Power Supply/CPU Module

H-PCP-J

PLC Communication Instruction Manual

[For LG PLC]

RKC® RKC INSTRUMENT INC. IMS01J06-E2

- Modbus is a registered trademark of Schneider Electric.
- The name of each programmable controller (PLC) means the products of each manufacturer.
- Company names and product names used in this manual are the trademarks or registered trademarks of the respective companies.

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.
- 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 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.
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CONTENTS

MEMO

1. OUTLINE

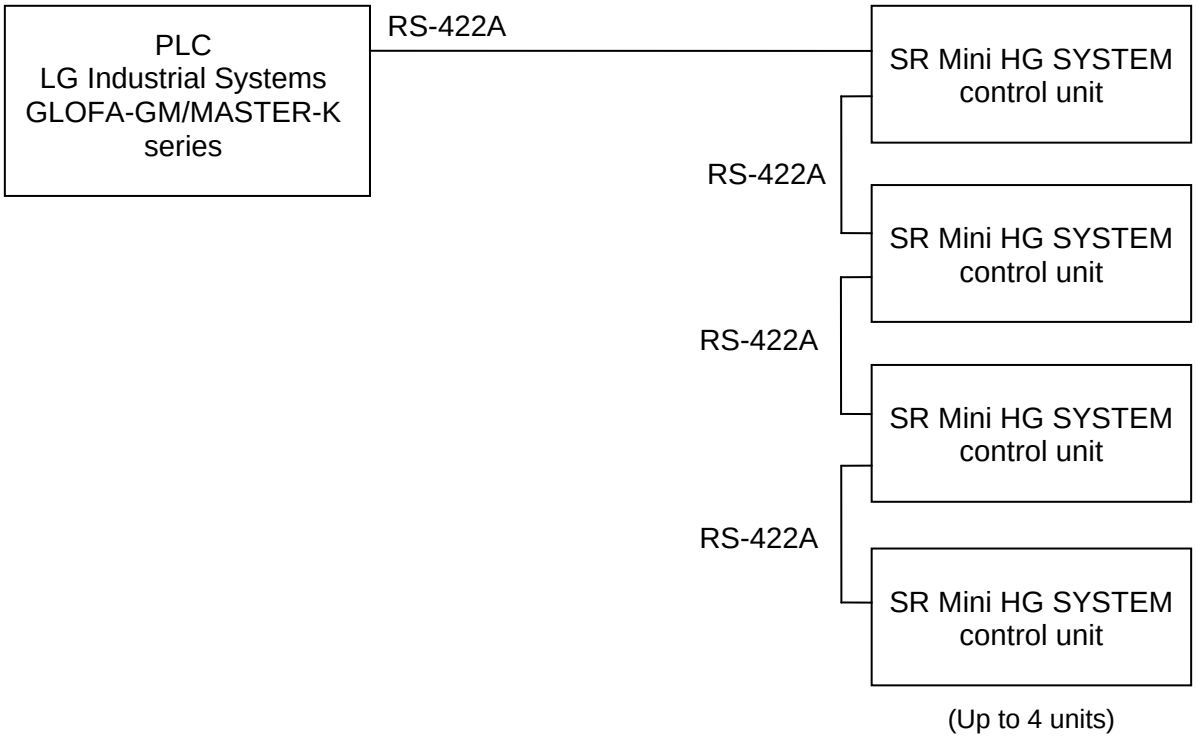
This manual describes the communication function of the SR Mini HG SYSTEM and the LG Industrial Systems programmable controller (hereafter called PLC).

📖 This manual is attached when the model code of H-PCP-J module is **H-PCP-J-□□□-D∗ □□-05E**.

☞ For details of the H-PCP-J module, see the **Power Supply/CPU Module H-PCP-J Instruction Manual (IMS01J02-E□)**.

☞ This manual should be used in conjunction with **Hardware Quick Manual (IMS01V01-E□)**.

The SR Mini HG SYSTEM can be connected to the LG Industrial Systems GLOFA-GM/MASTER-K series link unit without using any program.
The SR Mini HG SYSTEM occupies the fixed area in the PLC data memory for each unit address.
The control unit for SR Mini HG SYSTEM consists of the H-PCP-J module and temperature control function modules.



■ Usable modules (LG Industrial Systems GLOFA-GM series and MASTER-K series)

Name	Type
Cnet I/F module	G3L-CUEA (GLOFA-GM series and MASTER-K series) G4L-CUEA (GLOFA-GM series and MASTER-K series) G6L-CUEC (GLOFA-GM series and MASTER-K series) G7L-CUEC (GLOFA-GM series and MASTER-K series) etc.

■ Usable modules (SR Mini HG SYSTEM)

The following function module data can be used in PLC communication (see "Data map" on page 24). In addition, data on other modules connected (TI, AI, AO, etc.) can be used on one more communication port (RKC communication or Modbus).

Function module	Type
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
Position proportioning control module *	H-TIO-K
Speed control module *	H-SIO-A
Cascade control module *	H-CIO-A
Current transformer input module	H-CT-A (Up to 20 points/control unit are available)

* There is restriction on usable data. Only data described in **6.3 Communication Data List (P. 17)** can be used.

☞ For the function modules, see the **Hardware Quick Manual (IMS01V01-E□)** or **Hardware Instruction Manual (IMSRM15-E□)**.

2. COMMUNICATION SPECIFICATIONS

Interface:	Based on RS-422A, EIA standard
Connection method:	RS-422A: 4-wire system, multi-drop connection
Synchronous method:	Start/stop synchronous type
Communication speed:	9600 bps, 19200 bps, 38400 bps Communication speed can be selected with switch
Data bit configuration:	Start bit: 1 Data bit: 8 Parity bit: Without Stop bit: 1
Protocol:	Dedicated communication (LG Industrial Systems special protocol) Station address 00
Usable command:	WSB: Write continuous device RSB: Read continuous device
Specification mode:	MODE 1 (Dedicated)
Maximum connections:	4 control units per communication port of PLC

3. CONNECTIONS

⚠ WARNING

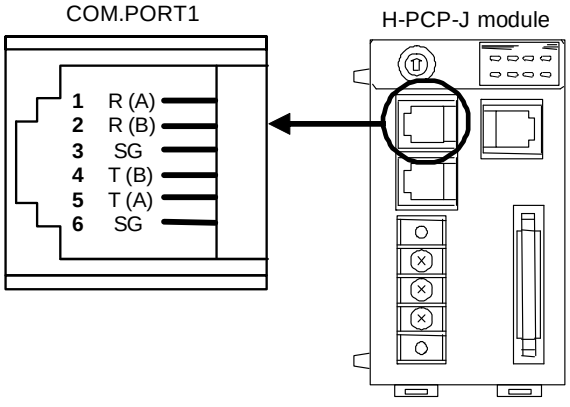
To prevent electric shock or instrument failure, turn off the power before connecting or disconnecting the instrument and peripheral equipment.

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.
- If the instrument is easily affected by noise, use the ferrite core at the both ends of the communication cable (nearest the connector).

■ RS-422A

- **Pin layout of modular connector (RS-422A)**



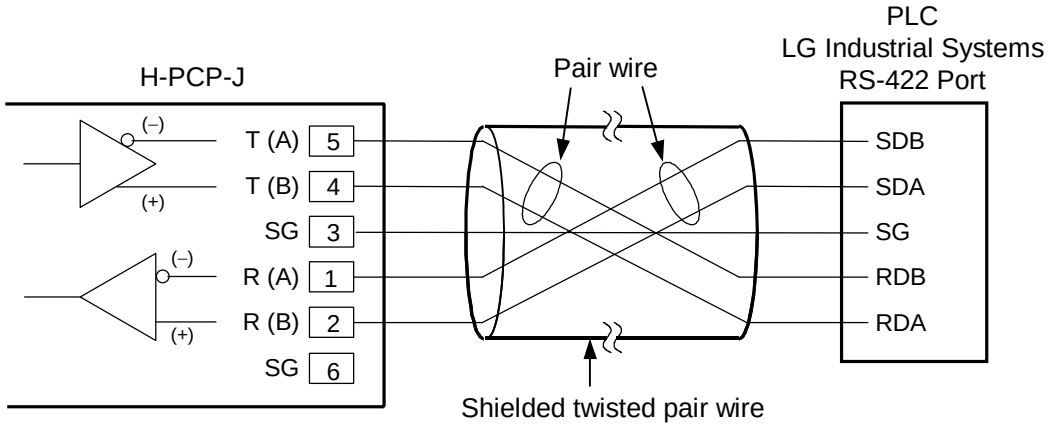
- **Connector pin number and signal details (RS-422A)**

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

● Diagram of RS-422A wiring

The signal polarity A and B may be reversed between the link unit of the LG Industrial Systems GLOFA-GM/MASTER-K series and the H-PCP-J module. Normally signal A of a certain device is connected to signal A of the other device, and so for B to B. However, in this case, signal polarity A should be connected to B and the polarity B to A.

Example: Connect the H-PCP-J module T (A) send data terminal to the RDB receive data terminal on the link module belonging to the LG Industrial Systems GLOFA-GM/MASTER-K series



📖 Connect as instructed to the below to make wiring using our connection cable W-BF-01.

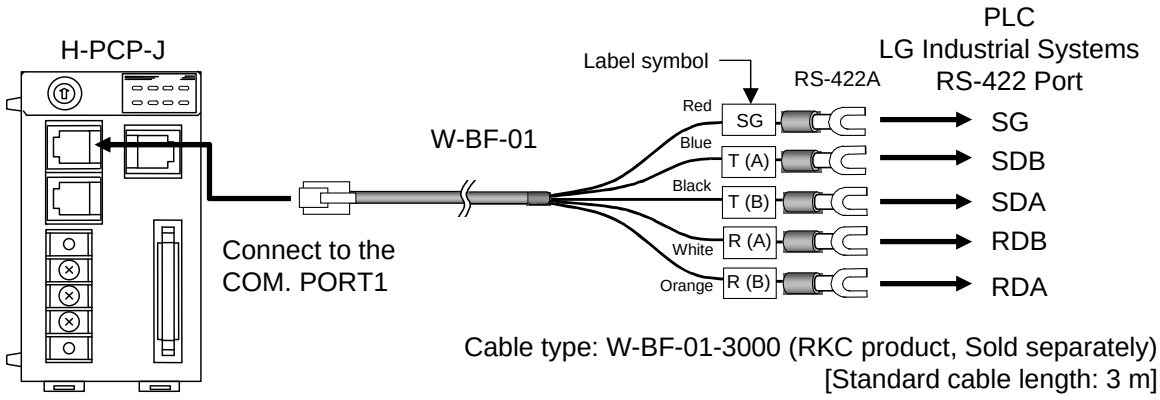
📖 The 6-pin type modular connector should be used for the connection to the H-PCP-J module. Recommended model: TM4P-66P (Manufactured by HIROSE ELECTRIC CO., LTD.,)

📖 Customer is requested to prepare a communication cable fit for the control unit to be connected by the PLC.

