EtherCAT
Communication Converter

COM-ME-3

[For FZ series/GZ series]

Instruction Manual

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.

- Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty, expressed or implied, with respect to the accuracy of the information. The information in this manual is subject to change without prior notice.

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- EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

  EtherCAT®

- TwinCAT® is registered trademark, licensed by Beckhoff Automation GmbH, Germany.
- 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.)

● This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take additional measures.

● This instrument is protected from electric shock by reinforced insulation. 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
EtherCAT Communication Converter COM-ME-3 [For FZ series/GZ series] Installation Manual	IMR02E34-E□	This manual is enclosed with instrument. This manual explains the mounting and wiring.
EtherCAT Communication Converter COM-ME-3 [For FZ series/GZ series] Instruction Manual	**IMR02E35-E1**	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.

Contents

1. OUTLINE

EtherCAT communication converter COM-ME-3 [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 EtherCAT.

This chapter describes features, package contents, model code, system configuration, etc.

- EtherCAT (Ethernet for Control Automation Technology) is an ultra high-speed fieldbus system based on Ethernet.

- Protocol: CAN application protocol over EtherCAT (CoE)

- EtherCAT communication methods supported by the COM-ME are "PDO (process data objects) communication" and "SDO (service data objects) communication."

- The master/slave architecture is implemented for EtherCAT communication and COM-ME is used as a slave device.

- Up to 31 FZ or GZ controllers (hereinafter referred to as a controller) can be connected to one COM-ME.
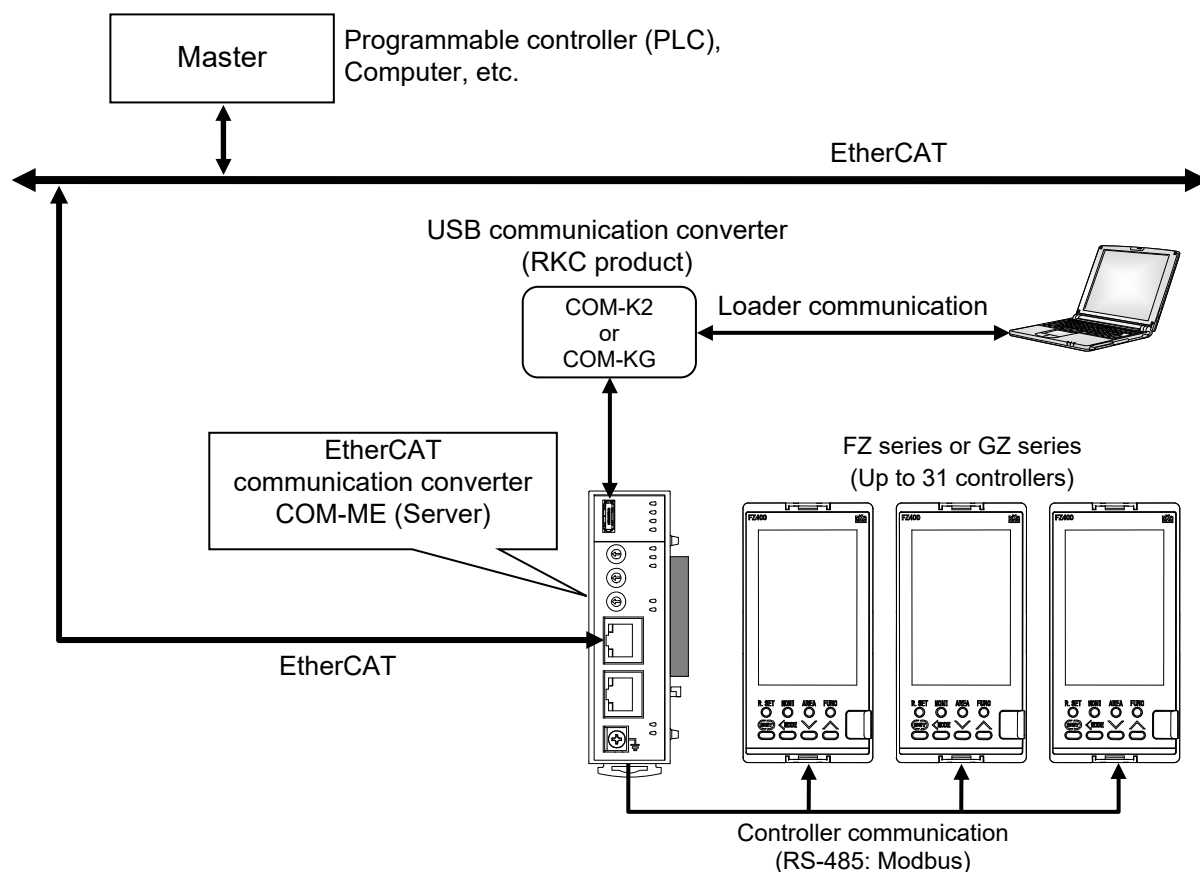
Example of System Configuration

☞ For EtherCAT, refer to the website of ETG (EtherCAT Technology Group).

URL: https://www.ethercat.org/

1.1 Checking the Product

Before using this product, check each of the following:

● Model code
● Check that there are no scratch or breakage 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-3 [For FZ series/GZ series] Installation Manual (IMR02E34-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-3 [For FZ series/GZ series] Instruction Manual (IMR02E35-E1)	1	This manual (sold separately) This manual can be downloaded from the official RKC website.
☐ ESI file *	1	Download

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

* ESI file
The ESI file is used for recognition of the COM-ME on EtherCAT in the configuration tool (software for environment settings and creating programs).
If you require the ESI file, download it from the official RKC website.
　https://www.rkcinst.co.jp/english/field_network_category/ethercat/

■ 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 (Optional: 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 - 3 5 ∗ 07 /□ □
(1) (2) (3) (4) (5)

(1) Network communication type
  3: EtherCAT

(2) Controller communication interface
  5: RS-485

(3) Corresponding to the RKC controller
  07: FZ series/GZ series

(4) Factory setting (supported communication mode) [optional]
  (blank): No factory setting
  1: with factory setting

(5) Supported communication mode [optional]
  (blank): Communication protocol not specified at the time of shipment
     (single word mode supported)
  1: Single word mode is supported
  2: FZ double word mode is supported
     (Data transfer: in the order from upper word to lower word)
  3: FZ double word mode is supported
     (Data transfer: in the order from lower word to upper word)
  4: GZ double word mode is supported
     (Data transfer: in the order from upper word to lower word)
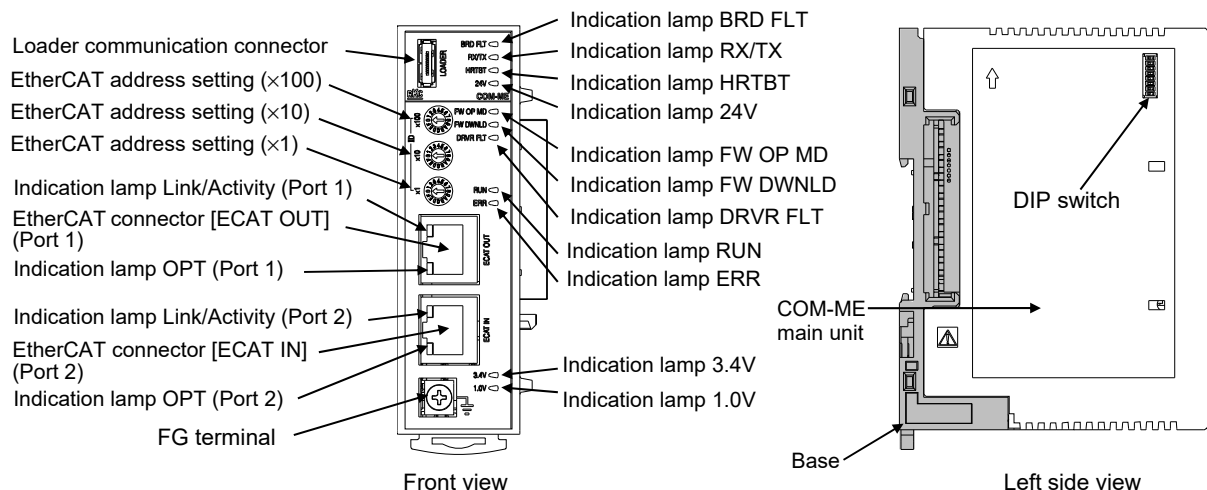 5: GZ double word mode is supported
     (Data transfer: in the order from lower word to upper word)
  6: GZ HA mode is supported
     (Data transfer: in the order from upper word to lower word)
  7: GZ HA mode is supported
     (Data transfer: in the order from lower word to upper word)

1.3 Parts Description

■ COM-ME main unit

Loader communication connector
EtherCAT address setting (×100)
EtherCAT address setting (×10)
EtherCAT address setting (×1)
Indication lamp Link/Activity (Port 1)
EtherCAT connector [ECAT OUT] (Port 1)
Indication lamp OPT (Port 1)
Indication lamp Link/Activity (Port 2)
EtherCAT connector [ECAT IN] (Port 2)
Indication lamp OPT (Port 2)
FG terminal

Indication lamp BRD FLT
Indication lamp RX/TX
Indication lamp HRTBT
Indication lamp 24V
Indication lamp FW OP MD
Indication lamp FW DWNLD
Indication lamp DRVR FLT
Indication lamp RUN
Indication lamp ERR
Indication lamp 3.4V
Indication lamp 1.0V

Front view

DIP switch
COM-ME main unit
Base

Left side view

● Indication lamps

BRD FLT	[Red]	• While in normal state:	Turns off
		• Self-diagnostic error (Major fault):	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
		• WDT(watchdog timer)error:	Turns off
24V	[Green]	While 24V power is supplied:	Green lamp turns on
FW OP MD	[Green]	• While OP is functioning:	Green lamp turns on
		• While Safe-OP is functioning:	Green lamp blinks
FW DWNLD	[Green]	• When the firmware is successfully started:	Green lamp turns on
		• When the firmware fails to be started:	Turns off
		• When the firmware is re-written:	Turns off
DRVR FLT		This lamp is not used.	
RUN	[Green]	• INIT or No power:	Turns off
		• OPERATIONAL:	Green lamp turns on
		• PRE-OPERATIONAL:	Green lamp blinks
		• SAFE-OPERATIONAL:	Green lamp single-flashes *
ERR	[Red]	• No error or No power:	Turns off
		• Configuration error:	Red lamp blinks
		• Local error:	Red lamp single-flashes *
		• Communication refused by the Master:	Red lamp double-flashes *
		• Co WDTO inside the Slave:	Red lamp turns on
		• Starting error:	Red lamp flashes fast
3.4V	[Green]	While 3.4V power is properly supplied:	Green lamp turns on
1.0V	[Green]	While 1.0V power is properly supplied:	Green lamp turns on
Link/Activity (Port 1/Port 2) [Green]		• No link or No power:	Turns off
		• Link sensed, activity detected:	Green lamp flashes fast
		• Link sensed, no activity:	Green lamp turns on
OPT (Port1/Port2)	[Yellow]	Constantly off	

* Single flashing: Repeats ON (200 ms)/OFF (1000 ms).

　Double flashing: Repeats ON (200 ms)/OFF (200 ms)/ON (200 ms)/OFF (1000 ms).

● **Communication port (modular connector) and communication connector**

Loader communication connector	Use to connecting the communication converter and personal computer when loader communication is performed.
EtherCAT connector (Port 1) [ECAT OUT]	Designed to connect EtherCAT with the next slave instrument.
EtherCAT connector (Port 2) [ECAT IN]	Designed to connect EtherCAT with the master instrument or the slave instrument located near the master instrument.

● **Switch**

EtherCAT address setting switch (ID selector) ($\times 100$, $\times 10$, $\times 1$)	Sets the fixed address of EtherCAT devices (hexadecimal). Supports Explicit Device Identification (Required ID) and Configured Station Alias. The set address is written into the register 0x0012 (Configured Station Alias) of the ESC (EtherCAT Slave Controller) at the start-up.
DIP switch	• Sets communication speed corresponding to controller communication. • Sets DIP switch setting validity/invalidity.

● **Terminal**

FG terminal	Terminal for grounding

■ **Base**

Front   Rear
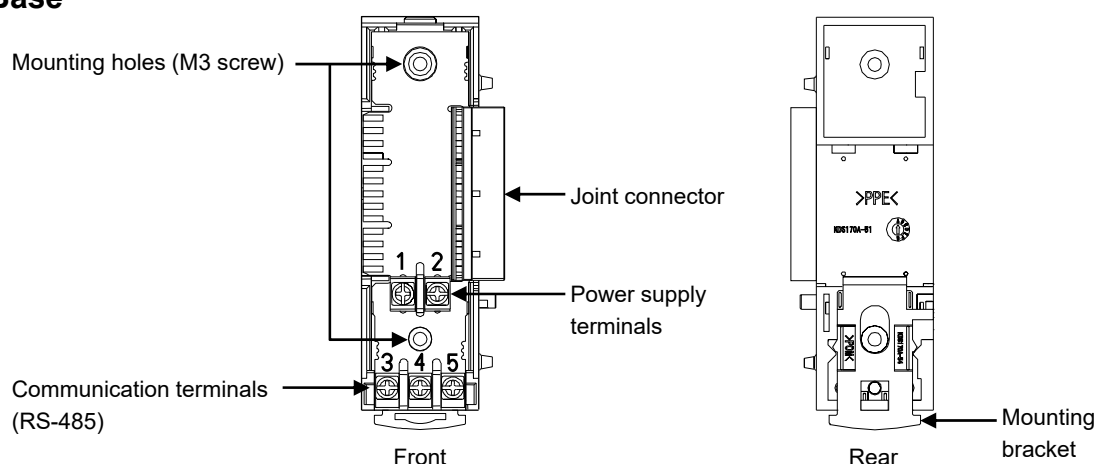
Mounting holes (M3 screw)	Holes for screws to fix the base to a panel, etc. Customer must provide the M3 screws.
Joint connector	Not used. Use the supplied joint connector cover.
Power supply terminals	These are terminals to supply power to the COM-ME. | Terminal number	Signal name	 |---|---| | 1	24 V DC (+)	 | 2	24 V DC (−)	
Terminal 3, 4 and 5	Terminal for connection to a controller. | Terminal number	Signal name	 |---|---| | 3	T/R (A)	 | 4	T/R (B)	 | 5	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	Conduct power wiring to the COM-ME, connect the COM-ME to the controller(s) and to the EtherCAT master.
	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 **8.3 Setting of Controller Communication (P. 53)**.
	• Refer to **8.4 Assigning Controller Communication Data (P. 59)**.
	• Refer to the **FZ110/FZ400/FZ900 Instruction Manual [Part1: Hardware] (IMR03A04-E☐) and GZ400/GZ900 Instruction Manual [Part1: Hardware] (IMR03D04-E☐) for the Controller communication setting.**

EtherCAT communication settings	Configure initial settings for EtherCAT communication.
	☞ • Refer to **6.2 Communication Method (P. 34)**.
	• Refer to **8.5 Tool Settings (P. 61)**.

Other communication data settings	Set the data for the COM-ME and controller.
	☞ • Refer to **7. COMMUNICATION DATA LIST (P. 37)**.

EtherCAT communication	Execute PDO communication or SDO communication.

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.

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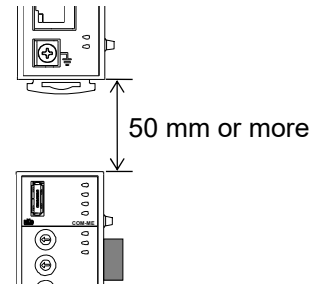
- Depth for modular cables mount type module:
  Space for modular cables must be considered when installing.

Communication cable

76.9 mm   Approx. 50 mm
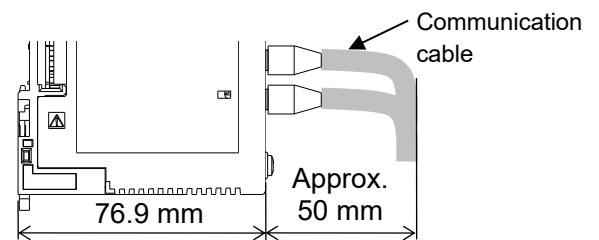
- It is recommended to use a joint connector cover on the connector on both sides of the mounted COM-ME for protection of connectors.

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

Joint connector cover
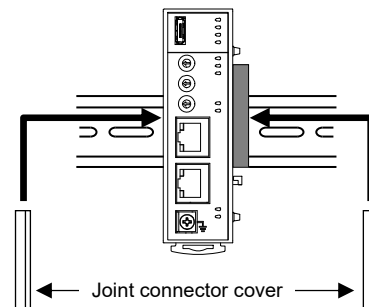
- Don't connect the COM-ME module to the others. Otherwise the communication may not be established properly.
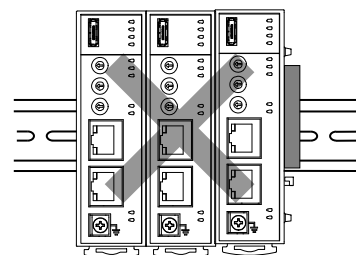
- To firmly fix the COM-ME, use end plates (DEP-01) sold separately on both sides of the mounted COM-ME. When mounting COM-ME, leave space at both ends for end plates.

(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.

IMR02E35-E1

3.2 Dimensions

(Unit: mm)
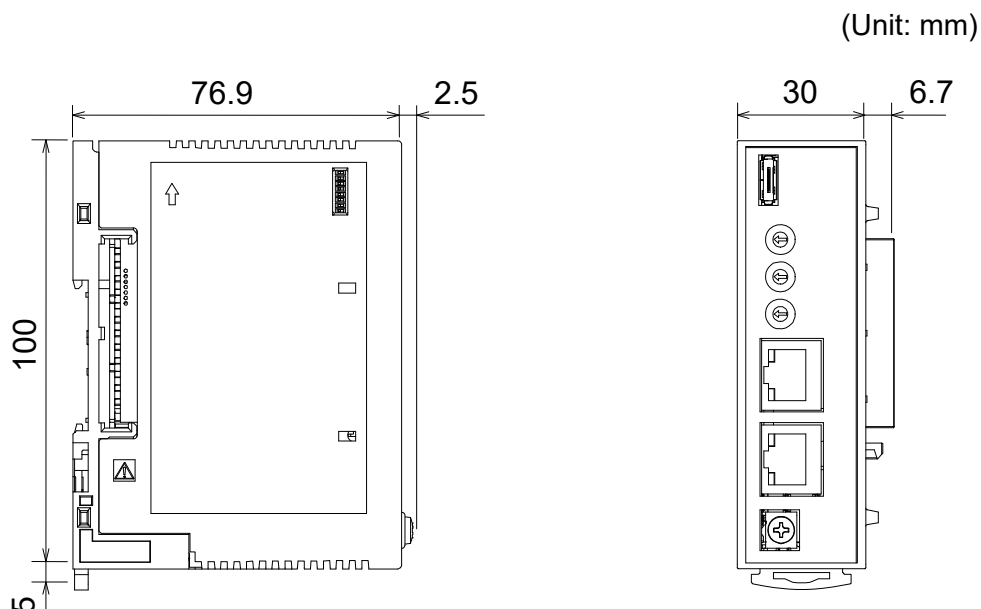
3.3 DIN Rail Mounting

■ **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).
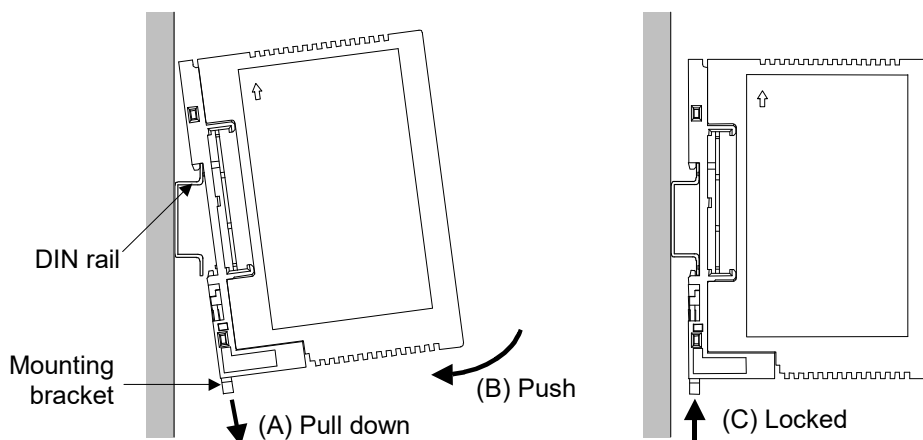
■ Removing procedures

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).

