*DeviceNet*
*Communication Converter*

# *COM-H*

## *Instruction Manual*

RKC® RKC INSTRUMENT INC.

IMR01L01-E6

- DeviceNet is a registered trademark of Open DeviceNet Vender Association, Inc.
- 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.
- This product has been self-tested by RKC at DeviceNet Protocol Conformance Test Software Version A-17.

Thank you for purchasing this RKC product. In order to achieve maximum performance and ensure proper operation of your new instrument, carefully read all the instructions in this manual. Please place the manual in a convenient location for easy reference.

# SYMBOLS

**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.

 : 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.

## ⚠ WARNING

- To prevent injury to persons, damage to instrument and 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 instrument and equipment.
- This instrument must be used in accordance with the specifications to prevent fire or damage to instrument and 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 can 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.)
- 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 by 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.
- All wiring must be completed before power is turned on to prevent electric shock, instrument failure, or incorrect action.
  The power must be turned off before repairing work for input break and output failure including replacement of sensor, contactor or SSR, and all wiring must be completed before power is turned on again.
- 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.
- 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 dispensation.
- 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 will occur. Use a soft, dry cloth to remove stains from the instrument.
- To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.
- Do not connect modular connectors to telephone line.
- When high alarm with hold action/re-hold action is used for Alarm function, alarm does not turn on while hold action is in operation. Take measures to prevent overheating which may occur if the control device fails.

## 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 purpose of illustration.
- 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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# 1. OUTLINE

This manual describes the specifications, mounting, wiring, switch setting and data details for the **COM-H**.

## 1.1 Product Outline

The COM-H DeviceNet communication converter (hereafter called "COM-H") is a communication converter used to connect the DeviceNet that is a multivendor compatible open field network to our RKC controllers (SR Mini HG SYSTEM, REX-F400/700/900, CB100/400/500/700/900, SA100/200, MA900/901, LE100, REX-PG410).
On the DeviceNet, a programmable controller (hereafter called "PLC") or personal computer becomes a master device, while the COM-H, a slave device.

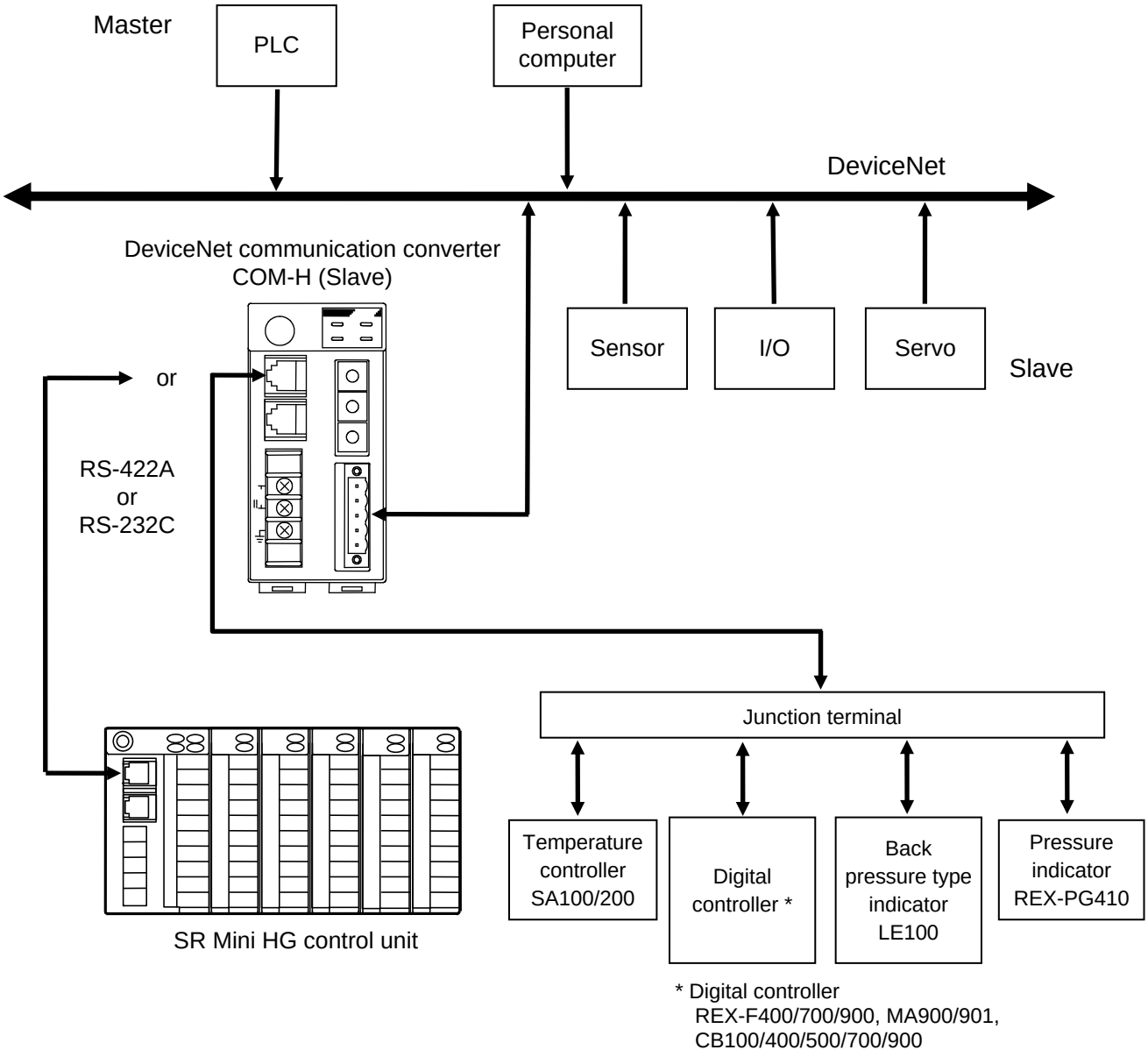


Fig. 1-1 System configuration example

## 1.1.1 Communication ports

COM-H has the following two kinds of communication ports.

### ■ DeviceNet communication port (COM. PORT3)

This is a port to be connected to DeviceNet. There is a 2 type of an open-style connector of an unsealed type and a micro-style connector (optional) of a sealed type.

☞ For DeviceNet, refer to the home page of ODVA (Open DeviceNet Vender Association).
URL: http://www.odva.org

### ■ RKC Controller communication port (COM. PORT1)

This port is a port for RKC standard communication to use for connection with SR Mini HG, REX-F400/700/900, CB100/400/500/700/900, SA100/200, MA900/901, LE100 or REX-PG410.

📖 **Cannot be connection that mixed SR Mini HG with REX-F400/700/900, CB100/400/500/700/900, SA100/200, MA900/901, LE100 and REX-PG410.**

### ■ Connectable controller

#### ● SR Mini HG

One SR Mini HG control unit can connect for one COM-H.

Modules (names/model codes) that can be configured by the SR Mini HG to be connected to the COM-H are as follows.

- Power supply/CPU module: H-PCP-A, H-PCP-B, H-PCP-J
- Temperature control module: H-TIO-A, H-TIO-B, H-TIO-C, H-TIO-D, H-TIO-E, H-TIO-F, H-TIO-G, H-TIO-H, H-TIO-J, H-TIO-P, H-TIO-R
- Current transformer input module: H-CT-A
- DO module: H-DO-A, H-DO-B, H-DO-C
- DI module: H-DI-A
- Analog input module: H-AI-A, H-AI-B
- Analog output module: H-AO-A

☞ For SR Mini HG module configuration method, refer to **SR Mini HG SYSTEM Hardware Quick Manual (IMS01V01-E□), SR Mini HG SYSTEM Hardware Instruction Manual (IMSRM15-E□)** or **Power supply/CPU module H-PCP-J Instruction Manual (IMS01J02-E□)**.

- **REX-F400/700/900**
  **CB100/400/500/700/900**
  **SA100/200**
  **LE100**
  **REX-PG410**

Up to 24 controllers can be connected to one COM-H.

- **MA900/901**

Up to six MA900 (4 channel specification) or up to three MA901 (8 channel specification) can be connected to one COM-H.

**The REX-F400/700/900, CB100/400/500/700/900, SA100/200 and MA900/901 can be connected together with the LE100. The maximum number of controllers when connected together is 24 in total. However for the MA900/901, one MA900 is counted as four controllers and one MA901, as eight controllers.**
**Cannot be connection that mixed SR Mini HG with REX-F400/700/900, CB100/400/500/700/900, SA100/200, MA900/901, LE100 and REX-PG410.**

## 1.1.2 EDS file

The EDS file for COM-H can be downloaded from the official RKC website:
http://www.rkcinst.com/english/download/field_network.htm.
Use the EDS file when recognizing the COM-H on the DeviceNet by using a configurator (tool used to set a master or slave environment on the DeviceNet) of each manufacturer.

For details, refer to Configuration Tool Instruction Manual of each company or Instruction Manual of the master product.

## 1.2 Model Code

The model code for the instrument you received is listed below. Please confirm that you have received the correct instrument by checking the nameplate, located on the left side of the COM-H, with this list. If the product you received is not the one ordered, contact RKC sales office or agent for replacement.

### ■ DeviceNet communication converter

**COM - H - 3 - 90 - □ - □**
**(1) (2) (3) (4)**

**(1) Power supply type**

3: 24 V DC

**(2) Corresponding RKC controller**

90: SR Mini HG SYSTEM
REX-F400/700/900
CB100/400/500/700/900
SA100/200
MA900/901
LE100
REX-PG410

**(3) Controller communication** *

1: RS-232C (RKC communication)
4: RS-422A (RKC communication)

* It is required to coincide with the communication interface for the corresponding RKC controller. When uses the controllers of RS-485 interface, wires it with TA-RA and TB-RB with the communication terminal of the controller.

**(4) Connector types**

N: Open-style connector (Unshielded type)
1: Micro-style connector (Shield type)

### ■ Modular connector cables (Sold separately)

**W - BF - 01 - □□□□**

W-BF-01: Used to connect the REX-F400/700/900, CB100/400/500/700/900, SA100/200, MA900/901, LE100 or REX-PG410. If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

**W - BF - 02 - □□□□**

W-BF-02: Used to connect the SR Mini HG. If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

"□□□□" are filled with cable length in mm. Please specify the length on your purchasing order. The standard length is "3000."

## 1.3 Parts Description

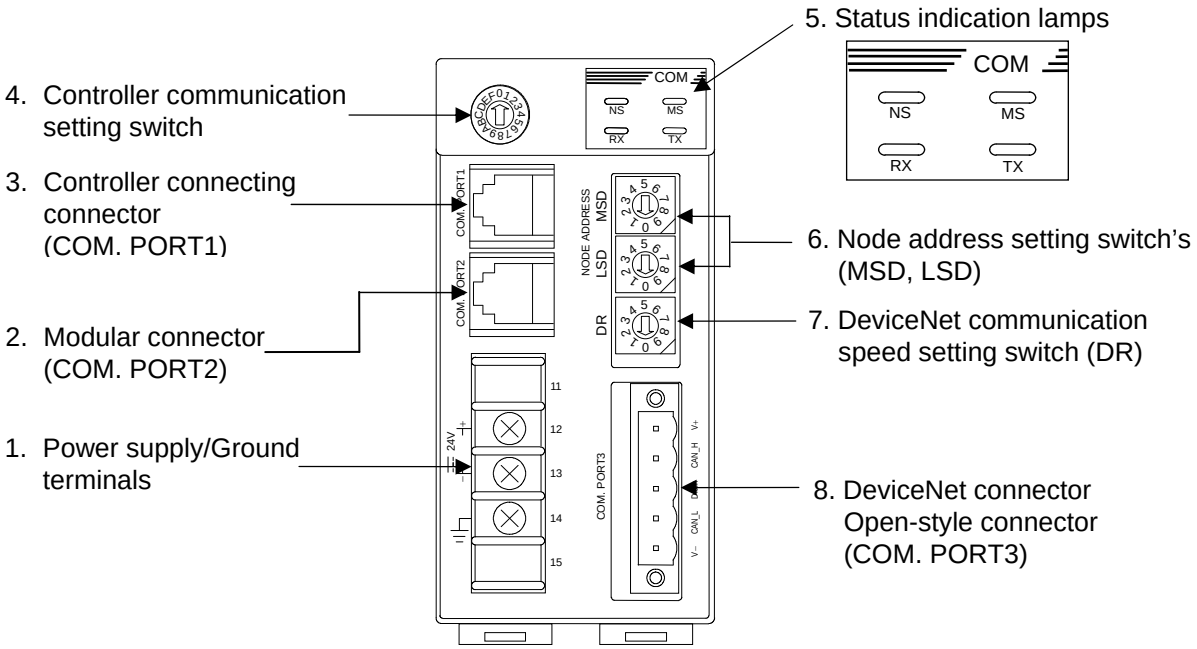


Fig. 1-2 Front view of open-style connector type

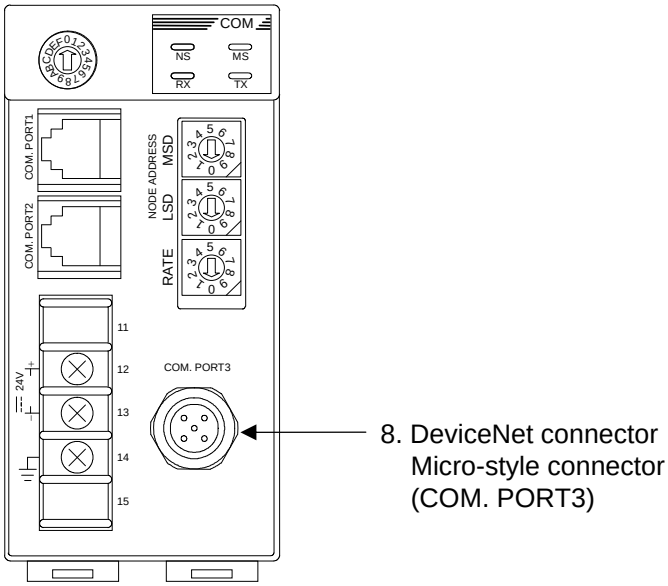


Fig. 1-3 Front view of micro-style connector type

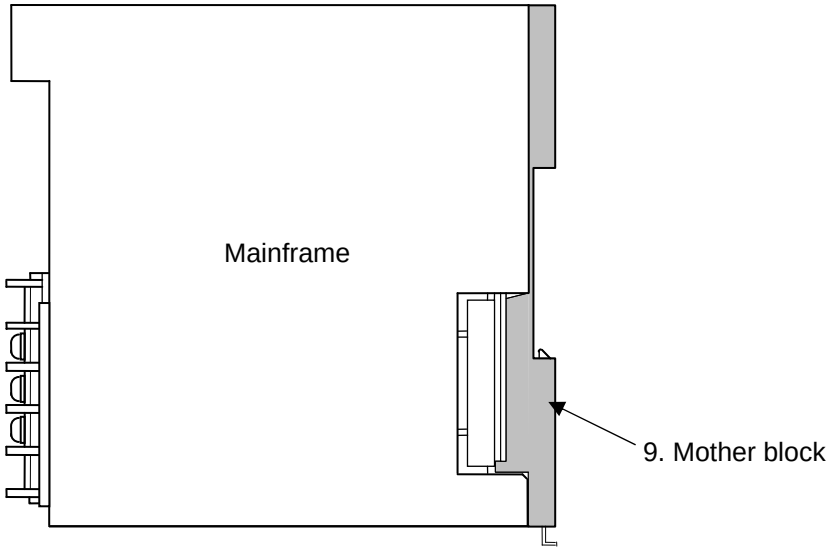


Fig. 1-4 Right side view

| No. | Name | Description |
|---|---|---|
| 1 | Power supply/Ground terminals | Power supply terminals and Ground terminal |
| 2 | Modular connector (COM. PORT2) | Unused |
| 3 | Controller connecting connector (COM. PORT1) | Controller communication port (RS-422A or RS-232C) |
| 4 | Controller communication setting switch | Controller communication speed and data bit configuration setting switch |
| 5 | Status indication lamps | NS (Network Status)<br>• OFF:<br>Power supply OFF or DeviceNet is off line<br>• Flashing (Green):<br>Network is operating normally, but communications have not yet been established<br>• ON (Green):<br>Network is operating normally (communications established)<br>• Flashing (Red):<br>Connection of one or more is timeout<br>• ON (Red):<br>A fatal communications error has occurred<br>Network communications are not possible<br>Check for a node address duplication or Bus Off error |

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| No. | Name | Description |
|---|---|---|
| 5 | Status indication lamps | MS (Module Status)<br>• OFF:<br>Power is not spplied<br>• Flashing (Green):<br>In activation, be checking communication with controller<br>• ON (Green):<br>Normal operating status<br>• ON (Red):<br>Watchdog timer error<br>RX (Yellow)<br>ON during the controller data is correctly received<br>TX (Yellow)<br>ON during the controller data is correctly sent |
| 6 | Node address setting switch's<br>(MSD, LSD) | Set node address (MAC ID) number of the DeviceNet<br>Setting range: 00 to 63<br>Upper-side (MSD): High-order digit setting (Set value × 10)<br>Lower-side (LSD): Low-order digit setting (Set value × 1) |
| 7 | DeviceNet communication speed setting switch<br>(DR or RATE) | DeviceNet communication speed setting switch |
| 8 | DeviceNet connector<br>(COM. PORT3) | The communication port for DeviceNet connection |
| 9 | Mother block | Module DIN rail mounting connector |

Various symbols are used on the equipment, they have the following meaning.


: Direct current


: Functional grounding terminal


: Reinforced insulation


: Safety precaution (Refer to the this Manual)

# 2. SPECIFICATIONS

## ■ DeviceNet communication

**Protocol:** DeviceNet

**Supported connection:** Polling I/O, Explicit message

**Connection method:** Multi-drop connection, T-branch connection
(Terminating resistor is necessary)

**Communication speed:** 125 kbps, 250 kbps, 500 kbps
(Communication speed can be selected with switch)
Factory set value: 125 kbps

**Communication length:**

| Communication speed | Maximum network length * | | Maximum drop length | Cumulative drop length |
|---|---|---|---|---|
| | Thick trunk length | Thin trunk length | | |
| 125 kbps | 500 m or less | 100 m or less | 6 m or less | 156 m or less |
| 250 kbps | 250 m or less | | | 78 m or less |
| 500 kbps | 100 m or less | | | 39 m or less |

* The maximum of length between nodes

**Maximum number of connection nodes:**
64 (including master)

**Error control:** CRC error, Node address (MAC ID) duplication check

## ■ Controller communication

**Communication interface:** Based on RS-422A, EIA standard
Based on RS-232C, EIA standard
Specify when ordering

**Communication method:** Four-wire system, half-duplex multi-drop connection (RS-422A)
Half-duplex point-to-point connection (RS-232C)

**Protocol:** Based on ANSI X 3.28-1976 subcategories 2.5 and B1

**Synchronous method:** Start/stop synchronous type

**Communication speed:** 4800 bps, 9600 bps, 19200 bps
(Communication speed can be selected with switch)
Factory set value: 9600 bps

**Data bit configuration:** Start bit: 1
Data bit: 7 or 8
Parity bit: Without, Odd or Even
Without for 8 data bits
Stop bit: 1

**Communication code:** ASCII 7-bit code

**Number of connections:** Number of the controller that it can be connected to for one COM-H *

- SR Mini HG: 1 unit
- REX-F400/700/900: Up to 24 controllers
- CB100/400/500/700/900: Up to 24 controllers
- SA100/200: Up to 24 controllers
- LE100: Up to 24 controllers
- REX-PG410: Up to 24 controllers
- MA900: Up to 6 controllers
- MA901: Up to 3 controllers

* The REX-F400/700/900, CB100/400/500/700/900, SA100/200, MA900/901, LE100 and REX-PG410 can be connected together with the REX-PG410. The maximum number of controllers when connected together is 24 in total. However for the MA900/901, one MA900 is counted as four controllers and one MA901, as eight controllers. In addition cannot do the connection that mixed SR Mini HG with REX-F400/700/900, CB100/400/500/700/900, SA100/200, MA900/901, LE100 and REX-PG410.

## ■ Power input

**Power supply voltage:** 24 V DC (Rating)

**Power supply voltage range:** 21.6 to 26.4 V DC
Ripple noise: 10 % (peak to peak) or less

**Power consumption:** 70 mA max.

## ■ Self-diagnostic

**Check item:** Watchdog timer

**Action at self-diagnostic error:** MS lamp (red) ON All the other display is OFF

## ■ General specifications

**Insulation resistance:** Between power and ground terminals:
20 MΩ or more at 500 V DC
Between communication and ground terminals:
20 MΩ or more at 500 V DC

**Withstand voltage:** Between power and ground terminals:
1 minute at 1500 V AC
Between communication and ground terminals:
1 minute at 1000 V AC

**Withstand noise:** 1500 V (peak to peak)
Pulse width: 1 μs
Rise time: 1 ns
By noise simulator

**Power failure:** A power failure of 50 ms or less will not affect the control action.

**Memory backup:** Backed up by non-volatile memory (EEPROM)
Number of writing: Approx. 100,000 times
Data storage period: Approx. 10 years

**Allowable ambient temperature:** 0 to 50 °C

**Allowable ambient humidity:** 45 to 85 % 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

**Ambient operating atmosphere:** There should be neither corrosive gases nor much dust.

**Storage temperature range:** –20 to +50 °C

**Storage humidity range:** 95 % RH or less (Non condensing)

**Dimensions:** 48 (W) × 96 (H) × 100 (D) mm

**Weight:** Approx. 270 g

# 3. MOUNTING

**⚠ WARNING**

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

## 3.1 Mounting Environment

(1) This instrument is intended to be used under the following environmental conditions. **(IEC61010-1)**
[OVERVOLTAGE CATEGORY II, POLLUTION DEGREE 2]

(2) Use this instrument within the following environment conditions:
- Allowable ambient temperature: 0 to 50 °C
- Allowable ambient humidity: 45 to 85 % 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 mainframe.
- 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:
- Ensure at least 50 mm space on top and bottom of the instrument for maintenance and environmental reasons.
- Do not mount this instrument directly above equipment that generates large amount of heat (heaters, transformers, semi-conductor functional devices, large-wattage resistors).
- If the ambient temperature rises above 50 °C, cool this instrument with a forced air fan, cooler, etc. 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.

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

## 3.2 Dimensions

### ■ External dimensions

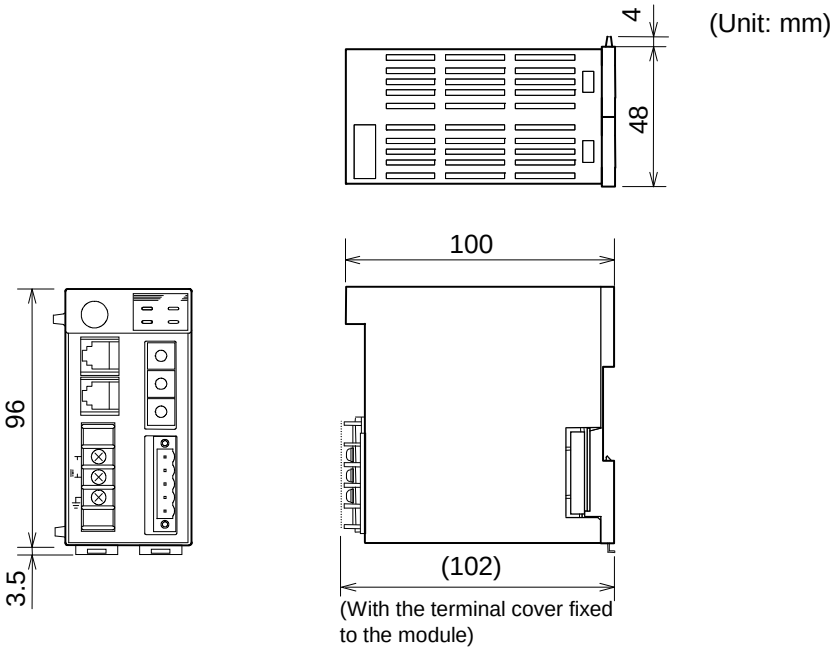



Fig. 3-1 External dimensions

The above figure is open-style connector type. The figure of micro-style connector type is the same as an open-style connector type.

### ■ Module mounting depth (for DIN rail mounting)

The mounting depth of module is 108 mm from the mounting surface inside the panel to the front of the module with the module mounted on the DIN rail.
However, when connected with a connection cable the following dimensions need to be added.

- Open-style connector type: Approx. 50 mm
- Micro-style connector type: Approx. 100 mm

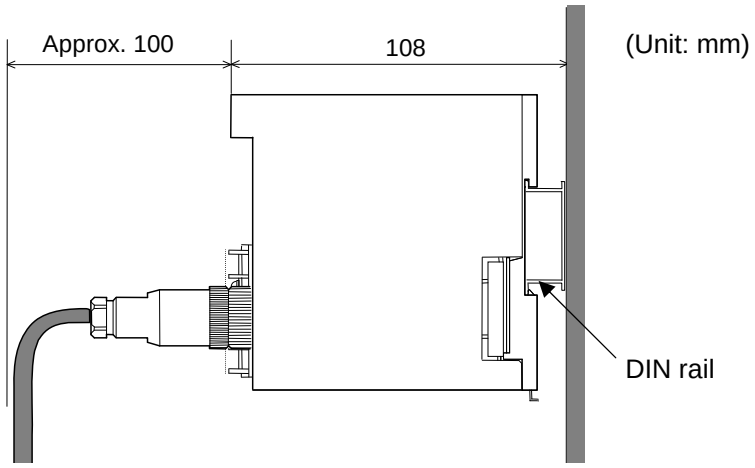



Fig. 3-2 Example of module mounting depth (For micro-style connector)

## 3.3 Mounting the Mother Block

The mother block can be mounted to a panel or DIN rail.

### ■ Panel mounting

***1.*** Refer to both the panel mounting dimensions below and the external dimensions in previous section when selecting the location.

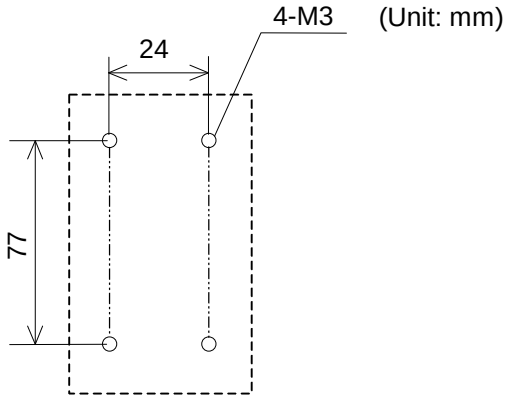
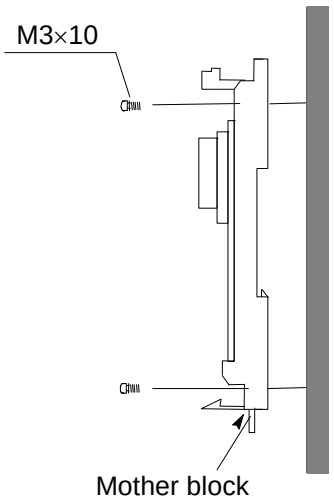



Fig. 3-3 Mounting dimensions

***2.*** Remove the module from the mother block. For details of removing the module, refer to **3.5 Removing the Module Mainframe (P. 15)**.

***3.*** Connect the mother blocks together before tightening the screws on the panel.
(Customer must provide the set screws)




**Recommended tightening torque :**
**0.3 N·m (3 kgf·cm)**

**When the mother block is mounted on the panel, 50 mm or more space is required at the top and bottom of the mother block to attach the module mainframe.**

Fig. 3-4 Panel mounting

## ■ DIN rail mounting

***1.*** Remove the module mainframe from the mother block. For details of removing the module mainframe, refer to **3.5 Removing the Module Mainframe (P. 15)**.

***2.*** Pull down both locking devices at the bottom of the mother block. (A)

***3.*** Attach the top bracket of the mother block to the DIN rail and push the lower section into place on the DIN rail. (B)

***4.*** Slide the locking devices up to secure the mother block to the DIN rail. (C)

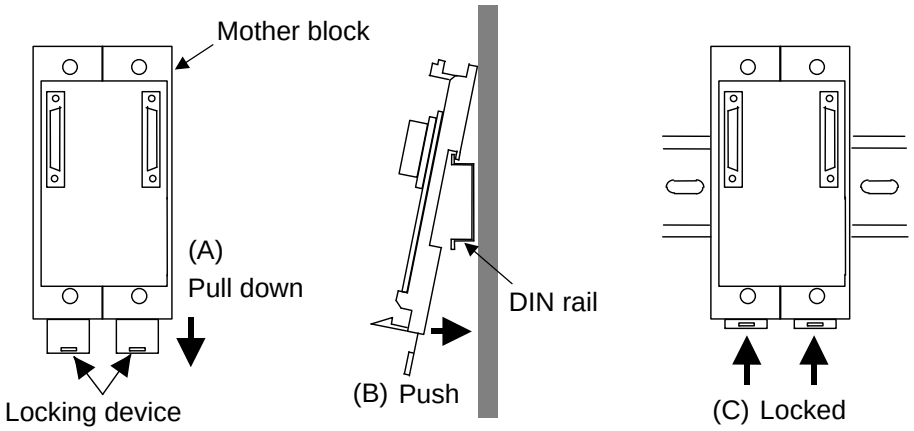



Fig. 3-5 Mounting the mother block

**When the mother block is mounted on panel, 50 mm or more space is required at the top and bottom of the mother block to attach the module mainframe.**

## 3.4 Mounting the Module Mainframe

It engages the module with the mother block that is mounted on DIN rail or a panel.

***1.*** Place the module mainframe opening on top of the mother block tab. (A)

***2.*** Snap the lower part of module mainframe on to the mother block. (B)

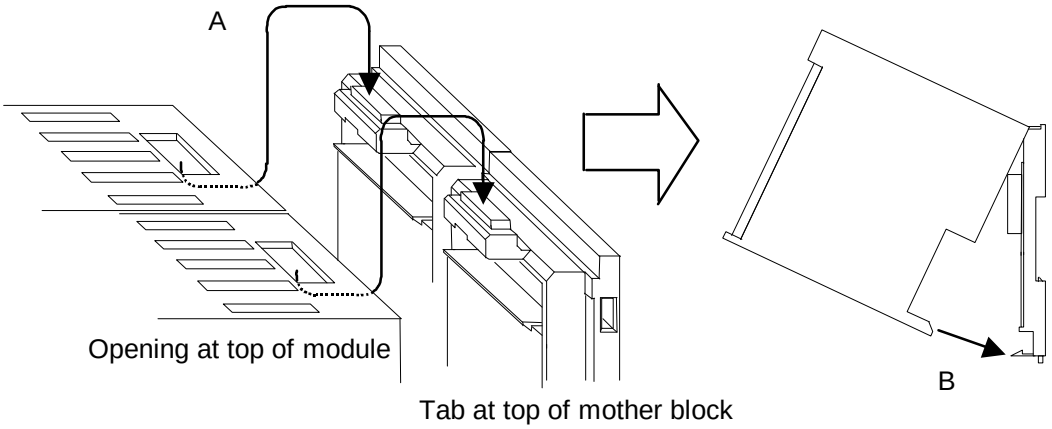



Fig. 3-6 Mounting the module mainframe

A snapping sound will be heard when module mainframe is securely connected to mother block.

## 3.5 Removing the Module Mainframe

To separate the module mainframe from the mother block, press the bottom on the module, lifting upward, to release connection.

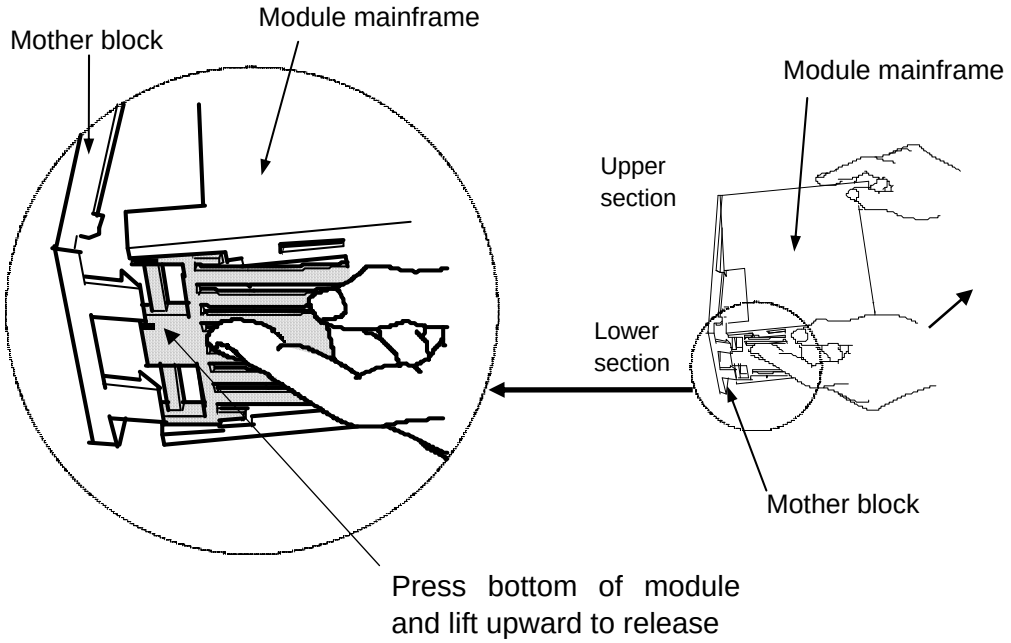



Fig. 3-7 Removing the module mainframe

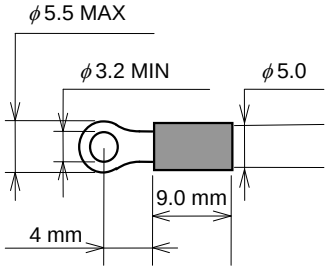
# 4. WIRING

## 4.1 Wiring Cautions

**⚠ WARNING**

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

- To avoid noise induction, keep communication signal wires 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.
- Use a shielded wire when wiring input or output in a noisy environment to resist noise influence.
- Power supply wiring must be twisted and have a low voltage drop.
- This instrument with 24 V power supply is not provided with an overcurrent protection device. For safety install an overcurrent protection device (such as fuse) with adequate breaking capacity close to the instrument.
  - Fuse type: Time-lag fuse (Approved fuse according IEC60127-2 and/or UL248-14)
  - Fuse rating: Rated current: 0.5 A
- For an instrument with 24 V power supply input, supply power from "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 8 A).
- COM-H is provided with a functional grounding terminal. A functional grounding terminal means one that is not required for safety purposes but is used for some functional purpose (such as grounding noise filters).
- Use the solderless terminal appropriate to the screw size.
  - Screw Size: M3 × 7
  - 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 terminals:
    Manufactured by J.S.T MFG CO., LTD.
    Circular terminal with isolation V1.25–3
    (M3 screw, width 5.5 mm, hole diameter 3.2 mm)




- Make sure that during field wiring parts of conductors cannot come into contact with adjacent conductive parts.

# 4.2 Terminal Configuration

**Terminal screw**
Screw size: M3
Recommended tightening torque:
0.4 N·m (4 kgf·cm)
Applicable wire:
Solid/twisted wire of
0.25 to 1.65 $mm^2$

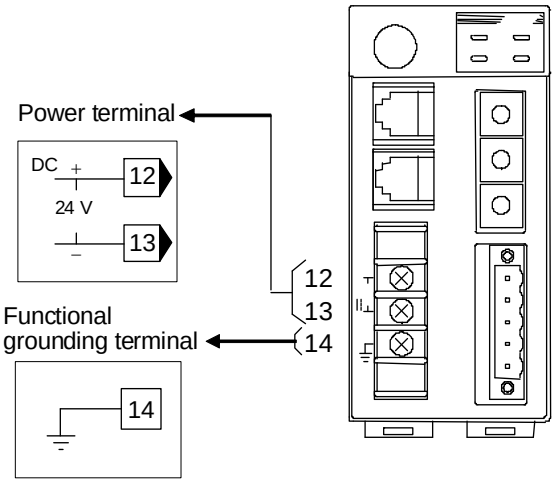



Fig. 4-1 Power supply/ground wiring

The above figure is open-style connector type. The figure of micro-style connector type is the same as an open-style connector type.

- **Power supply**

Use a power supply is within the power supply voltage variation range.
21.6 to 26.4 V DC (Rating: 24 V DC)

- **Functional ground**

A functional grounding terminal means one that is not required for safety purposes but is used for some functional purpose (such as grounding noise filters).

## 4.3 Connections

**⚠ WARNING**

To prevent electric shock or instrument failure, turn off the power before connecting or disconnecting the instrument and peripheral equipment.

**CAUTION**

- Connect connectors correctly in the right position. If it is forcibly pushed in with pins in the wrong positions, the pins may be bent resulting in instrument failure.
- When connecting or disconnecting the connectors, do not force it too far to right and left or up and down, but move it on the straight. Otherwise, the connector pins may be bent, causing instrument failure.
- When disconnecting a connector, hold it by the connector itself. Disconnecting connectors by yanking on their cables can cause breakdowns.
- To prevent malfunction, never touch the contact section of a connector with bare hands or with hands soiled with oil or the like.
- To prevent malfunction, connect cable connectors securely, then firmly tighten the connector fastening screws.
- To prevent damage to cables, do not bend cables over with excessive force.

## 4.3.1 Connection to DeviceNet

### ■ Open-style connector

- **Pin layout of COM.PORT3**

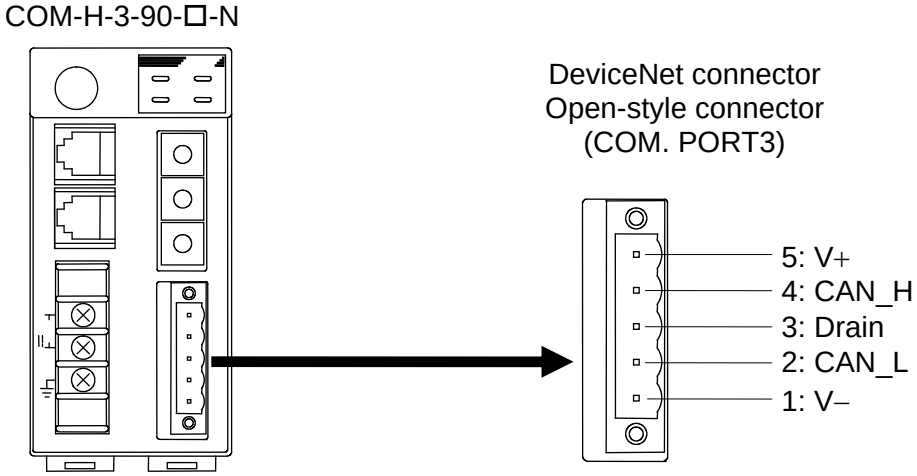



Fig. 4-2 Pin layout of COM.PORT3 (open-style connector)

- **Connector pin number and signal details**

| Pin No. | Signal Name | Symbol | Cable color |
|---|---|---|---|
| 1 | Power supply minus (–) | V– | Black |
| 2 | Communication data low | CAN_L | Blue |
| 3 | Shield | Drain | — |
| 4 | Communication data high | CAN_H | White |
| 5 | Power supply plus (+) | V+ | Red |

- **Connection plugs (recommended models)**
  - Standard type
    MSTB2.5/5-STF-5.08AU M: PHOENIX CONTACT, Inc.
  - Multi-drop type
    TMSTBP2.5/5-STF-5.08AU M: PHOENIX CONTACT, Inc.

## ■ Micro-style connector

- **Pin layout of COM.PORT3**

COM-H-3-90-□-1

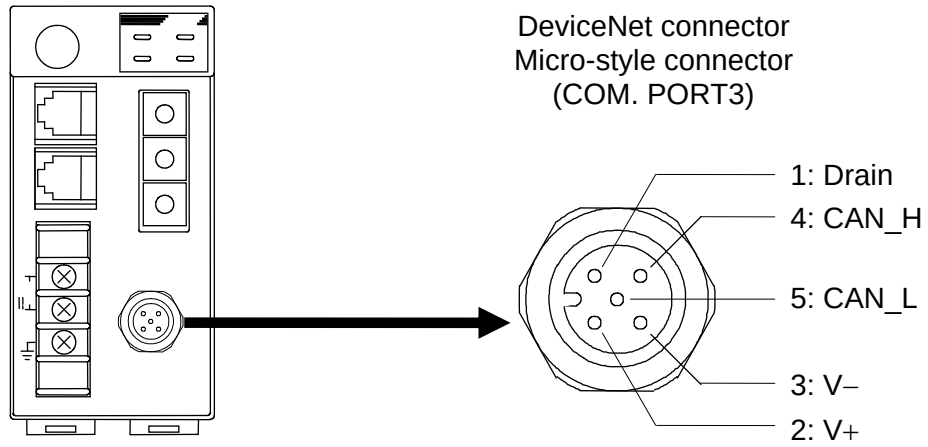



Fig. 4-3 Pin layout of COM.PORT3 (micro-style connector)

- **Connector pin number and signal details**

| Pin No. | Signal Name | Symbol | Cable color |
|---|---|---|---|
| 1 | Shield | Drain | — |
| 2 | Power supply plus (+) | V+ | Red |
| 3 | Power supply minus (–) | V– | Black |
| 4 | Communication data high | CAN_H | White |
| 5 | Communication data low | CAN_L | Blue |

- **Connection socket (recommended model)**
  SACC-M12FS-5CON-PG 9-M: PHOENIX CONTACT, Inc.

  This socket is a type to use thin cable.

## ■ Cable

Use the communication cable (thick cable or thin cable) that matched specification of DeviceNet.

By thickness of a cable to use and connection method, usable connection connector type is different.

For cable specifications, connection method and vendor, refer to the home page of ODVA (Open DeviceNet Vender Association).
URL: http://www.odva.org

## ■ Connection outline of DeviceNet

The following diagram shows the configuration of a DeviceNet network.