● Connection using our cable

Connection cable W-BF-01 * (RKC product) can be used to connect the PLC. 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 H-PCP-J connector.



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

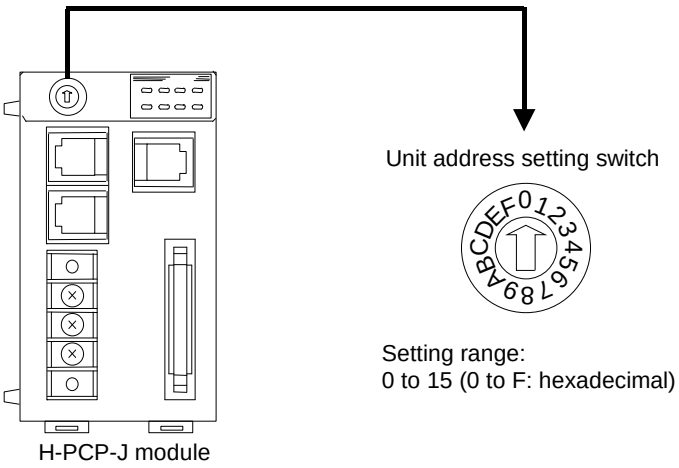
When wiring is to be made with W-BF-01 cable, connect as instructed in the above picture.
You do not need to reverse the signal polarity of A and B.
(Just use the label symbol for leadwire identification and ignore the contents.)

☞ The details of the connectable connector for the PLC please also read the instruction manual for the used PLC.

4. SETTING ON THE H-PCP-J MODULE SIDE

4.1 PLC Register Address Setting

Set the file register address of each control unit using the unit address setting switch at the front of the H-PCP-J module. For this setting, use a small blade screwdriver.



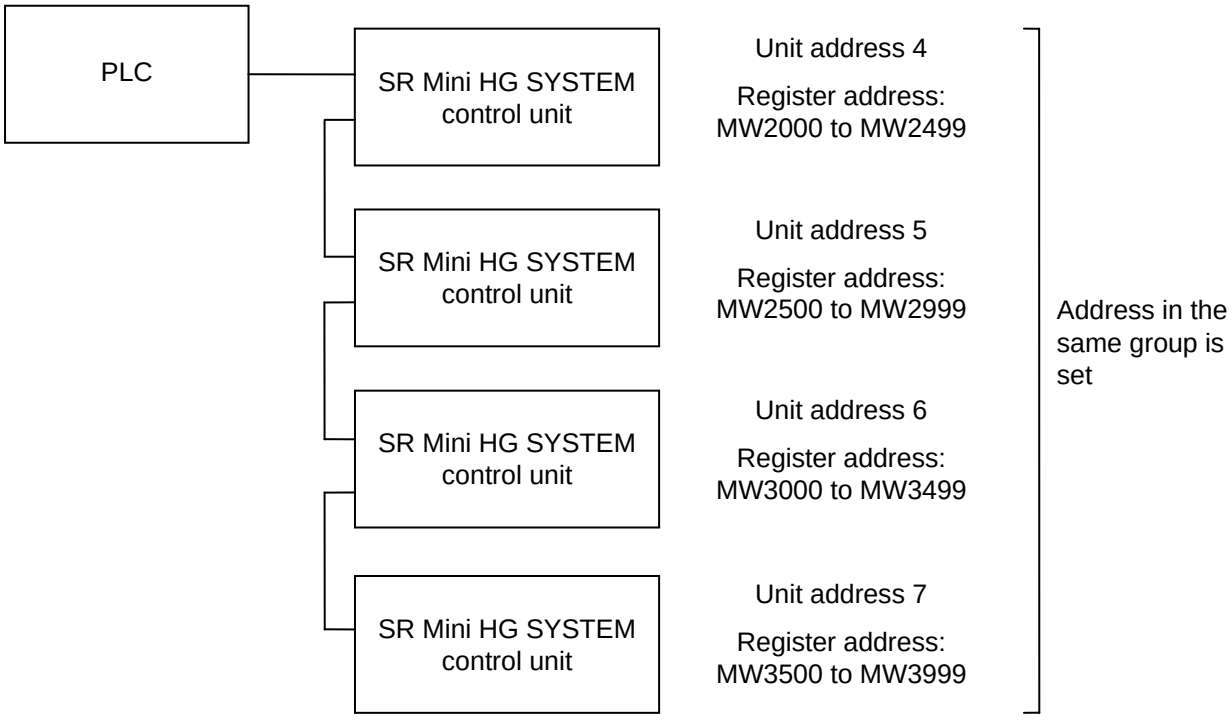
Up to 4 SR Mini HG SYSTEMs can be connected to a PLC communication port. Therefore the file register address uses the 4 SR Mini HG SYSTEMs as a group. The SR Mini HG SYSTEMs connected to the same PLC communication port sets the address in the same group.

Set unit address of each group including 0, 4, 8 and C by all means. 0, 4, 8 and C work as a master of communication transfer.

Set unit address within address range of PLC (CPU unit) to use.

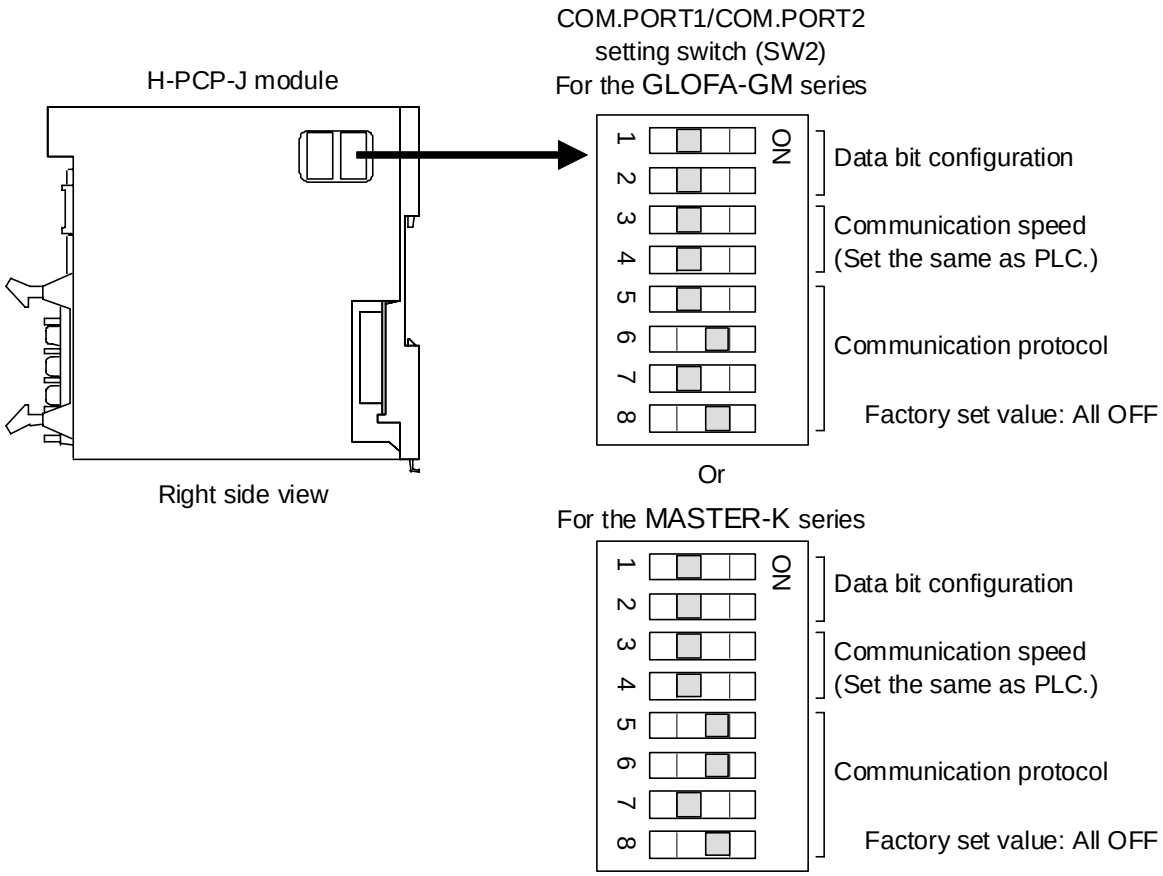
Group	Unit address setting switch	PLC register address for the GLOFA-GM series	PLC register address for the MASTER-K series
Group 1	**0**	MW0000 to MW0499	DW0000 to DW0499
	1	MW0500 to MW0999	DW0500 to DW0999
	2	MW1000 to MW1499	DW1000 to DW1499
	3	MW1500 to MW1999	DW1500 to DW1999
Group 2	**4**	MW2000 to MW2499	DW2000 to DW2499
	5	MW2500 to MW2999	DW2500 to DW2999
	6	MW3000 to MW3499	DW3000 to DW3499
	7	MW3500 to MW3999	DW3500 to DW3999
Group 3	**8**	MW4000 to MW4499	DW4000 to DW4499
	9	MW4500 to MW4999	DW4500 to DW4999
	A	MW5000 to MW5499	DW5000 to DW5499
	B	MW5500 to MW5999	DW5500 to DW5999
Group 4	**C**	MW6000 to MW6499	DW6000 to DW6499
	D	MW6500 to MW6999	DW6500 to DW6999
	E	MW7000 to MW7499	DW7000 to DW7499
	F	MW7500 to MW7999	DW7500 to DW7999

Setting example: When group 2 is used (for the GLOFA-GM series)



4.2 Protocol Selection and Communication Setting

Match the setting of data bit configuration, communication speed and communication protocol with the PLC communication specification by COM.PORT1/COM.PORT2 setting switch (SW2).
Setting example to recommend is shown in the following.



