Compact setting display unit

OP10 Operation Manual

IMS01W02-E1

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 this manual in a convenient location for easy reference.

This manual describes the operation only. For the mounting, wiring, parts description and specifications, see OP10 Installation Manual (IMS01W01-E☐). For the controller connected to the OP10, refer to the instruction manual for the respective controller.

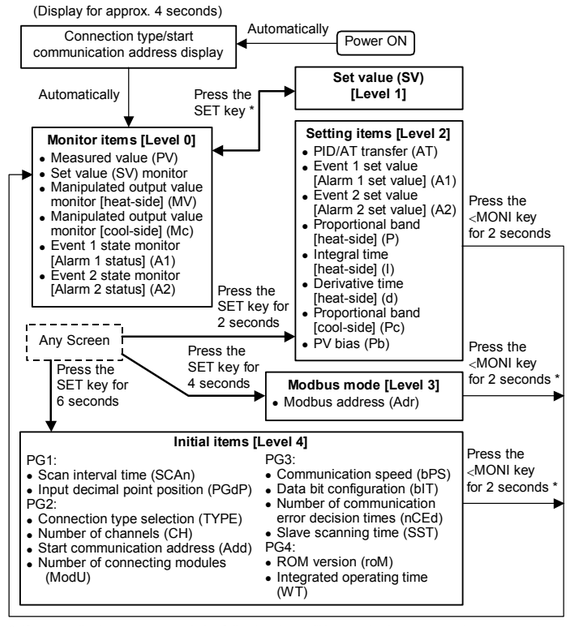
The controller manuals can be downloaded from our website:
URL: http://www.rkcinst.com/english/manual_load.htm

1. HANDLING PROCEDURES

- Mounting and wiring — • See OP10 Installation Manual (IMS01W01-E☐)
- Setting on the controller side — • See the instruction manual of controller
- Setting of initial items — See **3. SETTING OF INITIAL ITEMS**
- Connecting with controller — • See OP10 Installation Manual (IMS01W01-E☐)
- Operation (Setting/monitor) — See **2. CALLING UP PROCEDURE OF EACH LEVEL**, See **4. BASIC OPERATION**, See **5. PARAMETER LIST**, See **6. SETTING OF MODBUS MODE**

2. CALLING UP PROCEDURE OF EACH LEVEL

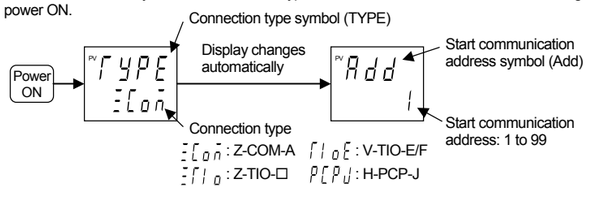
The OP10 has five different levels and all parameters belong to one of them. The following chart show how to access different levels.



* If a controller is not connected, the following time will be required to return to the measured value (PV).
(Communication error decision times + 1) × slave scanning time

● Connection type and start communication address display

The OP10 immediately confirms connection type and start communication address following power ON.



3. SETTING OF INITIAL ITEMS

The initial items [Level 4] settings must be made to perform communication with controller.

3.1 Initial Items Setting Method

1. Check the address and communication protocol on the controller side.

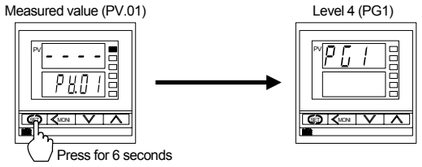
The communication protocol of the OP10 is Modbus. The factory setting for the communication protocol may be RKC on some controllers. In this case, be sure to change the setting to Modbus.

Set the addresses setting switch of controller in order from "0" without skipping any numbers. If a number is skipped, "communication error" will occur. In addition to avoid problems or malfunction, do not duplicate an address on the same communication line.

For the controller settings, see the instruction manual for the respective controller.

