# MAC6/MAP6 SERIES
# Digital Controller
# Infra-red ray Communication Instruction Manual

**Thank you for purchasing SHIMAX product. Please check that the product is the one you ordered. Please operate after you read the instruction manual and fully understand it.**

This instructions manual describes the communication interface, or option function of digital controller MAC6/MAP6. See the attached main body's instructions manual about operation of MAC6/MAP6 , and the details of each parameter.

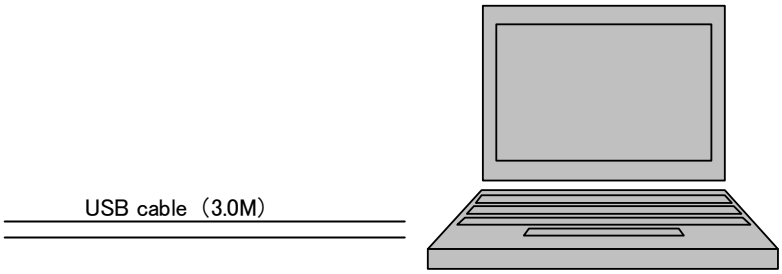
Table of Contents

## 1. Outline

MAC6/MAP6 Infra-red ray communication can be change parameter of MAC6/MAP6 from infra-red ray port from front panel.

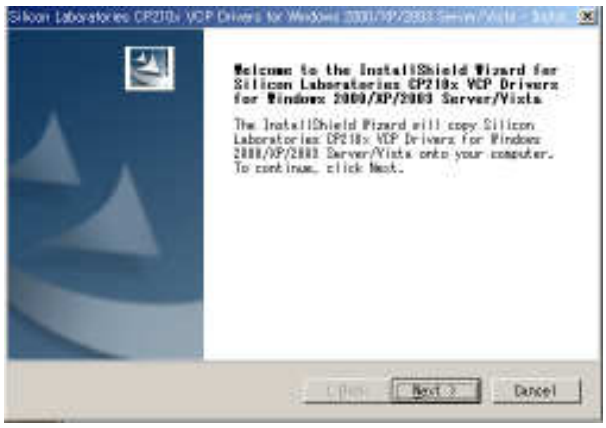
I is very easy to change the parametr that you want.

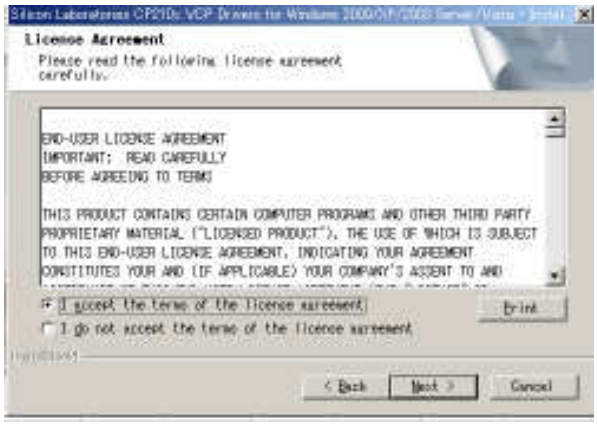
## 2 How to connect between Infra red ray adoptor and PC