- **Data bit configuration**

SW2		Data bit configuration
1	2	
OFF	OFF	Data 8-bit, Non parity, Stop 1-bit

- **Communication speed** Set the same as PLC.

SW2		Communication speed
3	4	
OFF	OFF	9600 bps
ON	OFF	19200 bps
OFF	ON	38400 bps
ON	ON	Don't set this one

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- **Using register selection** Select register corresponding to PLC.

SW2				Using register selection
5	6	7	8	
OFF	ON	OFF	ON	M register for the LG Industrial Systems GLOFA-GM series
ON	ON	OFF	ON	D register for the LG Industrial Systems MASTER-K series

4.3 PLC Scanning Time Setting

Set the PLC scanning time (time of waiting for a response from the PLC) so as to adapt to the environment used. **The PLC scanning time is set via host communication (RKC communication or Modbus).**

PLC scanning time setting Setting range: 0 to 3000 ms (Factory set value: 10 ms)

[Setting example]
Set PLC scanning time to any value more than twice as long as the maximum scanning time of PLC.

📖 **If PLC scanning time is extremely short (When at a factory set value of 10 ms as an example), the SR Mini HG SYSTEM may detect the time-out not conducting normal communication processing.**

📖 The maximum scanning time of PLC differs depending on the CPU processing speed, I/O unit configuration and the user program capacity of the PLC.

☞ For the PLC scanning time setting (Identifier ST), see the **Power Supply/CPU Module H-PCP-J Instruction Manual (IMS01J02-E□)**.

5. SETTING ON THE PLC SIDE

Set the PLC as follows. (Recommend setting example)

Item	Description
Mode	1
Channel	RS422 side
Station	00
Type	RS422
Data bit	8
Parity bit	Without
Stop bit	1
Transmission speed	38400 bps
Termination resistor	Termination resistor is inserted

☞ The setting item varies depending on the PLC. The details of the setting procedure for the PLC please also read the instruction manual for the used PLC.

6. COMMUNICATION DATA

6.1 Request Command and Data Transfer

Data transfer between PLC and SR Mini HG SYSTEM are executed by request command.

- **Request command "0: Monitor (PLC ← SR Mini HG SYSTEM)"**
  Command which requests the SR Mini HG SYSTEM to write data such as temperature measured values, etc. (attribute: RO) to the PLC side.
  The SR Mini HG SYSTEM always repeats data writing until "1: Setting" or "2: Set value monitor" is set to the request command.
  The PCP communication status is set to "1: Writing on monitor data" during data transfer.

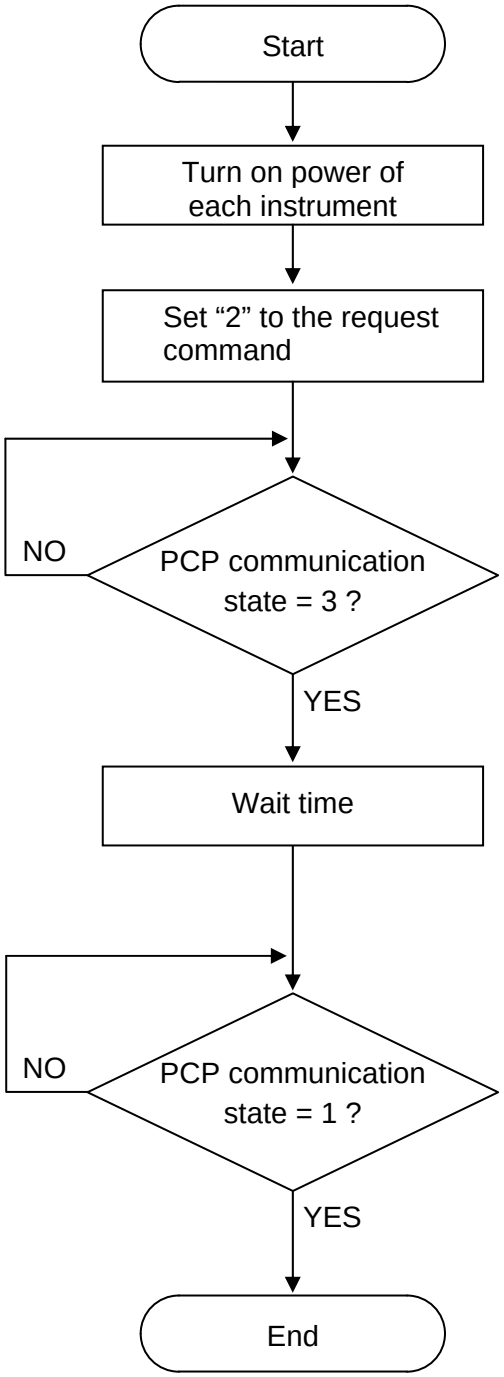
- **Request command "1: Setting (PLC → SR Mini HG SYSTEM)"**
  Command which requests the SR Mini HG SYSTEM to read data such as temperature set values, etc. (attribute: R/W or WO) from the PLC side. Just when "1: Setting" is set to the request command, the SR Mini HG SYSTEM starts reading the data from the PLC side.
  The PCP communication status is set to "2: Reading out setting data" during data transfer. After the data is transferred, the request command and PCP communication status returns to "0: Monitor" and "1: Writing on monitor data," respectively.

- **Request command "2: Set value monitor (PLC ← SR Mini HG SYSTEM)"**
  Command which requests the SR Mini HG SYSTEM to write data such as temperature set values, etc. (attribute: R/W) to the PLC side. Just when "2: Set value monitor" is set to the request command, the SR Mini HG SYSTEM starts writing the data to the PLC side.
  The PCP communication status is set to "3: Writing on setting data" during data transfer. After the data is transferred, the request command and PCP communication status returns to "0: Monitor" and "1: Writing on monitor data," respectively.

■ Data transfer procedures

Change each set value of SR Mini HG SYSTEM from the PLC after the initial settings are made.
If each set value of SR Mini HG SYSTEM is changed from the PLC without setting the initial values, it is re-written to 0 with each set value of the PLC at that time set to 0.

- **Initial Setting (When transmit data of temperature setting values from SR Mini HG SYSTEM to PLC)**



When 2 (Set value monitor) is set to request command, the SR Mini HG SYSTEM starts writing the data items such as temperature set value, etc. (attribute: R/W) to the PLC side.

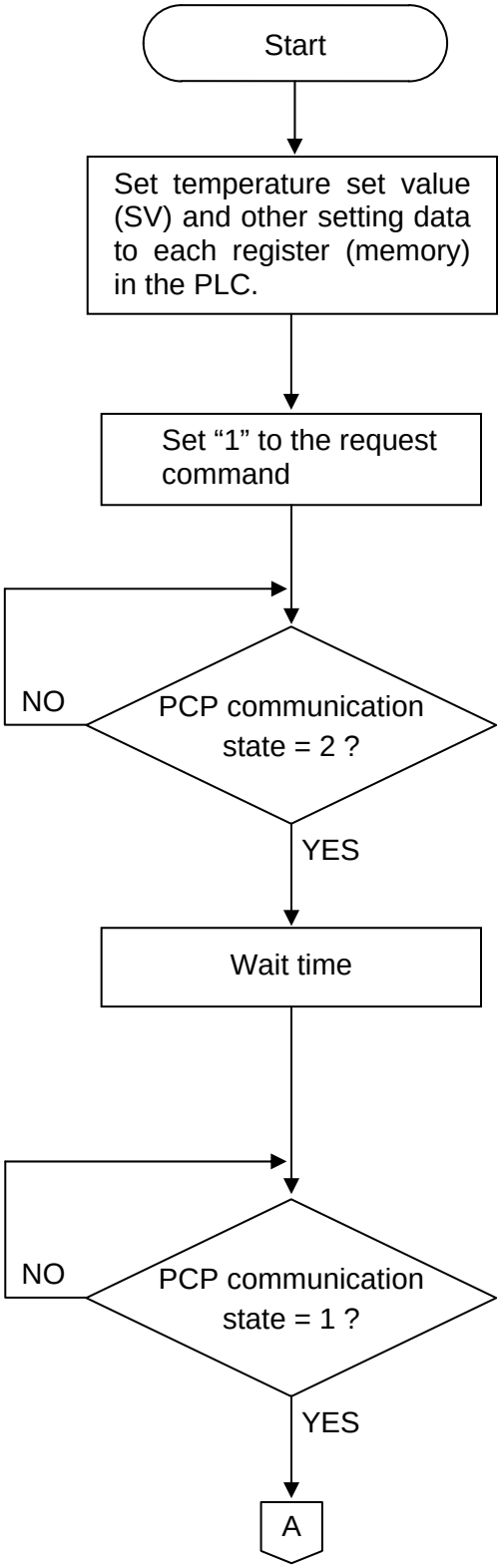
If 3 (Writing on setting data) is set to PCP communication state in the PLC, this indicates that SR Mini HG SYSTEM data items such as temperature set value, etc. (attribute: R/W) are being written into the PLC.

Reserve data write time as wait time. In addition, process data in each item as indefinite during this period.

Waiting time (for 38400 bps):
Approx. 1 second/control unit

If 1 (Writing on monitor data) is set to PCP communication state in the PLC, this indicates that SRV data items such as temperature set value, etc. (attribute: R/W) have been written to start writing SR Mini HG SYSTEM data items such as temperature measured values (PV), etc. (attribute: RO) into the PLC.

- **Data setting (When transmit data of temperature setting values from PLC to SR Mini HG SYSTEM)**



[Data setting]

When 1 (Setting) is set to request command, the SR Mini HG SYSTEM starts reading the temperature set value data set to the register (memory) on the PLC side.

If 2 (Reading out setting data) is set to PCP communication state in the PLC, this indicates that temperature set values data are being read from the PLC.

Reserve data read time as wait time. In addition, process data in each item as indefinite during this period.

Waiting time (for 38400 bps):
Approx. 2 seconds/control unit

If 1 (Writing on monitor data) is set to PCP communication state in the PLC, this indicates that temperature set value data have been read to start writing SR Mini HG SYSTEM data items such as temperature measured values (PV) etc. (attribute: RO) into the PLC.