(B) Lift and take off

(A) Pull down
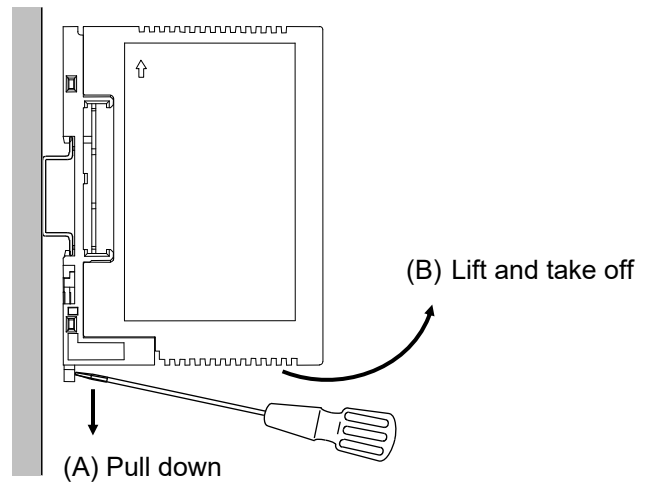
3.4 Panel Mounting

■ Mounting procedures

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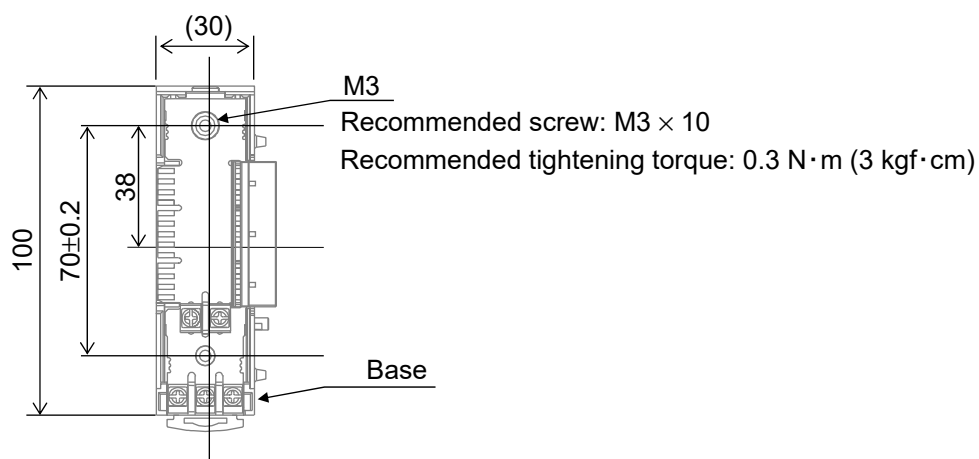
Mounting dimensions

2. Remove the base from the COM-ME main unit (B) while the lock is pressed (A).
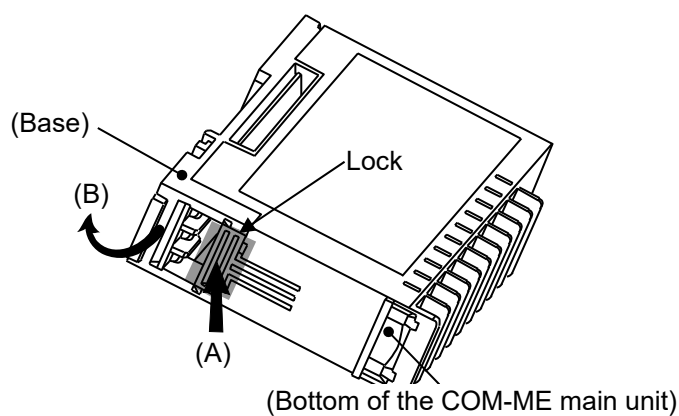
3. Fix the base to its mounting position using M3 screws. Customer must provide the screws.

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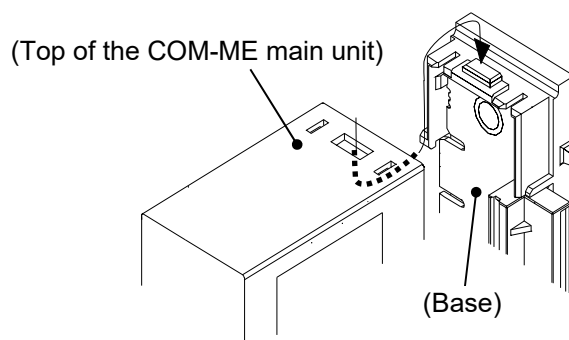
4. WIRING

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 the 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).
- The power supply must handle the rush current when the power is turned on.
  Power consumption (at maximum load): 150 mA max. (at 24 V DC)
  Rush current: 15 A or less
- When connecting the wiring to the power supply terminals on the base, use the specified solderless terminals. Only these specified solderless terminals can be used due to the insulation between the 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 during field wiring parts of conductors cannot come into contact with adjacent conductive parts.

ϕ5.5 MAX
ϕ3.2 MIN ϕ5.0
9.0 mm
5.6 mm
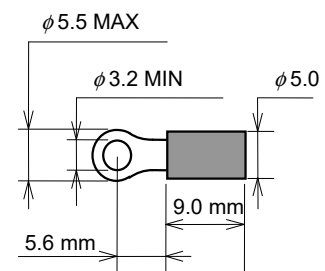
4.2 Terminal Configuration

■ 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
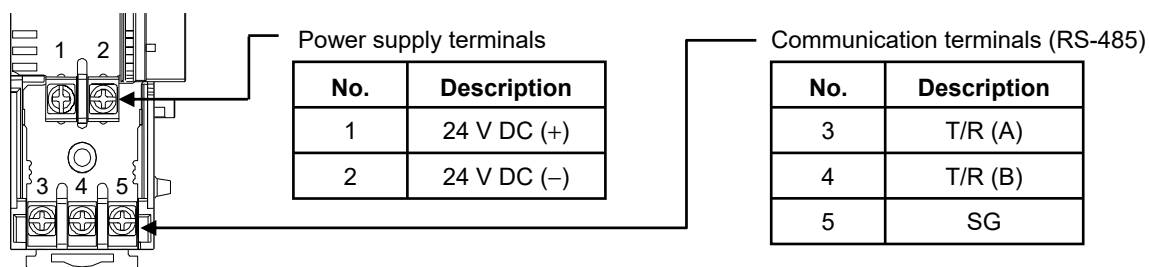
● Wiring method

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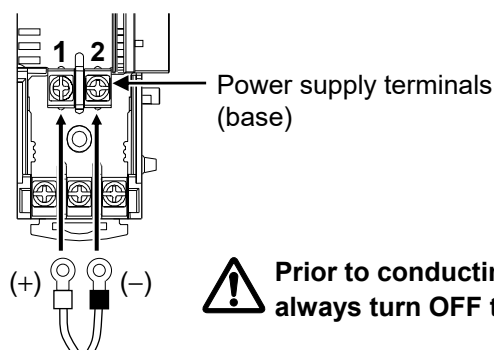
5. Attach the Power supply terminal cover on the terminal and return the COM-ME main unit to the base. This completes the wiring work.

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

■ FG terminal

FG terminal
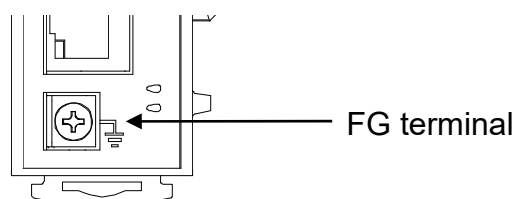
Low part of the front

- 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 EtherCAT

Connect COM-ME to EtherCAT.

■ Pin layout of connector

COM-ME

EtherCAT
communication connector
RJ-45
Pin number

1: TX+
2: TX−
3: RX+
4: Unused
5: Unused
6: RX−
7: Unused
8: Unused
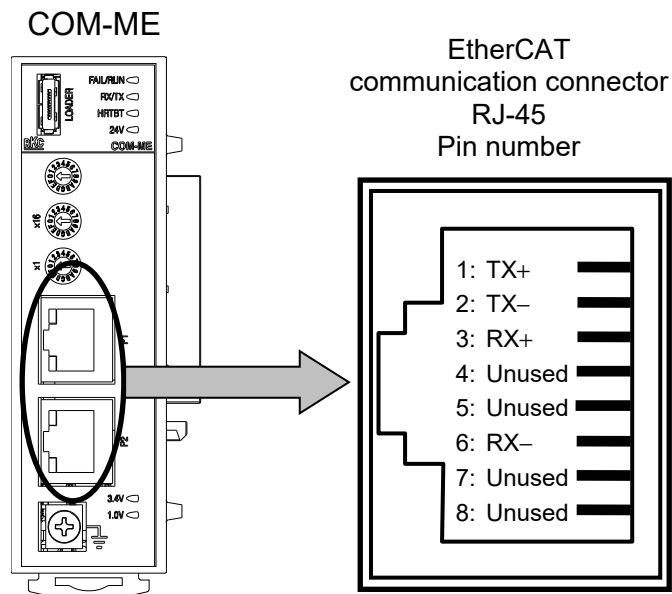
■ Connector pin number and signal details

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 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.

Ethernet cable (LAN cable)

Computer
(Master)

COM-ME
(Slave 1)

COM-ME
(Slave 2)

Use OUT port to connect with slave instrument

OUT

Ethernet cable
(LAN cable)

IN

IN

Use IN port to connect with master instrument
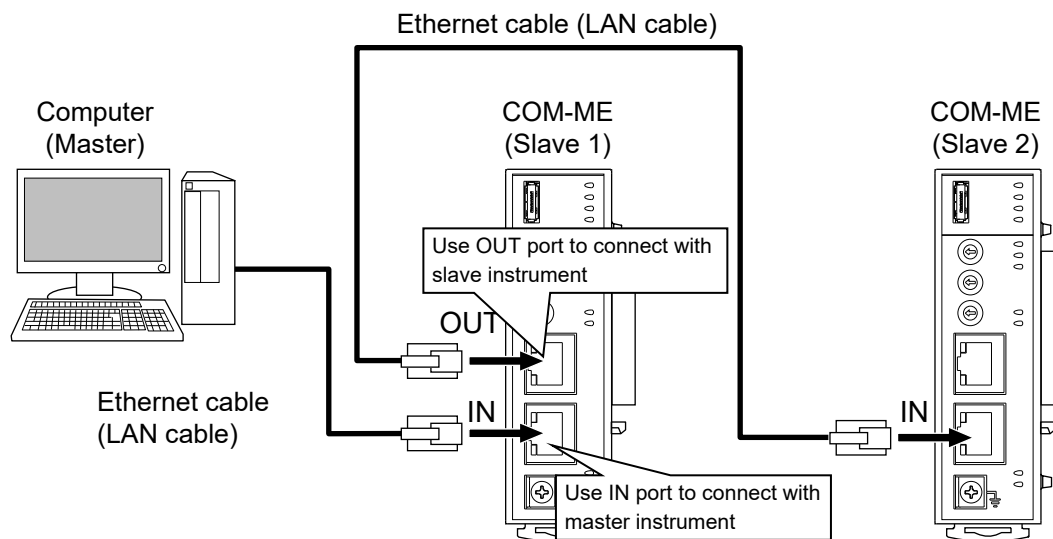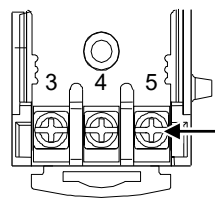
Use category 5 Ethernet cable (LAN cable).

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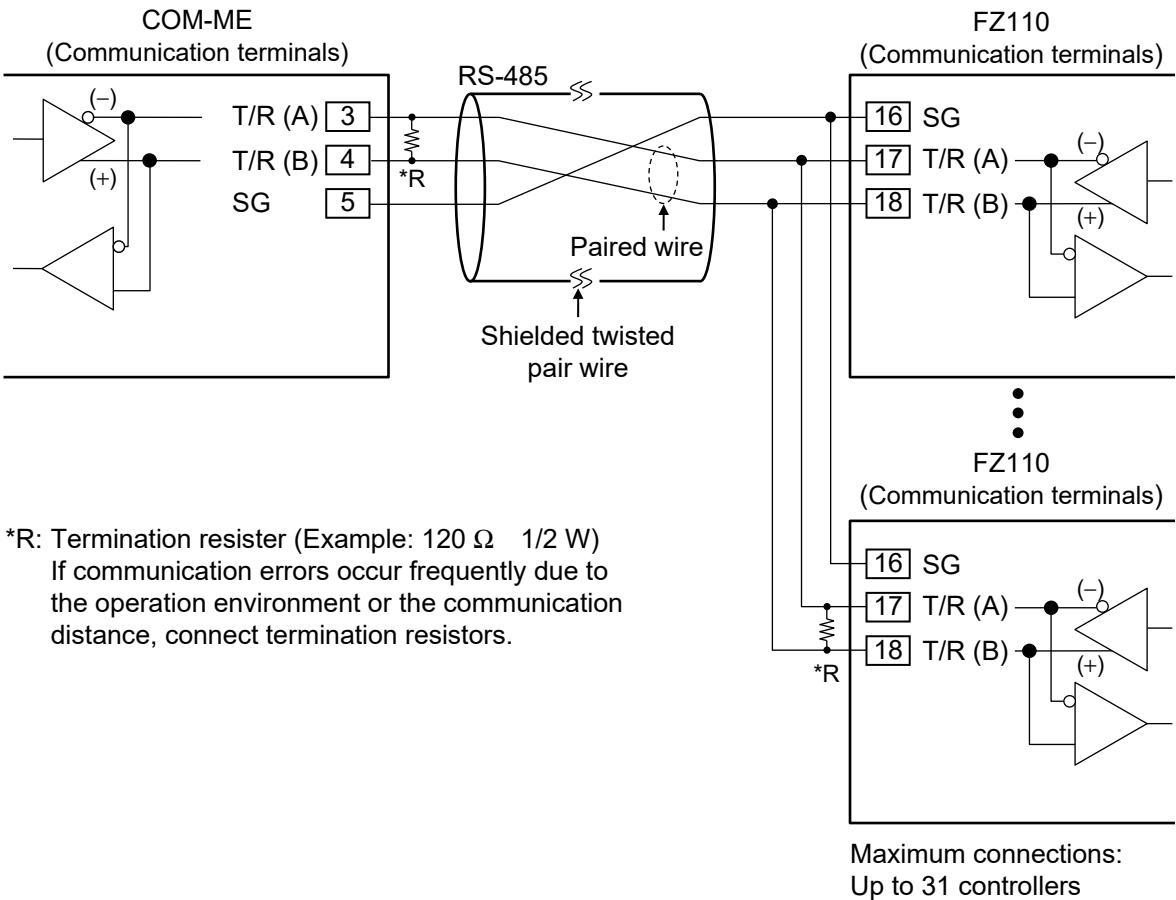
*R: Termination resister (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

Maximum connections:
Up to 31 controllers

■ Wiring example (FZ400, FZ900, GZ400, or GZ900)
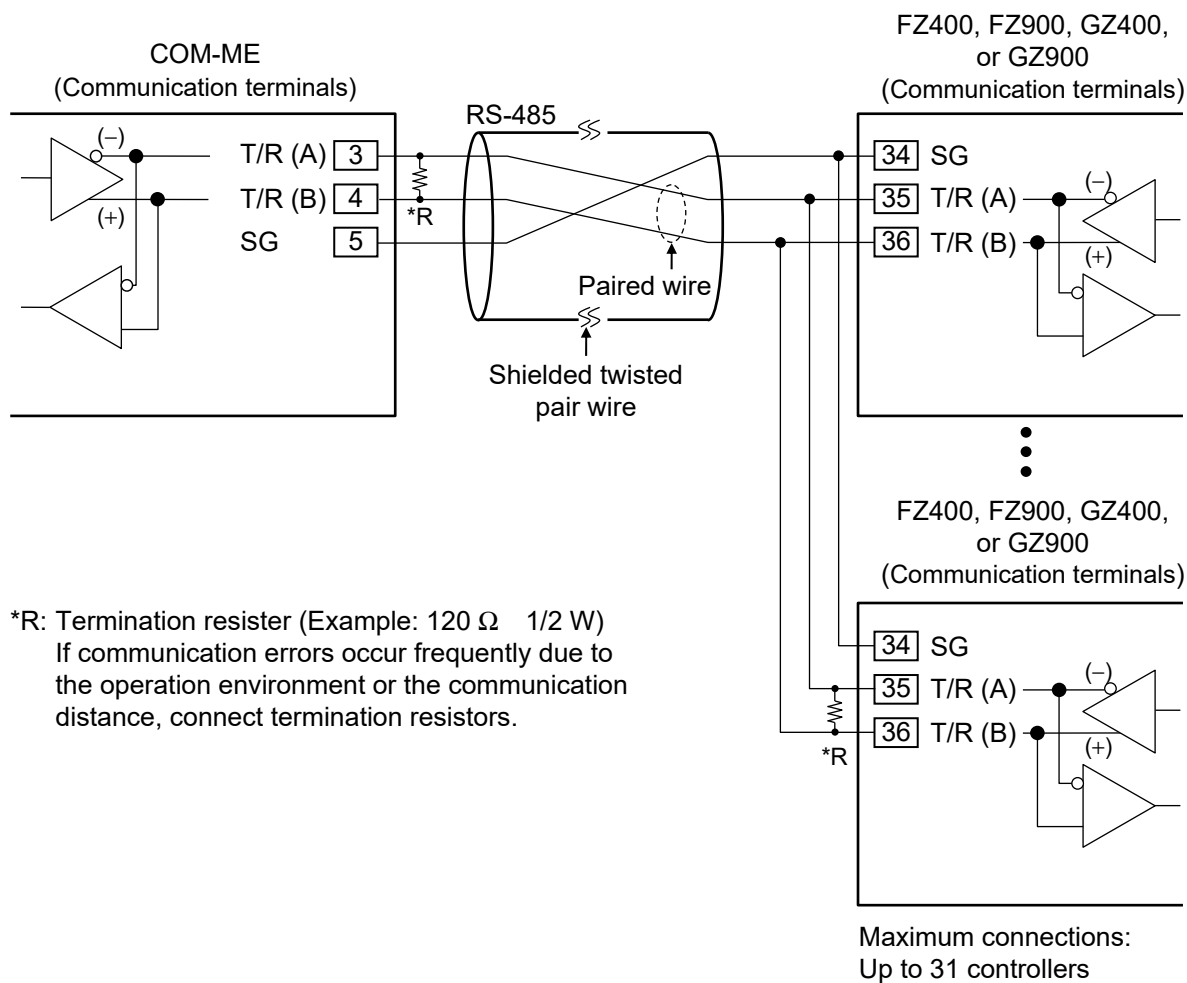
COM-ME
(Communication terminals)

FZ400, FZ900, GZ400,
or GZ900
(Communication terminals)

(−)
(+)
T/R (A) 3
T/R (B) 4
SG 5
*R

RS-485

Paired wire

Shielded twisted
pair wire

34 SG
35 T/R (A)
36 T/R (B)
(−)
(+)

FZ400, FZ900, GZ400,
or GZ900
(Communication terminals)

34 SG
35 T/R (A)
36 T/R (B)
(−)
(+)
*R

*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
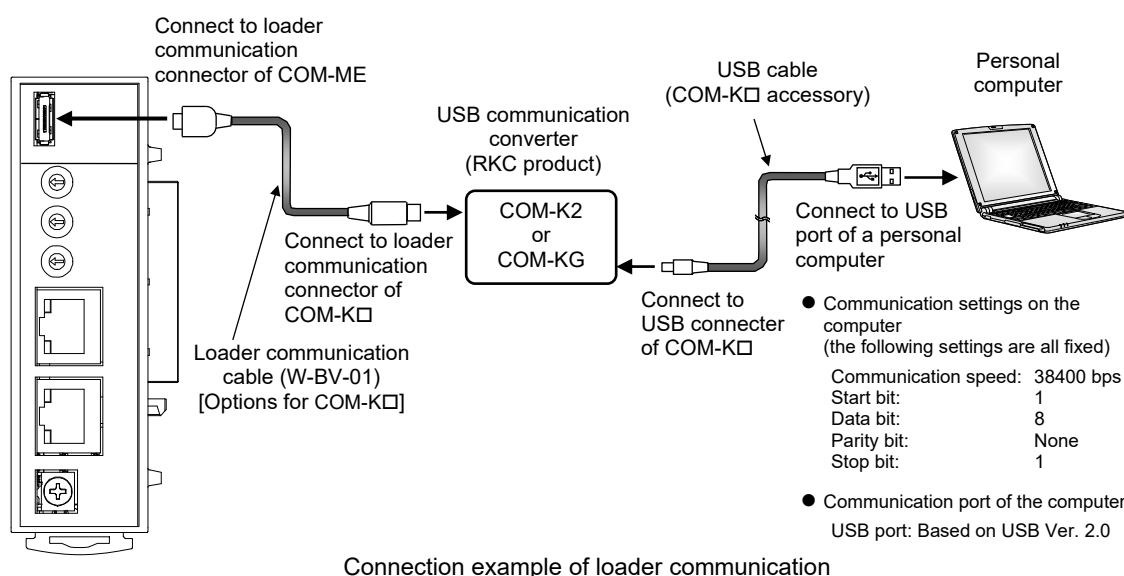
📖 **NOTE**

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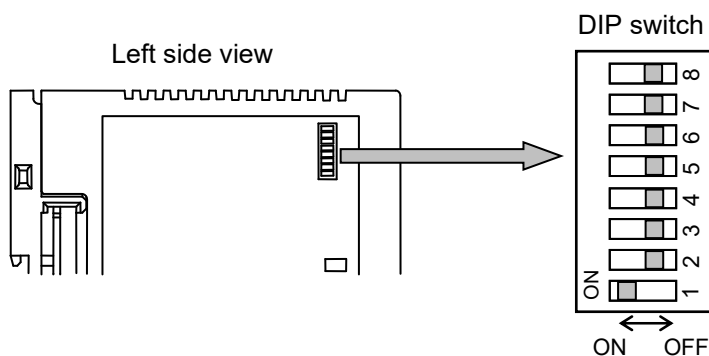
1	2	Controller communication speed	
OFF	OFF	9600 bps	
ON	OFF	19200 bps	[Factory set value]
OFF	ON	38400 bps	
ON	ON	57600 bps	

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 to No.7 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	6	7	
OFF	OFF	OFF	OFF	OFF	**Fixed (Do not set this one)**

📖 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."