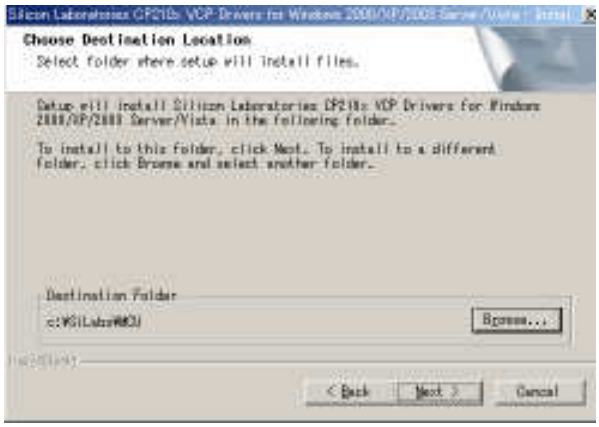


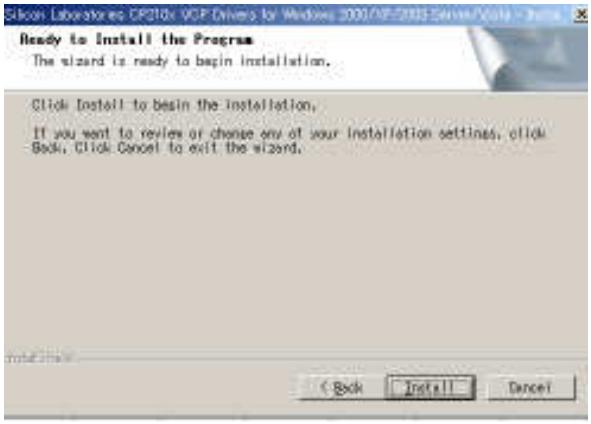

## 3 Installation of USB Driver

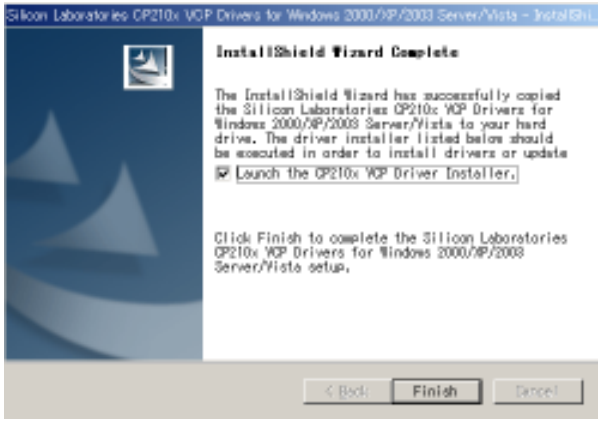
2 kind of driver both for win 98 and Win 2K, XP, VISTA , choose the driver to your P/C and install.




Choose Destination Location
Select folder where setup will install files.
Setup will install Silicon Laboratories CP210x VCP Drivers for Windows 2000/XP/2003 Server/Vista in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
Browse...
< Back
Next >
Cancel


Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
< Back
Install
Cancel


InstallShield Wizard Complete
The InstallShield Wizard has successfully copied the Silicon Laboratories CP210x VCP Drivers for Windows 2000/XP/2003 Server/Vista to your hard drive. The driver installer listed below should be executed in order to install drivers or update
Launch the CP210x VCP Driver Installer.
Click Finish to complete the Silicon Laboratories CP210x VCP Drivers for Windows 2000/XP/2003 Server/Vista setup.
< Back
Finish
Cancel

## 4 How to attach adoptor to MAC6/MAP6

Hung end of the adaptor to MAC6/MAP6

Clip the other side to MAC6/MAP6 and fix.

## 2. Outline of MODBUS Communication Protocol

### 2-1 Specification of MODBUS RTU

| | |
|---|---|
| protocol | Modbus RTU |
| Start bit | 1 (fix) |
| Data bit | 8 (fix) |
| Parity bit | none |
| Stop bit | 1 |
| Error checking | CRC-16 (Cycle redundancy check) |
| Time interval of data | Less than 28bit |
| Function code | 03(Read) ／ 06(Write) |
| Address | None |
| Transmission speed | 9600bps(fix) |
| R/W memory address | HEX4digits |
| Start character /end character | none |
| The number of simultaneous reading data | 1～10 |
| The number of simultaneous writing in data | 1 (fix) |
| Communication delay | 0 |

*MODBUS is a registered trademark of Schneider Electric.

### 2-2. Communication Procedure

1) Relation between master and slave
- A personal computer side is master side.
- MAC6/MAP6 is slave side.
- Communication is started by communication command from master side, and completed by communication answer from slave side. However, a communication answer is not performed when abnormalities, such as communication format error or BCC error etc., have been recognized.

2) Communication procedure
The slave side answers the master side, a transmitting right is transferred by turns, and a communication procedure is performed.

3) Communication data
RTU mode is 8-bit binary transmission.

| | | | |
|---|---|---|---|
| 01H | 23H | 45H | ABH |

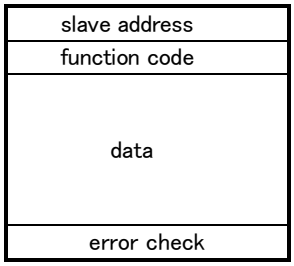
4) Message frame composition
RTU mode consists of only messages.

| |
|---|
| message |

5) Timeout
- RTU mode
When message stops during time equivalent to 28 bits, it is regarded as the end of message.
When a blank arises during time equivalent to 28 bits in the middle of message transmitting, it is judged as the end of message. It is an imperfect message, therefore slave performs no response.
* Reference: time equivalent to 28 bits (unit = msec)
9600bps:3.0

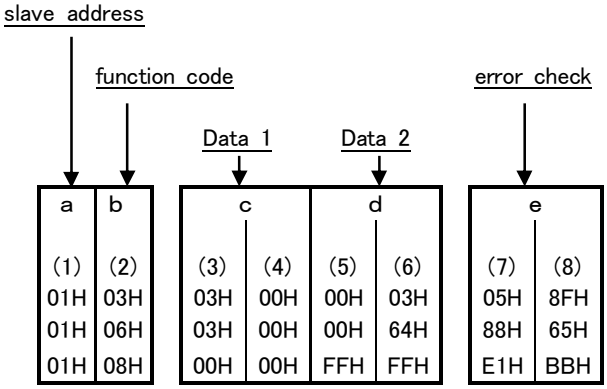
### 2-2. Communication Format

1) Composition of message
The MODBUS message has the following composition in RTU.
All the message components are treated not by a decimal number but by a hexadecimal number.