2. Turn on the power to the OP10.

3. To go to level 4 [Initial items], press and hold the SET key for 6 seconds at "PV.01."

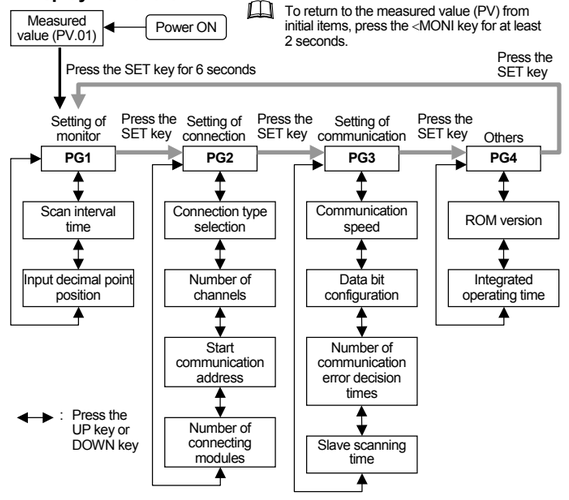


4. Referring to the following **3.2 Initial Items [Level 4] Parameters** set the initial items.

For the data setting procedure, see the ■ **Changing data settings** on the next page.

3.2 Initial Items [Level 4] Parameters

■ Display flowchart

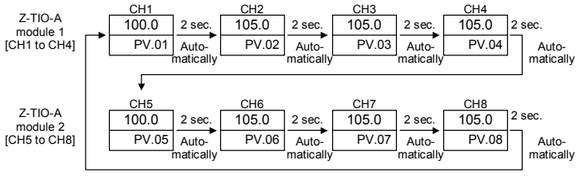


■ Parameter list

● PG1: Setting of monitor

Symbol	Name	Data range	Description	Factory set value
SCAn (SCAn)	Scan interval time *	0 to 60 seconds (0: No function)	Use to set the time until changed to the next screen automatically.	0
PGdP (PGdP)	Input decimal point position	0: No decimal place 1: One decimal place 2: Two decimal places 3: Three decimal places	Use to select the decimal point position of the displayed value.	1

* When a scan interval time is set, the level 0 (monitor item) screen changes automatically each time the set interval elapses.
Example: Measured value (PV) when two Z-TIO-A modules are connected.
Scan interval time: 2 seconds



● PG2: Setting of connection

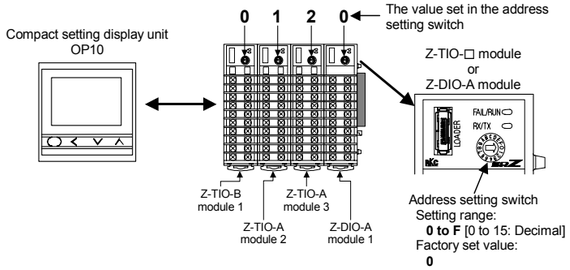
Symbol	Name	Data range	Description	Factory set value
TYPE (TYPE)	Connection type selection	ZCoM: Z-COM-A (SRZ) ZTIo: Z-TIO-☐ (SRZ) TIoE: V-TIO-E/F (SRV) PCPJ: H-PCP-J (SR Mini HG SYSTEM)	Use to set the type of controller (module) connected to the OP10. Pressing the UP or DOWN key enables type selection.	Depends on model code
CH (CH)	Number of channels * (per module)	1 to 99 CH Z-TIO-☐: Number of channels per module Z-COM-A, V-TIO-E/F, H-PCP-J: Number of channels per unit	Use to set the number of channels displayed on the OP10. Set at the factory to the optimum value for the connected model.	Z-COM-A: 64 Z-TIO-☐: 4 V-TIO-E/F: 62 H-PCP-J: 20
Add (Add)	Start communication address	1 to 99 The value (decimal) set in the address setting switch (rotary switch) of controller + 1 Example: If 2 is set in the controller address setting switch, set 3.	Controller address for initial start of communication.	1
ModU (ModU)	Number of connecting modules *	1 to 31 modules Z-TIO-☐: Number of Z-TIO-☐ modules, not including Z-DIO-A module. Z-COM-A, V-TIO-E/F, H-PCP-J: Number of Z-COM-A, V-TIO-E/F, and H-PCP-J modules (number of units), not including function modules.	Use to set the number of modules connected to the OP10.	1

* Number of modules and channels when Z-TIO-☐ modules are connected

When Z-DIO-A modules are connected to Z-TIO-☐ modules, do not include the Z-DIO-A modules in the number of connected modules.