(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

Data range
0: Number of measured value digits: 5 Modbus data: Double word (common to FZ/GZ)
1: Number of measured value digits: 4 Modbus data: Single word (common to FZ/GZ)
2: GZ_HA mode Number of measured value digits: 5 Modbus data: Double word (GZ only)

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
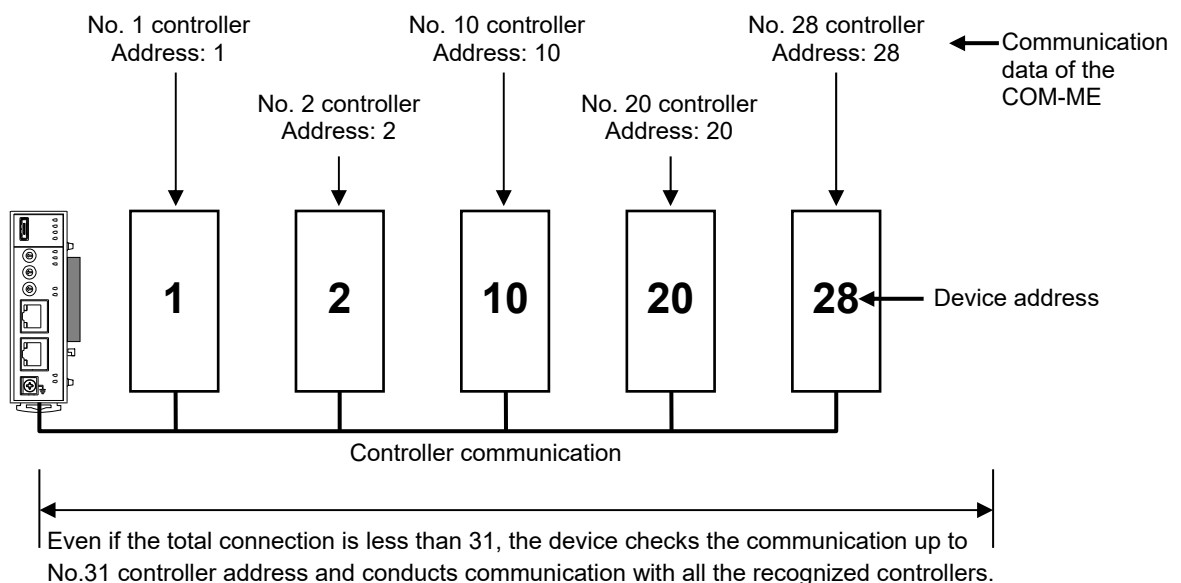
Continued from the previous page

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" 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

No. 3 controller
Address: Set value 32

No.1 controller
Address: Set value 5

No. 5 controller
Address: Set value 1

No. 4 controller
Address: Set value 20

No. 2 controller
Address: Set value 80

32   **5**   **1**   **20**   **80** ← Device address

Controller communication

Even if the total connection is less than 31, the device checks the communication up to "No.31 controller address" and conducts communication with all the recognized controllers.

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.

Device address has been continuously set from 1 to 31. The COM-ME recognizes 31 controllers and conducts communication with them.
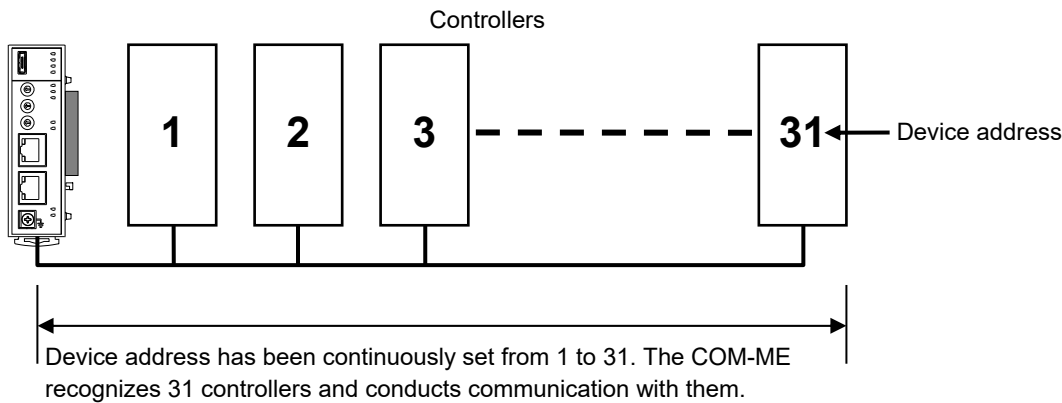
When controller device address has been intermittently set
If controller device addresses 4 and 7 are empty

Because the COM-ME could not recognize the controller at Device address 4, it terminates checking the connection.
The COM-ME communicates only with recognized controllers with device address 1 to 3.

The COM-ME will not communicate with controllers with device address larger than 3.
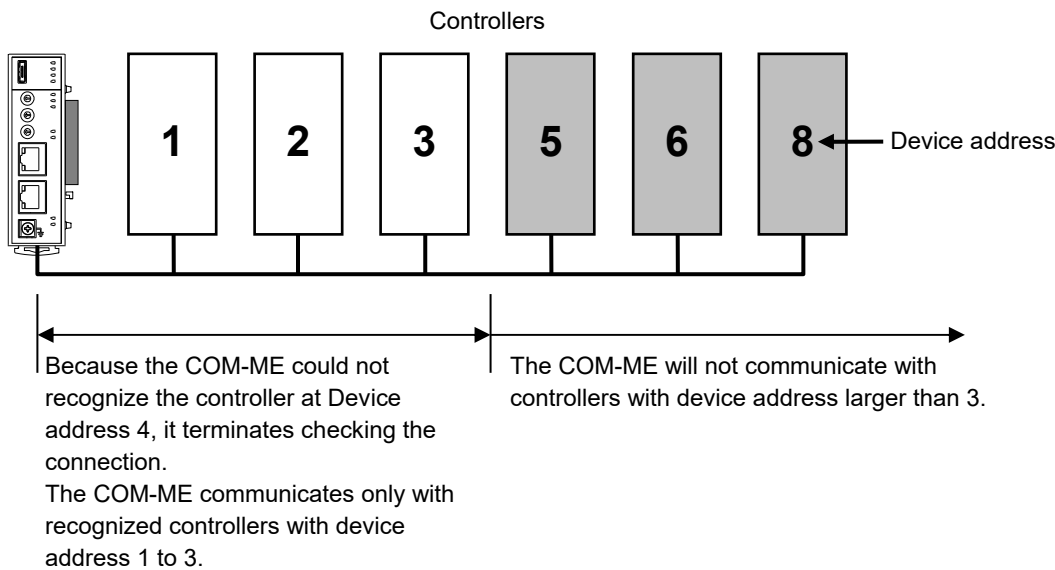
5.3.3 Controller address auto acquisition

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.

5.4 Assign Controller Communication Data

To send/receive the controller communication items on the EtherCAT network, you have to assign the register address of the controller communication items (in decimal) to the Readout register address of Controller communication data 1to 55 and also to the Write register address of Controller communication data 1 to 150.

These registers are preassigned with the factory preset value, but are freely adjustable. You can use the loader communication (also available on the EtherCAT) to conduct setting.

☞   Refer to the **list of factory preset values** (**P. 43**) for details.
Refer to instruction manuals of each controller for the register address of communication items of the controller.
   • **FZ110/FZ400/FZ900 Instruction Manual [Host Communication] (IMR03A07-E☐)**
   • **GZ400/GZ900 Instruction Manual [Host Communication] (IMR03D07-E☐)**

[Setting procedure on the loader communication]

■ 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.
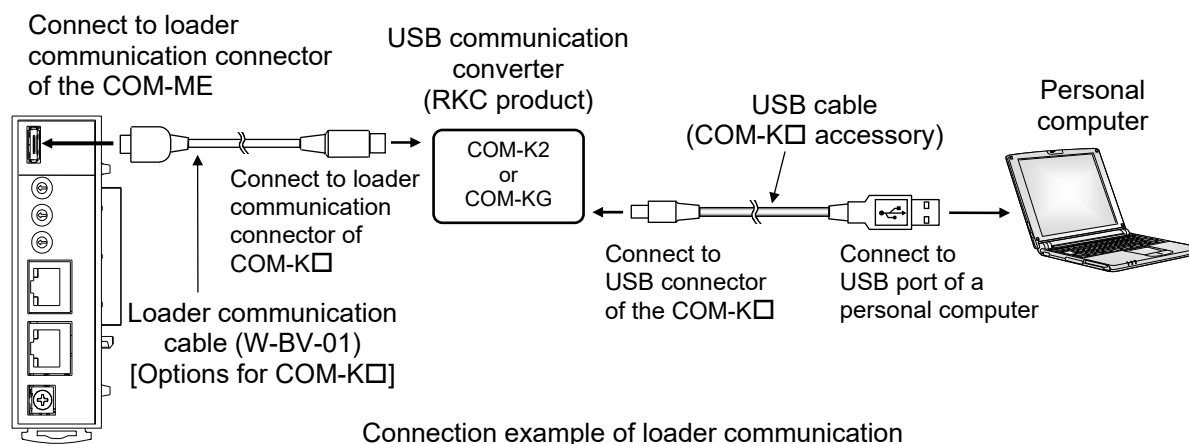
Connect to loader communication connector of the COM-ME

USB communication converter (RKC product)

COM-K2 or COM-KG

USB cable (COM-K☐ accessory)

Personal computer

Connect to loader communication connector of COM-K☐

Loader communication cable (W-BV-01) [Options for COM-K☐]

Connect to USB connector of the COM-K☐

Connect to USB port of a personal computer

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 PROTEM 2

1. Turn on the power of the personal computer

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.

① **Double click the icon on the desktop.**

② **Click "Base Tool"**

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

③ **Click "Select a model"**

④ **Select the "COM-ME-3 (FZ general purpose)"**

⑤ **Click "OK"**

(Base tool screen)

⑥ **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)."

⑦ **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

⑧ **Click "OK"**

3. Click "Com.set/Diagram" and check the communication address
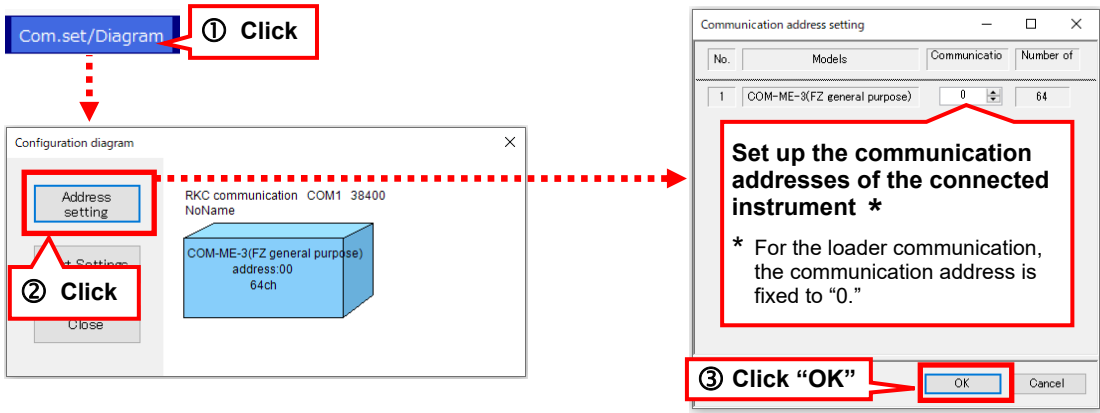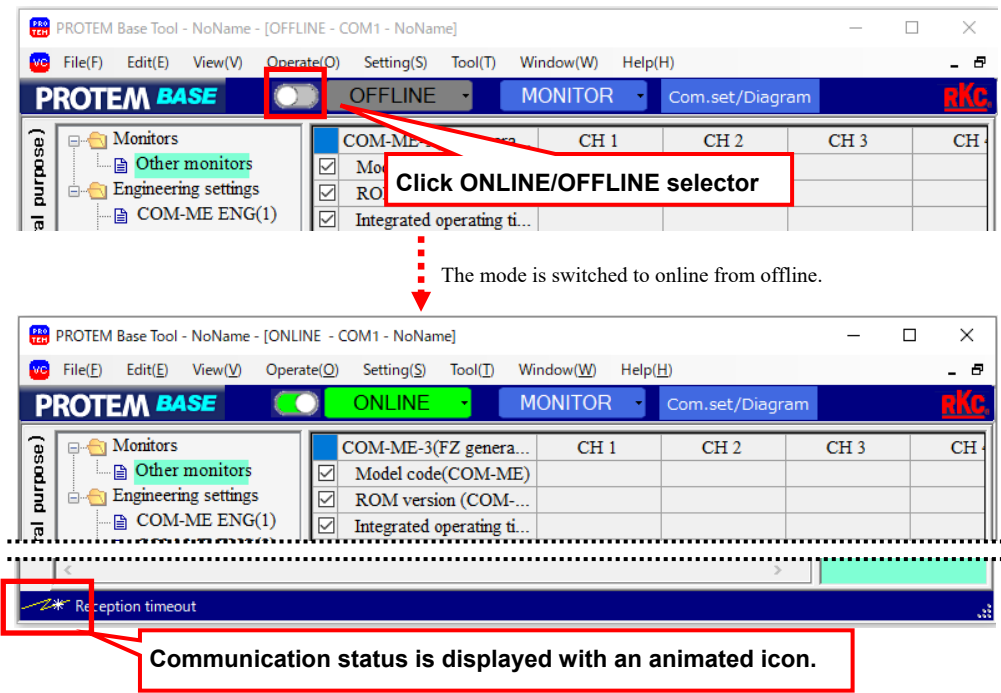
Set up the communication addresses of the connected instrument *

* For the loader communication, the communication address is fixed to "0."

4. Switching to online

Click ONLINE/OFFLINE selector

The mode is switched to online from offline.

Communication status is displayed with an animated icon.

5. Authorize a user to set the Engineering Setting Items.
To allow the user to change the set values, the user level must be switched.

① Click [Select user level] button

② Click "ENGINEER"
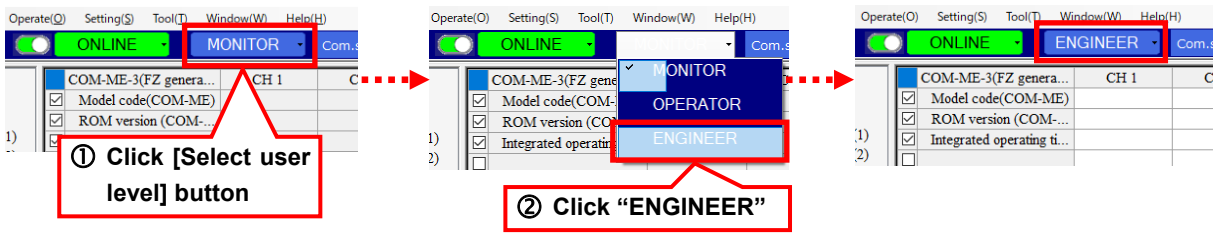
6. Select [COM-ME ENG(2)] in the treeview window.
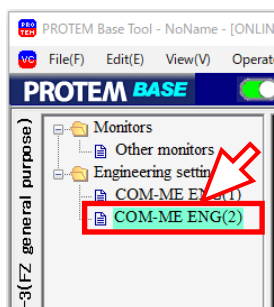
7. Set "Readout register address of Controller communication data X" and "Write register address of Controller communication data X, Y, Z." Set other items, if necessary. After having changed the setting, be sure to set "Controller communication register address setting instruction" to accept the changed data.
For the communication data, refer to **7. COMMUNICATION DATA LIST (P. 37)**.

6. EtherCAT

6.1 Outline of EtherCAT

■ EtherCAT protocol basics

The EtherCAT protocol can transport data within a standard Ethernet frame without changing its basic structure. When the master controller and slave devices are on the same subnet, data can be transported only by replacing the IP (Internet Protocol) in the Ethernet frame.