2) Communication command format (MODBUS:　Described by RTU because RTU is foundation)

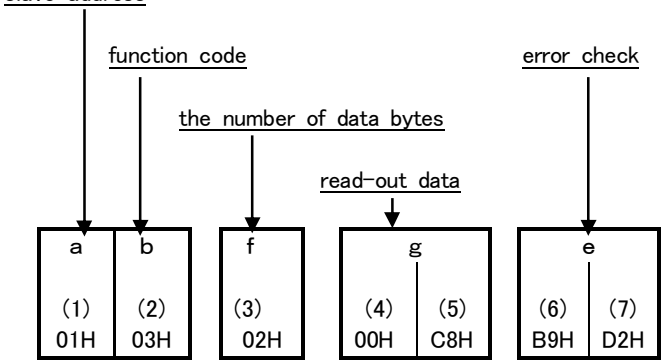
– As for the message from master, message length is being fixed regardless of the function code.



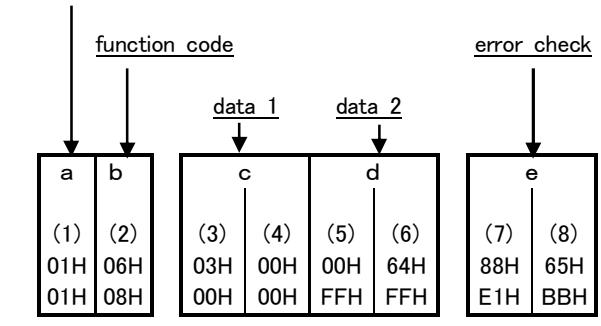

3)　Communication answer format (MODBUS: Described by RTU because RTU is foundations)

– The answer from a slave differs in message length along with a function code.

function code　03H




function code　06H.08H




a: Slave address

– The message which the master sent is received by all the connected equipment. Only the slave congruous with message's slave address answers the message.

– In MAC6/MAP6, 1～255 (01 H～FFH) can be appointed as slave address.

Note: In MODBUS specification, address which can be appointed to slave is 1～247 (01 H～F 7H)

b: Function code

- A code number shows the function to perform.

| function code | function |
|---|---|
| 03H | data read-out |
| 06H | data writing |
| 08H | loopback test |

c: Data 1
- Composition of data differs along with function code.

d: Data 2
- Composition of data differs along with function code.

| function code | data 1 content | data 2 content |
|---|---|---|
| 03H | data address | the number of read-out |
| 06H | data address | write-in data |
| 08H | fixed as 0000H | arbitrary data |

e: Error checking : CRC-16

f: The number of data bytes
- The number of read-out data bytes at the time of data read-out.
- Read-out demand is word unit; therefore it is twice of the number of read-out.

| the number of read-out | | the number of data bytes | |
|---|---|---|---|
| decimal number | hexa-decimal number | decimal number | hexa-decimal number |
| 1 | 01H | 2 | 02H |
| 2 | 02H | 4 | 04H |
| 3 | 03H | 6 | 06H |
| 4 | 04H | 8 | 08H |
| 5 | 05H | 10 | 0AH |
| 6 | 06H | 12 | 0CH |
| 7 | 07H | 14 | 0EH |
| 8 | 08H | 16 | 10H |
| 9 | 09H | 18 | 12H |
| 10 | 0AH | 20 | 14H |

g: Read-out data
- The data along with read-out demand is inserted.
- Along with the number of read-out, data length varies and there is no data breaking.
  The number of read-out is: 1 = 2 bytes, 3 = 6 bytes, and 10 = 20 bytes.

## 2-3. Error Checking

Error checking is calculated by the sending side and the result is attached to the end of outgoing message.
Error checking of incoming message is calculated by the reception side.
The result is checked if it is the same as received error checking.
If the check results met, incoming message is judged to be right, and answer operation to reception is started.
If it differs, data is judged as abnormal, and slave performs no response.

(1)CRC-16

CRC-16 is 2 bytes (16 bits) of error-checking code.
CRC-16 is calculated in the following procedures from slave address to the end of data.

1. to initialize CRC register by FFFFH.
2. Exclusive OR with CRC register and the first 1 byte of message.
   A calculation result is written in CRC register.
3. Shift 1 bit of CRC registers to the right.
4. If carry fragment (shift-out bit) is 1, exclusive OR with CRC register and A001H.
   The calculation result is written in CRC register.
5. Repeat 3. and 4. until it shifts eight times.

6. Exclusive OR with CRC register and 1 byte next to message.
   The calculation result is written in CRC register.
7. 3.～ 6. is repeated to all the data except CRC.
8. Data byte is calculated to the end. The computed CRC register value is assigned to a message in order of low rank and high rank.