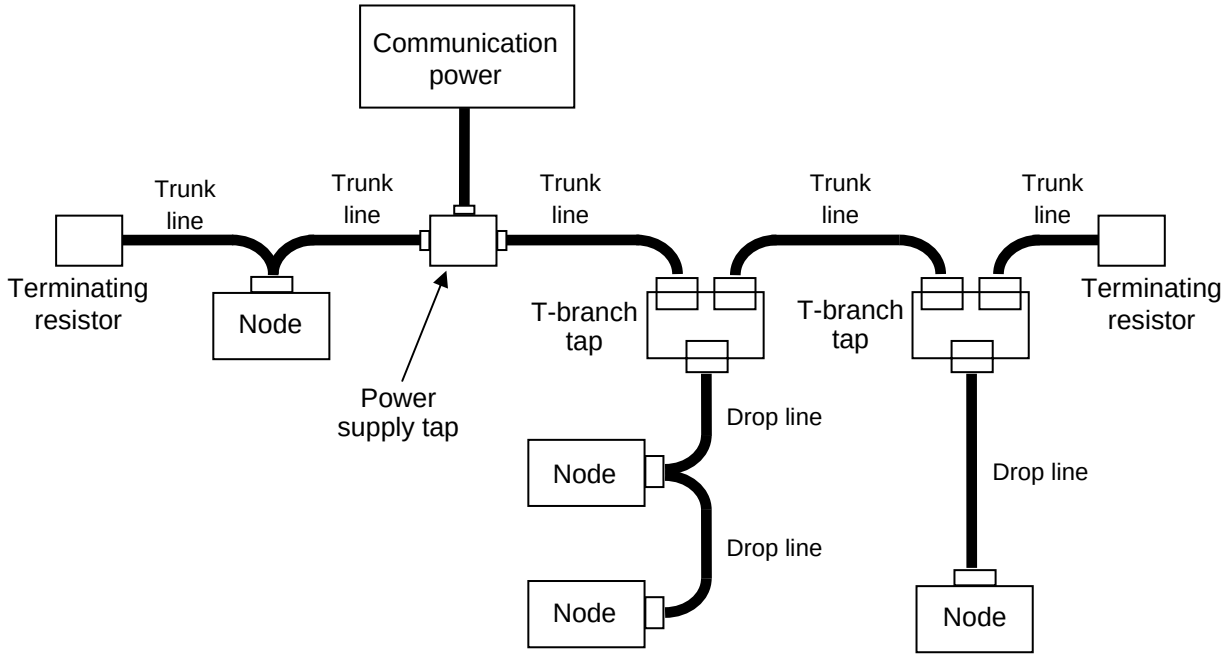



Fig. 4-4 Network configuration example

- **Nodes**
  There are two kinds of nodes of master and slave in DeviceNet. The master and slaves can be connected at any location in the network.
- **Trunk/Drop lines**
  The trunk line refers to the cable that has Terminating Resistors on both ends. Cables branching from the trunk line are known as drop lines.
  Use the DeviceNet communication cable (thick or thin cable) for Trunk/Drop lines.
- **Connection methods**
  Two methods can be used to connect DeviceNet nodes: The T-branch method and the multi-drop method. With the T-branch method, the node is connected to a drop line created with a T-branch Tap. With the multi-drop method, the node is directly connected to the trunk line or the drop line.
- **Terminating resistors**
  In DeviceNet a terminating resistor must be connected to each end of the trunk line
  Specification of terminating resistor: 121 Ω, ±1 %, 1/4 W (Metal film resistance)
- **Communications power supplies**
  To use DeviceNet, connect a communications power supply (24 V DC) to the communications connector of each node with a cable.

☞ For network laying requirement of DeviceNet/method, refer to Instruction Manual of master product or DeviceNet specifications. DeviceNet specifications are available from ODVA (Open DeviceNet Vender Association).
URL: http://www.odva.org

## 4.3.2 Connection to RKC controllers

Figures of the open-style connector type are used for the following description. However, those of the micro-style connector type can be similarly used.

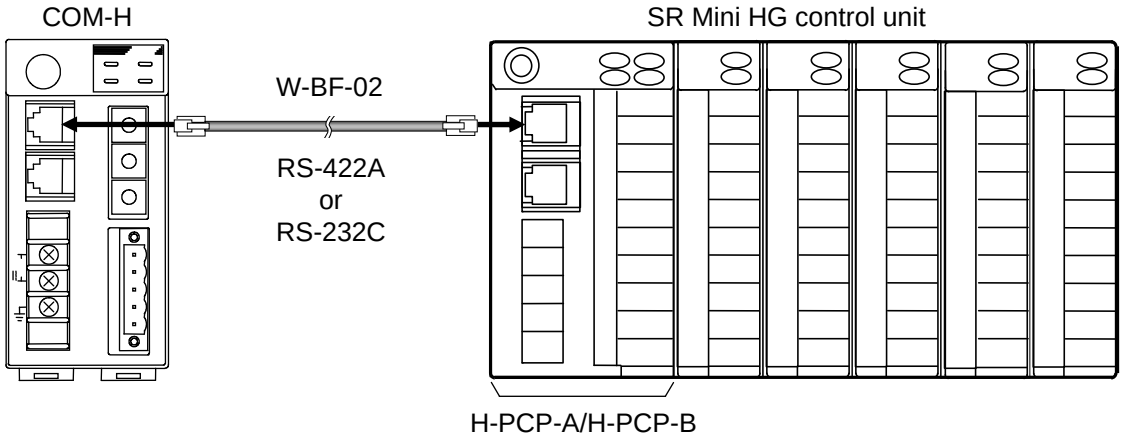
### (1) Connection to SR Mini HG

Communication interface can select either of RS-422A or RS-232C. (Specify when ordering)
It is necessary for communication interface of SR Mini HG to correspond with COM-H.
One SR Mini HG control unit can connect for one COM-H.

W-BF-02* communication cable (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

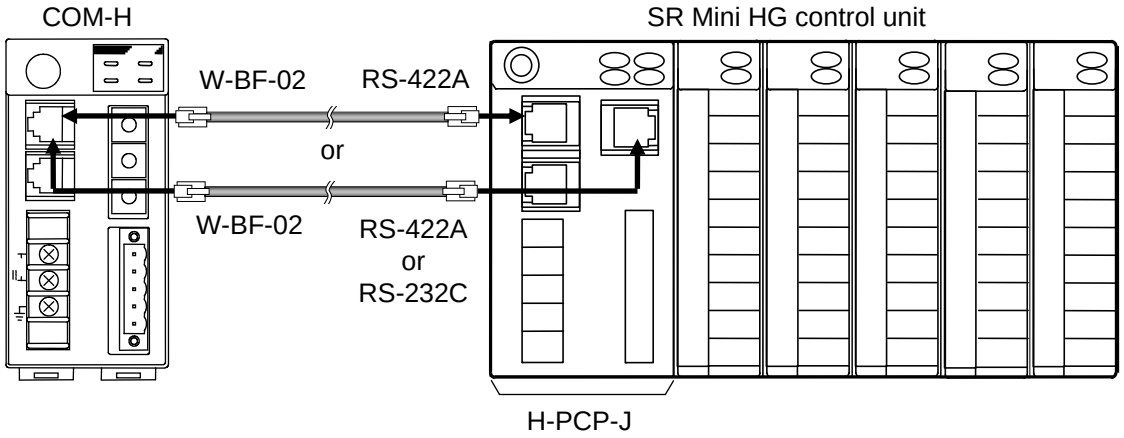
* Shields of the cable are connected to SG (No. 6 pin) of the COM-H connector.

- **When used H-PCP-A or H-PCP-B module**




Cable type: W-BF-02-3000 (RKC product, Sold separately)
[Standard cable length: 3 m]

- **When used H-PCP-J module**




Cable type: W-BF-02-3000 (RKC product, Sold separately)
[Standard cable length: 3 m]

## (2) Connection to CB100/400/500/700/900

Up to 24 CB100/400/500/700/900 can be connected to one COM-H.

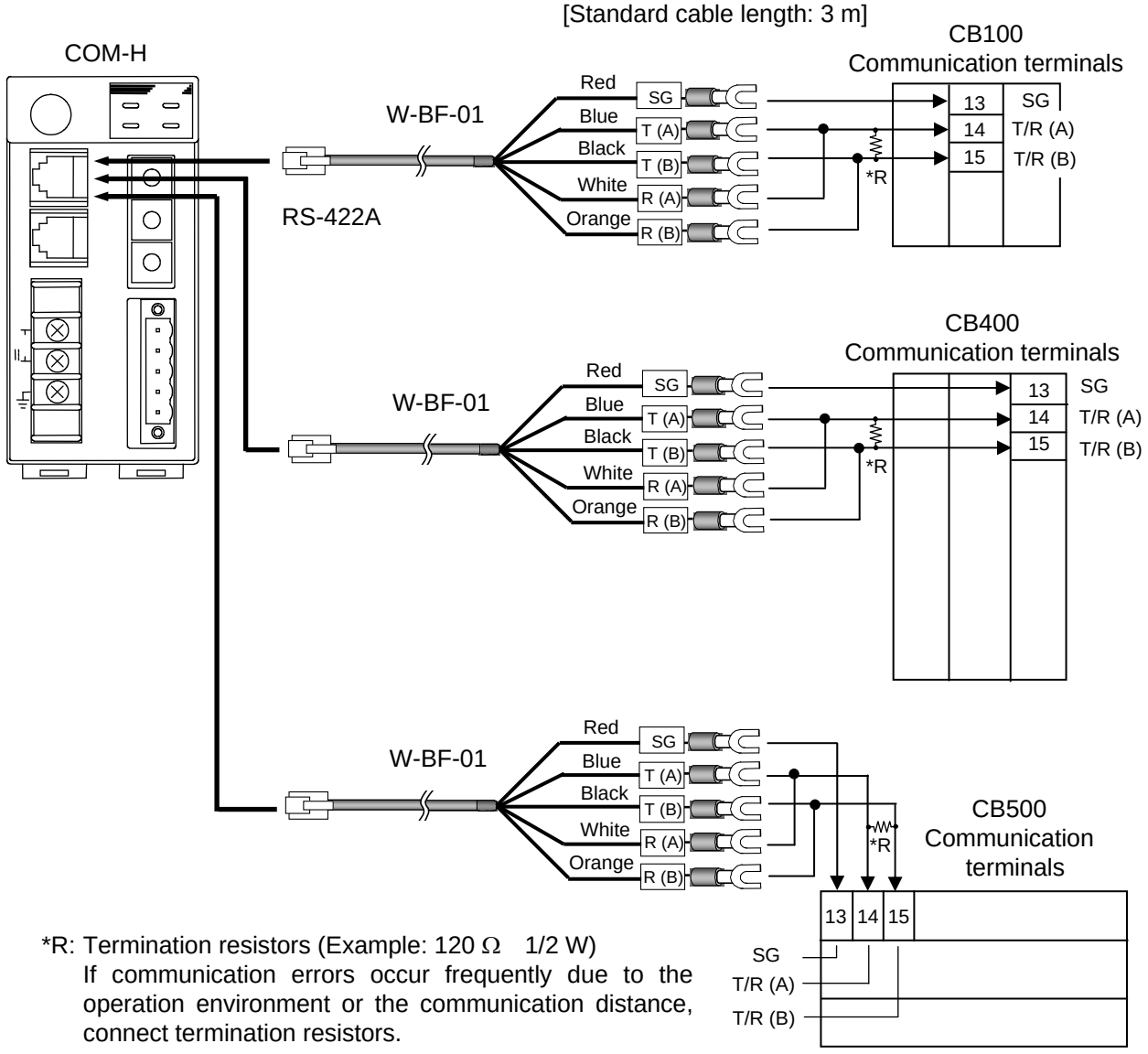
W-BF-01* communication cable (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

* Shields of the cable are connected to SG (No. 6 pin) of the COM-H connector.

### ● Connection method of the W-BF-01 cable.

When connected to the RS-485 interface controller by using the RS-422A interface for COM-H control communication, connect T (A) [blue] and R (A) [white] of the cable to the controller T/R (A) terminals and also T (B) [black] and R (B) [orange] of the cable to the controller T/R (B) terminals, respectively.

Cable type: W-BF-01-3000 (RKC product, Sold separately)
[Standard cable length: 3 m]




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

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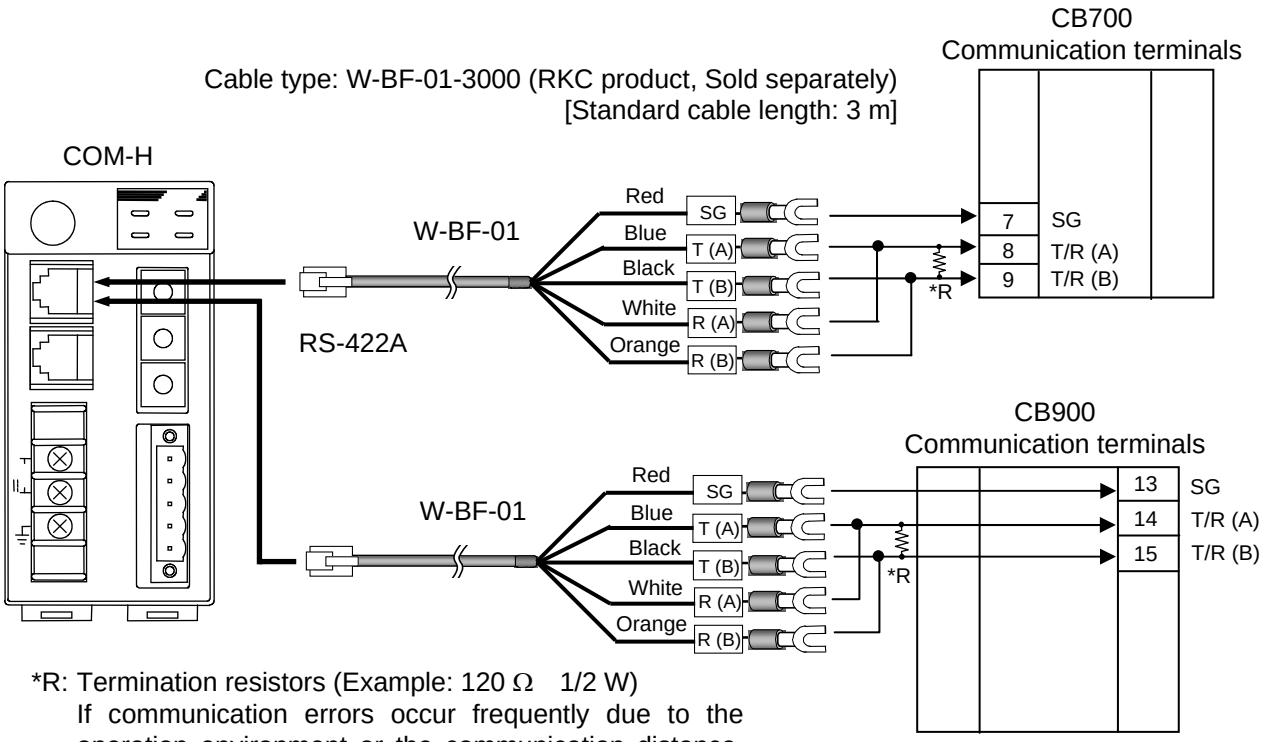
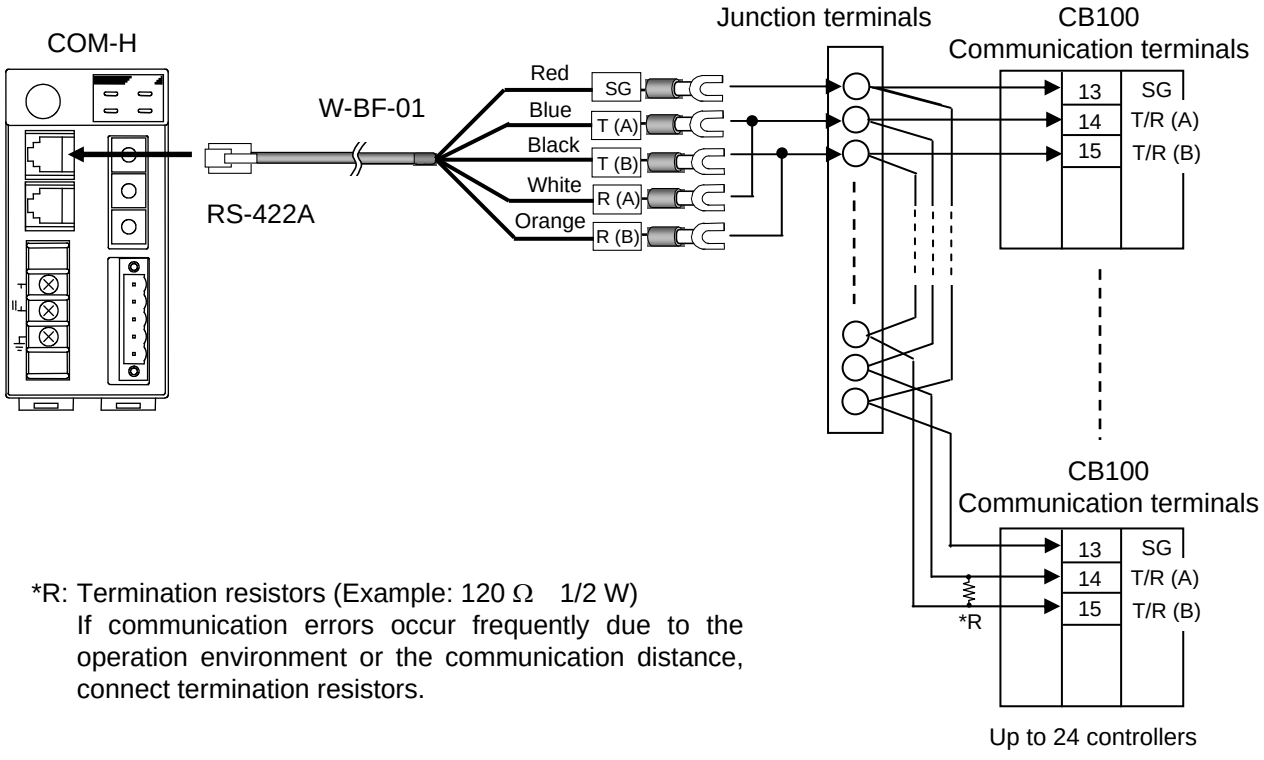



*R: Termination resistors (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

- **Multi-drop connecting example**




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

### (3) Connection to REX-F400/700/900

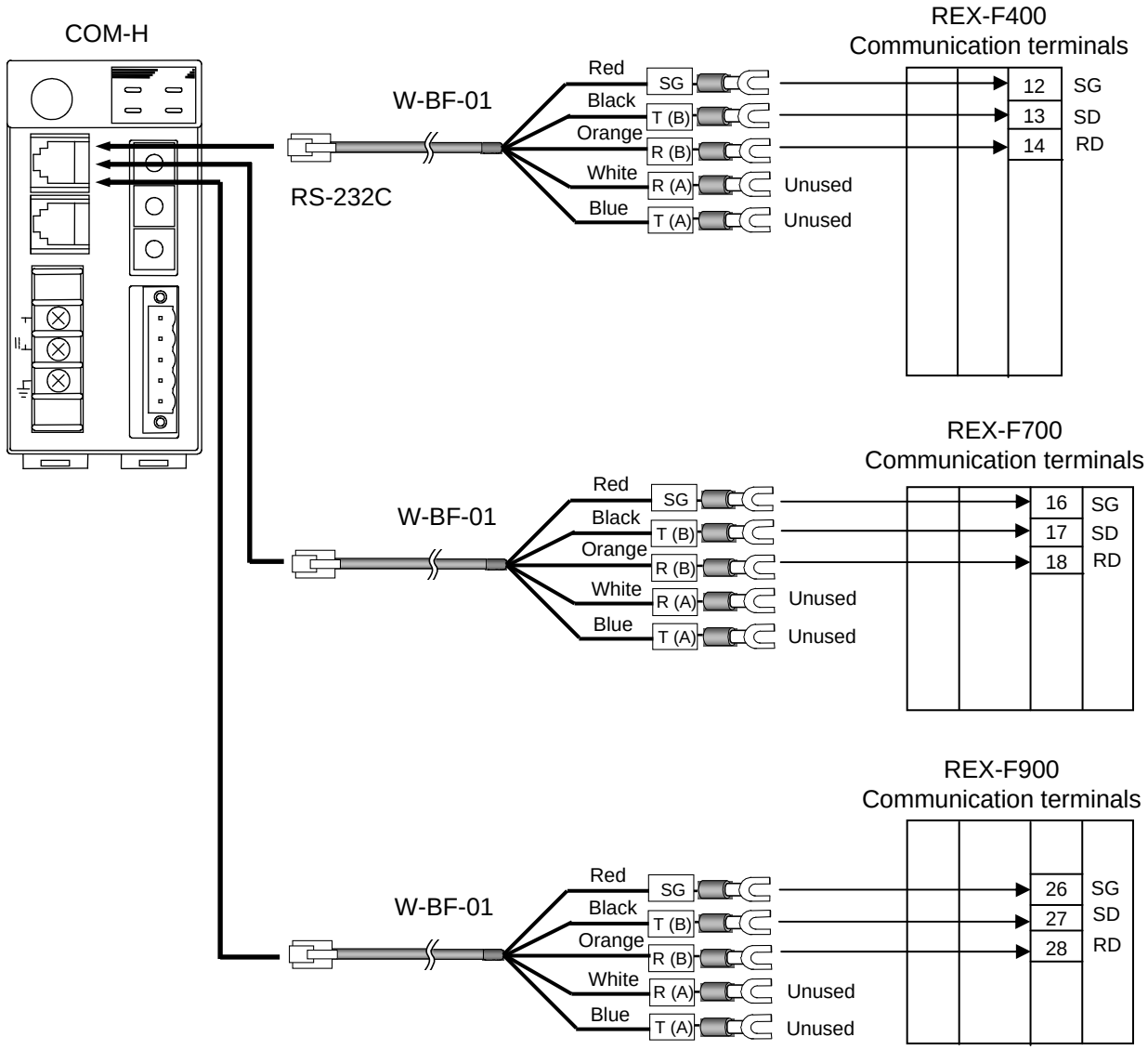
#### ■ RS-232C

One REX-F400/700/900 can be connected to one COM-H.

W-BF-01* communication cable (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

* Shields of the cable are connected to SG (No. 6 pin) of the COM-H connector.

Cable type: W-BF-01-3000 (RKC product, Sold separately)
[Standard cable length: 3 m]




**Be sure to insulate the wires that are not used by covering them with insulating tape.**

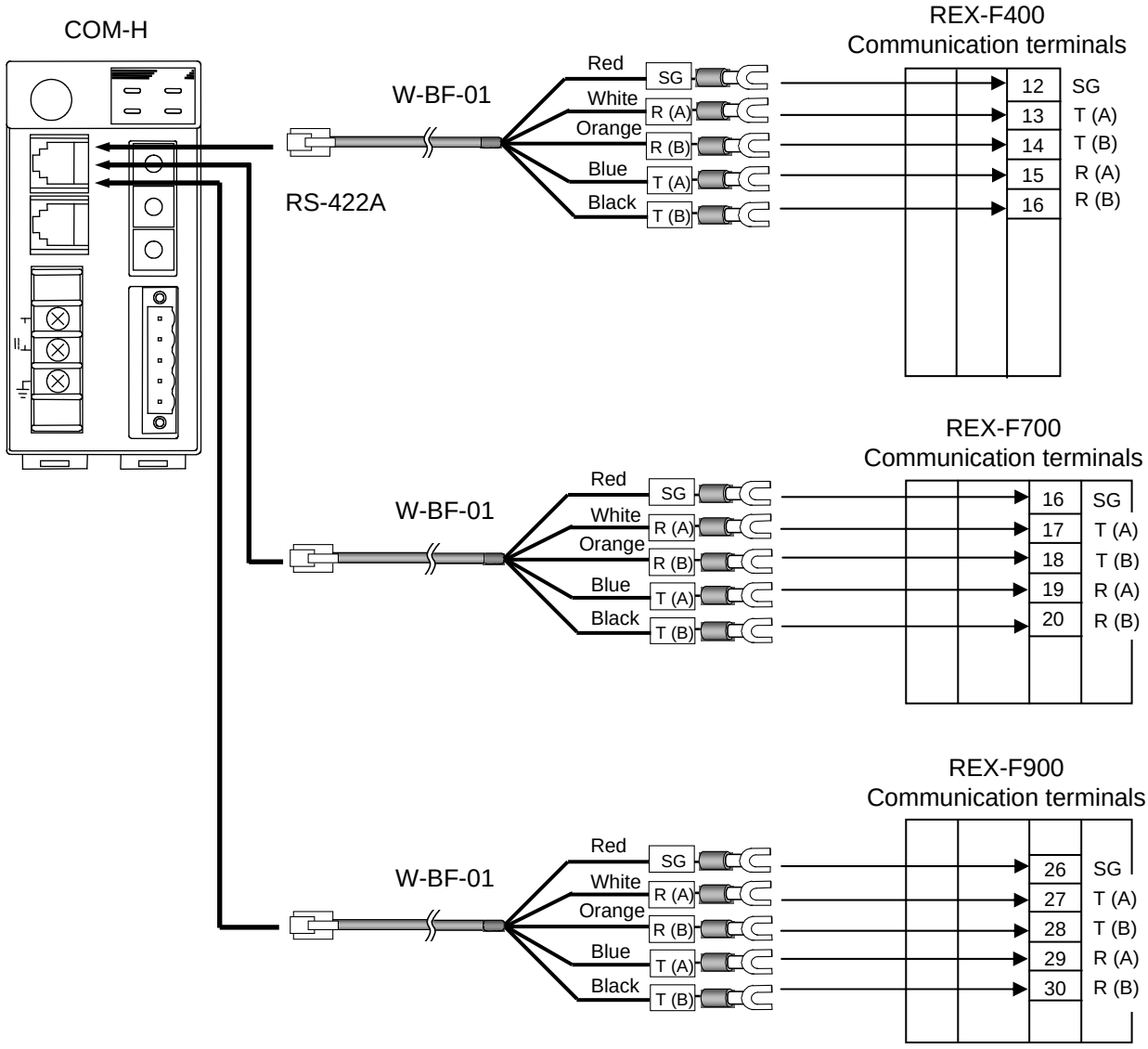
## ■ RS-422A

Up to 24 REX-F400/700/900 can be connected to one COM-H.

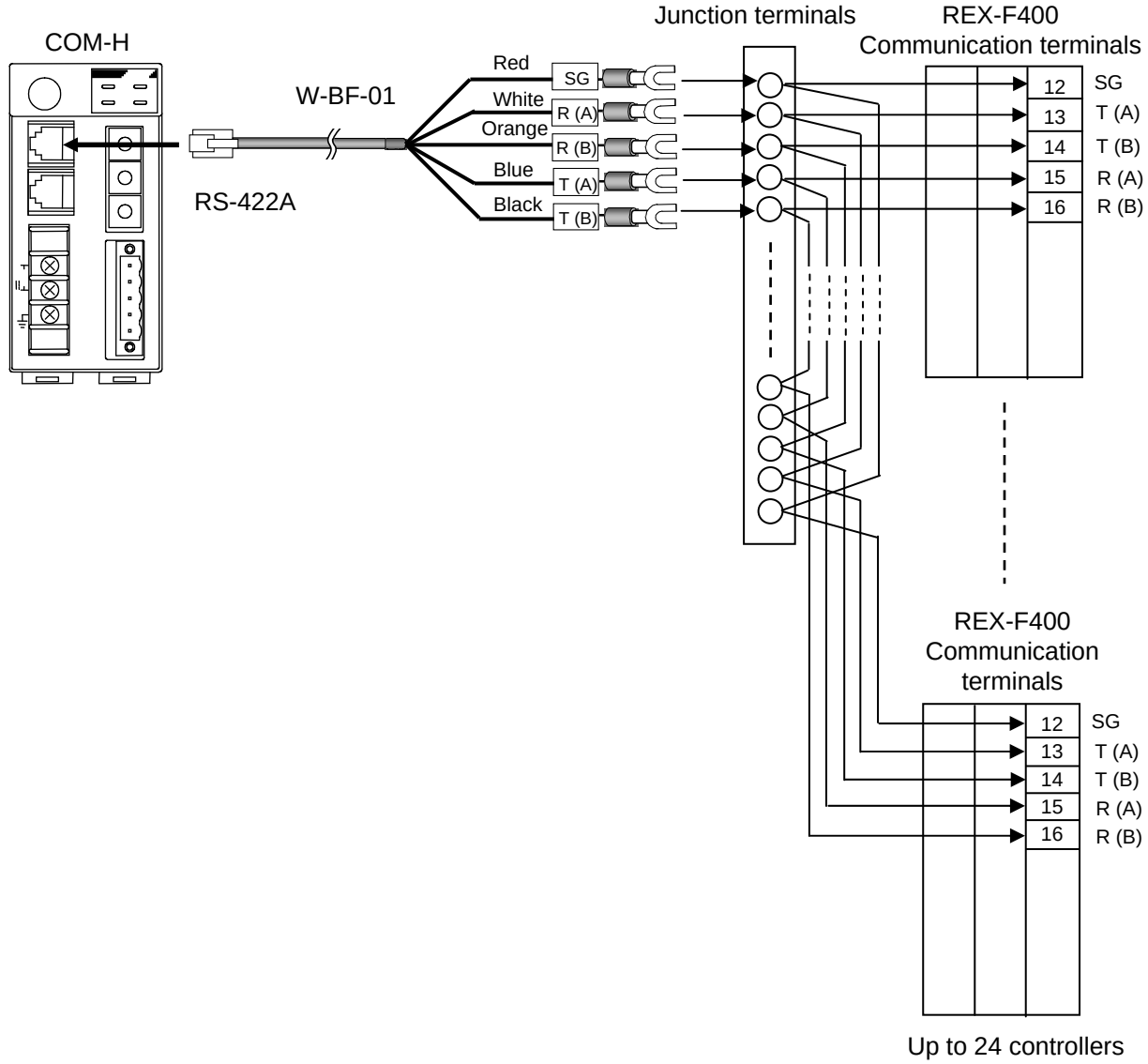
W-BF-01* communication cable (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

* Shields of the cable are connected to SG (No. 6 pin) of the COM-H connector.

Cable type: W-BF-01-3000 (RKC product, Sold separately)
[Standard cable length: 3 m]



- **Multi-drop connecting example**



## ■ RS-485

Up to 24 REX-F400/700/900 can be connected to one COM-H.

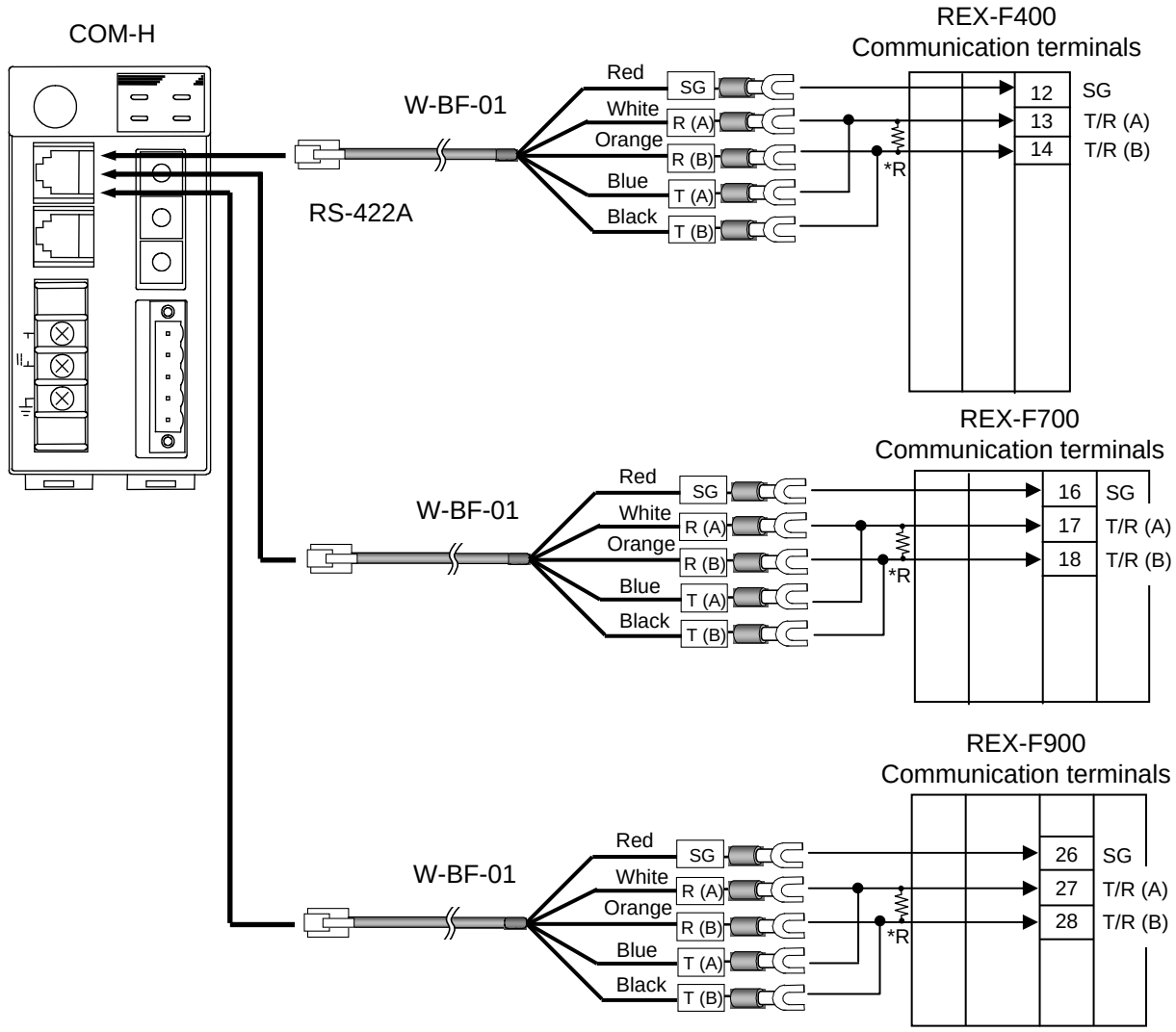
W-BF-01* communication cable (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

* Shields of the cable are connected to SG (No. 6 pin) of the COM-H connector.

### ● Connection method of the W-BF-01 cable

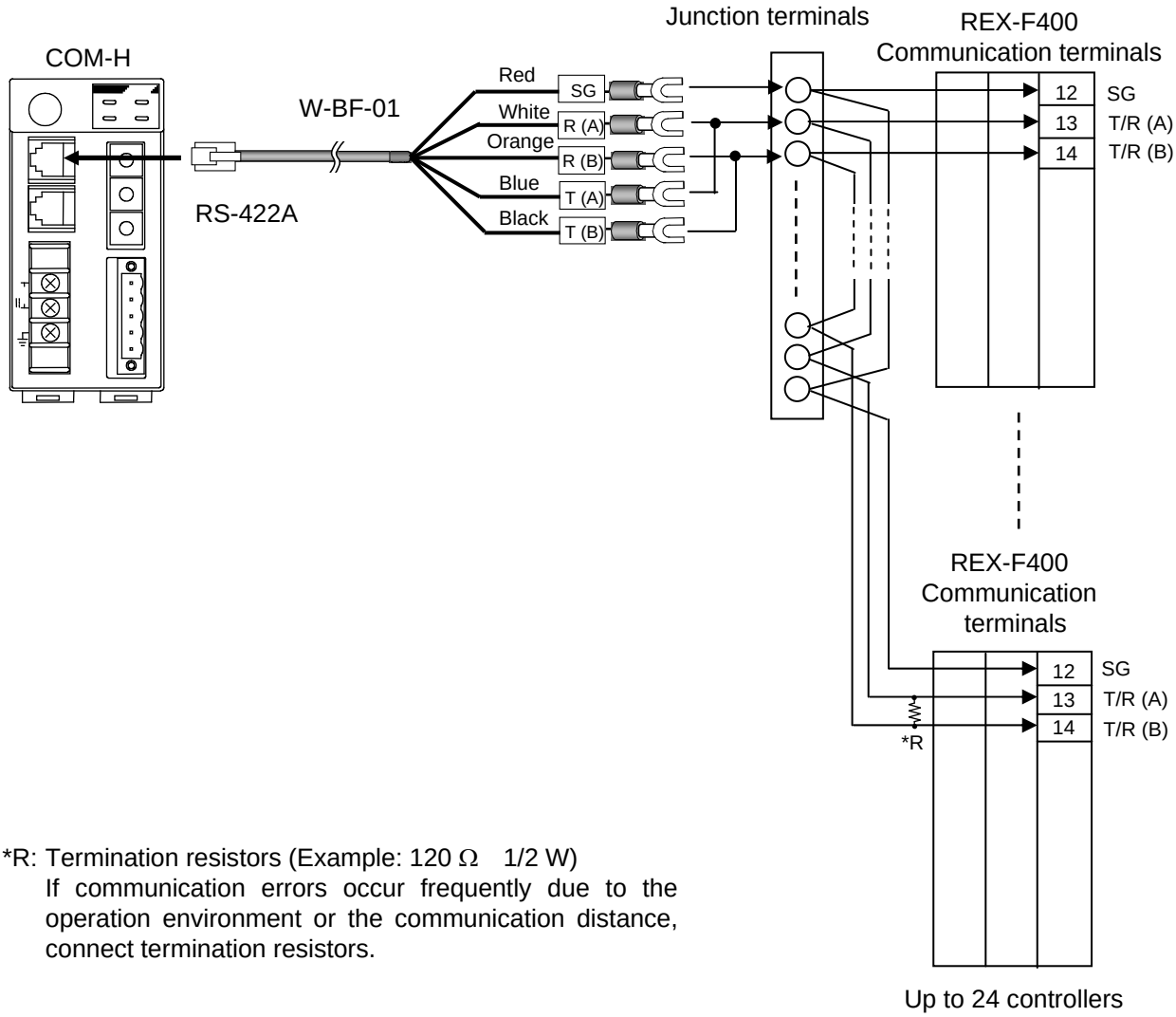
When connected to the RS-485 interface controller by using the RS-422A interface for COM-H control communication, connect T (A) [blue] and R (A) [white] of the cable to the controller T/R (A) terminals and also T (B) [black] and R (B) [orange] of the cable to the controller T/R (B) terminals, respectively.

Cable type: W-BF-01-3000 (RKC product, Sold separately)
[Standard cable length: 3 m]




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

- **Multi-drop connecting example**




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

## (4) Connection to SA100

Up to 24 SA100 can be connected to one COM-H.

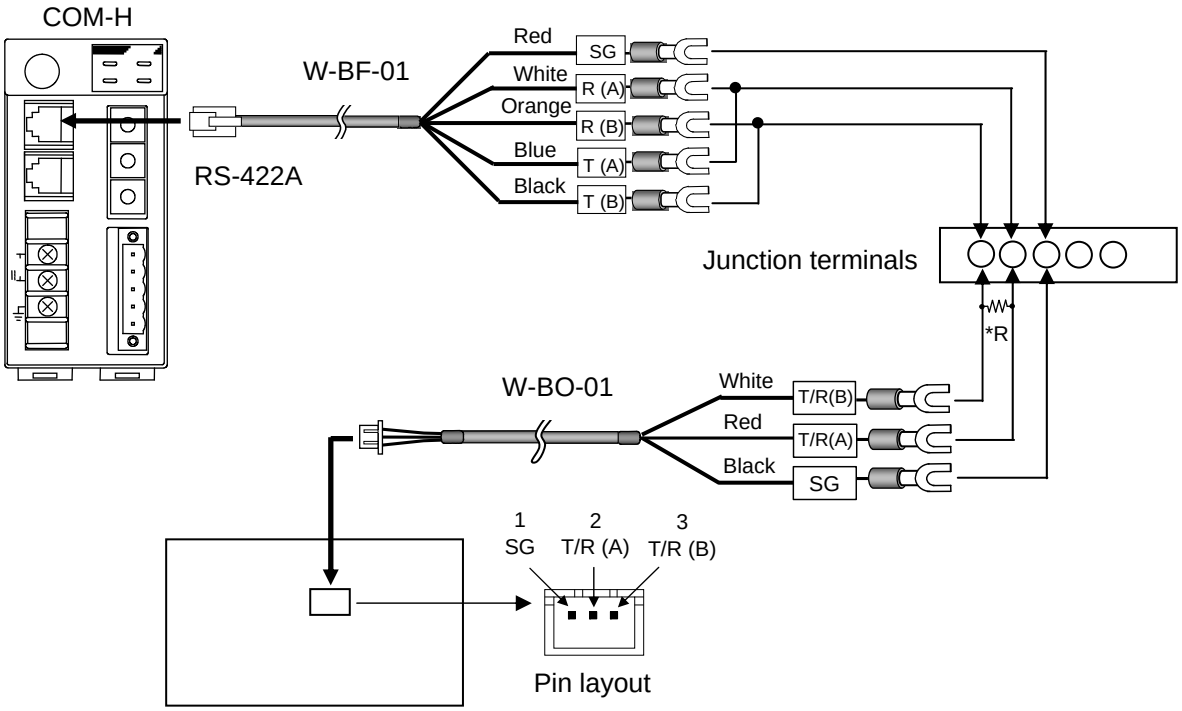
W-BF-01* and W-BO-01 communication cables (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

* Shields of the cable are connected to SG (No. 6 pin) of the COM-H connector.

### ● Connection method of the W-BF-01/W-BO-01 cable

When connected to the RS-485 interface controller by using the RS-422A interface for COM-H control communication, connect T (A) [blue] and R (A) [white] of the cable to the controller T/R (A) connector pin and also T (B) [black] and R (B) [orange] of the cable to the controller T/R (B) connector pin, respectively.

