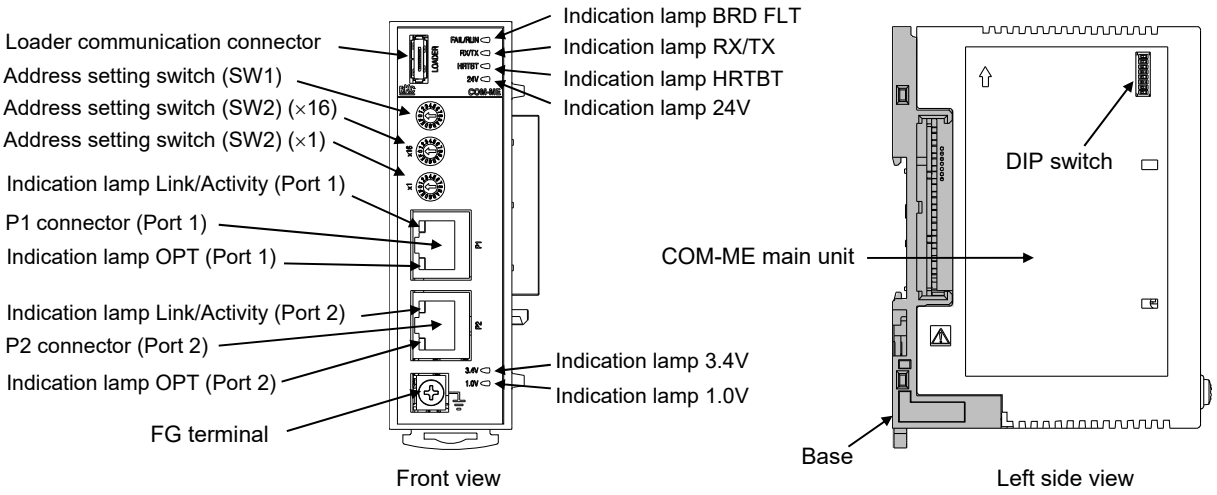
5: RS-485

(3) Corresponding to the RKC controller

07: FZ series or GZ series

1.3 Parts Description

■ COM-ME main unit



● Indication lamps

FAIL/RUN [Green or Red]	• When normal: • During setting of IP address setting: • Self-diagnostic error (Recoverable fault): • Self-diagnostic error (Major fault):	Green lamp turns on Green lamp blinks Green lamp blinks Red lamp turns on
RX/TX [Green]	During controller communication data send and receive:	Green lamp turns on
HRTBT [Green]	While software is properly running:	Green lamp blinks
24V [Green]	While 24 V power is supplied:	Green lamp turns on
3.4V [Green]	While 3.4 V power is supplied:	Green lamp turns on
1.0V [Green]	While 1.0 V power is supplied:	Green lamp turns on
Link/Activity (Port 1/Port 2) [Green]	• No link or No activity: • Link is being established or in data communication:	Turns off Green lamp turns on
OPT (Port1/Port2) [Yellow]	• When connected at 100 Mbps or when not in communication: • When connected at 10 Mbps:	Turns off Yellow lamp turns on

● Communication connector

Loader communication connector	Used to connect the communication converter and personal computer when loader communication is performed.
P1 connector (Port 1) P2 connector (Port 2)	Connector for connection to networks (Modbus/TCP).

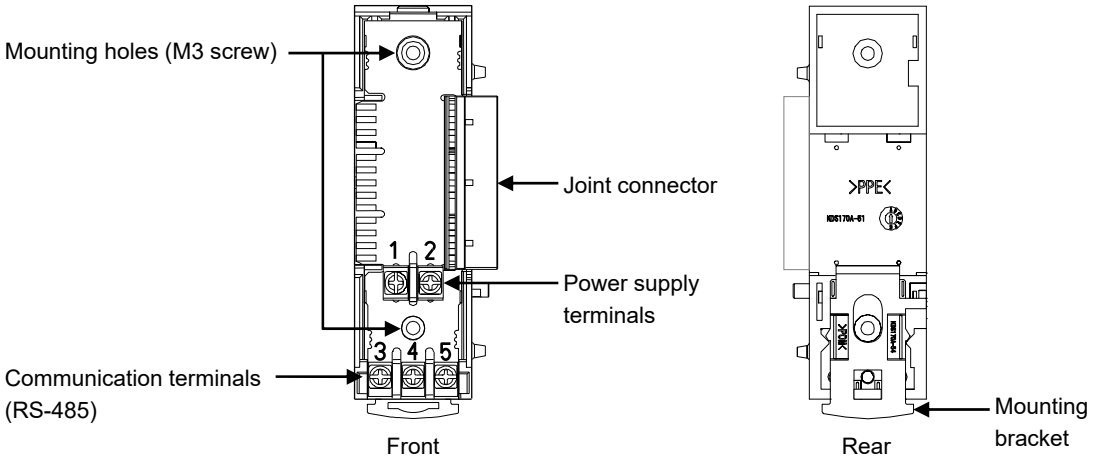
● Switch

Address setting switch (SW1)	• Used to set the IP address.
Address setting switch (SW2) (×16) Address setting switch (SW3) (×1)	• Sets the IP address in hexadecimal.
DIP switch	• Sets communication speed corresponding to controller communication. • Sets DIP switch setting enable/disable. • Used to set the IP address setting and how it works.

● Terminal

FG terminal	Terminal for grounding

■ Base



Mounting holes (M3 screw)	Holes for screws to fix the base to a panel, etc. Customer must provide the M3 screws.
Joint connector	Not used. Use the supplied joint connector cover.
Power supply terminals	These are terminals to supply power to the COM-ME. Terminal number: 1 — Signal name: 24 V DC (+) Terminal number: 2 — Signal name: 24 V DC (–)
Communication terminals (RS-485)	Terminal for connection to a controller. Terminal number: 3 — Signal name: T/R (A) Terminal number: 4 — Signal name: T/R (B) Terminal number: 5 — Signal name: SG
Mounting bracket	Used to fix the COM-ME on DIN rails.

2. HANDLING PROCEDURES

Conduct necessary setting before operation according to the procedure described below.

Mounting

Install the COM-ME.

☞ • Refer to **3. MOUNTING (P. 7)**.
• For controller, refer to **FZ110/FZ400/FZ900 Instruction Manual [Part1: Hardware] (IMR03A04-E□)** and **GZ400/GZ900 Instruction Manual [Part1: Hardware] (IMR03D04-E□)**.

Wiring and Connection

Make power wiring connections of the COM-ME, wiring between the COM-ME and the controller, and connect the COM-ME and the client to the Ethernet.
Connect the wiring for loader communication in the COM-ME.

☞ • Refer to **4. WIRING (P. 12)**
• For controller, refer to **FZ110/FZ400/FZ900 Instruction Manual [Part1: Hardware] (IMR03A04-E□)** and **GZ400/GZ900 Instruction Manual [Part1: Hardware] (IMR03D04-E□)**.

Setting of the controller communication

Make setting of the Controller communication to establish communication between the COM-ME and the controller.

☞ • Refer to **5. SETTING CONTROLLER COMMUNICATION (P. 19)**.
• Refer to the **FZ110/FZ400/FZ900 Instruction Manual [Part1: Hardware] (IMR03A04-E□)** or **GZ400/GZ900 Instruction Manual [Part1: Hardware] (IMR03D04-E□)** for the Controller communication setting.

IP address settings

Set the IP address of the COM-ME.

☞ Refer to **6. IP ADDRESS SETTING (P. 27)**.

Ethernet settings

Set the IP address and subnet mask of Ethernet.

☞ Refer to **9.8 Ethernet Settings (P. 92)**.

Assign the communication data

Set the communication data on the COM-ME that are sent/received on Modbus/TCP.

☞ • Refer to **9.7 Assigning Communication Data (P. 90)**.
• Refer to **8. COMMUNICATION DATA LIST (P. 45)**.

Communication environment settings of Client (master)

To establish Modbus/TCP communication, set the communication environment of the client according to the necessity.

☞ For the details of setting the communication environment, refer to the instruction manual of the client or of the setting tool.

Ethernet communication start

3. MOUNTING

This chapter describes installation environment, mounting cautions, dimensions and mounting procedures.

> **⚠ WARNING**
>
> To prevent electric shock or instrument failure, always turn off the power before mounting or removing the instrument.

3.1 Mounting Cautions

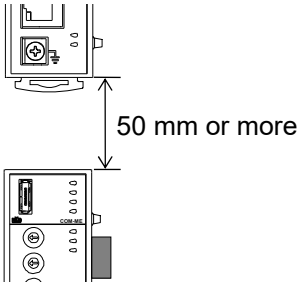
(1) This instrument is intended to be used under the following environmental conditions.
(IEC 61010-1) [POLLUTION DEGREE 2]

(2) Use this instrument within the following environment conditions:
- Allowable ambient temperature: −10 to +55 °C
- Allowable ambient humidity: 5 to 95 %RH
  (Absolute humidity: MAX. W. C 29 g/m^3 dry air at 101.3 kPa)
- Installation environment conditions: Indoor use
  Altitude up to 2000 m

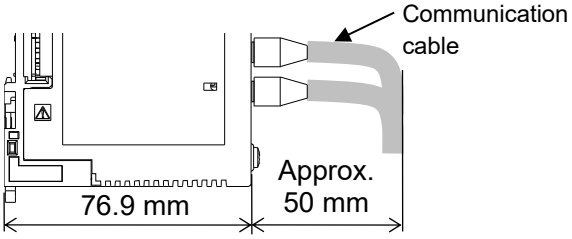
(3) Avoid the following conditions when selecting the mounting location:
- Rapid changes in ambient temperature which may cause condensation.
- Corrosive or inflammable gases.
- Direct vibration or shock to the main unit.
- Water, oil, chemicals, vapor or steam splashes.
- Excessive dust, salt or iron particles.
- Excessive induction noise, static electricity, magnetic fields or noise.
- Direct air flow from an air conditioner.
- Exposure to direct sunlight.
- Excessive heat accumulation.

(4) Mount this instrument in the panel considering the following conditions:
- Provide adequate ventilation space so that heat does not build up.
- Do not mount this instrument directly above the equipment that generates large amount of heat (heaters, transformers, semi-conductor functional devices, large-wattage resistors.)
- If the ambient temperature rises above 55 °C, cool this instrument with a forced air fan, cooler, or the like. Cooled air should not blow directly on this instrument.
- In order to improve safety and the immunity to withstand noise, mount this instrument as far away as possible from high voltage equipment, power lines, and rotating machinery.
  High voltage equipment: Do not mount within the same panel.
  Power lines: Separate at least 200 mm
  Rotating machinery: Separate as far as possible

- Space required between each vertically:
  When the module is mounted on the panel, allow a minimum of 50 mm at the top and bottom of the module to attach the module to the main unit.

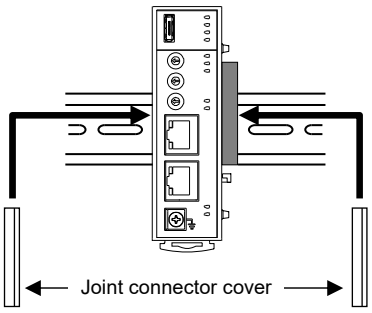


- Depth for modular cables mount type module:
  Space for modular cables must be considered when installing.

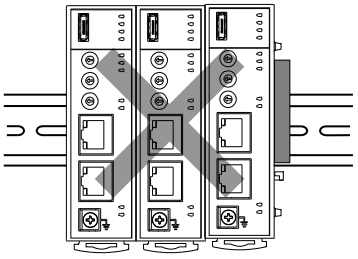


- It is recommended to use a joint connector cover on the connector on both sides of the mounted COM-ME for protection of connectors.

  When mounting COM-ME, leave space at both ends for covers.



- Don't connect the COM-ME module to the others. Otherwise the communication may not be established properly.

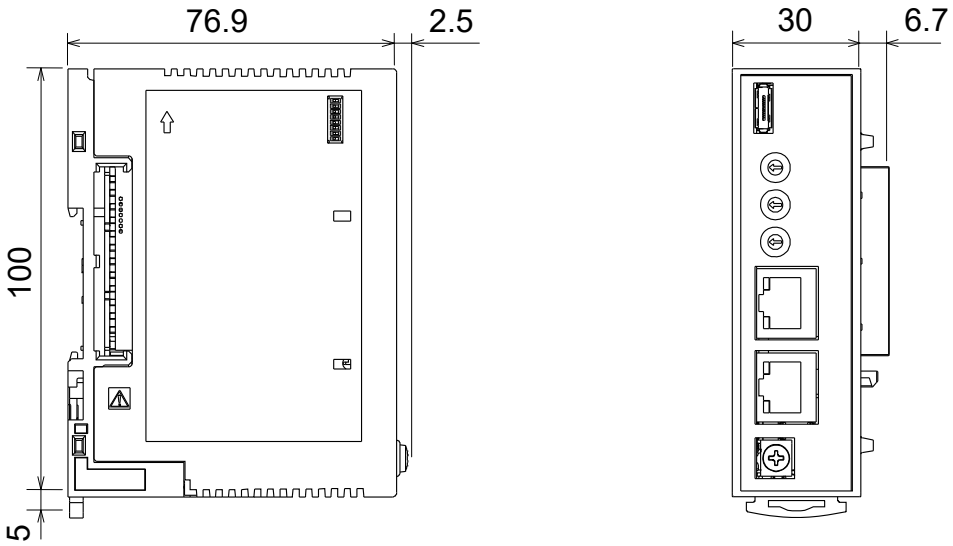


- To firmly fix the COM-ME, use end plates (DEP-01) sold separately on both sides of the mounted COM-ME. When mounting COM-ME, leave space at both ends for end plates.

(5) In case this instrument is connected to a supply by means of a permanent connection, a switch or circuit-breaker shall be included in the installation. This shall be in close proximity to the equipment and within easy reach of the operator. It shall be marked as the disconnecting device for the equipment.

3.2 Dimensions

(Unit: mm)

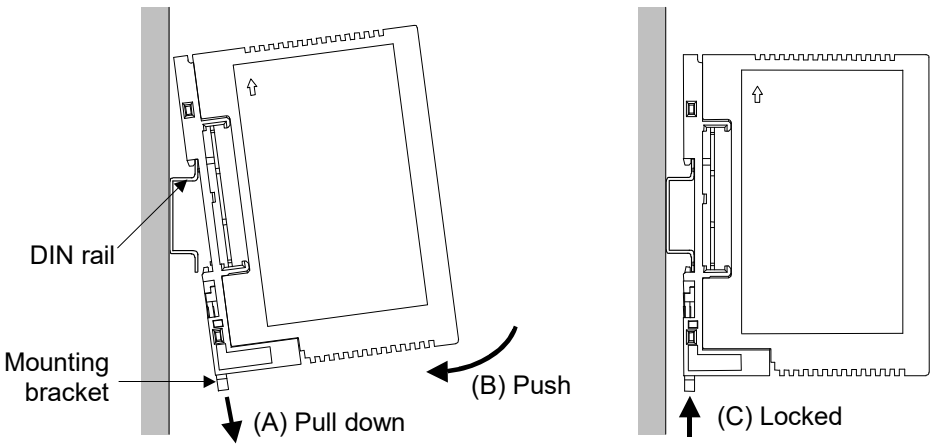


3.3 DIN Rail Mounting

■ Mounting procedures

1. Pull down the mounting bracket at the bottom of the base (A). Attach the hooks on the top of the base to the DIN rail and push the lower section into place on the DIN rail (B).

2. Slide the mounting bracket up to secure the COM-ME module to the DIN rail (C).

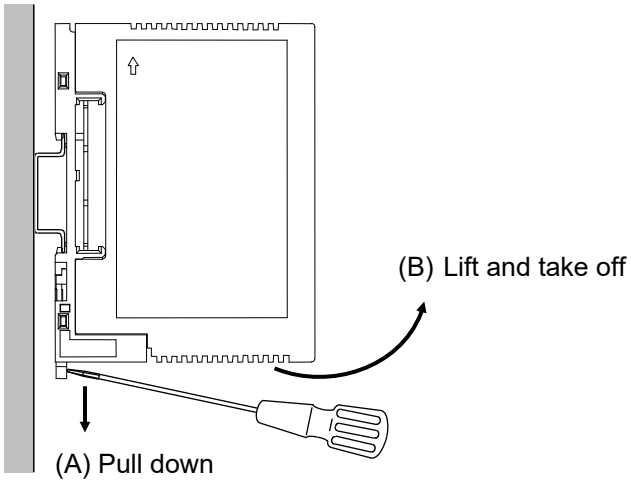


■ Removing procedures

1. Turn the power OFF.

2. Remove the wiring.

3. Pull down a mounting bracket with a slotted screwdriver (A).
Lift the COM-ME module from bottom, and take it off (B).

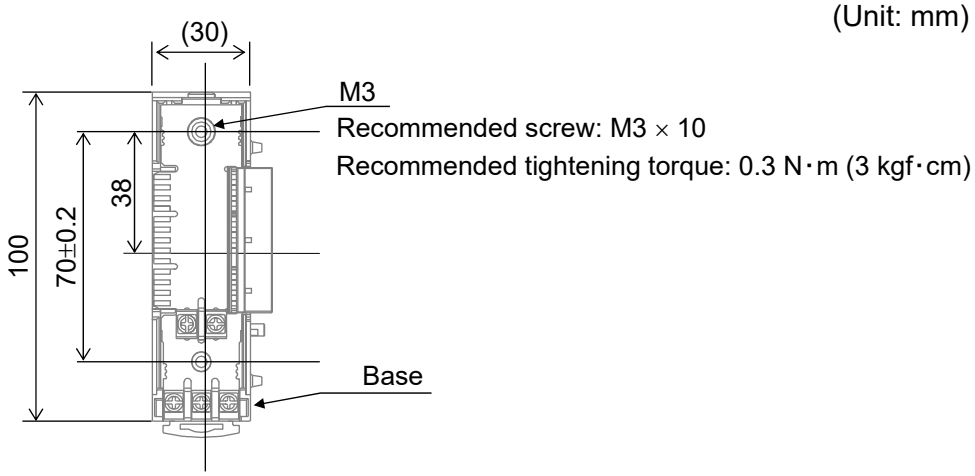


3.4 Panel Mounting

■ Mounting procedures

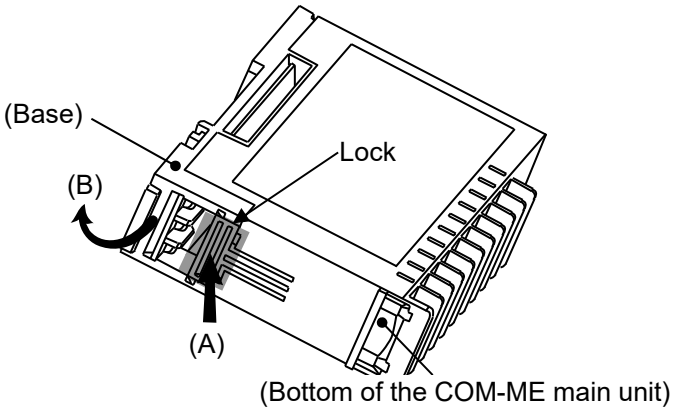
1. Refer to the mounting dimensions below when selecting the location.

(Unit: mm)



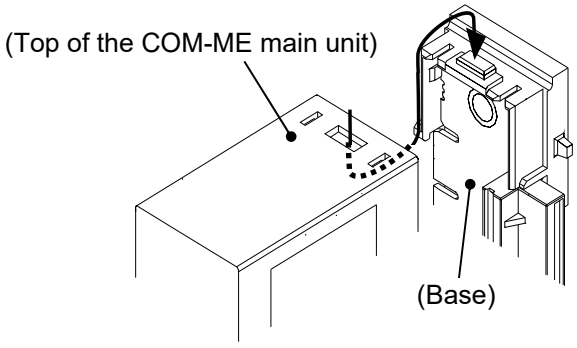
Mounting dimensions

2. Remove the base from the COM-ME main unit (B) while the lock is pressed (A).



3. Fix the base to its mounting position using M3 screws. Customer must provide the screws.

4. Mount the COM-ME main unit on the base.



4. WIRING

This chapter describes wiring cautions, terminal configuration and connections.

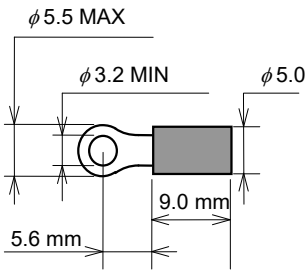
4.1 Wiring Cautions

⚠ WARNING

To prevent electric shock or instrument failure, do not turn on the power until all wiring is completed. Make sure that the wiring is correct before applying power to the instrument.

- To avoid noise induction, keep communication signal wire away from instrument power line, load lines and power lines of other electric equipment.
- If there is electrical noise in the vicinity of the instrument that could affect operation, use a noise filter.
  - Shorten the distance between the twisted power supply wire pitches to achieve the most effective noise reduction.
  - Always install the noise filter on a grounded panel. Minimize the wiring distance between the noise filter output and the instrument power supply terminals to achieve the most effective noise reduction.
  - Do not connect fuses or switches to the noise filter output wiring as this will reduce the effectiveness of the noise filter.
- Power supply wiring must be twisted and have a low voltage drop.
- For an instrument with 24 V power supply input, supply power from a "SELV" circuit defined as IEC 60950-1.
- A suitable power supply should be considered in end-use equipment. The power supply must be in compliance with a limited-energy circuits (maximum available current of 5.6 A).
- When wiring to the terminals, be sure to use the specified solderless terminals.

  Screw Size: Power supply terminals, Communication terminals: M3 × 7 (with 5.8 × 5.8 square washer)
  FG terminal: M3 × 6
  Recommended tightening torque: 0.4 N·m (4 kgf·cm)
  Applicable wire: Solid/twisted wire of 0.25 to 1.65 mm^2
  Specified solderless terminal:
  Manufactured by J.S.T MFG CO., LTD.
  Circular terminal with isolation V1.25–MS3

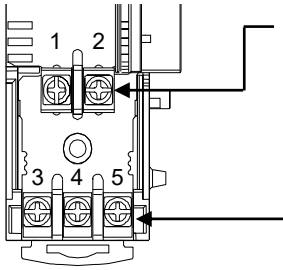


- Make sure that the any wiring such as solderless terminal is not in contact with the adjoining terminals.

4.2 Terminal Configuration

■ Power supply terminals, Communication terminals

The terminal layout of COM-ME (base) is as follows.



Power supply terminals

No.	Description
1	24 V DC (+)
2	24 V DC (–)

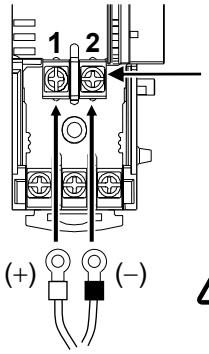
Communication terminals (RS-485)

No.	Description
3	T/R (A)
4	T/R (B)
5	SG

● Wiring method

As an example, the method of connecting to the power supply terminals (terminal numbers 1 and 2) is shown below.

1. Turn the power OFF.
2. Remove COM-ME main unit from the base.
3. Remove the Power supply terminal cover on the base.
4. Attach the solderless terminals to the power terminals with a Phillips head screwdriver. When attaching the terminals, make sure that the polarity (+ and –) is correct.



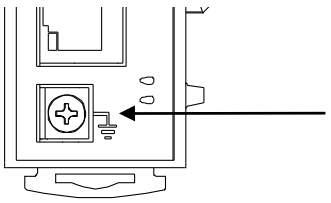
Power supply terminals (base)

Prior to conducting the wiring, always turn OFF the Power.

5. Attach the Power supply terminal cover on the terminal and return the COM-ME main unit to the base. This completes the wiring work.

Connections to the communication terminals (terminal numbers 3 to 5) are made in the same way.

■ FG terminal



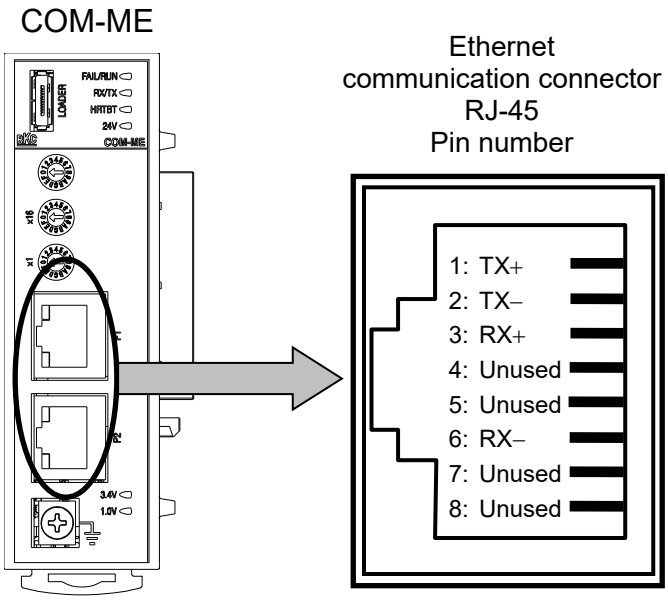
Low part of the front

- Ground the instrument separately from other equipment.
- The grounding resistance should be 100 Ω or less. Use grounding wires with a cross section area of 2 mm^2 or more.

4.3 Connection to Ethernet

Connect COM-ME to Ethernet.