## 2-4. Data Read-out (Function Code 03H) Details

Function code 03H is used on occasions when it reads (takes in) various data from a personal computer, etc.

(1) Data read-out format

- The format at the time of data read-out is as follows.

| a | b | c | | d | | e | |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 01H | 03H | 04H | 00H | 00H | 03H | 04H | FBH |

a: Slave address
b: Data read-out function code
c: Read-out lead data address
d: The number of read-out data from lead data address
＊The numbers of data which can be read is 1～10.
Therefore, binary code permitted here is 0001H～000AH, and error code is returned if value other than the above is appointed.
e: Error checking

- The above-mentioned command is as follows.
  Read-out lead data address = 0400H (hexadecimal number)
  The number of read-out data = 0003H (hexadecimal number)
  Three data read-out is appointed from data address 0400H

(2) The normal answer format at the time of data read-out

- The normal answer format to function code 03H is as follows.

| a | b | f | g | | | | | | e | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0400H | | 0401H | | 0402H | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| 01H | 03H | 06H | 00H | 1EH | 00H | 78H | 00H | 1EH | 89H | 66H |

a: Slave address
b: Function code
f: The number of read-out data bytes
＊three data read-out, so 6 bytes read-out. Therefore, it is 06H.
g: Read-out data
1. The same number of data as that of read-out data is inserted from read-out's data of lead data address, in order.
2. Nothing is inserted between data.
3. One data consists of binary digit 16 bits data(1 word) except for a decimal point.
4. Each data has position of peculiar decimal point.

e: Error checking

read-out lead data address (0400H) → number of read-out data (0003H:3)

| data address 16 bits (1 word) | data 16 bits (1 word) | |
|---|---|---|
| hexadecimal number | hexadecimal number | decimal number |
| 0400 | 001E | 30 |
| 0401 | 0078 | 120 |
| 0402 | 001E | 30 |

(3) The abnormal answer format at the time of data read-out

| a | b | h | e | |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| 01H | 83H | 03H | 01H | 31H |

a: Slave address
b: Function code
　＊ At the time of error, reception function code +80H is shown. It informs abnormal answer.
h: Error code
　＊ See **6-8. Error Message Details** about details of error code.
e: Error checking

### 2-5. Data Write-in (Function Code 06H) Details

Function code 06H is used on occasions when it writes in (changes) various data from a personal computer, etc.

(1) Data write-in format
　- The format at the time of data writing is as follows.

| a | b | c | | d | | e | |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 01H | 06H | 03H | 00H | 00H | 64H | 88H | 65H |

a: Slave address
b: Data write-in function code
c: A write-in data address
d: Write-in data
　1. Data consists of binary digit 16 bits data (1 word) except for a decimal point.
　2. Each data has position of peculiar decimal point.
e: Error checking

　- The above-mentioned command is as follows.
　　write-in lead data address　= 0300H　(hexadecimal number)
　　write-in data　= 0064H　(hexadecimal number)
　　= 100　(decimal number)
　Writing of the data addresses, 0300H (100:10 decimal numbers), is appointed.

address (0300H) →
write-in data (0064H)

| data address 16 bits (1 word) | data 16 bits (1 word) | |
|---|---|---|
| hexadecimal number | hexadecimal number | decimal number |
| 0300 | 0064 | 100 |
| 0301 | 0000 | 0 |
| 0302 | 0000 | 0 |

(2) The normal answer format at the time of data writing
　- The normal answering format to function code 06H is as follows.

| a | b | c | | d | | e | |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 01H | 06H | 03H | 00H | 00H | 64H | 88H | 65H |

　＊ The same one as the outgoing message from master is answered.

(3) The abnormal answer format at the time of data writing

| a | b | h | e | |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| 01H | 86H | 02H | C3H | A1H |

a: Slave address

b: Function code
＊ At the time of error, reception function code +80H is shown. It informs abnormal answer.
h: Error code
＊ See **6-8. Error Message Details** about error code details.
e: Error checking

## 2-6 Loopback Test (Function Code 08H) Details

The function code 08H returns the message from master as response massage as it is.
It is used as communication diagnosis between master and slave.

(1) Loopback format
- The format at the time of a loopback test is as follows.

| a | b | c | | d | | e | |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 01H | 08H | 00H | 00H | FFH | FFH | E1H | BBH |

a: Slave address
b: Data write-in function code
c: Test code
＊ Fixed as 0000H
d: Arbitrary data
＊ arbitrary 16 bit data of 0000H～FFFFH
e: Error checking

(2) Loopback normal answer format
- The normal answer format to the function code 08H is as follows.

| a | b | c | | d | | e | |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 01H | 08H | 00H | 00H | FFH | FFH | E1H | BBH |

＊ The same one as the outgoing message from master is answered.