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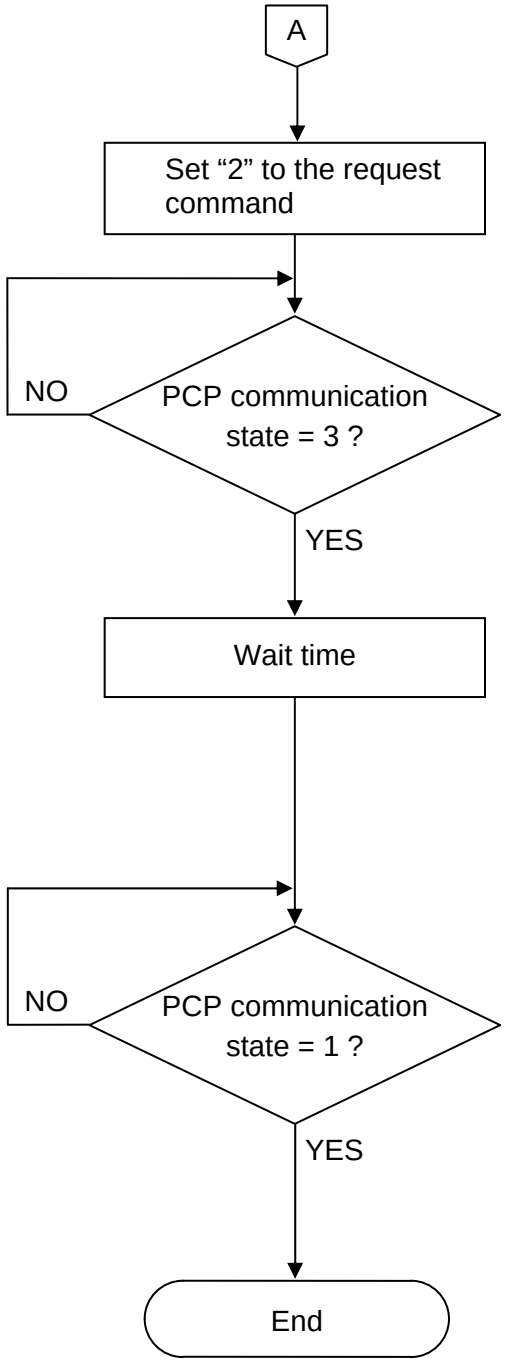

[Confirmation of setting data]

When 2 (Set value monitor) is set to request command, the SR Mini HG SYSTEM starts writing the temperature set value data set to the PLC side.

If 3 (Writing on setting data) is set to PCP communication state in the PLC, this indicates that SR Mini HG SYSTEM temperature set value data are being written into the PLC.

Reserve data write time as wait time. In addition, process data in each item as indefinite during this period.

Waiting time (for 38400 bps):
Approx. 1 second/control unit

If 1 (Writing on monitor data) is set to PCP communication state in the PLC, this indicates that temperature set values have been written to start writing SR Mini HG SYSTEM data items such as temperature measured values (PV), etc. (attribute: RO) into the PLC.

6.2 Data Processing Precautions

- With PLC communication, the maximum number of channels per unit address is 20.
- Read data of unused channel and undefined address is *0*.
- The data type is treated as binary data with a sign and without a decimal point. For this reason, carefully express and set the data. (excluding the TIO status)
  [Example] Heat-side proportional band

  Initial value of internal data: 3.0
  Communication data: 30
- If the data range error occurs during data setting, "Setting error" (bit 8 in the TIO status) is set to ON in the channel where the error occurs. The SR Mini HG SYSTEM continues operation at the present set value without updating the data.

  Any attempt to write to an unused channel is not processed as an error.
- The autotuning (AT) function starts its execution with PID/AT transfer and the request command set to "1: AT operation" and "1: Setting," respectively. After the autotuning function finishes its execution, PID/AT transfer returns to "0: PID control operation" and thus the PID constants are updated.
- When the PLC communication status is selected by selecting the H-PCP-J module DO type (Identifier VU), the digital output (DO) is turned on or off according to the status of communication between the H-PCP-J module and PLC.

Communication error	PLC communication status (H-PCP-J module DO)	Operation mode
When the communication is error after the power ON immediately	OFF	"1: Monitor"
When the communication is error during operation	OFF	Same as mode before the communication error

If communication between the H-PCP-J module and PLC is ready, the PLC communication status (H-PCP-J module DO) is turned on to enable operation to continue.

☞ The H-PCP-J module DO type selection (Identifier VU) is set by host communication. For the host communication, see the **Power Supply/CPU Module H-PCP-J Instruction Manual (IMS01J02-E□)**.

- Some communication data may become invalid depending on the module selection or the configuration of the SR Mini HG System control unit.
  If any one of the conditions listed below occurs and data items written are within the setting range, read data becomes *0*. Under these conditions, no error response message will occur.
  – When heat/cool control, manual output value and auto/manual transfer are invalid.
  – When heat control, cool-side manipulated output, cool-side proportional band and overlap/deadband are invalid.
  – When ON/OFF control, cool-side manipulated output, heat-side and cool-side proportional band, integral time, derivative time and overlap/deadband are invalid.
  – When the H-CT-A module is not provided, current transformer input measured value and heater break alarm set value are invalid.

6.3 Communication Data List

- Name
  ◆: Item stored in the memory area.
  [ ]: The functional module name that data becomes valid is written.
- Attributes
  RO: At the time of request command "0: Monitor," SR Mini HG SYSTEM writes in data. (SR Mini HG SYSTEM → PLC)
  R/W: At the time of request command "1: Setting," SR Mini HG SYSTEM read out data. At the time of request command "2: Set value monitor," SR Mini HG SYSTEM writes in data. (SR Mini HG SYSTEM ↔ PLC)
  WO: At the time of request command "1: Setting," SR Mini HG SYSTEM read out data. (SR Mini HG SYSTEM ← PLC)
- Structure
  C: Data for each channel U: Data for each unit address

Name	Attribute	Structure	Data range	Factory set value
Temperature set value (SV) ◆ [H-TIO-□, H-CIO-A]	R/W	C	TC/RTD input: Within input range (Within setting limiter) Current/voltage input: Within display scale range (Within setting limiter)	0 The position of the decimal point differs depending on the input range.
Motor speed set value ◆ [H-SIO-A]			Within display scale range (Within setting limiter)	
Alarm 1 set value ◆ [H-TIO-□, H-CIO-A, H-SIO-A]	R/W	C	TC/RTD input: Within input range or span range Current/voltage input, H-SIO-A: Within display scale range or span range	See Factory set value table of Alarm 1/ Alarm 2 set value *
Alarm 2 set value ◆ [H-TIO-□, H-CIO-A, H-SIO-A]	R/W	C		

* Factory set value table of Alarm 1/Alarm 2 set value

Input type	Alarm type	Alarm 1 set value	Alarm 2 set value
TC/RTD input	Process high alarm	Input range (high limit)	Input range (high limit)
	Process low alarm	Input range (low limit)	Input range (low limit)
	Deviation high alarm, Deviation high/low alarm, Band alarm	50 °C [1]	50 °C [1]
	Deviation low alarm	–50 °C [1]	–50 °C [1]
	No alarm function	Input range (high limit)	Input range (low limit)
Current/voltage input H-SIO-A	Process high alarm	100 (100.0) %	100 (100.0) %
	Process low alarm	0 (0.0) %	0 (0.0) %
	Deviation high alarm, Deviation high/low alarm, Band alarm	50 (50.0) %	50 (50.0) %
	Deviation low alarm	–50 (–50.0) %	–50 (–50.0) %
	No alarm function	100 (100.0) %	100 (100.0) %

[1] The position of the decimal point differs depending on the input range.

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Name	Attri-bute	Struc-ture	Data range	Factory set value
Heater break alarm set value [H-CT-A]	R/W	C	0.0 to 100.0 A or 0.0 to 30.0 A For the current transformer (CT) input of the H-CT-A module. Allocates the channels for H-TIO-☐ module to the input channels of H-CT-A module by CT channel setting. For the CT channel setting, see the **Power Supply/CPU Module H-PCP-J Instruction Manual (IMS01J02-E☐)**.	0.0
Operation mode transfer [H-TIO-☐, H-CIO-A, H-SIO-A]	R/W	C	0: Unused If set to "Unused," no control, monitor or alarm monitor is performed. 1: Monitor If set to "Monitor," only the monitor is performed. No control or alarm monitor is performed. 2: Alarm If set to "Alarm," monitor or alarm monitor is performed. No control is performed. 3: Normal Selected to normal mode to perform control, monitor or alarm monitor.	3
Auto/Manual transfer [H-TIO-☐, H-CIO-A]	R/W	C	0: Auto 1: Manual Setting will be invalid in ON/OFF control and heat/cool control.	0
Manual output value [H-TIO-☐, H-CIO-A]	R/W	C	−5.0 to +105.0 % Setting will be invalid in ON/OFF control and heat/cool control.	0.0
Overlap/deadband ◆ [H-TIO-☐, H-CIO-A]	R/W	C	−10.0 to +10.0 % of span	0.0
Heat-side proportional band ◆ [H-TIO-☐, H-CIO-A, H-SIO-A]	R/W	C	0.1 to 1000.0 % of span	H-TIO-☐, H-CIO-A: 3.0 H-SIO-A: 300.0
Cool-side proportional band ◆ [H-TIO-☐, H-CIO-A]	R/W	C	0.1 to 1000.0 % of span	3.0

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Name	Attri-bute	Struc-ture	Data range	Factory set value
Integral time ◆ [H-TIO-□, H-CIO-A, H-SIO-A]	R/W	C	1 to 3600 seconds	H-TIO-□, H-CIO-A: 240 H-SIO-A: 2
Derivative time ◆ [H-TIO-□, H-CIO-A, H-SIO-A]	R/W	C	0 to 3600 seconds (0: PI action)	H-TIO-□, H-CIO-A: 60 H-SIO-A: 0
PID/AT transfer * [H-TIO-□, H-CIO-A, H-SIO-A]	R/W	C	0: PID control operation 1: AT (Autotuning) operation The autotuning (AT) function starts its execution with PID/AT transfer and the request command set to "1: AT operation" and "1: Setting," respectively. After the autotuning function finishes its execution, PID/AT transfer returns to "0: PID control operation."	0

* Autotuning (AT) is the function which automatically measures, calculates and sets the optimum PID constants according to the set temperature.