■ Pin layout of connector



■ Connector pin number and signal details

Pin No.	Signal name	Symbol
1	Send data +	TX+
2	Send data –	TX–
3	Receive data +	RX+
4	Unused	—
5	Unused	—
6	Receive data –	RX–
7	Unused	—
8	Unused	—

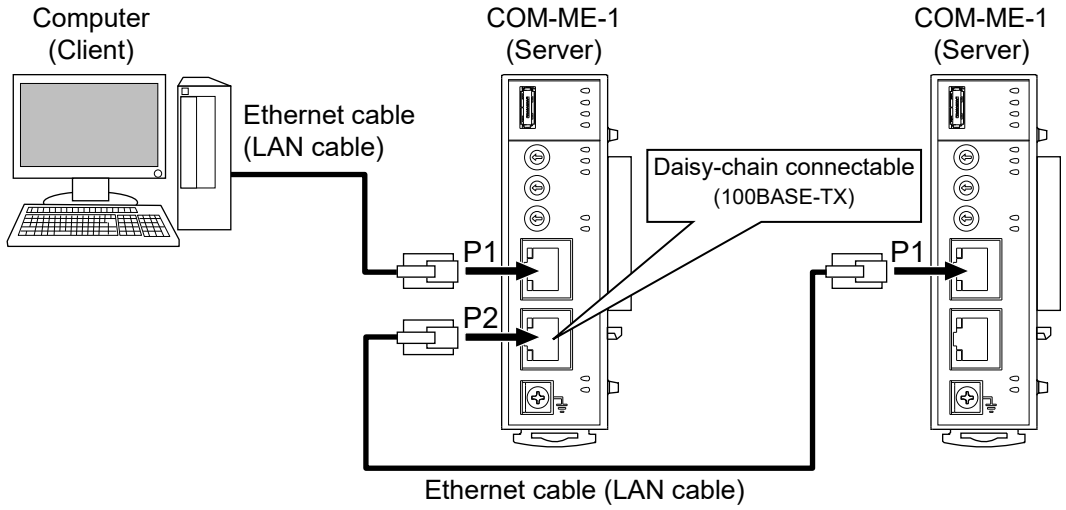
The cable must be provided by the customer.
Used cable: The cable is based on the 10BASE-T or the 100BASE-TX standard of Ethernet.
Used connector: RJ-45 type

■ Connection example

The Ethernet cable (LAN cable) which is marketed can be connected. The Ethernet cable (LAN cable) must be provided by the customer.

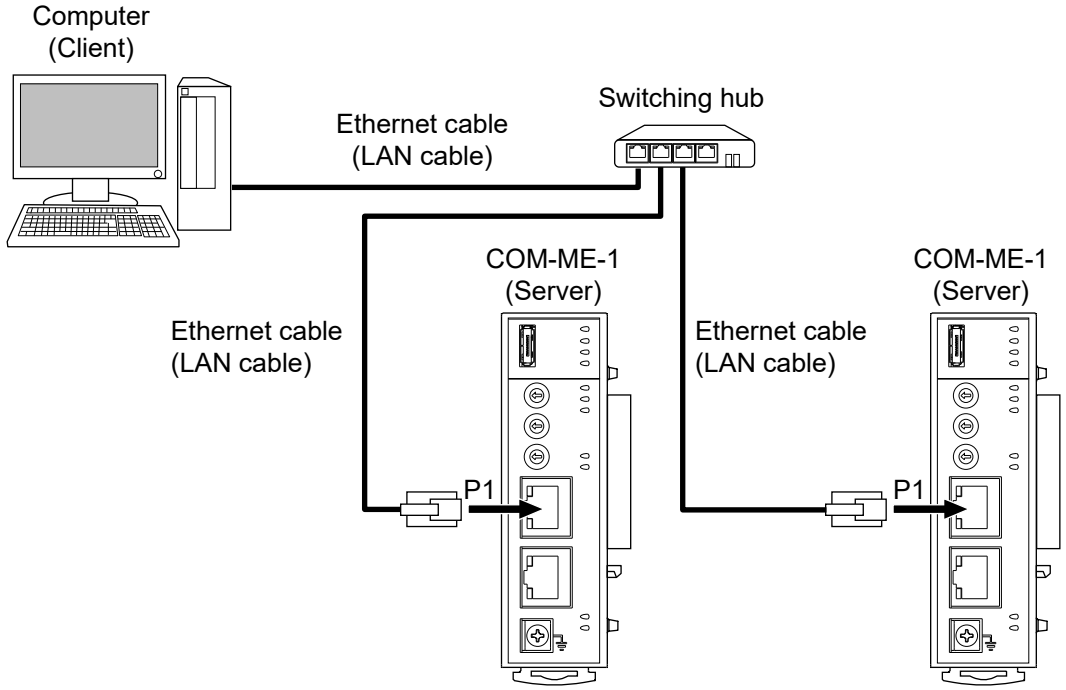
● Daisy-chain connection

Daisy-chain connection is available only when the converter is used on the 100BASE-TX network.



● When a switching hub is used

Use a switching hub when the 10BASE-T standard is used.



Use category 5 Ethernet cable (LAN cable).

Identification of the COM-ME on the Ethernet network is done by the IP address of the COM-ME. To use two or more COM-ME, set a unique IP address to each COM-ME.

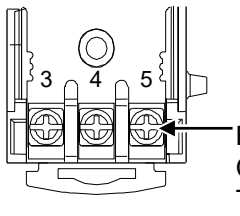
4.4 Connection to Controller

Connect the COM-ME and controllers as shown below.

☞ Refer to the instruction manual of the relevant model for the details of the size of the solderless terminal and how to conduct transition wiring.

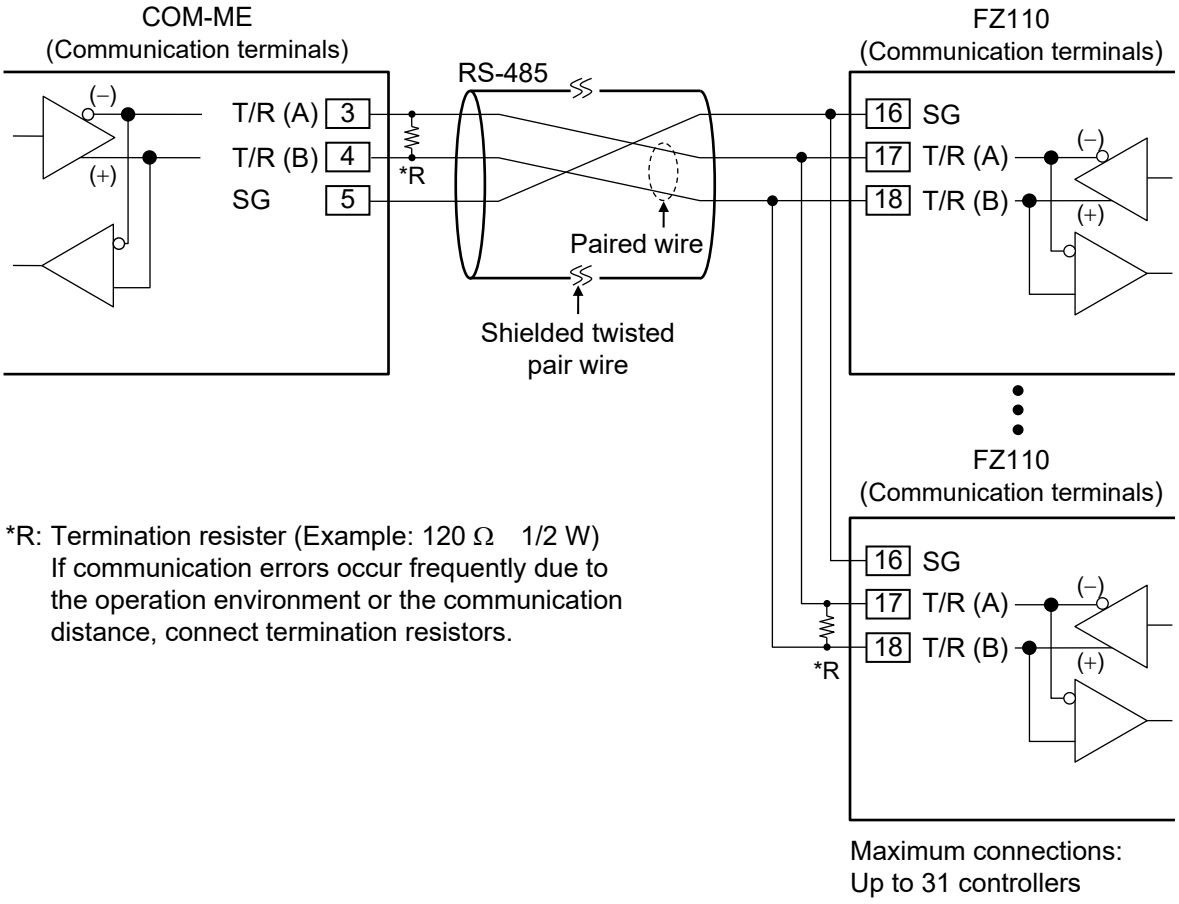
- **FZ110/FZ400/FZ900 Instruction Manual [Host Communication] (IMR03A07-E□)**
- **GZ400/GZ900 Instruction Manual [Host Communication] (IMR03D07-E□)**

■ Communication terminal number and signal details



Terminal No.	Signal name	Symbol
3	Send data/Receive data	T/R (A)
4	Send data/Receive data	T/R (B)
5	Signal ground	SG

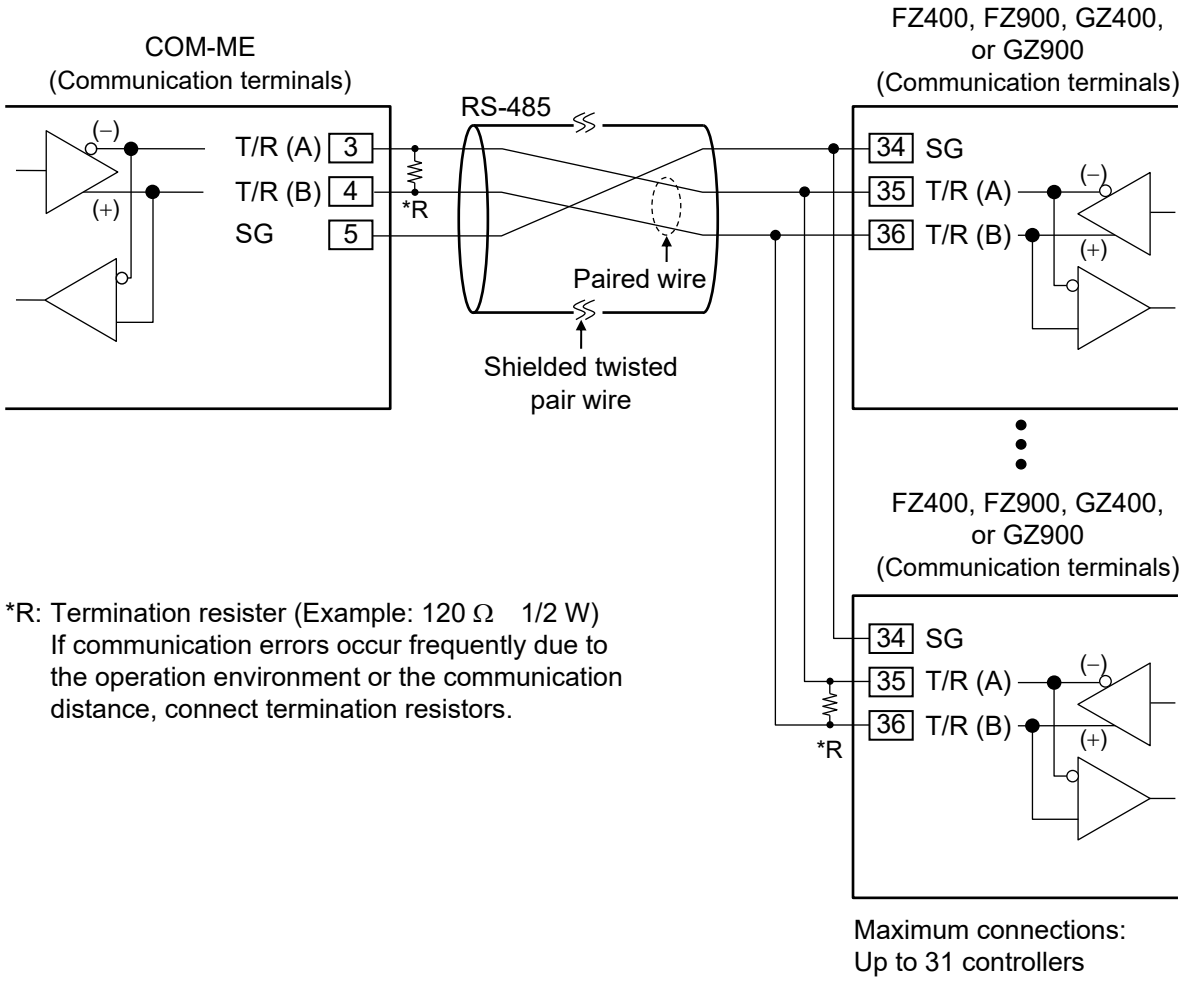
■ Wiring example (FZ110)



*R: Termination resister (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

Maximum connections:
Up to 31 controllers

■ Wiring example (FZ400, FZ900, GZ400, or GZ900)



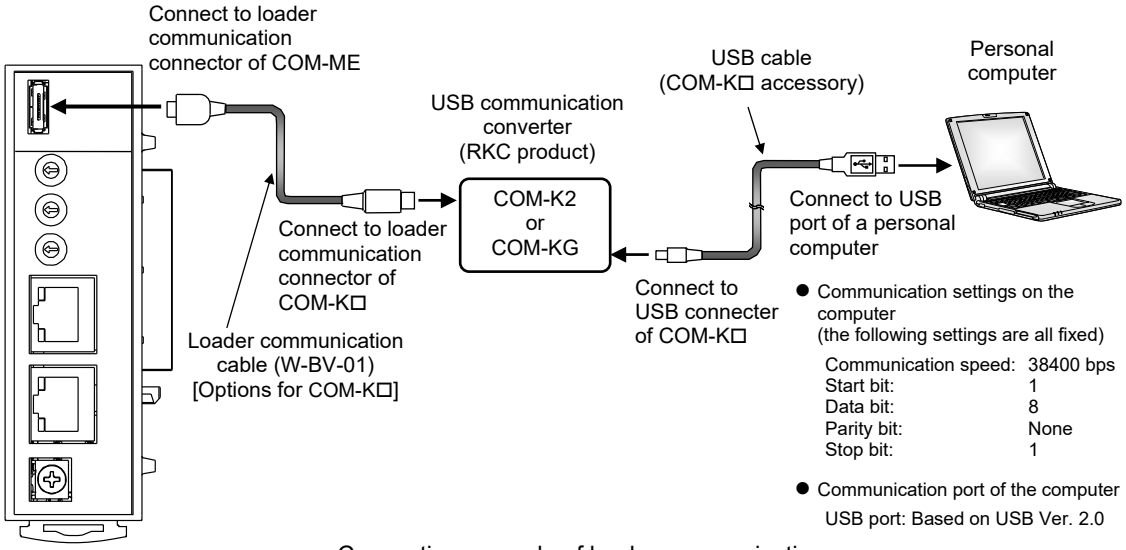
*R: Termination resister (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

Maximum connections:
Up to 31 controllers

4.5 Connections for Loader Communication

Connect a USB communication converter COM-K2 or COM-KG (sold separately) * between the host computer and the COM-ME.
Loader communication makes it possible to check and set data of the COM-ME and the controller.
Our communication tool PROTEM2 can be used to check and set the data.

* A loader communication cable (option) is required for the connection to the loader communication connector on the COM-ME.
  Model of USB communication converter with Loader communication cable:
  COM-K2-1 (cable length: 1.5 m)
  COM-KG-1N (cable length: 1.5 m)



Connection example of loader communication

NOTE

The Loader port is only for parameter setup. Not used for data logging during operation.

The PROTEM2 can be downloaded from the official RKC website.

During the loader communication, the COM-ME requires an external power source. The COM-ME will not function on the USB power from a personal computer alone.

The module address for loader communication is fixed at "0."

Loader communication corresponds to RKC communication (based on ANSI X3.28-1976 subcategories 2.5 and B1).

When using the loader communication, USB driver for COM-K2 and COM-KG (for Windows7) must be installed on the personal computer. The USB driver can be downloaded the official RKC website.
Installation of the USB driver is not necessary when the COM-KG is used on Windows 10.

For the COM-K2, refer to the **COM-K2 Instruction Manual**.
For the COM-KG, refer to the **COM-KG Instruction Manual**.

5. SETTING CONTROLLER COMMUNICATION

⚠ WARNING

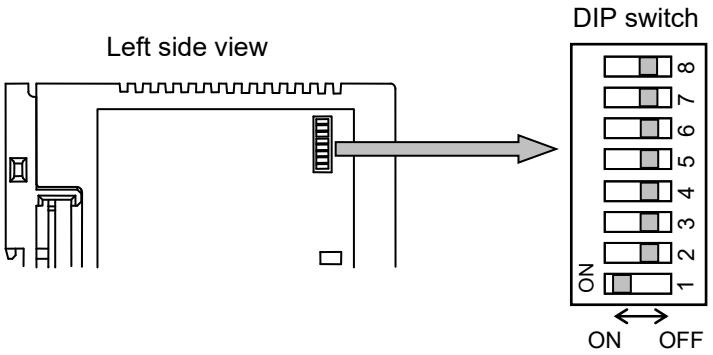
- To prevent electric shock or instrument failure, always turn off the power before setting the switch.
- To prevent electric shock or instrument failure, never touch any section other than those instructed in this manual.

5.1 Controller Communication Setting of COM-ME

To establish communication with the controller connected to the COM-ME, set the communication speed and the data bit configuration on the COM-ME. This setting can be achieved on the DIP switch or via the loader communication. This part of the document describes how to set the DIP switch.
When you use the DIP switch to set, setting the controller communication speed will automatically set the data bit configuration as follows: Data bit: 8 bits, no parity bit, and Stop bit: 1 bit. To change to another data bit configuration, set the data bit configuration in loader communication.

■ Setting on the DIP switch

The DIP switch is located on the left side of the COM-ME. After having set the communication speed on the DIP switches No.1 and No.2, set the DIP switch No.8 to OFF (enabled). Set the same communication speed for the controller connected to the COM-ME.



1	2	Controller communication speed
OFF	OFF	9600 bps
ON	OFF	19200 bps [Factory set value]
OFF	ON	38400 bps
ON	ON	57600 bps

8	DIP switch enable/disable
OFF	Enable (enable the DIP switch settings) [Factory set value]
ON	Disable (enable the loader communication settings) *

* Communication speed of the controller communication and data bit configuration are enabled with the loader communication setting.

NOTE

DIP switches No.3, No.4, and No.5 are set to OFF at the time of shipment. Do Not change the setting. Improper setting may result in unavailability of proper communication.

3	4	5	
OFF	OFF	OFF	**Fixed (Do not set this one)**

DIP switches No.6 and No.7 are used to set Ethernet [Modbus/TCP] communication.

☞ Refer to P. 32 for details for DIP switches No.6 and No.7.

If you wish to set the communication speed and the data bit configuration of the controller communication through the loader communication, first set DIP switch No.8 to ON.

5.2 Controller Communication Setting of FZ110/FZ400/ FZ900/GZ400/GZ900

To establish controller communication with the COM-ME, set the following communication data of the controller. Refer to the instruction manual of the relevant model for the details of setting.

- **FZ110/FZ400/FZ900 Instruction Manual [Host Communication] (IMR03A07-E□)**
- **GZ400/GZ900 Instruction Manual [Host Communication] (IMR03D07-E□)**

■ Communication data to be set

(1) Communication protocol

Set up the Modbus communication.

Data range
1: Modbus (Order of data transfer: upper word to lower word)
2: Modbus (Order of data transfer: lower word to upper word)

(2) Device address

There are two ways for controller device address setting: Continuous setting and Free setting. At the time of shipment, it is preset to "Continuous setting" Set the device address referring to **"5.3 Device Address Setting of Controller" (P. 23)**.

NOTE

Set a unique address to each device on the same line. Overlapped device address may cause a failure or a malfunction of the device.

Data range
1 to 99

(3) Communication speed

Data range
2: 9600 bps
3: 19200 bps
4: 38400 bps
5: 57600 bps

The COM-ME does not support communication speed of "2400 bps" and "4800 bps."

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(4) Data bit configuration

The data bit configuration of the controller must be the same as the configuration set on the COM-ME.

Data range			
Set value	Data bit	Parity bit	Stop bit
0	8	None	1
1	8	None	2
2	8	Even	1
3	8	Even	2
4	8	Odd	1
5	8	Odd	2

Do not set the data bit configuration “7.”
The COM-ME does not support the data bit configuration of “7.”

(5) Input data type

Set “Set value: 1” (single word).

Data range
1: Number of measured value digits: 4 Modbus data: Single word

The COM-ME does not support “Double word.”

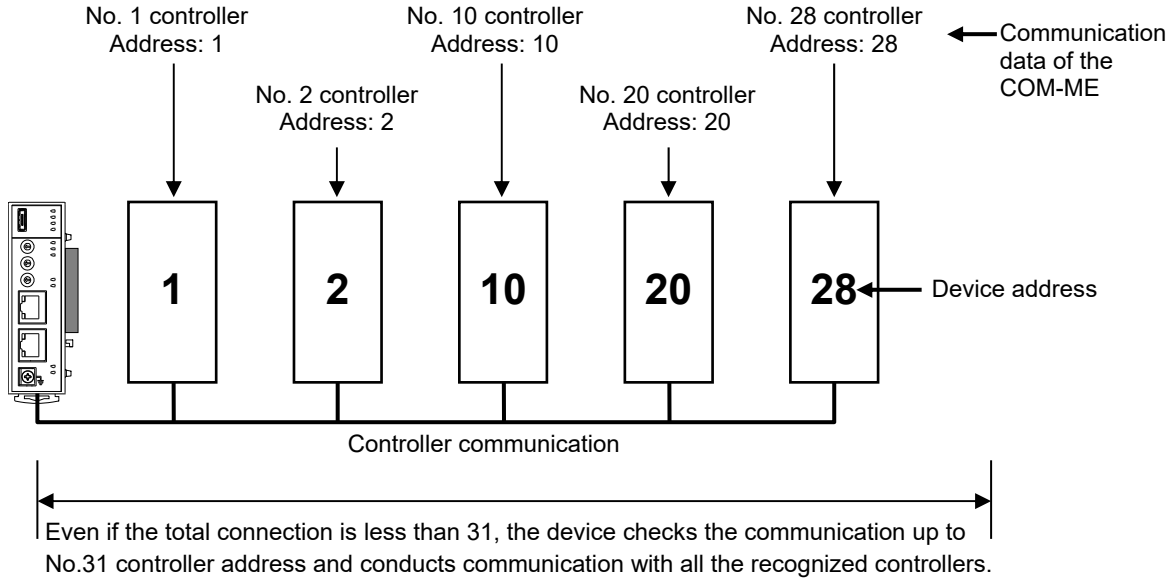
5.3 Device Address Setting of Controller

When conducting controller communication, set the device address on each controller, and set the device address of the controller connected to the COM-ME on the COM-ME. There are two ways for controller device address setting (Continuous setting and Free setting) that can be selected at "Action mode selection" of the COM-ME communication data. At the time of shipment, it is preset to "Continuous setting."
If the controller device address has been changed, the COM-ME needs to recognize the device address again. Use "Automatic acquisition of controller address" to ensure that the COM-ME recognizes the device address again.

5.3.1 Free setting

The controller device address can be freely settable in the range of 1 to 99.
The device address is required on both the controller and the communication data "No.1 to No.31 controller address" of the COM-ME. Factory preset value of the device address is in the sequence of 1 to 31 starting from the "No.1 controller address."
When device address is set in the range of 1 to 31, there is no need of setting at "No.1 to No.31 controller address." When device address is set in the range of 1 to 31, there is no need of setting at "No.1 to No.31 controller address." When device address is set to 32 or larger, it must be set to somewhere in the range of "No. 1 controller address" to "No. 31controller address."
The COM-ME scans the devices for connection in the order from "No.1 controller address" to "No.31 controller address." The COM-ME conducts communication with recognized controllers.

When 5 controllers are connected



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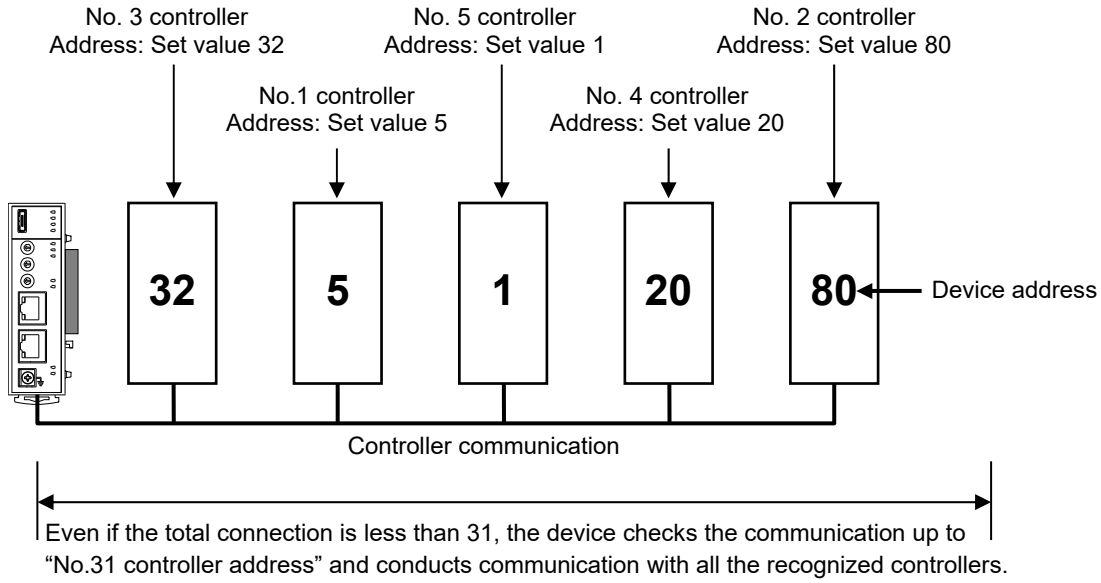
When device addresses are randomly set, including device addresses of 32 or more.

When the device address is set to 32 or more, the device address needs to be set somewhere at "No. 1 Controller address No. 1" to "No. 31 Controller address."