(3) The abnormal answer format at the time of loopback

| a | b | h | e | |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| 01H | 88H | 02H | C7H | C1H |

a: Slave address
b: Function code
＊ At the time of error, reception function code +80H is shown. It informs abnormal answer.
h: Error code
＊ See **6-8. Error Message Details** about error code details.
e: Error checking

## 2-7. No Response Conditions

Slave does not answer when the following abnormalities have been recognized.
- when hardware error takes place (overrun, framing, parity error)
- when slave address differs from its own address
- when the data interval of message is long.
  (RTU: time to be equivalent to 28 bits or more )
- when the message from master is not regulated one (Message is too long etc.,)

## 2-8. Error Message Details

Error code corresponding to the type of error is answered, when error other than no response condition is detected.

(1) Abnormal answer format

| a | b | h | e | |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| 01H | 83H | 03H | 01H | 31H |

a: Slave address
b: Function code
1. At the time of error, reception function code +80H is shown. It informs abnormal answer.
2. +80H is not shown at the time of function code beyond 80H, and returned as it is.
h: Error code
＊See the following table.
e: Error checking

| Error Code | Content of Errors |
|---|---|
| 01H | Function code error<br>– when function code other than regulated one is received<br>(All other than three sorts,< 03H, 06H, 08H>, correspond to this category) |
| 02H | Address error<br>– when it is written in the address only for reading<br>– when the address only for writing is read<br>– when a test code is not 0000H at the time of loopback test<br>– when non-existing address is appointed in the lead of read-out or write-in address.<br>(not yet added option etc. is included) |
| 03H | Data error<br>– when write-in data exceeds the writable data range (when ones other than 0 and 1 are written in AUTO/MANU switching etc.)<br>– when the written-in value had been already filled by other one, in the item only for an exclusion setup (DI corresponds to this)<br>– when the number of read-out data and the number possible to read-out is different.(In MAC6/MAP6, read-out is permitted between 1～10.)<br>An error code is answered when read-out is 0, or over 11.<br>– when the number of read-out data and the number possible to read-out is different.(In MAC6/MAP6, read-out is permitted between 1～10.)<br>– when parameter is rewritten under circumstances a change is not permitted (Items such as:at the time of change by key operation, a screen displays nothing or a change is impossible) |

(2) The priority of error code

The priority of error code becomes high as the value of error code becomes small. On occasions when plural error codes occur, the high priority error code is returned.

Example: Even if there are data error and address errors, 01H is returned when function code error is detected.

**2-9. Communication Data Address Details**

(1) Data address
– As for data address, binary digit (16 bit data) is expressed with hexadecimal number every 4 bits.

(2) About read-out (read)/write-in (write).
– R/W is the data in which read-out and writing are possible
– R is read-only data
– W is data only for writing.
– when the data address only for writing is appointed in data read-in (Function code 03H),
– when the read-only data address is appointed in data write-in (Function code 06H), it becomes address error and error code 02H is answered.

(3) Data address and the number of data

- When the data address, which is not described in data address, is appointed as lead data address,it becomes address error and error code 02H is answered.
- When the data address, to which the number of data is added, becomes outside of listed data address, in the area of outside-address, as data 0000 H is answered always.

(4) Data

- Since each data does not have a decimal point (16 bit data), the check of data type and decimal point is needed. (See the instruction manual of main body)
- In the case of the data whose unit is UNIT, measuring range determines the position of a decimal point.
- All the data is treated as binary digit with a code (16 bit data: −32768 ～ 32767).

Example: Method to express data with a decimal point

| | | Hexadecimal data |
|---|---|---|
| 20.0 | → 200 | → 00C8 |
| 100.00 | → 10000 | → 2710 |
| −40.00 | → −4000 | → F060 |

Example: Method to express 16 bit data

| data with code | |
|---|---|
| decimal number | hexadecimal number |
| 0 | 0000 |
| 1 | 0001 |
| ≈ | ≈ |
| 32767 | 7FFF |
| −32768 | 8000 |
| −32767 | 8001 |
| ≈ | |
| −2 | FFFE |
| −1 | FFFF |

(5) An option-related parameter

- When the data address of the parameter, which is not listed as an option, is appointed, it results in an error both at Read command (R) and Write command (W).And error code 02H is answered

(6) The parameter which is not displayed in an operator display because of operation specification or setting specification

-The parameter, which is not displayed (not used) in an operator display because of operation specification and setup specification, is possible to read-out in communication.
However, write-in becomes data error and error code 03H is answered.