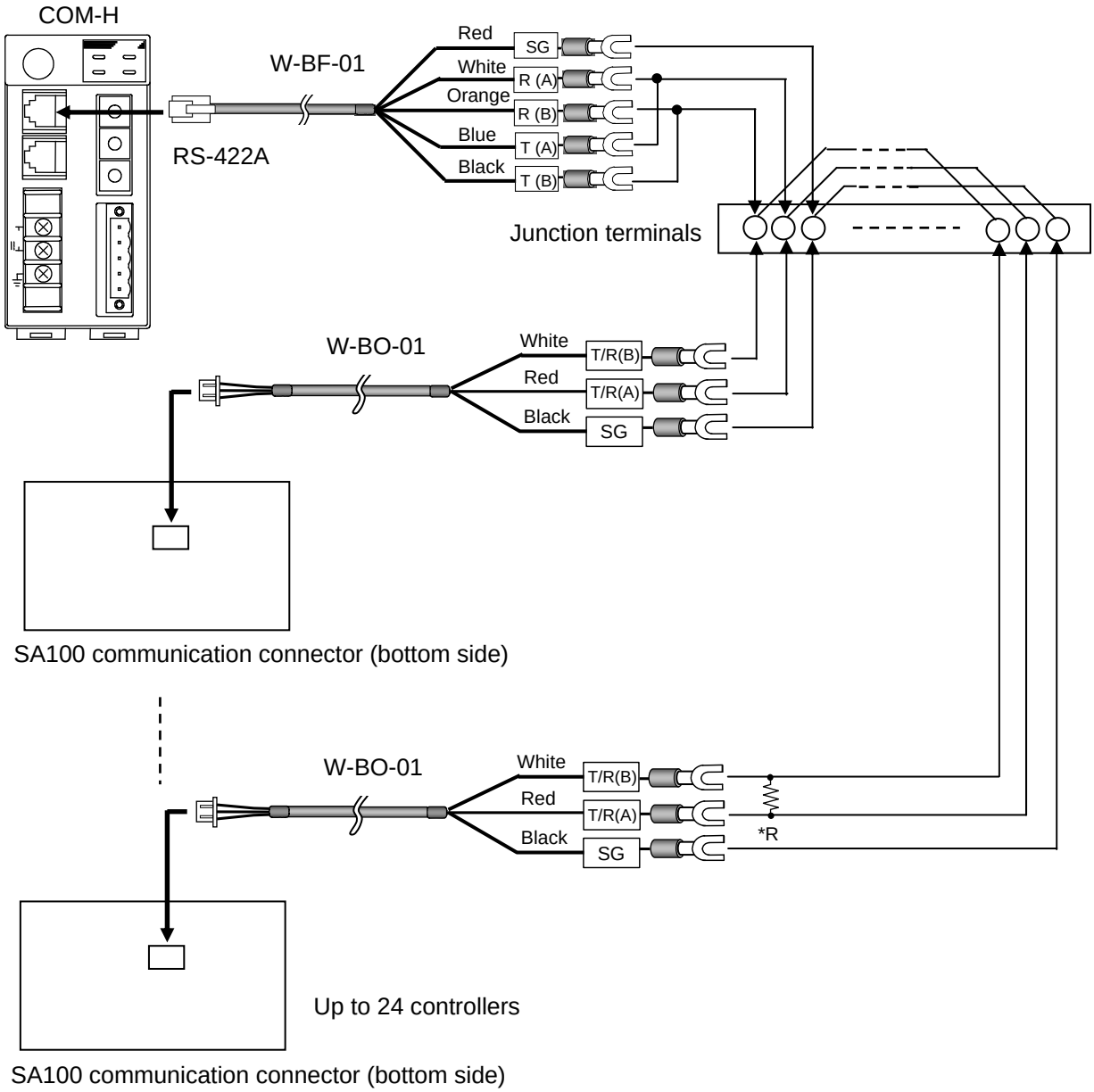
Cable type: W-BF-01-3000/W-BO-01-3000 (RKC product, Sold separately)
[Standard cable length: 3 m]




SA100 communication connector (bottom side)

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

- **Multi-drop connecting example**




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

## (5) Connection to SA200

Up to 24 SA200 can be connected to one COM-H.

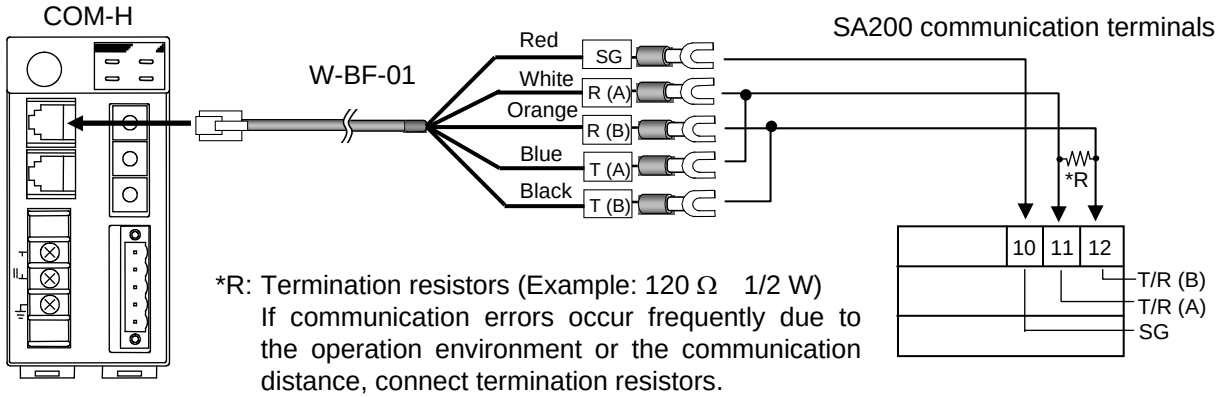
W-BF-01* communication cable (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

* Shields of the cable are connected to SG (No. 6 pin) of the COM-H connector.

### ● Connection method of the W-BF-01 cable

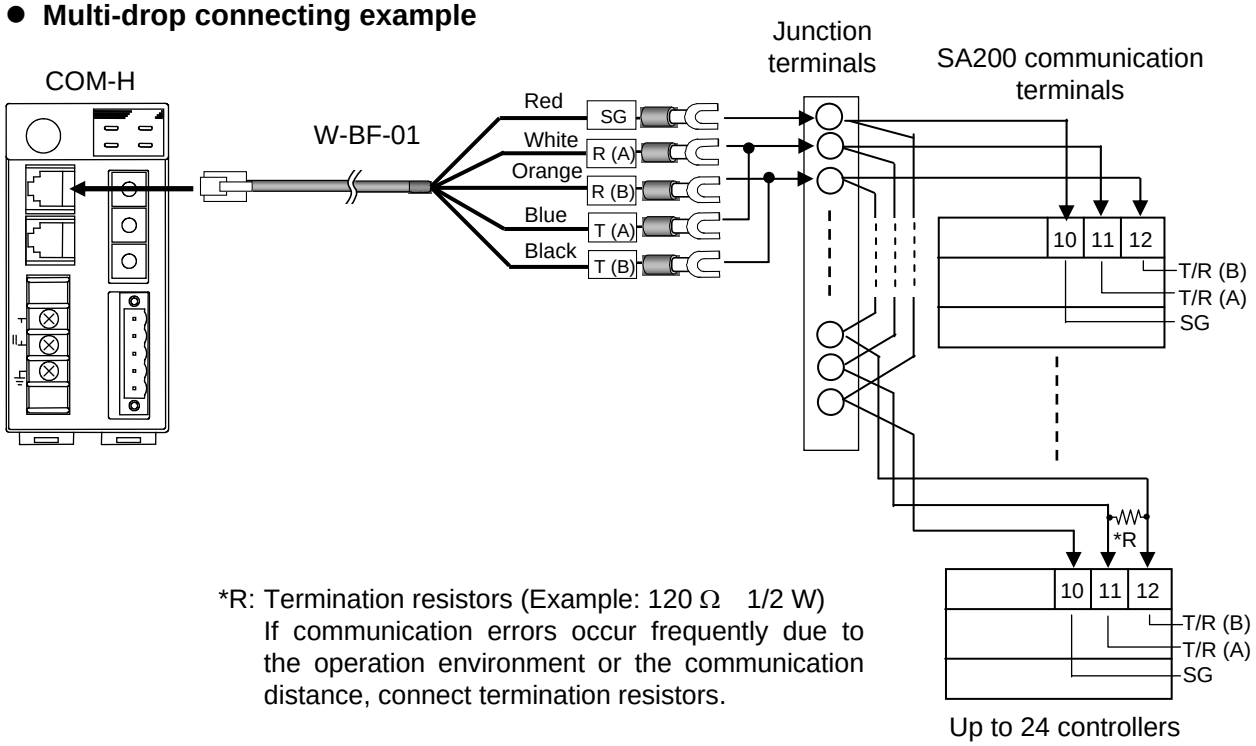
When connected to the RS-485 interface controller by using the RS-422A interface for COM-H control communication, connect T (A) [blue] and R (A) [white] of the cable to the controller T/R (A) terminals and also T (B) [black] and R (B) [orange] of the cable to the controller T/R (B) terminals, respectively.

Cable type: W-BF-01-3000 (RKC product, Sold separately)
[Standard cable length: 3 m]




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

### ● Multi-drop connecting example




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

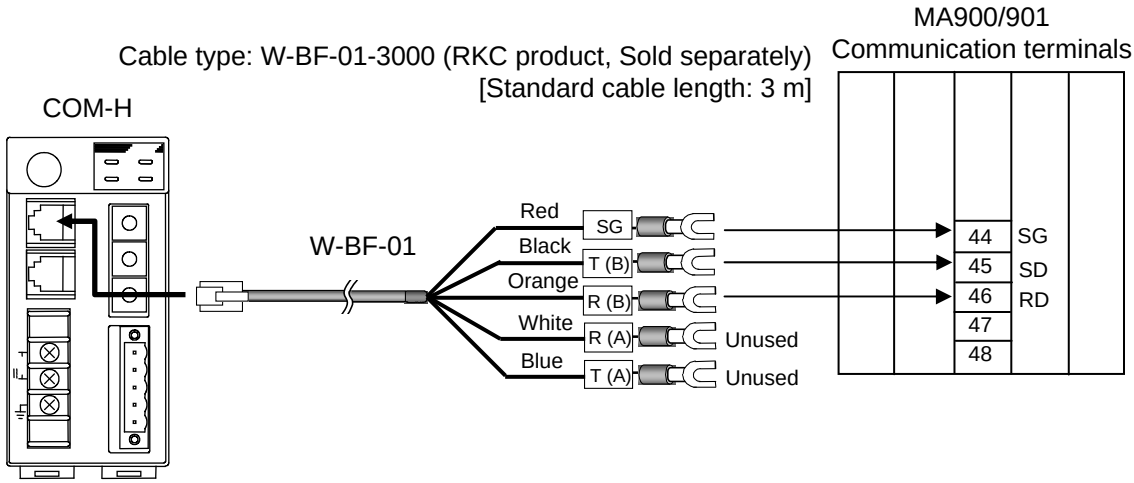
## (6) Connrction to MA900/901

### ■ RS-232C

One MA900/901 can be connected to one COM-H.

W-BF-01* communication cable (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

* Shields of the cable are connected to SG (No. 6 pin) of the COM-H connector.



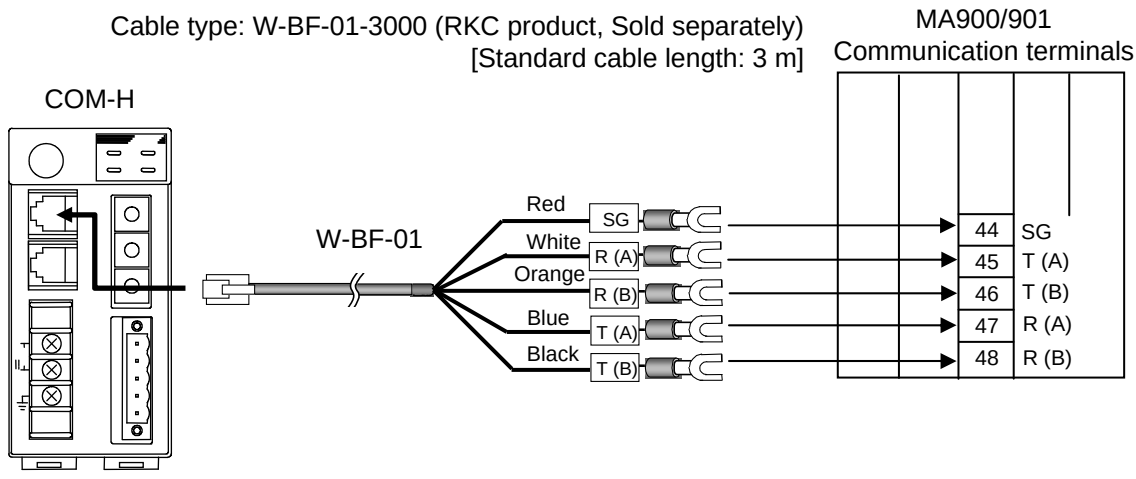

**Be sure to insulate the wires that are not used by covering them with insulating tape.**

### ■ RS-422A

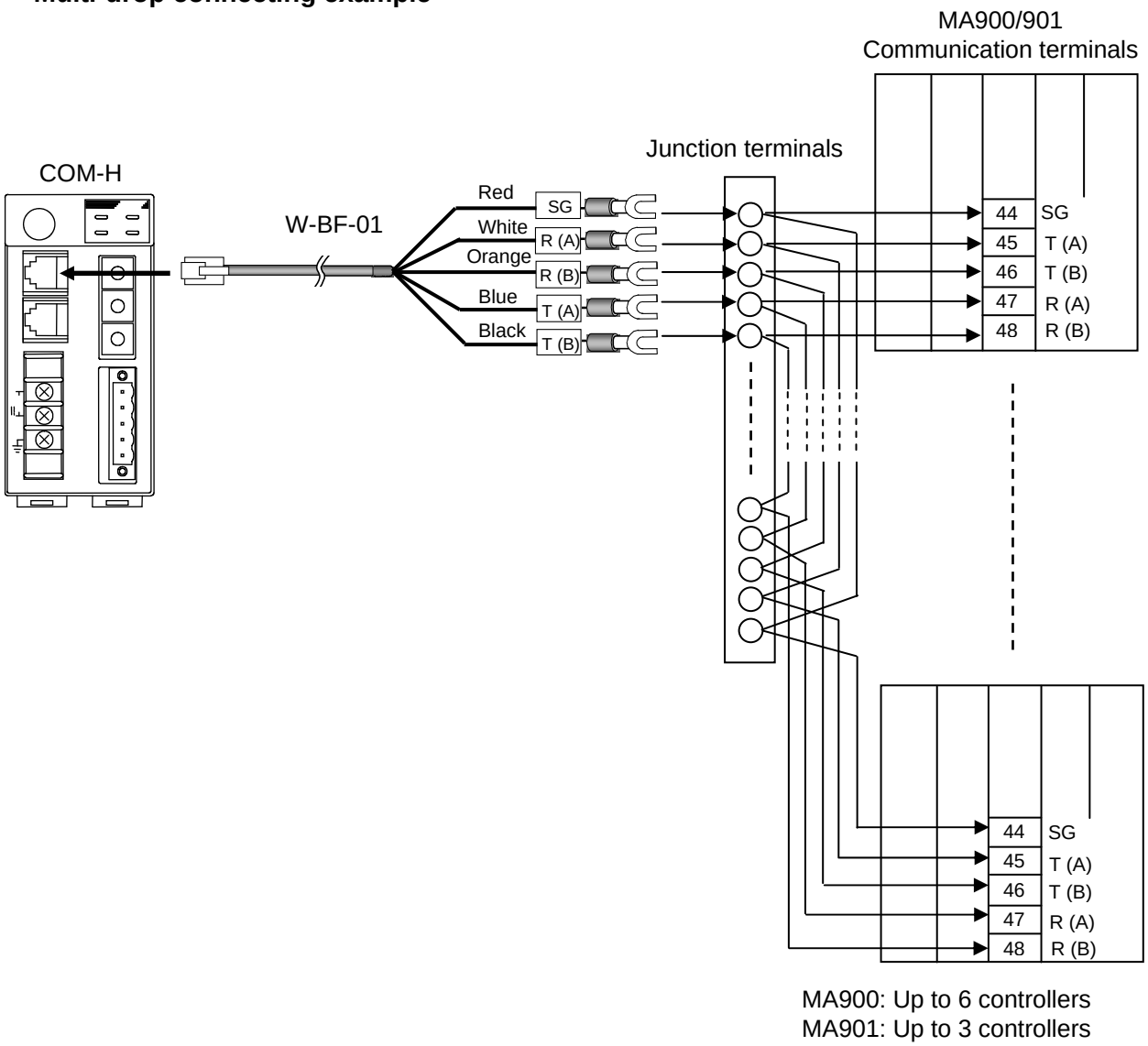
Up to six MA900 or up to three MA901 can be connected to one COM-H.

W-BF-01* communication cable (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

* Shields of the cable are connected to SG (No. 6 pin) of the COM-H connector.



- **Multi-drop connecting example**




MA900: Up to 6 controllers
MA901: Up to 3 controllers

## ■ RS-485

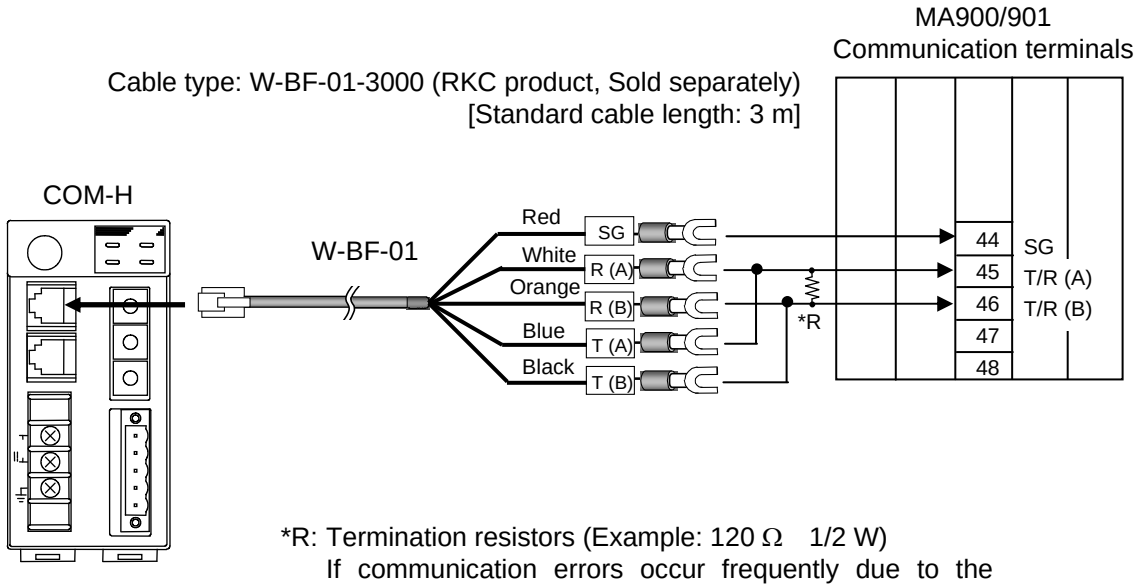
Up to six MA900 or up to three MA901 can be connected to one COM-H.

W-BF-01* communication cable (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

* Shields of the cable are connected to SG (No. 6 pin) of the COM-H connector.

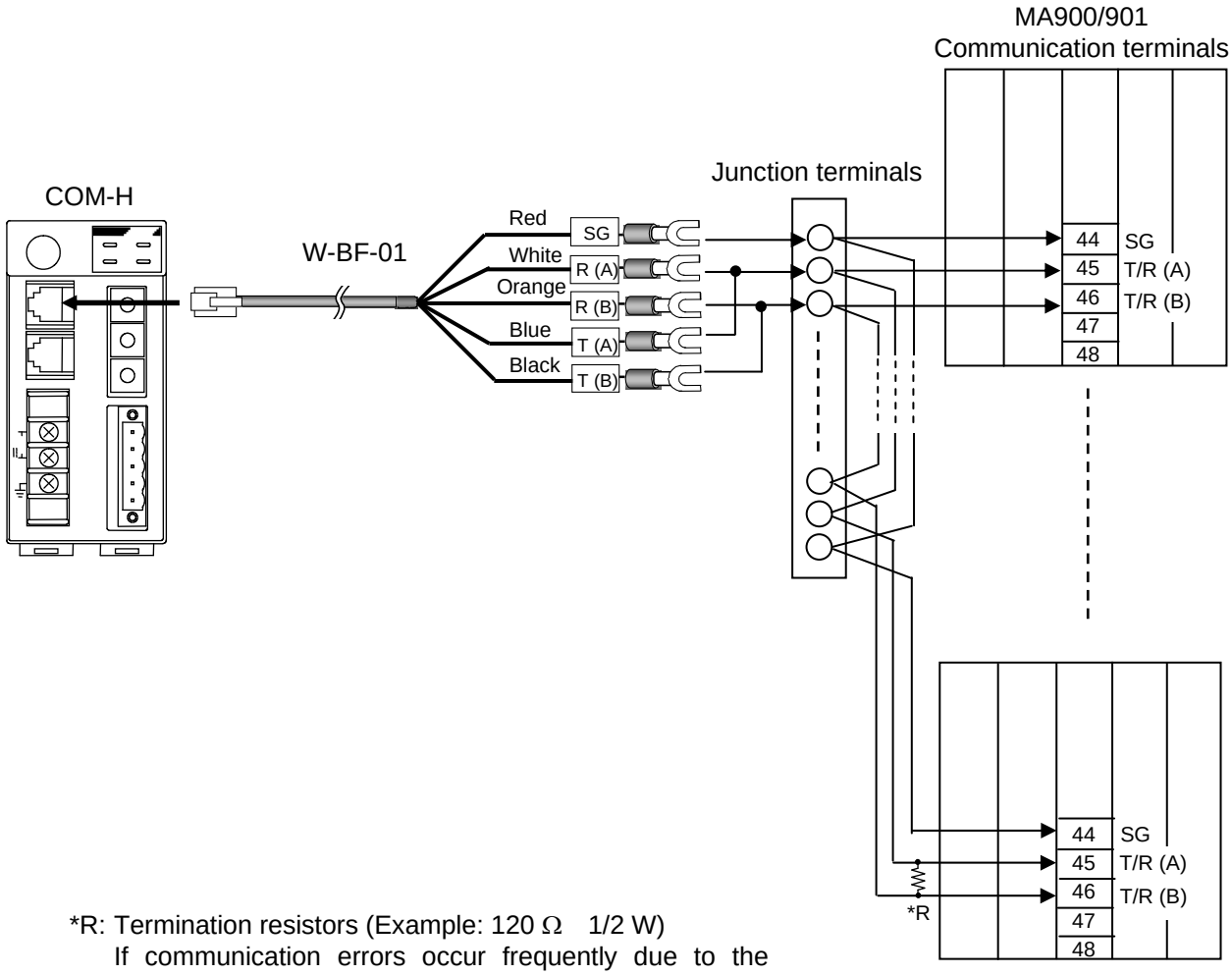
### ● Connection method of the W-BF-01 cable

When connected to the RS-485 interface controller by using the RS-422A interface for COM-H control communication, connect T (A) [blue] and R (A) [white] of the cable to the controller T/R (A) terminals and also T (B) [black] and R (B) [orange] of the cable to the controller T/R (B) terminals, respectively.




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

- **Multi-drop connecting example**




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

MA900: Up to 6 controllers
MA901: Up to 3 controllers

## (7) Connection to LE100

Up to 24 LE100 can be connected to one COM-H.

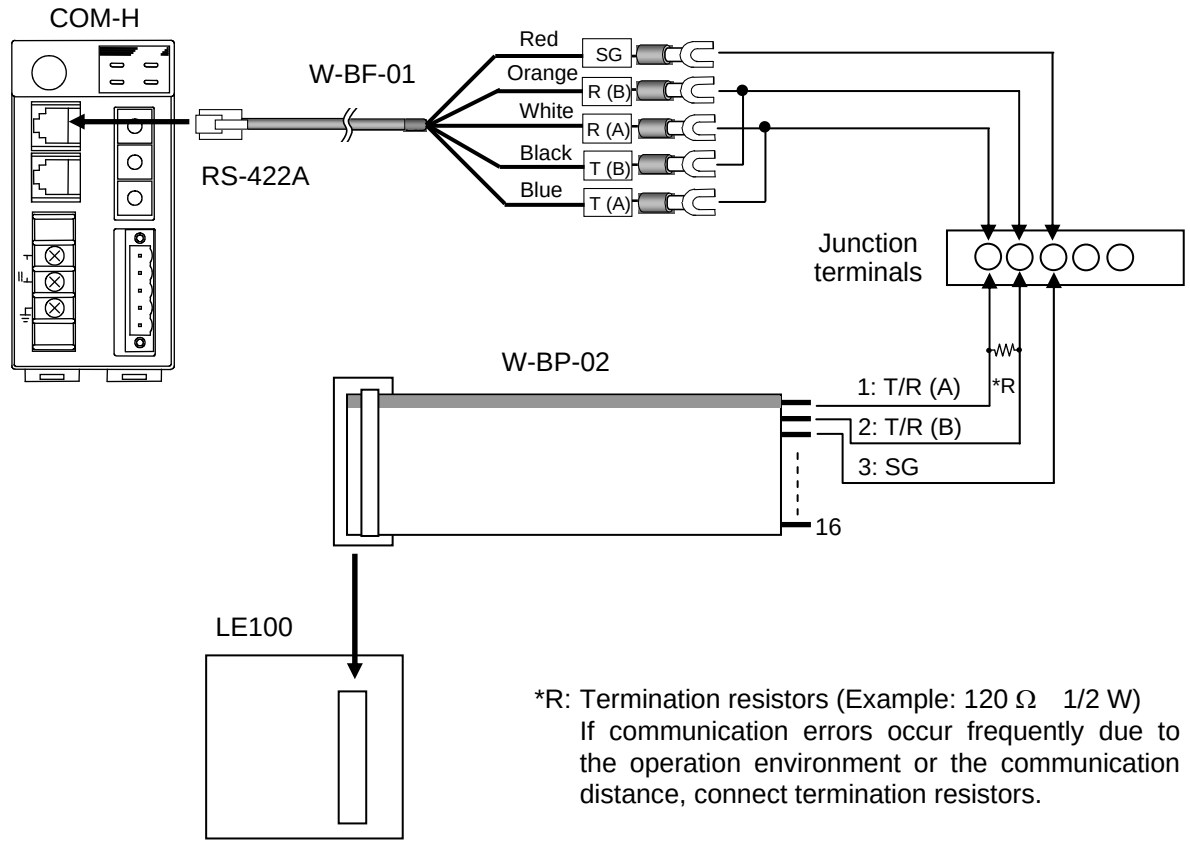
W-BF-01* and W-BP-02 communication cables (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

* Shields of the cable are connected to SG (No. 6 pin) of the COM-H connector.

### ● Connection method of the W-BF-01 cable

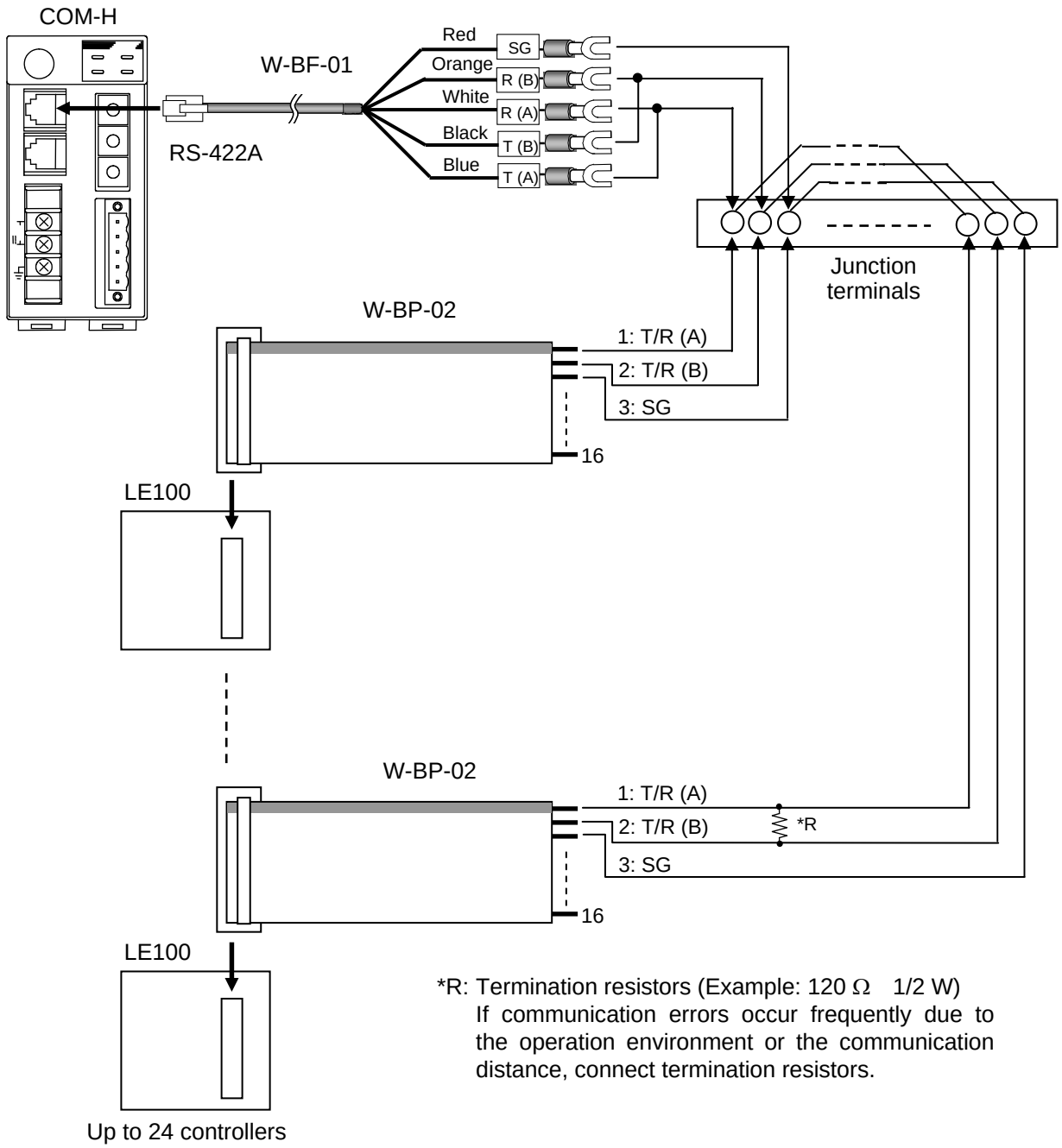
When connected to the RS-485 interface controller by using the RS-422A interface for COM-H control communication, connect T (A) [blue] and R (A) [white] of the cable to the controller T/R (A) connector pin and also T (B) [black] and R (B) [orange] of the cable to the controller T/R (B) connector pin, respectively.

Cable type: W-BF-01-3000 [Standard cable length: 3 m] (RKC product, Sold separately)
W-BP-02-☐ [☐: Cable length] (RKC product, Sold separately)




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

- **Multi-drop connecting example**




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

## (8) Connection to REX-PG410

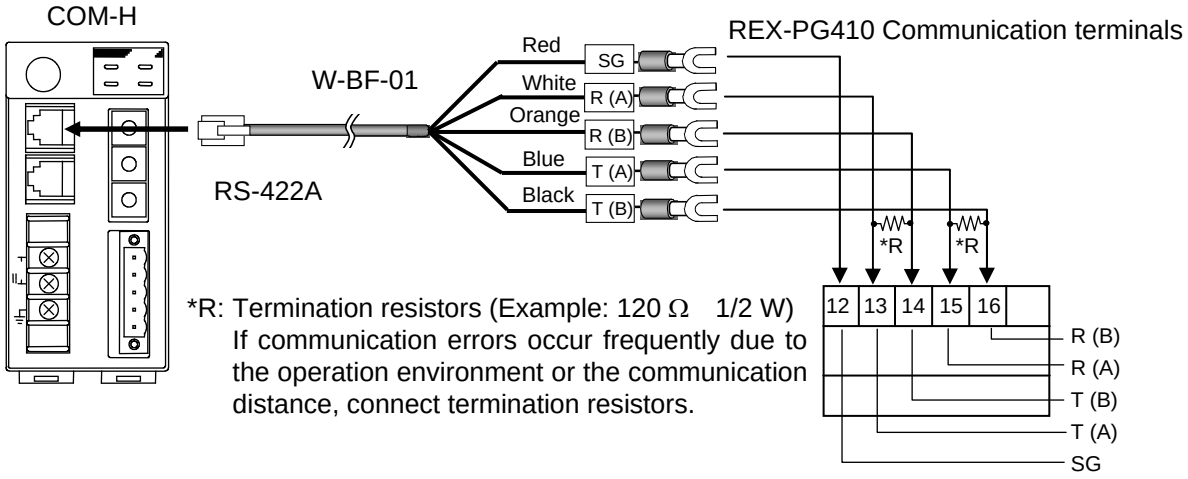
### ■ RS-422A

Up to 24 REX-PG410 can be connected to one COM-H.

W-BF-01* communication cable (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

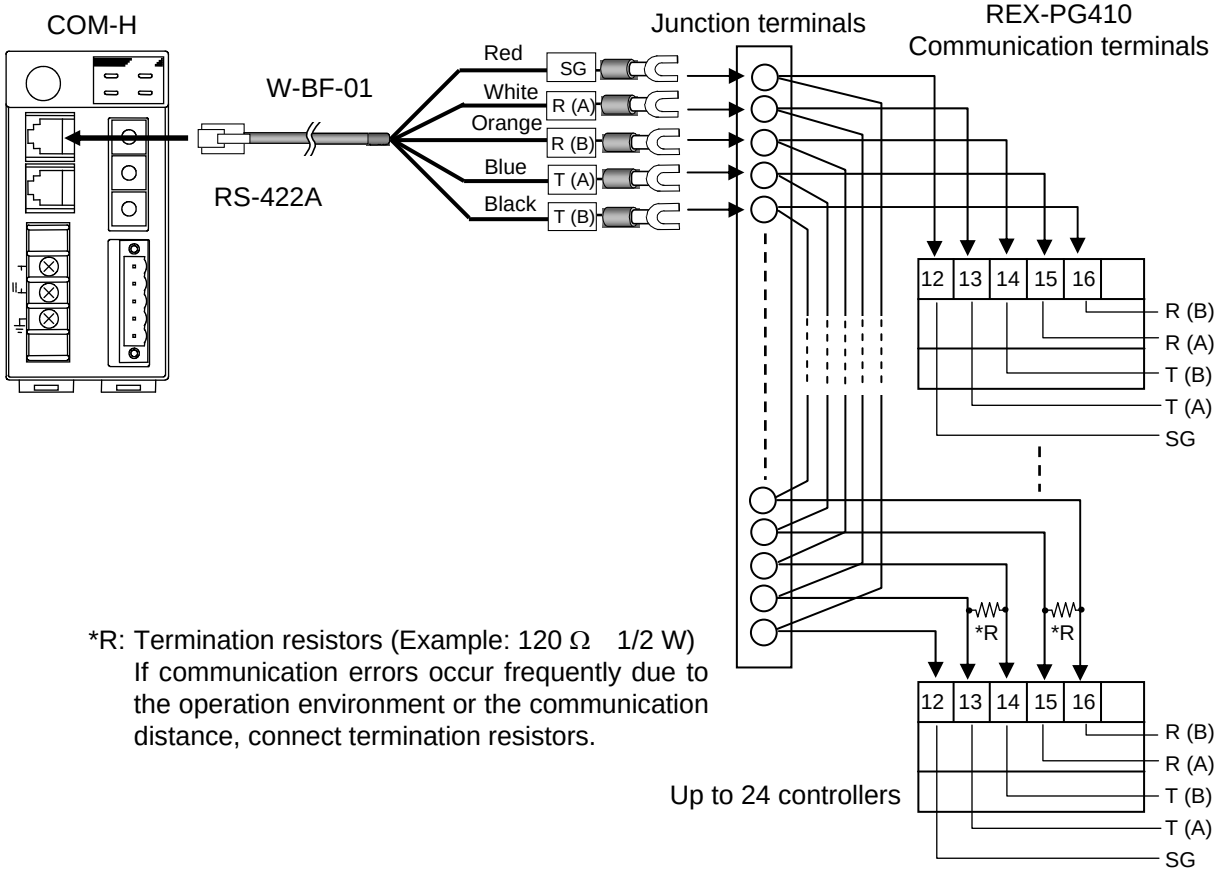
* Shields of the cable are connected to SG (No. 6 pin) of the COM-H connector.

Cable type: W-BF-01-3000 (RKC product, Sold separately)
[Standard cable length: 3 m]




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

- **Multi-drop connecting example**




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

## ■ RS-485

Up to 24 REX-PG410 can be connected to one COM-H.

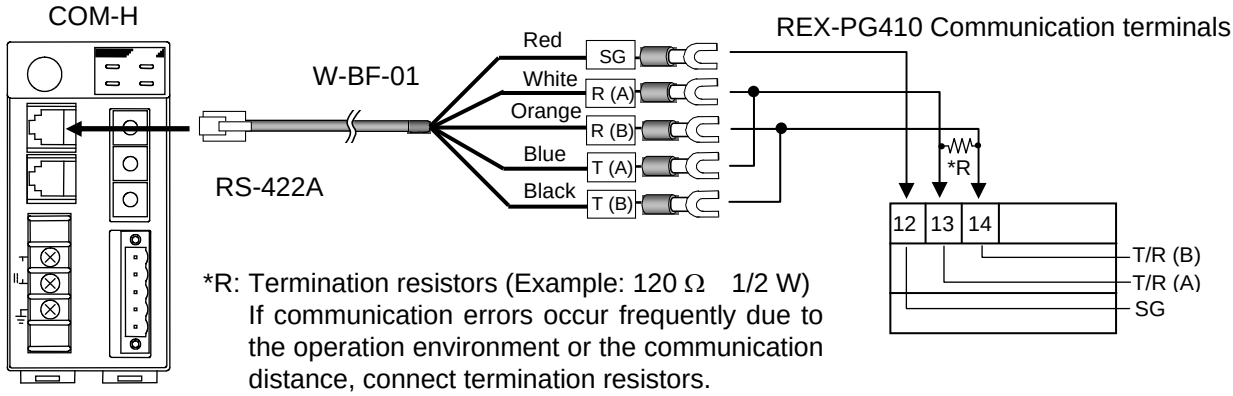
W-BF-01* communication cable (RKC product) can be used as communication cable (sold separately). If noise is a factor, customer should use a twisted pair cable (not included) or something to that effect.

* Shields of the cable are connected to SG (No. 6 pin) of the COM-H connector.

### ● Connection method of the W-BF-01 cable

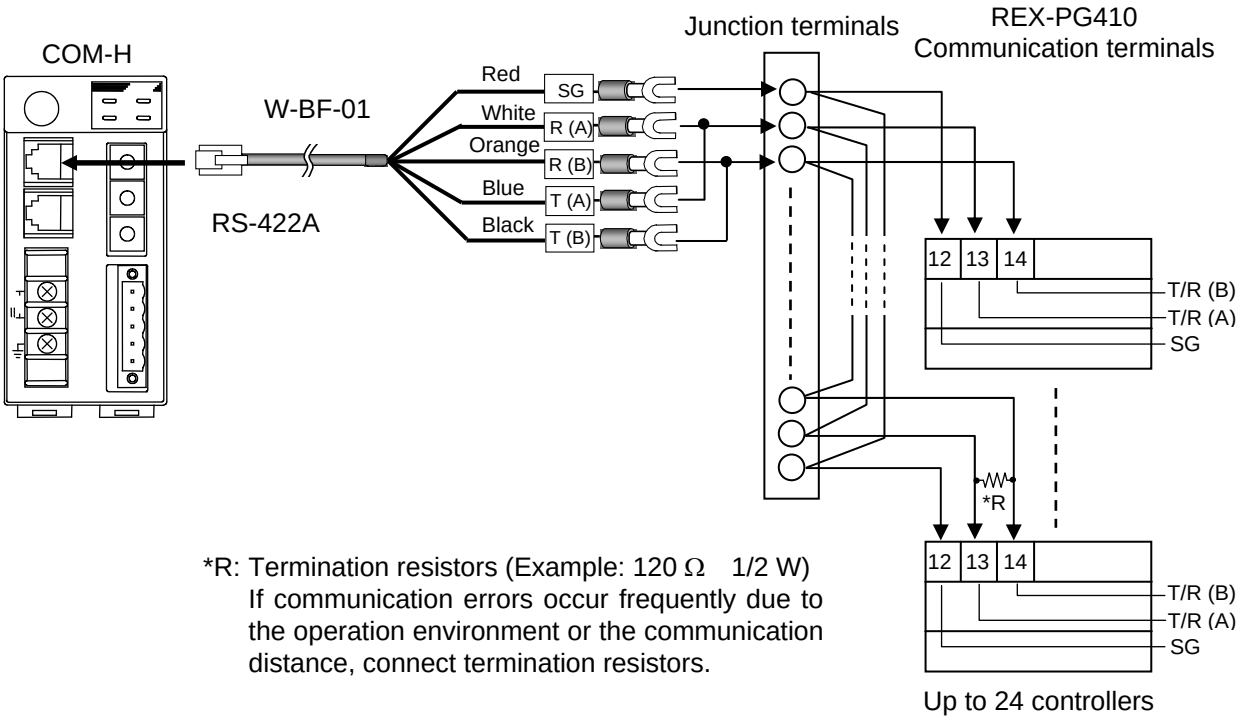
When connected to the RS-485 interface controller by using the RS-422A interface for COM-H control communication, connect T (A) [blue] and R (A) [white] of the cable to the controller T/R (A) terminals and also T (B) [black] and R (B) [orange] of the cable to the controller T/R (B) terminals, respectively.

Cable type: W-BF-01-3000 (RKC product, Sold separately)
[Standard cable length: 3 m]




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

### ● Multi-drop connecting example




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

# 5. SETTING

**⚠ 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 DeviceNet Setting

### 5.1.1 Node address setting

To identify each device connected to the network, it is necessary to set a different address to each device (node).
For the DeviceNet, as it is possible to connect up to 64 devices including a master to the network, node address (MAC ID) from 0 to 63 can be set.
For this setting, use a small blade screwdriver.