Even if 4-channel type and 2-channel type Z-TIO-☐ modules are mixed together, use 4 channels for the number of channels connected per module.

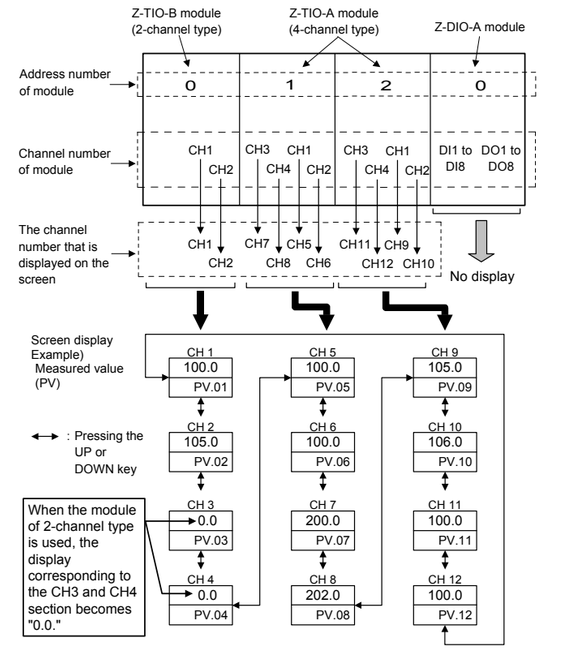
Example: Connection configuration below
Z-TIO-A module (4-channel type): 2 modules
Z-TIO-B module (2-channel type): 1 module
Z-DIO-A module: 1 module



PG2 connection settings are shown below.

Parameter	Set value
Connection type selection	ZTIo: Z-TIO-☐ (SRZ)
Number of channels	4 (per module)
Start communication address	1
Number of connecting modules	3 (number of modules excluding Z-DIO-A modules)

The screen display is shown below.



The number of channels displayed depends on the "Number of modules." If "Number of modules" is at 1 in the above system configuration, no data on and after CH5 is displayed.

● PG3: Setting of communication

Symbol	Name	Data range	Description	Factory set value
bPS (bPS)	Communication speed	4.8 kbps 9.6 kbps 19.2 kbps 38.4 kbps	Use to set the communication speed. Pressing the UP or DOWN key enables speed selection.	19.2
bIT (bIT)	Data bit configuration	See **Data bit configuration table**	Use to set the data bit configuration.	8n1
nCEd (nCEd)	Number of communication error decision times *	0 to 10 times	Number of times until the OP10 screen display changes to the communication error state (blinking "– – – –," COM lamp blinks).	3
SST (SST)	Slave scanning time *	1 to 100 (×100 ms)	Interval at which the OP10 sends messages to the controller.	10

* When a communication error occurs, the time until the OP10 screen display changes to the communication error state (blinking "– – – –," COM lamp blinks) varies depending on the number of communication error decision times setting and the slave scanning time setting.

Example 1: When the number of communication error decision times is 0 and the slave scanning time is 1 second
➔ A communication error state will occur after 1 second.

Example 2: When the number of communication error decision times is 3 and the slave scanning time is 1 second
Slave scanning time (1 sec) × [number of communication error decision times (3) + 1] = 4 seconds
➔ A communication error state will occur after 4 seconds.

Data bit configuration table

Set value	Description
8n1	Data 8-bit, without parity, Stop 1-bit
8E1	Data 8-bit, without parity, Stop 1-bit
8o1	Data 8-bit, without parity, Stop 1-bit

Pressing the UP or DOWN key enables data bit configuration selection.