Data address table

| Adress | Parameter | R/W |
|---|---|---|
| 0040 | Series 1 'M' 'A' | R |
| 0041 | Series 2 PROG '*' '6' *:C P | R |
| 0042 | Series 3 'A' 'O' | R |
| 0043 | Series 4 OUT1 'M' '#' #:C S I V Y X | R |
| 0044 | Software ver1 'O' '1' | R |
| 0045 | Software ver2 'O' 'O' | R |
| 0046 | Option 1 EV+OUT2 '*' '#' *:N E #:N C S I V E | R |
| 0047 | Option 2 DI+DO '*' '#' *:N D #:N J | R |
| 0048 | Opton 3 DO+AI '*' '#' *:N J H P #:N I V | R |
| 0049 | Option 4 AO+COM '*' '#' *:N T V #:N R W | R |
| 004A | NOTE No, | R |

| | | |
|---|---|---|
| 0050 | Device ID PV Ten thousand or one thousand digits ASCII code | R |
| 0051 | Device ID PV Ten thousand or one thousand digits ASCII code | R |
| 0052 | Device ID PV —, SV Ten thousand digits ASCII code | R |
| 0053 | Device ID SV One thousand or one hundred digits ASCII code | R |
| 0054 | Device ID SV Ten or one digits ASCII code | R |

★For example 6730460426

| Address | 0x0050 | 0x0051 | 0x0052 | 0x0053 | 0x0054 |
|---|---|---|---|---|---|
| Data | 0x36, 0x37 | 0x33, 0x30 | 0x34, 0x36 | 0x30, 0x34 | 0x32, 0x36 |

It overflows LONG as a result of the check parity function, so I make them read by an ASCII code.

| | | |
|---|---|---|
| 0100 | Mesuring value HHHH, CJHH, b---:0x7FFF LLLL, CJLL:0x8000 | R |
| 0101 | Excution SV value, within SV limiter | R |
| 0102 | Control Output 1 Value 0.0 ～100.0 | R |
| 0103 | Control Output 2 Value 0.0 ～100.0 | R |
| 0104 | Operation flagument<br>D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0<br>0 0 0 0 0 0 AT/W 0 0 0 0 0 0 STBY MAN AT<br>※On at the time AT/W:AT standby On at the time STBY:STBY(RST)<br>On at the time of MAN:MAN On at the time of AT:AT | R |
| 0105 | Event out flagment<br>D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0<br>0 0 0 0 0 0 DO6 DO5 DO4 DO3 DO2 DO1 EV4 EV3 EV2 EV1<br>※On at the time of EV3:EV3LED lighting On at the time of EV2:EV2LED lighting<br>On at the time of EV1:EV1LED lighting | R |
| 0106 | FIX Excution SV No. 1～8 | R |
| 0107 | Excution PID No. | R |
| 0108 | AI monitor | R |
| 0109 | CT 1 electric-current value | R |
| 010A | CT2 electric-Current value | R |
| 010B | DI input state flagment<br>D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0<br>0 0 0 0 0 0 0 0 0 DI7 DI6 DI5 DI4 DI3 DI2 DI1 | R |

| | | |
|---|---|---|
| 010D | Lacthing state Flagment<br>D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0<br>0 0 0 0 0 0 DO6 DO5 DO4 DO3 DO2 DO1 EV4 EV3 EV2 EV1<br>※In latching operating state, applicable bit turns ON at the time of event retention | R |
| 010E | Relay ON/OFF Flagment<br>D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0<br>0 0 0 0 0 0 DO6 DO5 DO4 DO3 DO2 DO1 EV4 EV3 EV2 EV1<br>※NO/NC setting availavle therefore it will not be event on = relay on.<br>At the time of Relay is ON , Flagment is ON | R |

| | | |
|---|---|---|
| 0120 | Program operation Flagment<br>D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0<br>PRG 0 0 0 0 UP LVL DW 0 0 0 0 SKIP 0 HOLD RUN<br>ON at the time of PRG:PROG OFF at the time of FIX<br>UP: ON during program is ascending LVL: ON during program flatness<br>DW: ON during program is descending SKIP:ON at the time of SKIP execution<br>HOLD: ON at the time of HOLD execution RUN: ON at the time of RUN | R |
| 0121 | Program excution No, No. 1～8 | R |

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| 0123 | Number of excution pattern ※Count the excution pattern 1～30001(Infinity Up to 30000 it clipped 30001 more than 30000) | R |
| 0124 | Excution step No, 1～96 | R |
| 0125 | Excution step time MM:SS ,HH:MM 000:00 ～300:00 HHH.H 0000.1 ～3000.0<br>Infinity 30001 | R |
| 0126 | Excution PID No. | R |

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| 0133 | Remaining Excution pattern No, 0～29999(Infinity 30001) | R |

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| 0135 | Remaining Excution step time MM:SS ,HH:MM 000:00 ～300:00 HHH.H 0000.1 ～3000.0<br>Infinity 30001 | R |

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| 0142 | servo position monitor | R |

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|---|---|---|
| 0180 | FIX excution SV No. 1～8 | W |