**Set the address such that it is different to the other addresses on the same line. Otherwise, problems or malfunction may result.**

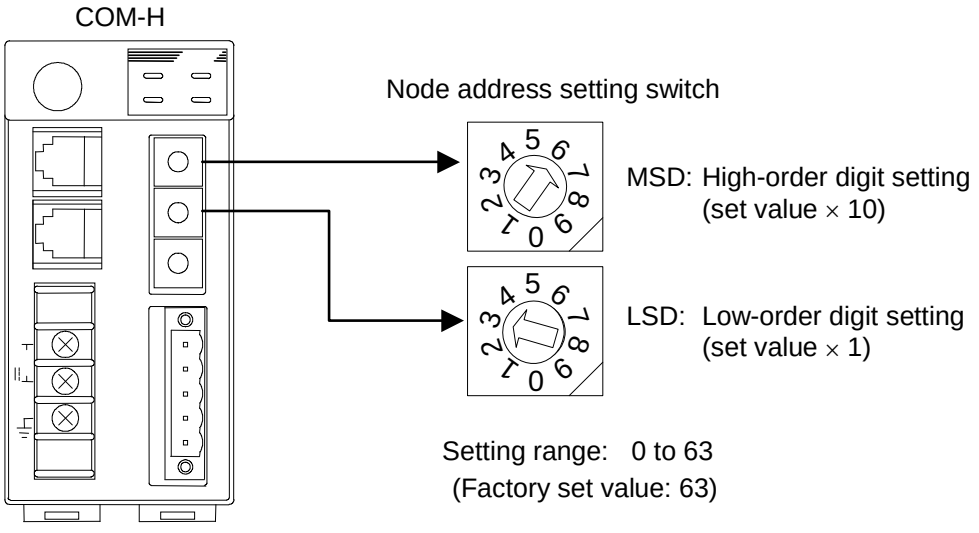



Fig. 5-1 Node address setting switch

The above figure is open-style connector type. The figure of micro-style connector type is the same as an open-style connector type.

## 5.1.2 DeviceNet communication speed setting

Set the communication speed of DeviceNet.
For this setting, use a small slotted screwdriver.

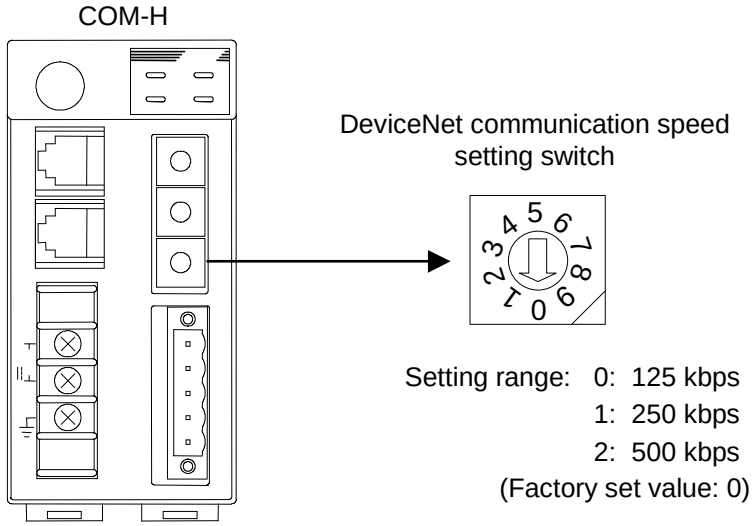



Fig. 5-2 DeviceNet communication speed setting switch

**Do not set 3 to 9. Otherwise, malfunction may result.**

The above figure is open-style connector type. The figure of micro-style connector type is the same as an open-style connector type.

## 5.2 Connection Controller and Communication Mode Setting

Connection controller type and Polling I/O communication mode can be set with the DIP switch located in the COM-H.

***1.*** To separate the module mainframe from the mother block, press the bottom on the module, lifting upward, to release connection.

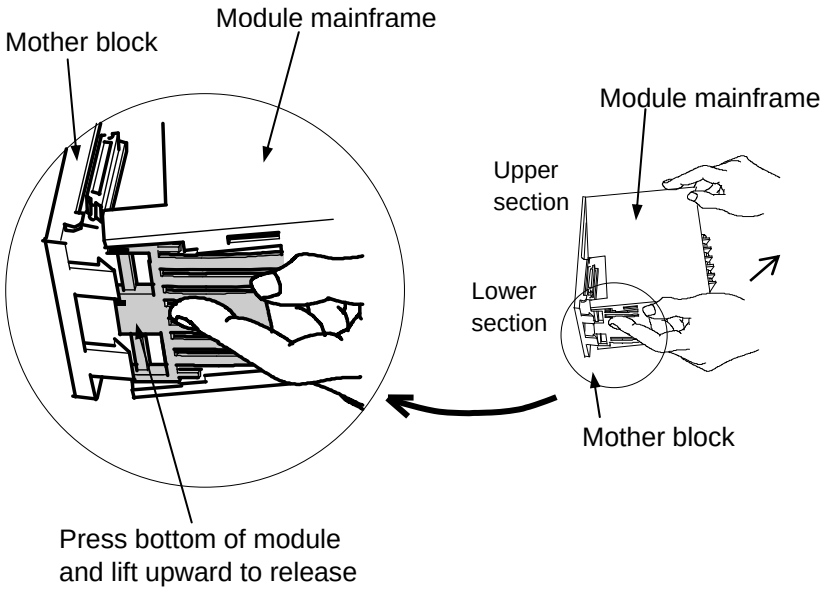



Fig. 5-3 Removing the Module

***2.*** Remove the MCU board from the case while holding the connector by hand with the stopper pulled in the direction shown by the arrow.

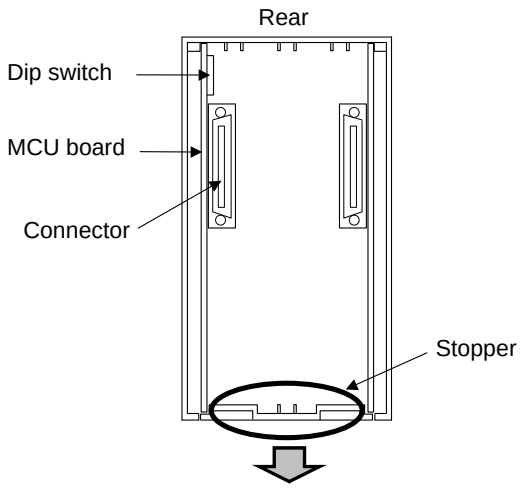



Fig. 5-4 View with the mother block removed

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***3.*** Connection controller and communication mode can be set with the DIP switch located in the COM-H.

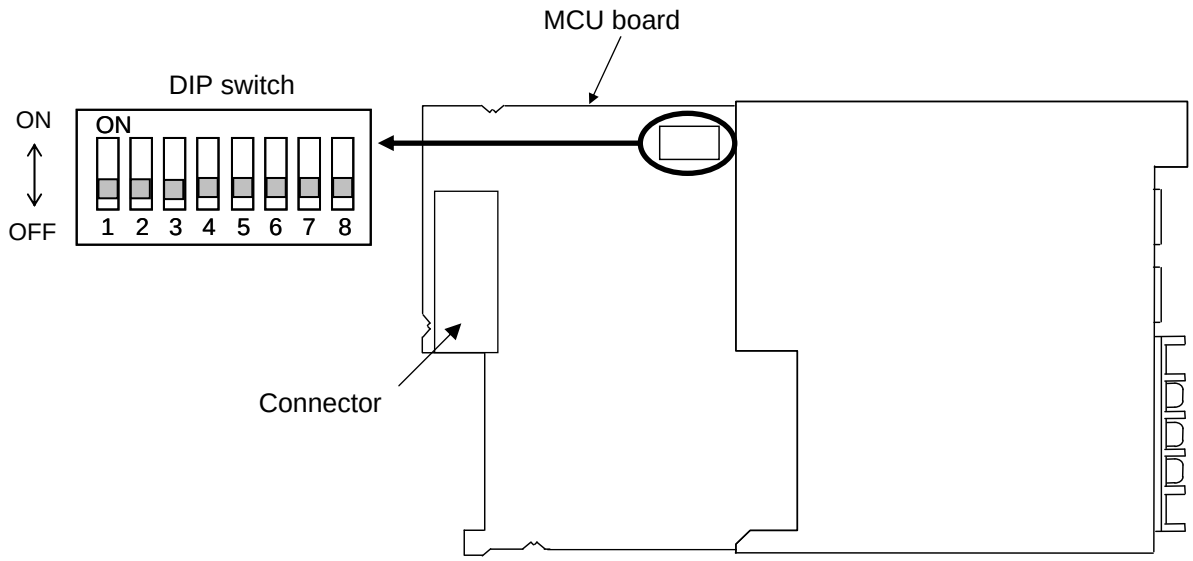



Fig 5-5 Location of DIP switch

- **Connection controller setting**

| Switch number 1 | Connection controller model |
|---|---|
| OFF | SR Mini HG |
| ON | CB100/400/500/700/900<br>REX-F400/700/900<br>SA100/200<br>MA900/901<br>LE100<br>REX-PG410 |

Factory set value: OFF (SR Mini HG)

- **Communication mode setting**

Setting of communicate mode is necessary when it uses Polling I/O communication.

| Switch number 2 | Communication mode |
|---|---|
| OFF | Communication mode A (Compatible mode) |
| ON | Communication mode B (Expansion mode) |

Factory set value: OFF (Communication mode A)

☞ For the communication mode A (compatible mode) and communication mode B (expansion mode), refer to **6.2.2 Polling I/O communication (P. 60).**

- **Transmission wait time setting**

  **When connecting the REX-PG410 to the COM-H, set the Transmission wait time to "ON (3 ms)."**

| Switch number | Transmission wait time |
|---|---|
| 3 | |
| OFF | 1 ms |
| ON | 3 ms |

Factory set value: OFF (1 ms)

**Switch No. 4 to 8: OFF fixed (Do not change this one)**

# 5.3 Controller Communication Setting

## ■ COM-H communication setting

Set a controller communication setting switch of COM-H to become the same value as communication speed and bit configuration of controller connecting with COM-H. For this setting, use a small slotted screwdriver.

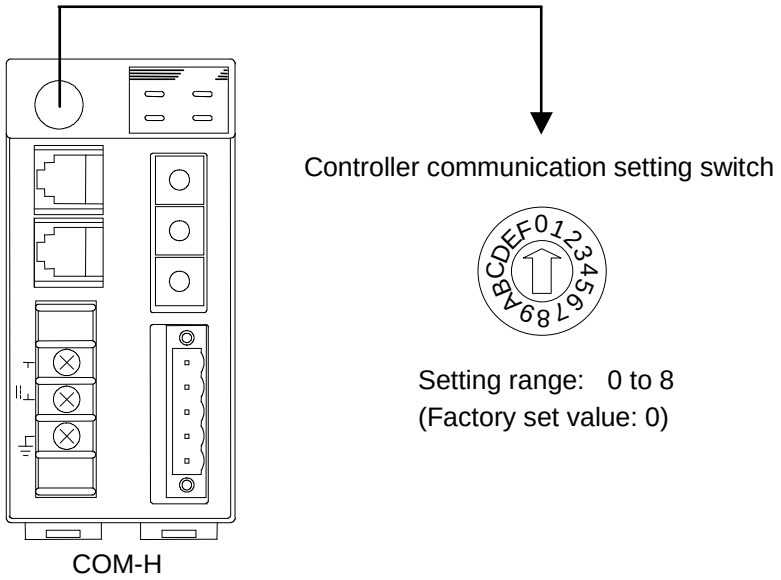



Fig. 5-6 Controller communication setting switch

| Setting | SR Mini HG communication speed | Data bit configuration |
|---|---|---|
| 0 | 9600 bps | Data 8-bit, without parity, Stop 1-bit |
| 1 | 9600 bps | Data 7-bit, Odd parity, Stop 1-bit |
| 2 | 9600 bps | Data 7-bit, Even parity, Stop 1-bit |
| 3 | 4800 bps | Data 8-bit, without parity, Stop 1-bit |
| 4 | 4800 bps | Data 7-bit, Odd parity, Stop 1-bit |
| 5 | 4800 bps | Data 7-bit, Even parity, Stop 1-bit |
| 6 | 19200 bps | Data 8-bit, without parity, Stop 1-bit |
| 7 | 19200 bps | Data 7-bit, Odd parity, Stop 1-bit |
| 8 | 19200 bps | Data 7-bit, Even parity, Stop 1-bit |

**Do not set 9 to F. Otherwise, malfunction may result.**

**Select controller communication setting to become the same as setting of controller.**

The above figure is open-style connector type. The figure of micro-style connector type is the same as an open-style connector type.

## ■ Communication setting of the controller side

### ● Communication speed and data bit configuration setting

Set the same communication speed and data bit configuration for both the controller and the COM-H.

### ● Address setting

- An address of SR Mini HG sets it with H-PCP module. Address setting value always set “0.” In address setting except 0, DeviceNet communication is impossible.
- Address setting range of REX-F400/700/900, CB100/400/500/700/900, SA100/200, MA900/901, LE100 and REX-PG410 is from 1 to 24. When setting the address, always set from “1.”

☞ For communication setting on each controller, refer to Instruction Manual of the following.

- SR Mini HG SYSTEM:
  **SR Mini HG SYSTEM Communication Quick Manual (IMS01V02-E□)**
  **SR Mini HG SYSTEM Communication Instruction Manual (IMSRM09-E□)**
  **Power supply/CPU module H-PCP-J Instruction Manual (IMS01J02-E□)**
- REX-F400/700/900:
  **REX-F400/F700/F900 Communication Instruction Manual (IM900F10-E□)**
- CB100/400/500/700/900:
  **CB100/CB400/CB500/CB700/CB900 Communication Instruction Manual (IMCB03-E□)**
- SA100:
  **SA100 Communication Instruction Manual (IMR01J02-E□)**
- SA200:
  **SA200 Communication Instruction Manual (IMR01D02-E□)**
- MA900/901:
  **MA900/MA901 Communication Instruction Manual (IMR01H02-E□)**
- LE100:
  **LE100 Communication Instruction Manual (IMR01C02-E□)**
- REX-PG410:
  **REX-PG410 Communication Instruction Manual (IM41PG02-E□)**

# 6. DeviceNet COMMUNICATIONS

## 6.1 Features and Functionality

- A DeviceNet network can have Media Access Control Identifiers (MAC ID: Node address) of maximum 64.
- Network length changes with communication speed.

| Communication speed | Maximum network length * | | Maximum drop length | Cumulative drop length |
|---|---|---|---|---|
| | Thick trunk length | Thin trunk length | | |
| 125 kbps | 500 m or less | 100 m or less | 6 m or less | 156 m or less |
| 250 kbps | 250 m or less | | | 78 m or less |
| 500 kbps | 100 m or less | | | 39 m or less |

* Maximum distance between nodes

- Install terminating resistor to both ends of a trunk line in DeviceNet.
  Specification of terminating resistor: 121 Ω, ±1 %, 1/4 W (Metal film resistance)
- A DeviceNet node is modeled as a collection of objects.
  The object model provides a template for organizing and implementing the Attributes (data), Services and Behaviors of the components of a DeviceNet product.
  This model has represented the construction of address designation to consist of four levels of Node address (MAC ID), Object class ID, Instance ID and Attribute ID.
  An address of this 4 level is used as an identification factor of data in Explicit message communication.

| Address | Lowest | Highest |
|---|---|---|
| Node | 0 | 63 |
| Object class | 1 | 65535 |
| Instance | 0 | 65535 |
| Attribute | 1 | 255 |

- DeviceNet incorporates CAN (Controller Area Network). CAN defines the syntax or form of the data movement. Data on the DeviceNet use CAN data frame, and be transmitted.

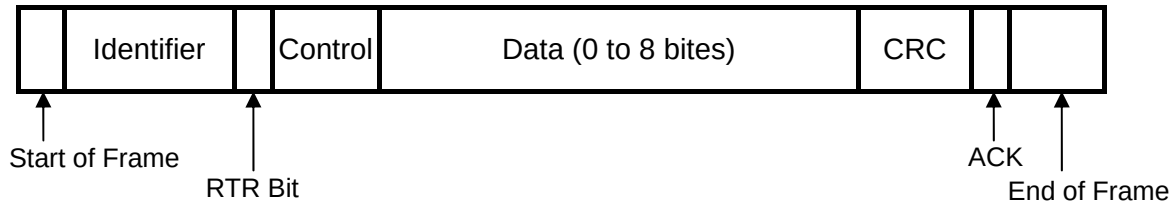


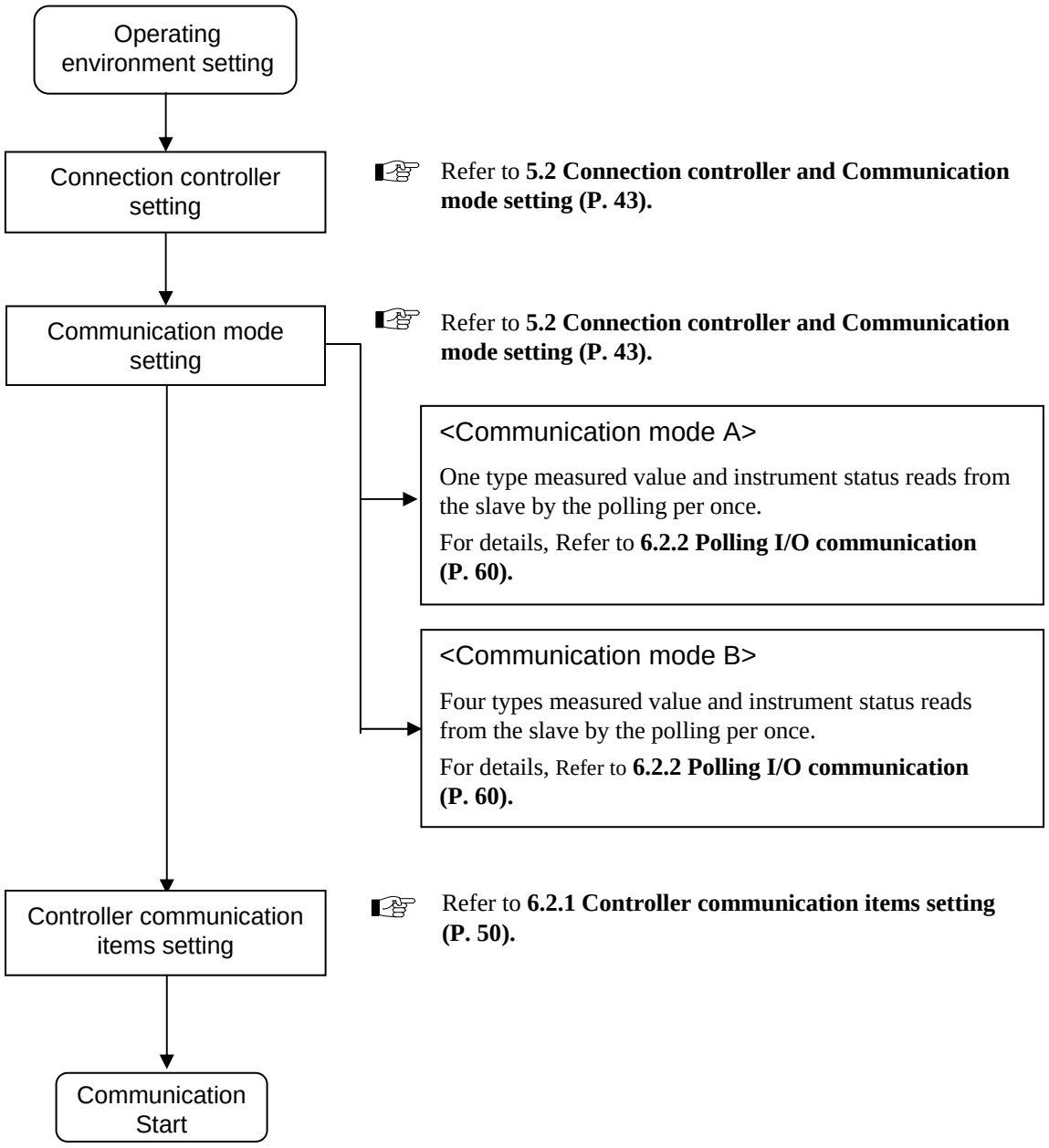

Fig. 6-1 CAN data frame

☞ For details on the communication specification of DeviceNet, refer to DeviceNet specifications. DeviceNet specifications are available from ODVA (Open DeviceNet Vender Association).
URL: http://www.odva.org

## 6.2 Communication Method

COM-H has supported “Polling I/O communication” and “Explicit message communication” as a communication method of DeviceNet.

### ■ Communication procedure



## 6.2.1 Controller communication items setting

Thirty controller communication items can be set to the COM-H. This setting can be made by using the configuration tool.

**Time-out may occur if trying to read any COM-H parameter from the configuration tool while in Polling I/O communication between the master station and COM-H. When reading or setting the parameters by the configuration tool, stop I/O polling at the master station.**

The communication items are stored in the inside of COM-H, and are held in case of power off.

For communication items in shipment, refer to ● C**ommunication items of shipment (P. 58).**

### ● Setting procedure

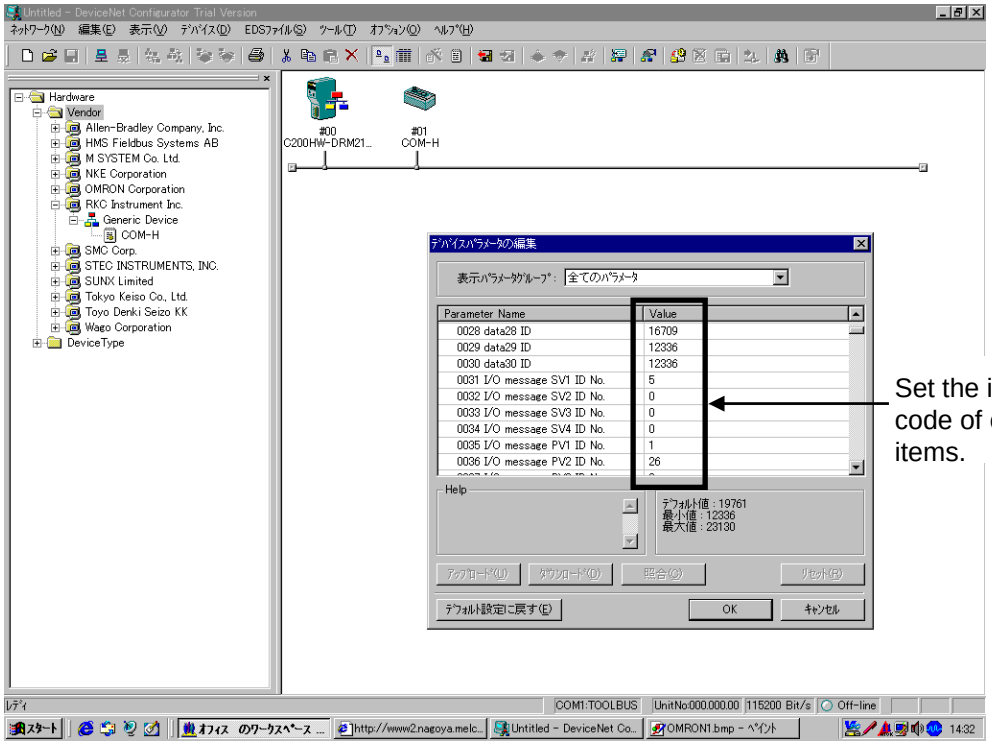
***1.*** Connect PC (Personal computer) to COM-H with DeviceNet.

***2.*** Install the EDS file of COM-H on the configuration tool.
Communication mode A and B are available for EDS files. Therefore, install the EDS file in the mode used.

- EDS file for communicate mode A (Compatible mode)
- EDS file for communicate mode B (Expansion mode)

For communication mode, refer to **6.2.2 Polling I/O communication (P. 60).**

***3.*** Set the DeviceNet to the on-line state by using the configuration tool to open the COM-H property screen.
<Reference screen 1: Configuration tool made by OMRON>




Set the identification code of communication items.

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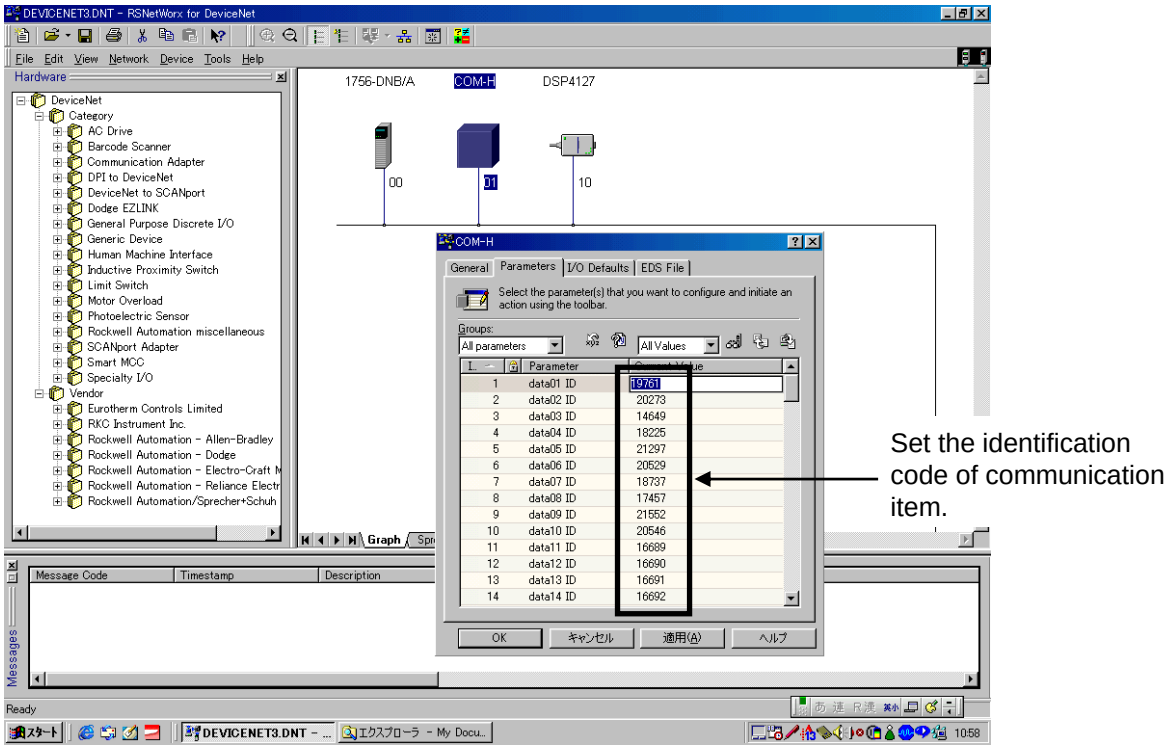
<Reference screen 2: Configuration tool made by Rockwell>




***4.*** With property screen, sets identification code of controller communication items in the parameter from 1 to 47.

☞ For identification code, refer to **6.3. Communication Items List (P. 68).**

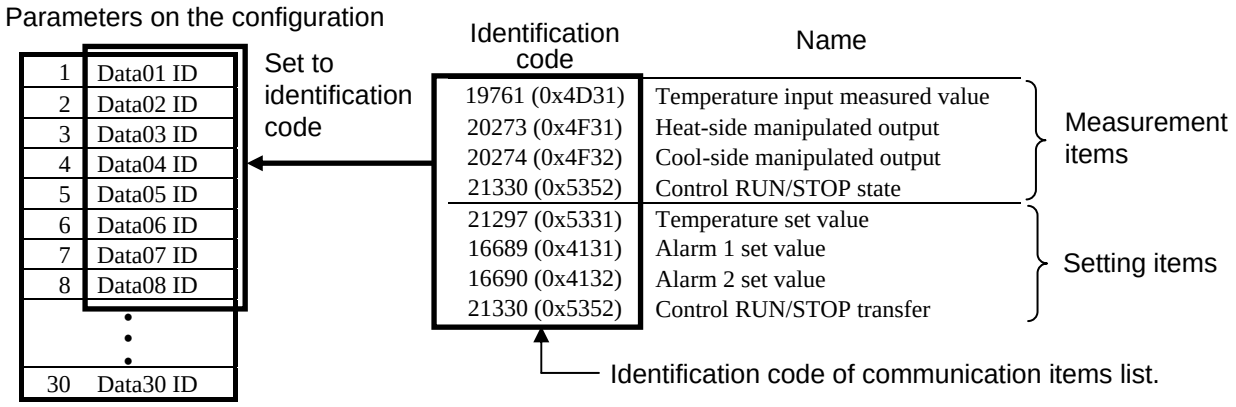
### ● Parameter setting example of Polling I/O communication

Parameter setting example at used the SR Mini HG.

- Measurement items: Temperature measured input value, Heat-side manipulated output, Cool-side manipulated output, Control RUN/STOP state
- Setting items: Temperature set value, Alarm 1 set value, Alarm 2 set value, Control RUN/STOP transfer
- Controller status: Alarm 1 status, Alarm 2 status, Heater break alarm status, Burnout status
- Number of maximum connection channels: 10 channels

**Conduct parameter set according to the procedure described below.**

***1.*** Selects identification code of polling data from the communication items list, and sets it in the parameter from 1 to 8.

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***2.*** The parameter numbers of measured items set to parameters 1 to 4 are set to parameters 35 to 38.

Parameter numbers of measured items.

| | Parameter | Identification code |
|---|---|---|
| 1 | Data01 ID | 19761 (0x4D31) |
| 2 | Data02 ID | 20273 (0x4F31) |
| 3 | Data03 ID | 20274 (0x4F32) |
| 4 | Data04 ID | 21330 (0x5352) |
| 5 | Data05 ID | 21297 (0x5331) |
| 6 | Data06 ID | 16689 (0x4131) |
| 7 | Data07 ID | 16690 (0x4132) |
| 8 | Data08 ID | 21330 (0x5352) |
| | ⋮ | ⋮ |
| 30 | Data30 ID | |
| 31 | SV1 ID No. | |
| | ⋮ | ⋮ |
| 34 | SV4 ID No. | |
| 35 | PV1 ID No. | 1 |
| 36 | PV2 ID No. | 2 |
| 37 | PV3 ID No. | 3 |
| 38 | PV4 ID No. | 4 |
| 39 | Status bit 0 | |
| | ⋮ | ⋮ |
| 46 | Status bit 7 | |
| 47 | Max temperature ch | |

Set to the parameter numbers of measured items.

If set to 0: Unused.

Continued on the next page.

Continued from the previous page.

***3.*** The parameter numbers of setting items set to parameters 5 to 8 are set to parameters 31 to 34.

Parameter numbers of setting items.

| Parameter | | Identification code |
|---|---|---|
| 1 | Data01 ID | 19761 (0x4D31) |
| 2 | Data02 ID | 20273 (0x4F31) |
| 3 | Data03 ID | 20274 (0x4F32) |
| 4 | Data04 ID | 21330 (0x5352) |
| 5 | Data05 ID | 21297 (0x5331) |
| 6 | Data06 ID | 16689 (0x4131) |
| 7 | Data07 ID | 16690 (0x4132) |
| 8 | Data08 ID | 21330 (0x5352) |
| | • • • | • • • |
| 30 | Data30 ID | |
| 31 | SV1 ID No. | 5 |
| 32 | SV2 ID No. | 6 |
| 33 | SV3 ID No. | 7 |
| 34 | SV4 ID No. | 8 |
| 35 | PV1 ID No. | 1 |
| 36 | PV2 ID No. | 2 |
| 37 | PV3 ID No. | 3 |
| 38 | PV4 ID No. | 4 |
| 39 | Status bit 0 | |
| | • • • | • • • |
| 46 | Status bit 7 | |
| 47 | Max temperature ch | |

Set to the parameter numbers of setting items.

If set to 0: Unused.

Continued on the next page.

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***4.*** Set the identification code of controller status in the parameter from 39 to 46.

| Parameter | Identification code |
|---|---|
| 1 Data01 ID | 19761 (0x4D31) |
| • • • | • • • |
| 8 Data08 ID | 21330 (0x5352) |
| • • • | • • • |
| 30 Data30 ID | |
| 31 SV1 ID No. | 5 |
| 32 SV2 ID No. | 6 |
| 33 SV3 ID No. | 7 |
| 34 SV4 ID No. | 8 |
| 35 PV1 ID No. | 1 |
| 36 PV2 ID No. | 2 |
| 37 PV3 ID No. | 3 |
| 38 PV4 ID No. | 4 |
| 39 Status bit 0 | 16705 (0x4141) |
| 40 Status bit 1 | 16706 (0x4142) |
| 41 Status bit 2 | 16707 (0x4143) |
| 42 Status bit 3 | 16945 (0x4231) |
| 43 Status bit 4 | 12336 (0x3030) |
| 44 Status bit 5 | 12336 (0x3030) |
| 45 Status bit 6 | 12336 (0x3030) |
| 46 Status bit 7 | 12336 (0x3030) |
| 47 Max temperature ch | |

Set to the identification code of alarm 1 status, alarm 2 status, heater break status and burnout status.

As Nos. 43 to 46 are not used, “12336 (0x3030)” (no communication item designated) is set.

Continued on the next page.

***5.*** Set the number of maximum connection channels in the parameter 47.

| | Parameter | Identification code |
|---|---|---|
| 1 | Data01 ID | 19761 (0x4D31) |
| | • • • | • • • |
| 8 | Data08 ID | 21330 (0x5352) |
| | • • • | • • • |
| 30 | Data30 ID | |
| 31 | SV1 ID No. | 5 |
| 32 | SV2 ID No. | 6 |
| 33 | SV3 ID No. | 7 |
| 34 | SV4 ID No. | 8 |
| 35 | PV1 ID No. | 1 |
| 36 | PV2 ID No. | 2 |
| 37 | PV3 ID No. | 3 |
| 38 | PV4 ID No. | 4 |
| 39 | Status bit 0 | 16705 (0x4141) |
| 40 | Status bit 1 | 16706 (0x4142) |
| 41 | Status bit 2 | 16707 (0x4143) |
| 42 | Status bit 3 | 16945 (0x4231) |
| 43 | Status bit 4 | 12336 (0x3030) |
| 44 | Status bit 5 | 12336 (0x3030) |
| 45 | Status bit 6 | 12336 (0x3030) |
| 46 | Status bit 7 | 12336 (0x3030) |
| 47 | Max temperature ch | 10 |

Set to the number of maximum connection channels.

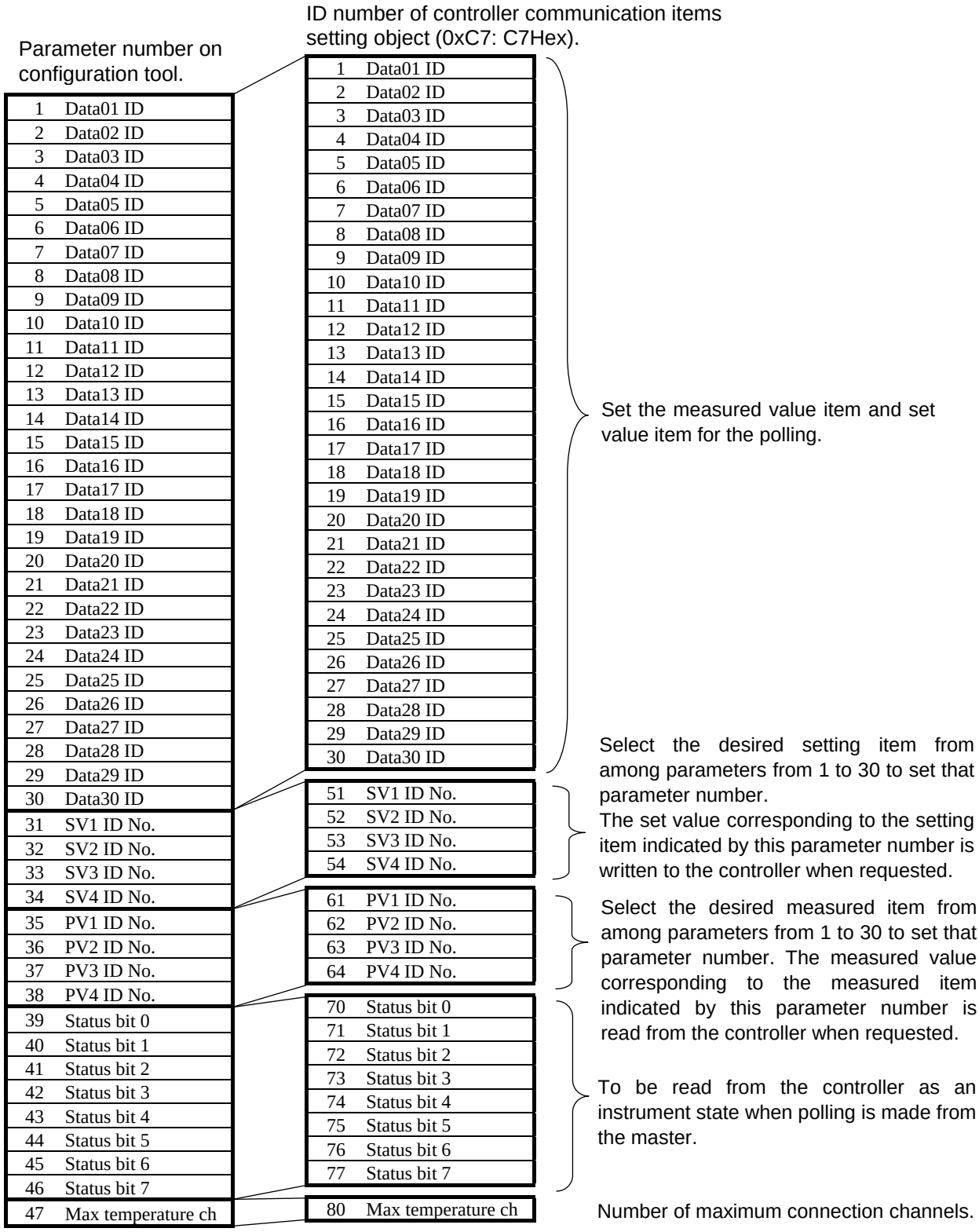
***6.*** Turn off the power of COM-H once and turn it on again to validate the setting data.

Number of connection channels.

- For SR Mini HG, set the number of maximum channel in temperature control module (H-TIO), current transformer input module (H-CT), DI module (H-DI), DO module (H-DO), analog input module (H-AI) and analog output module (H-AO).
- The REX-F400/700/900, CB100/400/500/700/900, SA100/200, LE100 and REX-PG410, one each is set as one channel.
- One MA900 is set as 4 channels, while one MA901, as 8 channels.

- **Relationship between the parameter numbers of configuration tool and controller communication item setting object (0xC7: C7Hex).**

  ☞ For specification of controller communication item setting object (0xC7: C7Hex), refer to **APPENDIX A. Device Profiles (P. 108)**.



### ● Communication items of shipment

In shipment of COM-H, communication items of the following are set.

| ID | Content | Identification code | Communication item |
|---|---|---|---|
| 1 | Data01 ID | 19761 (0x4D31) | Temperature input measured value |
| 2 | Data02 ID | 20273 (0x4F31) | Heat-side manipulated output |
| 3 | Data03 ID | 14649 (0x3939) | Controller status * |
| 4 | Data04 ID | 18225 (0x4731) | PID/AT transfer |
| 5 | Data05 ID | 21297 (0x5331) | Temperature set value |
| 6 | Data06 ID | 20529 (0x5031) | Heat-side proportional band |
| 7 | Data07 ID | 18737 (0x4931) | Integral time |
| 8 | Data08 ID | 17457 (0x4431) | Derivative time |
| 9 | Data09 ID | 21552 (0x5430) | Heat-side proportional cycle |
| 10 | Data10 ID | 20546 (0x5042) | PV bias |
| 11 | Data11 ID | 16689 (0x4131) | Alarm 1 set value |
| 12 | Data12 ID | 16690 (0x4132) | Alarm 2 set value |
| 13 | Data13 ID | 16691 (0x4133) | Heater break alarm 1 set value |
| 14 | Data14 ID | 16692 (0x4134) | Heater break alarm 2 set value |
| 15 | Data15 ID | 21330 (0x5352) | Control RUN/STOP |
| 16 | Data16 ID | 17737 (0x4549) | Operation mode transfer |
| 17 | Data17 ID | 17217 (0x4341) | Control response parameter |
| 18 | Data18 ID | 18776 (0x494E) | Initialize setting mode |
| 19 | Data19 ID | 22601 (0x5849) | Input range |
| 20 | Data20 ID | 22597 (0x5845) | Direct/Reverse action selection |
| 21 | Data21 ID | 23110 (0x5A46) | CT channel setting |
| 22 | Data22 ID | 20530 (0x5032) | Cool-side proportional band |
| 23 | Data23 ID | 21553 (0x5431) | Cool-side proportional cycle |
| 24 | Data24 ID | 20274 (0x4F32) | Cool-side manipulated output |
| 25 | Data25 ID | 22065 (0x5631) | Overlap/Deadband |
| 26 | Data26 ID | 19765 (0x4D35) | Analog input (AI) measured value |
| 27 | Data27 ID | 16708 (0x4144) | Analog input (AI) alarm 1 status |
| 28 | Data28 ID | 16709 (0x4145) | Analog input (AI) alarm 2 status |
| 29 | Data29 ID | 16693 (0x4135) | Analog input (AI) alarm 1 set value |
| 30 | Data30 ID | 16694 (0x4136) | Analog input (AI) alarm 2 set value |

* Controller status
Bit 0 to 7: Content of ID70 to 77
Bit 8 to 13: Unused
Bit 14: Polling I/O inside error
Bit 15: Unused

☞ Refer to ■ **Data which a master receives (response) (P.62)**.