Example: When device address is randomly set including device address over 32
(Total connection: 5)

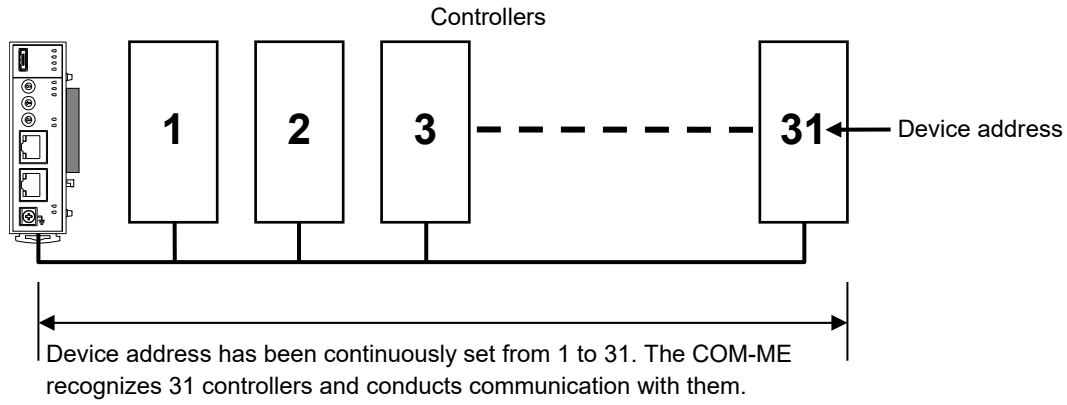
Communication data name	Controller device address
No. 1 controller address	Device address 5
No. 2 controller address	Device address 80
No. 3 controller address	Device address 32
No. 4 controller address	Device address 20
No. 5 controller address	Device address 1



5.3.2 Continuous setting

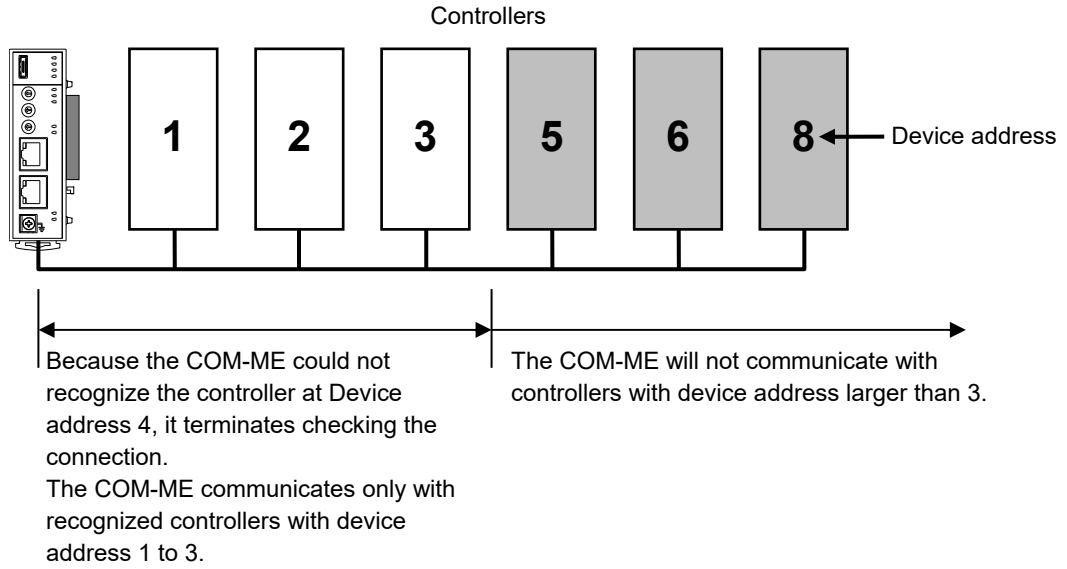
The device address is required be set on both the controller and the communication data "No.1 to No.31 controller address" of the COM-ME. Factory preset value of the device address is in the sequence of 1 to 31 starting from the "No.1 controller address." The COM-ME scans the devices for connection of the communication in the order from "No.1 controller address." If there is a controller that cannot be recognized, then the COM-ME finishes checking the connection. The COM-ME conducts communication with recognized controllers only.

When controller device address is continuously set from 1 to 31.



When controller device address has been intermittently set

If controller device addresses 4 and 7 are empty



5.3.3 Controller address auto acquisition

In such cases as shown below, conduct Controller address automatic acquisition.

- The COM-ME was powered on, but communication with controllers was not established.
- Device address of the controller was changed.
- Device address set at "No.1 to No.31 controller address" of the COM-ME communication data as changed.

■ Procedure of Controller address automatic acquisition

Controller address automatic acquisition is implemented at "Automatic acquisition of controller address" of the COM-ME communication data.

NOTE

Implement Controller address automatic acquisition while the system is off.

1. Set the “Automatic acquisition of controller address” to “1: Execute the automatic acquisition.”

2. Turn off the power of the COM-ME.

3. Turn on the power of the COM-ME.

4. Automatic acquisition is completed when the set value of “Automatic acquisition of controller address” changes from “1: Execute the automatic acquisition” to “0: Do not execute the automatic acquisition.”

5. Ensure that the communication is established with the controller(s) connected to the COM-ME.

6. IP ADDRESS SETTINGS

To use the COM-ME on Ethernet [Modbus/TCP], the IP address setting of the COM-ME is necessary. The IP address of the COM-ME can be set in loader communication or by the switch.

NOTE

For the IP address, check with the administrator of the network (LAN) to which the COM-ME is connected.

Our **Communication tool "PROTEM 2"** can be used for the communication setup. This tool can be downloaded from the official RKC website:

Identification of the COM-ME on the Ethernet network is done by the IP address of the COM-ME. To use two or more COM-ME, set a unique IP address to each COM-ME.

6.1 Loader Communication Settings

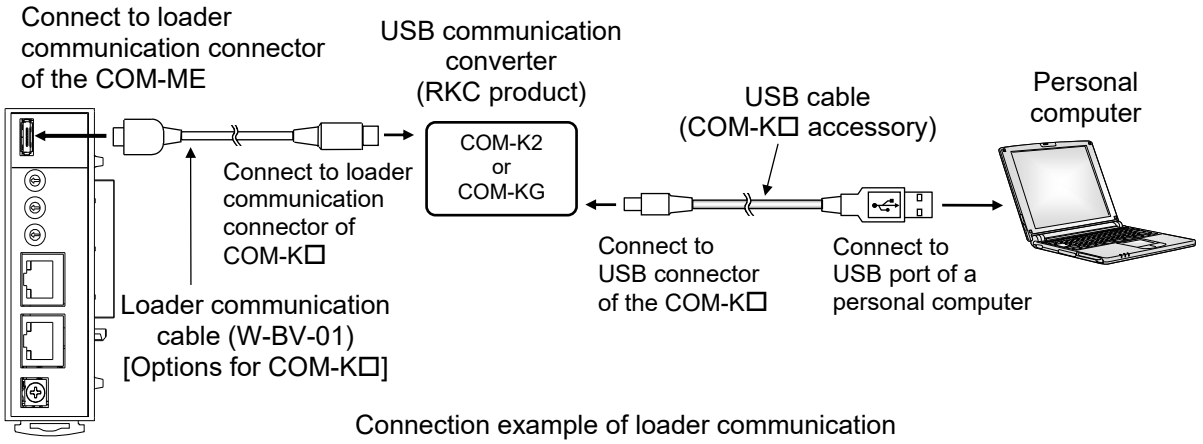
■ Preparation

To perform Loader communication, our converter and a communication cable are required.

- USB communication converter COM-K2 or COM-KG (With USB cable)
  To use the Loader communication, USB driver for COM-K2 or COM-KG (for Windows7) must be installed on the personal computer. The USB driver can be downloaded from the official RKC website.
  Installation of the USB driver is not necessary when the COM-KG is used on Windows 10.
- Loader communication cable W-BV-01 [Options for COM-K2 or COM-KG]
- Communication tool PROTEM 2

■ Connection method

Connect the COM-ME, the COM-K2 (COM-KG), and the personal computer with a USB cable and a loader communication cable.



Connection example of loader communication

During the loader communication, the COM-ME requires an external power source. The COM-ME will not function on the USB power from a personal computer alone.

■ Setting of loader communication

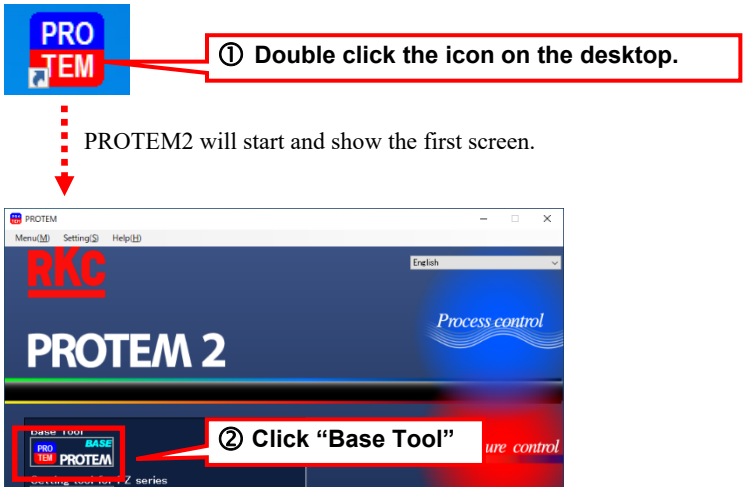
The device address, the communication speed and the data bit configuration are fixed as follows for the loader communication.

- Device address: 0
- Communication speed: 38400 bps
- Data bit configuration: Data 8-bit, None parity, Stop 1-bit

■ Setting of PROTEM 2

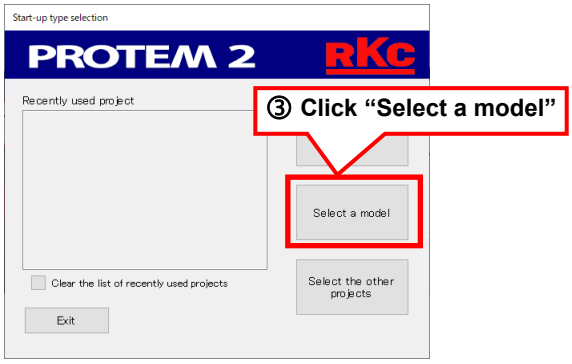
1. Turn on the power of the COM-ME.

2. Start PROTEM2, and set the communication port.
If you use the PROTEM2 for the first time, you have to create a new project and set a communication port.



PROTEM2 will start and show the first screen.

A dialog box, *Select a model*, appears.



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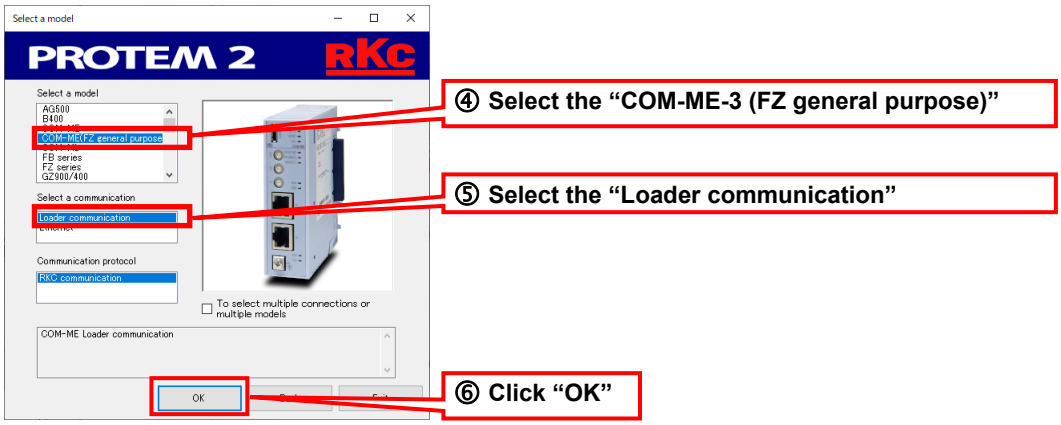
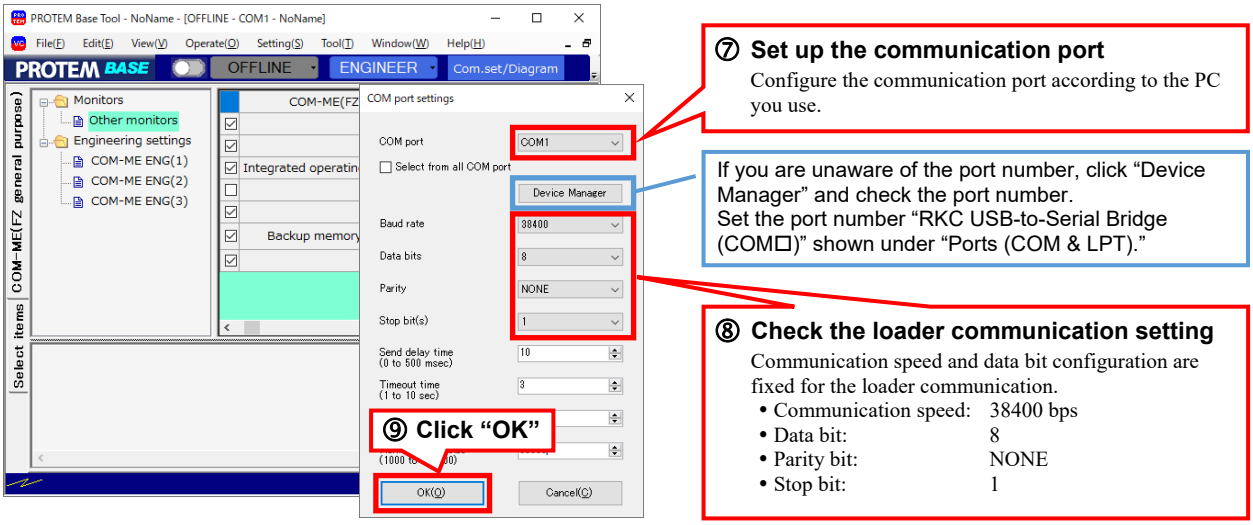
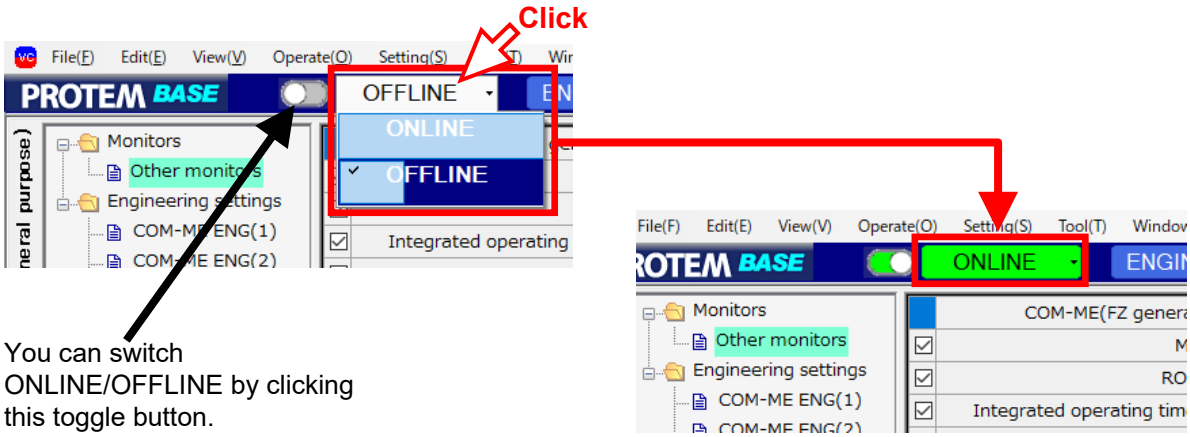


(Base tool screen)

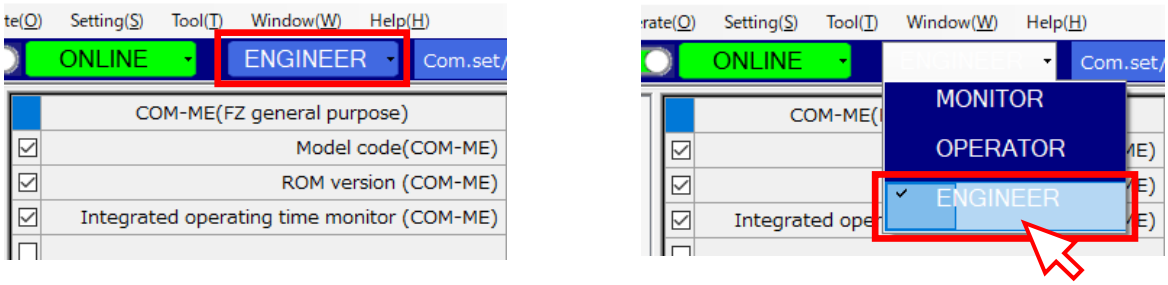


3. Click “Com.set/Diagram” and check the communication address.

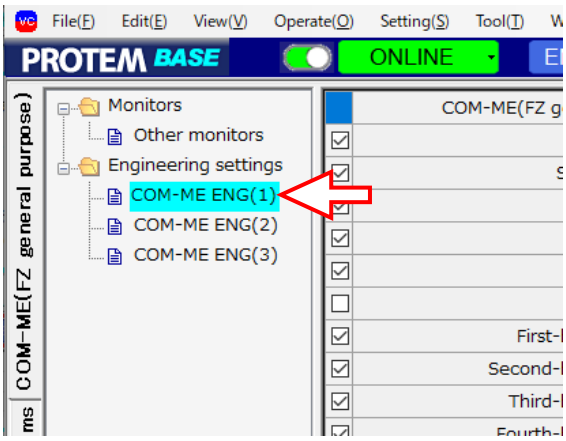
4. Switching to online.
lick “OFFLINE” to select “ONLINE.”



5. Make sure “ENGINEER” is displayed at the top bar. If any display other than ENGINEER (e.g. MONITOR, OPERATOR) appears, click the displayed part to select ENGINEER.



6. Select “COM-ME ENG(1)” under the “Engineering settings.”



7. Set the IP address and the TCP port number of the COM-ME.

	COM-ME(FZ general purpose)	CH 1
☑	First-byte of IP address	192
☑	Second-byte of IP address	168
☑	Third-byte of IP address	1
☑	Fourth-byte of IP address	1
☑	TCP port number	502
☐		
☑	First-byte of remote IP address	192
☑	Second-byte of remote IP address	168
☑	Third-byte of remote IP address	1
☑	Fourth-byte of remote IP address	2

The IP address of the COM-ME
(Factory set value: 192.168.1.1)

TCP port number of the COM-ME (Factory set value: 502)

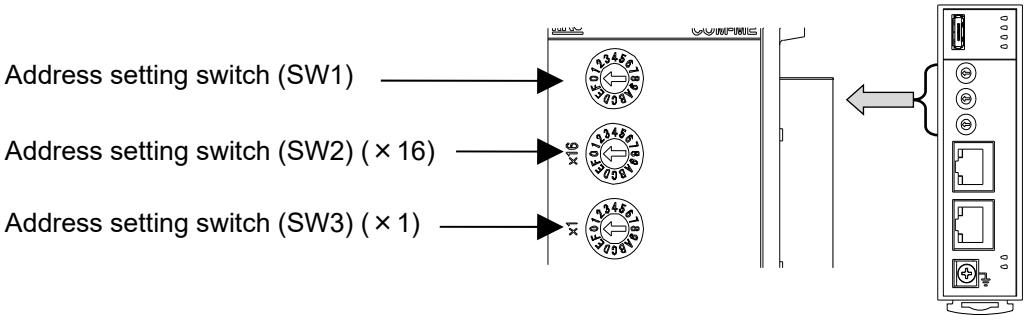
Remote IP address
(Factory set value: 192.168.1.2)
There is no need to change the remote IP address.
Please use the factory set value as it is.

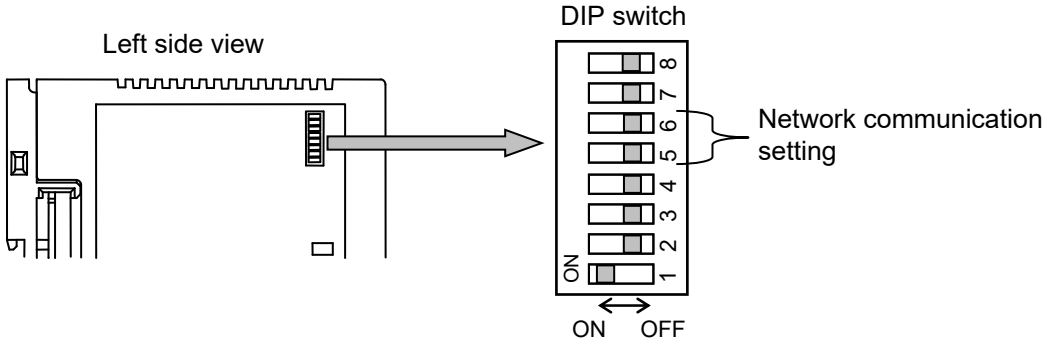
8. The set IP address and the TCP port number of the COM-ME are enabled by turning OFF the power and then turning it ON again.

6.2 Switch Settings

6.2.1 Setting the IP address on the switch

The IP address of the COM-ME can be set on the three address setting switches on the front of the COM-ME and the DIP switch on the left side.





6	7	Network communication
OFF	OFF	Operates with the set IP address [Factory set value]
ON	OFF	**Do not change**
OFF	ON	Performs IP address setting on the Address setting switches
ON	ON	Executes the default IP address setting *

* * Refer to **6.2.2 Default IP address setting (P. 35)**.

- **Settable items**

  First-byte of IP address
  Second-byte of IP address
  Third-byte of IP address
  Fourth-byte of IP address
  TCP port number
  Subnet mask CIDR

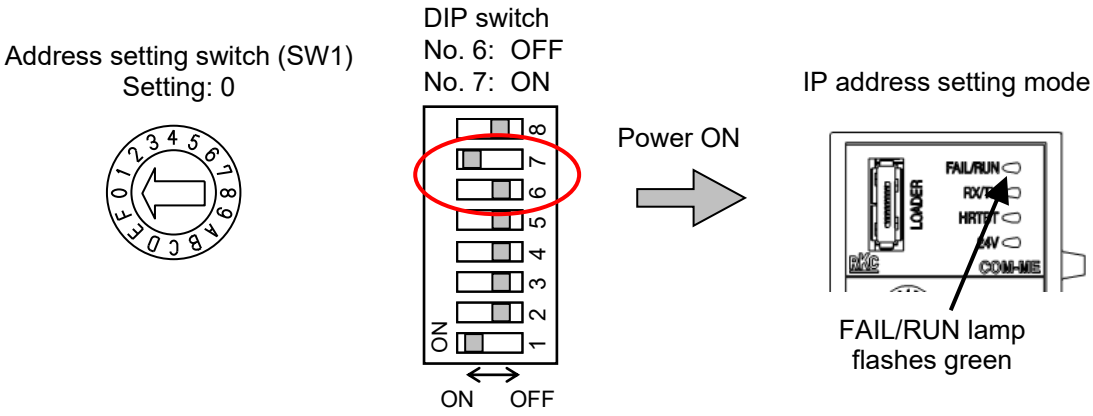
NOTE

IP addressing of the COM-ME by the switch requires the entire operating procedure to be performed. You are unable to set only specific items. If you quit setting halfway through, all the settings you have done so far will be invalid.

The value of the Subnet mask CIDR, when set with the switch, will be forced to the factory preset value 24. To change the Subnet mask CIDR to another value, set the configuration through the loader communication.

■ Setting procedures

1. Turn off the power.
Set the DIP switch No.6 to OFF and No.7 to ON. Power on the instrument with the Address setting switch (SW1) set to 0. The instrument is in the IP address setting mode.
Make sure the FAIL/RUN lamp flashes green (at 500 ms cycles).



See the following table for Steps *2.* to *21*.

Step	Setting items	SW1 setting	SW2 setting	SW3 setting	FAIL/RUN lamp	Operation
2.	First-byte of IP address	0	High-order 4 bits	Low-order 4 bits	Green lamp flashes	Set a value on SW2 and 3. (see Example 1)
3.	First-byte of IP address	0→1			Red lamp lights on	Modify a value on SW1 and set it.
4.	Second-byte of IP address	1	High-order 4 bits	Low-order 4 bits	Red lamp lights on	Set a value on SW2 and 3.
5.	Second-byte of IP address	1→2			Lights off	Modify a value on SW1 and set it.
6.	Third-byte of IP address	2	High-order 4 bits	Low-order 4 bits	Lights off	Set a value on SW2 and 3.
7.	Third-byte of IP address	2→3			Red lamp lights on	Modify a value on SW1 and set it.
8.	Fourth-byte of IP address	3	High-order 4 bits	Low-order 4 bits	Red lamp lights on	Set a value on SW2 and 3.
9.	Fourth-byte of IP address	3→4			Lights off	Modify a value on SW1 and set it.
10.	High-order byte of TCP port number	4	High-order 4 bits	Low-order 4 bits	Lights off	Set a value on SW2 and 3. (see Example 2)
11.	High-order byte of TCP port number	4→5			Red lamp lights on	Modify a value on SW1 and set it.

Example 1: To set “192”, as it is expressed as “C0” in hexadecimal notation, set “C” on SW2 and “0” on SW3.

Example 2: To set “502”, as it is expressed as “01F6” in hexadecimal notation and the high-order byte is “01”. Set “0” on SW2 and “1” on SW3.

Step	Setting items	SW1 setting	SW2 setting	SW3 setting	FAIL/RUN lamp	Operation
12.	Low-order byte of TCP port number	5	High-order 4 bits	Low-order 4 bits	Red lamp lights on	Set a value on SW2 and 3. (see Example 3)
13.	Low-order byte of TCP port number	5→6			Lights off	Modify a value on SW1 and set it.
14.	First-byte of remote IP address [1]	6	Setting not necessary	Setting not necessary	Lights off	None
15.	First-byte of remote IP address	6→7			Red lamp lights on	Modify a value on SW1.
16.	Second-byte of remote IP address [1]	7	Setting not necessary	Setting not necessary	Red lamp lights on	None
17.	Second-byte of remote IP address	7→8			Lights off	Modify a value on SW1.
18.	Third-byte of remote IP address [1]	8	Setting not necessary	Setting not necessary	Lights off	None
19.	Third-byte of remote IP address	8→9			Red lamp lights on	Modify a value on SW1.
20.	Fourth-byte of remote IP address [1]	9	Setting not necessary	Setting not necessary	Red lamp lights on	None
21.	Fourth-byte of remote IP address Subnet mask CIDR [2]	9→A			Lights off	Modify a value on SW1. If FAIL/RUN lamp turns off, backup was successfully completed. If FAIL/RUN lamp flashes red, backup failed.

[1] There is no need to change the remote IP address. Please use the factory set value as it is.

[2] The Subnet mask CIDR is set to a default value of 24.