TCP/UDP Header	TCP/UDP Data		EtherCAT Header	EtherCAT Datagram

IP Header	IP Data

Ethernet Header	Ethernet Data	FCS

EthernetFrame

● Frame structure

14 Byte			4 Byte
Ethernet Header	EtherCAT Header	EtherCAT Datagram	FCS

11 Bit	1 Bit	4 Bit	44 to 1498 Byte
Length	Res.	Type	EtherCAT Datagram 1 to n

EtherCAT Datagram 1	EtherCAT Datagram 2	· · ·	EtherCAT Datagram n

10 Byte	0 to 1486 Byte	2 Byte
Datagram Header	Data	WKC

WKC: Working Counter
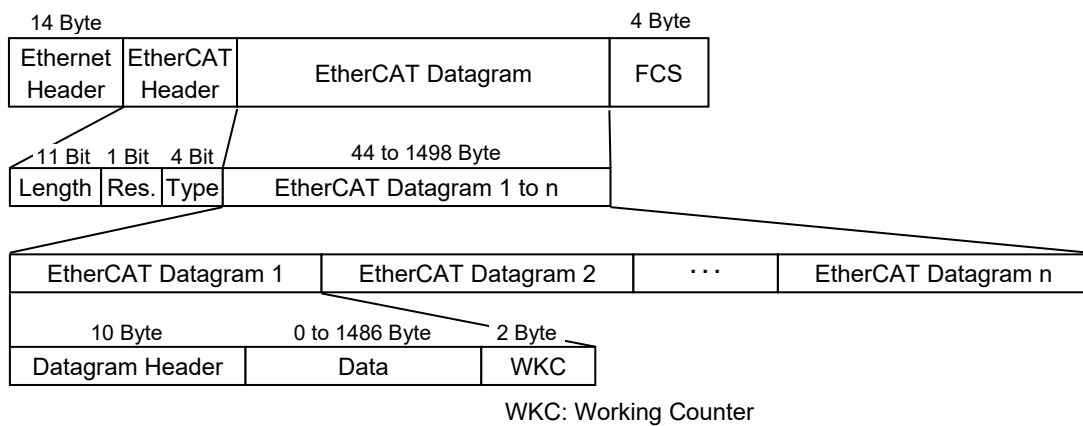
■ EtherCAT operation

EtherCAT sustains high-speed and real-time performances in data transfer by processing each Ethernet frame on-the-fly in all slaves to allow them to write send data or read receive data instead of sending data to each slave individually.
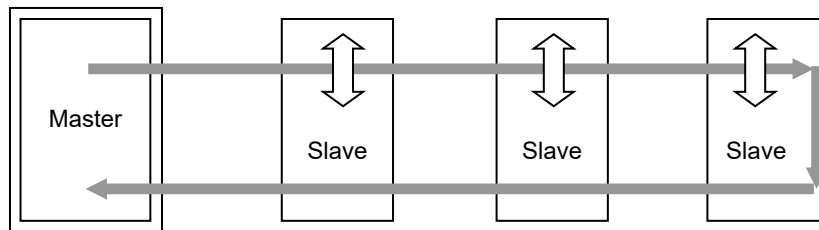
For example, imagine that the Ethernet frame is a moving train and the EtherCAT datagram is a train car. Then slave devices represent platforms of train stations and the bit of data is a passenger.

The train (Ethernet frame) passes through all platforms (slave devices) without stopping but passengers (data) can get on and off (Read/Write data) at appropriate platforms (slave devices). When the train (Ethernet frame) reaches the final platform (slave device), it returns to the first platform (slave device) and repeats the whole process.
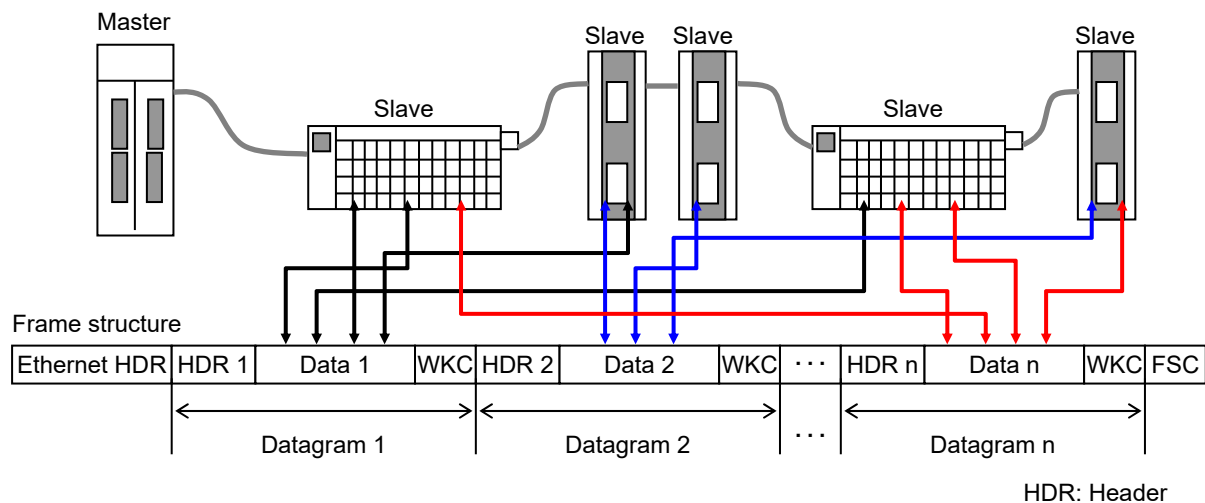
Data for a specific slave device or various data for all slave devices can be configured as data is read or written within one Ethernet frame by EtherCAT. Data is read or written at the appropriate slave device when the Ethernet frame passes each slave device.

■ EtherCAT device architecture of COM-ME

CoE (CAN application protocol over EtherCAT) is used as the protocol of the interface at application layer of COM-ME.
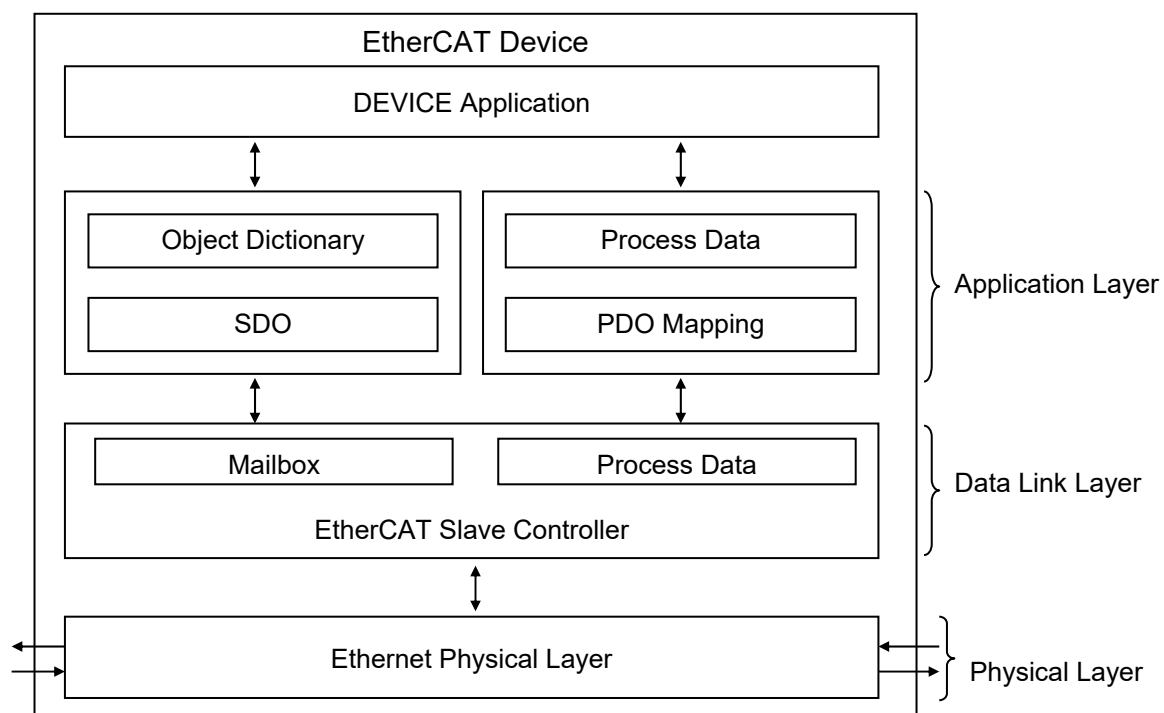
6.2 Communication Method

COM-ME supports "PDO communication" and "SDO communication" for EtherCAT.

📖 [Caution for PDO communication and SDO communication]

The COM-ME collects data from the controllers connected when the COM-ME is powered on. After the completion of the data collection, the COM-ME turns Bit 0 (of System communication status) to "1 (after the completion of data collection)." When Bit 0 (of System communication status) ="1," data can be written into the controller through PDO communication and SDO communication. The "System communication status" can be checked on both EtherCAT and Loader communication.

■ PDO communication

PDO communication is used to read or write data on a regular basis.
Data is periodically exchanged between the master and slave controller.

To establish a PDO communication, conduct PDO data mapping.
Assign data to the following indexes in the object dictionary.

- Index 0x1600 to 0x1606:   Allocate the data to set.
- Index 0x1A00 to 0x1A06: Allocate the data to monitor.
- Index 0x1C12:   Choose up to four indexes from Index 0x1600 to 0x1606.
- Index 0x1C13:   Choose up to four indexes from Index 0x1A00 to 0x1A06.

RxPDO: Setting "Master to Slave"

A maximum of 512 data can be allocated.

Index 0x1606
Index 0x1605
Index 0x1604
Index 0x1603
Index 0x1602
Index 0x1601
Index 0x1600

Designate the data allocated to RxPDO (128 data max.)

Settings: Index
              Sub-Index
              Bit length

TxPDO: Setting "Slave to master"

A maximum of 512 data can be allocated.

Index 0x1A06
Index 0x1A05
Index 01xA04
Index 0x1A03
Index 0x1A02
Index 0x1A01
Index 0x1A00

Designate the data allocated to TxPDO (128 data max.)

Settings: Index
              Sub-Index
              Bit length

● Contents of Index 0x1600 to 0x1606

Index	Sub-Index	Description
0x1600	0x00	The number of data designated under the Index. (0 to 128)
	0x01	The first parameter to set. (Index, Sub-Index, Bit length)
	⋮	⋮
	0x80	The 128th data to set. (Index, Sub-Index, Bit length)

The content is the same for 0x1601 to 0x1606.

[Example] When the parameter you want to change is "Write register address data CH1 * for Controller communication data 16.
  Index: 0x3213
  Sub-Index: 01 } Set value: 0x32130120
  Bit length: 20 (HEX) [32 bit]

  * The "Set value (SV) of device address 1" is preassigned as a default value to the "Write register address data CH1 for Controller communication data 16."

● Contents of Index 0x1A00 to 0x1A06

Index	Sub-Index	Description
0x1A00	0x00	The number of data designated under the Index. (0 to 128)
	0x01	The first parameter to monitor (Index, Sub-Index, Bit length)
	⋮	⋮
	0x80	The 128th parameter to monitor (Index, Sub-Index, Bit length)

The content is the same for 0x1A01 to 0x1A06.

[Example] When the parameter you want to monitor is "Readout register address monitor CH1 * for Controller communication data 1."
  Index: 0x2200
  Sub-Index: 01 } Set value: 0x22000120
  Bit length: 20 (HEX) [32 bit]

  * The "Measured value (PV) of device address 1" is preassigned as a factory preset value to the "Readout register address monitor CH1 for Controller communication data 1."

● Contents of Index 0x1C12

Index	Sub-Index	Description
0x1C12	0x01	Designate the first data (Index 0x1600 to 0x1606)
	0x02	Designate the second data (Index 0x1600 to 0x1606)
	0x03	Designate the third data (Index 0x1600 to 0x1606)
	0x04	Designate the fourth data (Index 0x1600 to 0x1606)

● Contents of Index 0x1C13

Index	Sub-Index	Description
0x1C13	0x01	Designate the first data (Index 0x1A00 to 0x1A06)
	0x02	Designate the second data (Index 0x1A00 to 0x1A06)
	0x03	Designate the third data (Index 0x1A00 to 0x1A06)
	0x04	Designate the fourth data (Index 0x1A00 to 0x1A06)

■ SDO communication

SDO communication is mainly used in peer-to-peer (1 to 1) communication.

Data communication between the master and slave controller only takes place when necessary (at an event).

   📖   Use tool to monitor or set data.
Setting tool: TwinCAT (by Beckhoff Automation GmbH product)

   📖   Use the loader communication to set the parameters of the COM-ME and the controller.
For the connection, refer to **4.5 Connections for Loader Communication (P. 18)**. In addition, for contents of setting data, refer to **7. COMMUNICATION DATA LIST (P. 37)**.

   ☞   For object dictionary, refer to **11. OBJECT DICTIONARY (P. 78)**.

6.3 EtherCAT Address Setting

Use three rotary switches to set the fixed address (Hexadecimal) of the EtherCAT so that the Master can recognize the Slave.

Supports Explicit Device Identification (Required ID) and Configured Station Alias.

The set address is written into the register 0x0012 (Configured Station Alias) of the ESC (EtherCAT Slave Controller) at the start-up.

Use a small flat-blade screwdriver to configure the setting.

EtherCAT address setting switch (ID selector)

EtherCAT address setting (×100)

EtherCAT address setting (×10)

EtherCAT address setting (×1)
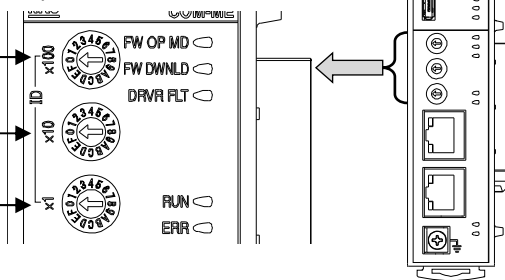
Setting range: 000h to FFFh
(Factory set value: 000h)

   📖   To activate the EtherCAT address setting, turn off the power once and turn it back on again.

7. COMMUNICATION DATA LIST

7.1 Reference to Communication Data List

(1) (2) (3) (4) (5) (6) (7)

No.	Name	Identifier	Channel	Digits	Attribute	Data range	Factory set value
1	Number of connected controller in controller communication	CU	CH1	7	RO	0 to 31	—

(1) Name: Communication data name

(2) Identifier: Communication identifier of RKC communication

(3) Channel: Number of communication data channels

(4) Digits: The number of communication data digits in RKC communication

(5) Attribute: A method of how communication data items are read or written when viewed from the master is described

RO: Read only data

Data direction
Master ◄──────── COM-ME

R/W: Read and Write data

Data direction
Master ◄────────► COM-ME

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

• ASCII code data (Example: 7 digits)

Most significant digit ·········· Least significant digit
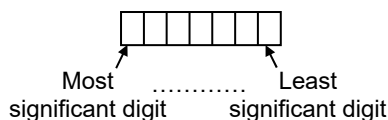
• 16-bit data (bit image)

Bit 15 ································· Bit 0
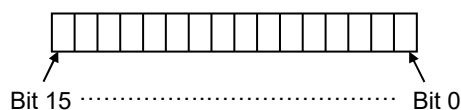
Refer to the communication manuals of each controller for the data range set in "Readout register address of Controller communication data 1to 55" and "Write register address of Controller communication data 1 to 150."

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

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

📖 Refer to the ■ **List of factory preset values (P. 43)** for the factory preset values of "Readout register address of Controller communication data 1 to 55," "Write register address of Controller communication data 1 to 150," and "Supported communication mode setting" of the COM-ME.

⚠ **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," "Data in the Engineering mode" and "Compatibility of identifiers with other models (dummy data)."

During RUN (control), the attribute of the data in the Engineering mode 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☐)**

7.2 Communication Data of COM-ME

No.	Name	Identifier	Channel	Digits	Attribute	Data range	Factory set value
1	Model code (COM-ME)	ID	CH1	32	RO	Model code (character)	—
2	ROM version (COM-ME)	VR	CH1	8	RO	ROM version	—
3	Integrated operating time monitor (COM-ME)	UT	CH1	7	RO	0 to 19999 hours	—
4	Error code (COM-ME)	ER	CH1	7	RO	2: Data back-up error 16: Controller communication error 64: Stack overflow	—
5	Backup memory state monitor (COM-ME)	EM	CH1	1	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.	—

6	System communication status	QM	CH1	1	RO	Bit data
						Bit 0: Data acquisition status
						    0: before the completion of data collection
						    1: after the completion of data collection
						Bit 1 to Bit 15: Unused
							—

7	Network error code	ES	CH1	7	RO	Bit data Bit 0: Network operation not possible Bit 1 to Bit 15: Unused Data 0: OFF 1: ON [Decimal number: 0, 1]	—
8	Controller communication communication speed [1]	VU	CH1	1	R/W	0 or 1: 9600 bps 2: 19200 bps 3: 38400 bps 4: 57600 bps	2
9	Controller communication data bit configuration [1]	VW	CH1	7	R/W	0 to 11 Refer to **Table 1: Data bit configuration**	0
10	EtherCAT address [2]	QJ	CH1	7	RO	0 to 4095	—

[1] Data that are activated by rebooting

[2] Data that are activated by starting the network operation after power is re-applied.

Table 1: Data bit configuration

Set value	Data bit	Parity bit	Stop bit	Set value	Data bit	Parity bit	Stop bit
0	8	None	1	6	8	None	2
1	8	Even	1	7	8	Even	2
2	8	Odd	1	8	8	Odd	2
3	8	None	1	9	8	None	1
4	8	None	1	10	8	None	1
5	8	None	1	11	8	None	1

Continued from the previous page.

No.	Name	Identifier	Channel	Digits	Attribute	Data range	Factory set value
11	EtherCAT write status	—	—	7	RO	Bit data Bit 0: PDO is being written Bit 1: Writing to PDO is completed Bit 2: SDO is being written Bit 3: Reserved Bit 4: Write error Bit 5 to Bit 15: Unused	—
12	General-purpose readout register	JX	CH1 ⋮ CH64	7	R/W	0 to 65535 Data of 0x2600 on EtherCAT Readable only on EtherCAT	0
13	General-purpose write register	JY	CH1 ⋮ CH64	7	R/W	0 to 65535 Data of 0x3600 on EtherCAT Readable and writable on EtherCAT	0

7.3 Controller Communication Data of COM-ME

No.	Name	Identifier	Channel	Digits	Attribute	Data range	Factory set value
1	Number of connected controller in controller communication	CU	CH1	7	RO	0 to 31	—
2	Action mode selection [1, 2]	CM	CH1	7	R/W	Bit data Bit 0: Address setting 0: Continuous setting 1: Free setting Bit 1 to Bit 14: Unused [Decimal number: 0 to 1]	0
3	Transmission wait time of controller communication [1]	CI	CH1	7	R/W	0 to 250 ms	10
4	No. 1 Controller state ⋮ No. 31 Controller state	CS	CH1 ⋮ CH31	7	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]	—
5	No. 1 Controller address [1] ⋮ No. 31 Controller address [1]	CA	CH1 ⋮ CH31	7	R/W	1 to 99 0: There is no connection controller	No.1 to No. 31: 1 to 31
6	Automatic acquisition of controller address [1, 3]	CD	CH1	7	R/W	0: Do not execute the automatic acquisition 1: Execute the automatic acquisition	0
7	Readout register address of Controller communication data 1 ⋮ Readout register address of Controller communication data 55	RA	CH1 ⋮ CH55	7	R/W	0 to 65534:Controller readout register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address (decimal number) of the communication data that is read out of the controller.	Refer to the List of factory preset values (P. 43)
8	Write register address of Controller communication data 1 ⋮ Write register address of Controller communication data 50	SA	CH1 ⋮ CH50	7	R/W	0 to 65534:Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address (decimal number) of the communication data that is written into the controller.	Refer to the List of factory preset values (P. 43)

[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."

Continued from the previous page.

No.	Name	Identifier	Channel	Digits	Attribute	Data range	Factory set value
9	Write register address of Controller communication data 51 ⋮ Write register address of Controller communication data 100	SB	CH1 ⋮ CH50	7	R/W	0 to 65534:Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address (decimal number) of the communication data that is written into the controller.	Refer to the List of factory preset values (P. 43)
10	Write register address of Controller communication data 101 ⋮ Write register address of Controller communication data 150	SC	CH1 ⋮ CH50	7	R/W	0 to 65534:Controller write register address 65535 (0xFFFF): Set to "Disabled" This communication data is for setting the address (decimal number) of the communication data that is written into the controller.	Refer to the List of factory preset values (P. 43)
11	Waiting time for Controller communication start *	WT	CH1	1	R/W	0 to 100 (0.0 to 10.0 seconds)	50
12	Controller communication register address setting instruction	LD	CH1	7	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

13	Supported communication mode setting *	SM	CH1	7	R/W	0: Single word mode
						1: Double word mode
						   (Data transfer: in the order from upper word to lower word)
						2: Double word mode
						   (Data transfer: in the order from lower word to upper word)
							Refer to the List of factory preset values (P. 43)

* Data that are activated by rebooting

■ List of factory preset values (by Models)

The following table shows a list of factory preset values of "Readout register address of Controller communication data," "Write register address of Controller communication data," and "Supported communication mode setting."
These values depend on the supported communication mode in the model code (optional).