Detail of controller status bit 0 to 7

| ID | Content | Identification | Communication item |
|---|---|---|---|
| 70 | Status bit 0 | 12336 (0x3030) * | ––– |
| 71 | Status bit 1 | 12336 (0x3030) * | ––– |
| 72 | Status bit 2 | 16708 (0x4144) | Analog input (AI) alarm 1 status |
| 73 | Status bit 3 | 16709 (0x4145) | Analog input (AI) alarm 2 status |
| 74 | Status bit 4 | 16705 (0x4141) | Alarm 1 status |
| 75 | Status bit 5 | 16706 (0x4142) | Alarm 2 status |
| 76 | Status bit 6 | 16945 (0x4231) | Burnout status |
| 77 | Status bit 7 | 16707 (0x4143) | Heater break alarm status |

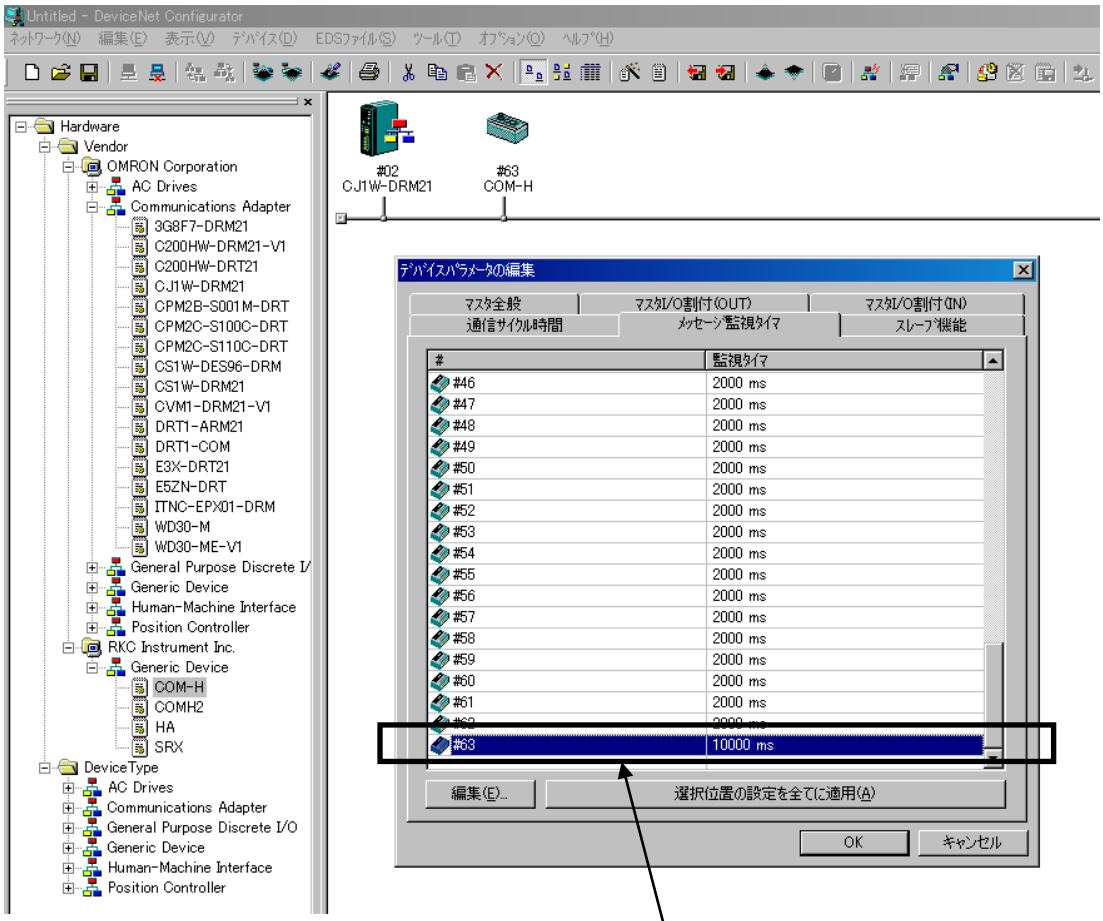
* Identification code is “12336 (0x3030)” when it does not designate communication item.

**If a PLC manufactured by OMRON is used and the Connection controller setting (dip switch No. 1) is tuned to ON (CB100/400/500/700/900, REX-F400/700/900, SA100/200, MA900/901, LE100, REX-PG410), set the PLC Message Timer to 10000 ms.**

**⟨Setting procedure of Message Timer⟩**

1. **Click the PLC name being displayed.**
2. **Click [Device] → [Parameter] → [Edit] in the menu. Thus "Edit Device Parameters" dialog box is displayed.**
3. **Click the [Message Timer] tab to set the COM-H Message Timer to 10000 ms.**

**< Message Timer, Configuration tool made by OMRON>**




Set the Message Timer of COM-H to "10000 ms."
(In this example, Message Timer of MAC ID 63)

## 6.2.2 Polling I/O communication

Polling I/O communication is the communication that master and slave always execute transmission and reception of data. Used always when checking data items such as measured values, etc.
Either one type or four types of measured value to be read can be selected by polling made once according to the communication mode in Polling I/O communication.

### ● Communication mode

Select either communicate mode A or B.
- Communication mode A (Compatible mode):
  For one time of polling [1] from the master, sends one measured value [2] and instrument status from the slave.
- Communication mode B (Expansion mode):
  For one time of polling [1] from the master, sends four measured value [2] and instrument status from the slave.

[1] Each sends data type, channel number and set value to slave.
[2] For data type, refer to ■ **A difference of polling data by communicate mode (P. 63)**.

☞ For setting method of communication mode, refer to **5.2 Connection Controller and Communication Mode Setting (P. 43)**.

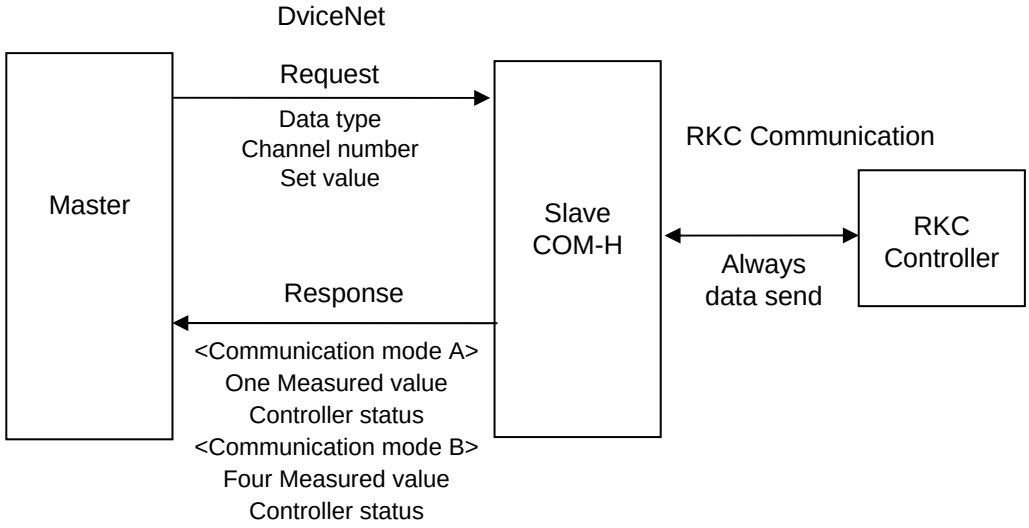



Fig. 6-1 Outline of polling I/O communication

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**When setting the set value or monitoring the measured value in each channel of the controller, it is necessary to create on the master side a program which sends the data while selecting the data type, channel number * or set value sent from the master.**

* Send device address of an instrument in REX-F400/700/900, CB100/400/500/700/900, SA100/200, MA900/901, LE100 and REX-PG410.

**For data processed in actual communication, its decimal point is ignored. In addition, data with a minus sign is expressed as 2's complement data.**

[Example 1]
For a set value of "120.0," set "1200."
[Example 2]
For a set value of "–1," set "65535."
(10000H – 1 = FFFFH = 65535)

The specification of Polling I/O communication is written with **APPENDIX A. Device Profiles**/**Assembly object (0x04) (P. 112)**.

## ■ Data to send from a master (request)

Corresponding object: Assembly object (0x04)
Instance ID: 101
Attribute ID: 3

A master transmits data of the following for slave (COM-H).

Attribute (data) contents

| ID | Items | Data range | |
|---|---|---|---|
| | | Communication mode A (Compatible mode) | Communication mode B (Expansion mode) |
| 3 | Data type | 1 to 4 [a] | 1 to 30 [b] |
| | Channel number * | 1 to 24 | |
| | Set value | Set value of setting items corresponding to data types from 1 to 4 (1 to 30). | |

* Specifies the channel number of set value which is sent from the master. In addition, the channel number specified here becomes the channel number of measured value which is sent from the slave.

[a] Data types from 1 to 4 correspond to controller communication item setting objects (0xC7: C7Hex) from ID51 to 54 to specify data types of set value to be sent from the master.

[b] Data types from 1 to 30 correspond to controller communication item setting objects (0xC7: C7Hex) from ID1 to 30 to specify data types of set value to be sent from the master.

## ■ Data which a master receives (response)

Corresponding object: Assembly object (0x04)
Instance ID: 100
Attribute ID: 3

For the transmission from a master, slave (COM-H) calls data of the following from controller, and transmit to a master.

Attribute (data) contents

| ID | Items | Data range | |
|---|---|---|---|
| | | **Communication mode A (Compatible mode)** | **Communication mode B (Expansion mode)** |
| 3 | Measured value | Measured value corresponding to the data type required from the master. | Four types measured value specified from ID61 to 64 by controller communication item setting object (0xC7: C7Hex). |
| | Controller status | Word type data<br>Bit 0 to 7: Controller status [1]<br>Bit 8 to 13: Unused<br>Bit 14: Polling I/O inside error [2]<br>Bit 15: Unused | |

[1] The lowest bit of the item designated by IDs 70 to 77 of Controller Communication Item Setting Object (0xC7: C7Hex) is set to controller status Bits 0 to 7.
- When alarm has occurred, become “1.”
- When alarm has not occurred, become “0.”

[2]
- When no response from the controller for Polling I/O Request, become “1.”
- When response of controller for Polling I/O Request is normal, become “0.”

## ■ A difference of polling data by communicate mode

### ● Communication mode A (Compatible mode)

Measured value corresponding to types of request data to be sent from the master are sent to the master from the COM-H as response data.

- Data type 1

  Request data from a master: The set value data specified with ID51 of 0xC7 *.
  Response data from COM-H: The measured value data specified with ID61 of 0xC7 *.

- Data type 2

  Request data from a master: The set value data specified with ID52 of 0xC7 *.
  Response data from COM-H: The measured value data specified with ID62 of 0xC7 *.

- Data type 3

  Request data from a master: The set value data specified with ID53 of 0xC7 *.
  Response data from COM-H: The measured value data specified with ID63 of 0xC7 *.

- Data type 4

  Request data from a master: The set value data specified with ID54 of 0xC7 *.
  Response data from COM-H: The measured value data specified with ID64 of 0xC7 *.

* Controller communication item setting object (0xC7: C7Hex)

<Set value and measured value corresponding to data type>

| Data type | ID of controller communication item setting object (0xC7: C7Hex) | |
|---|---|---|
| | Set value | Measurement value |
| 1 | ID51 | ID61 |
| 2 | ID52 | ID62 |
| 3 | ID53 | ID63 |
| 4 | ID54 | ID64 |

### ● Communication mode B (Expansion mode)

<Measurement value>

The following four types of measured value corresponding to the set value of request data to be sent from the master are sent to the master from the COM-H as response data regardless of these data types.

- The measured value data specified with ID61 of 0xC7 *.
- The measured value data specified with ID62 of 0xC7 *.
- The measured value data specified with ID63 of 0xC7 *.
- The measured value data specified with ID64 of 0xC7 *.

* Controller communication item setting object (0xC7: C7Hex)

<Set value>

The set value of request data to be sent from the master becomes that of the set item specified from among controller communication item setting objects (0xC7: C7Hex) ID1 to 30.

## 6.2.3 Explicit message communication

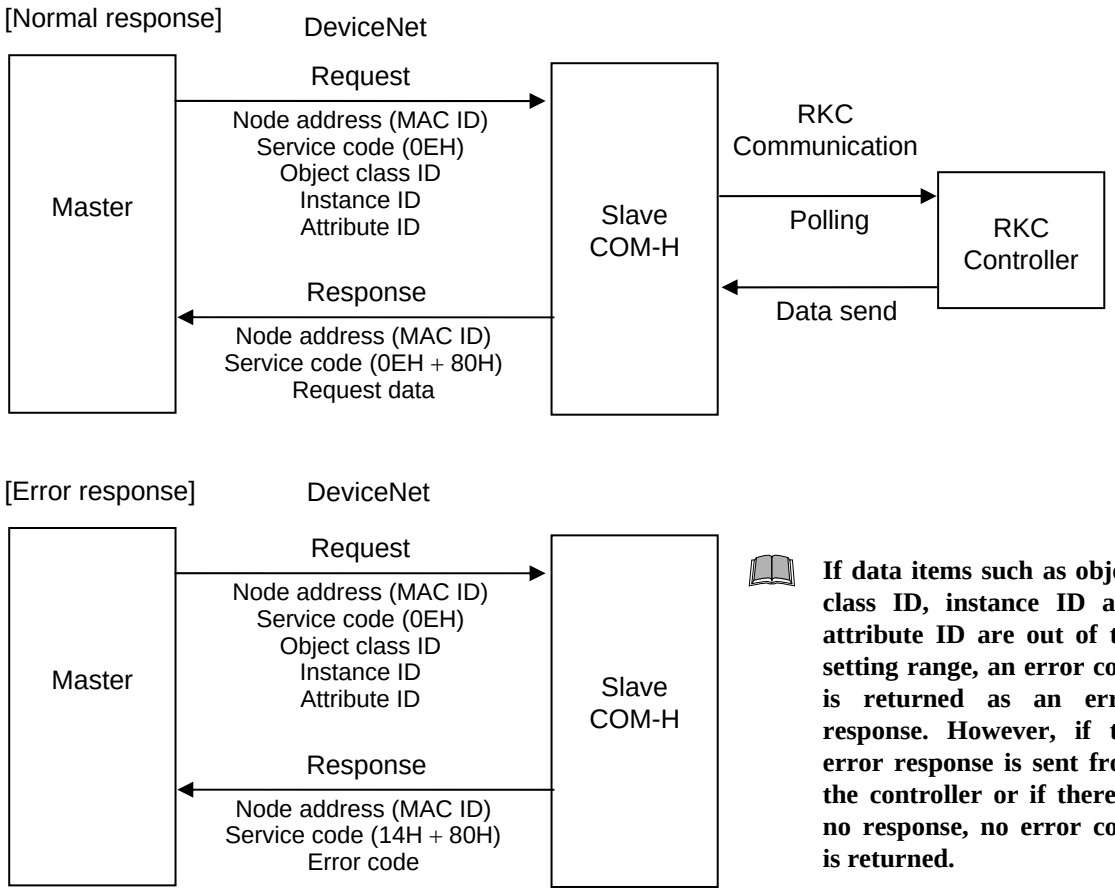
Explicit message communication uses an Explicit message defined with DeviceNet, and be communication to execute transmission and reception of data between nodes when it is necessary.
Explicit message communication is executed like the following, when COM-H (slave) is connected to a master instrument with DeviceNet, and controller is connected to COM-H.

In Explicit message communication, not only data relating to the controller bur also all of the attributes (data) described in **APPENDIX A. Device Profiles (P. 108)** are subject to being sent or received.

### ■ When read data

If the node address (MAC ID), service code (0EH: Get_Attribute_Single), object class ID, instance ID and attribute ID are sent from the master, the node address (MAC ID) thus sent and service code (0EH + 80H *) as well as the data requested are sent from the slave.

* 80H has shown that it is a response message.




**If data items such as object class ID, instance ID and attribute ID are out of the setting range, an error code is returned as an error response. However, if the error response is sent from the controller or if there is no response, no error code is returned.**

Fig. 6-2 Outline of Explicit message communication (data read)

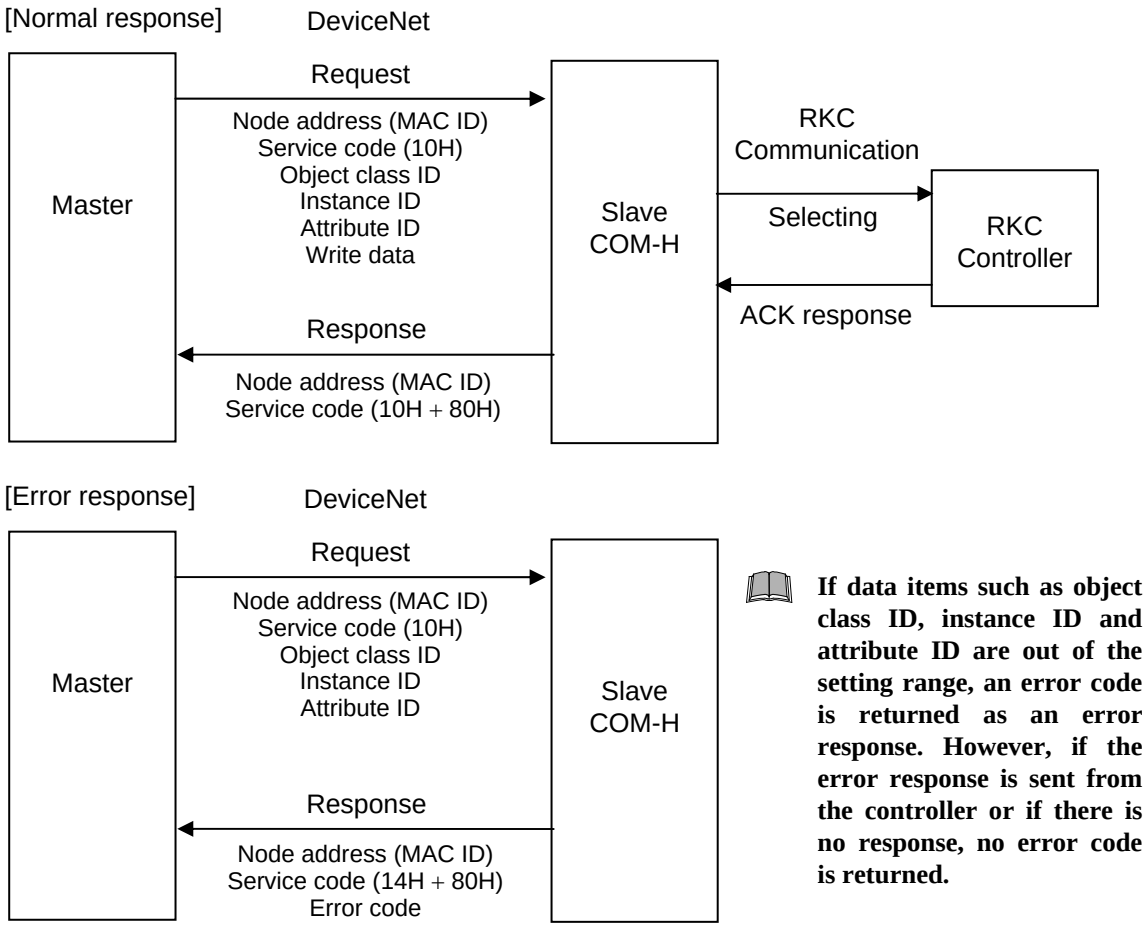
Service code 14H of [Error response] has shown that it is error response.

For Error code of [Error response], refer to DeviceNet specifications.

## ■ When write data

If the node address (MAC ID), service code (10H: Set_Attribute_Single), object class ID, instance ID attribute ID and write data are sent from the master, the node address (MAC ID) thus sent and service code (10H + 80H *) are sent from the slave.

* 80H has shown that it is a response message.




**If data items such as object class ID, instance ID and attribute ID are out of the setting range, an error code is returned as an error response. However, if the error response is sent from the controller or if there is no response, no error code is returned.**

Fig. 6-3 Outline of Explicit message communication (data write)

**For data processed in actual communication, its decimal point is ignored. In addition, data with a minus sign is expressed as 2's complement data.**

[Example 1] For a set value of "120.0," set "1200."

[Example 2] For a set value of "–1," set "65535."
(10000H – 1 = FFFFH = 65535)

**If the item of Controller Communication Item Setting Object (0xC7: C7Hex) is changed via Explicit message communication, always set "Number of maximum connection channels (ID80)" at the end, and turn the power off once and then turn it on again. Thus, the changed data becomes valid.**

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Service code 14H of [Error response] has shown that it is error response.

For Error code of [Error response], refer to DeviceNet specifications.

The explicit message communication specification of data to be related to SR Mini HG is written with **APPENDIX A. Device Profiles/Temperature controller object (0x64) (P. 116)** and **Controller Communication Item Setting Object (0xC7) (P. 117)**.

## ■ Data setting example

Describe data setting example of the SR Mini HG it with the following.

Corresponding object: Temperature controller object (0x64)
Object class ID: 64
Instance ID: 1 to 24
Attribute ID: 1 to 30

Object instances (Instance IDs) from 1 to 24 correspond to channels from 1 to 20 of the SR Mini HG. However, temperature input data, analog input (AI) data and CT input data exist in the SR Mini HG and each of them is used from channel 1. Therefore, the temperature input, analog input (AI) and CT input are not identified by Instance ID, but by the contents of data (namely, Attribute ID).

**[Example]**

- **When set 100 in "Alarm 1 set value" of Temperature input channel 1**
  (Node address of COM-H: 1)
  Node address (MAC ID): 1
  Service code: 10H (Set_Attribute_Single)
  Object class ID: 64
  Instance ID: 1 (Channel 1)
  Attribute ID: 11 (Temperature input, Alarm 1 set value)
  Write data: 100

- **When "Analog input measured value" of Analog input channel 1 is read out from slave.** (Node address of COM-H: 1)
  Node address (MAC ID): 1
  Service code: 0EH (Get_Attribute_Single)
  Object class ID: 64
  Instance ID: 1 (Channel 1)
  Attribute ID: 26 (Analog input measured value)

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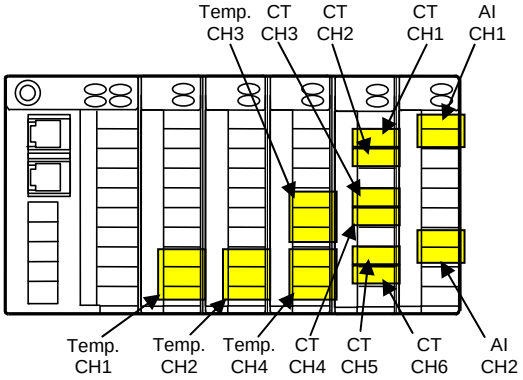
- When any channel which uses the CT in CT input channel 1 (temperature input channel for the H-TIO module corresponding to the CT input channel for the H-CT module) is set to 1
  (Node address of COM-H: 1)
  Node address (MAC ID): 1
  Service code: 10H (Set_Attribute_Single)
  Object class ID: 64
  Instance ID: 1 (Channel 1)
  Attribute ID: 21 (CT channel setting)
  Write data: 1




SR Mini HG module configuration of the left
H-PCP-A: 1 module
H-TIO-A: 2 modules
H-TIO-B: 1 module
H-CT-A: 1 module
H-AI-B: 1 module
Used channel
Temp. input (H-TIO-A, B): CH1 to 4
CT input (H-CT-A): CH1 to 6
Analog input (H-AI-B): CH1 to 2

Fig. 6-4 SR Mini HG channel assignment example

# 6.3 Communication Items List

ID code (Identification code):
ID code is written using both of decimal and hexadecimal (in parentheses) numbers.

Attribute: RO: Read only
Correspond to Service code: 0EH (Get_Attribute_Single) of DeviceNet.
For data request of a master, data is read from slave.

R/W: Read and Write
Correspond to Service code: 0EH (Get_Attribute_Single) /Service code: 10H (Set_Attribute_Single) of DeviceNet.
In Get_Attribute_Single, data is read for data request of a master from Slave.
In Set_Attribute_Single, write in data for Slave from a master.

WO: Write only
Correspond to Service code: 10H (Set_Attribute_Single) of DeviceNet.
In Set_Attribute_Single, write in data for Slave from a master.

## 6.3.1 SR Mini HG

| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 16689 (0x4131) | A1 | Alarm 1 set value | R/W |
| 16690 (0x4132) | A2 | Alarm 2 set value | R/W |
| 16691 (0x4133) | A3 | Heater break alarm (HBA) set value 1 | R/W |
| 16692 (0x4134) | A4 | Heater break alarm (HBA) set value 2 | R/W |
| 16693 (0x4135) | A5 | AI alarm 1 set value | R/W |
| 16694 (0x4136) | A6 | AI alarm 2 set value | R/W |
| 16695 (0x4137) | A7 | Event DO extension alarm set value | R/W |
| 16696 (0x4138) | A8 | TI alarm 1 set value | R/W |
| 16697 (0x4139) | A9 | TI alarm 2 set value | R/W |
| 16705 (0x4141) | AA | Alarm 1 status | RO |
| 16706 (0x4142) | AB | Alarm 2 status | RO |
| 16707 (0x4143) | AC | Heater break alarm (HBA) status | RO |
| 16708 (0x4144) | AD | AI alarm 1 status | RO |
| 16709 (0x4145) | AE | AI alarm 2 status | RO |
| 16710 (0x4146) | AF | TI alarm 1 status | RO |
| 16711 (0x4147) | AG | TI alarm 2 status | RO |
| 16712 (0x4148) | AH | CT module Heater break alarm status | RO |
| 16714 (0x414A) | AJ | Overall alarm status | RO |
| 16720 (0x4150) | AP | Control loop break alarm (LBA) status | RO |
| 16722 (0x4152) | AR | Alarm interlock release | WO |
| 16726 (0x4156) | AV | Input error determination point (high limit) | R/W |
| 16727 (0x4157) | AW | Input error determination point (low limit) | R/W |
| 16945 (0x4231) | B1 | Burnout status | RO |
| 16946 (0x4232) | B2 | TI burnout status | RO |
| 17201 (0x4331) | C1 | Local/Computer transfer | RO |
| 17202 (0x4332) | C2 | CC-Link Selecting flag | RO |

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| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 17206 (0x4336) | C6 | Control loop break alarm (LBA) time | R/W |
| 17217 (0x4341) | CA | Control response parameters | R/W |
| 17228 (0x434C) | CL | Module initialization | R/W |
| 17238 (0x4356) | CV | AO zooming high limit | R/W |
| 17239 (0x4357) | CW | AO zooming low limit | R/W |
| 17457 (0x4431) | D1 | Derivative time | R/W |
| 17478 (0x4446) | DF | Number of alarm delay times | R/W |
| 17479 (0x4447) | DG | Number of TI alarm delay times | R/W |
| 17480 (0x4448) | DH | Number of HBA trigger poins | R/W |
| 17713 (0x4531) | E1 | Event DI corresponding channel selection 1 | R/W |
| 17714 (0x4532) | E2 | Event DI corresponding channel selection 2 | R/W |
| 17715 (0x4533) | E3 | Event DI corresponding channel selection 3 | R/W |
| 17716 (0x4534) | E4 | Event DI corresponding channel selection 4 | R/W |
| 17737 (0x4549) | EI | Operation mode transfer | R/W |
| 17738 (0x454A) | EJ | TI operation mode transfer | R/W |
| 17739 (0x454B) | EK | Temperature rise completion hold function | R/W |
| 17746 (0x4552) | ER | Error code | RO |
| 17969 (0x4631) | F1 | Digital filter | R/W |
| 17970 (0x4632) | F2 | AI digital filter | R/W |
| 17971 (0x4633) | F3 | TI digital filter | R/W |
| 18006 (0x4656) | FV | Positioning adjustment counter | R/W |

| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 18225 (0x4731) | G1 | PID/AT transfer | R/W |
| 18242 (0x4742) | GB | AT bias | R/W |
| 18482 (0x4832) | H2 | DI using selection | R/W |
| 18483 (0x4833) | H3 | Cascade DI function selection | R/W |
| 18484 (0x4834) | H4 | PCP module DI function selection | R/W |
| 18497 (0x4841) | HA | Alarm 1 differential gap | R/W |
| 18498 (0x4842) | HB | Alarm 2 differential gap | R/W |
| 18499 (0x4843) | HC | AI alarm 1 differential gap | R/W |
| 18500 (0x4844) | HD | Temperature rise completion range | R/W |
| 18501 (0x4845) | HE | Temperature rise completion status | RO |
| 18502 (0x4846) | HF | AI alarm 2 differential gap | R/W |
| 18503 (0x4847) | HG | Event DO extension alarm differential gap | R/W |
| 18504 (0x4848) | HH | Setting change rate limiter | R/W |
| 18505 (0x4849) | HI | TI alarm 1 differential gap | R/W |
| 18506 (0x484A) | HJ | TI alarm 2 differential gap | R/W |
| 18512 (0x4850) | HP | LBA use selection | R/W |
| 18515 (0x4853) | HS | Temperature rise completion trigger | R/W |
| 18518 (0x4856) | HV | AO display scale high | R/W |
| 18519 (0x4857) | HW | AO display scale low | R/W |
| 18737 (0x4931) | I1 | Integral time | R/W |
| 18766 (0x494E) | IN | Initial setting mode | R/W |

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| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 18774 (0x4956) | IV | ON/OFF control differential gap (upper) | R/W |
| 18775 (0x4957) | IW | ON/OFF control differential gap (lower) | R/W |
| 18993 (0x4A31) | J1 | Auto/Manual transfer | R/W |
| 19017 (0x4A49) | JI | AI zero point correction | R/W |
| 19018 (0x4A4A) | JJ | AI full scale correction | R/W |
| 19019 (0x4A4B) | JK | AO zero point adjustment setting | R/W |
| 19020 (0x4A4C) | JL | AO full scale adjustment setting | R/W |
| 19026 (0x4A52) | JR | AO decimal point position | R/W |
| 19027 (0x4A53) | JS | AI display scale high | R/W |
| 19028 (0x4A54) | JT | Power supply frequency selection | R/W |
| 19029 (0x4A55) | JU | AI decimal point position | R/W |
| 19030 (0x4A56) | JV | AI display scale low | R/W |
| 19268 (0x4B44) | KD | Cascade data selection | R/W |
| 19270 (0x4B46) | KF | Cascade ON/OFF | R/W |
| 19271 (0x4B47) | KG | Cascade gain | R/W |
| 19272 (0x4B48) | KH | Cascade monitor | RO |
| 19273 (0x4B49) | KI | Cascade bias | R/W |
| 19505 (0x4C31) | L1 | H-DI-A module input status | RO |
| 19507 (0x4C33) | L3 | PCP module DI status | RO |
| 19508 (0x4C34) | L4 | Event DI contact input monitor | RO |
| 19509 (0x4C35) | L5 | Event DI logic input monitor | RO |

| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 19521 (0x4C41) | LA | Alarm 1 interlock | R/W |
| 19522 (0x4C42) | LB | Alarm 2 interlock | R/W |
| 19523 (0x4C43) | LC | AI alarm 1 interlock | R/W |
| 19524 (0x4C44) | LD | AI alarm 2 interlock | R/W |
| 19525 (0x4C45) | LE | Event DO extension alarm interlock | R/W |
| 19526 (0x4C46) | LF | TI alarm 1 interlock | R/W |
| 19527 (0x4C47) | LG | TI alarm 2 interlock | R/W |
| 19540 (0x4C54) | LT | DO function selection | R/W |
| 19541 (0x4C55) | LU | Event DI logic circuit selection | R/W |
| 19543 (0x4C57) | LW | Event DI delay timer setting | R/W |
| 19761 (0x4D31) | M1 | Temperature input measured value (PV) | RO |
| 19763 (0x4D33) | M3 | Current transformer input measured value 1 | RO |
| 19764 (0x4D34) | M4 | Current transformer input measured value 2 | RO |
| 19765 (0x4D35) | M5 | AI measured value | RO |
| 19766 (0x4D36) | M6 | AO output monitor | RO |
| 19767 (0x4D37) | M7 | TI measured value | RO |
| 19768 (0x4D38) | M8 | Positioning monitor | RO |
| 20042 (0x4E4A) | NJ | AI operation mode transfer | R/W |
| 20273 (0x4F31) | O1 | Heat-side manipulated output value | RO |
| 20274 (0x4F32) | O2 | Cool-side manipulated output value | RO |
| 20289 (0x4F41) | OA | Alarm 1 action at input error | R/W |

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| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 20290 (0x4F42) | OB | Alarm 2 action at input error | R/W |
| 20291 (0x4F43) | OC | TI alarm 1 action at input error | R/W |
| 20292 (0x4F44) | OD | TI alarm 2 action at input error | R/W |
| 20293 (0x4F45) | OE | Manipulated output value at input error | R/W |
| 20296 (0x4F48) | OH | Output limiter (high limit) | R/W |
| 20300 (0x4F4C) | OL | Output limiter (low limit) | R/W |
| 20302 (0x4F4E) | ON | Manual output value | R/W |
| 20303 (0x4F4F) | OO | Manual Positioning output value | R/W |
| 20307 (0x4F53) | OS | Integrated output limiter | R/W |
| 20313 (0x4F59) | OY | AO corresponding channel setting | R/W |
| 20529 (0x5031) | P1 | Heat-side proportional band | R/W |
| 20530 (0x5032) | P2 | Cool-side proportional band | R/W |
| 20546 (0x5042) | PB | PV bias | R/W |
| 20547 (0x5043) | PC | PV bias (TI module) | R/W |
| 20552 (0x5048) | PH | Output change rate limiter (up) | R/W |
| 20556 (0x504C) | PL | Output change rate limiter (down) | R/W |
| 20567 (0x5057) | PW | AO output change rate limiter | R/W |
| 20787 (0x5133) | Q3 | Event DO status | RO |
| 20788 (0x5134) | Q4 | Event DO manual output value | R/W |
| 20789 (0x5135) | Q5 | Event DI logic input monitor | RO |

| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 21041 (0x5231) | R1 | Event DI type selection 1 | R/W |
| 21042 (0x5232) | R2 | Event DI type selection 2 | R/W |
| 21043 (0x5233) | R3 | Event DI type selection 3 | R/W |
| 21044 (0x5234) | R4 | Event DI type selection 4 | R/W |
| 21297 (0x5331) | S1 | Temperature set value (SV) | R/W |
| 21302 (0x5336) | S6 | AO output set value | R/W |
| 21320 (0x5348) | SH | Setting limiter (high limit) | R/W |
| 21324 (0x534C) | SL | Setting limiter (low limit) | R/W |
| 21330 (0x5352) | SR | Control RUN/STOP | R/W |
| 21336 (0x5358) | SX | Start determination point | R/W |
| 21552 (0x5430) | T0 | Heat-side proportioning cycle time | R/W |
| 21553 (0x5431) | T1 | Cool-side proportioning cycle time | R/W |
| 21555 (0x5433) | T3 | Temperature rise completion soak time | R/W |
| 21577 (0x5449) | TI | Number of event DO extension alarm delay times | R/W |
| 21578 (0x544A) | TJ | Motor time | R/W |
| 21579 (0x544B) | TK | Number of AI alarm delay times | R/W |
| 22065 (0x5631) | V1 | Overlap/Deadband | R/W |
| 22066 (0x5632) | V2 | LBA deadband | R/W |
| 22067 (0x5633) | V3 | Positioning output neutral zone | R/W |
| 22081 (0x5641) | VA | AI moving aberage | R/W |

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| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 22091 (0x564B) | VK | AI input range number | R/W |
| 22096 (0x5650) | VP | PCP module DO type selection | R/W |
| 22097 (0x5651) | VQ | PCP module DI type selection | R/W |
| 22099 (0x5653) | VS | PCP module DO de-energized selection | R/W |
| 22321 (0x5731) | W1 | Event DI reversal selection 1 | R/W |
| 22322 (0x5732) | W2 | Event DI reversal selection 2 | R/W |
| 22323 (0x5733) | W3 | Event DI reversal selection 3 | R/W |
| 22324 (0x5734) | W4 | Event DI reversal selection 4 | R/W |
| 22337 (0x5741) | WA | Alarm 1 hold action | R/W |
| 22338 (0x5742) | WB | Alarm 2 hold action | R/W |
| 22339 (0x5743) | WC | AI alarm 1 hold action | R/W |
| 22340 (0x5744) | WD | AI alarm 2 hold action | R/W |
| 22341 (0x5745) | WE | TI alarm 1 hold action | R/W |
| 22342 (0x5746) | WF | TI alarm 2 hold action | R/W |
| 22344 (0x5748) | WH | Action at input error (high limit) | R/W |
| 22348 (0x574C) | WL | Action at input error (low limit) | R/W |
| 22577 (0x5831) | X1 | Control RUN/STOP holding | R/W |
| 22593 (0x5841) | XA | Alarm 1 type selection | R/W |
| 22594 (0x5842) | XB | Alarm 2 type selection | R/W |
| 22595 (0x5843) | XC | AI alarm 1 type selection | R/W |

| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 22596 (0x5844) | XD | AI alarm 2 type selection | R/W |
| 22597 (0x5845) | XE | Direct/Reverse action selection | R/W |
| 22598 (0x5846) | XF | Event DO function selection | R/W |
| 22599 (0x5847) | XG | Event DO corresponding channel setting | R/W |
| 22600 (0x5848) | XH | Event DO mode transfer | R/W |
| 22601 (0x5849) | XI | Input range number | R/W |
| 22602 (0x584A) | XJ | TI input range number | R/W |
| 22603 (0x584B) | XK | DI function selection | R/W |
| 22604 (0x584C) | XL | Cascade tracking | R/W |
| 22606 (0x584E) | XN | Hot/Cold start selection | R/W |
| 22607 (0x584F) | XO | AO function selection | R/W |
| 22608 (0x5850) | XP | TI alarm 1 type | R/W |
| 22609 (0x5851) | XQ | TI alarm 2 type | R/W |
| 22610 (0x5852) | XR | Temperature module type | RO |
| 22613 (0x5855) | XU | Decimal point position | R/W |
| 22614 (0x5856) | XV | Display scale high | R/W |
| 22615 (0x5857) | XW | Display scale low | R/W |
| 23105 (0x5A41) | ZA | Memory area number | R/W |
| 23110 (0x5A46) | ZF | CT channel setting | R/W |
| 23128 (0x5A58) | ZX | Interval time setting | R/W |

☞ For details, refer to the **SR Mini HG SYSTEM Communication Instruction Manual (IMSRM09-E□)** or **Power Supply/CPU Module H-PCP-J Instruction Manual (IMS01J02-E□)**.

## 6.3.2 CB100/400/500/700/900

| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 16689 (0x4131) | A1 | Alarm 1 setting | R/W |
| 16690 (0x4132) | A2 | Alarm 2 setting | R/W |
| 16691 (0x4133) | A3 | Heater break alarm 1 setting | R/W |
| 16692 (0x4134) | A4 | Heater break alarm 2 setting | R/W |
| 16693 (0x4135) | A5 | Control loop break alarm (LBA) setting | R/W |
| 16694 (0x4136) | A6 | LBA deadband | R/W |
| 16705 (0x4141) | AA | Alarm 1 status | RO |
| 16706 (0x4142) | AB | Alarm 2 status | RO |
| 16945 (0x4231) | B1 | Burnout | RO |
| 17457 (0x4431) | D1 | Derivative time | R/W |
| 17746 (0x4552) | ER | Error code | RO |
| 18225 (0x4731) | G1 | Autotuning (AT) | R/W |
| 18226 (0x4732) | G2 | Self tuning (ST) | R/W |
| 18737 (0x4931) | I1 | Integral time | R/W |
| 19761 (0x4D31) | M1 | Measured value (PV) | RO |
| 19762 (0x4D32) | M2 | Current transformer input 1 | RO |
| 19763 (0x4D33) | M3 | Current transformer input 2 | RO |
| 20529 (0x5031) | P1 | Heat-side proportional band | R/W |
| 20530 (0x5032) | P2 | Cool-side proportional band | R/W |
| 20546 (0x5042) | PB | PV bias | R/W |
| 21297 (0x5331) | S1 | Set value (SV) | R/W |
| 21330 (0x5352) | SR | RUN/STOP transfer | R/W |
| 21552 (0x5430) | T0 | Heat-side proportioning cycle time | R/W |
| 21553 (0x5431) | T1 | Cool-side proportioning cycle time | R/W |
| 22065 (0x5631) | V1 | Overlap/Deadband | R/W |
| 22321 (0x5731) | W1 | Anti-reset windup | R/W |

☞ For details, refer to the **CB100/CB400/CB500/CB700/CB900 Communication Instruction Manual (IMCB03-E□)**.