Example 3: When “502” is set, as it is expressed as “01F6” in hexadecimal notation, the low-order byte is “F6”. Set “F” on SW2 and “6” on SW3.

22. Turn off the power.
Set the DIP switch No.6 to OFF and No.7 to OFF. Return the setting of SW1, SW2 and SW3 to the original values. Turn ON the power. This completes the setting.

To redo the setting halfway through, start from Step ***1***.

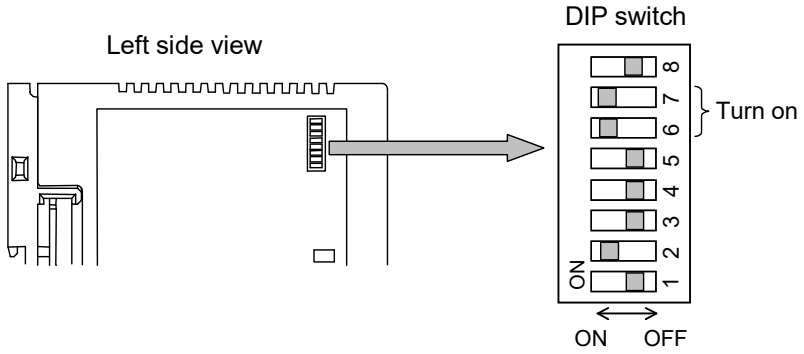
6.2.2 Default IP address setting

The IP address of the COM-ME can be set to the factory set value using the DIP switches.

■ Operation procedure

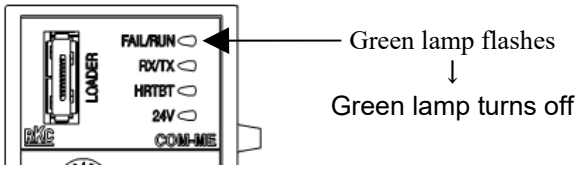
1. Turn off the power of the COM-ME.

2. Turn on No. 6 and No. 7 of the DIP switch.



3. Turn on the power of the COM-ME.

4. The FAIL/RUN lamp will flash green for about 5 seconds and then turns off.
At this point, the IP address of the COM-ME changes to the factory set value "192.168.1.1."



If default IP address setting fails, the FAIL/RUN lamp flashes green for about 5 seconds, then turns off. After that, the FAIL/RUN lamp starts flashing red.

5. Turn off the power of the COM-ME once again and return DIP switches No. 6 and No. 7 to OFF.

If DIP switches No. 6 and No. 7 are left ON, the set IP address of the COM-ME will revert to the factory set value every time the power is turned on.

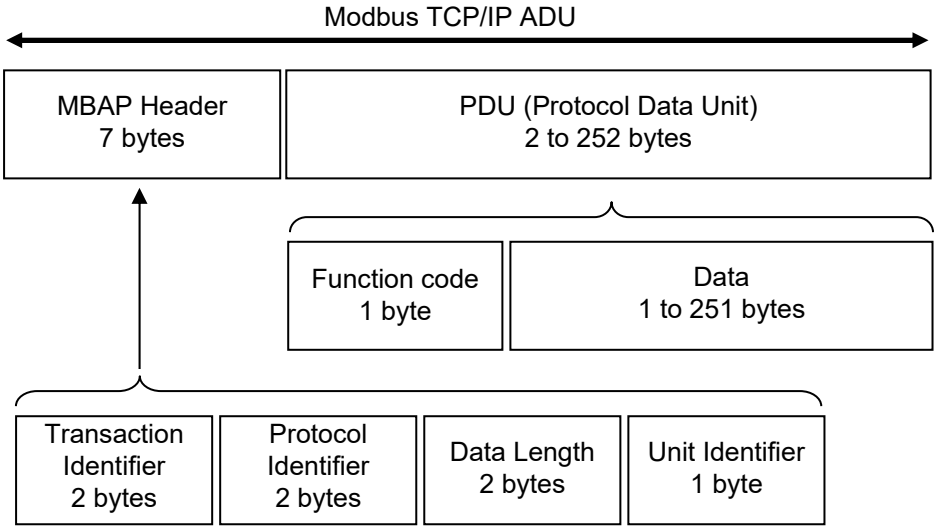
6. Turn the power of the COM-ME back on. This completes the procedure.

7. MODBUS/TCP PROTOCOL

Modbus/TCP is an open field network provided with the Modbus protocol on the TCP/IP protocol of Ethernet. The data request side is called “client” (such as computer) and the data response (supply) side is called “server” (COM-ME).

7.1 Message Configuration

Modbus ADU (Application Data Unit) on TCP/IP is in the following configuration.



■ MBAP Header

MBAP (Modbus Application Protocol) header contains the following fields: Transaction Identifier, Protocol Identifier, Data Length and Unit Identifier.

Fields	Length	Request (Client)	Response (Server)
Transaction Identifier	2 bytes	Unused However, data corresponding to two bytes is sent According to need, request and the response are used in order to take consistency	Returns data from the client as is
Protocol Identifier	2 bytes	“0” fixed (Modbus protocol = 0)	Returns data from the client as is
Data Length	2 bytes	The total number of bytes of Unit Identifier and PDU (253 bytes max.)	The total number of bytes of Unit Identifier and PDU (253 bytes max.)
Unit Identifier	1 byte	Unused However, data corresponding to one byte is sent According to need, request and the response are used in order to take consistency	Returns data from the client as is

■ PDU

PDU (Protocol Data Unit) consists of two blocks: function codes and data.

Fields	Length	Request (Client)	Response (Server)
Function code	1 byte	03H: Read holding registers 06H: Write single register 10H: Write multiple registers	Normal response Returns data from the client as is Error response 80H + Function code
Data	1 to 251 bytes	Data meeting the function code	Normal response Data meeting the function code Error response Exception code 01H: Illegal function code 02H: Illegal register address 03H: Illegal data value

7.2 Function Code

- **Function code contents**

Function code	Function	Contents
03H	Read holding registers	Measured value, Control output value, Current transformer input value, Event status, etc.
06H	Write single register	Set value, PID constants, Event set value, etc.
10H	Write multiple registers	Set value, PID constants, Event set value, etc.

- **Message (PDU) length of each function [Unit: byte]**

Function code	Function	Request message		Response message	
		Min	Max	Min	Max
03H	Read holding registers	5	5	4	252
06H	Write single register	5	5	5	5
10H	Write multiple registers	8	252	5	5

7.3 Server (COM-ME) Responses

■ Normal response

- In the response message of the read holding registers, the server (COM-ME) returns the “Function code,” “Number of data items” and the “Read out data” as the response message.
- In the response message of the write single register, the server (COM-ME) returns the same message as the request message.
- In the response message of the write multiple registers, the server (COM-ME) returns the “Function code,” the “Register address number” and the “Number of register” as the response message.

■ Defective message response

- If the request message from the client is defective, except for transmission error, the server (COM-ME) returns the exception response message without any action.
- If the self-diagnostic function of the server (COM-ME) detects an error, the server will return an exception response message to all request messages.

Function code
Exception code

Exception response message

- The function code of each exception response message is obtained by adding “80H” to the function code of the request message.

Exception code	Contents	Causes
01H	Illegal function code	An unsupported function code was specified
02H	Illegal register address	When the mismatched register address is specified.
03H	Illegal data value	• The number of specified data points was out of the following range during data read or write. Function code 03H: 1 to 125 Function code 10H: 1 to 123 • When the data written exceeds the setting range

Exception code priority order
Order of a no response in PDU data length error > 01H > 03H > 02H

■ No response

The server (COM-ME) ignores the request message and does not respond when:

- The IP address does not coincide.
- The server (COM-ME) is not connected to the network.
- The PDU (Protocol Data Unit) data length is abnormal.
  When the PDU data length specified by the request message does not coincide with the number of bytes received as one TCP packet.

7.4 Message Format

7.4.1 Read holding registers [03H]

The request message specifies the starting register address number and quantity of register addresses to be read.
The contents of the registers are entered in the response message as data, divided into two parts: the high-order eight bits and low-order eight bits, arranged in the order of the register numbers.

Example: The contents of the four registers from 0000H to 0003H are the read out.

Request message [Client]

Transaction Identifier	High	00H	MBAP Header
	Low	00H	
Protocol Identifier	High	00H	
	Low	00H	
Data Length	High	00H	
	Low	06H	
Unit Identifier		00H	
Function code		03H	
Register address	High	00H	First register address
	Low	00H	
Quantity (Number of words)	High	00H	The setting must be between 1 (0001H) and 125 (007DH).
	Low	04H	

Normal response message [Server]

Transaction Identifier	High	00H	MBAP Header
	Low	00H	
Protocol Identifier	High	00H	
	Low	00H	
Data Length	High	00H	
	Low	0BH	
Unit Identifier		00H	
Function code		03H	
Number of data (byte)		08H	→ Number of registers × 2
First register contents	High	01H	
	Low	24H	
Next register contents	High	01H	
	Low	1BH	
Next register contents	High	01H	
	Low	2BH	
Next register contents	High	01H	
	Low	22H	

Exception response message [Sever]

Transaction Identifier	High	00H	MBAP Header
	Low	00H	
Protocol Identifier	High	00H	
	Low	00H	
Data Length	High	00H	
	Low	03H	
Unit Identifier		00H	
80H + Function code		83H	
Exception code		03H	→ Outside the specified number of data points

7.4.2 Write single register [06H]

The request message specifies data to be written into the designated register.
Write data items are arranged in the request message in order starting from the smallest register address number. In addition, each register address is assigned in the order of high-order eight bits and low-order eight bits, respectively.

Example: When 100 (64H) is written to the register 0580H

Request message [Client]

Transaction Identifier	High	00H	MBAP Header
	Low	00H	
Protocol Identifier	High	00H	
	Low	00H	
Data Length	High	00H	
	Low	06H	
Unit Identifier		00H	
Function code		06H	
Register address	High	05H	
	Low	80H	
Write data	High	00H	Any data within the range
	Low	64H	

Normal response message [Server]

Transaction Identifier	High	00H	Contents will be the same as request message data
	Low	00H	
Protocol Identifier	High	00H	
	Low	00H	
Data Length	High	00H	
	Low	06H	
Unit Identifier		00H	
Function code		06H	
Register address	High	05H	
	Low	80H	
Write data	High	00H	
	Low	64H	

Exception response message [Sever]

Transaction Identifier	High	00H	MBAP Header
	Low	00H	
Protocol Identifier	High	00H	
	Low	00H	
Data Length	High	00H	
	Low	03H	
Unit Identifier		00H	
80H + Function code		86H	
Exception code		03H	→ When the data exceeds the setting range

7.4.3 Write multiple registers [10H]

Each data is written to registers in specified quantities starting from the specified register address.
Write data items are arranged in the request message in order starting from the smallest register address number. In addition, each register address is assigned in the order of high-order eight bits and low-order eight bits, respectively.

Example: When 100 (64H) and 120 (78H) are written to the register 0580H and 0581H (two in total)

Request message [Client]

Transaction Identifier	High	00H	MBAP Header
	Low	00H	
Protocol Identifier	High	00H	
	Low	00H	
Data Length	High	00H	
	Low	0BH	
Unit Identifier		00H	
Function code		10H	
Register address	High	05H	First register address
	Low	80H	
Quantity (Number of words)	High	00H	The setting must be between 1 (0001H) and 123 (007BH).
	Low	02H	
Number of data (byte)		04H	→ Quantity (Number of words) × 2
Data to first register	High	00H	
	Low	64H	
Data to next register	High	00H	
	Low	78H	

Normal response message [Server]

Transaction Identifier	High	00H	MBAP Header
	Low	00H	
Protocol Identifier	High	00H	
	Low	00H	
Data Length	High	00H	
	Low	06H	
Unit Identifier		00H	
Function code		10H	
Register address	High	05H	First register address
	Low	80H	
Quantity (Number of words)	High	00H	
	Low	02H	

Exception response message [Sever]

Transaction Identifier	High	00H	MBAP Header
	Low	00H	
Protocol Identifier	High	00H	
	Low	00H	
Data Length	High	00H	
	Low	03H	
Unit Identifier		00H	
80H + Function code		90H	
Exception code		03H	→ When the data exceeds the setting range

7.5 Data Processing Precautions

- The numeric range of data used in Modbus protocol is 0000H to FFFFH. Only the set value within the setting range is effective.

  FFFFH represents −1.

- The Modbus protocol does not recognize data with decimal points during communication.

  Example1: When Heater break alarm (HBA) set value is 20.0 A, 20.0 is processed as 200, 200 = 00C8H

Heater break alarm (HBA) set value	High	00H
	Low	C8H

  Example2: When Set value (SV) is −20.0 °C, −20.0 is processed as −200, −200 = 0000H − 00C8H = FF38H

Set value (SV)	High	FFH
	Low	38H

- If data (register) exceeding the accessible address range is accessed, an exception response message is returned.
- Read data of unused item is a default value.
- Any attempt to write to an unused item is not processed as an error. Data cannot be written into an unused item.
- If an error (data range error) is detected in the data writing process, an exception response message is returned. Writing is aborted at and after the addresses where an error occurred. After having completed the setting, check to see if the data was properly written.
- An attribute of the item for functions which are not in the controller is RO (read only). If read action to this item is performed, the read data will be “0.” If write action to this item is performed, no error message is indicated and no data is written.

For details, refer to **8. COMMUNICATION DATA LIST (P. 45)**.

8. COMMUNICATION DATA LIST

8.1 Reference to Communication Data List

(1) (2) (3) (4) (5) (6)

No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
	Readout register address monitor for Controller communication data 1	CH1 ⋮ CH32	0000 ⋮ 001F	0 ⋮ 31	RO	Depends on the data range of the communication data set at "Readout register address of Controller communication data 1 to 10."	—

: This area is not used by COM-ME-1.

(1) Name: Communication data name

(2) Channel: Number of communication data channels

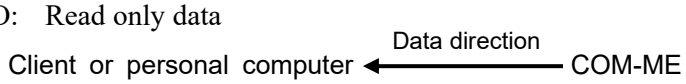
(3) Modbus register address:

Register address of Modbus data item specification
HEX: Hexadecimal
DEC: Decimal

The first register address and the last register address are written.

(4) Attribute: A method of how communication data are read or written when viewed from the client or personal computer is described

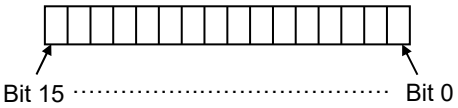
RO: Read only data



R/W: Read and Write data

(5) Data range: Read or write range of communication data

- 16-bit data (bit image)



The communication data that can be sent/received on Modbus/TCP is the communication data set at "Readout register address of Controller communication data 1 to 30" or "Write register address of Controller communication data 1 to 150." The data range depends on the communication data. Refer to the communication instruction manual of the relevant model for the data range.

- **FZ110/FZ400/FZ900 Instruction manual [Host Communication] (IMR03A07-E□)**
- **GZ400/GZ900 Instruction manual [Host Communication] (IMR03D07-E□)**

(6) Factory set value: Factory set value of communication data

The register address (Decimal number) of the FB series equivalent communication data * is set as a default setting for the "Readout register address of Controller communication data 1 to 30" or "Write register address of Controller communication data 1 to 150." Refer to the communication manual of the relevant model for the FB series equivalent communication data.

- **FZ110/FZ400/FZ900 Instruction manual [Host Communication] (IMR03A07-E□)**
- **GZ400/GZ900 Instruction manual [Host Communication] (IMR03D07-E□)**

* The "FB series equivalent communication data" means the data of our FB series controllers compatible with the data of FZ series/GZ series.

⚠ WARNING

The Engineering setting data should be set according to the application before setting any parameter related to operation. Once the communication data in the Engineering mode are set correctly, no further changes need to be made to parameters for the same application under normal conditions. If they are changed unnecessarily, it may result in malfunction or failure of the instrument. RKC will not bear any responsibility for malfunction or failure as a result of improper changes in the Engineering mode.

NOTE

Some of the communication data of the COM-ME will not be enabled until the power is turned on again.

NOTE

Communication data includes both "Normal setting data," "Engineering setting data" and "Compatibility of identifiers with other models (dummy data)."

During RUN (control), the attribute of Engineering setting data is RO.

To set up the parameters in the Engineering mode, the controller connected to the COM-ME must be stopped (STOP).

☞ For the communication data of the controller, refer to the following instruction manual.

- **FZ110/FZ400/FZ900 Instruction manual [Host Communication] (IMR03A07-E□)**
- **GZ400/GZ900 Instruction manual [Host Communication] (IMR03D07-E□)**

8.2 Communication Data of COM-ME

No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
1	Model code (COM-ME)	CH1	—	—	RO	Model code (character)	—
2	ROM version (COM-ME)	CH1	—	—	RO	ROM version	—
3	Integrated operating time monitor (COM-ME)	CH1	—	—	RO	0 to 19999 hours	—
4	Controller communication data	CH1 ⋮ CH32064	0000 ⋮ 7D40	0000 ⋮ 32064	RO	Refer to **8.3 Communication Data of Modbus/TCP (P. 64)**.	—
5	Ethernet selection*	CH1	8000	32768	R/W	0: Modbus/TCP 1 to 9999: Reserved	0
6	—	—	8001	32769	—	—	—
7	TCP port number*	CH1	8002	32770	R/W	0 to 65535	502
8	—	—	8003	32771	—	—	—
9	—	—	8004	32772	—	—	—
10	Controller communication communication speed*	CH1	8005	32773	R/W	0: 9600 bps 1: 9600 bps 2: 19200 bps 3: 38400 bps 4: 57600 bps	2
11	Controller communication data bit configuration *	CH1	8006	32774	R/W	0 to 11 Refer to **Table 1: Data bit configuration**	0
12	—	—	8007 ⋮ 801A	32775 ⋮ 32794	—	—	—
13	First-byte of IP address *	CH1	801B	32795	R/W	0 to 255	192
14	Second-byte of IP address *	CH1	801C	32796	R/W	0 to 255	168
15	Third-byte of IP address *	CH1	801D	32797	R/W	0 to 255	1
16	Fourth-byte of IP address *	CH1	801E	32798	R/W	0 to 255	1

* Data that are activated by rebooting

Table 1: Data bit configuration

Set value	Data bit	Parity bit	Stop bit
0	8	None	1
1	8	Even	1
2	8	Odd	1
3	8	None	1
4	8	None	1
5	8	None	1

Set value	Data bit	Parity bit	Stop bit
6	8	None	2
7	8	Even	2
8	8	Odd	2
9	8	None	1
10	8	None	1
11	8	None	1

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
17	—	—	801F ⋮ 813E	32799 ⋮ 33086	—	—	—
18	First-byte of gateway address *	CH1	813F	33087	R/W	0 to 255	0
19	Second-byte of gateway address *	CH1	8140	33088	R/W	0 to 255	0
20	Third-byte of gateway address *	CH1	8141	33089	R/W	0 to 255	0
21	Fourth-byte of gateway address *	CH1	8142	33090	R/W	0 to 255	0
22	Subnet mask CIDR *	CH1	8143	33091	R/W	0 to 32	24
23	—	—	8144 ⋮ 8443	33092 ⋮ 33859	—	—	—
24	Error code (COM-ME)	CH1	8444	33860	RO	2: Data back-up error 16: Internal communication error 64: Stack overflow	—
25	Backup memory state monitor (COM-ME)	CH1	8445	33861	RO	0: The content of the backup memory does not coincide with that of the RAM. 1: The content of the backup memory coincides with that of the RAM.	—
26	—	—	8446	33862	—	—	—
27	—	—	8447	33863	—	—	—
28	Network error code	CH1	8448	33864	RO	Bit data Bit 0: Network operation not possible Bit 1 to Bit 15: Unused Data 0: OFF 1: ON [Decimal number: 0, 1]	—
29	—	—	8449 ⋮ FA09	33865 ⋮ 64009	—	—	—
30	Number of connected controller in controller communication	CH1	FA0A	64010	RO	0 to 31	—
31	Number of connected channel in controller communication	CH1	FA0B	64011	RO	0 to 512	—

* Data that are activated by rebooting

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
32	Action mode selection [1, 2]	CH1	FA0C	64012	R/W	Bit data Bit 0: Address setting [1] 0: Continuous setting 1: Free setting Bit 1 to Bit 14: Unused [Decimal number: 0 to 1]	1
33	Number of connectable controller channels [1,]	CH1	FA0D	64013	R/W	1 to 512	32
34	Transmission wait time of controller communication [1,]	CH1	FA0E	64014	R/W	0 to 250 ms	10
35	—	—	FA0F ⋮ FA47	64015 ⋮ 64071	—	—	—
36	No. 1 Controller state ⋮ No. 31 Controller state	CH1 ⋮ CH31	FA48 ⋮ FA66	64072 ⋮ 64102	RO	Bit data Bit 0: Presence or absence of controller Bit 1: Presence or absence of abnormal response Bit 2 to Bit 15: Unused Data 0: Absence 1: Presence [Decimal number: 0 to 3]	—
37	—	CH1	FA67	64103	—	—	—
38	No. 1 Controller address [1,] ⋮ No. 31 Controller address [1,]	CH1 ⋮ CH31	FA68 ⋮ FA86	64104 ⋮ 64134	R/W	1 to 99 0: There is no connection controller	No.1 to No. 31: 1 to 31
39	Automatic acquisition of controller address [1, 3]	CH1	FA87	64135	R/W	0: Do not execute the automatic acquisition 1: Execute the automatic acquisition	0
40	—	—	FA88 ⋮ FAAF	64136 ⋮ 64175	—	—	—
41	Readout register address of Controller communication data 1	CH1	FAB0	64176	R/W	0 to 65534: Controller readout register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is read out of the controller.	0
42	Readout register address of Controller communication data 2	CH1	FAB1	64177	R/W		1
43	Readout register address of Controller communication data 3	CH1	FAB2	64178	R/W		2

[1] Data that are activated by rebooting

[2] There are two device address settings for the controller connecting to the COM-ME: continuous setting and free setting.
- For the continuous setting (factory set value), consecutive numbers starting from 1 are set to each controller.
- Free settings can be made in the range of 1 to 99.

[3] When the instrument is powered on again after the controller address automatic acquisition is set to "1: Execute the automatic acquisition," the instrument conducts the controller address automatic acquisition. When the automatic acquisition is finished, the mode will automatically return to "0: Do not execute the automatic acquisition."

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
44	Readout register address of Controller communication data 4	CH1	FAB3	64179	R/W	0 to 65534:Controller readout register address 65535 (0xFFFF): Set to “Disabled” This communication data is for setting the address of the communication data that is read out of the controller.	3
45	Readout register address of Controller communication data 5	CH1	FAB4	64180	R/W		4
46	Readout register address of Controller communication data 6	CH1	FAB5	64181	R/W		5
47	Readout register address of Controller communication data 7	CH1	FAB6	64182	R/W		6
48	Readout register address of Controller communication data 8	CH1	FAB7	64183	R/W		7
49	Readout register address of Controller communication data 9	CH1	FAB8	64184	R/W		8
50	Readout register address of Controller communication data 10	CH1	FAB9	64185	R/W		9
51	Readout register address of Controller communication data 11	CH1	FABA	64186	R/W		10
52	Readout register address of Controller communication data 12	CH1	FABB	64187	R/W		11
53	Readout register address of Controller communication data 13	CH1	FABC	64188	R/W		12
54	Readout register address of Controller communication data 14	CH1	FABD	64189	R/W		13
55	Readout register address of Controller communication data 15	CH1	FABE	64190	R/W		14
56	Readout register address of Controller communication data 16	CH1	FABF	64191	R/W		15
57	Readout register address of Controller communication data 17	CH1	FAC0	64192	R/W		65535
58	Readout register address of Controller communication data 18	CH1	FAC1	64193	R/W		65535
59	Readout register address of Controller communication data 19	CH1	FAC2	64194	R/W		65535

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
60	Readout register address of Controller communication data 20	CH1	FAC3	64195	R/W	0 to 65534: Controller readout register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is read out of the controller.	19
61	Readout register address of Controller communication data 21	CH1	FAC4	64196	R/W		20
62	Readout register address of Controller communication data 22	CH1	FAC5	64197	R/W		21
63	Readout register address of Controller communication data 23	CH1	FAC6	64198	R/W		65535
64	Readout register address of Controller communication data 24	CH1	FAC7	64199	R/W		65535
65	Readout register address of Controller communication data 25	CH1	FAC8	64200	R/W		65535
66	Readout register address of Controller communication data 26	CH1	FAC9	64201	R/W		65535
67	Readout register address of Controller communication data 27	CH1	FACA	64202	R/W		65535
68	Readout register address of Controller communication data 28	CH1	FACB	64203	R/W		65535
69	Readout register address of Controller communication data 29	CH1	FACC	64204	R/W		65535
70	Readout register address of Controller communication data 30	CH1	FACD	64205	R/W		65535
71	Number of readouts of Controller communication data 1 ⋮ Number of readouts of Controller communication data 30 *	Each 1CH	FACE ⋮ FAEB	64206 ⋮ 64235	R/W	1 to 16 This communication data is for setting how many communication data set at "Readout register address of Controller communication data 1 to 30" should be read out from the controller.	1
72	Write register address of Controller communication data 1	CH1	FAEC	64236	R/W	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is written into the controller.	32
73	Write register address of Controller communication data 2	CH1	FAED	64237	R/W		33

* The total of "Number of readouts of Controller communication data 1 to 30" and "Number of writes of Controller communication data 1 to 150" must be 1000 or less. If 1000 is exceeded, writing is not possible.