● Object data by models

COM-ME-35*07/11: FZ/GZ, single word mode (DEC: decimal)
COM-ME-35*07/12: FZ, double word mode (DEC: decimal)
COM-ME-35*07/13: FZ, double word mode (DEC: decimal)
COM-ME-35*07/14: GZ, double word mode (DEC: decimal)
COM-ME-35*07/15: GZ, double word mode (DEC: decimal)
COM-ME-35*07/16: GZ , HA mode (DEC: decimal)
COM-ME-35*07/17: GZ, HA mode (DEC: decimal)

☞ For the model code, refer to the **1.2 Model Code (P. 3)**.

NAME	Iden-tifier	Factory preset values by models						
		COM-ME-35*07/11	COM-ME-35*07/12	COM-ME-35*07/13	COM-ME-35*07/14	COM-ME-35*07/15	COM-ME-35*07/16	COM-ME-35*07/17
Readout register address of Controller communication data 1	RA	0	0	0	0	0	0	0
Readout register address of Controller communication data 2		1	2	2	2	2	2	2
Readout register address of Controller communication data 3		2	4	4	4	4	4	4
Readout register address of Controller communication data 4		3	6	6	6	6	6	6
Readout register address of Controller communication data 5		4	8	8	8	8	8	8
Readout register address of Controller communication data 6		5	10	10	10	10	10	10
Readout register address of Controller communication data 7		6	12	12	12	12	12	12
Readout register address of Controller communication data 8		7	14	14	14	14	14	14
Readout register address of Controller communication data 9		8	16	16	16	16	16	16
Readout register address of Controller communication data 10		9	18	18	18	18	18	18
Readout register address of Controller communication data 11		10	20	20	20	20	20	20
Readout register address of Controller communication data 12		11	22	22	22	22	22	22
Readout register address of Controller communication data 13		12	24	24	24	24	24	24
Readout register address of Controller communication data 14		13	26	26	26	26	26	26
Readout register address of Controller communication data 15		14	28	28	28	28	28	28
Readout register address of Controller communication data 16		15	30	30	30	30	30	30
Readout register address of Controller communication data 17		19	32	32	32	32	32	32
Readout register address of Controller communication data 18		20	34	34	34	34	34	34
Readout register address of Controller communication data 19		21	36	36	36	36	36	36

Continued from the previous page.

NAME	Iden-tifier	Factory preset values by models						
		COM-ME -35∗07/11	COM-ME -35∗07/12	COM-ME -35∗07/13	COM-ME -35∗07/14	COM-ME -35∗07/15	COM-ME -35∗07/16	COM-ME -35∗07/17
Readout register address of Controller communication data 20	RA	65535	38	38	38	38	38	38
Readout register address of Controller communication data 21		65535	40	40	40	40	40	40
Readout register address of Controller communication data 22		65535	42	42	42	42	42	42
Readout register address of Controller communication data 23		65535	44	44	44	44	44	44
Readout register address of Controller communication data 24		65535	46	46	46	46	46	46
Readout register address of Controller communication data 25		65535	48	48	48	48	65535	65535
Readout register address of Controller communication data 26		65535	50	50	50	50	65535	65535
Readout register address of Controller communication data 27		65535	52	52	52	52	65535	65535
Readout register address of Controller communication data 28		65535	54	54	54	54	65535	65535
Readout register address of Controller communication data 29		65535	56	56	56	56	65535	65535
Readout register address of Controller communication data 30		65535	58	58	58	58	65535	65535
Readout register address of Controller communication data 31		65535	60	60	60	60	65535	65535
Readout register address of Controller communication data 32		65535	62	62	62	62	65535	65535
Readout register address of Controller communication data 33		65535	64	64	64	64	65535	65535
Readout register address of Controller communication data 34		65535	66	66	66	66	65535	65535
Readout register address of Controller communication data 35		65535	68	68	68	68	65535	65535
Readout register address of Controller communication data 36		65535	70	70	70	70	65535	65535
Readout register address of Controller communication data 37		65535	72	72	72	72	65535	65535
Readout register address of Controller communication data 38		65535	74	74	74	74	65535	65535
Readout register address of Controller communication data 39		65535	76	76	76	76	65535	65535
Readout register address of Controller communication data 40		65535	78	78	78	78	65535	65535
Readout register address of Controller communication data 41		65535	80	80	80	80	65535	65535
Readout register address of Controller communication data 42		65535	82	82	82	82	65535	65535
Readout register address of Controller communication data 43		65535	84	84	84	84	65535	65535
Readout register address of Controller communication data 44		65535	86	86	86	86	65535	65535
Readout register address of Controller communication data 45		65535	88	88	88	88	65535	65535
Readout register address of Controller communication data 46		65535	90	90	90	90	65535	65535
Readout register address of Controller communication data 47		65535	92	92	92	92	65535	65535
Readout register address of Controller communication data 48		65535	94	94	94	94	65535	65535
Readout register address of Controller communication data 49		65535	96	96	96	96	65535	65535

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NAME	Iden-tifier	Factory preset values by models						
		COM-ME -35∗07/11	COM-ME -35∗07/12	COM-ME -35∗07/13	COM-ME -35∗07/14	COM-ME -35∗07/15	COM-ME -35∗07/16	COM-ME -35∗07/17
Readout register address of Controller communication data 50	RA	65535	98	98	65535	65535	65535	65535
Readout register address of Controller communication data 51		65535	100	100	65535	65535	65535	65535
Readout register address of Controller communication data 52		65535	65535	65535	65535	65535	65535	65535
Readout register address of Controller communication data 53		65535	65535	65535	65535	65535	65535	65535
Readout register address of Controller communication data 54		65535	65535	65535	65535	65535	65535	65535
Readout register address of Controller communication data 55		65535	65535	65535	65535	65535	65535	65535
Write register address of Controller communication data 1	SA	32	102	102	98	98	48	48
Write register address of Controller communication data 2		33	104	104	100	100	50	50
Write register address of Controller communication data 3		34	106	106	102	102	52	52
Write register address of Controller communication data 4		35	108	108	104	104	54	54
Write register address of Controller communication data 5		36	110	110	106	106	56	56
Write register address of Controller communication data 6		37	112	112	108	108	58	58
Write register address of Controller communication data 7		38	114	114	110	110	60	60
Write register address of Controller communication data 8		39	116	116	112	112	62	62
Write register address of Controller communication data 9		40	118	118	114	114	64	64
Write register address of Controller communication data 10		41	120	120	116	116	66	66
Write register address of Controller communication data 11		42	122	122	118	118	68	68
Write register address of Controller communication data 12		43	124	124	120	120	70	70
Write register address of Controller communication data 13		65535	126	126	122	122	72	72
Write register address of Controller communication data 14		65535	128	128	124	124	74	74
Write register address of Controller communication data 15		65535	65535	65535	65535	65535	76	76
Write register address of Controller communication data 16		44	130	130	126	126	78	78
Write register address of Controller communication data 17		45	132	132	128	128	80	80
Write register address of Controller communication data 18		46	134	134	130	130	82	82
Write register address of Controller communication data 19		47	136	136	132	132	84	84
Write register address of Controller communication data 20		48	138	138	134	134	86	86
Write register address of Controller communication data 21		49	140	140	136	136	65535	65535
Write register address of Controller communication data 22		50	142	142	138	138	90	90
Write register address of Controller communication data 23		51	144	144	140	140	92	92
Write register address of Controller communication data 24		52	146	146	142	142	94	94

Continued from the previous page.

NAME	Iden-tifier	Factory preset values by models						
		COM-ME -35∗07/11	COM-ME -35∗07/12	COM-ME -35∗07/13	COM-ME -35∗07/14	COM-ME -35∗07/15	COM-ME -35∗07/16	COM-ME -35∗07/17
Write register address of Controller communication data 25	SA	53	148	148	144	144	96	96
Write register address of Controller communication data 26		54	150	150	146	146	98	98
Write register address of Controller communication data 27		55	152	152	148	148	65535	65535
Write register address of Controller communication data 28		56	154	154	150	150	102	102
Write register address of Controller communication data 29		57	156	156	152	152	104	104
Write register address of Controller communication data 30		58	158	158	154	154	106	106
Write register address of Controller communication data 31		61	160	160	156	156	108	108
Write register address of Controller communication data 32		64	162	162	158	158	110	110
Write register address of Controller communication data 33		65	164	164	160	160	112	112
Write register address of Controller communication data 34		66	166	166	162	162	114	114
Write register address of Controller communication data 35		67	168	168	164	164	116	116
Write register address of Controller communication data 36		68	170	170	166	166	118	118
Write register address of Controller communication data 37		69	172	172	168	168	120	120
Write register address of Controller communication data 38		70	174	174	170	170	122	122
Write register address of Controller communication data 39		71	176	176	172	172	124	124
Write register address of Controller communication data 40		72	178	178	174	174	126	126
Write register address of Controller communication data 41		73	180	180	176	176	128	128
Write register address of Controller communication data 42		74	182	182	178	178	130	130
Write register address of Controller communication data 43		75	184	184	180	180	132	132
Write register address of Controller communication data 44		65535	186	186	182	182	134	134
Write register address of Controller communication data 45		65535	188	188	184	184	136	136
Write register address of Controller communication data 46		65535	190	190	186	186	138	138
Write register address of Controller communication data 47		65535	192	192	188	188	140	140
Write register address of Controller communication data 48		65535	194	194	190	190	142	142
Write register address of Controller communication data 49		65535	196	196	192	192	144	144
Write register address of Controller communication data 50		65535	198	198	194	194	146	146
Write register address of Controller communication data 51	SB	65535	200	200	196	196	148	148
Write register address of Controller communication data 52		65535	202	202	198	198	150	150
Write register address of Controller communication data 53		65535	204	204	200	200	152	152
Write register address of Controller communication data 54		65535	206	206	202	202	154	154

Continued from the previous page.

NAME	Iden-tifier	Factory preset values by models						
		COM-ME -35*07/11	COM-ME -35*07/12	COM-ME -35*07/13	COM-ME -35*07/14	COM-ME -35*07/15	COM-ME -35*07/16	COM-ME -35*07/17
Write register address of Controller communication data 55		65535	208	208	204	204	512	512
Write register address of Controller communication data 56		65535	210	210	206	206	514	514
Write register address of Controller communication data 57		65535	212	212	208	208	516	516
Write register address of Controller communication data 58		65535	214	214	210	210	65535	65535
Write register address of Controller communication data 59		65535	216	216	212	212	520	520
Write register address of Controller communication data 60		65535	218	218	214	214	522	522
Write register address of Controller communication data 61		65535	220	220	216	216	524	524
Write register address of Controller communication data 62		65535	222	222	218	218	65535	65535
Write register address of Controller communication data 63		65535	224	224	220	220	65535	65535
Write register address of Controller communication data 64		65535	226	226	222	222	65535	65535
Write register address of Controller communication data 65		65535	228	228	224	224	65535	65535
Write register address of Controller communication data 66		65535	230	230	226	226	65535	65535
Write register address of Controller communication data 67		65535	232	232	228	228	65535	65535
Write register address of Controller communication data 68		65535	234	234	230	230	65535	65535
Write register address of Controller communication data 69	SB	65535	236	236	232	232	65535	65535
Write register address of Controller communication data 70		65535	238	238	234	234	65535	65535
Write register address of Controller communication data 71		65535	240	240	236	236	65535	65535
Write register address of Controller communication data 72		65535	242	242	238	238	65535	65535
Write register address of Controller communication data 73		65535	244	244	240	240	65535	65535
Write register address of Controller communication data 74		65535	246	246	242	242	65535	65535
Write register address of Controller communication data 75		65535	248	248	244	244	65535	65535
Write register address of Controller communication data 76		65535	250	250	246	246	65535	65535
Write register address of Controller communication data 77		65535	252	252	248	248	65535	65535
Write register address of Controller communication data 78		65535	254	254	250	250	65535	65535
Write register address of Controller communication data 79		65535	256	256	252	252	65535	65535
Write register address of Controller communication data 80		65535	258	258	254	254	65535	65535
Write register address of Controller communication data 81		65535	260	260	256	256	65535	65535
Write register address of Controller communication data 82		65535	262	262	258	258	65535	65535
Write register address of Controller communication data 83		65535	264	264	260	260	65535	65535
Write register address of Controller communication data 84		65535	266	266	262	262	65535	65535

Continued from the previous page.

NAME	Iden-tifier	Factory preset values by models						
		COM-ME -35∗07/11	COM-ME -35∗07/12	COM-ME -35∗07/13	COM-ME -35∗07/14	COM-ME -35∗07/15	COM-ME -35∗07/16	COM-ME -35∗07/17
Write register address of Controller communication data 85	SB	65535	268	268	264	264	65535	65535
Write register address of Controller communication data 86		65535	270	270	266	266	65535	65535
Write register address of Controller communication data 87		65535	272	272	268	268	65535	65535
Write register address of Controller communication data 88		65535	274	274	270	270	65535	65535
Write register address of Controller communication data 89		65535	276	276	272	272	65535	65535
Write register address of Controller communication data 90		65535	278	278	274	274	65535	65535
Write register address of Controller communication data 91		65535	280	280	276	276	65535	65535
Write register address of Controller communication data 92		65535	282	282	278	278	65535	65535
Write register address of Controller communication data 93		65535	284	284	280	280	65535	65535
Write register address of Controller communication data 94		65535	286	286	282	282	65535	65535
Write register address of Controller communication data 95		65535	288	288	284	284	65535	65535
Write register address of Controller communication data 96		65535	290	290	286	286	65535	65535
Write register address of Controller communication data 97		65535	292	292	288	288	65535	65535
Write register address of Controller communication data 98		65535	294	294	290	290	65535	65535
Write register address of Controller communication data 99		65535	296	296	292	292	65535	65535
Write register address of Controller communication data 100		65535	298	298	294	294	65535	65535
Write register address of Controller communication data 101	SC	65535	300	300	296	296	65535	65535
Write register address of Controller communication data 102		65535	302	302	298	298	65535	65535
Write register address of Controller communication data 103		65535	304	304	300	300	65535	65535
Write register address of Controller communication data 104		65535	306	306	302	302	65535	65535
Write register address of Controller communication data 105		65535	308	308	304	304	65535	65535
Write register address of Controller communication data 106		65535	310	310	306	306	65535	65535
Write register address of Controller communication data 107		65535	312	312	308	308	65535	65535
Write register address of Controller communication data 108		65535	314	314	310	310	65535	65535
Write register address of Controller communication data 109		65535	316	316	312	312	65535	65535
Write register address of Controller communication data 110		65535	318	318	314	314	65535	65535
Write register address of Controller communication data 111		65535	320	320	316	316	65535	65535
Write register address of Controller communication data 112		65535	322	322	318	318	65535	65535
Write register address of Controller communication data 113		65535	324	324	320	320	65535	65535
Write register address of Controller communication data 114		65535	326	326	322	322	65535	65535

Continued from the previous page.

NAME	Iden-tifier	Factory preset values by models						
		COM-ME -35∗07/11	COM-ME -35∗07/12	COM-ME -35∗07/13	COM-ME -35∗07/14	COM-ME -35∗07/15	COM-ME -35∗07/16	COM-ME -35∗07/17
Write register address of Controller communication data 115	SC	65535	328	328	324	324	65535	65535
Write register address of Controller communication data 116		65535	330	330	326	326	65535	65535
Write register address of Controller communication data 117		65535	332	332	328	328	65535	65535
Write register address of Controller communication data 118		65535	334	334	330	330	65535	65535
Write register address of Controller communication data 119		65535	336	336	332	332	65535	65535
Write register address of Controller communication data 120		65535	338	338	334	334	65535	65535
Write register address of Controller communication data 121		65535	340	340	336	336	65535	65535
Write register address of Controller communication data 122		65535	342	342	338	338	65535	65535
Write register address of Controller communication data 123		65535	344	344	340	340	65535	65535
Write register address of Controller communication data 124		65535	346	346	342	342	65535	65535
Write register address of Controller communication data 125		65535	348	348	344	344	65535	65535
Write register address of Controller communication data 126		65535	350	350	346	346	65535	65535
Write register address of Controller communication data 127		65535	352	352	348	348	65535	65535
Write register address of Controller communication data 128		65535	354	354	350	350	65535	65535
Write register address of Controller communication data 129		65535	356	356	352	352	65535	65535
Write register address of Controller communication data 130		65535	358	358	354	354	65535	65535
Write register address of Controller communication data 131		65535	360	360	356	356	65535	65535
Write register address of Controller communication data 132		65535	362	362	358	358	65535	65535
Write register address of Controller communication data 133		65535	364	364	360	360	65535	65535
Write register address of Controller communication data 134		65535	366	366	362	362	65535	65535
Write register address of Controller communication data 135		65535	368	368	364	364	65535	65535
Write register address of Controller communication data 136		65535	370	370	366	366	65535	65535
Write register address of Controller communication data 137		65535	372	372	368	368	65535	65535
Write register address of Controller communication data 138		65535	65535	65535	370	370	65535	65535
Write register address of Controller communication data 139		65535	65535	65535	372	372	65535	65535
Write register address of Controller communication data 140		65535	65535	65535	374	374	65535	65535
Write register address of Controller communication data 141		65535	65535	65535	376	376	65535	65535
Write register address of Controller communication data 142		65535	65535	65535	378	378	65535	65535
Write register address of Controller communication data 143		65535	65535	65535	380	380	65535	65535
Write register address of Controller communication data 144		65535	65535	65535	382	382	65535	65535

Continued from the previous page.

NAME	Iden-tifier	Factory preset values by models						
		COM-ME -35∗07/11	COM-ME -35∗07/12	COM-ME -35∗07/13	COM-ME -35∗07/14	COM-ME -35∗07/15	COM-ME -35∗07/16	COM-ME -35∗07/17
Write register address of Controller communication data 145	SC	65535	65535	65535	384	384	65535	65535
Write register address of Controller communication data 146		65535	65535	65535	386	386	65535	65535
Write register address of Controller communication data 147		65535	65535	65535	388	388	65535	65535
Write register address of Controller communication data 148		65535	65535	65535	390	390	65535	65535
Write register address of Controller communication data 149		65535	65535	65535	65535	65535	65535	65535
Write register address of Controller communication data 150		65535	65535	65535	65535	65535	65535	65535
Supported communication mode setting	SM	0	1	2	1	2	1	2

8. USAGE EXAMPLE

This chapter describes the usage example of EtherCAT communication when using the software of the PLC master installed in the personal computer as a master and connecting COM-ME to controllers (FZ).

8.1 Handling Procedures

Preparations of configuration instrument	☞ Refer to **8.2 System Configuration (P. 52)**.
⬇	
Mounting and Wiring	☞ • For mounting and wiring of the COM-ME, refer to **3. MOUNTIMG (P. 7)** and **4. WIRING (P. 12)**.
	• Refer to the instruction manual of the relevant model for the Mounting and Wiring of the controller.
	• For information on connecting the Loader communication, refer to **4.5 Connections for Loader Communication (P. 18)**.
⬇	
Setting of Contrller communication	☞ Refer to **8.3 Setting of Controller Communication (P. 53)**.
⬇	
Assign the communication data	☞ Refer to **8.4 Assigning Controller Communication Data (P. 59)**.
⬇	
EtherCAT communication	☞ Refer to **8.5 Tool Settings (P. 61)**.