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| 0182 | Control output 1 manual setting value ※Only at the time of manual | W |
| 0183 | Control output 2 manual setting value ※Only at the time of manual | W |
| 0184 | ＡＴ excution OFF:0 ON:1 | W |
| 0185 | AUTO/MANU switching AUTO:0 MANU:1 | W |
| 0186 | RUN/STBY switching RUN:0 STBY:1 | W |

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|---|---|---|
| 0191 | Hold excution OFF:0 ON:1 | W |
| 0192 | Skip excution OFF:0 ON:1 | W |

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|---|---|---|
| 0198 | Latching release OFF:0 EV1:1 EV2:2 EV3:3 EV4:4<br>DO1:5 DO2:6 DO3:7 DO4:8 DO5:9 DO6:10 | W |

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|---|---|---|
| 0300 | ＦＩＸ Mode ＳＶ１ | R/W |
| 0301 | ＦＩＸ Mode ＳＶ２ | R/W |
| 0302 | ＦＩＸ Mode ＳＶ３ | R/W |
| 0303 | ＦＩＸ Mode ＳＶ４ | R/W |
| 0304 | ＦＩＸ Mode ＳＶ５ | R/W |
| 0305 | ＦＩＸ Mode ＳＶ６ | R/W |
| 0306 | ＦＩＸ Mode ＳＶ７ | R/W |
| 0307 | ＦＩＸ Mode ＳＶ８ | R/W |

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|---|---|---|
| 030A | ＳＶ limiter lower limit value | R/W |
| 030B | ＳＶ limiter upper limit value | R/W |

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|---|---|---|
| 030C | RAMP mode 0,1,10,11,100,101,110,111,200,201,210,211 | R/W |
| 030D | RAMP Start SV | R/W |
| 030E | RAMP time Unit 0:MMSS 1:HHMM 2:HHHH | R/W |
| 030F | RAMPtime 000:01～300:00 (At time unit MMSS,HHMM)<br>0000.1～3000.0 (At time unit HHHH) | R/W |

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|---|---|---|
| 0314 | AI scaling L | R/W |
| 0315 | AI scaling H | R/W |
| 0316 | AI offset -5000～5000 | R/W |
| 0317 | AI filter 0～10000 | R/W |

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|---|---|---|
| 031A | AI Mode 0:NON 1:SV 2:PV OF 3:OUT1L 4:OUT1H 5:MANU 1 6:OUT2L 7:OUT2H 8:MANU 2<br>9:EV1 10:EV2 11:EV3 12:EV4 13:DO1 14:DO2 15:DO3 16:DO4 17:DO5<br>18:DO6 | R/W |

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|---|---|---|
| 031F | AI gain -5000～5000 | R/W |