### 6.3.3 REX-F400/700/900

| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 16689 (0x4131) | A1 | Alarm 1 setting | R/W |
| 16690 (0x4132) | A2 | Alarm 2 setting | R/W |
| 16691 (0x4133) | A3 | Heater break alarm setting | R/W |
| 16705 (0x4141) | AA | Alarm 1 status | RO |
| 16706 (0x4142) | AB | Alarm 2 status | RO |
| 16707 (0x4143) | AC | Heater break alarm output | RO |
| 16726 (0x4156) | AV | Input error determination point (high limit) | R/W |
| 16727 (0x4157) | AW | Input error determination point (low limit) | R/W |
| 16945 (0x4231) | B1 | Burnout | RO |
| 16946 (0x4232) | B2 | Feedback resistance (FBR) input burnout | RO |
| 17201 (0x4331) | C1 | Local/Remote transfer | R/W |
| 17217 (0x4341) | CA | Control response parameter | R/W |
| 17457 (0x4431) | D1 | Derivative time | R/W |
| 17473 (0x4441) | DA | Bar-graph display selection | R/W |
| 17480 (0x4448) | DH | Operation RUN/STOP display lock | R/W |
| 17488 (0x4450) | DP | PV low input cut-off | R/W |
| 17713 (0x4531) | E1 | Local/External memory area transfer | R/W |
| 17969 (0x4631) | F1 | PV digital filter | R/W |
| 17970 (0x4632) | F2 | RS digital filter | R/W |
| 18225 (0x4731) | G1 | PID/Autotuning transfer | R/W |
| 18242 (0x4742) | GB | AT bias | R/W |
| 18497 (0x4841) | HA | Alarm 1 differential gap | R/W |
| 18498 (0x4842) | HB | Alarm 2 differential gap | R/W |
| 18504 (0x4848) | HH | Setting change rate limiter | R/W |
| 18518 (0x4856) | HV | Analog output range (high limit) | R/W |
| 18519 (0x4857) | HW | Analog output range (low limit) | R/W |
| 18737 (0x4931) | I1 | Integral time | R/W |
| 18774 (0x4956) | IV | ON/OFF control differential gap (upper) | R/W |
| 18775 (0x4957) | IW | ON/OFF control differential gap (lower) | R/W |
| 18993 (0x4A31) | J1 | Auto/Manual transfer | R/W |
| 19521 (0x4C41) | LA | Analog output specification selection | R/W |
| 19532 (0x4C4C) | LL | Area lock | R/W |
| 19761 (0x4D31) | M1 | Measured value (PV) | RO |
| 19762 (0x4D32) | M2 | Feedback resistance input value (POS) | RO |
| 19763 (0x4D33) | M3 | Current transformer input value | RO |
| 20033 (0x4E41) | NA | Alarm 1 energized/de-energized | R/W |
| 20034 (0x4E42) | NB | Alarm 2 energized/de-energized | R/W |
| 20273 (0x4F31) | O1 | Heat-side manipulated output | RO |

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| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 20274 (0x4F32) | O2 | Cool-side manipulated output | RO |
| 20289 (0x4F41) | OA | Alarm 1 action at input error | R/W |
| 20290 (0x4F42) | OB | Alarm 2 action at input error | R/W |
| 20293 (0x4F45) | OE | Manual output at input error | R/W |
| 20296 (0x4F48) | OH | Output limiter (high limit) | R/W |
| 20300 (0x4F4C) | OL | Output limiter (low limit) | R/W |
| 20302 (0x4F4E) | ON | Manipulated output value (MV) | R/W |
| 20305 (0x4F51) | OQ | Shortest cooling output ON time | R/W |
| 20529 (0x5031) | P1 | Heat-side proportional band | R/W |
| 20530 (0x5032) | P2 | Cool-side proportional band | R/W |
| 20546 (0x5042) | PB | PV bias | R/W |
| 20552 (0x5048) | PH | Output change rate limiter (up) | R/W |
| 20556 (0x504C) | PL | Output change rate limiter (down) | R/W |
| 21057 (0x5241) | RA | Local/Computer mode identification | RO |
| 21058 (0x5242) | RB | RS bias | R/W |
| 21074 (0x5252) | RR | RS ratio | R/W |
| 21297 (0x5331) | S1 | Set value (SV) | R/W |
| 21298 (0x5332) | S2 | Remote set value (RS) | R/W |
| 21320 (0x5348) | SH | Setting limiter (high limit) | R/W |
| 21324 (0x534C) | SL | Setting limiter (low limit) | R/W |
| 21330 (0x5352) | SR | Operation RUN/STOP transfer | R/W |
| 21336 (0x5358) | SX | Start determination point | R/W |
| 21337 (0x5359) | SY | Action selection feedback resistance (FBR) input break | R/W |
| 21552 (0x5430) | T0 | Heat-side proportioning cycle time | R/W |
| 21553 (0x5431) | T1 | Cool-side proportioning cycle time | R/W |
| 21572 (0x5444) | TD | Alarm 1 timer setting | R/W |
| 21575 (0x5447) | TG | Alarm 2 timer setting | R/W |
| 22065 (0x5631) | V1 | Overlap/Deadband | R/W |
| 22066 (0x5632) | V2 | Neutral zone | R/W |
| 22337 (0x5741) | WA | Alarm 1 hold action selection | R/W |
| 22338 (0x5742) | WB | Alarm 2 hold action selection | R/W |
| 22344 (0x5748) | WH | Action selection at input error (high limit) | R/W |
| 22348 (0x574C) | WL | Action selection at input error (low limit) | R/W |
| 22577 (0x5831) | X1 | PV input type selection | R/W |
| 22593 (0x5841) | XA | Alarm 1 action selection | R/W |
| 22594 (0x5842) | XB | Alarm 2 action selection | R/W |
| 22597 (0x5845) | XE | Direct/Reverse action selection | R/W |
| 22600 (0x5848) | XH | Square root extraction selection | R/W |
| 22604 (0x584C) | XL | SV tracking selection | R/W |
| 22606 (0x584E) | XN | Hot/Cold start selection | R/W |

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| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 22610 (0x5852) | XR | RS input type selection | R/W |
| 22613 (0x5855) | XU | Decimal point position selection | R/W |
| 22614 (0x5856) | XV | Input programmable range (high limit) | R/W |
| 22615 (0x5857) | XW | Input programmable range (low limit) | R/W |
| 23105 (0x5A41) | ZA | Control area number transfer | R/W |

☞ For details, refer to the **REX-F400/F700/F900 Communication Instruction Manual (IM900F10-E□)**.

## 6.3.4 SA100/200

| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 16689 (0x4131) | A1 | Alarm 1 set value | R/W |
| 16690 (0x4132) | A2 | Alarm 2 set value | R/W |
| 16693 (0x4135) | A5 | Control loop break alarm | R/W |
| 16694 (0x4136) | A6 | Control loop break alarm deadband | R/W |
| 16705 (0x4141) | AA | Alarm 1 status | RO |
| 16706 (0x4142) | AB | Alarm 2 status | RO |
| 16945 (0x4231) | B1 | Burnout | RO |
| 17457 (0x4431) | D1 | Derivative time | R/W |
| 17730 (0x4542) | EB | EEPROM storage mode | R/W |
| 17741 (0x454D) | EM | EEPROM storage status | RO |
| 17746 (0x4552) | ER | Error code | RO |
| 17969 (0x4631) | F1 | Digital filter | R/W |
| 18225 (0x4731) | G1 | Autotuning | R/W |
| 18226 (0x4732) | G2 | Self-tuning | R/W |
| 18737 (0x4931) | I1 | Integral time | R/W |
| 19761 (0x4D31) | M1 | Measured value (PV) | RO |
| 20273 (0x4F31) | O1 | Heat-side manipulated output value | RO |
| 20274 (0x4F32) | O2 | Cool-side manipulated output value | RO |
| 20529 (0x5031) | P1 | Heat-side proportional band | R/W |
| 20530 (0x5032) | P2 | Cool-side proportional band | R/W |
| 20546 (0x5042) | PB | PV bias | R/W |
| 21297 (0x5331) | S1 | Set value (SV) | R/W |
| 21330 (0x5352) | SR | RUN/STOP function | R/W |
| 21552 (0x5430) | T0 | Heat-side proportioning cycle time | R/W |
| 21553 (0x5431) | T1 | Cool-side proportioning cycle time | R/W |
| 22065 (0x5631) | V1 | Overlap/Deadband | R/W |
| 22321 (0x5731) | W1 | Anti-reset windup | R/W |

☞ For details, refer to the **SA100 Communication Instruction Manual (IMR01J02-E□)**, **SA200 Communication Instruction Manual (IMR01D02-E□)**.

## 6.3.5 MA900/901

| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 16689 (0x4131) | A1 | Alarm 1 set value | R/W |
| 16690 (0x4132) | A2 | Alarm 2 set value | R/W |
| 16691 (0x4133) | A3 | Alarm 3 set value | R/W |
| 16705 (0x4141) | AA | Alarm 1 status | RO |
| 16706 (0x4142) | AB | Alarm 2 status | RO |
| 16707 (0x4143) | AC | Alarm 3 status | RO |
| 16714 (0x414A) | AJ | Output status | RO |
| 16945 (0x4231) | B1 | Burnout status | RO |
| 17457 (0x4431) | D1 | Derivative time | R/W |
| 17730 (0x4542) | EB | EEPROM storage mode | R/W |
| 17737 (0x4549) | EI | Used/unused of channel | R/W |
| 17741 (0x454D) | EM | EEPROM storage status | RO |
| 17746 (0x4552) | ER | Error code | RO |
| 17969 (0x4631) | F1 | Digital filter | R/W |
| 18225 (0x4731) | G1 | PID/AT transfer | R/W |
| 18504 (0x4848) | HH | Setting change rate limiter | R/W |
| 18737 (0x4931) | I1 | Integral time | R/W |
| 18768 (0x4950) | IP | Device address | R/W |
| 18769 (0x4951) | IQ | Data bit configuration | R/W |
| 18770 (0x4952) | IR | Communication speed | R/W |
| 18772 (0x4954) | IT | Interval time | R/W |
| 19505 (0x4C31) | L1 | DI sutatus | RO |
| 19531 (0x4C4B) | LK | Lock level 1 | R/W |
| 19532 (0x4C4C) | LL | Lock level 2 | R/W |
| 19761 (0x4D31) | M1 | Measured value (PV) | RO |
| 19762 (0x4D32) | M2 | Current transformer 1 measured value | RO |
| 19763 (0x4D33) | M3 | Current transformer 2 measured value | RO |
| 19795 (0x4D53) | MS | Set value monitor | RO |
| 20017 (0x4E31) | N1 | Control loop break alarm deadband (LBD) | R/W |
| 20018 (0x4E32) | N2 | Heater break alarm 2 (MA900 only) | R/W |
| 20273 (0x4F31) | O1 | Manipulated output value | RO |
| 20274 (0x4F32) | O2 | Cool-side manipulated output value (MA900 only) | RO |
| 20529 (0x5031) | P1 | Proportional band | R/W |
| 20530 (0x5032) | P2 | Cool-side Proportional band (MA900 only) | R/W |
| 20546 (0x5042) | PB | PV bias | R/W |
| 21297 (0x5331) | S1 | Set value (SV) | R/W |
| 21330 (0x5352) | SR | RUN/STOP transfer | R/W |
| 21552 (0x5430) | T0 | Proportioning cycle time | R/W |

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| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 21553 (0x5431) | T1 | Cool-side Proportioning cycle time (MA900 only) | R/W |
| 21580 (0x544C) | TL | Scan interval time | R/W |
| 22065 (0x5631) | V1 | Overlap/Deadband | R/W |
| 22321 (0x5731) | W1 | Anti-reset windup | R/W |
| 23105 (0x5A41) | ZA | Memory area number selection | R/W |

☞ For details, refer to the **MA900/MA901 Communication Instruction Manual (IMR01H02-E□)**.

## 6.3.6 LE100

| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 16689 (0x4131) | A1 | Output 1 set value | R/W |
| 16690 (0x4132) | A2 | Output 2 set value | R/W |
| 16691 (0x4133) | A3 | Output 3 set value | R/W |
| 16692 (0x4134) | A4 | Output 4 set value | R/W |
| 16693 (0x4135) | A5 | Output 5 set value | R/W |
| 16694 (0x4136) | A6 | Output 6 set value | R/W |
| 16695 (0x4137) | A7 | Output 7 set value | R/W |
| 16696 (0x4138) | A8 | Output 8 set value | R/W |
| 16697 (0x4139) | A9 | Actual liquid output setting | WO |
| 16705 (0x4141) | AA | Output 1 status | RO |
| 16706 (0x4142) | AB | Output 2 status | RO |
| 16707 (0x4143) | AC | Output 3 status | RO |
| 16708 (0x4144) | AD | Output 4 status | RO |
| 16709 (0x4145) | AE | Output 5 status | RO |
| 16710 (0x4146) | AF | Output 6 status | RO |
| 16711 (0x4147) | AG | Output 7 status | RO |
| 16712 (0x4148) | AH | Output 8 status | RO |
| 16730 (0x415A) | AZ | Emptiness adjustment | R/W |
| 16945 (0x4231) | B1 | Burnout | RO |
| 17239 (0x4357) | CW | Initializing the number of wafer processing times | WO |
| 17473 (0x4441) | DA | Output 1 deviation value setting | R/W |
| 17474 (0x4442) | DB | Output 2 deviation value setting | R/W |
| 17475 (0x4443) | DC | Output 3 deviation value setting | R/W |
| 17476 (0x4444) | DD | Output 4 deviation value setting | R/W |
| 17477 (0x4445) | DE | Output 5 deviation value setting | R/W |
| 17478 (0x4446) | DF | Output 6 deviation value setting | R/W |
| 17479 (0x4447) | DG | Output 7 deviation value setting | R/W |
| 17480 (0x4448) | DH | Output 8 deviation value setting | R/W |
| 17491 (0x4453) | DS | DI function selection | R/W |
| 17731 (0x4543) | EC | Error release | WO |
| 17735 (0x4547) | EG | End specific gravity setting | R/W |
| 17746 (0x4552) | ER | Error code | RO |
| 17969 (0x4631) | F1 | Digital filter | R/W |
| 18497 (0x4841) | HA | Output 1 differential gap | R/W |
| 18498 (0x4842) | HB | Output 2 differential gap | R/W |
| 18499 (0x4843) | HC | Output 3 differential gap | R/W |
| 18500 (0x4844) | HD | Output 4 differential gap | R/W |
| 18501 (0x4845) | HE | Output 5 differential gap | R/W |
| 18502 (0x4846) | HF | Output 6 differential gap | R/W |
| 18503 (0x4847) | HG | Output 7 differential gap | R/W |

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| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 18504 (0x4848) | HH | Output 8 differential gap | R/W |
| 18512 (0x4850) | HP | Peak hold monitor | RO |
| 18513 (0x4851) | HQ | Bottom hold monitor | RO |
| 18514 (0x4852) | HR | Hold reset | WO |
| 18518 (0x4856) | HV | Monitor output high | R/W |
| 18519 (0x4857) | HW | Monitor output high | R/W |
| 18770 (0x4952) | IR | Interlock release | WO |
| 18771 (0x4953) | IS | Default setting | WO |
| 18993 (0x4A31) | J1 | Scale 1 actual liquid setting | R/W |
| 18994 (0x4A32) | J2 | Scale 2 actual liquid setting | R/W |
| 18995 (0x4A33) | J3 | Correction on the low limit side by actual liquid 2 | WO |
| 18996 (0x4A34) | J4 | Correction on the high limit side by actual liquid 2 | WO |
| 19504 (0x4C30) | L0 | Linearizing table setting 0 | R/W |
| 19505 (0x4C31) | L1 | Linearizing table setting 1 | R/W |
| 19506 (0x4C32) | L2 | Linearizing table setting 2 | R/W |
| 19507 (0x4C33) | L3 | Linearizing table setting 3 | R/W |
| 19508 (0x4C34) | L4 | Linearizing table setting 4 | R/W |
| 19509 (0x4C35) | L5 | Linearizing table setting 5 | R/W |
| 19510 (0x4C36) | L6 | Linearizing table setting 6 | R/W |
| 19511 (0x4C37) | L7 | Linearizing table setting 7 | R/W |
| 19512 (0x4C38) | L8 | Linearizing table setting 8 | R/W |
| 19513 (0x4C39) | L9 | Linearizing table setting 9 | R/W |
| 19521 (0x4C41) | LA | Linearizing table setting 10 | R/W |
| 19540 (0x4C54) | LT | Number of linearizing table setting | R/W |
| 19541 (0x4C55) | LU | Decimal point position selection | R/W |
| 19761 (0x4D31) | M1 | Measured value (PV) | RO |
| 19788 (0x4D4C) | ML | Scale low monitor | RO |
| 19784 (0x4D48) | MH | Scale high monitor | RO |
| 19789 (0x4D4D) | MM | Volume/level display selection | R/W |
| 19799 (0x4D57) | MW | Number of wafer processing times monitor | RO |
| 19802 (0x4D5A) | MZ | Amount of emptiness correction monitor | RO |
| 20033 (0x4E41) | NA | Output 1 a/b contact selection | R/W |
| 20034 (0x4E42) | NB | Output 2 a/b contact selection | R/W |
| 20035 (0x4E43) | NC | Output 3 a/b contact selection | R/W |
| 20036 (0x4E44) | ND | Output 4 a/b contact selection | R/W |
| 20037 (0x4E45) | NE | Output 5 a/b contact selection | R/W |
| 20038 (0x4E46) | NF | Output 6 a/b contact selection | R/W |
| 20039 (0x4E47) | NG | Output 7 a/b contact selection | R/W |
| 20040 (0x4E48) | NH | Output 8 a/b contact selection | R/W |
| 20801 (0x5141) | QA | Output 1 interlocking function selection | R/W |

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| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 20802 (0x5142) | QB | Output 2 interlocking function selection | R/W |
| 20803 (0x5143) | QC | Output 3 interlocking function selection | R/W |
| 20804 (0x5144) | QD | Output 4 interlocking function selection | R/W |
| 20805 (0x5145) | QE | Output 5 interlocking function selection | R/W |
| 20806 (0x5146) | QF | Output 6 interlocking function selection | R/W |
| 20807 (0x5147) | QG | Output 7 interlocking function selection | R/W |
| 20808 (0x5148) | QH | Output 8 interlocking function selection | R/W |
| 21319 (0x5347) | SG | Specific gravity setting | R/W |
| 21328 (0x5350) | SP | Specific gravity setting transfer | R/W |
| 21331 (0x5353) | SS | Specific gravity correction function selection | R/W |
| 21335 (0x5357) | SW | Number of wafer processing times setting | R/W |
| 21569 (0x5441) | TA | Output 1 timer setting | R/W |
| 21570 (0x5442) | TB | Output 2 timer setting | R/W |
| 21571 (0x5443) | TC | Output 3 timer setting | R/W |
| 21572 (0x5444) | TD | Output 4 timer setting | R/W |
| 21573 (0x5445) | TE | Output 5 timer setting | R/W |
| 21574 (0x5446) | TF | Output 6 timer setting | R/W |
| 21575 (0x5447) | TG | Output 7 timer setting | R/W |
| 21576 (0x5448) | TH | Output 8 timer setting | R/W |
| 21838 (0x554E) | UN | Unit setting | R/W |
| 22356 (0x5754) | WT | Number of wafer processing times | WO |
| 22593 (0x5841) | XA | Output 1 type selection | R/W |
| 22594 (0x5842) | XB | Output 2 type selection | R/W |
| 22595 (0x5843) | XC | Output 3 type selection | R/W |
| 22596 (0x5844) | XD | Output 4 type selection | R/W |
| 22597 (0x5845) | XE | Output 5 type selection | R/W |
| 22598 (0x5846) | XF | Output 6 type selection | R/W |
| 22599 (0x5847) | XG | Output 7 type selection | R/W |
| 22600 (0x5848) | XH | Output 8 type selection | R/W |
| 22616 (0x5858) | XX | Scale low | R/W |

☞ For details, refer to the **LE100 Communication Instruction Manual (IMR01C02-E□)**.

## 6.3.7 REX-PG410

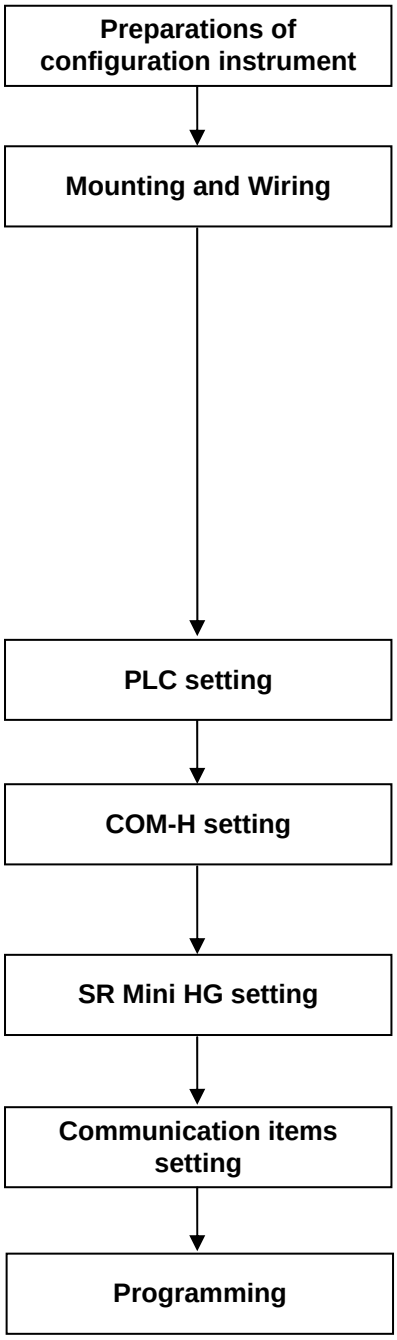
| ID code | Identi-fier | Communication items | Attri-bute |
|---|---|---|---|
| 16689 (0x4131) | A1 | First alarm setting | R/W |
| 16690 (0x4132) | A2 | Second alarm setting | R/W |
| 16705 (0x4141) | AA | First alarm monitor | RO |
| 16706 (0x4142) | AB | Second alarm monitor | RO |
| 16730 (0x415A) | AZ | Auto-zero | R/W |
| 16945 (0x4231) | B1 | Burnout | RO |
| 17746 (0x4552) | ER | Error data | RO |
| 18241 (0x4741) | GA | Gain setting | R/W |
| 18497 (0x4841) | HA | First alarm differential gap | R/W |
| 18498 (0x4842) | HB | Second alarm differential gap | R/W |
| 18512 (0x4850) | HP | Peak hold monitor | RO |
| 18513 (0x4851) | HQ | Bottom hold monitor | RO |
| 18514 (0x4852) | HR | Hold reset | WO |
| 18518 (0x4856) | HV | High-limit setting of analog output | R/W |
| 18519 (0x4857) | HW | Low-limit setting of analog output | R/W |
| 18754 (0x4942) | IB | Action of input break selection | R/W |
| 18770 (0x4952) | IR | Alarm interlock release | WO |
| 19529 (0x4C49) | LI | Linearize type selection | R/W |
| 19761 (0x4D31) | M1 | Measured value (PV) | RO |
| 20033 (0x4E41) | NA | First alarm Energized/ De-energized | R/W |
| 20034 (0x4E42) | NB | Second alarm Energized/ De-energized | R/W |
| 20565 (0x5055) | PU | Pressure unit setting | R/W |
| 20801 (0x5141) | QA | First alarm interlock function | R/W |
| 20802 (0x5142) | QB | Second alarm interlock function | R/W |
| 21572 (0x5444) | TD | First alarm timer setting | R/W |
| 21575 (0x5447) | TG | Second alarm timer setting | R/W |
| 21580 (0x544C) | TL | Display timer setting | R/W |
| 21583 (0x544F) | TO | Analog output timer setting | R/W |
| 22593 (0x5841) | XA | First alarm action selection | R/W |
| 22594 (0x5842) | XB | Second alarm action selection | R/W |
| 22601 (0x5849) | XI | Input type selection | R/W |
| 22613 (0x5855) | XU | Decimal point position selection | R/W |
| 22614 (0x5856) | XW | Low-limit setting of pressure display | R/W |
| 22615 (0x5857) | XV | High-limit setting of pressure display | R/W |

☞ For details, refer to the **REX-PG410 Communication Instruction Manual (IM41PG02-E□)**.

# 7. USAGE EXAMPLE

In this Chapter, an example of using DeviceNet communication when the COM-H and SR Mini HG are connected to a PLC as a master.

## 7.1 Handling Procedures




☞ Refer to **7.2 System Configuration (P. 85)**

☞
- For mounting and wiring of COM-H, refer to **3. MOUNTING (P. 11)** and **4. WIRING (P. 16)**.
- For mounting and wiring of PLC, refer to **PLC Instruction Manual**.
- For mounting and wiring of SR Mini HG, refer to **SR Mini HG SYSTEM Hardware Instruction Manual (IMSRM15-E□)**.

☞ For network laying requirement of DeviceNet/method, refer to **Instruction Manual of master product** or **home page of ODVA** (Open DeviceNet Vender Association).
URL: http://www.odva.org

☞ Refer to **7.3 Hardware Setting (P. 86)** and **PLC Instruction Manual**.

☞ Refer to **5.1 DeviceNet Setting (P. 41)**, **5.3 Controller Communication Setting (P. 46)** and **7.3 Hardware Setting (P. 86)**.

☞ Refer to **5.3 Controller Communication Setting (P. 46)**, **7.3 Hardware Setting (P. 86)**.

☞ Refer to **6.2.1 Controller communication items setting (P. 50)** and **7.4 Communication Items Setting (P. 87)**.

☞ Refer to **7.5 Sample Programs (P.89)** and **PLC Instruction Manual**

## 7.2 System Configuration

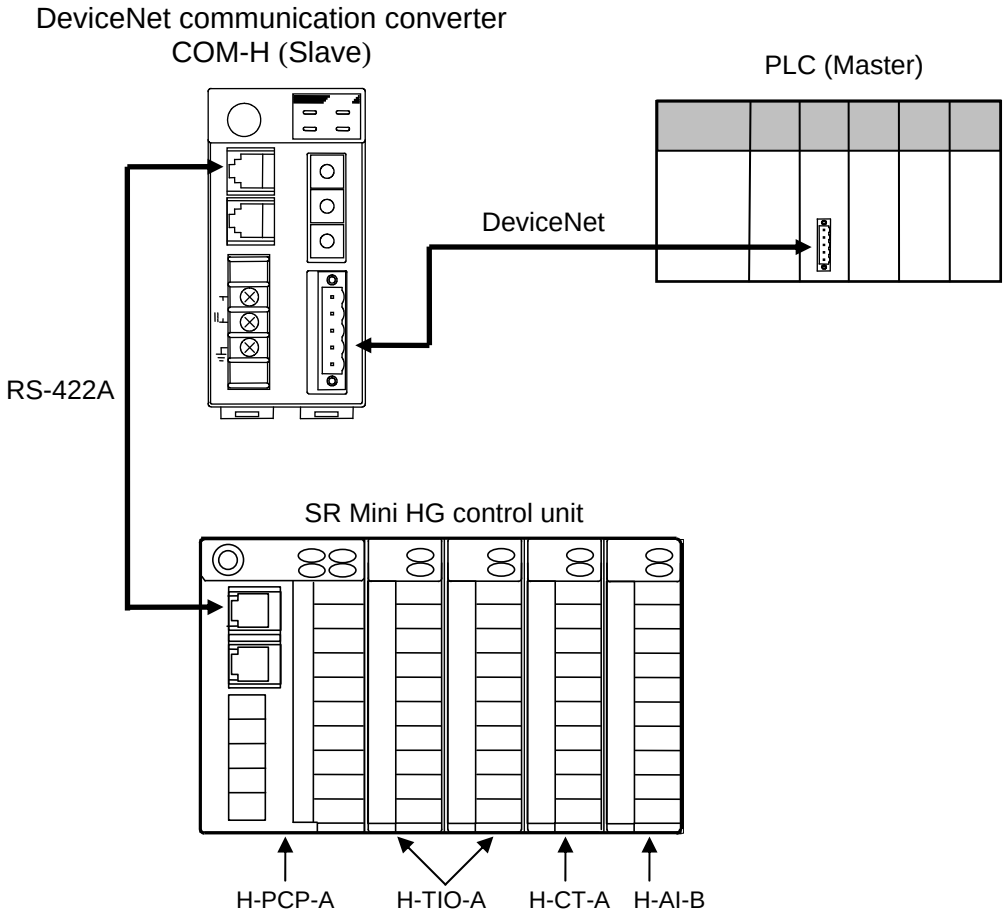



Fig. 7-1 Example of system configurations

### ■ Use instruments

- **DeviceNet communication converter**

  COM-H-3-90-1-N
- **SR Mini HG SYSTEM**

  Power/CPU module H-PCP-A, Temperature control module H-TIO-A, Current transformer input module H-CT-A, Analog input module H-AI-B
- **PLC**

  - SYSMAC CS1 (OMRON product)

    CPU unit: CS1G-CPU44, DeviceNet master unit: C200HW-DRM21-V1

    or

  - Control Logix 5550 [Rockwell Inc. (Allen-Bradley)]

    CPU module: 1756-L1, LINK module (DeviceNet): 1756-DNB

## 7.3 Hardware Setting

Set each hardware's as the following.

### ■ PLC setting

Set PLC in requirement of the following.

[DeviceNet communication requirement]

- Node address: 0
- DeviceNet communication speed: 125 kbps
- Unit Number: 0

☞ For setting method, refer to Instruction Manual for PLC.

### ■ COM-H setting

Set COM-H in requirement of the following.

[DeviceNet communication requirement]

- Node address: 1
- DeviceNet communication speed: 125 kbps
- Connection controller model: SR Mini HG
- Communication mode: Communication model A (Compatible mode) or Communication model B (Expansion mode)

[SR Mini HG communication requirement]

- SR Mini HG communication speed: 9600 bps
- SR Mini HG data bit configuration: Data 8 bits, Without parity, Stop 1 bit

☞ For setting method, refer to **5.1 DeviceNet Setting (P. 41)**, **5.2 Connection Controller and Communication Mode Setting (P.43)** and **5.3 Controller Communication Setting (P. 46)**.

### ■ SR Mini HG setting

Set SR Mini HG in requirement of the following.

[SR Mini HG communication requirement]

- SR Mini HG address: 0
- SR Mini HG communication speed: 9600 bps
- SR Mini HG data bit configuration: Data 8 bits, Without parity, Stop 1 bit

☞ For setting method, refer to **5.3 Controller Communication Setting (P. 46)** and **SR Mini HG Communication Instruction Manual (IMSRM09-E□)**.

## 7.4 Communication Items Setting

Set the communication items of the following as example.

| ID | Contents | Identification code | Communication items |
|---|---|---|---|
| 1 | Data01 ID | 19761 (0x4D31) | Temperature input measured value |
| 2 | Data02 ID | 20273 (0x4F31) | Heat-side manipulated output value |
| 3 | Data03 ID | 14649 (0x3939) | Instrument status |
| 4 | Data04 ID | 18225 (0x4731) | PID/AT transfer |
| 5 | Data05 ID | 21297 (0x5331) | Temperature set value (SV) |
| 6 | Data06 ID | 20529 (0x5031) | Heat-side proportional band |
| 7 | Data07 ID | 18737 (0x4931) | Integral time |
| 8 | Data08 ID | 17457 (0x4431) | Derivative time |
| 9 | Data09 ID | 21552 (0x5430) | Heat-side proportioning cycle time |
| 10 | Data10 ID | 20546 (0x5042) | PV bias |
| 11 | Data11 ID | 16689 (0x4131) | Alarm 1 set value |
| 12 | Data12 ID | 16690 (0x4132) | Alarm 2 set value |
| 13 | Data13 ID | 16691 (0x4133) | Heater break alarm set value 1 |
| 14 | Data14 ID | 16692 (0x4134) | Heater break alarm set value 2 |
| 15 | Data15 ID | 21330 (0x5352) | Control RUN/STOP |
| 16 | Data16 ID | 17737 (0x4549) | Operation mode transfer |
| 17 | Data17 ID | 17217 (0x4341) | Control response parameter |
| 18 | Data18 ID | 18776 (0x494E) | Initialize setting mode |
| 19 | Data19 ID | 22601 (0x5849) | Input range |
| 20 | Data20 ID | 22597 (0x5845) | Direct/Reverse action selection |
| 21 | Data21 ID | 23110 (0x5A46) | CT channel setting |
| 22 | Data22 ID | 20530 (0x5032) | Cool-side proportional band |
| 23 | Data23 ID | 21553 (0x5431) | Cool-side proportioning cycle time |
| 24 | Data24 ID | 20274 (0x4F32) | Cool-side manipulated output value |
| 25 | Data25 ID | 22065 (0x5631) | Overlap/Deadband |
| 26 | Data26 ID | 19765 (0x4D35) | AI measured value |
| 27 | Data27 ID | 16708 (0x4144) | Analog input (AI) alarm 1 status |
| 28 | Data28 ID | 16709 (0x4145) | Analog input (AI) alarm 2 status |
| 29 | Data29 ID | 16693 (0x4135) | Analog input (AI) alarm 1 set value |
| 30 | Data30 ID | 16694 (0x4136) | Analog input (AI) alarm 2 set value |

- **Setting items**

| ID | Contents | Identification code * | Communication items |
|---|---|---|---|
| 51 | SV1 ID No. | 5 | Temperature set value (SV) |
| 52 | SV2 ID No. | 11 | Alarm 1 set value |
| 53 | SV3 ID No. | 12 | Alarm 2 set value |
| 54 | SV4 ID No. | 0 | ––– |

* Set the relevant ID No. from among IDs 1 to 30.

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- **Measured items**

| ID | Contents | Identification code * | Communication items |
|---|---|---|---|
| 61 | PV1 ID No. | 1 | Temperature input measured value |
| 62 | PV2 ID No. | 5 | Temperature set value (SV) |
| 63 | PV3 ID No. | 11 | Alarm 1 set value |
| 64 | PV4 ID No. | 12 | Alarm 2 set value |

* Set the relevant ID No. from among IDs 1 to 30.

- **Controller status**

| ID | Contents | Identification code | Communication items |
|---|---|---|---|
| 70 | Status bit 0 | 12336 (0x3030) * | ––– |
| 71 | Status bit 1 | 12336 (0x3030) * | ––– |
| 72 | Status bit 2 | 16708 (0x4144) | Analog input (AI) alarm 1 status |
| 73 | Status bit 3 | 16709 (0x4145) | Analog input (AI) alarm 2 status |
| 74 | Status bit 4 | 16705 (0x4141) | Alarm 1 status |
| 75 | Status bit 5 | 16706 (0x4142) | Alarm 2 status |
| 76 | Status bit 6 | 16945 (0x4231) | Burnout status |
| 77 | Status bit 7 | 16707 (0x4143) | Heater break alarm status |

* Identification code is “12336 (0x3030)” when it does not designate communication item.

- **Number of maximum connection channel**

| ID | Contents | Identification code | Communication items |
|---|---|---|---|
| 80 | Maximum temperature channel | 02 | 2 channels |

☞ For details, refer to the **6.2.1 Controller communication items setting (P. 50)**.

# 7.5 Sample Programs

## 7.5.1 Polling I/O communication (When the SYSMAC CS1)

Polling I/O communication is called “Remote I/O communication” in OMRON PLC related instruction manuals.

### ■ Communication requirement

The data type (temperature input data), channel number (1 or 2) and set value are sent from the SYSMAC CS1, and temperature input measured values corresponding to temperature control channels 1 and 2 are read from the COM-H.

- **Communication mode setting**
  - Communication mode A (Compatible mode)
- **Data to send from a PLC**
  - Temperature control channel 1 set value: 100
  - Temperature control channel 2 set value: 100
- **Storage location of read data**
  - Temperature control channel 1 measured value: D00001
  - Temperature control channel 2 measured value: D00002
- **Memory allocation**

Default allocations (without Configuration)

- SYSMAC CS1 I/O allocation

  Output area: IR0050 to IR0099
  Input area: IR0350 to IR0399

- COM-H (Node address 1) I/O allocation

  Output area: IR0051, IR0052
  Input area: IR0351, IR0352

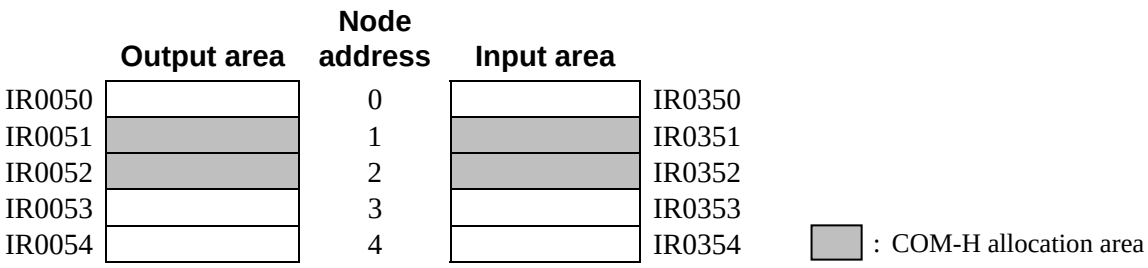


Fig. 7-2 Memory allocation

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[COM-H I/O allocation]
Can confirm an COM-H I/O allocation area with **APPENDIX A. Device Profiles**/Connection Object (0x05)/Object instance 2/Attribute 7: Produced connection size and Attribute 8: Consumed connection size.

- Produced connection size: This is the amount of memory (usually in bytes) allocated as input.
- Consumed connection size: This is the amount of memory (usually in bytes) allocated as output.

If the connection size is an even number of bytes: bytes/2 = The number of allocated words
If the connection size is an odd number of bytes: (bytes + 1)/2 = The number of allocated words
COM-H

- Produced connection size: 4 → The number of allocated words of input area: 2
- Consumed connection size: 4 → The number of allocated words of output area: 2

## ■ Sample program (ladder)

### ● Program action

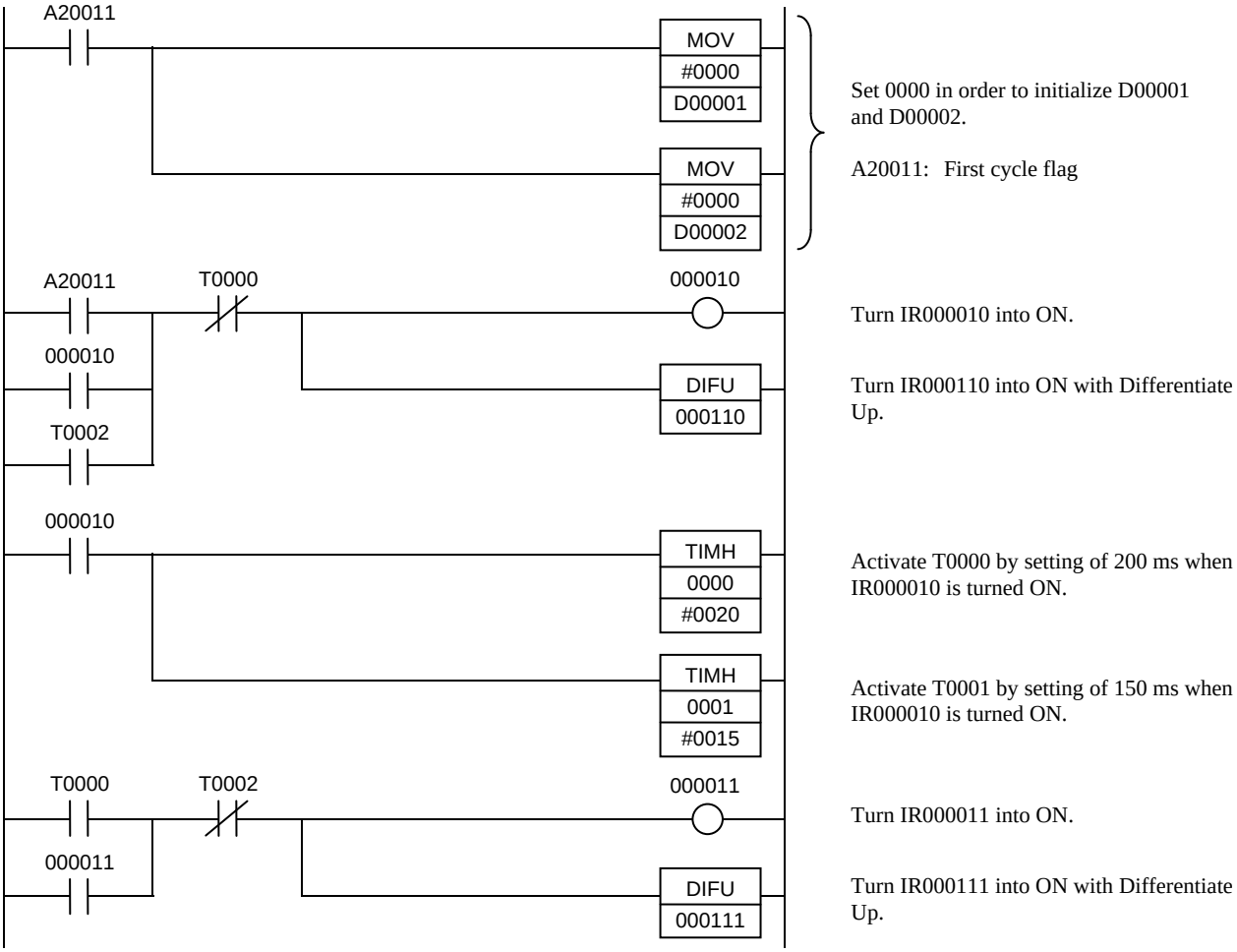
***1.*** Read the measured value of temperature control channel 1

- When the relay No. 000110 is ON:
  "Data types (temperature input data)" and "Channel number (1)" are set to IR0051.
  Set value of set data in IR0051 is set to IR0052.
- Measured value of temperature control channel 1 is written in IR0351.
- Measured value of IR0351 is stored to D00001 when IR000112 is ON.

***2.*** Read the measured value of temperature control channel 2

- When the relay No. 000111 is ON:
  "Data types (temperature input data)" and "Channel number (2)" are set to IR0051.
  Set value of set data in 0051CH is set to IR0052.
- Measured value of temperature control channel 2 is written in IR0351.
- Measured value of IR0351 is stored to D00002 when IR000113 is ON.

As IR0051, IR0052 and IR0351 are shared by temperature control channels 1 and 2, the timing is staggered by timers.

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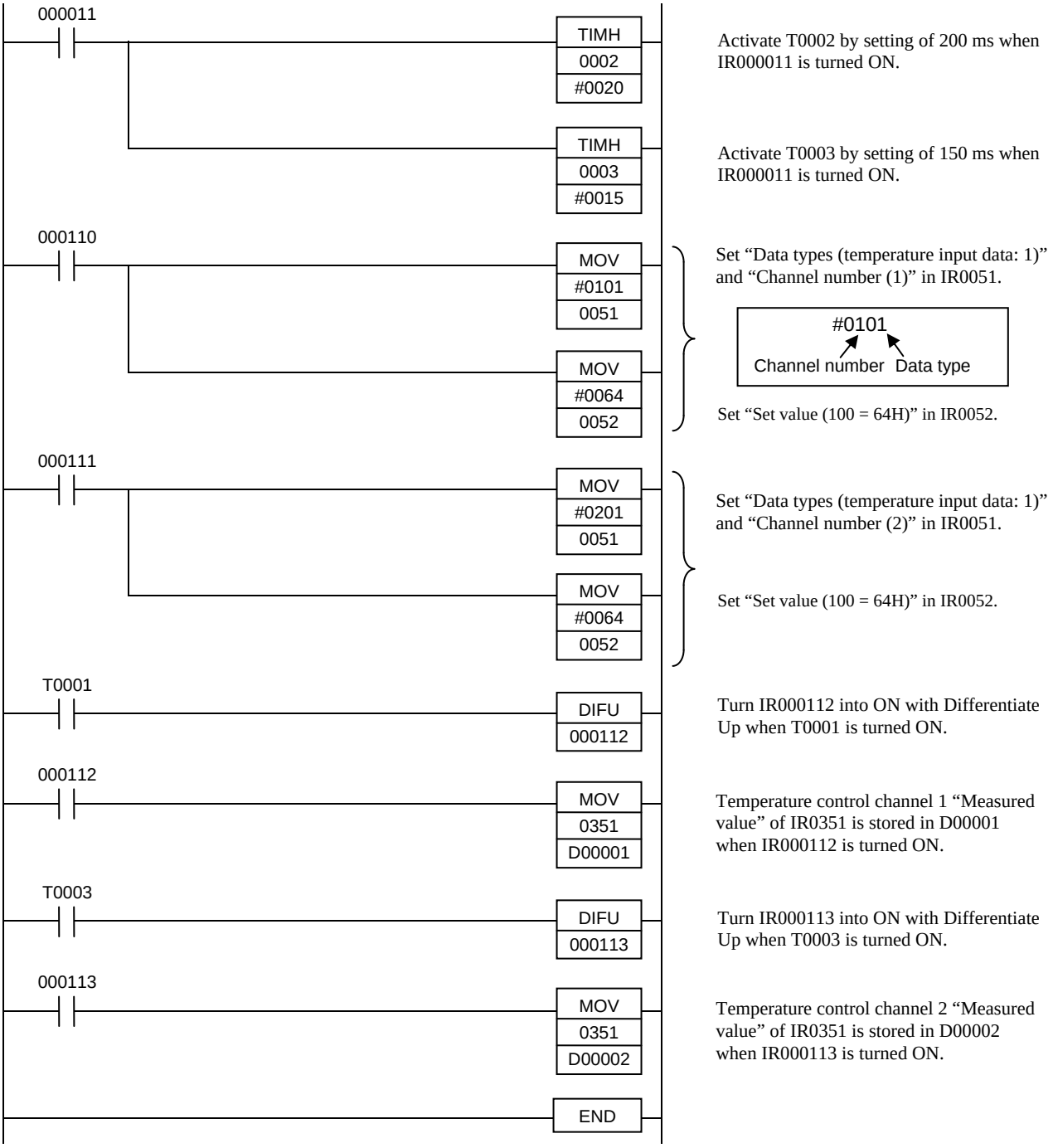

## 7.5.2 Polling I/O communication (When the Control Logix 5550)

### ■ Communication requirement

The data type (temperature input data), channel number (1 or 2) and set value are sent from the "Rockwell (Allen-Bradley) Control Logix 5550," and temperature input measured values corresponding to temperature control channels 1 and 2 are read from the "COM-H."