Caution for using the Autotuning (AT)
When a temperature change (UP and/or Down) is 1C or less per minute during Autotuning, Autotuning may be cancelled before calculating PID values. In that case, adjust the PID values manually. It is possible to happen when the set value is around the ambient temperature or is close to the maximum temperature achieved by the load.

The following is the conditions necessary to carry out autotuning and the conditions which will cause the autotuning to stop.

Conditions necessary for autotuning:

The autotuning should be executed after satisfying all of the following conditions:

- Operation mode conditions:
  – Auto/Manual transfer → Auto mode
  – PID/AT transfer → PID control mode
  – Control RUN/STOP transfer → Control RUN mode
- The measured value (PV) is without input error range [Input error determination point (high) > Measured value (PV) > Input error determination point (low)].
- The output limiter high limit should be more than 0.1 % and the output limiter low limit should be less than 99.9 %.
- When operation mode is set to "Normal (Can be controlled)."

When the autotuning is finished, the display of each channel automatically returns to "0: PID control operation."

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Conditions which will cause the autotuning to stop:

- When the temperature set value (SV) is changed.
- When the memory area is changed.
- When the PV bias value is changed.
- When the AT bias value is changed.
- When transfer to Manual mode using the Auto/Manual transfer.
- When the measured value (PV) goes to input error range [Measured value (PV) ≥ Input error determination point (high) or Input error determination point (low) ≥ Measured value (PV)].
- When the power is cut off.
- When FAIL occurs in the module whose channel is under the autotuning. Otherwise, when FAIL occurs in the H-PCP-J module.
- When transfer to the PID control mode by the PID/AT transfer.
- When operation mode is set to “Unused,” “Monitor” or “Alarm.”
- When the Control RUN/STOP function is changed to the “Control STOP” function.

When the above-mentioned conditions to stop the autotuning occurs, the autotuning is immediately stopped and switch over to the PID control mode. The PID constants return to the values at the start of the autotuning.

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Name	Attri-bute	Struc-ture	Data range	Factory set value
Temperature measured value (PV) [H-TIO-☐, H-CIO-A]	RO	C	TC/RTD input: Within input range Current/voltage input: Within display scale range	—
Motor speed measured value [H-SIO-A]			Within display scale range	—
Heat-side manipulated output value [H-TIO-☐, H-CIO-A]	RO	C	−0.5 to +105.0 %	—
Cool-side manipulated output value [H-TIO-☐, H-CIO-A]	RO	C	−0.5 to +105.0 %	—
Current transformer input measured value [H-CT-A]	RO	C	0.0 to 100.0 A or 0.0 to 30.0 A Current transformer (CT) input measured value of the H-CT-A module. Allocates the channels for H-TIO-☐ module to the input channels of H-CT-A module by CT channel setting. For the CT channel setting, see the **Power Supply/CPU Module H-PCP-J Instruction Manual (IMS01J02-E☐)**.	—
TIO status [H-TIO-☐, H-CIO-A, H-SIO-A]	RO	C	Each operation status is assigned as a bit image in binary numbers. Bit data bit 0: Heat-side manipulated output status bit 1: Unused bit 2: Alarm 1 status bit 3: Alarm 2 status bit 4: Burnout status bit 5: Heater break alarm status bit 6: Control loop break alarm (LBA) status bit 7: Temperature rise completion status bit 8: Setting error bit 9 to 15: Unused Data 0: OFF 1: ON bit 15 ····· bit 0 Bit image: 0000000000000000 [Decimal number: 0 to 509]	—
Set value monitor [H-TIO-☐, H-CIO-A, H-SIO-A]	RO	C	TC/RTD input: Within input range Current/voltage input, H-SIO-A: Within display scale range	—

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Name	Attri-bute	Struc-ture	Data range	Factory set value
Request command [H-PCP-J]	R/W	U	0: Monitor Command which requests the SR Mini HG SYSTEM to write data such as temperature measured values, etc. (attribute: RO) to the PLC side. The SR Mini HG SYSTEM always repeats data writing until "1: Setting" or "2: Set value monitor" is set to the request command. The PCP communication status is set to "1: Writing on monitor data" during data transfer. 1: Setting Command which requests the SR Mini HG SYSTEM to read data such as temperature set values, etc. (attribute: R/W or WO) from the PLC side. Just when "1: Setting" is set to the request command, the SR Mini HG SYSTEM starts reading the data from the PLC side. The PCP communication status is set to "2: Reading out setting data" during data transfer. After the data is transferred, the request command and PCP communication status returns to "0: Monitor" and "1: Writing on monitor data," respectively. 2: Set value monitor Command which requests the SR Mini HG SYSTEM to write data such as temperature set values, etc. (attribute: R/W) to the PLC side. Just when "2: Set value monitor" is set to the request command, the SR Mini HG SYSTEM starts writing the data to the PLC side. The PCP communication status is set to "3: Writing on setting data" during data transfer. After the data is transferred, the request command and PCP communication status returns to "0: Monitor" and "1: Writing on monitor data," respectively.	0
PCP communication status [H-PCP-J]	RO	U	1: Writing on monitor data During monitor data of attribute RO is written to PLC 2: Reading out setting data During setting data of attribute R/W or WO is read from PLC 3: Writing on setting data During setting data of attribute R/W is written to PLC	—

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Name	Attri-bute	Struc-ture	Data range	Factory set value
PCP normal communication flag [H-PCP-J]	RO	U	The numbers 0 and then 1 are repeated in every communication period. The SR Mini HG SYSTEM rewrites 0 and 1 in this area alternately like 0 → 1 → 0 in every communication period. It is possible to determine whether or not the SR Mini HG SYSTEM makes communication by monitoring this area periodically using the PLC program.	—
Memory area number [H-TIO-☐, H-CIO-A, H-SIO-A]	WO	U	1 to 8 Data reading is always made from the PLC regardless of the request command. Any numeric value other than 1 to 8 becomes invalid. Changing the memory area automatically writes each set value to the PLC.	—
Control RUN/STOP transfer * [H-PCP-J]	WO	U	0: Control STOP 1: Control RUN	—
PV bias [H-TIO-☐, H-CIO-A, H-SIO-A]	R/W	C	–5.00 to +5.00 % of span ZK-1103 specification: –Input span to +Input span	0.00 ZK-1103: 0 [a]
Setting change rate limiter ◆ [H-TIO-☐, H-CIO-A, H-SIO-A]	R/W	C	0.0 to 100.0 % of span/minute	0.0

* **When the control RUN/STOP holding setting is set to "Not hold" or "Hold":**

The control RUN/STOP transfer setting is always read from the PLC regardless of the request command. Any numeric value other than *0* and *1* becomes invalid.

When the control RUN/STOP holding setting is set to "Start-up from control RUN status":

As the control RUN/STOP transfer setting is always set to "1: Control RUN," any value set to the control RUN/STOP transfer becomes invalid.

☞ The Control RUN/STOP holding (Identifier X1) is set by host communication. For the host communication, see the **Power Supply/CPU Module H-PCP-J Instruction Manual (IMS01J02-E☐)**.

[a] Unit (°C, °F, etc.) and decimal point position (No decimal place, One decimal place, Two decimal places or Three decimal places) depends on input range type.

7. DATA MAP

7.1 Reference to Data Map

This data map summarizes the data (M register and D register) addresses, channels and names that can be used with PLC. For details on each data range, see the **6.3 Communication Data List (P. 17)**.

(b)

(a) Unit address 0	Unit address 1	Unit address 2	Unit address 3	Name
(c) MW0000 to MW0019	MW0500 to MW0519	MW1000 to MW1019	MW1500 to MW1519	Temperature set value (SV) CH1 to CH20
MW0020 to MW0039	MW0520 to MW0539	MW1020 to MW1039	MW1520 to MW1539	Alarm 1 set value CH1 to CH20

(a) Unit address: Unit address of SR Mini HG SYSTEM

(b) Name: Data names

(c) Address: Data (M register and D register) addresses
Register address is expressed in decimal number
M register: GLOFA-GM series
D register: MASTER-K series

7.2 Data Map List

7.2.1 GLOFA-GM series

■ Unit address 0 to 3 (Group 1)

Unit address 0	Unit address 1	Unit address 2	Unit address 3	Name
MW0000 to MW0019	MW0500 to MW0519	MW1000 to MW1019	MW1500 to MW1519	Temperature set value (SV) CH1 to CH20
MW0020 to MW0039	MW0520 to MW0539	MW1020 to MW1039	MW1520 to MW1539	Alarm 1 set value CH1 to CH20
MW0040 to MW0059	MW0540 to MW0559	MW1040 to MW1059	MW1540 to MW1559	Alarm 2 set value CH1 to CH20
MW0060 to MW0079	MW0560 to MW0579	MW1060 to MW1079	MW1560 to MW1579	Heater break alarm set value (H-CT-A module) CH1 to CH20
MW0080 to MW0099	MW0580 to MW0599	MW1080 to MW1099	MW1580 to MW1599	Operation mode transfer CH1 to CH20
MW0100 to MW0119	MW0600 to MW0619	MW1100 to MW1119	MW1600 to MW1619	Auto/Manual transfer CH1 to CH20
MW0120 to MW0139	MW0620 to MW0639	MW1120 to MW1139	MW1620 to MW1639	Manual output value CH1 to CH20
MW0140 to MW0159	MW0640 to MW0659	MW1140 to MW1159	MW1640 to MW1659	Overlap/deadband CH1 to CH20
MW0160 to MW0179	MW0660 to MW0679	MW1160 to MW1179	MW1660 to MW1679	Heat-side proportional band CH1 to CH20
MW0180 to MW0199	MW0680 to MW0699	MW1180 to MW1199	MW1680 to MW1699	Cool-side proportional band CH1 to CH20
MW0200 to MW0219	MW0700 to MW0719	MW1200 to MW1219	MW1700 to MW1719	Integral time CH1 to CH20
MW0220 to MW0239	MW0720 to MW0739	MW1220 to MW1239	MW1720 to MW1739	Derivative time CH1 to CH20
MW0240 to MW0259	MW0740 to MW0759	MW1240 to MW1259	MW1740 to MW1759	PID/AT transfer CH1 to CH20
MW0260 to MW0279	MW0760 to MW0779	MW1260 to MW1279	MW1760 to MW1779	Temperature measured value (PV) CH1 to CH20
MW0280 to MW0299	MW0780 to MW0799	MW1280 to MW1299	MW1780 to MW1799	Heat-side manipulated output value CH1 to CH20
MW0300 to MW0319	MW0800 to MW0819	MW1300 to MW1319	MW1800 to MW1819	Cool-side manipulated output value CH1 to CH20
MW0320 to MW0339	MW0820 to MW0839	MW1320 to MW1339	MW1820 to MW1839	Current transformer input measured value (H-CT-A module) CH1 to CH20
MW0340 to MW0359	MW0840 to MW0859	MW1340 to MW1359	MW1840 to MW1859	TIO status CH1 to CH20
MW0360 to MW0379	MW0860 to MW0879	MW1360 to MW1379	MW1860 to MW1879	Set value monitor CH1 to CH20
MW0380	MW0880	MW1380	MW1880	Request command
MW0381	MW0881	MW1381	MW1881	PCP communication status