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
74	Write register address of Controller communication data 3	CH1	FAEE	64238	R/W	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is written into the controller.	34
75	Write register address of Controller communication data 4	CH1	FAEF	64239	R/W		35
76	Write register address of Controller communication data 5	CH1	FAF0	64240	R/W		36
77	Write register address of Controller communication data 6	CH1	FAF1	64241	R/W		37
78	Write register address of Controller communication data 7	CH1	FAF2	64242	R/W		38
79	Write register address of Controller communication data 8	CH1	FAF3	64243	R/W		39
80	Write register address of Controller communication data 9	CH1	FAF4	64244	R/W		40
81	Write register address of Controller communication data 10	CH1	FAF5	64245	R/W		41
82	Write register address of Controller communication data 11	CH1	FAF6	64246	R/W		42
83	Write register address of Controller communication data 12	CH1	FAF7	64247	R/W		43
84	Write register address of Controller communication data 13	CH1	FAF8	64248	R/W		44
85	Write register address of Controller communication data 14	CH1	FAF9	64249	R/W		45
86	Write register address of Controller communication data 15	CH1	FAFA	64250	R/W		46

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
87	Write register address of Controller communication data 16	CH1	FAFB	64251	R/W	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is written into the controller.	47
88	Write register address of Controller communication data 17	CH1	FAFC	64252	R/W		48
89	Write register address of Controller communication data 18	CH1	FAFD	64253	R/W		49
90	Write register address of Controller communication data 19	CH1	FAFE	64254	R/W		50
91	Write register address of Controller communication data 20	CH1	FAFF	64255	R/W		51
92	Write register address of Controller communication data 21	CH1	FB00	64256	R/W		52
93	Write register address of Controller communication data 22	CH1	FB01	64257	R/W		53
94	Write register address of Controller communication data 23	CH1	FB02	64258	R/W		54
95	Write register address of Controller communication data 24	CH1	FB03	64259	R/W		55
96	Write register address of Controller communication data 25	CH1	FB04	64260	R/W		56
97	Write register address of Controller communication data 26	CH1	FB05	64261	R/W		57
98	Write register address of Controller communication data 27	CH1	FB06	64262	R/W		58
99	Write register address of Controller communication data 28	CH1	FB07	64263	R/W		65535

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
100	Write register address of Controller communication data 29	CH1	FB08	64264	R/W	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is written into the controller.	65535
101	Write register address of Controller communication data 30	CH1	FB09	64265	R/W		61
102	Write register address of Controller communication data 31	CH1	FB0A	64266	R/W		65535
103	Write register address of Controller communication data 32	CH1	FB0B	64267	R/W		65535
104	Write register address of Controller communication data 33	CH1	FB0C	64268	R/W		64
105	Write register address of Controller communication data 34	CH1	FB0D	64269	R/W		65
106	Write register address of Controller communication data 35	CH1	FB0E	64270	R/W		66
107	Write register address of Controller communication data 36	CH1	FB0F	64271	R/W		67
108	Write register address of Controller communication data 37	CH1	FB10	64272	R/W		68
109	Write register address of Controller communication data 38	CH1	FB11	64273	R/W		69
110	Write register address of Controller communication data 39	CH1	FB12	64274	R/W		70
111	Write register address of Controller communication data 40	CH1	FB13	64275	R/W		71
112	Write register address of Controller communication data 41	CH1	FB14	64276	R/W		72

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
113	Write register address of Controller communication data 42	CH1	FB15	64277	R/W	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is written into the controller.	73
114	Write register address of Controller communication data 43	CH1	FB16	64278	R/W		74
115	Write register address of Controller communication data 44	CH1	FB17	64279	R/W		75
116	Write register address of Controller communication data 45	CH1	FB18	64280	R/W		65535
117	Write register address of Controller communication data 46	CH1	FB19	64281	R/W		65535
118	Write register address of Controller communication data 47	CH1	FB1A	64282	R/W		65535
119	Write register address of Controller communication data 48	CH1	FB1B	64283	R/W		65535
120	Write register address of Controller communication data 49	CH1	FB1C	64284	R/W		65535
121	Write register address of Controller communication data 50	CH1	FB1D	64285	R/W		65535
122	Write register address of Controller communication data 51	CH1	FB1E	64286	R/W		65535
123	Write register address of Controller communication data 52	CH1	FB1F	64287	R/W		65535
124	Write register address of Controller communication data 53	CH1	FB20	64288	R/W		65535
125	Write register address of Controller communication data 54	CH1	FB21	64289	R/W		65535

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
126	Write register address of Controller communication data 55	CH1	FB22	64290	R/W	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is written into the controller.	65535
127	Write register address of Controller communication data 56	CH1	FB23	64291	R/W		65535
128	Write register address of Controller communication data 57	CH1	FB24	64292	R/W		65535
129	Write register address of Controller communication data 58	CH1	FB25	64293	R/W		65535
130	Write register address of Controller communication data 59	CH1	FB26	64294	R/W		65535
131	Write register address of Controller communication data 60	CH1	FB27	64295	R/W		65535
132	Write register address of Controller communication data 61	CH1	FB28	64296	R/W		65535
133	Write register address of Controller communication data 62	CH1	FB29	64297	R/W		65535
134	Write register address of Controller communication data 63	CH1	FB2A	64298	R/W		65535
135	Write register address of Controller communication data 64	CH1	FB2B	64299	R/W		65535
136	Write register address of Controller communication data 65	CH1	FB2C	64300	R/W		65535
137	Write register address of Controller communication data 66	CH1	FB2D	64301	R/W		65535
138	Write register address of Controller communication data 67	CH1	FB2E	64302	R/W		65535

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
139	Write register address of Controller communication data 68	CH1	FB2F	64303	R/W	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is written into the controller.	65535
140	Write register address of Controller communication data 69	CH1	FB30	64304	R/W		65535
141	Write register address of Controller communication data 70	CH1	FB31	64305	R/W		65535
142	Write register address of Controller communication data 71	CH1	FB32	64306	R/W		65535
143	Write register address of Controller communication data 72	CH1	FB33	64307	R/W		65535
144	Write register address of Controller communication data 73	CH1	FB34	64308	R/W		65535
145	Write register address of Controller communication data 74	CH1	FB35	64309	R/W		65535
146	Write register address of Controller communication data 75	CH1	FB36	64310	R/W		65535
147	Write register address of Controller communication data 76	CH1	FB37	64311	R/W		65535
148	Write register address of Controller communication data 77	CH1	FB38	64312	R/W		65535
149	Write register address of Controller communication data 78	CH1	FB39	64313	R/W		65535
150	Write register address of Controller communication data 79	CH1	FB3A	64314	R/W		65535
151	Write register address of Controller communication data 80	CH1	FB3B	64315	R/W		65535

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
152	Write register address of Controller communication data 81	CH1	FB3C	64316	R/W	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is written into the controller.	65535
153	Write register address of Controller communication data 82	CH1	FB3D	64317	R/W		65535
154	Write register address of Controller communication data 83	CH1	FB3E	64318	R/W		65535
155	Write register address of Controller communication data 84	CH1	FB3F	64319	R/W		65535
156	Write register address of Controller communication data 85	CH1	FB40	64320	R/W		65535
157	Write register address of Controller communication data 86	CH1	FB41	64321	R/W		65535
158	Write register address of Controller communication data 87	CH1	FB42	64322	R/W		65535
159	Write register address of Controller communication data 88	CH1	FB43	64323	R/W		65535
160	Write register address of Controller communication data 89	CH1	FB44	64324	R/W		65535
161	Write register address of Controller communication data 90	CH1	FB45	64325	R/W		65535
162	Write register address of Controller communication data 91	CH1	FB46	64326	R/W		65535
163	Write register address of Controller communication data 92	CH1	FB47	64327	R/W		65535
164	Write register address of Controller communication data 93	CH1	FB48	64328	R/W		65535

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
165	Write register address of Controller communication data 94	CH1	FB49	64329	R/W	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is written into the controller.	65535
166	Write register address of Controller communication data 95	CH1	FB4A	64330	R/W		65535
167	Write register address of Controller communication data 96	CH1	FB4B	64331	R/W		65535
168	Write register address of Controller communication data 97	CH1	FB4C	64332	R/W		65535
169	Write register address of Controller communication data 98	CH1	FB4D	64333	R/W		65535
170	Write register address of Controller communication data 99	CH1	FB4E	64334	R/W		65535
171	Write register address of Controller communication data 100	CH1	FB4F	64335	R/W		65535
172	Write register address of Controller communication data 101	CH1	FB50	64336	R/W		65535
173	Write register address of Controller communication data 102	CH1	FB51	64337	R/W		65535
174	Write register address of Controller communication data 103	CH1	FB52	64338	R/W		65535
175	Write register address of Controller communication data 104	CH1	FB53	64339	R/W		65535
176	Write register address of Controller communication data 105	CH1	FB54	64340	R/W		65535
177	Write register address of Controller communication data 106	CH1	FB55	64341	R/W		65535

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
178	Write register address of Controller communication data 107	CH1	FB56	64342	R/W	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is written into the controller.	65535
179	Write register address of Controller communication data 108	CH1	FB57	64343	R/W		65535
180	Write register address of Controller communication data 109	CH1	FB58	64344	R/W		65535
181	Write register address of Controller communication data 110	CH1	FB59	64345	R/W		65535
182	Write register address of Controller communication data 111	CH1	FB5A	64346	R/W		65535
183	Write register address of Controller communication data 112	CH1	FB5B	64347	R/W		65535
184	Write register address of Controller communication data 113	CH1	FB5C	64348	R/W		65535
185	Write register address of Controller communication data 114	CH1	FB5D	64349	R/W		65535
186	Write register address of Controller communication data 115	CH1	FB5E	64350	R/W		65535
187	Write register address of Controller communication data 116	CH1	FB5F	64351	R/W		65535
188	Write register address of Controller communication data 117	CH1	FB60	64352	R/W		65535
189	Write register address of Controller communication data 118	CH1	FB61	64353	R/W		65535
190	Write register address of Controller communication data 119	CH1	FB62	64354	R/W		65535

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
191	Write register address of Controller communication data 20	CH1	FB63	64355	R/W	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is written into the controller.	65535
192	Write register address of Controller communication data 121	CH1	FB64	64356	R/W		65535
193	Write register address of Controller communication data 122	CH1	FB65	64357	R/W		65535
194	Write register address of Controller communication data 123	CH1	FB66	64358	R/W		65535
195	Write register address of Controller communication data 124	CH1	FB67	64359	R/W		65535
196	Write register address of Controller communication data 125	CH1	FB68	64360	R/W		65535
197	Write register address of Controller communication data 126	CH1	FB69	64361	R/W		65535
198	Write register address of Controller communication data 127	CH1	FB6A	64362	R/W		65535
199	Write register address of Controller communication data 128	CH1	FB6B	64363	R/W		65535
200	Write register address of Controller communication data 129	CH1	FB6C	64364	R/W		65535
201	Write register address of Controller communication data 130	CH1	FB6D	64365	R/W		65535
202	Write register address of Controller communication data 131	CH1	FB6E	64366	R/W		65535
203	Write register address of Controller communication data 132	CH1	FB6F	64367	R/W		65535

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
204	Write register address of Controller communication data 133	CH1	FB70	64368	R/W	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is written into the controller.	65535
205	Write register address of Controller communication data 134	CH1	FB71	64369	R/W		65535
206	Write register address of Controller communication data 135	CH1	FB72	64370	R/W		65535
207	Write register address of Controller communication data 136	CH1	FB73	64371	R/W		65535
208	Write register address of Controller communication data 137	CH1	FB74	64372	R/W		65535
209	Write register address of Controller communication data 138	CH1	FB75	64373	R/W		65535
210	Write register address of Controller communication data 139	CH1	FB76	64374	R/W		65535
211	Write register address of Controller communication data 140	CH1	FB77	64375	R/W		65535
212	Write register address of Controller communication data 141	CH1	FB78	64376	R/W		65535
213	Write register address of Controller communication data 142	CH1	FB79	64377	R/W		65535
214	Write register address of Controller communication data 143	CH1	FB7A	64378	R/W		65535
215	Write register address of Controller communication data 144	CH1	FB7B	64379	R/W		65535
216	Write register address of Controller communication data 145	CH1	FB7C	64380	R/W		65535

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
217	Write register address of Controller communication data 146	CH1	FB7D	64381	R/W	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address of the communication data that is written into the controller.	65535
218	Write register address of Controller communication data 147	CH1	FB7E	64382	R/W		65535
219	Write register address of Controller communication data 148	CH1	FB7F	64383	R/W		65535
220	Write register address of Controller communication data 149	CH1	FB80	64384	R/W		65535
221	Write register address of Controller communication data 150	CH1	FB81	64385	R/W		65535
222	Number of writes of Controller communication data 1 ⋮ Number of writes of Controller communication data 50	CH1 ⋮ CH50	FB82 ⋮ FBB3	64386 ⋮ 64435	R/W	1 to 16 * This communication data is for setting how many communication data set at "Write register address of Controller communication data 1 to 150" should be written into the controller.	1
223	Number of writes of Controller communication data 51 ⋮ Number of writes of Controller communication data 100	CH1 ⋮ CH50	FBB4 ⋮ FBE5	64436 ⋮ 64485	R/W		1
224	Number of writes of Controller communication data 101 ⋮ Number of writes of Controller communication data 150 [1]	CH1 ⋮ CH50	FBE6 ⋮ FC17	64486 ⋮ 64535	R/W		1
225	Waiting time for Controller communication start [2]	CH1	FC18	64536	R/W	0 to 100 (0.0 to 10.0 seconds)	50
226	Controller communication register address setting instruction	CH1	FC19	64537	R/W	0: Initial state at power on/End of setting 1: Start setting After "1" was set, the value will automatically return to "0."	0

[1] The total of "Number of readouts of Controller communication data 1 to 30" and "Number of writes of Controller communication data 1 to 150" must be 1000 or less. If 1000 is exceeded, writing is not possible.

[2] Data that are activated by rebooting

8.3 Communication Data of Modbus/TCP

The communication data that can be sent/received on Modbus/TCP is the communication data set at "Readout register address of Controller communication data 1 to 30" or "Write register address of Controller communication data 1 to 150." The data range depends on the communication data. Refer to the communication instruction manual of the relevant model for the data range.

- **FZ110/FZ400/FZ900 Instruction Manual [Host Communication] (IMR03A07-E□)**
- **GZ400/GZ900 Instruction Manual [Host Communication] (IMR03D07-E□)**

No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
1	Readout register address monitor for Controller communication data 1	CH1 ⋮ CH32	0000 ⋮ 001F	0 ⋮ 31	RO	Depends on the data range of the communication data set at "Readout register address of Controller communication data 1 to 10." When "65535 (0xFFFF) = Set to Disabled" is set at "Readout register address of Controller communication data 1 to 10," the range is "0."	—
2	Readout register address monitor for Controller communication data 2	CH1 ⋮ CH32	0020 ⋮ 003F	32 ⋮ 63	RO		—
3	Readout register address monitor for Controller communication data 3	CH1 ⋮ CH32	0040 ⋮ 005F	64 ⋮ 95	RO		—
4	Readout register address monitor for Controller communication data 4	CH1 ⋮ CH32	0060 ⋮ 007F	96 ⋮ 127	RO		—
5	Readout register address monitor for Controller communication data 5	CH1 ⋮ CH32	0080 ⋮ 009F	128 ⋮ 159	RO		—
6	Readout register address monitor for Controller communication data 6	CH1 ⋮ CH32	00A0 ⋮ 00BF	160 ⋮ 191	RO		—
7	Readout register address monitor for Controller communication data 7	CH1 ⋮ CH32	00C0 ⋮ 00DF	192 ⋮ 223	RO		—
8	Readout register address monitor for Controller communication data 8	CH1 ⋮ CH32	00E0 ⋮ 00FF	224 ⋮ 255	RO		—
9	Readout register address monitor for Controller communication data 9	CH1 ⋮ CH32	0100 ⋮ 011F	256 ⋮ 287	RO		—
10	Readout register address monitor for Controller communication data 10	CH1 ⋮ CH32	0120 ⋮ 013F	288 ⋮ 319	RO		—

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
11	Readout register address monitor for Controller communication data 11	CH1 ⋮ CH32	0140 ⋮ 015F	320 ⋮ 351	RO	Depends on the data range of the communication data set at "Readout register address of Controller communication data 11 to 23. When "65535 (0xFFFF) = Set to Disabled" is set at "Readout register address of Controller communication data 11 to 23," the range is "0."	—
12	Readout register address monitor for Controller communication data 12	CH1 ⋮ CH32	0160 ⋮ 017F	352 ⋮ 383	RO		—
13	Readout register address monitor for Controller communication data 13	CH1 ⋮ CH32	0180 ⋮ 019F	384 ⋮ 415	RO		—
14	Readout register address monitor for Controller communication data 14	CH1 ⋮ CH32	01A0 ⋮ 01BF	416 ⋮ 447	RO		—
15	Readout register address monitor for Controller communication data 15	CH1 ⋮ CH32	01C0 ⋮ 01DF	448 ⋮ 479	RO		—
16	Readout register address monitor for Controller communication data 16	CH1 ⋮ CH32	01E0 ⋮ 01FF	480 ⋮ 511	RO		—
17	Readout register address monitor for Controller communication data 17	CH1 ⋮ CH32	0200 ⋮ 021F	512 ⋮ 543	RO		—
18	Readout register address monitor for Controller communication data 18	CH1 ⋮ CH32	0220 ⋮ 023F	544 ⋮ 575	RO		—
19	Readout register address monitor for Controller communication data 19	CH1 ⋮ CH32	0240 ⋮ 025F	576 ⋮ 607	RO		—
20	Readout register address monitor for Controller communication data 20	CH1 ⋮ CH32	0260 ⋮ 027F	608 ⋮ 639	RO		—
21	Readout register address monitor for Controller communication data 21	CH1 ⋮ CH32	0280 ⋮ 029F	640 ⋮ 671	RO		—
22	Readout register address monitor for Controller communication data 22	CH1 ⋮ CH32	02A0 ⋮ 02BF	672 ⋮ 703	RO		—
23	Readout register address monitor for Controller communication data 23	CH1 ⋮ CH32	02C0 ⋮ 02DF	704 ⋮ 735	RO		—

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
24	Readout register address monitor for Controller communication data 24	CH1 ⋮ CH32	02E0 ⋮ 02FF	736 ⋮ 767	RO	Depends on the data range of the communication data set at "Readout register address of Controller communication data 24 to 30. When "65535 (0xFFFF) = Set to Disabled" is set at "Readout register address of Controller communication data 24 to 30," the range is "0."	—
25	Readout register address monitor for Controller communication data 25	CH1 ⋮ CH32	0300 ⋮ 031F	768 ⋮ 799	RO		—
26	Readout register address monitor for Controller communication data 26	CH1 ⋮ CH32	0320 ⋮ 033F	800 ⋮ 831	RO		—
27	Readout register address monitor for Controller communication data 27	CH1 ⋮ CH32	0340 ⋮ 035F	832 ⋮ 863	RO		—
28	Readout register address monitor for Controller communication data 28	CH1 ⋮ CH32	0360 ⋮ 037F	864 ⋮ 895	RO		—
29	Readout register address monitor for Controller communication data 29	CH1 ⋮ CH32	0380 ⋮ 039F	896 ⋮ 927	RO		—
30	Readout register address monitor for Controller communication data 30	CH1 ⋮ CH32	03A0 ⋮ 03BF	928 ⋮ 959	RO		—
31	—	—	03C0 ⋮ 03FF	960 ⋮ 1023	—	—	—
32	Write register address data for Controller communication data 1	CH1 ⋮ CH32	0400 ⋮ 041F	1024 ⋮ 1055	R/W	Depends on the data range of the communication data set at "Write register address of Controller communication data 1 to 5." When "65535 (0xFFFF) = Set to Disabled" is set at "Write register address of Controller communication data 1 to 5," the range is "0."	—
33	Write register address data for Controller communication data 2	CH1 ⋮ CH32	0420 ⋮ 043F	1056 ⋮ 1087	R/W		—
34	Write register address data for Controller communication data 3	CH1 ⋮ CH32	0440 ⋮ 045F	1088 ⋮ 1119	R/W		—
35	Write register address data for Controller communication data 4	CH1 ⋮ CH32	0460 ⋮ 047F	1120 ⋮ 1151	R/W		—
36	Write register address data for Controller communication data 5	CH1 ⋮ CH32	0480 ⋮ 049F	1152 ⋮ 1183	R/W		—

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
37	Write register address data for Controller communication data 6	CH1 ⋮ CH32	04A0 ⋮ 04BF	1184 ⋮ 1215	R/W	Depends on the data range of the communication data set at "Write register address of Controller communication data 6 to 18." When "65535 (0xFFFF) = Set to Disabled" is set at "Write register address of Controller communication data 6 to 18," the range is "0."	—
38	Write register address data for Controller communication data 7	CH1 ⋮ CH32	04C0 ⋮ 04DF	1216 ⋮ 1247	R/W		—
39	Write register address data for Controller communication data 8	CH1 ⋮ CH32	04E0 ⋮ 04FF	1248 ⋮ 1279	R/W		—
40	Write register address data for Controller communication data 9	CH1 ⋮ CH32	0500 ⋮ 051F	1280 ⋮ 1311	R/W		—
41	Write register address data for Controller communication data 10	CH1 ⋮ CH32	0520 ⋮ 053F	1312 ⋮ 1343	R/W		—
42	Write register address data for Controller communication data 11	CH1 ⋮ CH32	0540 ⋮ 055F	1344 ⋮ 1375	R/W		—
43	Write register address data for Controller communication data 12	CH1 ⋮ CH32	0560 ⋮ 057F	1376 ⋮ 1407	R/W		—
44	Write register address data for Controller communication data 13	CH1 ⋮ CH32	0580 ⋮ 059F	1408 ⋮ 1439	R/W		—
45	Write register address data for Controller communication data 14	CH1 ⋮ CH32	05A0 ⋮ 05BF	1440 ⋮ 1471	R/W		—
46	Write register address data for Controller communication data 15	CH1 ⋮ CH32	05C0 ⋮ 05DF	1472 ⋮ 1503	R/W		—
47	Write register address data for Controller communication data 16	CH1 ⋮ CH32	05E0 ⋮ 05FF	1504 ⋮ 1535	R/W		—
48	Write register address data for Controller communication data 17	CH1 ⋮ CH32	0600 ⋮ 061F	1536 ⋮ 1567	R/W		—
49	Write register address data for Controller communication data 18	CH1 ⋮ CH32	0620 ⋮ 063F	1568 ⋮ 1599	R/W		—

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
50	Write register address data for Controller communication data 19	CH1 ⋮ CH32	0640 ⋮ 065F	1600 ⋮ 1631	R/W	Depends on the data range of the communication data set at "Write register address of Controller communication data 19 to 31." When "65535 (0xFFFF) = Set to Disabled" is set at "Write register address of Controller communication data 19 to 31," the range is "0."	—
51	Write register address data for Controller communication data 20	CH1 ⋮ CH32	0660 ⋮ 067F	1632 ⋮ 1663	R/W		—
52	Write register address data for Controller communication data 21	CH1 ⋮ CH32	0680 ⋮ 069F	1664 ⋮ 1695	R/W		—
53	Write register address data for Controller communication data 22	CH1 ⋮ CH32	06A0 ⋮ 06BF	1696 ⋮ 1727	R/W		—
54	Write register address data for Controller communication data 23	CH1 ⋮ CH32	06C0 ⋮ 06DF	1728 ⋮ 1759	R/W		—
55	Write register address data for Controller communication data 24	CH1 ⋮ CH32	06E0 ⋮ 06FF	1760 ⋮ 1791	R/W		—
56	Write register address data for Controller communication data 25	CH1 ⋮ CH32	0700 ⋮ 071F	1792 ⋮ 1823	R/W		—
57	Write register address data for Controller communication data 26	CH1 ⋮ CH32	0720 ⋮ 073F	1824 ⋮ 1855	R/W		—
58	Write register address data for Controller communication data 27	CH1 ⋮ CH32	0740 ⋮ 075F	1856 ⋮ 1887	R/W		—
59	Write register address data for Controller communication data 28	CH1 ⋮ CH32	0760 ⋮ 077F	1888 ⋮ 1919	R/W		—
60	Write register address data for Controller communication data 29	CH1 ⋮ CH32	0780 ⋮ 079F	1920 ⋮ 1951	R/W		—
61	Write register address data for Controller communication data 30	CH1 ⋮ CH32	07A0 ⋮ 07BF	1952 ⋮ 1983	R/W		—
62	Write register address data for Controller communication data 31	CH1 ⋮ CH32	07C0 ⋮ 07DF	1984 ⋮ 2015	R/W		—

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
63	Write register address data for Controller communication data 32	CH1 ⋮ CH32	07E0 ⋮ 07FF	2016 ⋮ 2047	R/W	Depends on the data range of the communication data set at "Write register address of Controller communication data 32 to 44." When "65535 (0xFFFF) = Set to Disabled" is set at "Write register address of Controller communication data 32 to 44," the range is "0."	—
64	Write register address data for Controller communication data 33	CH1 ⋮ CH32	0800 ⋮ 081F	2048 ⋮ 2079	R/W		—
65	Write register address data for Controller communication data 34	CH1 ⋮ CH32	0820 ⋮ 083F	2080 ⋮ 2111	R/W		—
66	Write register address data for Controller communication data 35	CH1 ⋮ CH32	0840 ⋮ 085F	2112 ⋮ 2143	R/W		—
67	Write register address data for Controller communication data 36	CH1 ⋮ CH32	0860 ⋮ 087F	2144 ⋮ 2175	R/W		—
68	Write register address data for Controller communication data 37	CH1 ⋮ CH32	0880 ⋮ 089F	2176 ⋮ 2207	R/W		—
69	Write register address data for Controller communication data 38	CH1 ⋮ CH32	08A0 ⋮ 08BF	2208 ⋮ 2239	R/W		—
70	Write register address data for Controller communication data 39	CH1 ⋮ CH32	08C0 ⋮ 08DF	2240 ⋮ 2271	R/W		—
71	Write register address data for Controller communication data 40	CH1 ⋮ CH32	08E0 ⋮ 08FF	2272 ⋮ 2303	R/W		—
72	Write register address data for Controller communication data 41	CH1 ⋮ CH32	0900 ⋮ 091F	2304 ⋮ 2335	R/W		—
73	Write register address data for Controller communication data 42	CH1 ⋮ CH32	0920 ⋮ 093F	2336 ⋮ 2367	R/W		—
74	Write register address data for Controller communication data 43	CH1 ⋮ CH32	0940 ⋮ 095F	2368 ⋮ 2399	R/W		—
75	Write register address data for Controller communication data 44	CH1 ⋮ CH32	0960 ⋮ 097F	2400 ⋮ 2431	R/W		—