8.2 System Configuration

The example given in this section is based on the system configuration below.
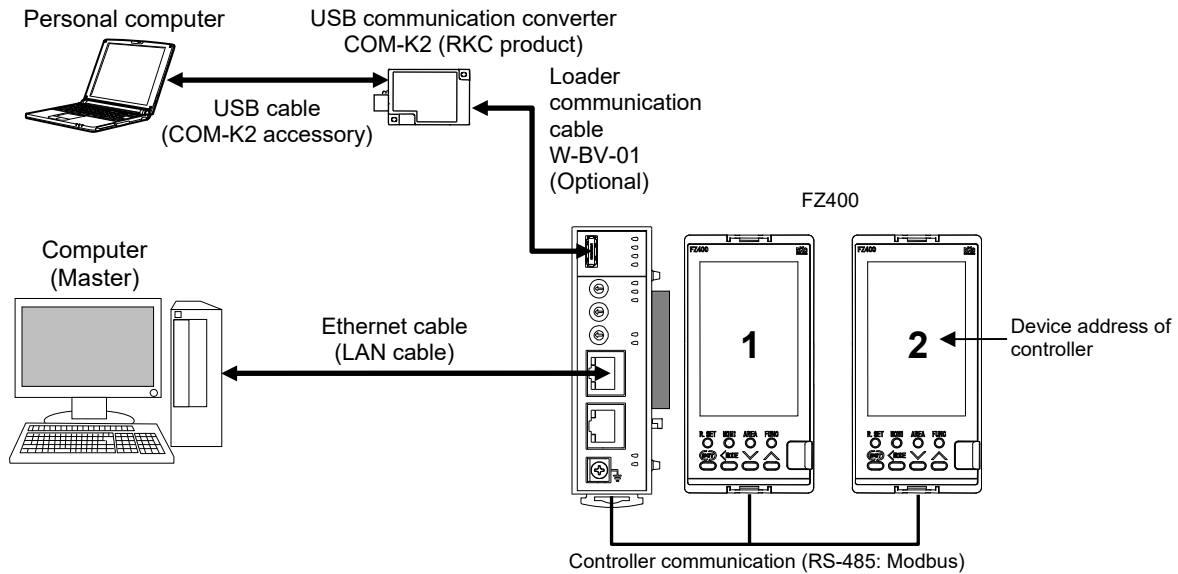
■ **Use instruments**

● **EtherCAT communication converter COM-ME-3 [for FZ series/GZ series]**
COM-ME-35 ∗ 07 /11:   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

● **Computer (Master)**
TwinCAT software must be installed (Beckhoff Automation GmbH product).
EtherCAT communication operates with software implementing a master without using a specific hardware as a master device.

● **Personal computer**
RKC's configuration support tool PROTEM2 needs to be installed. Use PROTEM2 to set communication setting and assign data.
The PROTEM2 can be downloaded from the RKC official website.

8.3 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)**." In this example set "1" and "2."

> 📖 **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

In this example set "3" (factory preset value).

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 from the previous page

(4) Data bit configuration

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

In this example set "2" (factory preset value).

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

In this example set "1."

Data range
0: Number of measured value digits: 5   Modbus data: Double word (common to FZ/GZ)
1: Number of measured value digits: 4   Modbus data: Single word (common to FZ/GZ)

2: GZ_HA mode
    Number of measured value digits: 5
    Modbus data: Double word (GZ only)

(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.
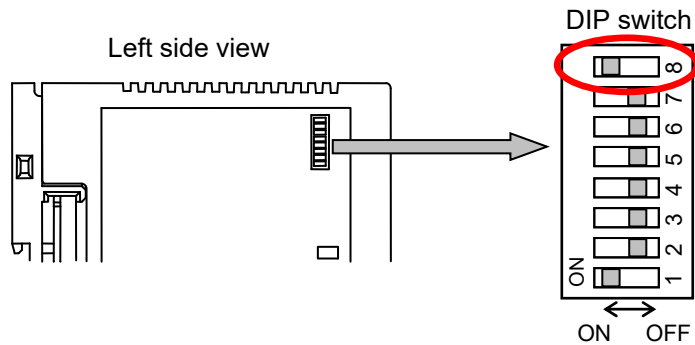
Left side view

DIP switch

ON   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.

① **Double click the icon on the desktop.**

PROTEM2 will start and show the first screen.

② **Click "Base Tool"**

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

Continued on the next page.

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③ **Click "Select a model"**

④ **Select the "COM-ME-3 (FZ general purpose)"**

⑤ **Click "OK"**

(Base tool screen)

⑥ **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)."

⑦ **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

⑧ **Click "OK"**

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

① **Click**

② **Click**

Set up the communication addresses of the connected instrument *

* For the loader communication, the communication address is fixed to "0."

③ **Click "OK"**

5. Switching to online

The mode is switched to online from offline.

6. Authorize a user to set the Engineering Setting Items.
To allow the user to change the set values, the user level must be switched.

7. Select the "COM-ME ENG(1)" in a TreeView
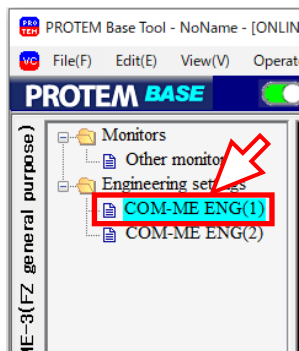
8. Set the desired communication speed and data bit configuration.
(In this example we will use the factory preset values of "2: 19200 bps" and "0: Data bit 8, Parity bit: None, Stop bit: 1")
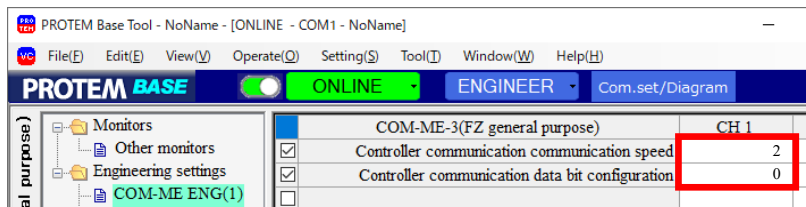
9. To activate the changed data, power off the instrument once, and apply power again.

8.4 Assigning Controller Communication Data

To send/receive the controller communication items on the EtherCAT network, you have to assign the register address of the controller communication items (in decimal) to the Readout register address of Controller communication data 1to 55 and also to the Write register address of Controller communication data 1 to 150.

These registers are preassigned with the factory preset value, but are freely adjustable. You can use the loader communication (also available on the EtherCAT) to conduct setting.

☞   Refer to the **list of factory preset values (P. 43)** for details.
Refer to instruction manuals of each controller for the register address of communication items of the controller.
• **FZ110/FZ400/FZ900 Instruction Manual [Host Communication] (IMR03A07-E☐)**
• **GZ400/GZ900 Instruction Manual [Host Communication] (IMR03D07-E☐)**

Setting screen of PROTEM2

Setting items

- No. X Controller address (X: 1 to 31)
  Make a proper setting according to the controller device address.

- Readout register address of Controller communication data X (X: 1 to 55)
  Up to a maximum of 55 data items can be read out.
  Set a register address of the read item (in decimal).
  It is not possible to change the read items for each controller.

  📖 When all the set values of "Readout register address of Controller communication data 1 to
  55" are disabled (Set value: 65535 [0xFFFF]), "Write register address data for Controller
  communication data 1 to 150 (Index 0x3200 to 0x32C5)" cannot be used.

- Write register address of Controller communication data X (X: 1 to 50)
  Up to 150 data items can be written per controller.
  50 data items can be set per register (X, Y, Z).
  Set a register address of the write item (in decimal).
  It is not possible to change the write items for each controller.

- Write register address of Controller communication data Y (Y 51 to 100)
  Up to 150 data items can be written per controller.
  50 data items can be set per register (X, Y, Z).
  Set a register address of the write item (in decimal).
  It is not possible to change the write items for each controller.

- Write register address of Controller communication data Z (Z 101 to 150)
  Up to 150 data items can be written per controller.
  50 data items can be set per register (X, Y, Z).
  Set a register address of the write item (in decimal).
  It is not possible to change the write items for each controller.

- Controller communication register address setting instruction
  When "Readout register address of Controller communication data 1to 55" and "Controller
  communication data 1 to 150" are changed, use this setting to accept the value. Change the setting
  to "1." When the value returns to "0" automatically, the setting is completed.

  [Items applicable for this change]
  Readout register address of Controller communication data X
  Write register address of Controller communication data X
  Write register address of Controller communication data Y
  Write register address of Controller communication data Z

- Corresponding communication mode setting
  Choose from the following according to the communication mode of the controller.
  0: Single word mode is supported
  1: Double word mode is supported
     (Data transfer: in the order from upper word to lower word)
  2: Double word mode is supported
     (Data transfer: in the order from lower word to upper word)

Conduct other settings if necessary.

8.5 Tool Settings

Configure the various settings by using TwinCAT software.

Before using the software, make sure all wiring is completed.

📖 [Caution for PDO communication and SDO communication]

The COM-ME collects data from the controllers connected when the COM-ME is powered on. After the completion of the data collection, the COM-ME turns Bit 0 (of System communication status) to "1 (after the completion of data collection)." When Bit 0 (of System communication status) ="1," data can be written into the controller through PDO communication and SDO communication. The "System communication status" can be checked on both EtherCAT and Loader communication.

■ ESI file download

To recognize the COM-ME on the TwinCAT, download the ESI file of the COM-ME from our website.

https://www.rkcinst.co.jp/english/field_network_category/ethercat/

📖 When TwinCAT3 is installed in the drive C, the ESI file is stored in "C:¥TwinCAT¥3.1¥Config¥Io¥EtherCAT".

In the following operation example, we assume that we use TwinCAT3.

■ Establish the communication with the COM-ME

1. Start the TwinCAT XAE Shell.

2. Create a new project.
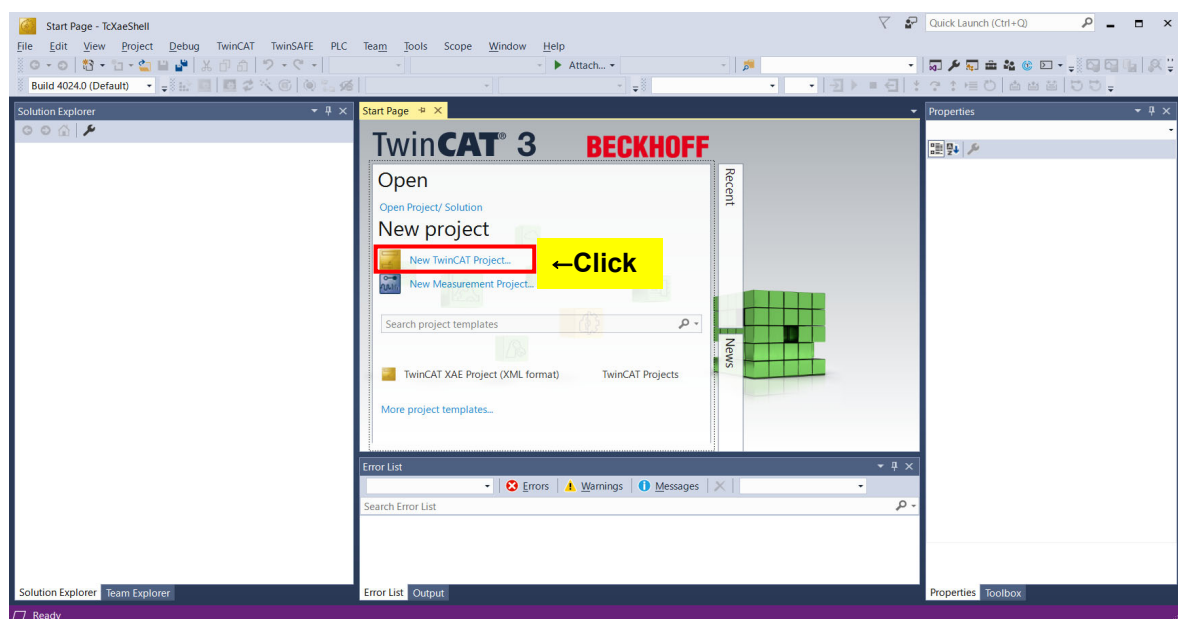
3. Add I/O devices.

Select EtherCAT Master as a new item.
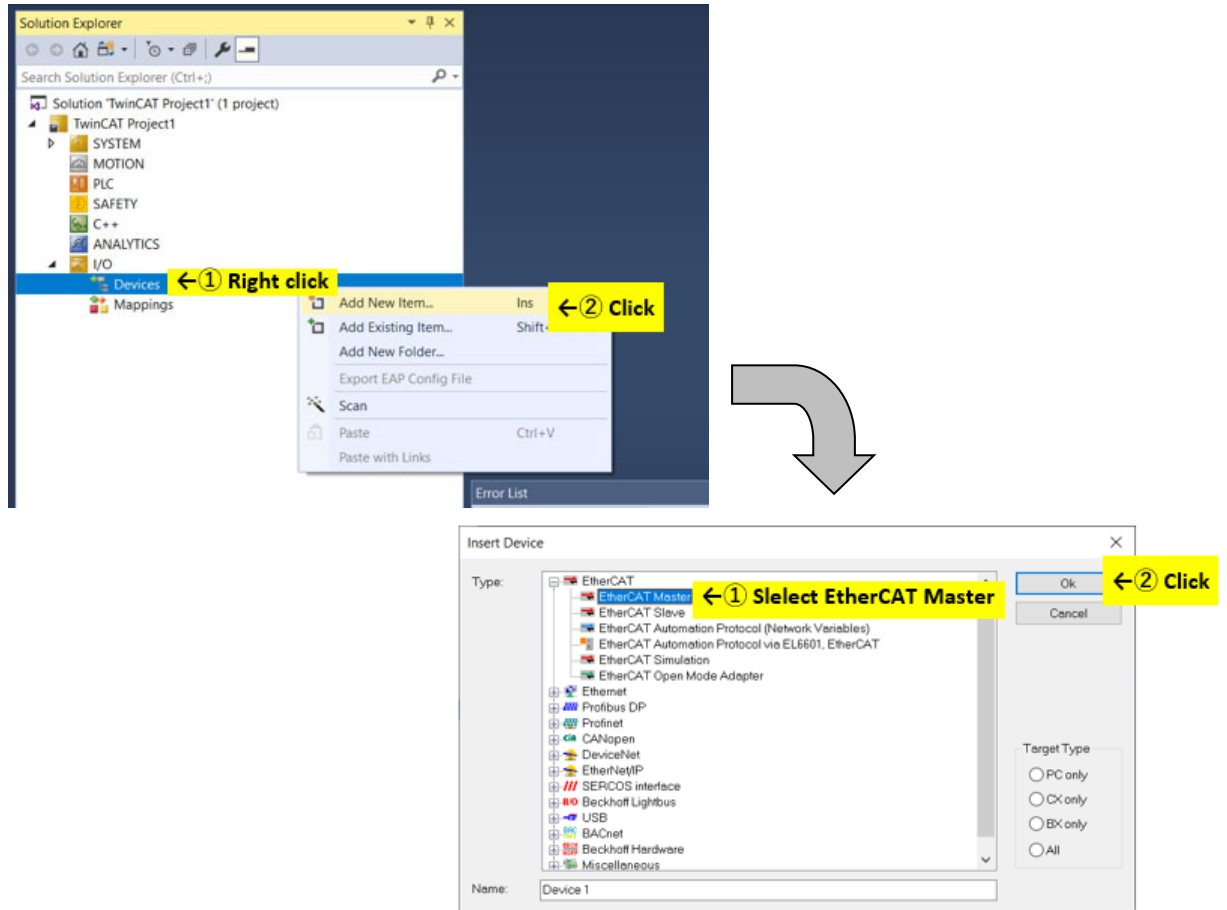
4. Use the adapter of the added devices [Device 1 (EtherCAT)] to conduct Search and select "Ethernet (TwinCAT-Intel PCI Ethernat Adapter (Gigabit))".
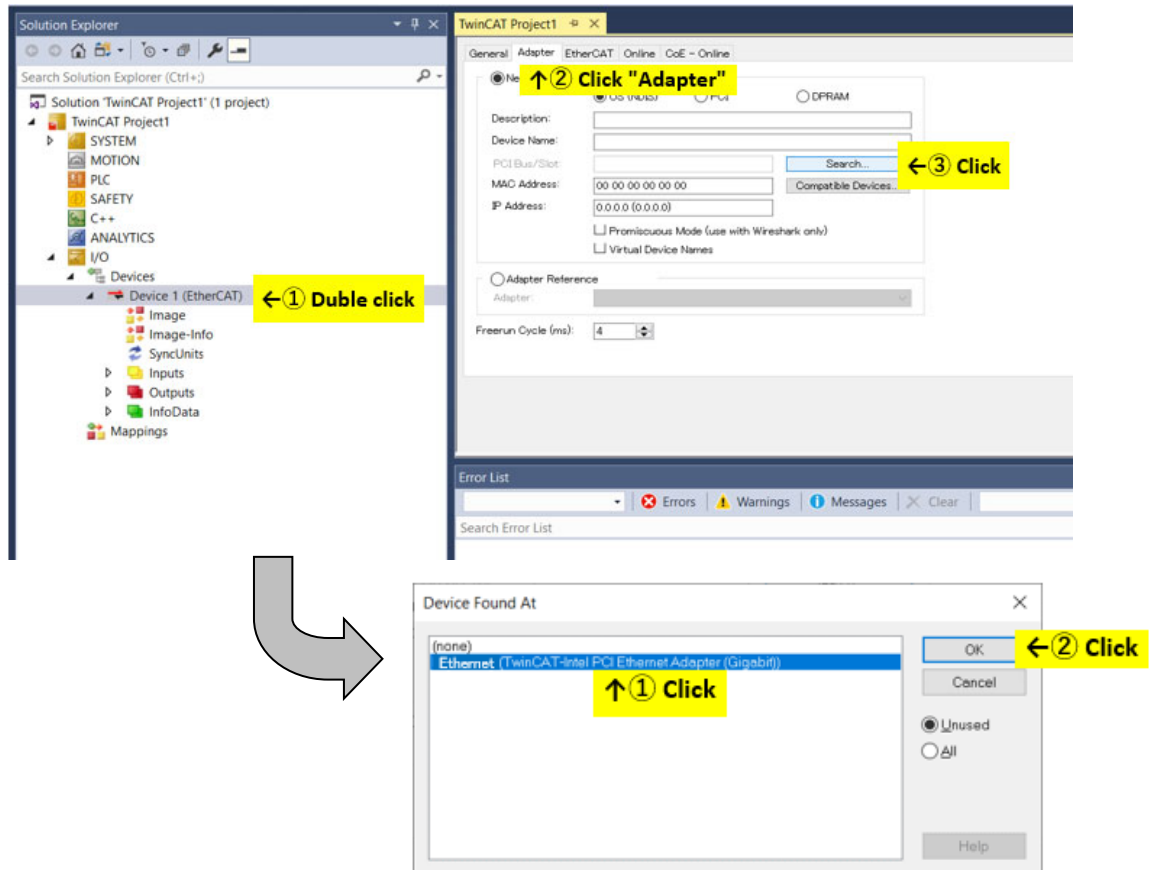
In case no candidates are searched, bind the compatible devices.
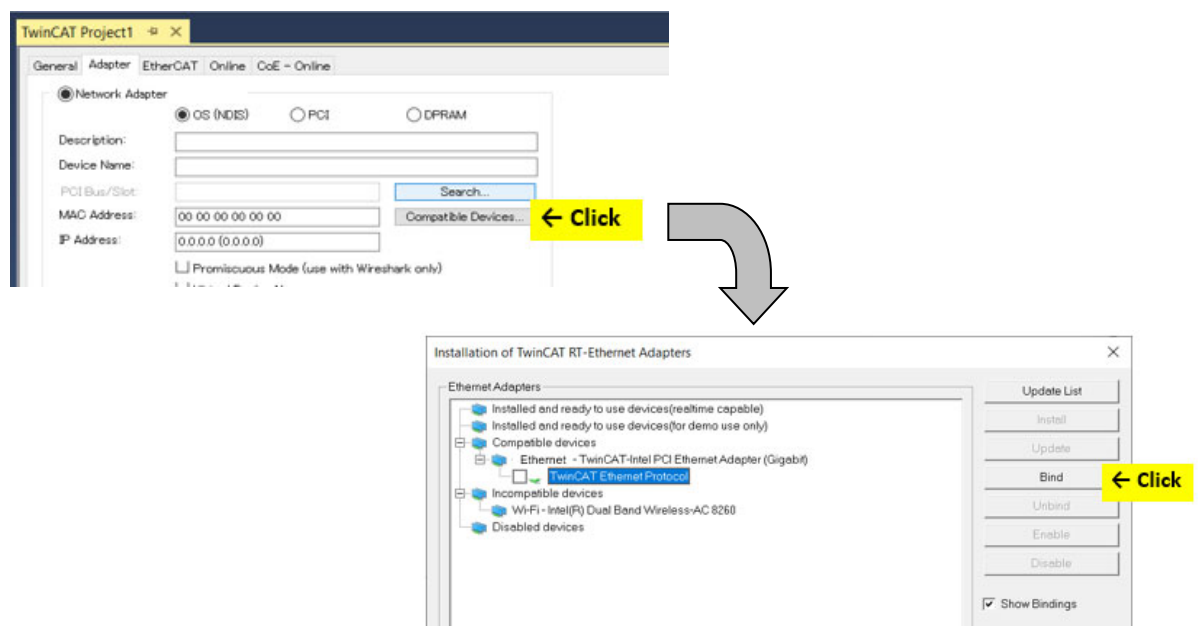
5. Scan the added device [Device 1 (EtherCAT)].
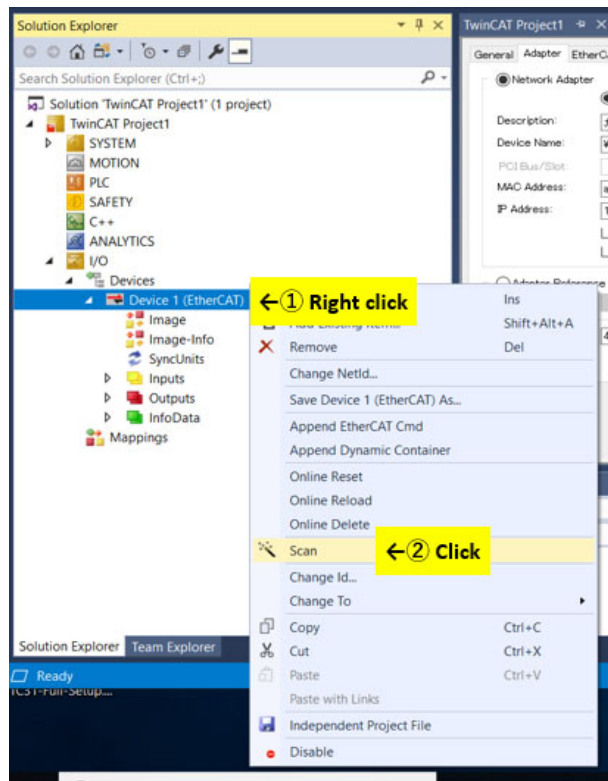
6. The tree shows "Box 1 (COM-ME-35*07)" to indicate that the communication with the COM-ME has been established.