**● Communication mode setting**

- Communication mode B (Expansion mode)

**● Data to send from a PLC**

Send the following three items sequentially.

- Temperature set value (Data type = 1: ID5)
- Alarm 1 set value (Data type = 2: ID11)
- Alarm 2 set value (Data type = 3: ID12)

**● Data to send from a COM-H**

- Temperature input measured value (ID1)
- Temperature set value (ID5)
- Alarm 1 set value (ID11)
- Alarm 2 set value (ID12)
- Controller status

 In case of the temperature controller, set value does poling as monitor data.

**● Program action**

As action of sequence program, there are monitor mode and setting mode. Execute the mode transfer with display unit connected to PLC.

<Monitor mode>

In case of monitor mode, set value does not send from PLC when set data type in "0." Only read of the measured value from the controller.

- Storage location of read data (Variable)
  - Temperature control channel 1 measured value: N20[1]
  - Temperature control channel 2 measured value: N20[2]
  - Temperature control channel 1 set value: N20[11]
  - Temperature control channel 2 set value: N20[12]
  - Temperature control channel 1 alarm 1 set value: N20[21]
  - Temperature control channel 2 alarm 1 set value: N20[22]
  - Temperature control channel 1 alarm 2 set value: N20[31]
  - Temperature control channel 2 alarm 2 set value: N20[32]
  - Temperature control channel 1 status: N20[41]
  - Temperature control channel 2 status: N20[42]

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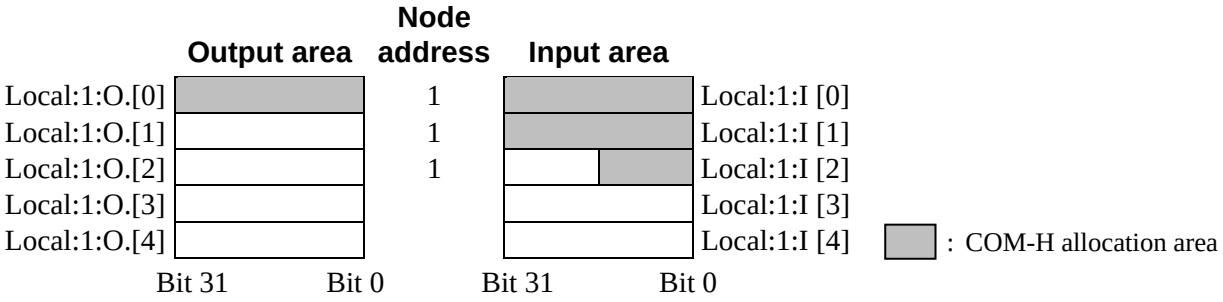
<Setting mode>

Send set value of the PLC internal register set by display unit.

- Storage location of write data (Variable)
  - Temperature control channel 1 set value: N24[1]
  - Temperature control channel 2 set value: N24[2]
  - Temperature control channel 1 alarm 1 set value: N24[11]
  - Temperature control channel 2 alarm 1 set value: N24[12]
  - Temperature control channel 1 alarm 2 set value: N24[21]
  - Temperature control channel 2 alarm 2 set value: N24[22]

### ● Memory allocation

Do the memory allocations of PLC as the following.




## ■ Sample program (ladder)

### ● Program area

S = Special relay
T4 = Timer
N20 = Internal register (Register for storage of read data)
N23 = Internal register (Register for work)
N24 = Internal register (Register for storage of writ data)
DevWr = Internal register (Register for send data)
B10 = Internal relay
Local:1:O = OUT area (Area for DeviceNet polling I/O)
Local:1:I = IN area (Area for DeviceNet polling I/O)

- **Program action**

***1.*** When data read of the temperature control channel 1

- With monitor mode (MODE[0]=OFF) in case of internal relay (B10[0]) ON

  Sets “data type: 0” and “channel number: 1” to “Local:1:O.Data[0].”
  Data of temperature control channel 1 is written in at I/O area.

  Local:1:I.Data[0]:
  low-order data: Measured value
  High-order data: Set value
  Local:1:I.Data[1]:
  low-order data: Alarm 1 set value
  High-order data: Alarm 2 set value
  Local:1:I.Data[2]:
  low-order data: Instrument status

- With time-up of “T4[0],” saved data of “Local:1:I.Data [0 to 2]” in each storage areas.

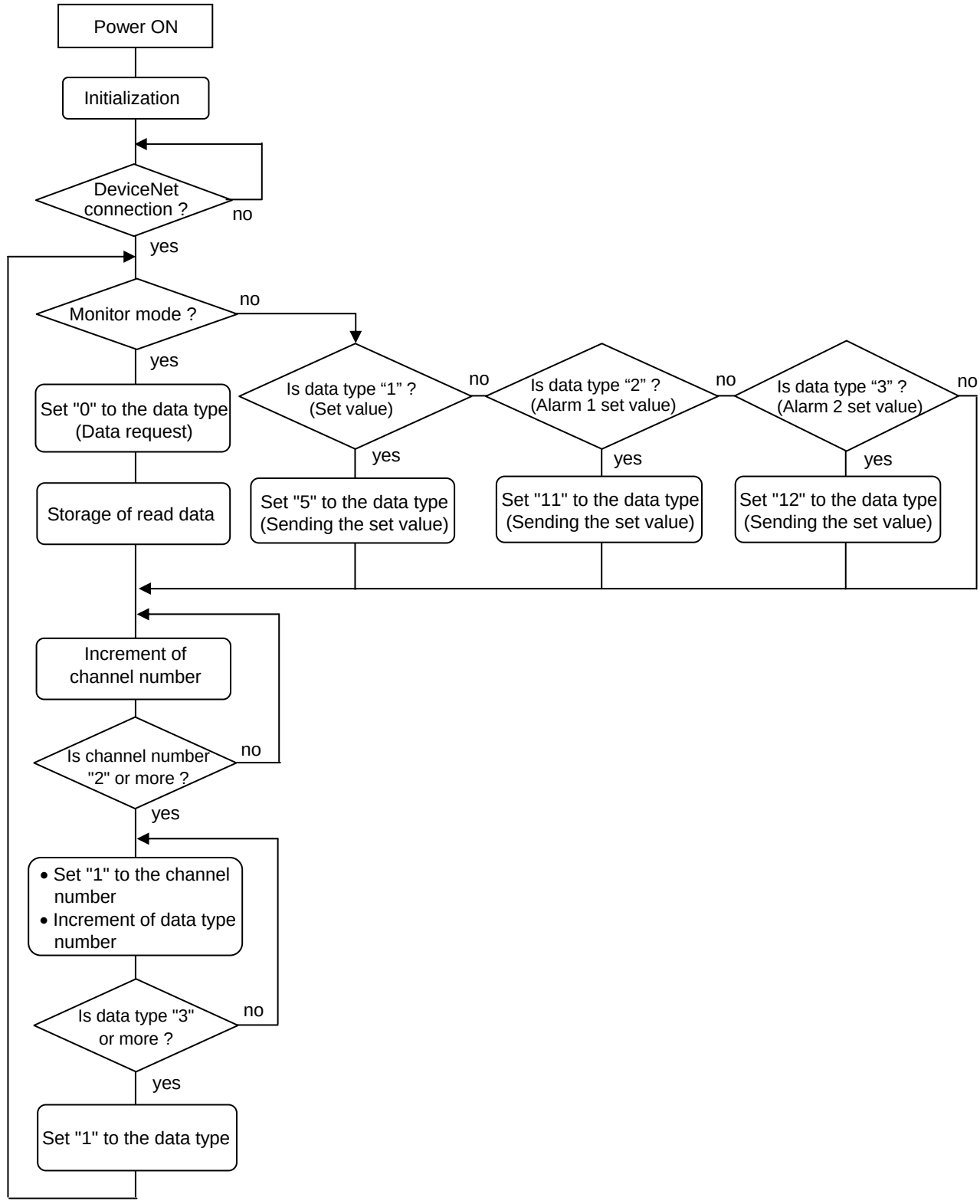
***2.*** When writes in set value of the temperature control channel 2

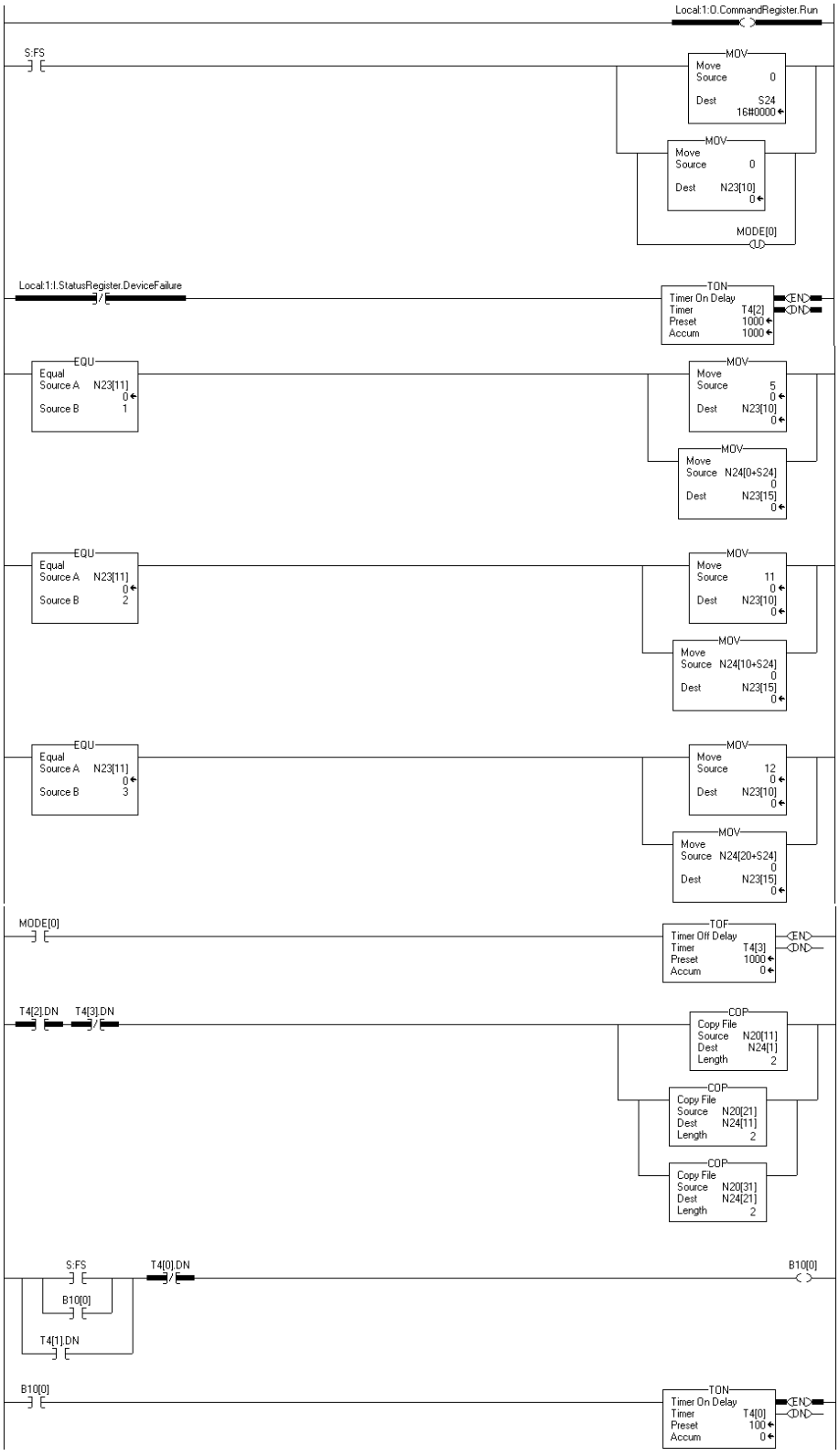
- With setting mode (MODE[0]=ON) in case of internal relay (B10[0]) ON

  Sets “data type: 5,” “channel number: 2” and set value to “Local:1:O.Data[0].”

As “Local:1:O” and “Local:1:I” are shared by temperature control channels 1 and 2, the timing is staggered by timers.

- **The flow chart of sample program**






Turns “Local:1:O.Comand Register .Run” of OUT area into ON, and starts DeviceNet.

Writes in “0” at “S24” (chNo.) and ”N23[10]」” (data type) at start-up, and initializes it.
Clears mode, and changes it into monitor mode.

- S:FS = Is ON only one-scan at start-up.

Confirm that slave was connected to DeviceNet with “Local:1:I.StatusRegister.DeviceFailure. ” Start I/O polling processing from the connection one second later.

If “N24[11]” (data type No.) is set to “1,” set “5” which is the set value data type ID No. to “N24[10]” (data type setting register).
Set the set value stored in “N24[chNo.]” to “N23[15]” (set value setting register).

If “N24[11]” (data type No.) is set to “2,” set “11” which is the alarm 1 set value data type ID No. to “N24[10]” (data type setting register).
Set the alarm 1 set value stored in “N24[chNo.]” to “N23[15]” (set value setting register).

If “N24[11]” (data type No.) is set to “3,” set “12” which is the alarm 1 set value data type ID No. to “N24[10]” (data type setting register).
Set the alarm 2 set value stored in “N24[chNo.]” to “N23[15]” (set value setting register).

When changing the set mode to the monitor mode, set the one-second-delay timer.

- It takes about one second to transmit all the set value of tow channel.

When at “T4:[2]” = ON (DeviceNet connection) and “T4:[3]” = OFF (monitor mode), the set value, alarm 1 set value and alarm 2 set value read from the slave are copied to the storage area used for data write.

The internal relay, “B10[0]” is self-held at the time of start-up or when the timer, “T40[0]” is time-up (processing end of each channel).
The hold-relay reset is done in time-up of timer “T4[0].”

While “B10[0]” is being held, a time of 100 ms is counted by the timer, “T4[0].”

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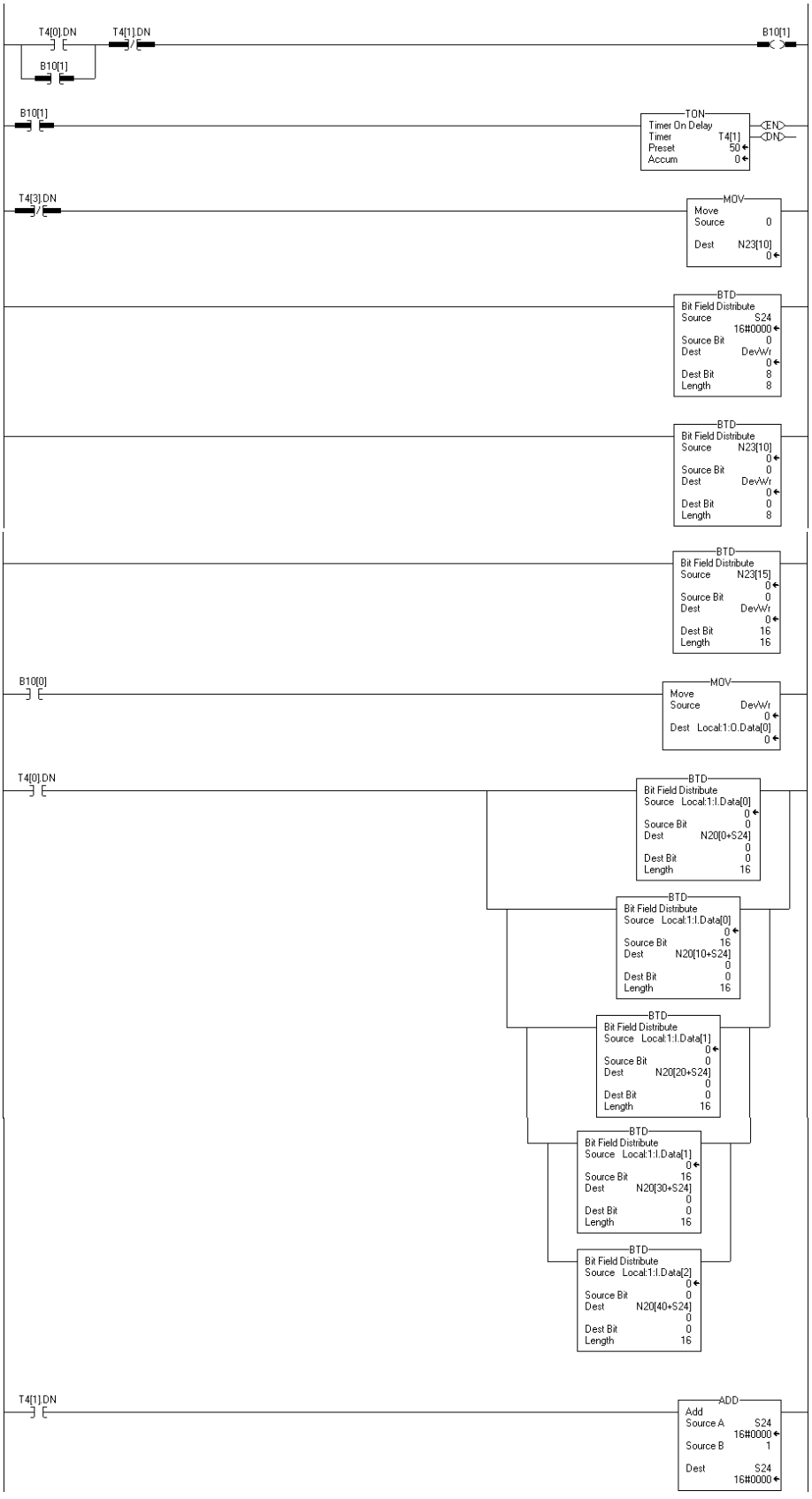


The internal relay, “B10[0]” is self-held at the time of when the timer, “T40[0]” is time-up (processing end of each channel).
The hold-relay reset is done in time-up of timer “T4[1].”
A time of 50 ms is counted by the timer, “T 4[1].”

When at “T4[3]” = OFF (monitor mode), “0” is set to “N23[10]” (data type setting register) so that no set value can be sent.

“S24” (ch. number) is written to bits 8 to 16 of “DevWr.”

“N23[10]” (data type) is written to low order 8 bits of “DevWr.”

“N23[15]” (set value) is written to high order 16 bits of “DevWr.”

While “B10[0]” is being held, “DevWr” is written to the OUT area to send data.

DevWr = # 0000 00 00

- Data type
- Ch number
- Set value

Measured value captured to the IN area are stored.

Set value captured to the IN area are stored.

Alarm 1 set value captured to the IN area are stored.

Alarm 2 set value captured to the IN area are stored.

Instrument status captured to the IN area are stored.

After “T4[1]” time-up, does increment of “S24” (chNo.).

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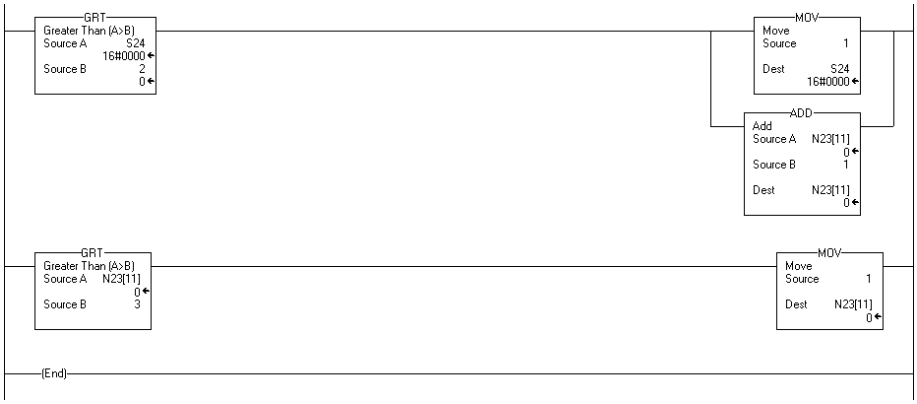



If at more than “2” as a result of incrementing “S24” (chNo.), set “S24” to “1” to be set to channel 1. Also increment “N23[11]” (data type No.).

If at more than “3” as a result of incrementing “N23[11],” set “N23[11]” to “1” to set the data type to the set value.

## 7.5.3 Explicit message communication

In order to conduct Explicit message communication using the OMRON SYSMAC CS1 PLC, the FINS command for FINS communication (communication protocol developed by OMRON) is used.

### ■ Communication requirement

The vendor code is read from the COM-H (slave). (RKC vendor code: 394 = 018AH)

- Using the “Explicit message send” command (2801) of FINS command.
- The “IOWR instruction” is used to send FINS commands.
  IOWR instruction is executed when “Message Communications Enabled Flag” is turned ON.
- Write location of request data from master: On and after D01000
- Storage location of response data from slave: On and after D02000
- The completion code is stored in D00006 when execution of IOWR has been completed and then the command is executed again.
- When an Explicit message is sent by the SYSMAC CS1, the send location of the FINS command is assigned to the DeviceNet master unit of its own node instead of the actual send location (COM-H). The COM-H node address is specified within Explicit message send command data.

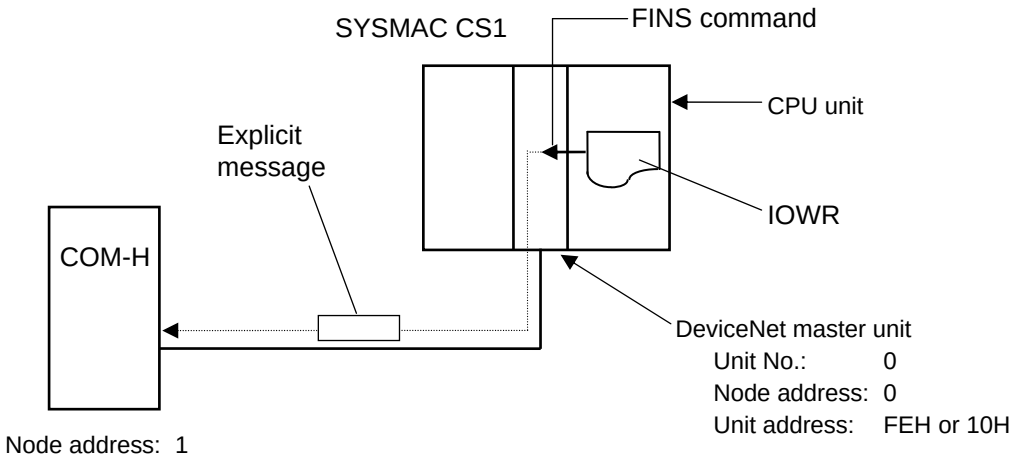
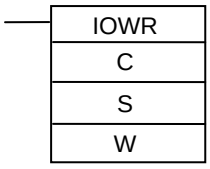
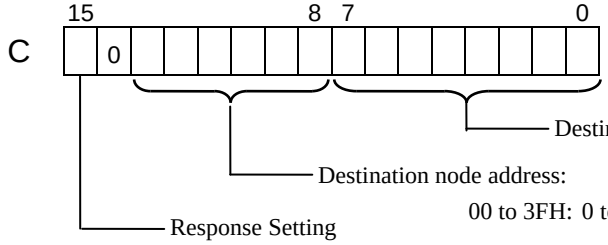



Fig. 7-2 Explicit message flow

## ● Description of IOWR



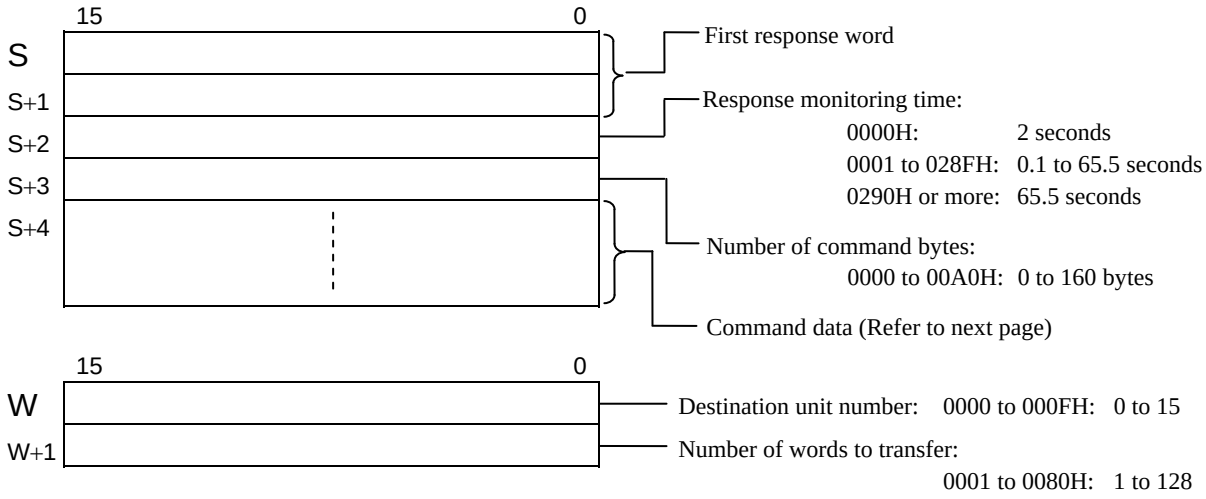

C: Control code
S: First source word
W: Destination information




Destination unit address: 00H: CPU unit
FEH: Communication unit
10 to 1FH: Special I/O unit (Unit No. + 10H)

Destination node address: 00 to 3FH: 0 to 63

Response Setting
0: Response returned
1: No response







[For sample program]

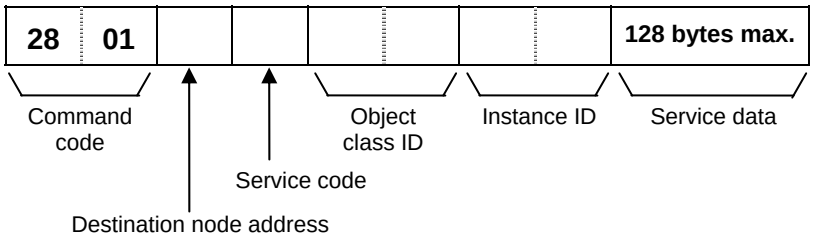
| | | | | |
|---|---|---|---|---|
| C | D00100 | | 00FEH | Response returned (0), Destination node address (00H), Destination unit address: FEH (or 10H) |
| S | D01000 | + 0 | 8207H * | First response word (D02000) |
| | | + 1 | D000H* | |
| | | + 2 | 028FH | Response monitoring time (65.5 seconds) |
| | | + 3 | 0009H | Number of command bytes (9 bytes) |
| | | + 4 | 2801H | Explicit message sending command |
| | | + 5 | 010EH | Slave node address (1), Service code (0EH) |
| | | + 6 | 0001H | Object class ID (0001H) |
| | | + 7 | 0001H | Instance ID (0001H) |
| | | + 8 | 0100H | Attribute ID (01H) |
| W | | + 0 | #0000 | Destination unit number (Lower 4 digits) |
| | | + 1 | #0009 | Number of words to transfer (Upper 4 digits) |

* Divide “8207D000” into 2, and have entered
82: Memory area code (Data Memory: D)
07D0: 2000
00: Specified “00”

### ● Command data format

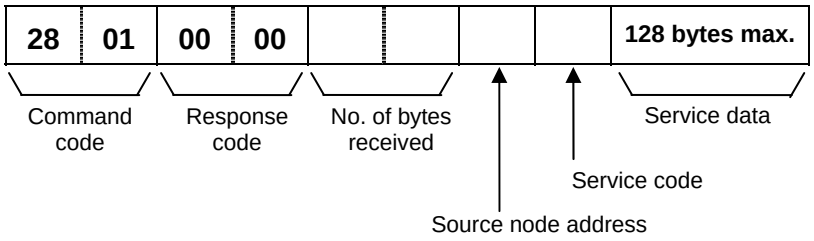
Command data format at communicating by an Explicit message with SYSMAC CS1 is shown with the following.

[Request data format from master]

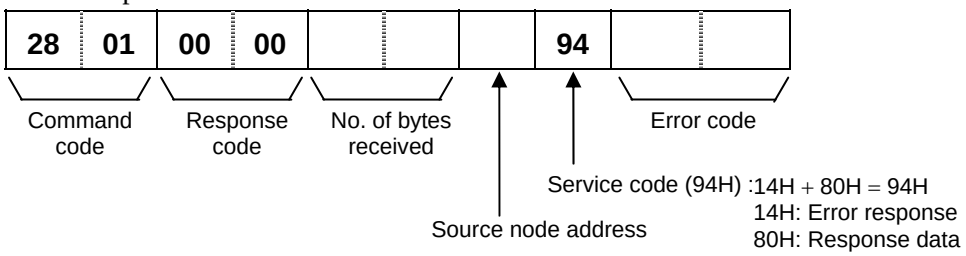



[Response data format]

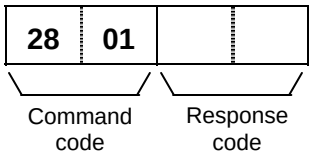
• Normal response




• Error response

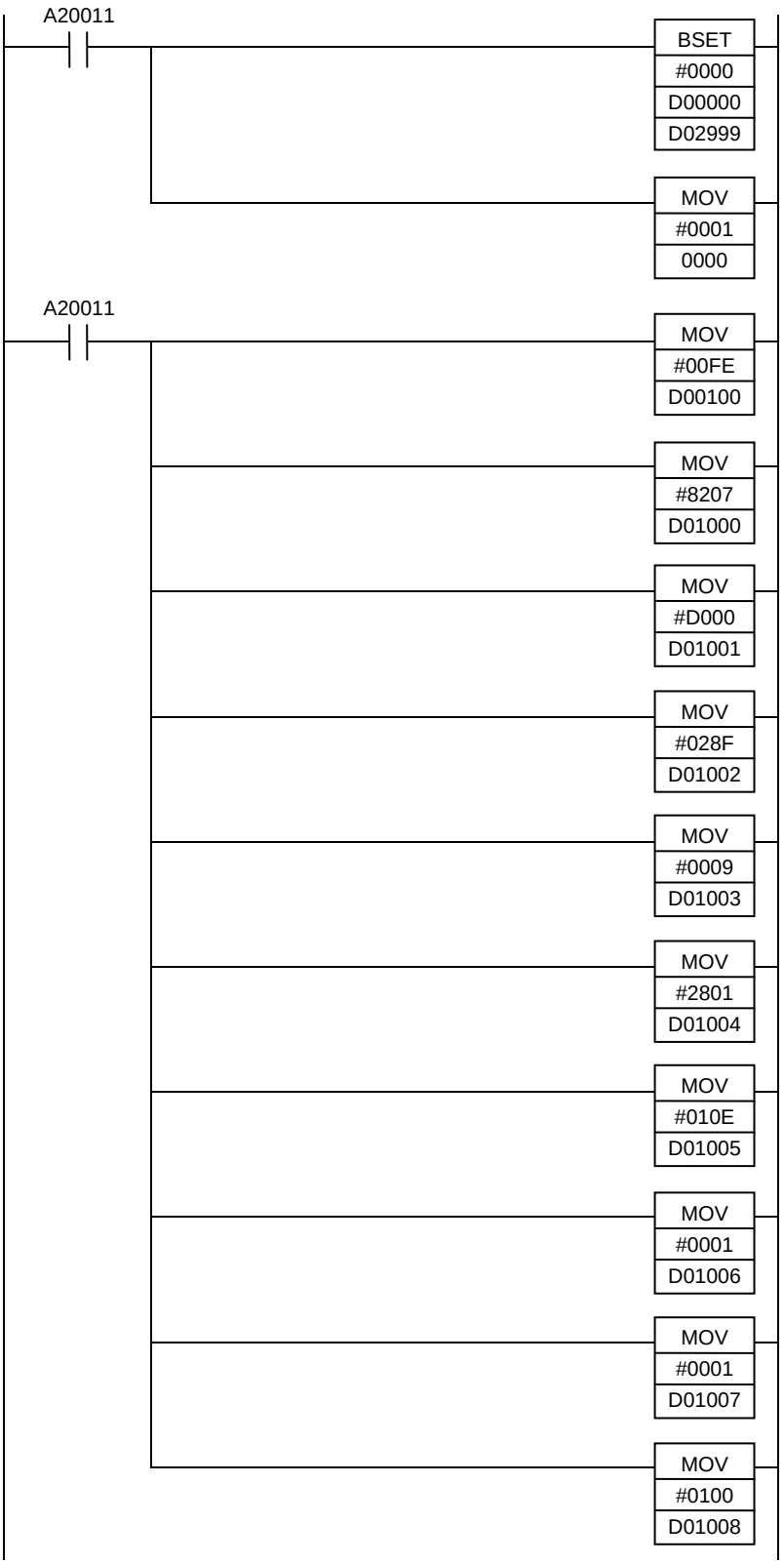



• Cannot be sent/Timeout




As this response (Cannot be sent/Timeout) is an error response sent to the CPU unit from the DeviceNet master unit of the SYSMAC CS1, this is not an error in DeviceNet communication.

## ■ Sample program (ladder)




Set 0000 in order to initialize D00000 to D02999.

A20011: First cycle flag

Set 0001 in IR0000.

Set 00FE in D00100.
Response returned: bit15: 0
Destination node address: 00H
Destination unit address: FEH

Set the first response storage word
Set 8207 in D01000.
Set D000 in D01001.
Divide "8207D000" into 2
82: Memory area code
(Data Memory: D)
07D0: 2000
00: Specified "00"

Set 028F in D01002.
Response monitoring time:
65.5 seconds

Set 0009 in D01003.
Number of command bytes: 9 bytes

Set 2801 in D01004.
Explicit message send command

Set 010E in D01005.
Slave node address: 1
Service code: 0EH

Set 0001 in D01006.
Object class ID: 0001H

Set 0001 in D01007.
Instance ID: 0001H

Set 0100 in D01008.
Attribute ID: 01H

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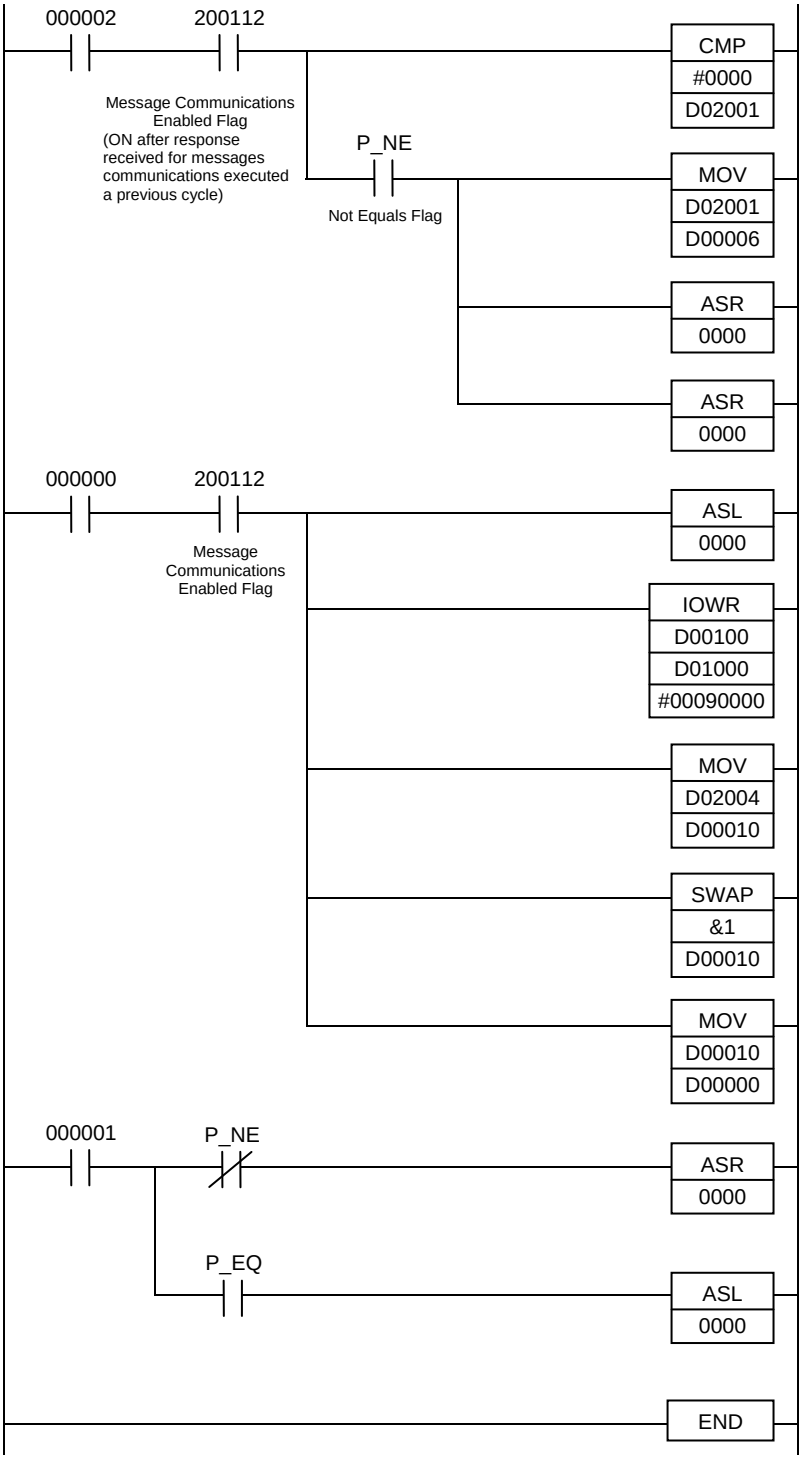


Compares contents of D02001 to 0000 after IOWR execution and response reception have been completed the previous cycle.

Places the contents of D02001 into D00006 if the comparison results is not equals (error).

Shifts the contents of IR0000 one bit right to turn ON IR000001.

Shifts the contents of IR0000 one bit right to turn ON (reset) IR000000.

Shifts the contents of IR0000 one bit to the left to turn ON IR000001.

Transfers the 9 words of command data starting from D01000 at the CPU Unit to the DeviceNet Master Unit (unit number 0).

Transfer contents of D02004 (response data from slave: vendor ID) to D00010.

As the high-order and low-order bytes of data thus written are reversed, replace the high-order byte with the low-order byte.

Transfer contents of D00010 to D00000.

If the write for IOWR has been completed, IR0000 is shifted one bit to the right to turn ON (reset) IR000000.

If the write for IOWR has not been completed, IR0000 is shifted one bit to the left to turn ON IR000002.

# 8. TROUBLESHOOTING

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

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.

| Problem | Possible cause | Solution |
|---|---|---|
| No response (DeviceNet) | Wrong connection, no connection or disconnection of the DeviceNet communication cable | Confirm the connection method or condition and connect correctly |
| | Breakage, wrong wiring, or imperfect contact of the DeviceNet communication cable | Confirm the wiring or connector and repair or replace the wrong one |
| | Communication speed setting of COM-H and RKC controllers is mismatch | Confirm the communication speed setting and set that correctly |
| | Wrong node address setting | Confirm the address setting and set that correctly |
| | Wrong RKC controllers address setting | Sets following value to RKC controllers address<br>- SR Mini HG: 0<br>- Others: Sets in order from 1 |

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| Problem | Possible cause | Solution |
|---|---|---|
| • NS lamp OFF<br>• MS lamp ON (Green) | Wait for completion of node address duplication check with a master | If only the COM-H is in this state though both of the NS/MS lamps are lit in green, re-start after checking that each communication speed is the same |
| • NS lamp OFF<br>• MS lamp ON (Red) | Watchdog timer error | Replace COM-H |
| • NS lamp ON (Red)<br>• MS lamp ON (Green) | Node address duplication | Re-start after the re-setting is made so that no node address is duplicated |
| | Bus off status (communication stop by data abnormality frequent occurrence) | Re-start after checking the following items.<br>• Does the speed coincide with the master communication speed ?<br>• Is not the DeviceNet communication cable connected yet, incorrectly connected or removed ?<br>• Is the length of the DeviceNet communication cable appropriate ?<br>• Are termination resistors (121 Ω) connected only to both ends of the trunk line ?<br>• Does much noise exist ? |
| | Breakdown of communication device | Replace COM-H |
| • NS lamp Flashing (Red)<br>• MS lamp ON (Green) | DeviceNet communication timeout status | Re-start after checking the following items.<br>• Does the speed coincide with the master communication speed ?<br>• Is not the DeviceNet communication cable connected yet, incorrectly connected or removed ?<br>• Is the length of the DeviceNet communication cable appropriate ?<br>• Are termination resistors (121 Ω) connected only to both ends of the trunk line ?<br>• Does much noise exist ? |

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| Problem | Possible cause | Solution |
|---|---|---|
| RX (data reception) lamp does not flash | Wrong connection, no connection or disconnection of the controller communication cable | Confirm the connection method or condition and connect correctly |
| TX (data transmission) lamp does not flash | Breakage, wrong wiring, or imperfect contact of the controller communication cable | Confirm the wiring or connector and repair or replace the wrong one |
| | CPU section defect | Replace COM-H |
| | Power not being supplied | Check the power supply voltage and cable |

# APPENDIX

## A. Device Profiles

A device profile is the specification that defined each necessary parameter with DeviceNet.
Use it after understanding contents of a device profile of COM-H fully when connected to a master.