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Unit address 0	Unit address 1	Unit address 2	Unit address 3	Name	
MW0382	MW0882	MW1382	MW1882	PCP normal communication flag	
MW0383 to MW0389	MW0883 to MW0889	MW1383 to MW1389	MW1883 to MW1889	Do not use this address range	
MW0390	MW0890	MW1390	MW1890	Memory area number	
MW0391	MW0891	MW1391	MW1891	Control RUN/STOP transfer	
MW0392 to MW0399	MW0892 to MW0899	MW1392 to MW1399	MW1892 to MW1899	Do not use this address range	
MW0400 to MW0419	MW0900 to MW0919	MW1400 to MW1419	MW1900 to MW1919	PV bias	CH1 to CH20
MW0420 to MW0439	MW0920 to MW0939	MW1420 to MW1439	MW1920 to MW1939	Setting change rate limiter	CH1 to CH20
MW0440 to MW0499	MW0940 to MW0999	MW1440 to MW1499	MW1940 to MW1999	Do not use this address range	

■ Unit address 4 to 7 (Group 2)

Unit address 4	Unit address 5	Unit address 6	Unit address 7	Name	
MW2000 to MW2019	MW2500 to MW2519	MW3000 to MW3019	MW3500 to MW3519	Temperature set value (SV)	CH1 to CH20
MW2020 to MW2039	MW2520 to MW2539	MW3020 to MW3039	MW3520 to MW3539	Alarm 1 set value	CH1 to CH20
MW2040 to MW2059	MW2540 to MW2559	MW3040 to MW3059	MW3540 to MW3559	Alarm 2 set value	CH1 to CH20
MW2060 to MW2079	MW2560 to MW2579	MW3060 to MW3079	MW3560 to MW3579	Heater break alarm set value (H-CT-A module)	CH1 to CH20
MW2080 to MW2099	MW2580 to MW2599	MW3080 to MW3099	MW3580 to MW3599	Operation mode transfer	CH1 to CH20
MW2100 to MW2119	MW2600 to MW2619	MW3100 to MW3119	MW3600 to MW3619	Auto/Manual transfer	CH1 to CH20
MW2120 to MW2139	MW2620 to MW2639	MW3120 to MW3139	MW3620 to MW3639	Manual output value	CH1 to CH20
MW2140 to MW2159	MW2640 to MW2659	MW3140 to MW3159	MW3640 to MW3659	Overlap/deadband	CH1 to CH20
MW2160 to MW2179	MW2660 to MW2679	MW3160 to MW3179	MW3660 to MW3679	Heat-side proportional band	CH1 to CH20
MW2180 to MW2199	MW2680 to MW2699	MW3180 to MW3199	MW3680 to MW3699	Cool-side proportional band	CH1 to CH20
MW2200 to MW2219	MW2700 to MW2719	MW3200 to MW3219	MW3700 to MW3719	Integral time	CH1 to CH20

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Unit address 4	Unit address 5	Unit address 6	Unit address 7	Name
MW2220 to MW2239	MW2720 to MW2739	MW3220 to MW3239	MW3720 to MW3739	Derivative time CH1 to CH20
MW2240 to MW2259	MW2740 to MW2759	MW3240 to MW3259	MW3740 to MW3759	PID/AT transfer CH1 to CH20
MW2260 to MW2279	MW2760 to MW2779	MW3260 to MW34279	MW3760 to MW3779	Temperature measured value (PV) CH1 to CH20
MW2280 to MW2299	MW2780 to MW2799	MW3280 to MW3299	MW3780 to MW3799	Heat-side manipulated output value CH1 to CH20
MW2300 to MW2319	MW2800 to MW2819	MW3300 to MW3319	MW3800 to MW3819	Cool-side manipulated output value CH1 to CH20
MW2320 to MW2339	MW2820 to MW2839	MW3320 to MW3339	MW3820 to MW3839	Current transformer input measured value (H-CT-A module) CH1 to CH20
MW2340 to MW2359	MW2840 to MW2859	MW3340 to MW3359	MW3840 to MW3859	TIO status CH1 to CH20
MW2360 to MW2379	MW2860 to MW2879	MW3360 to MW3379	MW3860 to MW3879	Set value monitor CH1 to CH20
MW2380	MW2880	MW3380	MW3880	Request command
MW2381	MW2881	MW3381	MW3881	PCP communication status
MW2382	MW2882	MW3382	MW3882	PCP normal communication flag
MW2383 to MW2389	MW2883 to MW2889	MW3383 to MW3389	MW3883 to MW3889	Do not use this address range
MW2390	MW2890	MW3390	MW3890	Memory area number
MW2391	MW2891	MW3391	MW3891	Control RUN/STOP transfer
MW2392 to MW2399	MW2892 to MW2899	MW3392 to MW3399	MW3892 to MW3899	Do not use this address range
MW2400 to MW2419	MW2900 to MW2919	MW3400 to MW3419	MW3900 to MW3919	PV bias CH1 to CH20
MW2420 to MW2439	MW2920 to MW2939	MW3420 to MW3439	MW3920 to MW3939	Setting change rate limiter CH1 to CH20
MW2440 to MW2499	MW2940 to MW2999	MW3440 to MW3499	MW3940 to MW3999	Do not use this address range

■ Unit address 8 to B (Group 3)

Unit address 8	Unit address 9	Unit address A	Unit address B	Name	
MW4000 to MW4019	MW4500 to MW4519	MW5000 to MW5019	MW5500 to MW5519	Temperature set value (SV)	CH1 to CH20
MW4020 to MW4039	MW4520 to MW4539	MW5020 to MW5039	MW5520 to MW5539	Alarm 1 set value	CH1 to CH20
MW4040 to MW4059	MW4540 to MW4559	MW5040 to MW5059	MW5540 to MW5559	Alarm 2 set value	CH1 to CH20
MW4060 to MW4079	MW4560 to MW4579	MW5060 to MW5079	MW5560 to MW5579	Heater break alarm set value (H-CT-A module)	CH1 to CH20
MW4080 to MW4099	MW4580 to MW4599	MW5080 to MW5099	MW5580 to MW5599	Operation mode transfer	CH1 to CH20
MW4100 to MW4119	MW4600 to MW4619	MW5100 to MW5119	MW5600 to MW5619	Auto/Manual transfer	CH1 to CH20
MW4120 to MW4139	MW4620 to MW4639	MW5120 to MW5139	MW5620 to MW5639	Manual output value	CH1 to CH20
MW4140 to MW4159	MW4640 to MW4659	MW5140 to MW5159	MW5640 to MW5659	Overlap/deadband	CH1 to CH20
MW4160 to MW4179	MW4660 to MW4679	MW5160 to MW5179	MW5660 to MW5679	Heat-side proportional band	CH1 to CH20
MW4180 to MW4199	MW4680 to MW4699	MW5180 to MW5199	MW5680 to MW5699	Cool-side proportional band	CH1 to CH20
MW4200 to MW4219	MW4700 to MW4719	MW5200 to MW5219	MW5700 to MW5719	Integral time	CH1 to CH20
MW4220 to MW4239	MW4720 to MW4739	MW5220 to MW5239	MW5720 to MW5739	Derivative time	CH1 to CH20
MW4240 to MW4259	MW4740 to MW4759	MW5240 to MW5259	MW5740 to MW5759	PID/AT transfer	CH1 to CH20
MW4260 to MW4279	MW4760 to MW4779	MW5260 to MW5279	MW5760 to MW5779	Temperature measured value (PV)	CH1 to CH20
MW4280 to MW4299	MW4780 to MW4799	MW5280 to MW5299	MW5780 to MW5799	Heat-side manipulated output value	CH1 to CH20
MW4300 to MW4319	MW4800 to MW4819	MW5300 to MW5319	MW5800 to MW5819	Cool-side manipulated output value	CH1 to CH20
MW4320 to MW4339	MW4820 to MW4839	MW5320 to MW5339	MW5820 to MW5839	Current transformer input measured value (H-CT-A module)	CH1 to CH20
MW4340 to MW4359	MW4840 to MW4859	MW5340 to MW5359	MW5840 to MW5859	TIO status	CH1 to CH20
MW4360 to MW4379	MW4860 to MW4879	MW5360 to MW5379	MW5860 to MW5879	Set value monitor	CH1 to CH20
MW4380	MW4880	MW5380	MW5880	Request command	
MW4381	MW4881	MW5381	MW5881	PCP communication status	
MW4382	MW4882	MW5382	MW5882	PCP normal communication flag	
MW4383 to MW4389	MW4883 to MW4889	MW5383 to MW5389	MW5883 to MW5889	Do not use this address range	

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Unit address 8	Unit address 9	Unit address A	Unit address B	Name	
MW4390	MW4890	MW5390	MW5890	Memory area number	
MW4391	MW4891	MW5391	MW5891	Control RUN/STOP transfer	
MW4392 to MW4399	MW4892 to MW4899	MW5392 to MW5399	MW5892 to MW5899	Do not use this address range	
MW4400 to MW4419	MW4900 to MW4919	MW5400 to MW5419	MW5900 to MW5919	PV bias	CH1 to CH20
MW4420 to MW4439	MW4920 to MW4939	MW5420 to MW5439	MW5920 to MW5939	Setting change rate limiter	CH1 to CH20
MW4440 to MW4499	MW4940 to MW4999	MW5440 to MW5499	MW5940 to MW5999	Do not use this address range	

■ Unit address C to F (Group 4)