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
76	Write register address data for Controller communication data 45	CH1 ⋮ CH32	0980 ⋮ 099F	2432 ⋮ 2463	R/W	Depends on the data range of the communication data set at "Write register address of Controller communication data 45 to 57." When "65535 (0xFFFF) = Set to Disabled" is set at "Write register address of Controller communication data 45 to 57," the range is "0."	—
77	Write register address data for Controller communication data 46	CH1 ⋮ CH32	09A0 ⋮ 09BF	2464 ⋮ 2495	R/W		—
78	Write register address data for Controller communication data 47	CH1 ⋮ CH32	09C0 ⋮ 09DF	2496 ⋮ 2527	R/W		—
79	Write register address data for Controller communication data 48	CH1 ⋮ CH32	09E0 ⋮ 09FF	2528 ⋮ 2559	R/W		—
80	Write register address data for Controller communication data 49	CH1 ⋮ CH32	0A00 ⋮ 0A1F	2560 ⋮ 2591	R/W		—
81	Write register address data for Controller communication data 50	CH1 ⋮ CH32	0A20 ⋮ 0A3F	2592 ⋮ 2623	R/W		—
82	Write register address data for Controller communication data 51	CH1 ⋮ CH32	0A40 ⋮ 0A5F	2624 ⋮ 2655	R/W		—
83	Write register address data for Controller communication data 52	CH1 ⋮ CH32	0A60 ⋮ 0A7F	2656 ⋮ 2687	R/W		—
84	Write register address data for Controller communication data 53	CH1 ⋮ CH32	0A80 ⋮ 0A9F	2688 ⋮ 2719	R/W		—
85	Write register address data for Controller communication data 54	CH1 ⋮ CH32	0AA0 ⋮ 0ABF	2720 ⋮ 2751	R/W		—
86	Write register address data for Controller communication data 55	CH1 ⋮ CH32	0AC0 ⋮ 0ADF	2752 ⋮ 2783	R/W		—
87	Write register address data for Controller communication data 56	CH1 ⋮ CH32	0AE0 ⋮ 0AFF	2784 ⋮ 2815	R/W		—
88	Write register address data for Controller communication data 57	CH1 ⋮ CH32	0B00 ⋮ 0B1F	2816 ⋮ 2847	R/W		—

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
89	Write register address data for Controller communication data 58	CH1 ⋮ CH32	0B20 ⋮ 0B3F	2848 ⋮ 2879	R/W	Depends on the data range of the communication data set at "Write register address of Controller communication data 58 to 70." When "65535 (0xFFFF) = Set to Disabled" is set at "Write register address of Controller communication data 58 to 70," the range is "0."	—
90	Write register address data for Controller communication data 59	CH1 ⋮ CH32	0B40 ⋮ 0B5F	2880 ⋮ 2911	R/W		—
91	Write register address data for Controller communication data 60	CH1 ⋮ CH32	0B60 ⋮ 0B7F	2912 ⋮ 2943	R/W		—
92	Write register address data for Controller communication data 61	CH1 ⋮ CH32	0B80 ⋮ 0B9F	2944 ⋮ 2975	R/W		—
93	Write register address data for Controller communication data 62	CH1 ⋮ CH32	0BA0 ⋮ 0BBF	2976 ⋮ 3007	R/W		—
94	Write register address data for Controller communication data 63	CH1 ⋮ CH32	0BC0 ⋮ 0BDF	3008 ⋮ 3039	R/W		—
95	Write register address data for Controller communication data 64	CH1 ⋮ CH32	0BE0 ⋮ 0BFF	3040 ⋮ 3071	R/W		—
96	Write register address data for Controller communication data 65	CH1 ⋮ CH32	0C00 ⋮ 0C1F	3072 ⋮ 3103	R/W		—
97	Write register address data for Controller communication data 66	CH1 ⋮ CH32	0C20 ⋮ 0C3F	3104 ⋮ 3135	R/W		—
98	Write register address data for Controller communication data 67	CH1 ⋮ CH32	0C40 ⋮ 0C5F	3136 ⋮ 3167	R/W		—
99	Write register address data for Controller communication data 68	CH1 ⋮ CH32	0C60 ⋮ 0C7F	3168 ⋮ 3199	R/W		—
100	Write register address data for Controller communication data 69	CH1 ⋮ CH32	0C80 ⋮ 0C9F	3200 ⋮ 3231	R/W		—
101	Write register address data for Controller communication data 70	CH1 ⋮ CH32	0CA0 ⋮ 0CBF	3232 ⋮ 3263	R/W		—

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
102	Write register address data for Controller communication data 71	CH1 ⋮ CH32	0CC0 ⋮ 0CDF	3264 ⋮ 3295	R/W	Depends on the data range of the communication data set at "Write register address of Controller communication data 71 to 83." When "65535 (0xFFFF) = Set to Disabled" is set at "Write register address of Controller communication data 71 to 83," the range is "0."	—
103	Write register address data for Controller communication data 72	CH1 ⋮ CH32	0CE0 ⋮ 0CFF	3296 ⋮ 3327	R/W		—
104	Write register address data for Controller communication data 73	CH1 ⋮ CH32	0D00 ⋮ 0D1F	3328 ⋮ 3359	R/W		—
105	Write register address data for Controller communication data 74	CH1 ⋮ CH32	0D20 ⋮ 0D3F	3360 ⋮ 3391	R/W		—
106	Write register address data for Controller communication data 75	CH1 ⋮ CH32	0D40 ⋮ 0D5F	3392 ⋮ 3423	R/W		—
107	Write register address data for Controller communication data 76	CH1 ⋮ CH32	0D60 ⋮ 0D7F	3424 ⋮ 3455	R/W		—
108	Write register address data for Controller communication data 77	CH1 ⋮ CH32	0D80 ⋮ 0D9F	3456 ⋮ 3487	R/W		—
109	Write register address data for Controller communication data 78	CH1 ⋮ CH32	0DA0 ⋮ 0DBF	3488 ⋮ 3519	R/W		—
110	Write register address data for Controller communication data 79	CH1 ⋮ CH32	0DC0 ⋮ 0DDF	3520 ⋮ 3551	R/W		—
111	Write register address data for Controller communication data 80	CH1 ⋮ CH32	0DE0 ⋮ 0DFF	3552 ⋮ 3583	R/W		—
112	Write register address data for Controller communication data 81	CH1 ⋮ CH32	0E00 ⋮ 0E1F	3584 ⋮ 3615	R/W		—
113	Write register address data for Controller communication data 82	CH1 ⋮ CH32	0E20 ⋮ 0E3F	3616 ⋮ 3647	R/W		—
114	Write register address data for Controller communication data 83	CH1 ⋮ CH32	0E40 ⋮ 0E5F	3648 ⋮ 3679	R/W		—

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
115	Write register address data for Controller communication data 84	CH1 ⋮ CH32	0E60 ⋮ 0E7F	3680 ⋮ 3711	R/W	Depends on the data range of the communication data set at "Write register address of Controller communication data 84 to 96." When "65535 (0xFFFF) = Set to Disabled" is set at "Write register address of Controller communication data 84 to 96," the range is "0."	—
116	Write register address data for Controller communication data 85	CH1 ⋮ CH32	0E80 ⋮ 0E9F	3712 ⋮ 3743	R/W		—
117	Write register address data for Controller communication data 86	CH1 ⋮ CH32	0EA0 ⋮ 0EBF	3744 ⋮ 3775	R/W		—
118	Write register address data for Controller communication data 87	CH1 ⋮ CH32	0EC0 ⋮ 0EDF	3776 ⋮ 3807	R/W		—
119	Write register address data for Controller communication data 88	CH1 ⋮ CH32	0EE0 ⋮ 0EFF	3808 ⋮ 3839	R/W		—
120	Write register address data for Controller communication data 89	CH1 ⋮ CH32	0F00 ⋮ 0F1F	3840 ⋮ 3871	R/W		—
121	Write register address data for Controller communication data 90	CH1 ⋮ CH32	0F20 ⋮ 0F3F	3872 ⋮ 3903	R/W		—
122	Write register address data for Controller communication data 91	CH1 ⋮ CH32	0F40 ⋮ 0F5F	3904 ⋮ 3935	R/W		—
123	Write register address data for Controller communication data 92	CH1 ⋮ CH32	0F60 ⋮ 0F7F	3936 ⋮ 3967	R/W		—
124	Write register address data for Controller communication data 93	CH1 ⋮ CH32	0F80 ⋮ 0F9F	3968 ⋮ 3999	R/W		—
125	Write register address data for Controller communication data 94	CH1 ⋮ CH32	0FA0 ⋮ 0FBF	4000 ⋮ 4031	R/W		—
126	Write register address data for Controller communication data 95	CH1 ⋮ CH32	0FC0 ⋮ 0FDF	4032 ⋮ 4063	R/W		—
127	Write register address data for Controller communication data 96	CH1 ⋮ CH32	0FE0 ⋮ 0FFF	4064 ⋮ 4095	R/W		—

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
128	Write register address data for Controller communication data 97	CH1 ⋮ CH32	1000 ⋮ 101F	4096 ⋮ 4127	R/W	Depends on the data range of the communication data set at "Write register address of Controller communication data 97 to 109." When "65535 (0xFFFF) = Set to Disabled" is set at "Write register address of Controller communication data 97 to 109," the range is "0."	—
129	Write register address data for Controller communication data 98	CH1 ⋮ CH32	1020 ⋮ 103F	4128 ⋮ 4159	R/W		—
130	Write register address data for Controller communication data 99	CH1 ⋮ CH32	1040 ⋮ 105F	4160 ⋮ 4191	R/W		—
131	Write register address data for Controller communication data 100	CH1 ⋮ CH32	1060 ⋮ 107F	4192 ⋮ 4223	R/W		—
132	Write register address data for Controller communication data 101	CH1 ⋮ CH32	1080 ⋮ 109F	4224 ⋮ 4255	R/W		—
133	Write register address data for Controller communication data 102	CH1 ⋮ CH32	10A0 ⋮ 10BF	4256 ⋮ 4287	R/W		—
134	Write register address data for Controller communication data 103	CH1 ⋮ CH32	10C0 ⋮ 10DF	4288 ⋮ 4319	R/W		—
135	Write register address data for Controller communication data 104	CH1 ⋮ CH32	10E0 ⋮ 10FF	4320 ⋮ 4351	R/W		—
136	Write register address data for Controller communication data 105	CH1 ⋮ CH32	1100 ⋮ 111F	4352 ⋮ 4383	R/W		—
137	Write register address data for Controller communication data 106	CH1 ⋮ CH32	1120 ⋮ 113F	4384 ⋮ 4415	R/W		—
138	Write register address data for Controller communication data 107	CH1 ⋮ CH32	1140 ⋮ 115F	4416 ⋮ 4447	R/W		—
139	Write register address data for Controller communication data 108	CH1 ⋮ CH32	1160 ⋮ 117F	4448 ⋮ 4479	R/W		—
140	Write register address data for Controller communication data 109	CH1 ⋮ CH32	1180 ⋮ 119F	4480 ⋮ 4511	R/W		—

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
141	Write register address data for Controller communication data 110	CH1 ⋮ CH32	11A0 ⋮ 11BF	4512 ⋮ 4543	R/W	Depends on the data range of the communication data set at "Write register address of Controller communication data 110 to 122." When "65535 (0xFFFF) = Set to Disabled" is set at "Write register address of Controller communication data 110 to 122," the range is "0."	—
142	Write register address data for Controller communication data 111	CH1 ⋮ CH32	11C0 ⋮ 11DF	4544 ⋮ 4575	R/W		—
143	Write register address data for Controller communication data 112	CH1 ⋮ CH32	11E0 ⋮ 11FF	4576 ⋮ 4607	R/W		—
144	Write register address data for Controller communication data 113	CH1 ⋮ CH32	1200 ⋮ 121F	4608 ⋮ 4639	R/W		—
145	Write register address data for Controller communication data 114	CH1 ⋮ CH32	1220 ⋮ 123F	4640 ⋮ 4671	R/W		—
146	Write register address data for Controller communication data 115	CH1 ⋮ CH32	1240 ⋮ 125F	4672 ⋮ 4703	R/W		—
147	Write register address data for Controller communication data 116	CH1 ⋮ CH32	1260 ⋮ 127F	4704 ⋮ 4735	R/W		—
148	Write register address data for Controller communication data 117	CH1 ⋮ CH32	1280 ⋮ 129F	4736 ⋮ 4767	R/W		—
149	Write register address data for Controller communication data 118	CH1 ⋮ CH32	12A0 ⋮ 12BF	4768 ⋮ 4799	R/W		—
150	Write register address data for Controller communication data 119	CH1 ⋮ CH32	12C0 ⋮ 12DF	4800 ⋮ 4831	R/W		—
151	Write register address data for Controller communication data 120	CH1 ⋮ CH32	12E0 ⋮ 12FF	4832 ⋮ 4863	R/W		—
152	Write register address data for Controller communication data 121	CH1 ⋮ CH32	1300 ⋮ 131F	4864 ⋮ 4895	R/W		—
153	Write register address data for Controller communication data 122	CH1 ⋮ CH32	1320 ⋮ 133F	4896 ⋮ 4927	R/W		—

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
154	Write register address data for Controller communication data 123	CH1 ⋮ CH32	1340 ⋮ 135F	4928 ⋮ 4959	R/W	Depends on the data range of the communication data set at "Write register address of Controller communication data 123 to 135." When "65535 (0xFFFF) = Set to Disabled" is set at "Write register address of Controller communication data 123 to 135," the range is "0."	—
155	Write register address data for Controller communication data 124	CH1 ⋮ CH32	1360 ⋮ 137F	4960 ⋮ 4991	R/W		—
156	Write register address data for Controller communication data 125	CH1 ⋮ CH32	1380 ⋮ 139F	4992 ⋮ 5023	R/W		—
157	Write register address data for Controller communication data 126	CH1 ⋮ CH32	13A0 ⋮ 13BF	5024 ⋮ 5055	R/W		—
158	Write register address data for Controller communication data 127	CH1 ⋮ CH32	13C0 ⋮ 13DF	5056 ⋮ 5087	R/W		—
159	Write register address data for Controller communication data 128	CH1 ⋮ CH32	13E0 ⋮ 13FF	5088 ⋮ 5119	R/W		—
160	Write register address data for Controller communication data 129	CH1 ⋮ CH32	1400 ⋮ 141F	5120 ⋮ 5151	R/W		—
161	Write register address data for Controller communication data 130	CH1 ⋮ CH32	1420 ⋮ 143F	5152 ⋮ 5183	R/W		—
162	Write register address data for Controller communication data 131	CH1 ⋮ CH32	1440 ⋮ 145F	5184 ⋮ 5215	R/W		—
163	Write register address data for Controller communication data 132	CH1 ⋮ CH32	1460 ⋮ 147F	5216 ⋮ 5247	R/W		—
164	Write register address data for Controller communication data 133	CH1 ⋮ CH32	1480 ⋮ 149F	5248 ⋮ 5279	R/W		—
165	Write register address data for Controller communication data 134	CH1 ⋮ CH32	14A0 ⋮ 14BF	5280 ⋮ 5311	R/W		—
166	Write register address data for Controller communication data 135	CH1 ⋮ CH32	14C0 ⋮ 14DF	5312 ⋮ 5343	R/W		—

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No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
167	Write register address data for Controller communication data 136	CH1 ⋮ CH32	14E0 ⋮ 14FF	5344 ⋮ 5375	R/W	Depends on the data range of the communication data set at "Write register address of Controller communication data 136 to 148." When "65535 (0xFFFF) = Set to Disabled" is set at "Write register address of Controller communication data 136 to 148," the range is "0."	—
168	Write register address data for Controller communication data 137	CH1 ⋮ CH32	1500 ⋮ 151F	5376 ⋮ 5407	R/W		—
169	Write register address data for Controller communication data 138	CH1 ⋮ CH32	1520 ⋮ 153F	5408 ⋮ 5439	R/W		—
170	Write register address data for Controller communication data 139	CH1 ⋮ CH32	1540 ⋮ 155F	5440 ⋮ 5471	R/W		—
171	Write register address data for Controller communication data 140	CH1 ⋮ CH32	1560 ⋮ 157F	5472 ⋮ 5503	R/W		—
172	Write register address data for Controller communication data 141	CH1 ⋮ CH32	1580 ⋮ 159F	5504 ⋮ 5535	R/W		—
173	Write register address data for Controller communication data 142	CH1 ⋮ CH32	15A0 ⋮ 15BF	5536 ⋮ 5567	R/W		—
174	Write register address data for Controller communication data 143	CH1 ⋮ CH32	15C0 ⋮ 15DF	5568 ⋮ 5599	R/W		—
175	Write register address data for Controller communication data 144	CH1 ⋮ CH32	15E0 ⋮ 15FF	5600 ⋮ 5631	R/W		—
176	Write register address data for Controller communication data 145	CH1 ⋮ CH32	1600 ⋮ 161F	5632 ⋮ 5663	R/W		—
177	Write register address data for Controller communication data 146	CH1 ⋮ CH32	1620 ⋮ 163F	5664 ⋮ 5695	R/W		—
178	Write register address data for Controller communication data 147	CH1 ⋮ CH32	1640 ⋮ 165F	5696 ⋮ 5727	R/W		—
179	Write register address data for Controller communication data 148	CH1 ⋮ CH32	1660 ⋮ 167F	5728 ⋮ 5759	R/W		—

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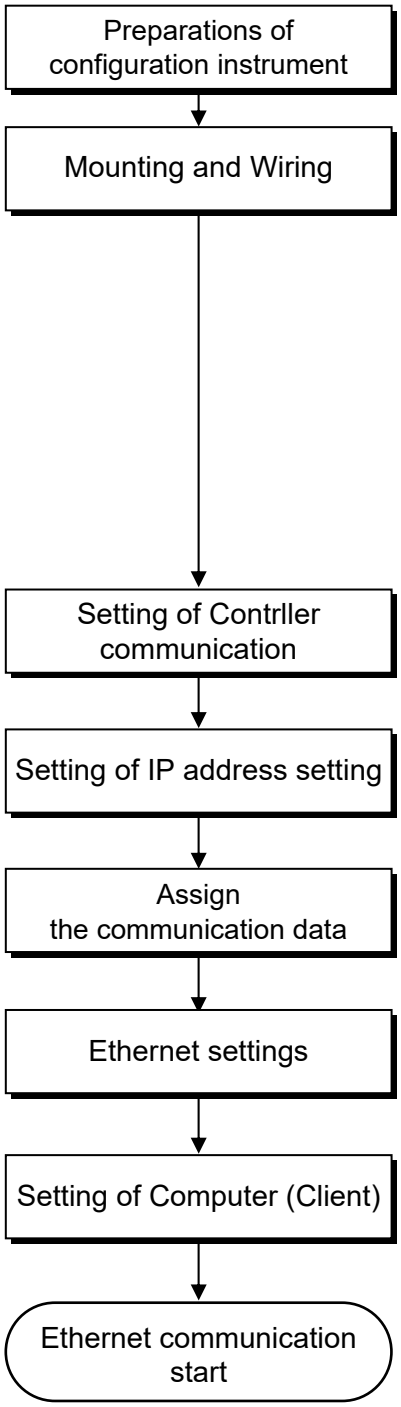
No.	Name	Channel	Modbus register address		Attribute	Data range	Factory set value
			HEX	DEC			
180	Write register address data for Controller communication data 149	CH1 ⋮ CH32	1680 ⋮ 169F	5760 ⋮ 5791	R/W	Depends on the data range of the communication data set at “Write register address of Controller communication data 149 and 150.”	—
181	Write register address data for Controller communication data 150	CH1 ⋮ CH32	16A0 ⋮ 16BF	5792 ⋮ 5823	R/W	When “65535 (0xFFFF) = Disabled” is set at “Write register address of Controller communication data 149 and 150,” the range is “0.”	—
182	—	—	16C0 ⋮ 7FFF	5824 ⋮ 32767	—	—	—

9. SETTENG EXAMPLE OF MODBUS/TCP

9.1 Handling Procedures

In this Chapter, an example of setting procedure is explained when the COM-ME (Server) is connected to a Host computer (Client). In this example, the IP address of the COM-ME and Controller setting data settings are configured by loader communication.



☞ Refer to **9.2 System Configuration (P. 80)**.

☞ For installation of the COM-ME, refer to "**3. MOUNTING (P. 7).**"

☞ For the COM-ME power wiring and connection to the controller, refer to "**4. WIRING (P. 12)**."

☞ Refer to the instruction manual of the relevant model for the input/output wiring of the controller.

☞ For information on connecting the Loader communication, refer to **9.3 Connection of Loader Communication (P. 81)**.

☞ For information on connecting the COM-ME to a Computer (Client), refer to **9.4 Connection with Computer (Client) (P. 81)**.

☞ Refer to **9.5 Setting of Controller Communication (P. 82)**.

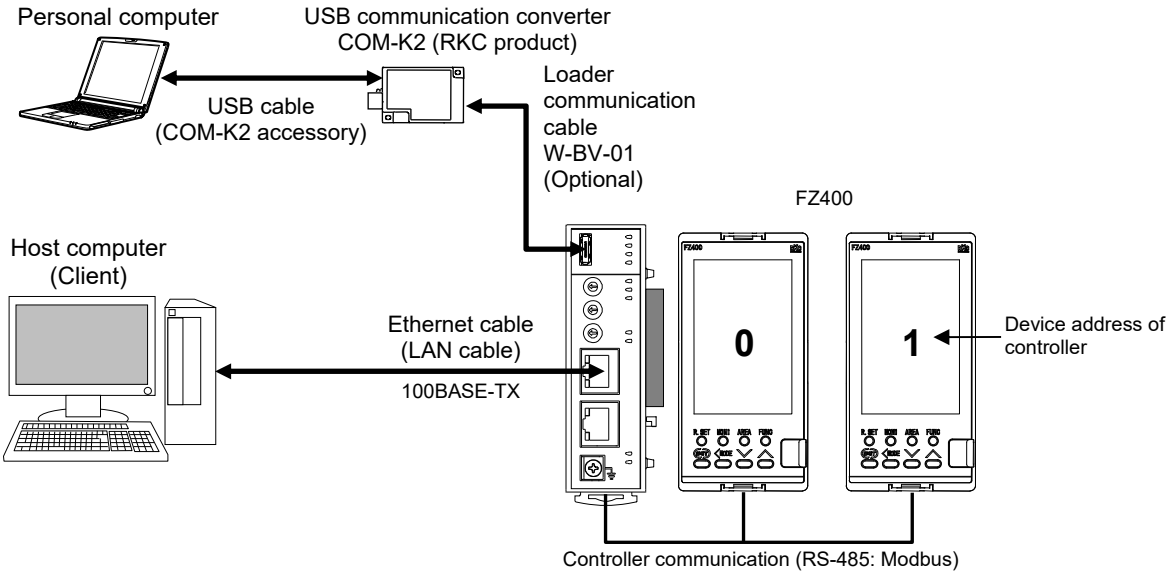
☞ Refer to **9.6 Setting of IP address (P. 88)**.

☞ Refer to **9.7 Assigning Communication Data (P. 90)**.

☞ Refer to **9.8 Ethernet Settings (P. 92)**.

☞ Refer to **9.9 Computer (Client) Settings (P. 95)**.

9.2 System Configuration



■ Use instruments

- **Ethernet Modbus/TCP communication converter COM-ME-1 [for FZ series/GZ series]**
  COM-ME-15 ∗ 07: 1

- **Temperature Controller**
  FZ400: 2

- **Communication converter**
  USB communication converter COM-K2 (RKC product): 1

- **Connection cable for connecting COM-ME and personal computer**
  USB cable (COM-K2 accessory) [Cable length: 1 m]: 1
  W-BV-01 (COM-K2 optional) [Cable length: 1.5 m]: 1

- **Others**
  Ethernet cable (LAN cable): 1

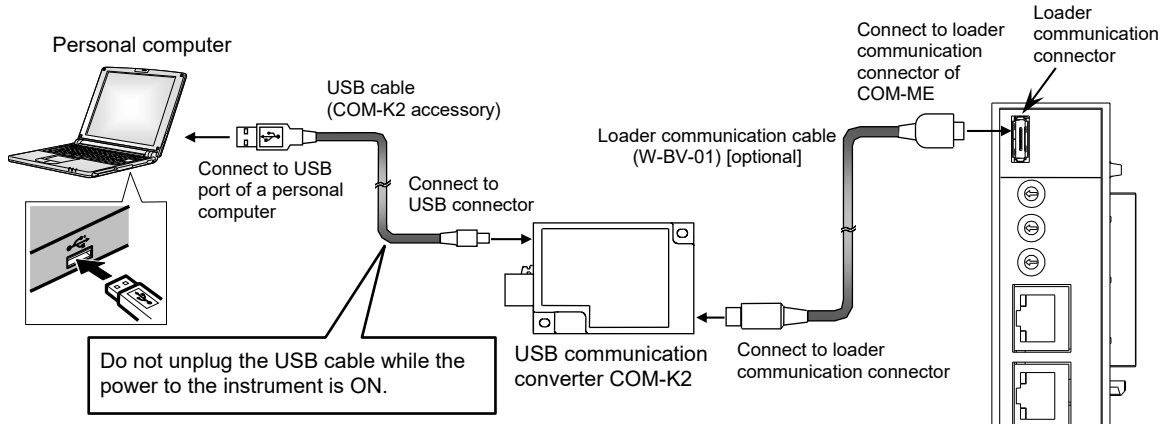
- **Personal computer and Host computer (Client)**
  Install our configuration software PROTEM2 on your PC and computer (client) as shown in the picture. Use PROTEM2 to set communication setting and assign data.

  You can choose Modbus/TCP as a communication protocol to send/receive the data between the COM-ME and the computer (client).

  The PROTEM2 can be downloaded from the RKC official website.

9.3 Connection of Loader Communication

Connect a personal computer, COM-K2 and COM-ME.