● PG4: Others

Symbol	Name	Data range	Description	Factory set value
roM (roM)	ROM version	00.00 to 99.99	This value is a version of the ROM loaded on the OP10.	—
WT (WT)	Integrated operating time	0000 to EA5FH (Hexadecimal) hours Decimal number: 0 to 59999 hours	This value is an integrated operating time of the OP10. The integrated value is reset to 0 when it exceeds EA5FH.	—

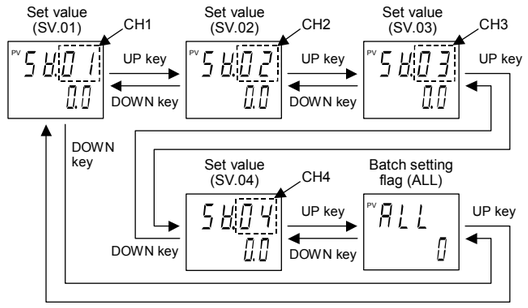
4. BASIC OPERATION

■ Channel selection

Pressing the UP or DOWN key enables channel selection.
When the UP key or DOWN key is pressed repeatedly in the set value (SV) [Level 1] and setting item [Level 2] parameters, the batch settings flag (ALL) will appear after the last channel.

● Select the channel of setting value (SV)

An example in which the number of channels of the set value (SV) is 4 is shown below. The procedure for other monitor item and setting item parameters is the same.



The number of channels displayed:
Number of connecting modules (Symbol: ModU) × Number of channels per module (Symbol: CH)

The SET key (for setting items) or the <MONI key (for monitor items) can be pressed to change items while retaining the currently displayed channel.

■ Changing data settings

- To store a new value for the parameter, always press the SET key.
- After a new value has been displayed by using the UP and DOWN keys, the SET key must be pressed within one minute, or the new value is not stored and the display will return to the value returns to that before the setting is changed.

If a value outside the setting range is set, the value will blink for 5 seconds and then revert to the previous value.

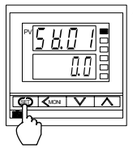
To cancel a setting while setting data, press the DOWN key for at least 2 seconds while pressing the UP key. The set data is canceled and the setting reverts to the previous value.

If display value becomes more than 10000 (No decimal place), the "oooo" is displayed. In addition, if display value becomes less than −2000 (No decimal place), the "uuuu" is displayed.

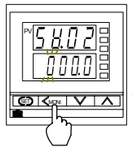
If a value outside the setting range was previously set ("oooo" or "uuuu" display), 9999 or −1999 will appear when you start to change a setting (press the <MONI key).

● Change the set value (SV)

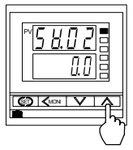
Here, an example of changing the CH2 set value (SV.02) to 200 °C is shown. Other data can also be set by the same procedures as described in steps ***3*** to ***6***.



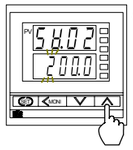
1. **Select the level 1**
Press the SET key at monitor items [Level 0] screen until set value (SV) [Level 1] screen is displayed.



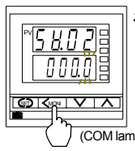
4. **Shift the blinking digit**
Press the <MONI key to blink the hundreds digit. The blinking digit indicates which digit can be set.



2. **Select the CH2 of set value**
Press the UP key to select the CH2 of set value (SV.02).

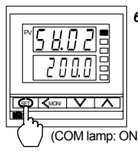


5. **Change the set value**
Press the UP key to change the number to 2.



3. **Blink the units digit**
Press the <MONI key to blink the units digit.

(COM lamp: OFF)



6. **Store the set value**
Press the SET key to store the new set value.

(COM lamp: ON)

■ Data batch setting

This setting lets you apply data set for one channel to all channels.

If the batch setting is used on a controller on which a communication error has occurred, the value being set will blink for 5 seconds. Channels after the controller address where the communication error occurred will revert to the values that were in effect before the batch setting was executed.

When using the batch setting, if the set value of a channel is outside the setting range, the value will blink for 5 seconds (the value will not blink on a V-TIO-E/F module). In addition, the set values of channels after the address of the controller to which the out-of-range channel belongs will be as indicated below.