Unit address C	Unit address D	Unit address E	Unit address F	Name	
MW6000 to MW6019	MW6500 to MW6519	MW7000 to MW7019	MW7500 to MW7519	Temperature set value (SV)	CH1 to CH20
MW6020 to MW6039	MW6520 to MW6539	MW7020 to MW7039	MW7520 to MW7539	Alarm 1 set value	CH1 to CH20
MW6040 to MW6059	MW6540 to MW6559	MW7040 to MW7059	MW7540 to MW7559	Alarm 2 set value	CH1 to CH20
MW6060 to MW6079	MW6560 to MW6579	MW7060 to MW7079	MW7560 to MW7579	Heater break alarm set value (H-CT-A module)	CH1 to CH20
MW6080 to MW6099	MW6580 to MW6599	MW7080 to MW7099	MW7580 to MW7599	Operation mode transfer	CH1 to CH20
MW6100 to MW6119	MW6600 to MW6619	MW7100 to MW7119	MW7600 to MW7619	Auto/Manual transfer	CH1 to CH20
MW6120 to MW6139	MW6620 to MW6639	MW7120 to MW7139	MW7620 to MW7639	Manual output value	CH1 to CH20
MW6140 to MW6159	MW6640 to MW6659	MW7140 to MW7159	MW7640 to MW7659	Overlap/deadband	CH1 to CH20
MW6160 to MW6179	MW6660 to MW6679	MW7160 to MW7179	MW7660 to MW7679	Heat-side proportional band	CH1 to CH20
MW6180 to MW6199	MW6680 to MW6699	MW7180 to MW7199	MW7680 to MW7699	Cool-side proportional band	CH1 to CH20
MW6200 to MW6219	MW6700 to MW6719	MW7200 to MW7219	MW7700 to MW7719	Integral time	CH1 to CH20
MW6220 to MW6239	MW6720 to MW6739	MW7220 to MW7239	MW7720 to MW7739	Derivative time	CH1 to CH20
MW6240 to MW6259	MW6740 to MW6759	MW7240 to MW7259	MW7740 to MW7759	PID/AT transfer	CH1 to CH20

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Unit address C	Unit address D	Unit address E	Unit address F	Name
MW6260 to MW6279	MW6760 to MW6779	MW7260 to MW7279	MW7760 to MW7779	Temperature measured value (PV) CH1 to CH20
MW6280 to MW6299	MW6780 to MW6799	MW7280 to MW7299	MW7780 to MW7799	Heat-side manipulated output value CH1 to CH20
MW6300 to MW6319	MW6800 to MW6819	MW7300 to MW7319	MW7800 to MW7819	Cool-side manipulated output value CH1 to CH20
MW6320 to MW6339	MW6820 to MW6839	MW7320 to MW7339	MW7820 to MW7839	Current transformer input measured value (H-CT-A module) CH1 to CH20
MW6340 to MW6359	MW6840 to MW6859	MW7340 to MW7359	MW7840 to MW7859	TIO status CH1 to CH20
MW6360 to MW6379	MW6860 to MW6879	MW7360 to MW7379	MW7860 to MW7879	Set value monitor CH1 to CH20
MW6380	MW6880	MW7380	MW7880	Request command
MW6381	MW6881	MW7381	MW7881	PCP communication status
MW6382	MW6882	MW7382	MW7882	PCP normal communication flag
MW6383 to MW6389	MW6883 to MW6889	MW7383 to MW7389	MW7883 to MW7889	Do not use this address range
MW6390	MW6890	MW7390	MW7890	Memory area number
MW6391	MW6891	MW7391	MW7891	Control RUN/STOP transfer
MW6392 to MW6399	MW6892 to MW6899	MW7392 to MW7399	MW7892 to MW7899	Do not use this address range
MW6400 to MW6419	MW6900 to MW6919	MW7400 to MW7419	MW7900 to MW7919	PV bias CH1 to CH20
MW6420 to MW6439	MW6920 to MW6939	MW7420 to MW7439	MW7920 to MW7939	Setting change rate limiter CH1 to CH20
MW6440 to MW6499	MW6940 to MW6999	MW7440 to MW7499	MW7940 to MW7999	Do not use this address range

7.2.2 MASTER-K series

■ Unit address 0 to 3 (Group 1)

Unit address 0	Unit address 1	Unit address 2	Unit address 3	Name
DW0000 to DW0019	DW0500 to DW0519	DW1000 to DW1019	DW1500 to DW1519	Temperature set value (SV) CH1 to CH20
DW0020 to DW0039	DW0520 to DW0539	DW1020 to DW1039	DW1520 to DW1539	Alarm 1 set value CH1 to CH20
DW0040 to DW0059	DW0540 to DW0559	DW1040 to DW1059	DW1540 to DW1559	Alarm 2 set value CH1 to CH20
DW0060 to DW0079	DW0560 to DW0579	DW1060 to DW1079	DW1560 to DW1579	Heater break alarm set value (H-CT-A module) CH1 to CH20
DW0080 to DW0099	DW0580 to DW0599	DW1080 to DW1099	DW1580 to DW1599	Operation mode transfer CH1 to CH20
DW0100 to DW0119	DW0600 to DW0619	DW1100 to DW1119	DW1600 to DW1619	Auto/Manual transfer CH1 to CH20
DW0120 to DW0139	DW0620 to DW0639	DW1120 to DW1139	DW1620 to DW1639	Manual output value CH1 to CH20
DW0140 to DW0159	DW0640 to DW0659	DW1140 to DW1159	DW1640 to DW1659	Overlap/deadband CH1 to CH20
DW0160 to DW0179	DW0660 to DW0679	DW1160 to DW1179	DW1660 to DW1679	Heat-side proportional band CH1 to CH20
DW0180 to DW0199	DW0680 to DW0699	DW1180 to DW1199	DW1680 to DW1699	Cool-side proportional band CH1 to CH20
DW0200 to DW0219	DW0700 to DW0719	DW1200 to DW1219	DW1700 to DW1719	Integral time CH1 to CH20
DW0220 to DW0239	DW0720 to DW0739	DW1220 to DW1239	DW1720 to DW1739	Derivative time CH1 to CH20
DW0240 to DW0259	DW0740 to DW0759	DW1240 to DW1259	DW1740 to DW1759	PID/AT transfer CH1 to CH20
DW0260 to DW0279	DW0760 to DW0779	DW1260 to DW1279	DW1760 to DW1779	Temperature measured value (PV) CH1 to CH20
DW0280 to DW0299	DW0780 to DW0799	DW1280 to DW1299	DW1780 to DW1799	Heat-side manipulated output value CH1 to CH20
DW0300 to DW0319	DW0800 to DW0819	DW1300 to DW1319	DW1800 to DW1819	Cool-side manipulated output value CH1 to CH20
DW0320 to DW0339	DW0820 to DW0839	DW1320 to DW1339	DW1820 to DW1839	Current transformer input measured value (H-CT-A module) CH1 to CH20
DW0340 to DW0359	DW0840 to DW0859	DW1340 to DW1359	DW1840 to DW1859	TIO status CH1 to CH20
DW0360 to DW0379	DW0860 to DW0879	DW1360 to DW1379	DW1860 to DW1879	Set value monitor CH1 to CH20
DW0380	DW0880	DW1380	DW1880	Request command
DW0381	DW0881	DW1381	DW1881	PCP communication status
DW0382	DW0882	DW1382	DW1882	PCP normal communication flag
DW0383 to DW0389	DW0883 to DW0889	DW1383 to DW1389	DW1883 to DW1889	Do not use this address range

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Unit address 0	Unit address 1	Unit address 2	Unit address 3	Name	
DW0390	DW0890	DW1390	DW1890	Memory area number	
DW0391	DW0891	DW1391	DW1891	Control RUN/STOP transfer	
DW0392 to DW0399	DW0892 to DW0899	DW1392 to DW1399	DW1892 to DW1899	Do not use this address range	
DW0400 to DW0419	DW0900 to DW0919	DW1400 to DW1419	DW1900 to DW1919	PV bias	CH1 to CH20
DW0420 to DW0439	DW0920 to DW0939	DW1420 to DW1439	DW1920 to DW1939	Setting change rate limiter	CH1 to CH20
DW0440 to DW0499	DW0940 to DW0999	DW1440 to DW1499	DW1940 to DW1999	Do not use this address range	

■ Unit address 4 to 7 (Group 2)

Unit address 4	Unit address 5	Unit address 6	Unit address 7	Name	
DW2000 to DW2019	DW2500 to DW2519	DW3000 to DW3019	DW3500 to DW3519	Temperature set value (SV)	CH1 to CH20
DW2020 to DW2039	DW2520 to DW2539	DW3020 to DW3039	DW3520 to DW3539	Alarm 1 set value	CH1 to CH20
DW2040 to DW2059	DW2540 to DW2559	DW3040 to DW3059	DW3540 to DW3559	Alarm 2 set value	CH1 to CH20
DW2060 to DW2079	DW2560 to DW2579	DW3060 to DW3079	DW3560 to DW3579	Heater break alarm set value (H-CT-A module)	CH1 to CH20
DW2080 to DW2099	DW2580 to DW2599	DW3080 to DW3099	DW3580 to DW3599	Operation mode transfer	CH1 to CH20
DW2100 to DW2119	DW2600 to DW2619	DW3100 to DW3119	DW3600 to DW3619	Auto/Manual transfer	CH1 to CH20
DW2120 to DW2139	DW2620 to DW2639	DW3120 to DW3139	DW3620 to DW3639	Manual output value	CH1 to CH20
DW2140 to DW2159	DW2640 to DW2659	DW3140 to DW3159	DW3640 to DW3659	Overlap/deadband	CH1 to CH20
DW2160 to DW2179	DW2660 to DW2679	DW3160 to DW3179	DW3660 to DW3679	Heat-side proportional band	CH1 to CH20
DW2180 to DW2199	DW2680 to DW2699	DW3180 to DW3199	DW3680 to DW3699	Cool-side proportional band	CH1 to CH20
DW2200 to DW2219	DW2700 to DW2719	DW3200 to DW3219	DW3700 to DW3719	Integral time	CH1 to CH20
DW2220 to DW2239	DW2720 to DW2739	DW3220 to DW3239	DW3720 to DW3739	Derivative time	CH1 to CH20
DW2240 to DW2259	DW2740 to DW2759	DW3240 to DW3259	DW3740 to DW3759	PID/AT transfer	CH1 to CH20