## A.1 Basic data

### ■ General device data

| | |
|---|---|
| Conforms to DeviceNet specification | Volume I -Release 2.0<br>Volume II -Release 2.0 |
| Vender name | RKC INSTRUMENT INC. (Vender ID = 394) |
| Device profile name | Generic Device |
| Product catalog number | Instruction manual number: IMR01L01-E□ (English)<br>IMR01L01-J□ (Japanese) |
| Product revision | 3.1 |

### ■ Physical conformance data

| | |
|---|---|
| Network power consumption | 50 mA @ 11 V DC<br>40 mA @ 24 V DC |
| Connector type | Open-style connector or Micro-style connector |
| Insulated physical layer | Provided |
| LEDs supported | Module, Network |
| MAC ID setting | Rotary switch (Node address setting) |
| Default MAC ID | 63 |
| Communication speed setting | Rotary switch |
| Communication speed supported | 125 kbps, 250 kbps, 500 kbps |

### ■ Communication data

| | |
|---|---|
| Predefined master/slave connection set | Group 2 Only server |
| Dynamic connection supported (UCMM) | Not supported |
| Fragmented Explicit Messaging | None |

## A.2 Object mounting

### ■ Identity Object (0x01: 01Hex)

#### ● Object class

| | |
|---|---|
| Attributes | Not supported |
| Services | Not supported |

#### ● Object instance

| | ID | Description | Get | Set | Type | Value |
|---|---|---|---|---|---|---|
| Attributes | 1 | Vender | Yes | No | UINT | 394 |
| | 2 | Product type | Yes | No | UINT | 0 |
| | 3 | Product code | Yes | No | UINT | 1 |
| | 4 | Revision | Yes | No | | |
| | | Major revision | | | USINT | 3 |
| | | Minor revision | | | USINT | 1 |
| | 5 | Status (bits supported) | Yes | No | WORD | Note 1 |
| | 6 | Serial number | Yes | No | UDINT | Note 2 |
| | 7 | Product name | Yes | No | | |
| | | Length | | | USINT | 5 |
| | | Name | | | STRING | COM-H |

| | DeviceNet service | | Parameter option |
|---|---|---|---|
| Services | 0x05 | Reset | 0 |
| | 0x0E | Get_Attribute_Single | None |

Note 1: A bit layout of “Status”
Bit 0: Owned
Bit 7: Become 1 when communication with a controller became abnormal and when the either bit of “Controller status” became 1.
Bit 1 to 6 and Bit 8 to 15: Unused

Note 2: An individual number of every COM-H

## ■ Message Router Object (0x02: 02Hex)

### ● Object class

| | |
|---|---|
| Attributes | Not supported |
| Services | Not supported |

### ● Object instance

| | |
|---|---|
| Attributes | Not supported |
| Services | Not supported |

## ■ DeviceNet Object (0x03: 03Hex)

### ● Object class

| | ID | Description | Get | Set | Type | Value |
|---|---|---|---|---|---|---|
| Attributes | 1 | Revision | Yes | No | UINT | 2 |
| | **DeviceNet service** | | **Parameter option** | | | |
| Services | 0x0E | Get_Attribute_Single | None | | | |

### ● Object instance

| | ID | Description | Get | Set | Type | Value |
|---|---|---|---|---|---|---|
| Attributes | 1 | MAC ID | Yes | No | USINT | 0 to 63 |
| | 2 | Baud rate | Yes | No | USINT | 0 to 2 |
| | 3 | BOI | Yes | No | BOOL | 0 |
| | 4 | Bus-off counter | Yes | Yes | USINT | |
| | 5 | Allocation information | Yes | No | | |
| | | Allocation choice byte | | | BYTE | |
| | | Master's MAC ID | | | USINT | |
| | 6 | MAC ID switch changed | Yes | No | BOOL | 0, 1 |
| | 7 | Baud rate switch changed | Yes | No | BOOL | 0, 1 |
| | 8 | MAC ID switch value | Yes | No | USINT | 0 to 63 |
| | 9 | Baud rate switch value | Yes | No | USINT | 0 to 2 |
| | **DeviceNet service** | | **Parameter option** | | | |
| Services | 0x0E | Get_Attribute_Single | None | | | |
| | 0x10 | Set_Attribute_Single | None | | | |
| | 0x4B | Allocate_Master/Slave_ Connection_Set | None | | | |
| | 0x4C | Release_Group_2_ Identifier_Set | None | | | |

## ■ Assembly Object (0x04: 04Hex)

### [Communication mode A]

#### ● Object class

| | ID | Description | Get | Set | Type | Value |
|---|---|---|---|---|---|---|
| Attributes | 1 | Revision | Yes | No | UINT | 2 |

| | DeviceNet service | | Parameter option |
|---|---|---|---|
| Services | 0x0E | Get_Attribute_Single | None |

#### ● Object instance 100

| | ID | Description | Get | Set | Type | Value |
|---|---|---|---|---|---|---|
| Attributes | 3 | Data | Yes | No | | |
| | | Measured value | | | INT | Note 1 |
| | | Controller status | | | WORD | Note 2 |

| | DeviceNet service | | Parameter option |
|---|---|---|---|
| Services | 0x0E | Get_Attribute_Single | None |

Note 1: Data item values set to ID61 to 64 from among data items set to controller communication item setting object (0xC7)/object instance 1 ID1 to 30 are read.

Note 2: Data item values set to controller communication item setting object (0xC7)/object instance 1 ID70 to 77 are read.

#### ● Object instance 101

| | ID | Description | Get | Set | Type | Value |
|---|---|---|---|---|---|---|
| Attributes | 3 | Data | No | Yes | | |
| | | Data types | | | USINT | 1 to 4 |
| | | Channel number | | | USINT | 1 to 24 |
| | | Set value | | | INT | Note 1 |

| | DeviceNet service | | Parameter option |
|---|---|---|---|
| Services | 0x10 | Set_Attribute_Single | None |

Note 1: One type of data item value selected by “data type” from among data items set to controller communication item setting object (0xC7)/object instance 1 ID51 to 54 are written.

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## [Communication mode B]

- **Object class**

| | ID | Description | Get | Set | Type | Value |
|---|---|---|---|---|---|---|
| Attributes | 1 | Revision | Yes | No | UINT | 2 |

| | DeviceNet service | | Parameter option |
|---|---|---|---|
| Services | 0x0E | Get_Attribute_Single | None |

- **Object instance 100**

| | ID | Description | Get | Set | Type | Value |
|---|---|---|---|---|---|---|
| Attributes | 3 | Data | Yes | No | | |
| | | Measured value 1 | | | INT | Note 1 |
| | | Measured value 2 | | | INT | |
| | | Measured value 3 | | | INT | |
| | | Measured value 4 | | | INT | |
| | | Controller status | | | WORD | Note 2 |

| | DeviceNet service | | Parameter option |
|---|---|---|---|
| Services | 0x0E | Get_Attribute_Single | None |

Note 1: Data item values set to ID61 to 64 from among data items set to controller communication item setting object (0xC7)/object instance 1 ID1 to 30 are read.

Note 2: Data item values set to controller communication item setting object (0xC7)/object instance 1 ID70 to 77 are read.

- **Object instance 101**

| | ID | Description | Get | Set | Type | Value |
|---|---|---|---|---|---|---|
| Attributes | 3 | Data | No | Yes | | |
| | | Data types | | | USINT | 1 to 30 |
| | | Channel number | | | USINT | 1 to 24 |
| | | Set value | | | INT | Note 1 |

| | DeviceNet service | | Parameter option |
|---|---|---|---|
| Services | 0x10 | Set_Attribute_Single | None |

Note 1: One type of data item value selected by “data type” from among data items set to controller communication item setting object (0xC7)/object instance 1 ID1 to 30 are written.

## ■ Connection Object (0x05: 05Hex)

### ● Object class

| | |
|---|---|
| Attributes | Not supported |
| Services | Not supported |
| Number of maximum possible active connection | 1 |

### ● Object instance 1

| | Section | Information | Number of maximum instance |
|---|---|---|---|
| | Instance type | Explicit Message | 1 |
| | Production trigger | Cyclic | |
| | Transport type | Server | |
| | Transport class | 3 | |

| | ID | Description | Get | Set | Type | Value |
|---|---|---|---|---|---|---|
| Attributes | 1 | State | Yes | No | USINT | |
| | 2 | Instance type | Yes | No | USINT | 0x00 |
| | 3 | Transport class trigger | Yes | No | BYTE | 0x83 |
| | 4 | Produced connection ID | Yes | No | UINT | |
| | 5 | Consumed connection ID | Yes | No | UINT | |
| | 6 | Initial comm. Characteristics | Yes | No | BYTE | 0x21 |
| | 7 | Produced connection size | Yes | No | UINT | 7 |
| | 8 | Consumed connection size | Yes | No | UINT | 7 |
| | 9 | Expected packet rate | Yes | Yes | UINT | Default: 2500 |
| | 12 | Watchdog time-out action | Yes | Yes | USINT | 1, 3 |
| | 13 | Produced connection path length | Yes | No | UINT | 0 |
| | 14 | Produced connection path | Yes | No | (null) | |
| | 15 | Consumed connection path length | Yes | No | UINT | 0 |
| | 16 | Consumed connection path | Yes | No | (null) | |

| | DeviceNet service | | Parameter option |
|---|---|---|---|
| Services | 0x05 | Reset | None |
| | 0x0E | Get_Attribute_Single | None |
| | 0x10 | Set_Attribute_Single | None |

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- **Object instance 2**

| | Section | Information | Number of maximum instance |
|---|---|---|---|
| | Instance type | Polled I/O | 1 |
| | Production trigger | Cyclic | |
| | Transport type | Server | |
| | Transport class | 2 | |

| | ID | Description | Get | Set | Type | Value |
|---|---|---|---|---|---|---|
| Attribute | 1 | State | Yes | No | USINT | |
| | 2 | Instance type | Yes | No | USINT | 0x01 |
| | 3 | Transport class trigger | Yes | No | BYTE | 0x82 |
| | 4 | Produced connection ID | Yes | No | UINT | |
| | 5 | Consumed connection ID | Yes | No | UINT | |
| | 6 | Initial comm. Characteristics | Yes | No | BYTE | 0x01 |
| | 7 | Produced connection size | Yes | No | UINT | Note 1 |
| | 8 | Consumed connection size | Yes | No | UINT | 4 |
| | 9 | Expected packet rate | Yes | Yes | UINT | Default: 0 |
| | 12 | Watchdog time-out action | Yes | No | USINT | 0 |
| | 13 | Produced connection path length | Yes | No | UINT | 6 |
| | 14 | Produced connection path | Yes | No | | |
| | | Logic Segment, Class | | | USINT | 0x20 |
| | | Class Number | | | USINT | 0x04 |
| | | Logic Segment, Instance | | | USINT | 0x24 |
| | | Instance Number | | | USINT | 0x64 |
| | | Logic Segment, Attributes | | | USINT | 0x30 |
| | | Attributes Number | | | USINT | 0x03 |
| | 15 | Consumed connection path length | Yes | No | UINT | 6 |
| | 16 | Consumed connection path | Yes | No | | |
| | | Logic Segment, Class | | | USINT | 0x20 |
| | | Class Number | | | USINT | 0x04 |
| | | Logic Segment, Instance | | | USINT | 0x24 |
| | | Instance Number | | | USINT | 0x65 |
| | | Logic Segment, Attributes | | | USINT | 0x30 |
| | | Attributes Number | | | USINT | 0x03 |

| | DeviceNet service | | Parameter option |
|---|---|---|---|
| Services | 0x05 | Reset | None |
| | 0x0E | Get_Attribute_Single | None |
| | 0x10 | Set_Attribute_Single | None |

Note 1: Communication mode A: 4, Communication mode B: 10

## ■ Temperature Controller Object (0x64: 64Hex)

### ● Object class

| | |
|---|---|
| Attributes | Not supported |
| Services | Not supported |

### ● Object instance □ (□: 1 to 24)

| | ID | Description | Get | Set | Type |
|---|---|---|---|---|---|
| Attributes | 1 | Data 1 | Yes | Yes | INT |
| | 2 | Data 2 | Yes | Yes | INT |
| | 3 | Data 3 | Yes | Yes | INT |
| | 4 | Data 4 | Yes | Yes | INT |
| | 5 | Data 5 | Yes | Yes | INT |
| | 6 | Data 6 | Yes | Yes | INT |
| | 7 | Data 7 | Yes | Yes | INT |
| | 8 | Data 8 | Yes | Yes | INT |
| | 9 | Data 9 | Yes | Yes | INT |
| | 10 | Data 10 | Yes | Yes | INT |
| | 11 | Data 11 | Yes | Yes | INT |
| | 12 | Data 12 | Yes | Yes | INT |
| | 13 | Data 13 | Yes | Yes | INT |
| | 14 | Data 14 | Yes | Yes | INT |
| | 15 | Data 15 | Yes | Yes | INT |
| | 16 | Data 16 | Yes | Yes | INT |
| | 17 | Data 17 | Yes | Yes | INT |
| | 18 | Data 18 | Yes | Yes | INT |
| | 19 | Data 19 | Yes | Yes | INT |
| | 20 | Data 20 | Yes | Yes | INT |
| | 21 | Data 21 | Yes | Yes | INT |
| | 22 | Data 22 | Yes | Yes | INT |
| | 23 | Data 23 | Yes | Yes | INT |
| | 24 | Data 24 | Yes | Yes | INT |
| | 25 | Data 25 | Yes | Yes | INT |
| | 26 | Data 26 | Yes | Yes | INT |
| | 27 | Data 27 | Yes | Yes | INT |
| | 28 | Data 28 | Yes | Yes | INT |
| | 29 | Data 29 | Yes | Yes | INT |
| | 30 | Data 30 | Yes | Yes | INT |

| | DeviceNet service | | Parameter option |
|---|---|---|---|
| Services | 0x0E | Get_Attribute_Single | None |
| | 0x10 | Set_Attribute_Single | None |

## ■ Controller Communication Item Setting Object (0xC7: C7Hex)

### ● Object class

| | |
|---|---|
| Attributes | Not supported |
| Services | Not supported |

### ● Object instance 1

| | ID | Description | Get | Set | Type | Value (Default) |
|---|---|---|---|---|---|---|
| Attributes | 1 | Data 1 ID | Yes | Yes | UINT | 19761 = 0x4D31 (M1) |
| | 2 | Data 2 ID | Yes | Yes | UINT | 20273 = 0x4F31 (O1) |
| | 3 | Data 3 ID | Yes | Yes | UINT | 14649 = 0x3939 (99) |
| | 4 | Data 4 ID | Yes | Yes | UINT | 18225 = 0x4731 (G1) |
| | 5 | Data 5 ID | Yes | Yes | UINT | 21297 = 0x5331 (S1) |
| | 6 | Data 6 ID | Yes | Yes | UINT | 20529 = 0x5031 (P1) |
| | 7 | Data 7 ID | Yes | Yes | UINT | 18737 = 0x4931 (I1) |
| | 8 | Data 8 ID | Yes | Yes | UINT | 17457 = 0x4431 (D1) |
| | 9 | Data 9 ID | Yes | Yes | UINT | 21552 = 0x5430 (T0) |
| | 10 | Data 10 ID | Yes | Yes | UINT | 20546 = 0x5042 (PB) |
| | 11 | Data 11 ID | Yes | Yes | UINT | 16689 = 0x4131 (A1) |
| | 12 | Data 12 ID | Yes | Yes | UINT | 16690 = 0x4132 (A2) |
| | 13 | Data 13 ID | Yes | Yes | UINT | 16691 = 0x4133 (A3) |
| | 14 | Data 14 ID | Yes | Yes | UINT | 16692 = 0x4134 (A4) |
| | 15 | Data 15 ID | Yes | Yes | UINT | 21330 = 0x5352 (SR) |
| | 16 | Data 16 ID | Yes | Yes | UINT | 17737 = 0x4549 (EI) |
| | 17 | Data 17 ID | Yes | Yes | UINT | 17217 = 0x4341 (CA) |
| | 18 | Data 18 ID | Yes | Yes | UINT | 18766 = 0x494E (IN) |
| | 19 | Data 19 ID | Yes | Yes | UINT | 22601 = 0x5849 (XI) |
| | 20 | Data 20 ID | Yes | Yes | UINT | 22597 = 0x5845 (XE) |
| | 21 | Data 21 ID | Yes | Yes | UINT | 23110 = 0x5A46 (ZF) |
| | 22 | Data 22 ID | Yes | Yes | UINT | 20530 = 0x5032 (P2) |
| | 23 | Data 23 ID | Yes | Yes | UINT | 21553 = 0x5431 (T1) |
| | 24 | Data 24 ID | Yes | Yes | UINT | 20274 = 0x4F32 (O2) |
| | 25 | Data 25 ID | Yes | Yes | UINT | 22065 = 0x5631 (V1) |
| | 26 | Data 26 ID | Yes | Yes | UINT | 19765 = 0x4D35 (M5) |
| | 27 | Data 27 ID | Yes | Yes | UINT | 16708 = 0x4144 (AD) |
| | 28 | Data 28 ID | Yes | Yes | UINT | 16709 = 0x4145 (AE) |
| | 29 | Data 29 ID | Yes | Yes | UINT | 16693 = 0x4135 (A5) |
| | 30 | Data 30 ID | Yes | Yes | UINT | 16694 = 0x4136 (A6) |

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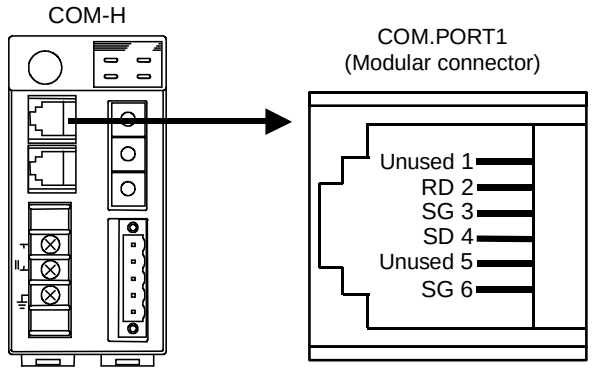
| | ID | Description | Get | Set | Type | Value (Default) |
|---|---|---|---|---|---|---|
| Attributes | 51 | I/O message SV 1 ID number | Yes | Yes | UINT | 5 (1 to 30) |
| | 52 | I/O message SV 2 ID number | Yes | Yes | UINT | 0 (1 to 30) |
| | 53 | I/O message SV 3 ID number | Yes | Yes | UINT | 0 (1 to 30) |
| | 54 | I/O message SV 4 ID number | Yes | Yes | UINT | 0 (1 to 30) |
| | 61 | I/O message PV 1 ID number | Yes | Yes | UINT | 1 (1 to 30) |
| | 62 | I/O message PV 2 ID number | Yes | Yes | UINT | 26 (1 to 30) |
| | 63 | I/O message PV 3 ID number | Yes | Yes | UINT | 0 (1 to 30) |
| | 64 | I/O message PV 4 ID number | Yes | Yes | UINT | 0 (1 to 30) |
| | 70 | I/O message Controller status Bit 0 | Yes | Yes | UINT | 12336 = 0x3030 (00) |
| | 71 | I/O message Controller status Bit 1 | Yes | Yes | UINT | 12336 = 0x3030 (00) |
| | 72 | I/O message Controller status Bit 2 | Yes | Yes | UINT | 16708 = 0x4144 (AD) |
| | 73 | I/O message Controller status Bit 3 | Yes | Yes | UINT | 16709 = 0x4145 (AE) |
| | 74 | I/O message Controller status Bit 4 | Yes | Yes | UINT | 16705 = 0x4141 (AA) |
| | 75 | I/O message Controller status Bit 5 | Yes | Yes | UINT | 16706 = 0x4142 (AB) |
| | 76 | I/O message Controller status Bit 6 | Yes | Yes | UINT | 16945 = 0x4231 (B1) |
| | 77 | I/O message Controller status Bit 7 | Yes | Yes | UINT | 16707 = 0x4143 (AC) |
| | 80 | Number of maximum connection channels | Yes | Yes | UINT | 20 |

| | DeviceNet service | | Parameter option |
|---|---|---|---|
| Services | 0x0E | Get_Attribute_Single | None |
| | 0x10 | Set_Attribute_Single | None |

# B. Signal Description and Wiring Diagram of COM.PORT1

## B.1 RS-232C

### ■ Pin layout of modular connector

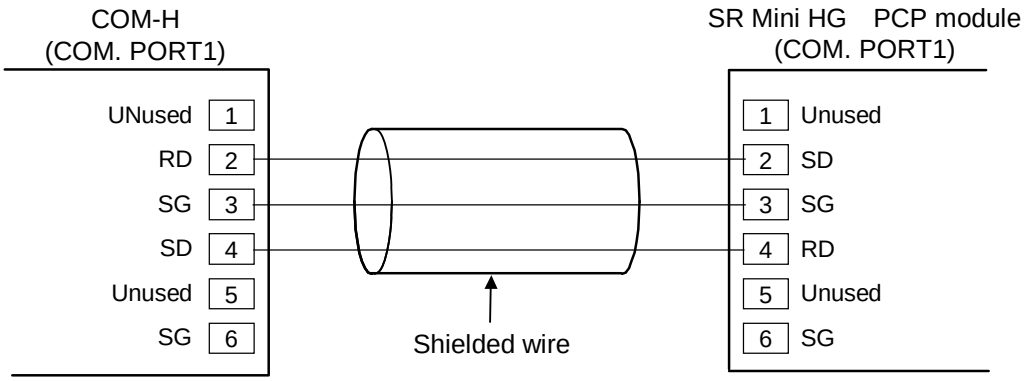



● Connector pin number and signal details

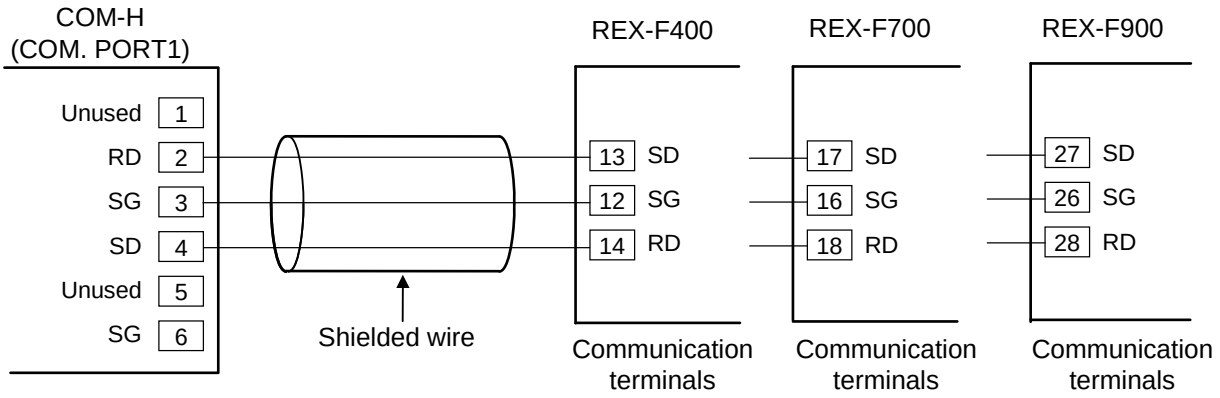
| Pin No. | Signal name | Symbol |
|---|---|---|
| 1 | Unused | — |
| 2 | Receive data | RD (RXD) |
| 3 | Signal ground | SG |
| 4 | Send data | SD (TXD) |
| 5 | Unused | — |
| 6 | Signal ground | SG |

The 6-pin type modular connector should be used for the connection to the COM-H.
Recommended model: TM4P-66P (Manufactured by HIROSE ELECTRIC CO., LTD.,)

### ■ Wiring of SR Mini HG




### ■ Wiring of REX-F400/700/900

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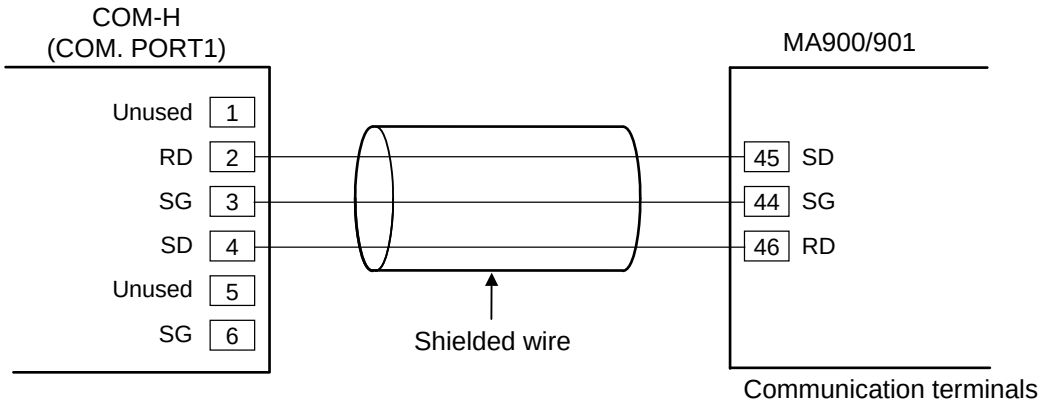
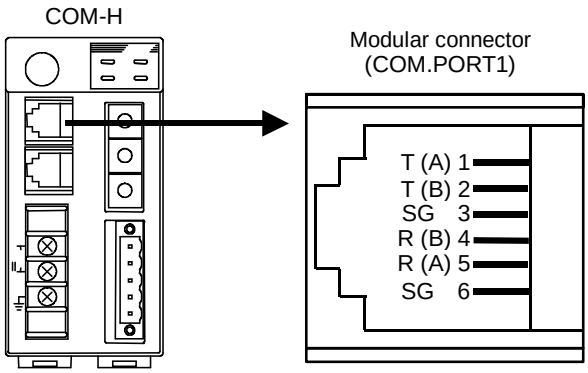
## ■ Wiring of MA900/901



## B.2 RS-422A

### ■ Pin layout of modular connector



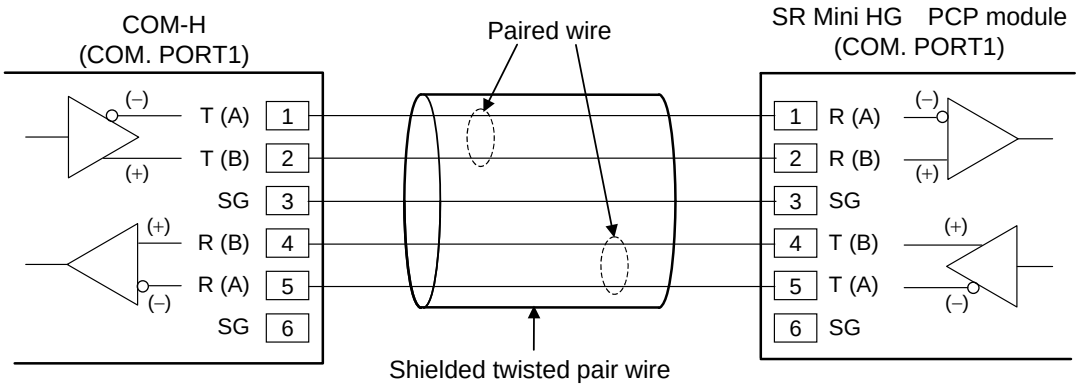

- Connector pin number and

| Pin No. | Signal name | Symbol |
|---|---|---|
| 1 | Send data | T (A) |
| 2 | Send data | T (B) |
| 3 | Signal ground | SG |
| 4 | Receive data | R (B) |
| 5 | Receive data | R (A) |
| 6 | Signal ground | SG |

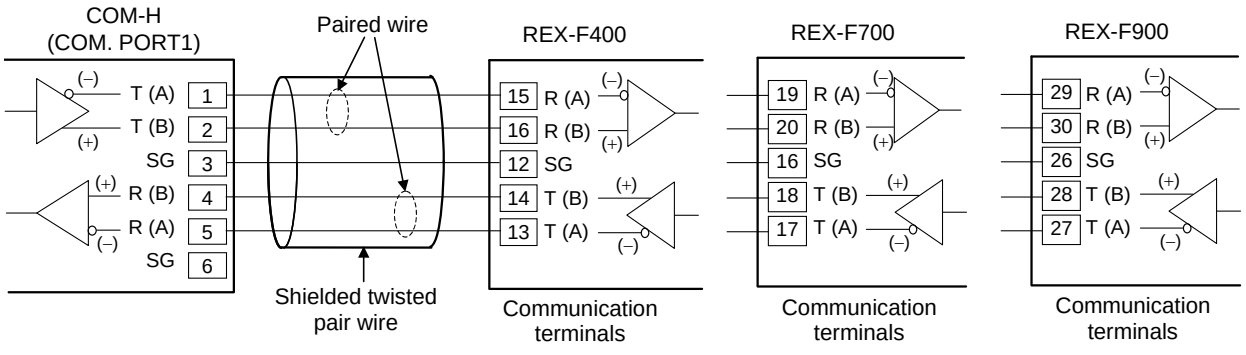
The 6-pin type modular connector should be used for the connection to the COM-H.
Recommended model: TM4P-66P (Manufactured by HIROSE ELECTRIC CO., LTD.,)

## B.2.1 Connection to the RS-422A interface of the controllers

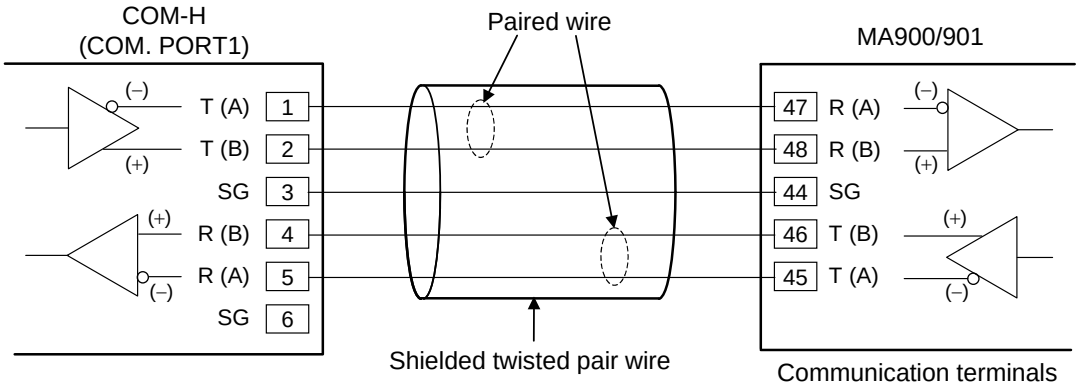
### ■ Wiring of SR Mini HG



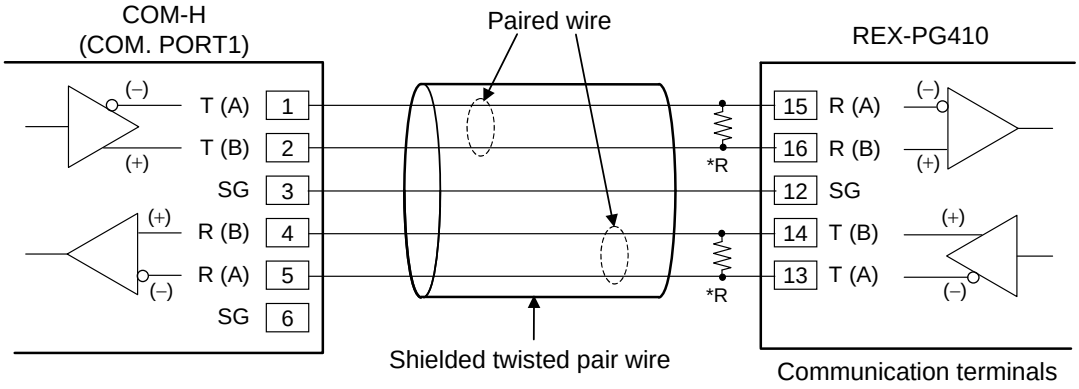

### ■ Wiring of REX-F400/700/900



## ■ Wiring of MA900/901




## ■ Wiring of REX-PG410

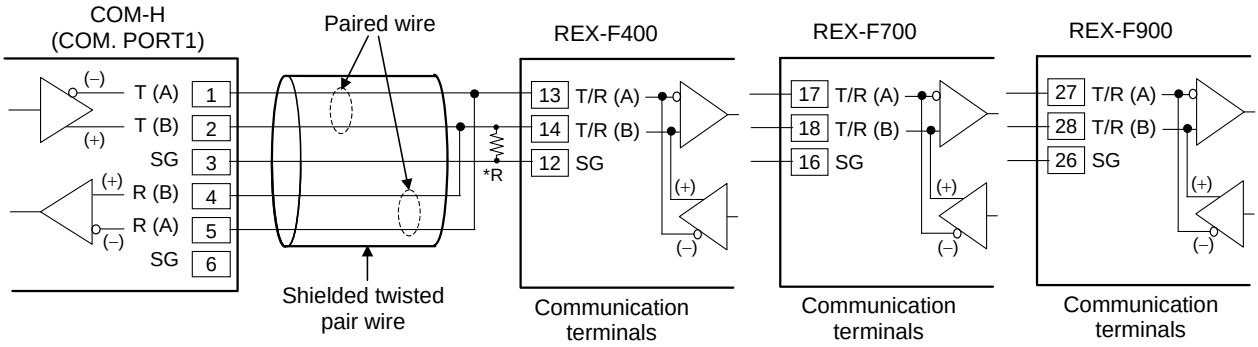



*R: Termination resistors (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

## B.2.2 Connection to the RS-485 interface of the controllers

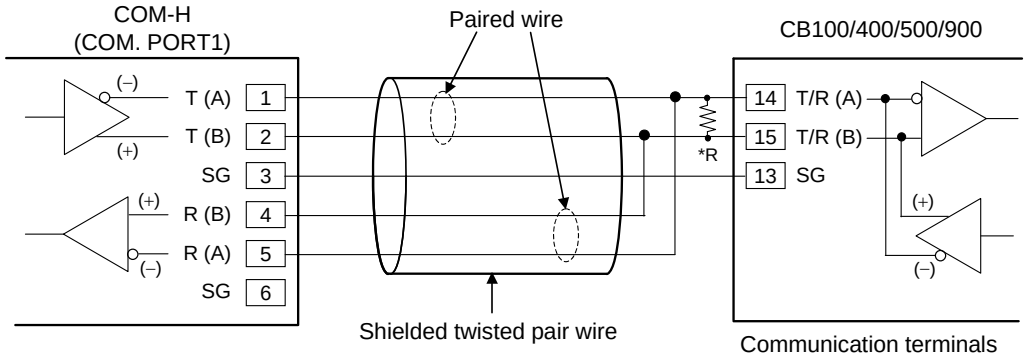
When connected to the RS-485 interface controller by using the RS-422A interface for COM-H control communication, connect T (A) and R (A) of the cable to the controller T/R (A) terminals and also T (B) and R (B) of the cable to the controller T/R (B) terminals, respectively.

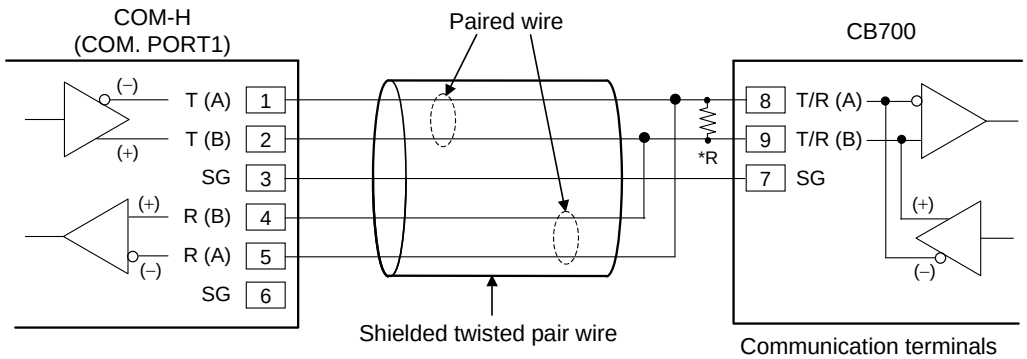
### ■ Wiring of REX-F400/700/900




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

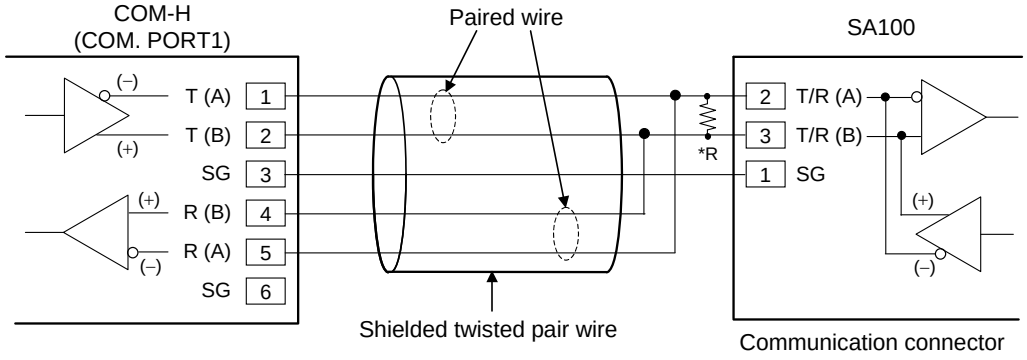
### ■ Wiring of CB100/400/500/700/900



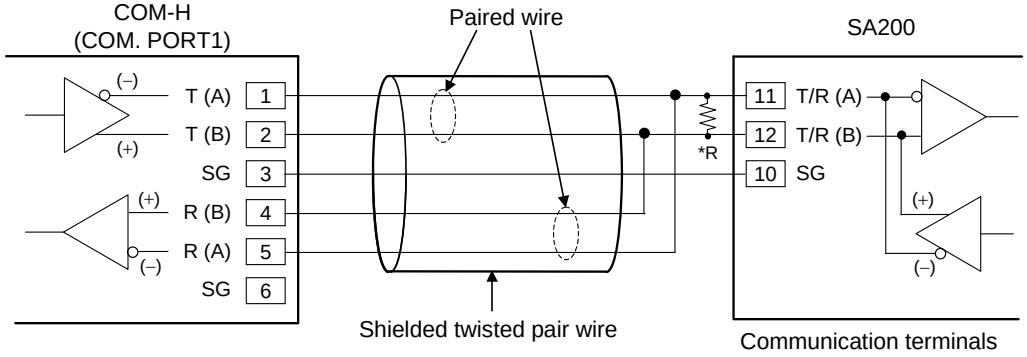

*R: Termination resistors (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

## ■ Wiring of SA100



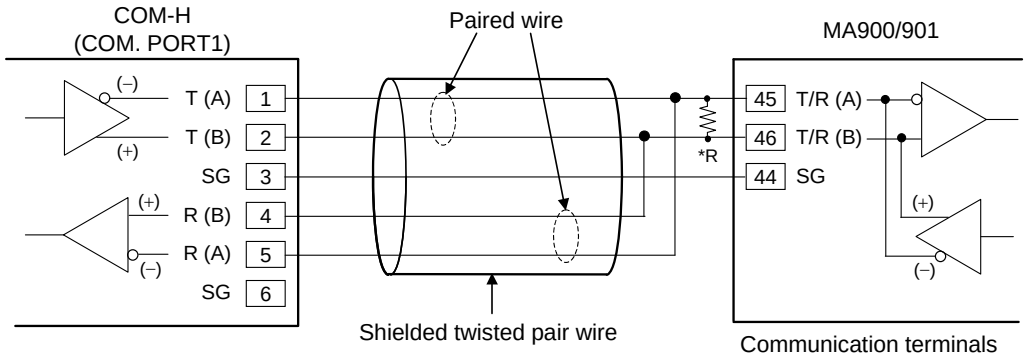

*R: Termination resistors (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

## ■ Wiring of SA200



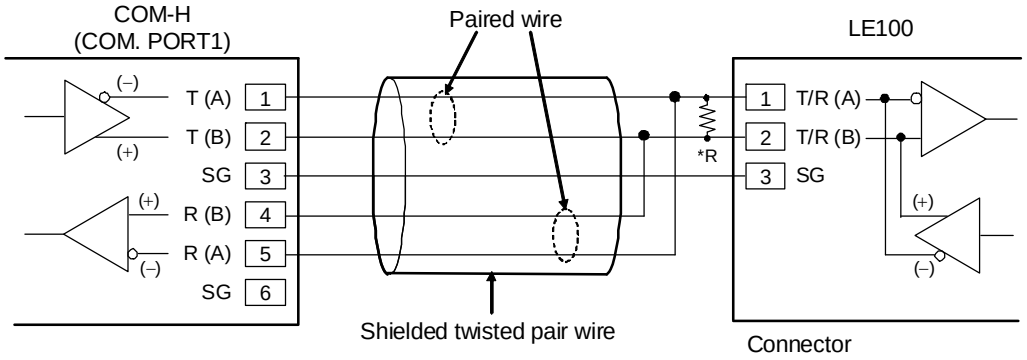

*R: Termination resistors (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

## ■ Wiring of MA900/901



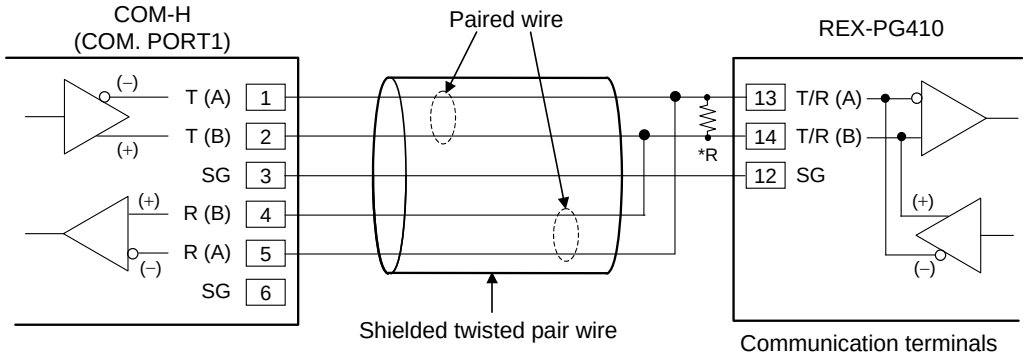

*R: Termination resistors (Example: 120 Ω 1/2 W)
If communication errors occur frequently due to the operation environment or the communication distance, connect termination resistors.

## ■ Wiring of LE100




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

## ■ Wiring of REX-PG410




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

# *MEMO*

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