■ Mapping of PDO communication data

1. Double click Box 1 (COM-ME-3), and then click the tab "Process Data".

2. Click Outputs in Sync Manager, and then check "0x1600" in PDO Assignment (0x1C12) so that Index 0x1600 can be used.
In this state you can see that 8.0 bytes (equal to 4 data) [default] are assigned to 0x1600 in the PDO list.
Also, you can check the assigned data in PDO Content (0x1600).
The following data are assigned to Index 0x1600.

- Index 0x3213: Sub-Index 0x01:

  Write register address data for Controller communication data 16: CH1

  (The set value (SV) of device address 1 is assigned.)

- Index 0x3213: Sub-Index 0x02:

  Write register address data for Controller communication data 16: CH2

  (The set value (SV) of device address 2 is assigned.)

3. Click Inputs in Sync Manager, and then check "0x1A00" in PDO Assignment (0x1C13) so that Index 0x1A00 can be used.

In this state you can see that 8.0 bytes (equal to 2 data) [default] are assigned to 0x1600 in the PDO list.

Also, you can check the assigned data in PDO Content (0x1A00).

The following data are assigned to Index 0x1A00.

- Index 0x2200: Sub-Index 0x01:
  Readout register address monitor for Controller communication data 1: CH1
  (The measured value (PV) of device address 1 is assigned.)
- Index 0x2200: Sub-Index 0x02:
  Readout register address monitor for Controller communication data: CH2
  (The measured value (PV) of device address 2 is assigned.)
- Index 0x3213: Sub-Index 0x01:
  Write register address data for Controller communication data 16: CH1
  (The set value (SV) of device address 1 is assigned.)
- Index 0x3213: Sub-Index 0x02:
  Write register address data for Controller communication data 16: CH2
  (The set value (SV) of device address 2 is assigned.)

These data are not yet assigned.

4. In the state shown on the previous page, assignment of 8.0 bytes (equal to 2 data) is insufficient, and you need to add data.

■ Starting PDO communication

1. Click "Restart TwinCAT (Config Mode)" information icon and restart in the Config Mode.
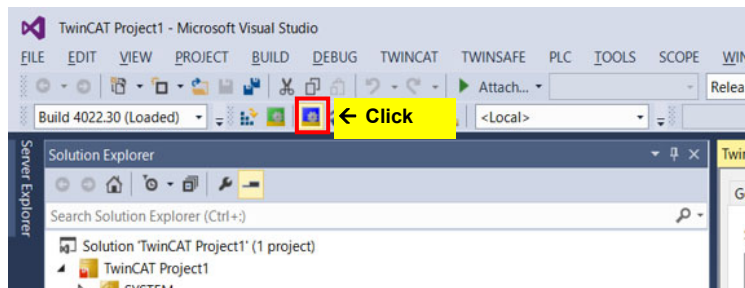
2. Click "OK" at each dialog being displayed to establish the connection between COM-ME and TwinCAT.

3. Double click TxPDO mapping 1 in the tree, then the online values are displayed in the right pane. As the values of Write register addresses of Controller communication data 16: CH1 and CH2 (Set values (SV) of Device addresses 1 and 2 are assigned here) are zero, set desired values.
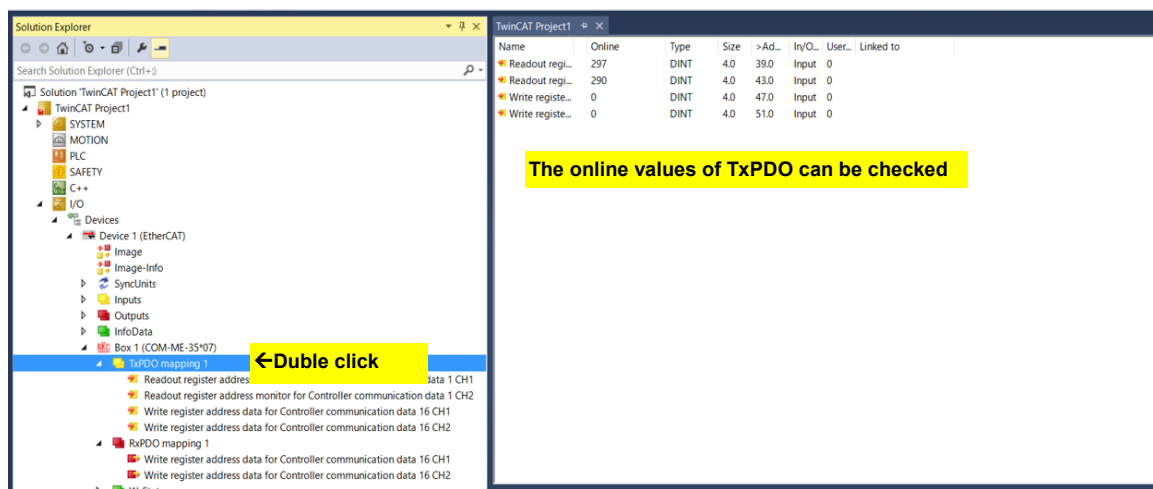
4. Double click the RxPDO mapping 1 in the tree, and show the RxPDO data in the right pane to change the set value.
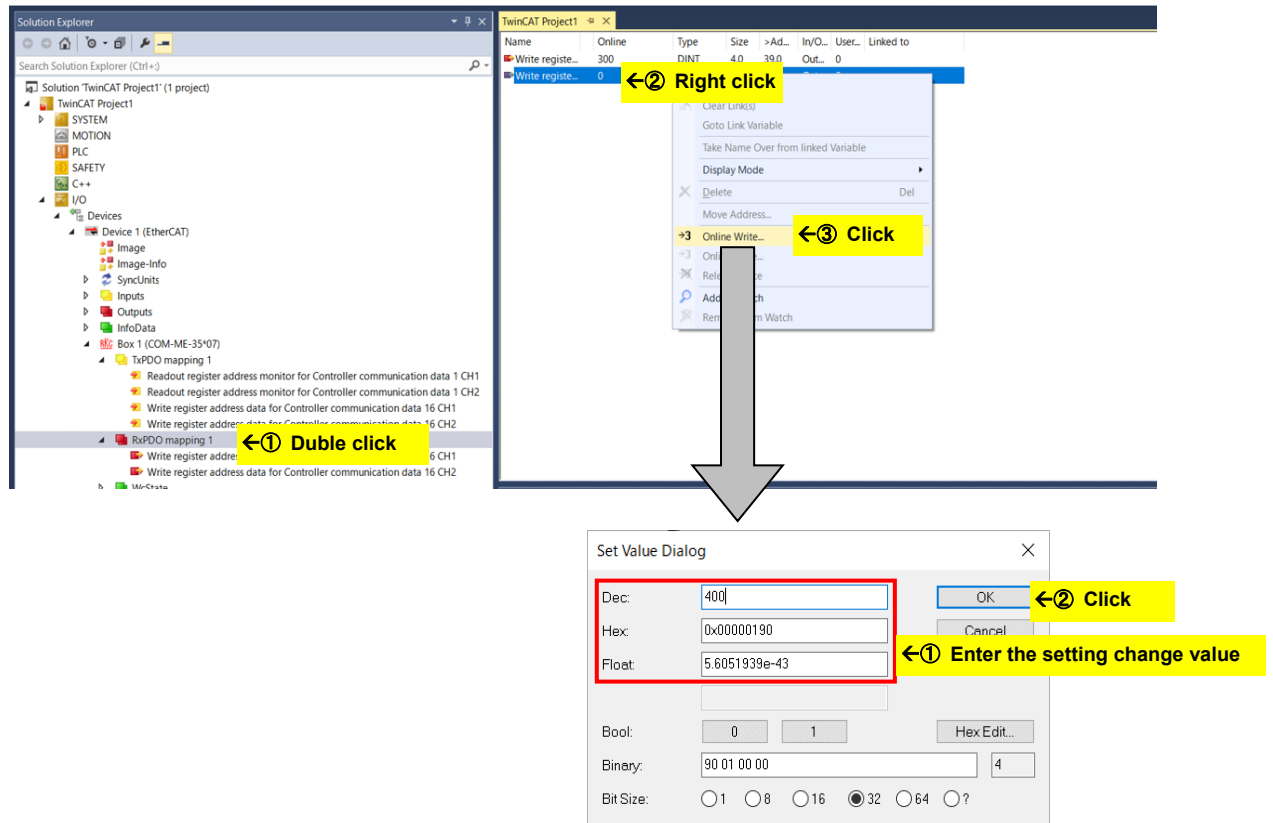
5. After the values were changed, check that the modified values are read out and displayed in TxPDO mapping 1.
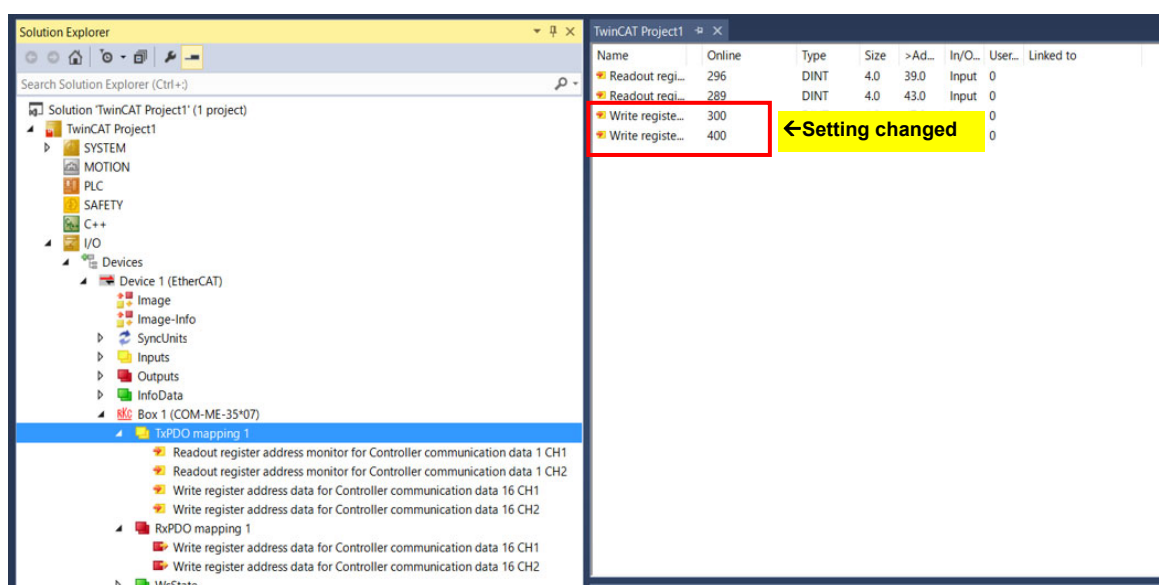
9. TROUBLESHOOTING

This section explains probable 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 it is necessary to replace a device, 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 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 controller with a new one, always use the controller with the same model code. If the controller 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
The BRD FLT lamp flashes: Major fault occur	Data backup error (Error code 2) EEPROM read/write 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.
BRD FLT lamp blinks or HRT BT lamp turns off.	Power suooly voltage monitoring error	
HRT BT lamp turns off.	Watchdog timer error	
Abnormal symptoms other than the above.	Controller communication error (Error code 16)	
	Stack overflow (Error code 64) Runaway of the program, etc.	

■ **EtherCAT**

Problem	Possible 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
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.
ERR lamp: Blinks (red)	Configuration error	Review the setting of the PDO mapping, and assign appropriate values, if necessary.
ERR lamp: Double-flashes (red)	Communication disconnection from the master was detected. (Timeout)	Turn OFF first and then restore the power supply. If the operation does not recover normally, replace the COM-ME.
ERR lamp: ON (red)	Time-out of the Watchdog in the slave	Turn OFF first and then restore the power supply. If the operation does not recover normally, replace the COM-ME.
Some devices cannot access data in daisy-chained connection.	Communication fails at the slave device connected to the master device (by failure, power supply OFF, cable breakage etc.).	Disconnect the failed device from the Daisy chain or change the wiring configuration into Star connection.
		Change the wiring configuration into dual-redundant system by making a new route from the OUT port of the end device to the master device.
Data cannot be sent or written by following the PDO communication cycle.	A switching hub commercially available is used or PDO data access route is complicated.	Use a branch unit dedicated for EtherCAT.
		Change the wiring configuration into Daisy-chained connection.
		Change the PDO communication cycle of the master device.

[Daisy-chained connection]
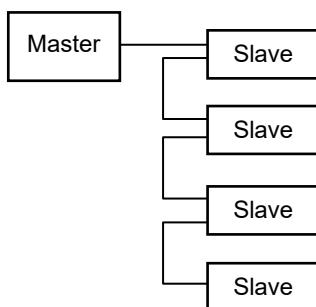
[Star connection]
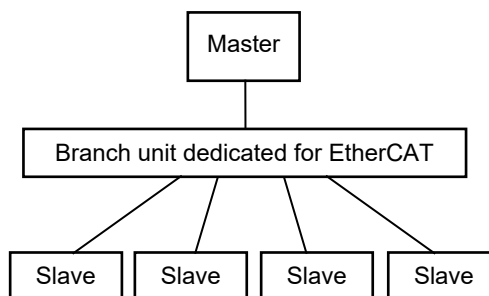
■ **Controller communication**

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	

10. SPECIFICATIONS

■ EtherCAT communication

Physical layer:	100BASE-TX
User layer:	EtherCAT
Device type:	No profile
Corresponding protocol:	CAN application protocol over EtherCAT (CoE)
Communication object:	Service data objects (SDO), Process data objects (PDO)
PDO data length:	Up to 1024 byte for both RxPDO and TxPDO
Synchronization mode:	Free Run
Number of supported FMMUs:	8
Connector type:	RJ-45 × 2 ports
Network topology:	EtherCAT compliant
Cable type:	Category 5 or higher (Shielded cable recommended)
Transmission distance:	Within 100 meters between nodes
Conformance test version:	Version 2.2.1.0

■ 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
$V(A) - V(B) \geq 1.5$ V	0 (SPACE)
$V(A) - V(B) \leq -1.5$ 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
"Controller communication register address setting instruction":

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 controller

📖   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: The display turns OFF or BRD FLT lights red.
Error communication: Communication stop
Recovery: Power off the instrument once, and power it on again.

Data backup error: Error display: BRD FLT lights red
Error communication: Error code 2
Recovery: Power off the instrument once, and power it on again.

Watchdog timer error: Error display: HRT BT turns off
Error communication: Communication stop
Recovery: Power off the instrument once, and power it on again.

● Recoverable fault

Controller communication error:
Error communication: Error code 16
Recovery: Power off the instrument once, and power it on again.

Stack overflow: 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

11. OBJECT DICTIONARY

Object dictionary defines the parameters for EtherCAT.

📖 Subindex 0 in the item where there are plural Subindexes displays the number of Subindexes in USINT data type as "Number of entries." However, if the "Number of entries" is fixed, Subindex 0 is not shown in this document.

📖 Control must be stopped to change settings of items marked with ★ in the Access column.

● **Communication Specific Data**

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x1000	0x00	Device Type	UDINT	RO		0x00000000 (No profile)
0x1008	0x00	Manufacturer Device Name	STRING	RO		COM-ME-35∗07
0x1009	0x00	Manufacturer Hardware Version	STRING	RO		xx.xx.xx
0x100A	0x00	Manufacturer Software Version	STRING	RO		xx.xx.xx
0x100B	0x00	Manufacturer Bootloader Version	STRING	RO		xx.xx.xx
0x1018		Identity Object	IDENTITY	RO		—
	0x01	Vendor ID	UDINT	RO		0x00000563
	0x02	Product Code	UDINT	RO		0x0000000F
	0x03	Revision Number	UDINT	RO		—
	0x04	Serial Number	UDINT	RO		unique number
0x10F8	0x00	Timestamp Object	ULINT	RO		Not available for DC
0x1600		RxPDO mapping 1				
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				
0x1601		RxPDO mapping 2				
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				
0x1602		RxPDO mapping 3				
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x1603		RxPDO mapping 4				
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				
0x1604		RxPDO mapping 5				
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				
0x1605		RxPDO mapping 6				
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				
0x1606		RxPDO mapping 7				
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				
0x1A00		TxPDO mapping 1				
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				
0x1A01		TxPDO mapping 2				
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x1A02	TxPDO mapping 3					
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				
0x1A03	TxPDO mapping 4					
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				
0x1A04	TxPDO mapping 5					
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				
0x1A05	TxPDO mapping 6					
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				
0x1A06	TxPDO mapping 7					
	0x00	No. of mapped application objects in PDO	USINT	RW		0 to 128
	0x01	Mapping entry 1	UDINT	RW		—
	0x02	Mapping entry 2				
	⋮	⋮				
	0x80	Mapping entry 128				
0x1C00	Sync Manager Communication Type					
	0x01	Mailbox wr	USINT	RO		1
	0x02	Mailbox rd	USINT	RO		2
	0x03	Process Data out	USINT	RO		3
	0x04	Process Data in	USINT	RO		4

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x1C12		Sync Manager Rx PDO Assign				
	0x00	Number of entries	USINT	RW		0 to 4
	0x01	Assigned PDO1	UINT	RW		0x1600 to 0x1606
	0x02	Assigned PDO2	UINT	RW		
	0x03	Assigned PDO3	UINT	RW		
	0x04	Assigned PDO4	UINT	RW		
0x1C13		Sync Manager Tx PDO Assign				
	0x00	Number of entries	USINT	RW		0 to 4
	0x01	Assigned PDO1	UINT	RW		0x1A00 to 0x1A06
	0x02	Assigned PDO2	UINT	RW		
	0x03	Assigned PDO3	UINT	RW		
	0x04	Assigned PDO4	UINT	RW		
0x1C32		SM output parameter				
	0x01	Synchronization Type	UINT	RW		0x0000 (Free Run)
	0x02	Cycle Time	UDINT	RO		Not available
	0x03	Shift Time	UDINT	RO		0
	0x04	Synchronization Types supported	UINT	RO		0x0001 (Free Run)
	0x05	Minimum Cycle Time	UDINT	RO		Not available
	0x06	Calc and Copy Time	UDINT	RO		Not available
0x1C33		SM input parameter				
	0x01	Synchronization Type	UINT	RW		0x0000 (Free Run)
	0x02	Cycle Time	UDINT	RO		Not available
	0x03	Shift Time	UDINT	RO		0
	0x04	Synchronization Types supported	UINT	RO		0x0001 (Free Run)
	0x05	Minimum Cycle Time	UDINT	RO		Not available
	0x06	Calc and Copy Time	UDINT	RO		Not available

● **Manufacturer Specific Inputs**

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x2100		Error code (COM-ME)				
	0x01	Error code (COM-ME)	UINT	RO	Tx	2: Data back-up error 16: Controller communication error 64: Stack overflow
0x2102		Backup memory state monitor (COM-ME)				
	0x01	Backup memory state monitor (COM-ME)	UINT	RO	Tx	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.
0x2104		System communication status				

	0x01	System communication status	UINT	RO	Tx	Bit data
						Bit 0: Data acquisition status
						    0: before the completion of data collection
						    1: after the completion of data collection
						Bit 1 to Bit 15: Unused

0x2105		Unused				
	0x01	Unused	UINT	RO	Tx	—
0x2106		Network error code				
	0x01	Network error code	UINT	RO	Tx	Bit data Bit 0: Network operation not possible Data 0: OFF 1: ON Bit 1 to Bit 15: Unused
0x2108		EtherCAT address				
	0x01	EtherCAT address	UINT	RO	Tx	0 to 4095 Data that are activated by starting the network operation after power is re-applied.