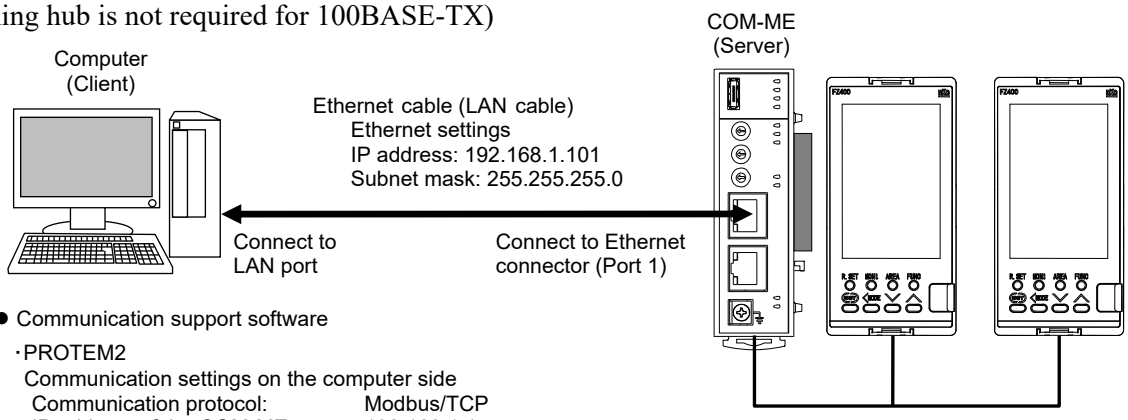
- Communication tool
  PROTEM2
- Communication port of personal computer
  USB port: Based on USB Ver.2.0
- Communication settings on the computer
  (The following values are all fixed)
  Communication speed: 38400 bps
  Start bit: 1
  Data bit: 8
  Parity bit: None
  Stop bit: 1

During the loader communication, the COM-ME requires an external power source. The COM-ME will not function on the USB power from a personal computer alone.

For the COM-K2, refer to **COM-K2 Instruction Manual (IMR01Z02-E□)**.

9.4 Connection with Computer (Client)

Standard Ethernet cable (LAN cable) which is marketed can be used.
(Switching hub is not required for 100BASE-TX)



- Communication support software
  ・PROTEM2
  Communication settings on the computer side
  Communication protocol: Modbus/TCP
  IP address of the COM-ME: 192.168.1.1
  TCP port number of the COM-ME: 502

9.5 Setting of Controller Communication

(1) Controller Communication Setting of FZ400

To establish controller communication with the COM-ME, set the following communication data of the controller. Refer to the instruction manual of the relevant model for the details of setting.

- **FZ110/FZ400/FZ900 Instruction Manual [Host Communication] (IMR03A07-E□)**
- **GZ400/GZ900 Instruction Manual [Host Communication] (IMR03D07-E□)**

■ Communication data to be set

(1) Communication protocol

Set the Modbus communication.

Data range
1: Modbus (Order of data transfer: upper word to lower word)
2: Modbus (Order of data transfer: lower word to upper word)

(2) Device address

There are two ways for controller device address setting: Continuous setting and Free setting. At the time of shipment, it is preset to "Continuous setting". Set the device address referring to "**5.3 Device Address Setting of Controller (P.23)**."

NOTE

Set a unique address to each device on the same line. Overlapped device address may cause a failure or a malfunction of the device.

Data range
1 to 99

(3) Communication speed

Data range
2: 9600 bps
3: 19200 bps
4: 38400 bps
5: 57600 bps

The COM-ME does not support communication speed of 2400 bps and 4800 bps.

Continued on the next page

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(4) Data bit configuration

The data bit configuration of the controller must be the same as the configuration set on the COM-ME.

Data range			
Set value	Data bit	Parity bit	Stop bit
0	8	None	1
1	8	None	2
2	8	Even	1
3	8	Even	2
4	8	Odd	1
5	8	Odd	2

Do not set the data bit configuration “7.” The COM-ME does not support the data bit configuration of “7.”

(5) Input data type

Set “Set value: 1” (single word).

Data range
1: Number of measured value digits: 4 Modbus data: Single word

The COM-ME does not support “Double word.”

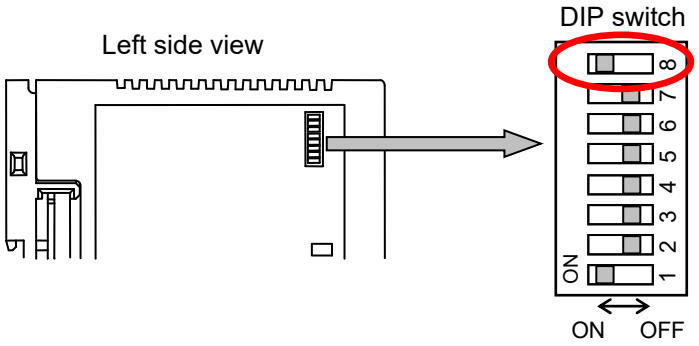
(2) Controller Communication Setting of COM-ME

Use PROTEM2 to set the communication speed and the data bit configuration.

☞ **PROTEM2 Users Guide (IMT01D11-E□)** for detailed operation of PROTEM2.

During the loader communication, the COM-ME requires an external power source. The COM-ME will not function on the USB power from a personal computer alone.

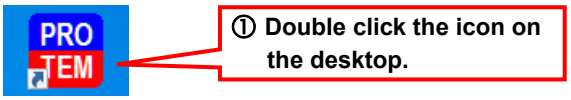
1. Set the DIP switch No.8 to ON while the COM-ME is switched off.



8	DIP switch enable/disable	
OFF	Enable (enable the DIP switch settings)	[Factory set value]
ON	Disable (enable the loader communication settings)	

2. Turn on the power of the COM-ME.

3. Start PROTEM2, and set the communication port.
If you use the PROTEM2 for the first time, you have to create a new project and set a communication port.



PROTEM2 will start and show the first screen.

A dialog box, *Select a model*, appears.

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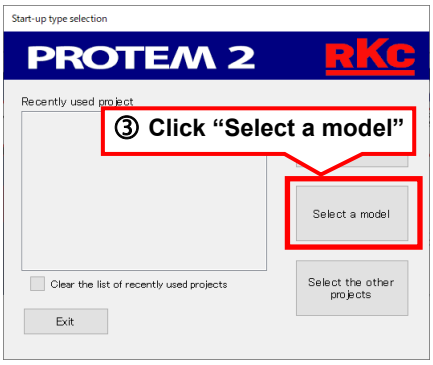
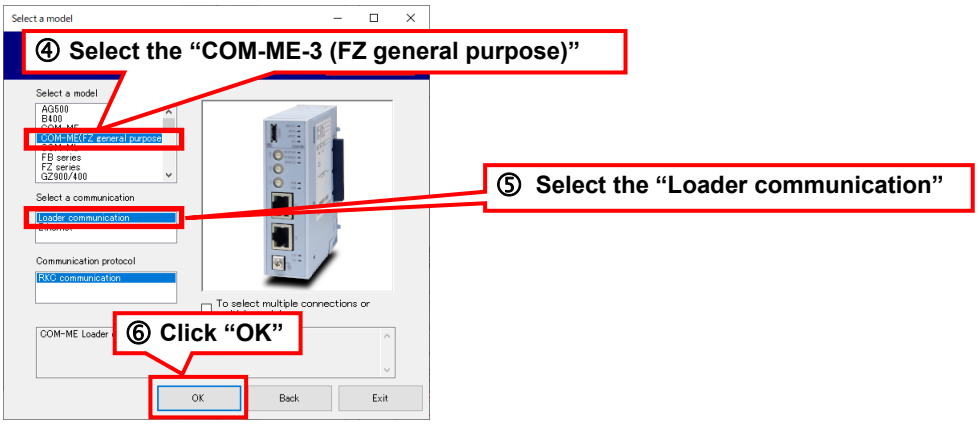
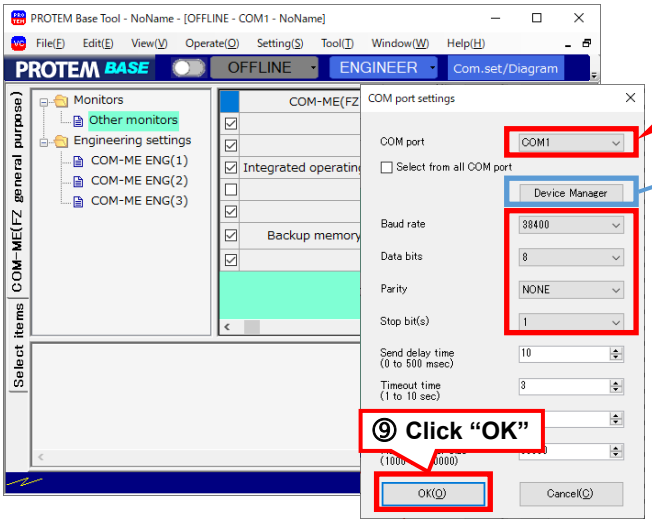




(Base tool screen)



⑦ Set up the communication port

Configure the communication port according to the PC you use.

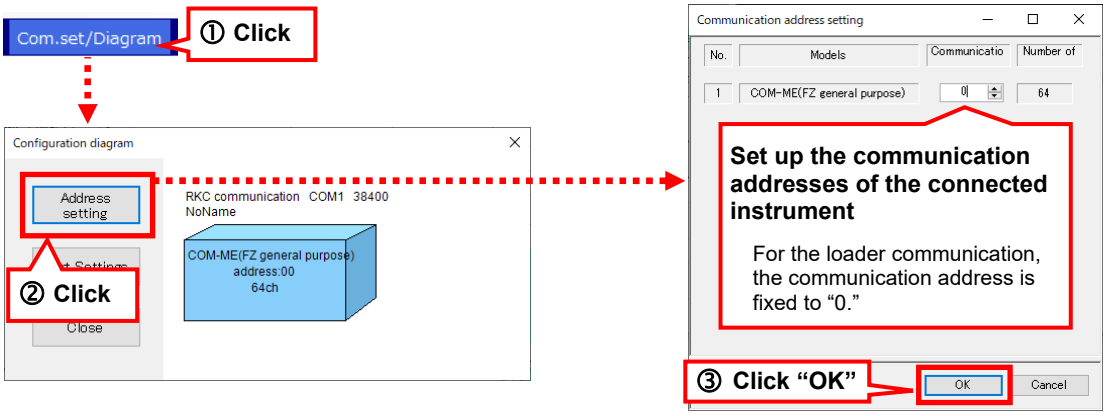
If you are unaware of the port number, click “Device Manager” and check the port number.
Set the port number “RKC USB-to-Serial Bridge (COM□)” shown under “Ports (COM & LPT).”

⑧ Check the loader communication setting

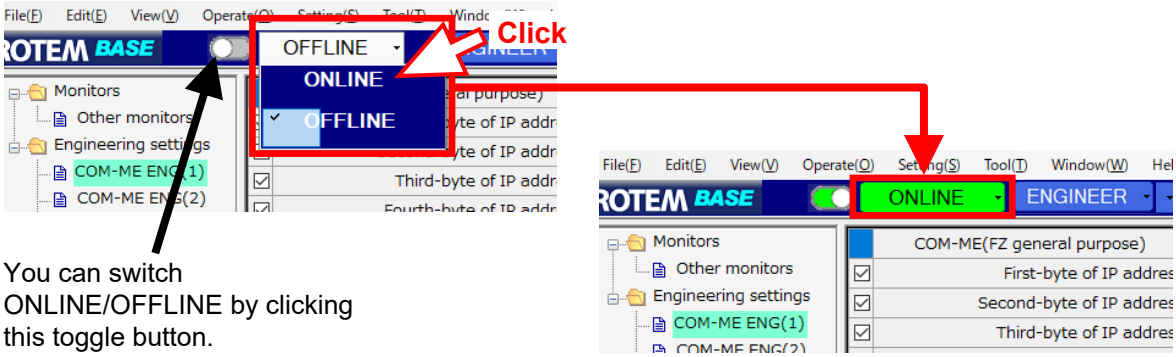
Communication speed and data bit configuration are fixed for the loader communication.

- Communication speed: 38400 bps
- Data bit: 8
- Parity bit: NONE
- Stop bit: 1

4. Click “Com.set/Diagram” and check the communication address

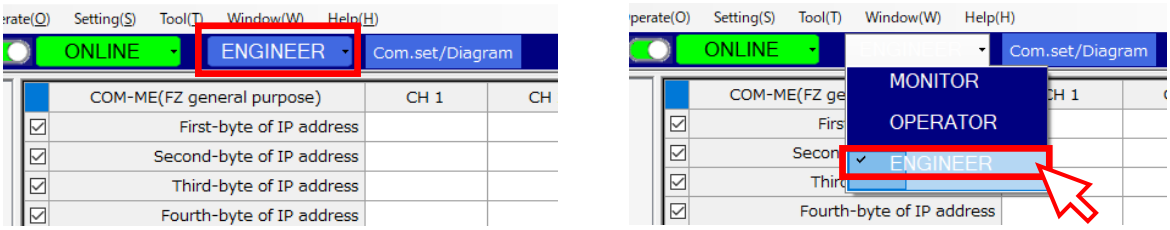


5. Switching to online.
Click “OFFLINE” to select “ONLINE.”

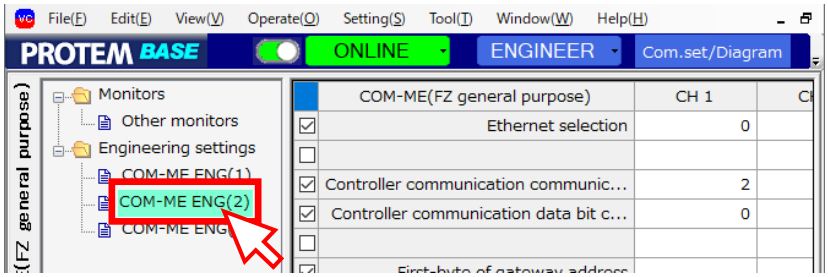


You can switch ONLINE/OFFLINE by clicking this toggle button.

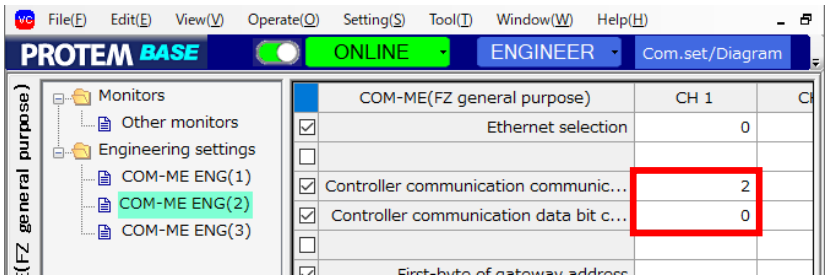
6. Make sure “ENGINEER” is displayed at the top bar. If any display other than ENGINEER (e.g. MONITOR, OPERATOR) appears, click the displayed part to select ENGINEER.



7. Select “COM-ME ENG(2)” under the “Engineering settings.”



8. Set the desired communication speed and data bit configuration.
(In this example we will use the factory preset values of “2: 19200 bps” and “0: Data bit 8, Parity bit: None, Stop bit: 1”)



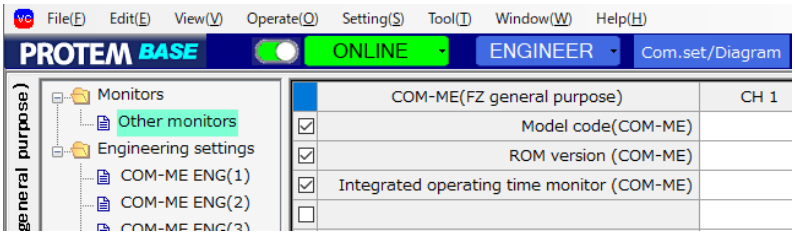
9. To activate the changed data, power off the instrument once, and apply power again.

9.6 Setting of IP address

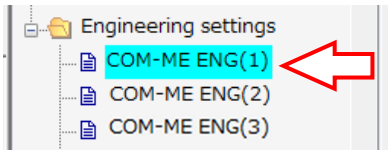
Use PROTEM2 to set the IP address and the TCP port number of the COM-ME.

1. Turn on the PC and the COM-ME.

2. Start PROTEM2 and show the setting screen of the COM-ME.



3. Select “COM-ME ENG(1)” under the “Engineering settings.”



4. Set the IP address and the TCP port number of the COM-ME.

	COM-ME	CH 1
☑	First-byte of IP address	192
☑	Second-byte of IP address	168
☑	Third-byte of IP address	1
☑	Fourth-byte of IP address	1
☑	TCP port number	502
☐		
☑	First-byte of remote IP address	192
☑	Second-byte of remote IP address	168
☑	Third-byte of remote IP address	1
☑	Fourth-byte of remote IP address	2

IP address of the COM-ME
Example of IP address setting: 192.168.1.1 (Factoryset value)

← Setting example of “the TCP port number of the COM-ME”: 502

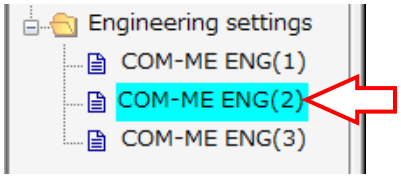
IP address of the computer (client)
There is no need to change the remote IP address.
Please use the factory set value as it is.

Local loop back address (127.0.0.1 to 127.255.255.254) is not available.

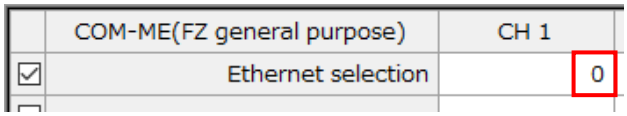
The instrument can be used with the factory preset values for the IP address and the TCP port number of the COM-ME. Change the setting according to the system configuration.

■ Confirm the Ethernet selection

1. Select “COM-ME ENG(2)” under the “Engineering settings.”



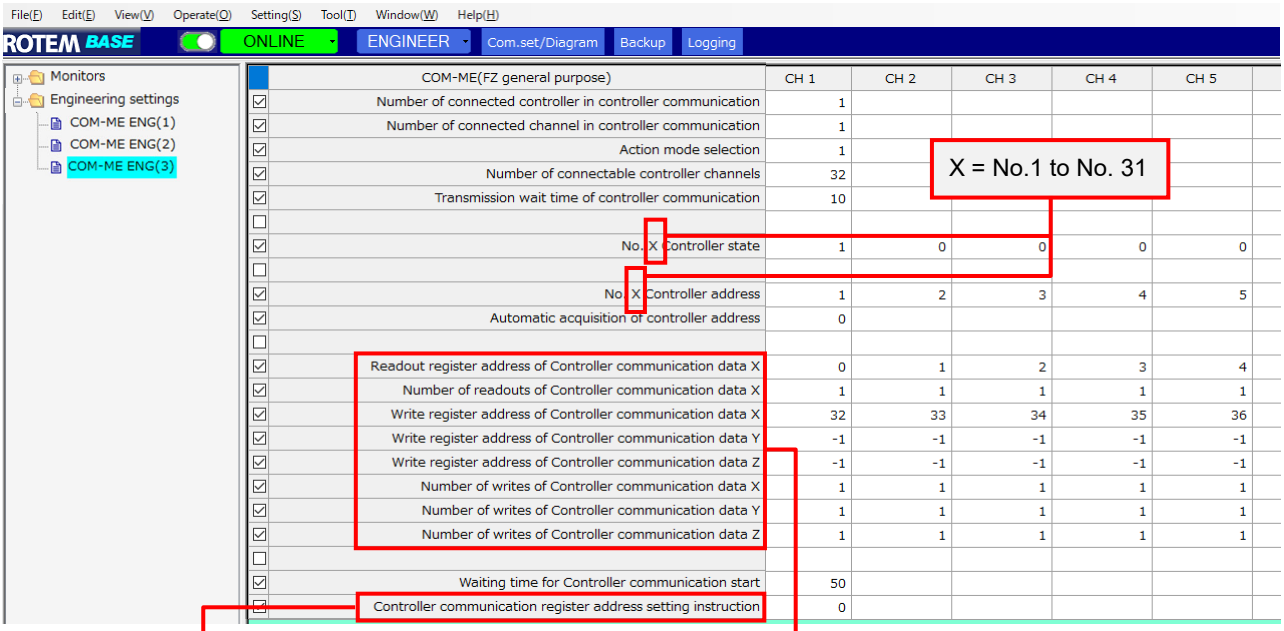
2. Confirm that the Ethernet selection is “0: Modbus/TCP.”



9.7 Assigning Communication Data

COM-ME allows communication data sent/received on Modbus to be freely assigned. Communication data is also assigned to the factory preset value. To change data by yourself, use PROTEM2. You can use either Loader communication or MODBUS/TCP to change data. You can make changes at the following communication data.

Communication data screen of COM-ME



You can set the communication data and the numbers that can be read and written on the Modbus/TCP. The alphabet (X, Y and Z) in the product name is a serial number of the communication data.

Readout register address of Controller communication data X: X = 1 to 30
Number of readouts of Controller communication data X: X = 1 to 30
Write register address of Controller communication data X: X = 1 to 50
Write register address of Controller communication data Y: Y = 51 to 100
Write register address of Controller communication data Z: Z = 101 to 150
Number of writes of Controller communication data X: X = 1 to 50
Number of writes of Controller communication data Y: Y = 51 to 100
Number of writes of Controller communication data Z: Z = 101 to 150

Refer to the **8. COMMUNICATION DATA LIST (P. 45)** for details of communication data.

Accept the changed communication data and the numbers. Without this setting, communication will not be established with

■ Assigning Procedure

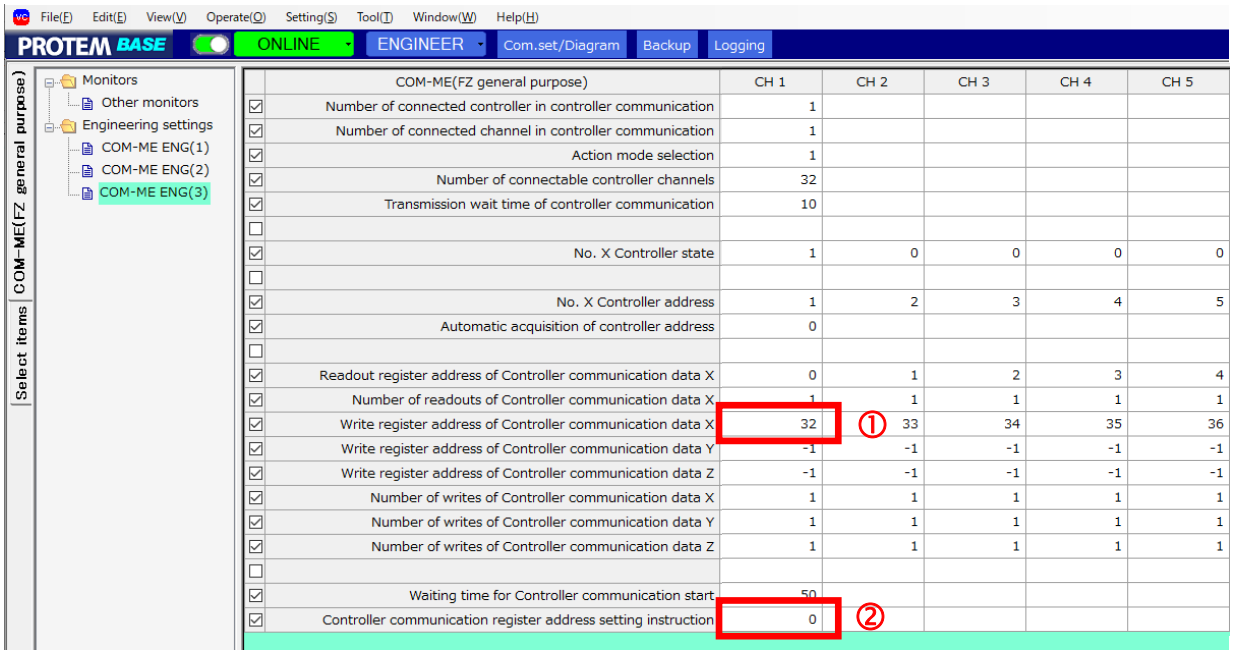
Example: Change the “Write register address of Controller communication data 1” of controller device addresses 1 and 2 to “203: Start-up tuning of input 1 (ST)” from “32: Auto-tuning of input 1 (AT).”

① Change “Write register address of Controller communication data 1” to “203: Start-up tuning of input 1 (ST)” from “32: Auto-tuning of input 1 (AT).” (The set value is set in decimal.)

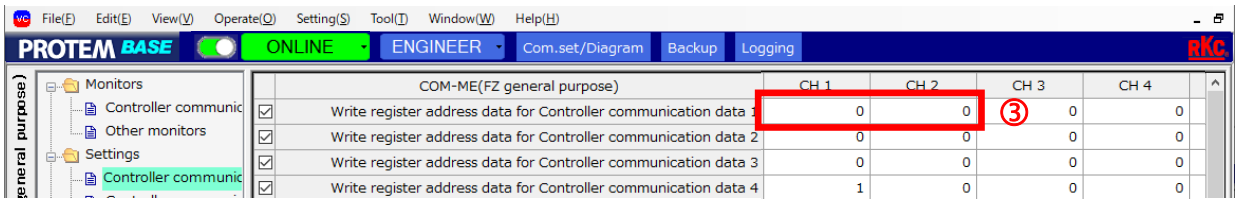
② Change “Controller communication register address setting instruction” from 0 to 1.
Setting is complete when the set value automatically returns to “0” from “1.”

③ In MODBUS/TCP communication, the communication data of the changed “Start-up tuning of input 1 (ST)” will be displayed.

Setting screen



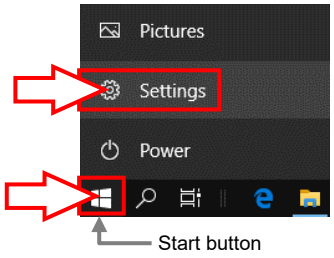
Data display screen



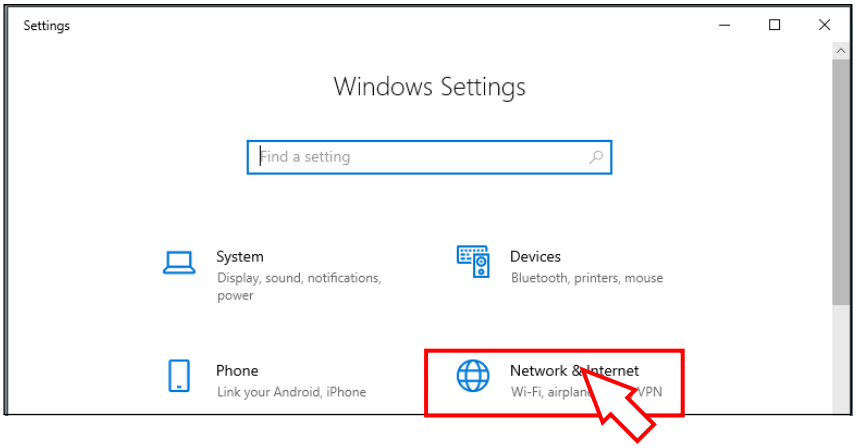
9.8 Ethernet Settings

Set the Ethernet IP address and subnet mask on the computer (client).