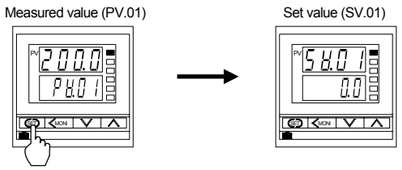
Example) Out-of-range value in "SV.07" when the batch setting is used

Communication address 1		Communication address 2		Communication address 3	
SV.01	SV.03	SV.05	SV.07	SV.09	SV.11
SV.02	SV.04	SV.06	SV.08	SV.10	SV.12
Settings that are changed		The value being set is canceled and the previous value is restored. Operation varies depending on the connected model. Z-COM-A, Z-TIO-□: Settings that are changed: SV.05, SV.06 Settings that revert to the previous value: SV.07 to SV.12 V-TIO-E/F: Settings that are changed: SV.05, SV.06, SV.08 to SV.12 Settings that revert to the previous value: SV.07 H-PCP-J: Settings that are changed: SV.05, SV.06, SV.08 Settings that revert to the previous value: SV.07, SV.09 to SV.12		

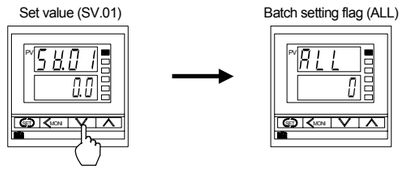
● Change the set value (SV) by batch setting

Here, an example of changing the set value (SV) of all channels to 200 °C is shown. Other data can also be set by the same procedures as described in steps ***2*** to ***6***.

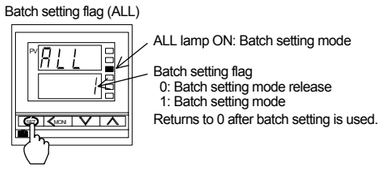
1. Press the SET key at monitor items [Level 0] until "SV.01" [CH1 of set value (SV) screen] is displayed.



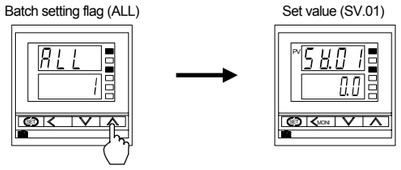
2. Press the UP or DOWN key until "ALL" (Batch setting flag screen) is displayed.
In the following, the DOWN key is pressed to display the batch setting flag (ALL).



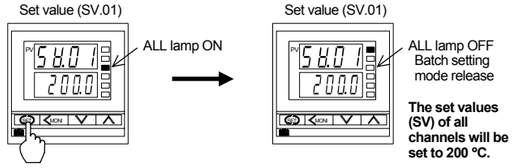
3. Set "1" in batch setting flag. Press the SET key to store the new value.



4. Press the UP key or DOWN key to display any set value (SV) channel.
In the following, the UP key is pressed to select set value CH1 (SV.01).



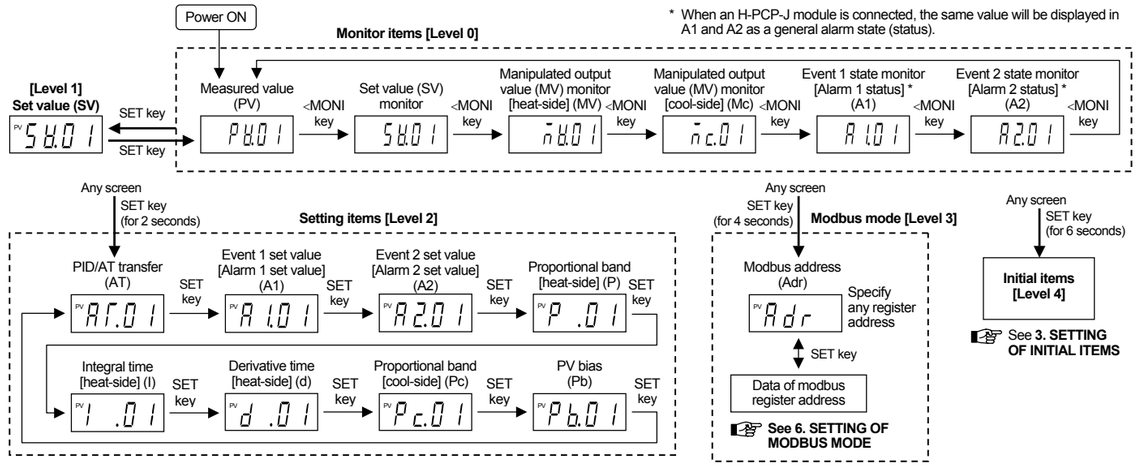
5. Set 200 °C and press the SET key.
The set values (SV) of all channels will be set to 200 °C.