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x210A		EtherCAT write status				
	0x01	EtherCAT write status	UINT	RO	Tx	Bit data Bit 0: PDO is being written Bit 1: Writing to PDO is completed "Writing to PDO is completed" is enabled only when "RxPDO data setting is enabled" (0x3120) is used. Bit 2: SDO is being written Bit 3: Reserved Bit 4: Write error After occurrence of the PDO write error, the PDO write error is kept until the setting permission is changed to "0: Not allowed" is enabled when "RxPDO data setting is enabled" (0x3120) is used. If the "RxPDO data setting is enabled" (0x3120) is not used, the PDO write error is kept for one second after the occurrence of the error. Bit 5 to Bit 15: Unused
0x2200		Readout register address monitor for Controller communication data 1				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2201		Readout register address monitor for Controller communication data 2				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2202		Readout register address monitor for Controller communication data 3				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2203		Readout register address monitor for Controller communication data 4				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2204		Readout register address monitor for Controller communication data 5				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2205		Readout register address monitor for Controller communication data 6				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x2206		Readout register address monitor for Controller communication data 7				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2207		Readout register address monitor for Controller communication data 8				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2208		Readout register address monitor for Controller communication data 9				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2209		Readout register address monitor for Controller communication data 10				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x220A		Readout register address monitor for Controller communication data 11				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x220B		Readout register address monitor for Controller communication data 12				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2210		Readout register address monitor for Controller communication data 13				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2211		Readout register address monitor for Controller communication data 14				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2212		Readout register address monitor for Controller communication data 15				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2213		Readout register address monitor for Controller communication data 16				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x2214		Readout register address monitor for Controller communication data 17				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2215		Readout register address monitor for Controller communication data 18				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2216		Readout register address monitor for Controller communication data 19				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2217		Readout register address monitor for Controller communication data 20				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2218		Readout register address monitor for Controller communication data 21				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2219		Readout register address monitor for Controller communication data 22				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x221A		Readout register address monitor for Controller communication data 23				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x221B		Readout register address monitor for Controller communication data 24				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2220		Readout register address monitor for Controller communication data 25				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2221		Readout register address monitor for Controller communication data 26				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2222		Readout register address monitor for Controller communication data 27				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x2223		Readout register address monitor for Controller communication data 28				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2224		Readout register address monitor for Controller communication data 29				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2225		Readout register address monitor for Controller communication data 30				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2226		Readout register address monitor for Controller communication data 31				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2227		Readout register address monitor for Controller communication data 32				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2228		Readout register address monitor for Controller communication data 33				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2229		Readout register address monitor for Controller communication data 34				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x222A		Readout register address monitor for Controller communication data 35				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x222B		Readout register address monitor for Controller communication data 36				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2230		Readout register address monitor for Controller communication data 37				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2231		Readout register address monitor for Controller communication data 38				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x2232		Readout register address monitor for Controller communication data 39				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2233		Readout register address monitor for Controller communication data 40				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2234		Readout register address monitor for Controller communication data 41				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2235		Readout register address monitor for Controller communication data 42				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2236		Readout register address monitor for Controller communication data 43				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2237		Readout register address monitor for Controller communication data 44				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2238		Readout register address monitor for Controller communication data 45				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2239		Readout register address monitor for Controller communication data 46				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x223A		Readout register address monitor for Controller communication data 47				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x223B		Readout register address monitor for Controller communication data 48				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2240		Readout register address monitor for Controller communication data 49				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x2241		Readout register address monitor for Controller communication data 50				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2242		Readout register address monitor for Controller communication data 51				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2243		Readout register address monitor for Controller communication data 52				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2244		Readout register address monitor for Controller communication data 53				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2245		Readout register address monitor for Controller communication data 54				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2246		Readout register address monitor for Controller communication data 55				
	0x01	CH1	DINT	RO	Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x2300		Number of connected controller in controller communication				
	0x01	Number of connected controller in controller communication	UINT	RO	Tx	0 to 31
0x2301		Controller state				
	0x01	CH1	INT	RO	Tx	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]
	⋮	⋮				
	0x1F	CH31				
0x2600		General-purpose readout register				
	0x01	CH1	UINT	RO	Tx	0 to 65535
	⋮	⋮				
	0x40	CH64				

● **Manufacturer Specific Outputs**

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x3104		Controller communication communication speed				
	0x01	Controller communication communication speed	UINT	RW ★	Rx/Tx	0 or 1: 9600 bps 2: 19200 bps 3: 38400 bps 4: 57600 bps
0x3105		Controller communication data bit configuration				
	0x01	Controller communication data bit configuration	UINT	RW ★	Rx/Tx	0 to 11 Refer to **Table 1: Data bit configuration**
0x3120		RxPDO data setting enabled				

	0x01	RxPDO data setting enabled	UINT	RW	Rx/Tx	Bit data
						Bit 0: Data setting disabled/enabled
						    0: Setting disable
						    1: Setting enable
						Bit 1 to Bit 15: Unused
						Valid only when the data is assigned to the head of RxPDO 0x1600:01

0x3200		Write register address data for Controller communication data 1				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3201		Write register address data for Controller communication data 2				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3202		Write register address data for Controller communication data 3				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3203		Write register address data for Controller communication data 4				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Table 1: Data bit configuration

Set value	Data bit	Parity bit	Stop bit		Set value	Data bit	Parity bit	Stop bit
0	8	None	1		6	8	None	2
1	8	Even	1		7	8	Even	2
2	8	Odd	1		8	8	Odd	2
3	8	None	1		9	8	None	1
4	8	None	1		10	8	None	1
5	8	None	1		11	8	None	1

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x3204		Write register address data for Controller communication data 5				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3205		Write register address data for Controller communication data 6				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3206		Write register address data for Controller communication data 7				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3207		Write register address data for Controller communication data 8				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3208		Write register address data for Controller communication data 9				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3209		Write register address data for Controller communication data 10				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x320A		Write register address data for Controller communication data 11				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x320B		Write register address data for Controller communication data 12				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3210		Write register address data for Controller communication data 13				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3211		Write register address data for Controller communication data 14				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3212		Write register address data for Controller communication data 15				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x3213	Write register address data for Controller communication data 16					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3214	Write register address data for Controller communication data 17					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3215	Write register address data for Controller communication data 18					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3216	Write register address data for Controller communication data 19					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3217	Write register address data for Controller communication data 20					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3218	Write register address data for Controller communication data 21					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3219	Write register address data for Controller communication data 22					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x321A	Write register address data for Controller communication data 23					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x321B	Write register address data for Controller communication data 24					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3220	Write register address data for Controller communication data 25					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3221	Write register address data for Controller communication data 26					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x3222		Write register address data for Controller communication data 27				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3223		Write register address data for Controller communication data 28				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3224		Write register address data for Controller communication data 29				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3225		Write register address data for Controller communication data 30				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3226		Write register address data for Controller communication data 31				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3227		Write register address data for Controller communication data 32				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3228		Write register address data for Controller communication data 33				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3229		Write register address data for Controller communication data 34				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x322A		Write register address data for Controller communication data 35				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x322B		Write register address data for Controller communication data 36				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3230		Write register address data for Controller communication data 37				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x3231	Write register address data for Controller communication data 38					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3232	Write register address data for Controller communication data 39					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3233	Write register address data for Controller communication data 40					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3234	Write register address data for Controller communication data 41					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3235	Write register address data for Controller communication data 42					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3236	Write register address data for Controller communication data 43					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3237	Write register address data for Controller communication data 44					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3238	Write register address data for Controller communication data 45					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3239	Write register address data for Controller communication data 46					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x323A	Write register address data for Controller communication data 47					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x323B	Write register address data for Controller communication data 48					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description	
0x3240		Write register address data for Controller communication data 49					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.	
	⋮	⋮					
	0x1F	CH31					
0x3241		Write register address data for Controller communication data 50					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.	
	⋮	⋮					
	0x1F	CH31					
0x3242		Write register address data for Controller communication data 51					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.	
	⋮	⋮					
	0x1F	CH31					
0x3243		Write register address data for Controller communication data 52					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.	
	⋮	⋮					
	0x1F	CH31					
0x3244		Write register address data for Controller communication data 53					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.	
	⋮	⋮					
	0x1F	CH31					
0x3245		Write register address data for Controller communication data 54					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.	
	⋮	⋮					
	0x1F	CH31					
0x3246		Write register address data for Controller communication data 55					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.	
	⋮	⋮					
	0x1F	CH31					
0x3247		Write register address data for Controller communication data 56					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.	
	⋮	⋮					
	0x1F	CH31					
0x3248		Write register address data for Controller communication data 57					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.	
	⋮	⋮					
	0x1F	CH31					
0x3249		Write register address data for Controller communication data 58					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.	
	⋮	⋮					
	0x1F	CH31					
0x324A		Write register address data for Controller communication data 59					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.	
	⋮	⋮					
	0x1F	CH31					

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x324B	Write register address data for Controller communication data 60					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3250	Write register address data for Controller communication data 61					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3251	Write register address data for Controller communication data 62					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3252	Write register address data for Controller communication data 63					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3253	Write register address data for Controller communication data 64					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3254	Write register address data for Controller communication data 65					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3255	Write register address data for Controller communication data 66					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3256	Write register address data for Controller communication data 67					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3257	Write register address data for Controller communication data 68					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3258	Write register address data for Controller communication data 69					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3259	Write register address data for Controller communication data 70					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x325A	Write register address data for Controller communication data 71					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x325B	Write register address data for Controller communication data 72					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3260	Write register address data for Controller communication data 73					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3261	Write register address data for Controller communication data 74					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3262	Write register address data for Controller communication data 75					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3263	Write register address data for Controller communication data 76					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3264	Write register address data for Controller communication data 77					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3265	Write register address data for Controller communication data 78					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3266	Write register address data for Controller communication data 79					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3267	Write register address data for Controller communication data 80					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3268	Write register address data for Controller communication data 81					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x3269	Write register address data for Controller communication data 82					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x326A	Write register address data for Controller communication data 83					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x326B	Write register address data for Controller communication data 84					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3270	Write register address data for Controller communication data 85					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3271	Write register address data for Controller communication data 86					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3272	Write register address data for Controller communication data 87					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3273	Write register address data for Controller communication data 88					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3274	Write register address data for Controller communication data 89					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3275	Write register address data for Controller communication data 90					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3276	Write register address data for Controller communication data 91					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3277	Write register address data for Controller communication data 92					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x3278		Write register address data for Controller communication data 93				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3279		Write register address data for Controller communication data 94				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x327A		Write register address data for Controller communication data 95				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x327B		Write register address data for Controller communication data 96				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3280		Write register address data for Controller communication data 97				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3281		Write register address data for Controller communication data 98				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3282		Write register address data for Controller communication data 99				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3283		Write register address data for Controller communication data 100				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3284		Write register address data for Controller communication data 101				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3285		Write register address data for Controller communication data 102				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3286		Write register address data for Controller communication data 103				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x3287	Write register address data for Controller communication data 104					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3288	Write register address data for Controller communication data 105					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3289	Write register address data for Controller communication data 106					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x328A	Write register address data for Controller communication data 107					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x328B	Write register address data for Controller communication data 108					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3290	Write register address data for Controller communication data 109					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3291	Write register address data for Controller communication data 110					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3292	Write register address data for Controller communication data 111					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3293	Write register address data for Controller communication data 112					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3294	Write register address data for Controller communication data 113					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3295	Write register address data for Controller communication data 114					
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x3296		Write register address data for Controller communication data 115				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3297		Write register address data for Controller communication data 116				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3298		Write register address data for Controller communication data 117				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3299		Write register address data for Controller communication data 118				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x329A		Write register address data for Controller communication data 119				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x329B		Write register address data for Controller communication data 120				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32A0		Write register address data for Controller communication data 121				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32A1		Write register address data for Controller communication data 122				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32A2		Write register address data for Controller communication data 123				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32A3		Write register address data for Controller communication data 124				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32A4		Write register address data for Controller communication data 125				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x32A5		Write register address data for Controller communication data 126				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32A6		Write register address data for Controller communication data 127				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32A7		Write register address data for Controller communication data 128				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32A8		Write register address data for Controller communication data 129				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32A9		Write register address data for Controller communication data 130				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32AA		Write register address data for Controller communication data 131				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32AB		Write register address data for Controller communication data 132				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32B0		Write register address data for Controller communication data 133				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32B1		Write register address data for Controller communication data 134				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32B2		Write register address data for Controller communication data 135				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32B3		Write register address data for Controller communication data 136				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x32B4		Write register address data for Controller communication data 137				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32B5		Write register address data for Controller communication data 138				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32B6		Write register address data for Controller communication data 139				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32B7		Write register address data for Controller communication data 140				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32B8		Write register address data for Controller communication data 141				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32B9		Write register address data for Controller communication data 142				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32BA		Write register address data for Controller communication data 143				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32BB		Write register address data for Controller communication data 144				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32C0		Write register address data for Controller communication data 145				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32C1		Write register address data for Controller communication data 146				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32C2		Write register address data for Controller communication data 147				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x32C3		Write register address data for Controller communication data 148				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32C4		Write register address data for Controller communication data 149				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x32C5		Write register address data for Controller communication data 150				
	0x01	CH1	DINT	RW	Rx/Tx	The data range depends on the assigned data.
	⋮	⋮				
	0x1F	CH31				
0x3300		Action mode selection				
	0x01	Action mode selection	UINT	RW ★	Rx/Tx	Bit data Bit 0: Address setting 　0: Continuous setting 　1: Free setting Bit 1 to Bit 14: Unused [Decimal number: 0 to 1]
0x3301		Transmission wait time of controller communication				
	0x01	Transmission wait time of controller communication	UINT	RW ★	Rx/Tx	0 to 250 ms
0x3302		Controller address				
	0x01	No. 1 Controller address	UINT	RW ★	Rx/Tx	1 to 99 0: There is no connection controller
	⋮	⋮				
	0x1F	No. 31 Controller address				
0x3303		Automatic acquisition of controller address				
	0x01	Automatic acquisition of controller address	UINT	RW ★	Rx/Tx	0: Do not execute the automatic acquisition 1: Execute the automatic acquisition
0x3304		Readout register address of Controller communication				
	0x01	Readout register address of Controller communication data 1	UINT	RW	Rx/Tx	0 to 65534: Controller readout register address 65535 (0xFFFF): Set to "Disabled"
	⋮	⋮				
	0x37	Readout register address of Controller communication data 55				

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0x3305		Write register address of Controller communication X				
	0x01	Write register address of Controller communication data 1	UINT	RW	Rx/Tx	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled"
	⋮	⋮				
	0x32	Write register address of Controller communication data 50				
0x3306		Write register address of Controller communication Y				
	0x01	Write register address of Controller communication data 51	UINT	RW	Rx/Tx	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled"
	⋮	⋮				
	0x32	Write register address of Controller communication data 100				
0x3307		Write register address of Controller communication Z				
	0x01	Write register address of Controller communication data 101	UINT	RW	Rx/Tx	0 to 65534: Controller write register address 65535 (0xFFFF): Set to "Disabled"
	⋮	⋮				
	0x32	Write register address of Controller communication data 150				
0x3308		Waiting time for Controller communication start				
	0x01	Waiting time for Controller communication start	UINT	RW ★	Rx/Tx	0 to 100 (0.0 to 10.0 秒)
0x3309		Controller communication register address setting instruction				
	0x01	Controller communication register address setting instruction	UINT	RW	Rx/Tx	0: Initial state at power on/End of setting 1: Start setting After "1" was set, the value will automatically return to "0."
0x330A		Supported communication mode setting				
	0x01	Supported communication mode setting	UINT	RW ★	Rx/Tx	0: Single word mode 1: Double word mode (Data transfer: in the order from upper word to lower word) 2: Double word mode (Data transfer: in the order from lower word to upper word)
0x3600		General-purpose readout register				
	0x01	CH1	UINT	RW	Rx/Tx	0 to 65535
	⋮	⋮				
	0x40	CH64				

● **Semiconductor Device Profile Area**

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0xF000		Semiconductor Device Profile				
	0x01	Index Distance	UINT	RO		0x0800
	0x02	Maximum Number of Modules	UINT	RO		1
0xF010		Module Profile List				
	0x01	Module Profile List	UDINT	RO		0x00000000 (No Profile)

● **CDP Device Specific Inputs**

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0xF6F0		Input Latch Local Timestamp				
	0x01	Input Latch Local Timestamp	UDINT	RO	Tx	0x00000000 to 0xFFFFFFFF Updated at the timing of updating TxPDO data (unit: μs)

● CDP Device Specific Information Data

Index	Sub-Index	Name	Data type	Access	PDO mapping	Description
0xF9F0	0x00	Manufacturer Serial Number	STRING(20)	RO		Displayed in a maximum of 20 digit string. (RKC's 8-digit serial number including alphabet is displayed)
0xF9F1		CDP Functional Generation Number				
	0x01	CDP Functional Generation Number	UDINT	RO		CDP Functional Generation Number 0x00000002 is displayed
0xF9F2		SDP Functional Generation Number				
	0x01	SDP Functional Generation Number	UDINT	RO		SDP Functional Generation Number No particular SDP is supported and 0x00000000 is displayed.
0xF9F3	0x00	Vendor Name	STRING(24)	RO		RKC INSTRUMENT INC.
0xF9F4		Semiconductor SDP Device Name				
	0x01	Semiconductor SDP Device Name	STRING(32)	RO		No particular SDP is supported and "N/A" is displayed.
0xF9F5		Output Identifier				
	0x01	Output Identifier	USINT	RW	Rx/Tx	0x00 to 0xFF
0xF9F6	0x00	Time since power on	UDINT	RO		Time since power on is displayed. 0 to 4294967295 seconds
0xF9F7	0x00	Total time powered	UDINT	RO		0 to 4294967295 seconds (Total time device has received power in seconds. Time less than one hour is truncated)
0xF9F8	0x00	Firmware Update Functional Generation Number	UDINT	RO		Firmware update functional generation number 0x00000001 is displayed.

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