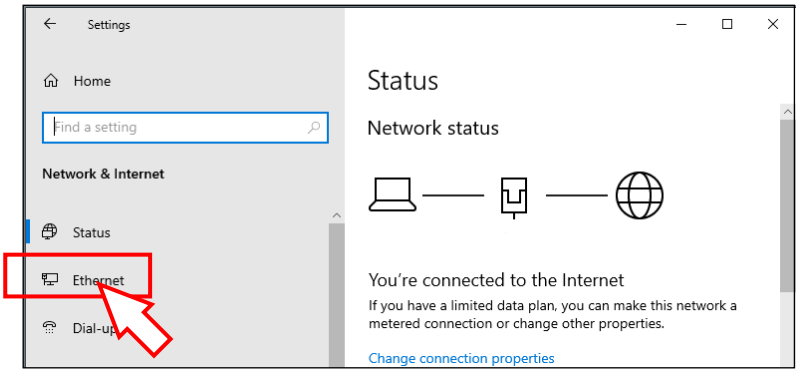
1. Click the Windows Start button and click “Settings” from the Start menu.



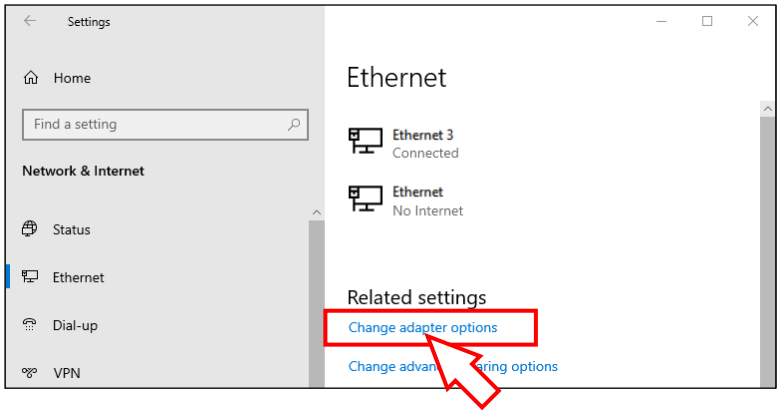
2. Click “Network & Internet” on the “Windows Settings” screen.



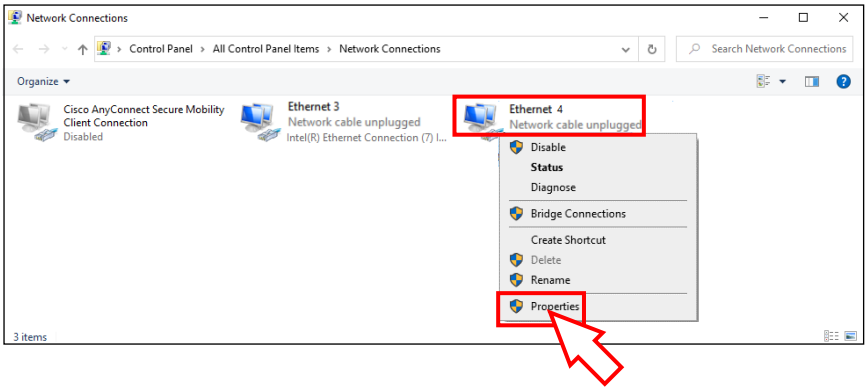
3. Click “Ethernet.”



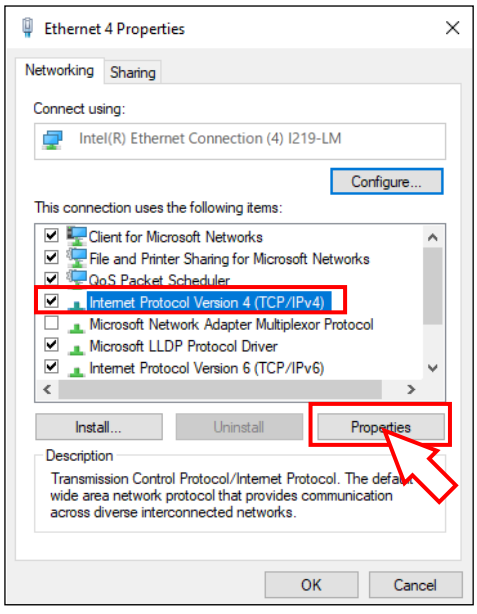
4. Click “Change adapter options.”



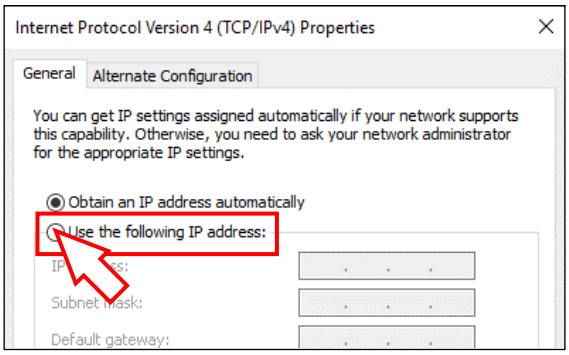
5. Right click the connection icon that shows the name of the adapter to be changed. Then, click “Properties.”



6. Make sure the “Internet Protocol Version 4 (TCP/IPv4)” is checked. Select “Internet Protocol Version 4 (TCP/IPv4)” and click “Properties.”

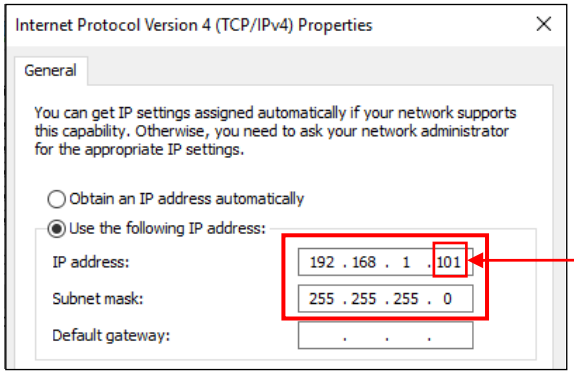


7. Click “Use the following IP address.”



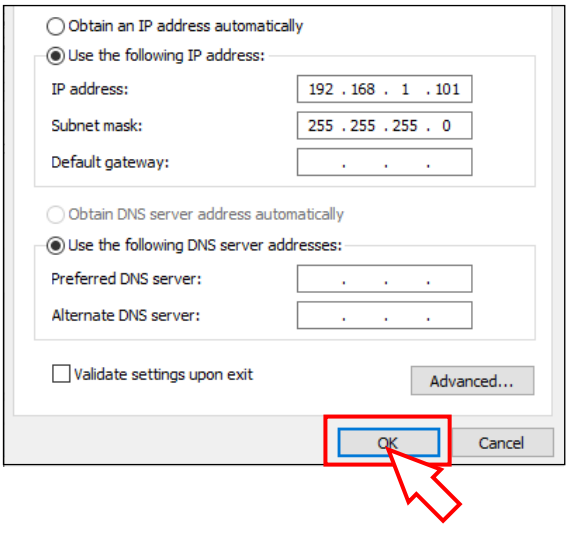
8. Set the IP address and the Subnet mask as follows. Set the IP address to the one that is not overlapped with the IP address of the COM-ME.

IP address: 192.168.1.101
Subnet mask: 255.255.255.0



Change the last numbers of the IP address (4th Octet) so that the IP address will not overlap the others.

9. Click “OK” to complete the setting.

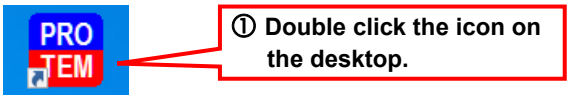


9.9 Computer (Client) Settings

Configure the communication setting of the PROTEM2 software installed on the computer (client) to send/receive the data over Ethernet [Modbus/TCP].

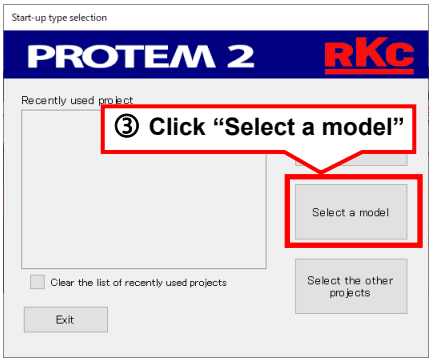
1. Turn on the computer (client).

2. Start PROTEM2, and set the communication port.



PROTEM2 will start and show the first screen.

A dialog box, *Select a model*, appears.



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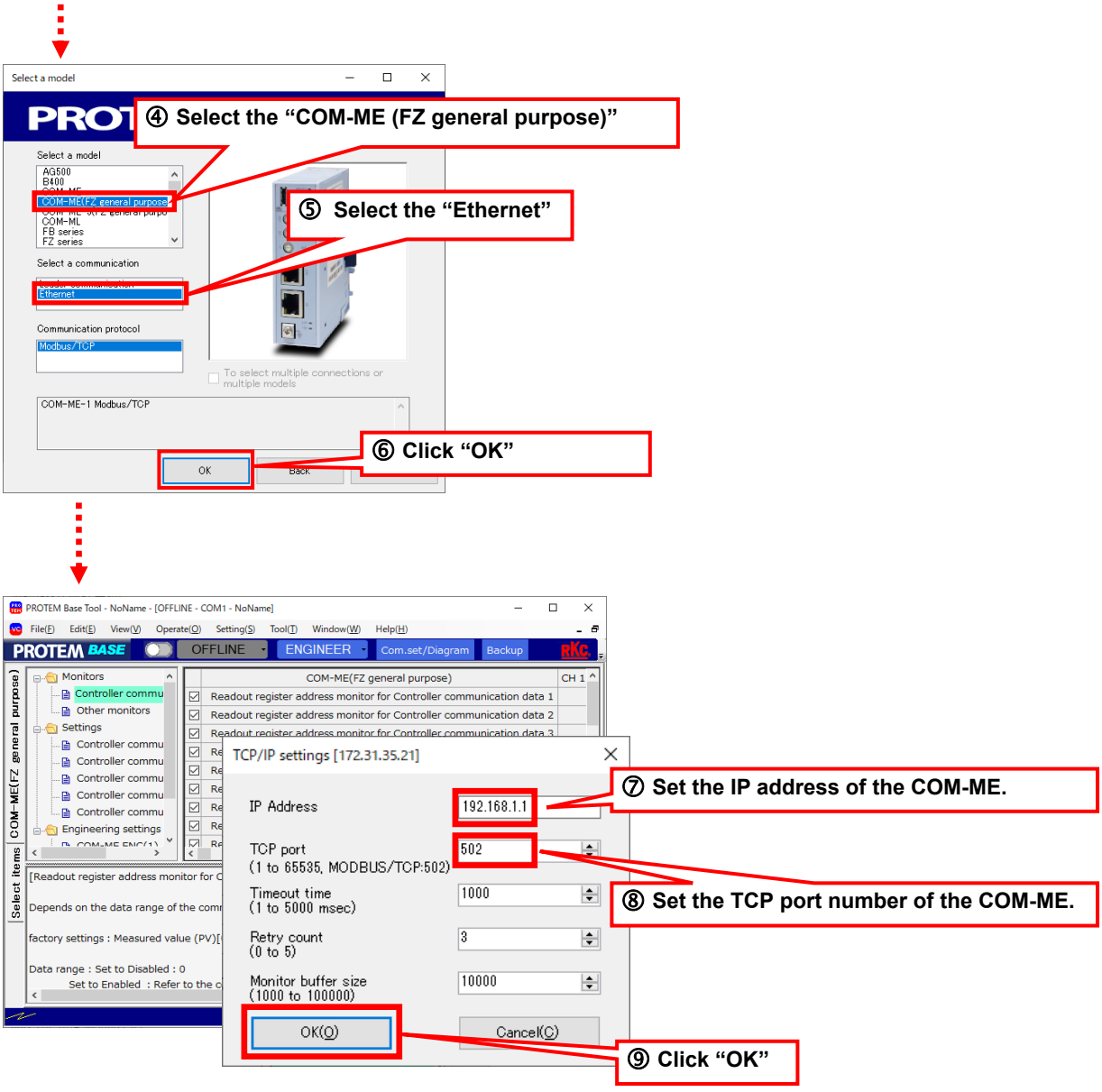
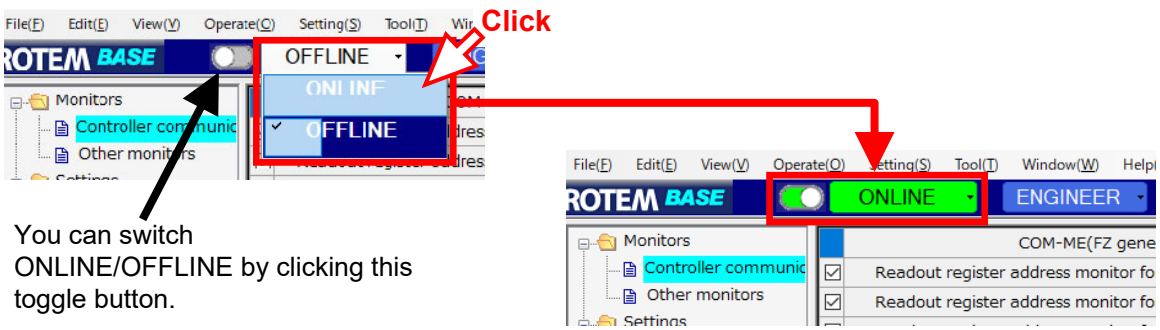
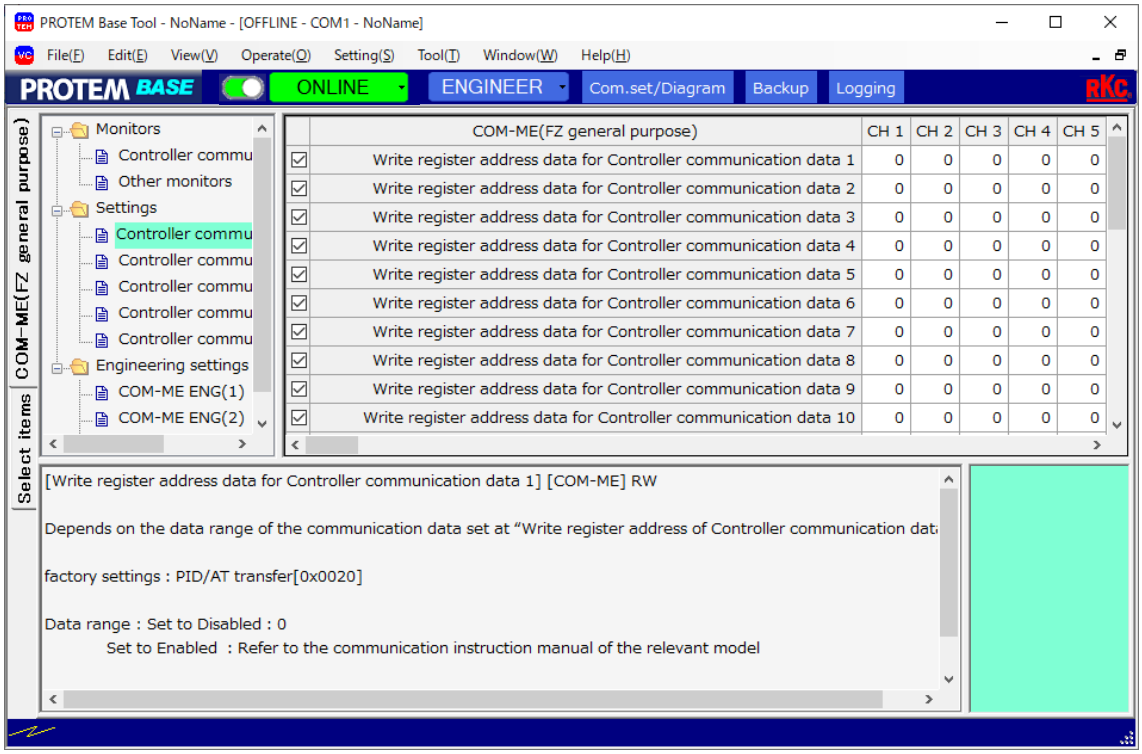


3. Switching to online.
Click “OFFLINE” to select “ONLINE.”



4. Communication data of function modules will be displayed on the screen of PROTEM2 and the communication over Ethernet [Modbus/TCP] has been enabled.



10. TROUBLESHOOTING

This section explains possible causes and solutions if any abnormality occurs in the instrument. For any inquiries or to confirm the specifications of the product, please contact RKC sales office or the agent.

If the instrument needs to replaced, always strictly observe the warnings below.

⚠ WARNING

- To prevent electric shock or instrument failure, always turn off the system power before replacing the instrument.
- To prevent electric shock or instrument failure, always turn off the power before mounting or removing the instrument.
- To prevent electric shock or instrument failure, do not turn on the power until all the wiring is completed. Make sure that the wiring is correct before applying power to the instrument.
- To prevent electric shock or instrument failure, do not touch the inside of the instrument.
- All wiring must be performed by authorized personnel with electrical experience in this type of work.

⚠ CAUTION

All wiring must be completed before power is turned on to prevent electric shock, instrument failure, or incorrect action.

NOTE

When replacing the module with a new one, always use the module with the same model code. If the module is replaced, it is necessary to re-set each data item.

■ COM-ME

Problem	Possible cause	Solution
Any of the lamps for 24V, 3.4V, and 1.0V will not light.	Power not being supplied	Check external breaker etc.
	Appropriate power supply voltage not being supplied	Check the power supply
	Power supply terminal contact defect	Tighten the screw with a recommended tightening torque of 0.4 N·m (4 kgf·cm).
	Power supply section defect	Replace COM-ME
FAIL/RUN lamp turns red, and HRT BT lamp turns off: Major fault occur	Watchdog timer error	Turn off the power to the instrument. If the same error occurs when the power is turned back on, please contact RKC sales office or the agent.
FAIL/RUN lamp turns red or HRT BT lamp turns off.	Power supply voltage monitoring error	
FAIL/RUN lamp flashes green: Recoverable fault occur	Data backup error (Error code 2) EEPROM read/write error	
	Stack overflow (Error code 64) Runaway of the program, etc.	

■ Ethernet

Problem	Probable cause	Solution
The Client and the Server are not in the connected state (the Client cannot recognize the Server)	The IP address class and subnet mask of the Client do not coincide with those of the Server	Coincide the IP address class and subnet mask of the Client with those of the Server
	The network related software was started before the connection of the Ethernet cable	First connect the Ethernet cable and then start the network related software
No response	Wrong connection, no connection or disconnection of the communication cable	Confirm the connection method or condition and connect correctly
	Breakage, wrong wiring, or imperfect contact of the communication cable	Confirm the wiring or connector and repair or replace the wrong one
	Wrong IP address setting	Confirm the settings and set them correctly
Link/Activity lamp: OFF	Link has not been established. Destination is not on Ethernet.	Confirm that the power supply is ON and the Ethernet cable is connected correctly. Then permit the connection of the destination device.

■ Modbus/TCP

Problem	Probable cause	Solution
No response	Wrong connection, no connection or disconnection of the communication cable	Confirm the connection method or condition and connect correctly
	Breakage, wrong wiring, or imperfect contact of the communication cable	Confirm the wiring or connector and repair or replace the wrong one
	Wrong IP address setting	Confirm the settings and set them correctly
	There is length of query message exceeds set range	
	The number of data points is not twice the specified number of data points at the time of data write	
Exception code: 01H	Illegal function code (An unsupported function code was specified)	Confirm the function code
Exception code: 02H	Illegal register address (When the mismatched register address is specified)	Confirm the address of holding register
Exception code: 03H	Illegal data value • The number of specified data points was out of the following range during data read or write. Function code 03H: 1 to 125 Function code 10H: 1 to 123 • When the data written exceeds the setting range	Confirm the setting data

■ Controller communication

Problem	Probable cause	Solution
No response	Incorrect wiring of communication cable	Check the connection point and correctly wire the cable.
	Communication cable is not connected or disconnected.	Check wiring and wire the communication cable or replace the cable.
	The controller power is off.	Turn on the controller power.
	Mismatch of the setting data of Communication speed and Data bit configuration with those of the COM-ME	Confirm the settings and set them correctly
	Wrong address setting	

11. SPECIFICATIONS

■ Ethernet communication

● Modbus/TCP

Physical layer: 10BASE-T/100BASE-TX automatic recognition

User layer: Modbus/TCP

Communication data: Conforms to the Modbus/TCP communication data list
(Refer to P. 64)

Connector type: RJ-45 (2 ports)

IP address: 0.0.0.0 to 255.255.255.255
The Local Loopback Address (127.0.0.1 to 127.255.255.254) cannot be used.

Subnet mast: 0.0.0.0 to 255.255.255.255

■ Controller communication

Interface: Based on RS-485, EIA standard

Connection method: 2-wire system, half-duplex multi-drop connection

Synchronous method: Start/stop synchronous type

Communication speed: 9600 bps, 19200 bps, 38400 bps, 57600 bps

Data bit configuration:
Start bit: 1
Data bit: 8
Parity bit: None, Odd or Even
Stop bit: 1 or 2

Protocol: Modbus

Signal transmission mode: Remote Terminal Unit (RTU) mode

Error check method: CRC-16

Termination resistor: External connection is necessary (Example: 120 Ω, 1/2 W)

Xon/Xoff control: None

Maximum connections: Up to 31 controllers

Signal logic: RS-485

Signal logic	Logic
V (A) – V (B) ≥ 1.5 V	0 (SPACE)
V (A) – V (B) ≤ –1.5 V	1 (MARK)

Voltage between V (A) and V (B) is the voltage of (A) terminal for the (B) terminal.

Maximum transmission distance:
1.2 km (This is the maximum value specified in the standard and actual value depends on the product specification.)

Controller address setting: 1 to 99

Readout register address setting:

65535: Set to disabled
0 to 65534: Set register address of Controller communication data

Write register address setting: 65535: Set to disabled
0 to 65534: Set register address of Controller communication data

Number of Readout/Write: 1000 or less

Controller communication register address setting instruction:

0: Initial state at power on/End of setting
1: Start setting

Operation mode selection: Continuous setting
Free setting

Controller address automatic acquisition:

Connection of device address from 1 to 99 is checked and
the device address from which response is obtained is saved.

Priority order between Operation mode selection and Address automatic acquisition:

Address automatic acquisition > Operation mode

Waiting time for Controller communication start:

0.0 to 10.0 seconds

Waiting time for controller communication transmission:

0 to 250 ms

Number of controller connection (Controller communication):

Show the number of slaves with established connection

Controller communication connection channel:

Communication data, show number of data per item

■ Loader communication

Interface:	Connection with a loader communication cable for our USB communication converter COM-K2 or COM-KG (sold separately).
Protocol:	RKC communication (ANSI X3.28-1976 subcategories 2.5 and B1)
Synchronous method:	Start/Stop synchronous type
Communication speed:	38400 bps
Data bit configuration:	Start bit: 1 Data bit: 8 Parity bit: None Stop bit: 1
Maximum connections:	One module

Power cannot be supplied from COM-K2 or COM-KG to COM-ME. To conduct loader communication, power on the COM-ME.

■ Self-diagnostic function

● Major fault

Monitoring of the operation:	Error display:	Display is off, FAIL/RUN lamp turns red
	Error communication:	Communication stop
	Recovery:	Power off the instrument once, and power it on again.
Watchdog timer error:	Error display:	FAIL/RUN lamp turns red, and HRTBT lamp turns off
	Error communication:	Communication stop
	Recovery:	Power off the instrument once, and power it on again.

● Recoverable fault

Data back-up error:	Error display:	A green lamp (FAIL/RUN) flashes
	Error communication:	Error code 2
	Recovery:	Power off the instrument once, and power it on again.
Stack overflow:	Error display:	A green lamp (FAIL/RUN) flashes
	Error communication:	Error code 64
	Recovery:	Power off the instrument once, and power it on again.

■ General specifications

Power supply voltage: 20.4 to 26.4 V DC [Including power supply voltage variation]
(Rating 24 V DC)

Power consumption: 150 mA max. (at 24 V DC)

Rush current: 15 A or less

Insulation resistance: Refer to table shown below

	①	②	③
① Grounding terminal			
② Power supply terminal, Controller comm.	20 MΩ or more at 500 V DC		
③ Network communication	20 MΩ or more at 500 V DC	20 MΩ or more at 500 V DC	
④ Loader communication	20 MΩ or more at 500 V DC	20 MΩ or more at 500 V DC	20 MΩ or more at 500 V DC

Withstand voltage: Refer to table shown below

Time: 1 min.	①	②	③
① Grounding terminal			
② Power supply terminal, Controller comm.	750 V AC		
③ Network communication	750 V AC	750 V AC	
④ Loader communication	750 V AC	750 V AC	750 V AC

Power failure: A power failure of 4 ms or less will not affect the control action.

Memory backup: Backed up by non-volatile memory
Number of writing: Approx. 1,000,000 times
Data storage period: Approx. 10 years

Vibration: Frequency range: 10 to 150 Hz
Amplitude: < 0.075 mm
Acceleration: < 9.8 m/s^2
Each direction of XYZ axes

Shock: Free fall: Height 50 mm or less
Each direction of XYZ axes (de-energized state)

Allowable ambient temperature:
−10 to +55 °C

Allowable ambient humidity: 5 to 95 %RH
(Absolute humidity: MAX.W.C 29 g/m^3 dry air at 101.3 kPa)

Installation environment conditions:
Indoor use
Altitude up to 2000 m

Operating environment: Avoid the following conditions when selecting the mounting location.
- Rapid changes in ambient temperature which may cause condensation.
- Corrosive or inflammable gases.
- Water, oil, chemicals, vapor or steam splashes.
- Direct air flow from an air conditioner.
- Exposure to direct sunlight.
- Excessive heat accumulation.

Weight: Approx. 150 g

Dimensions: 30.0 × 100.0 × 76.9 mm (W×H×D) (Not including protruding parts)

■ Standard

Safety standards: UL: UL 61010-1
cUL: CAN/CSA-C22.2 No.61010-1

CE marking: EMC: EN61326-1
RoHS: EN50581

RCM: EN55011

MEMO

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