6. The value of the batch setting flag (ALL) returns to 0.

5. PARAMETER LIST

For the data range and description of each parameter, see the instruction manual for the respective controller.



To return to the measured value (PV) from items other than monitor items and set values, press the <MONI key for at least 2 seconds.
If a controller is not connected, the following time will be required to return to the measured value (PV).
(Communication error decision times + 1) × slave scanning time

To change the channel, press the UP key or DOWN key.

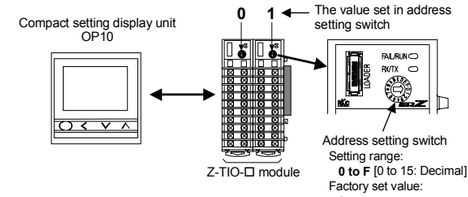
6. SETTING OF MODBUS MODE

Any Modbus register address can be specified to set or display data. This is used to set or display data that is not included within the OP10 parameters.

To prevent incorrect settings, when specifying the Modbus register address, set the start register address of the monitor item or the setting item.

The specified Modbus register address data is displayed without a decimal point.

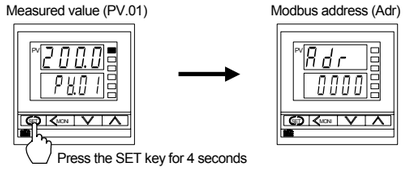
Example: Calling up Modbus register address 008EH [set value (SV)] when two Z-TIO-□ modules are connected



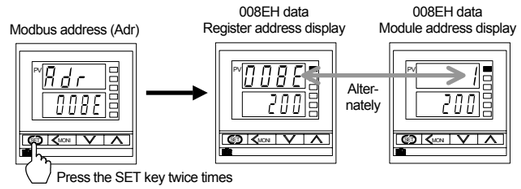
Modbus register address		Data name
HEX	DEC	
⋮	⋮	⋮
008E to 0091	142 to 145	Set value (SV)
⋮	⋮	⋮

Start register address of items

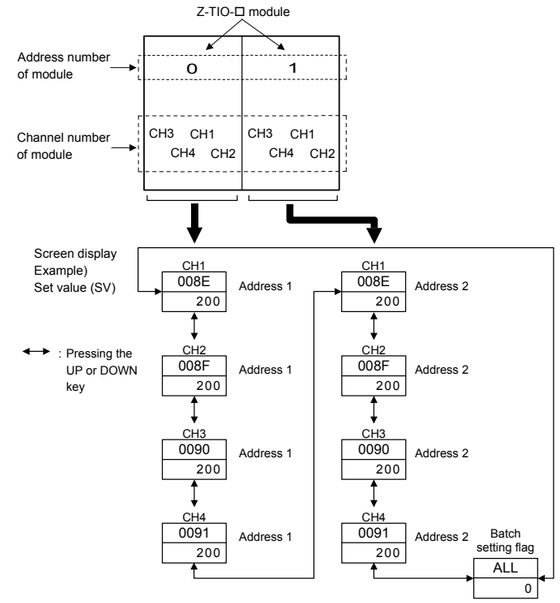
1. Press the SET key for 4 seconds at monitor items [Level 0] until "Adr" (Modbus address screen) is displayed.



2. Set the register address (hexadecimal) (press the UP key or the DOWN key), and then press the SET key. Press the SET key again to display the set register address data.
In the following, register address 008EH [set value (SV)] is set.



3. Press the UP key or the DOWN key to display all channels of register addresses that have been set. Here, the set values (SV) and batch setting flag (ALL) are displayed.



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