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Unit address 4	Unit address 5	Unit address 6	Unit address 7	Name
DW2260 to DW2279	DW2760 to DW2779	DW3260 to DW34279	DW3760 to DW3779	Temperature measured value (PV) CH1 to CH20
DW2280 to DW2299	DW2780 to DW2799	DW3280 to DW3299	DW3780 to DW3799	Heat-side manipulated output value CH1 to CH20
DW2300 to DW2319	DW2800 to DW2819	DW3300 to DW3319	DW3800 to DW3819	Cool-side manipulated output value CH1 to CH20
DW2320 to DW2339	DW2820 to DW2839	DW3320 to DW3339	DW3820 to DW3839	Current transformer input measured value (H-CT-A module) CH1 to CH20
DW2340 to DW2359	DW2840 to DW2859	DW3340 to DW3359	DW3840 to DW3859	TIO status CH1 to CH20
DW2360 to DW2379	DW2860 to DW2879	DW3360 to DW3379	DW3860 to DW3879	Set value monitor CH1 to CH20
DW2380	DW2880	DW3380	DW3880	Request command
DW2381	DW2881	DW3381	DW3881	PCP communication status
DW2382	DW2882	DW3382	DW3882	PCP normal communication flag
DW2383 to DW2389	DW2883 to DW2889	DW3383 to DW3389	DW3883 to DW3889	Do not use this address range
DW2390	DW2890	DW3390	DW3890	Memory area number
DW2391	DW2891	DW3391	DW3891	Control RUN/STOP transfer
DW2392 to DW2399	DW2892 to DW2899	DW3392 to DW3399	DW3892 to DW3899	Do not use this address range
DW2400 to DW2419	DW2900 to DW2919	DW3400 to DW3419	DW3900 to DW3919	PV bias CH1 to CH20
DW2420 to DW2439	DW2920 to DW2939	DW3420 to DW3439	DW3920 to DW3939	Setting change rate limiter CH1 to CH20
DW2440 to DW2499	DW2940 to DW2999	DW3440 to DW3499	DW3940 to DW3999	Do not use this address range

■ Unit address 8 to B (Group 3)

Unit address 8	Unit address 9	Unit address A	Unit address B	Name
DW4000 to DW4019	DW4500 to DW4519	DW5000 to DW5019	DW5500 to DW5519	Temperature set value (SV) CH1 to CH20
DW4020 to DW4039	DW4520 to DW4539	DW5020 to DW5039	DW5520 to DW5539	Alarm 1 set value CH1 to CH20
DW4040 to DW4059	DW4540 to DW4559	DW5040 to DW5059	DW5540 to DW5559	Alarm 2 set value CH1 to CH20
DW4060 to DW4079	DW4560 to DW4579	DW5060 to DW5079	DW5560 to DW5579	Heater break alarm set value (H-CT-A module) CH1 to CH20
DW4080 to DW4099	DW4580 to DW4599	DW5080 to DW5099	DW5580 to DW5599	Operation mode transfer CH1 to CH20
DW4100 to DW4119	DW4600 to DW4619	DW5100 to DW5119	DW5600 to DW5619	Auto/Manual transfer CH1 to CH20
DW4120 to DW4139	DW4620 to DW4639	DW5120 to DW5139	DW5620 to DW5639	Manual output value CH1 to CH20
DW4140 to DW4159	DW4640 to DW4659	DW5140 to DW5159	DW5640 to DW5659	Overlap/deadband CH1 to CH20
DW4160 to DW4179	DW4660 to DW4679	DW5160 to DW5179	DW5660 to DW5679	Heat-side proportional band CH1 to CH20
DW4180 to DW4199	DW4680 to DW4699	DW5180 to DW5199	DW5680 to DW5699	Cool-side proportional band CH1 to CH20
DW4200 to DW4219	DW4700 to DW4719	DW5200 to DW5219	DW5700 to DW5719	Integral time CH1 to CH20
DW4220 to DW4239	DW4720 to DW4739	DW5220 to DW5239	DW5720 to DW5739	Derivative time CH1 to CH20
DW4240 to DW4259	DW4740 to DW4759	DW5240 to DW5259	DW5740 to DW5759	PID/AT transfer CH1 to CH20
DW4260 to DW4279	DW4760 to DW4779	DW5260 to DW5279	DW5760 to DW5779	Temperature measured value (PV) CH1 to CH20
DW4280 to DW4299	DW4780 to DW4799	DW5280 to DW5299	DW5780 to DW5799	Heat-side manipulated output value CH1 to CH20
DW4300 to DW4319	DW4800 to DW4819	DW5300 to DW5319	DW5800 to DW5819	Cool-side manipulated output value CH1 to CH20
DW4320 to DW4339	DW4820 to DW4839	DW5320 to DW5339	DW5820 to DW5839	Current transformer input measured value (H-CT-A module) CH1 to CH20
DW4340 to DW4359	DW4840 to DW4859	DW5340 to DW5359	DW5840 to DW5859	TIO status CH1 to CH20
DW4360 to DW4379	DW4860 to DW4879	DW5360 to DW5379	DW5860 to DW5879	Set value monitor CH1 to CH20
DW4380	DW4880	DW5380	DW5880	Request command
DW4381	DW4881	DW5381	DW5881	PCP communication status
DW4382	DW4882	DW5382	DW5882	PCP normal communication flag
DW4383 to DW4389	DW4883 to DW4889	DW5383 to DW5389	DW5883 to DW5889	Do not use this address range

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Unit address 8	Unit address 9	Unit address A	Unit address B	Name	
DW4390	DW4890	DW5390	DW5890	Memory area number	
DW4391	DW4891	DW5391	DW5891	Control RUN/STOP transfer	
DW4392 to DW4399	DW4892 to DW4899	DW5392 to DW5399	DW5892 to DW5899	Do not use this address range	
DW4400 to DW4419	DW4900 to DW4919	DW5400 to DW5419	DW5900 to DW5919	PV bias	CH1 to CH20
DW4420 to DW4439	DW4920 to DW4939	DW5420 to DW5439	DW5920 to DW5939	Setting change rate limiter	CH1 to CH20
DW4440 to DW4499	DW4940 to DW4999	DW5440 to DW5499	DW5940 to DW5999	Do not use this address range	

■ Unit address C to F (Group 4)

Unit address C	Unit address D	Unit address E	Unit address F	Name	
DW6000 to DW6019	DW6500 to DW6519	DW7000 to DW7019	DW7500 to DW7519	Temperature set value (SV)	CH1 to CH20
DW6020 to DW6039	DW6520 to DW6539	DW7020 to DW7039	DW7520 to DW7539	Alarm 1 set value	CH1 to CH20
DW6040 to DW6059	DW6540 to DW6559	DW7040 to DW7059	DW7540 to DW7559	Alarm 2 set value	CH1 to CH20
DW6060 to DW6079	DW6560 to DW6579	DW7060 to DW7079	DW7560 to DW7579	Heater break alarm set value (H-CT-A module)	CH1 to CH20
DW6080 to DW6099	DW6580 to DW6599	DW7080 to DW7099	DW7580 to DW7599	Operation mode transfer	CH1 to CH20
DW6100 to DW6119	DW6600 to DW6619	DW7100 to DW7119	DW7600 to DW7619	Auto/Manual transfer	CH1 to CH20
DW6120 to DW6139	DW6620 to DW6639	DW7120 to DW7139	DW7620 to DW7639	Manual output value	CH1 to CH20
DW6140 to DW6159	DW6640 to DW6659	DW7140 to DW7159	DW7640 to DW7659	Overlap/deadband	CH1 to CH20
DW6160 to DW6179	DW6660 to DW6679	DW7160 to DW7179	DW7660 to DW7679	Heat-side proportional band	CH1 to CH20
DW6180 to DW6199	DW6680 to DW6699	DW7180 to DW7199	DW7680 to DW7699	Cool-side proportional band	CH1 to CH20
DW6200 to DW6219	DW6700 to DW6719	DW7200 to DW7219	DW7700 to DW7719	Integral time	CH1 to CH20
DW6220 to DW6239	DW6720 to DW6739	DW7220 to DW7239	DW7720 to DW7739	Derivative time	CH1 to CH20
DW6240 to DW6259	DW6740 to DW6759	DW7240 to DW7259	DW7740 to DW7759	PID/AT transfer	CH1 to CH20

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Unit address C	Unit address D	Unit address E	Unit address F	Name
DW6260 to DW6279	DW6760 to DW6779	DW7260 to DW7279	DW7760 to DW7779	Temperature measured value (PV) CH1 to CH20
DW6280 to DW6299	DW6780 to DW6799	DW7280 to DW7299	DW7780 to DW7799	Heat-side manipulated output value CH1 to CH20
DW6300 to DW6319	DW6800 to DW6819	DW7300 to DW7319	DW7800 to DW7819	Cool-side manipulated output value CH1 to CH20
DW6320 to DW6339	DW6820 to DW6839	DW7320 to DW7339	DW7820 to DW7839	Current transformer input measured value (H-CT-A module) CH1 to CH20
DW6340 to DW6359	DW6840 to DW6859	DW7340 to DW7359	DW7840 to DW7859	TIO status CH1 to CH20
DW6360 to DW6379	DW6860 to DW6879	DW7360 to DW7379	DW7860 to DW7879	Set value monitor CH1 to CH20
DW6380	DW6880	DW7380	DW7880	Request command
DW6381	DW6881	DW7381	DW7881	PCP communication status
DW6382	DW6882	DW7382	DW7882	PCP normal communication flag
DW6383 to DW6389	DW6883 to DW6889	DW7383 to DW7389	DW7883 to DW7889	Do not use this address range
DW6390	DW6890	DW7390	DW7890	Memory area number
DW6391	DW6891	DW7391	DW7891	Control RUN/STOP transfer
DW6392 to DW6399	DW6892 to DW6899	DW7392 to DW7399	DW7892 to DW7899	Do not use this address range
DW6400 to DW6419	DW6900 to DW6919	DW7400 to DW7419	DW7900 to DW7919	PV bias CH1 to CH20
DW6420 to DW6439	DW6920 to DW6939	DW7420 to DW7439	DW7920 to DW7939	Setting change rate limiter CH1 to CH20
DW6440 to DW6499	DW6940 to DW6999	DW7440 to DW7499	DW7940 to DW7999	Do not use this address range

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