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|---|---|---|---|
| 0400 | OUT1-PID1 | proportional band 0:OFF 1～10000 | R/W |
| 0401 | | integration time 0:OFF 1～6000 | R/W |
| 0402 | | derivative time 0:OFF 1～3600 | R/W |
| 0403 | | manual reset -500～500 | R/W |
| 0404 | | differential gap Lo 1～10000 | R/W |
| 0405 | | output limiter lower limit 0～999 | R/W |
| 0406 | | output limiter upper limit 1～1000 | R/W |
| 0407 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0408 | OUT1-PID2 | proportional band 0:OFF 1～10000 | R/W |
| 0409 | | integration time 0:OFF 1～6000 | R/W |
| 040A | | derivative time 0:OFF 1～3600 | R/W |
| 040B | | manual reset -500～500 | R/W |
| 040C | | differential gap Lo 1～10000 | R/W |
| 040D | | output limiter lower limit 0～999 | R/W |
| 040E | | output limiter upper limit 1～1000 | R/W |
| 040F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0410 | OUT1-PID3 | proportional band 0:OFF 1～10000 | R/W |
| 0411 | | integration time 0:OFF 1～6000 | R/W |
| 0412 | | derivative time 0:OFF 1～3600 | R/W |
| 0413 | | manual reset -500～500 | R/W |
| 0414 | | differential gap Lo 1～10000 | R/W |
| 0415 | | output limiter lower limit 0～999 | R/W |
| 0416 | | output limiter upper limit 1～1000 | R/W |
| 0417 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0418 | OUT1-PID4 | proportional band 0:OFF 1～10000 | R/W |
| 0419 | | integration time 0:OFF 1～6000 | R/W |
| 041A | | derivative time 0:OFF 1～3600 | R/W |
| 041B | | manual reset -500～500 | R/W |
| 041C | | differential gap Lo 1～10000 | R/W |
| 041D | | output limiter lower limit 0～999 | R/W |
| 041E | | output limiter upper limit 1～1000 | R/W |
| 041F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0420 | OUT1-PID5 | proportional band 0:OFF 1～10000 | R/W |
| 0421 | | integration time 0:OFF 1～6000 | R/W |
| 0422 | | derivative time 0:OFF 1～3600 | R/W |
| 0423 | | manual reset -500～500 | R/W |
| 0424 | | differential gap Lo 1～10000 | R/W |
| 0425 | | output limiter lower limit 0～999 | R/W |
| 0426 | | output limiter upper limit 1～1000 | R/W |
| 0427 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0428 | OUT1-PID6 | proportional band 0:OFF 1～10000 | R/W |
| 0429 | | integration time 0:OFF 1～6000 | R/W |
| 042A | | derivative time 0:OFF 1～3600 | R/W |
| 042B | | manual reset -500～500 | R/W |
| 042C | | differential gap Lo 1～10000 | R/W |
| 042D | | output limiter lower limit 0～999 | R/W |
| 042E | | output limiter upper limit 1～1000 | R/W |
| 042F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0430 | OUT1-PID7 | proportional band 0:OFF 1～10000 | R/W |
| 0431 | | integration time 0:OFF 1～6000 | R/W |
| 0432 | | derivative time 0:OFF 1～3600 | R/W |
| 0433 | | manual reset -500～500 | R/W |
| 0434 | | differential gap Lo 1～10000 | R/W |
| 0435 | | output limiter lower limit 0～999 | R/W |
| 0436 | | output limiter upper limit 1～1000 | R/W |
| 0437 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0438 | OUT1-PID8 | proportional band 0:OFF 1～10000 | R/W |
| 0439 | | integration time 0:OFF 1～6000 | R/W |
| 043A | | derivative time 0:OFF 1～3600 | R/W |
| 043B | | manual reset -500～500 | R/W |
| 043C | | differential gap Lo 1～10000 | R/W |
| 043D | | output limiter lower limit 0～999 | R/W |
| 043E | | output limiter upper limit 1～1000 | R/W |
| 043F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0460 | OUT2-PID1 | proportional band 0:OFF 1～10000 | R/W |
| 0461 | | integration time 0:OFF 1～6000 | R/W |
| 0462 | | derivative time 0:OFF 1～3600 | R/W |
| 0463 | | Dead Band -20000～20000 | R/W |
| 0464 | | differential gap Lo 1～10000 | R/W |
| 0465 | | output limiter lower limit 0～999 | R/W |
| 0466 | | output limiter upper limit 1～1000 | R/W |
| 0467 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0468 | OUT2-PID2 | proportional band 0:OFF 1～10000 | R/W |
| 0469 | | integration time 0:OFF 1～6000 | R/W |
| 046A | | derivative time 0:OFF 1～3600 | R/W |
| 046B | | Dead Band -20000～20000 | R/W |
| 046C | | differential gap Lo 1～10000 | R/W |
| 046D | | output limiter lower limit 0～999 | R/W |
| 046E | | output limiter upper limit 1～1000 | R/W |
| 046F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0470 | OUT2-PID3 | proportional band 0:OFF 1～10000 | R/W |
| 0471 | | integration time 0:OFF 1～6000 | R/W |
| 0472 | | derivative time 0:OFF 1～3600 | R/W |
| 0473 | | Dead Band -20000～20000 | R/W |
| 0474 | | differential gap Lo 1～10000 | R/W |
| 0475 | | output limiter lower limit 0～999 | R/W |
| 0476 | | output limiter upper limit 1～1000 | R/W |
| 0477 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0478 | OUT2-PID4 | proportional band 0:OFF 1～10000 | R/W |
| 0479 | | integration time 0:OFF 1～6000 | R/W |
| 047A | | derivative time 0:OFF 1～3600 | R/W |
| 047B | | Dead Band -20000～20000 | R/W |
| 047C | | differential gap Lo 1～10000 | R/W |
| 047D | | output limiter lower limit 0～999 | R/W |
| 047E | | output limiter upper limit 1～1000 | R/W |
| 047F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0480 | OUT2-PID5 | proportional band 0:OFF 1～10000 | R/W |
| 0481 | | integration time 0:OFF 1～6000 | R/W |
| 0482 | | derivative time 0:OFF 1～3600 | R/W |
| 0483 | | Dead Band -20000～20000 | R/W |
| 0484 | | differential gap Lo 1～10000 | R/W |
| 0485 | | output limiter lower limit 0～999 | R/W |
| 0486 | | output limiter upper limit 1～1000 | R/W |
| 0487 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0488 | OUT2-PID6 | proportional band 0:OFF 1～10000 | R/W |
| 0489 | | integration time 0:OFF 1～6000 | R/W |
| 048A | | derivative time 0:OFF 1～3600 | R/W |
| 048B | | Dead Band -20000～20000 | R/W |
| 048C | | differential gap Lo 1～10000 | R/W |
| 048D | | output limiter lower limit 0～999 | R/W |
| 048E | | output limiter upper limit 1～1000 | R/W |
| 048F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0490 | OUT2-PID7 | proportional band 0:OFF 1～10000 | R/W |
| 0491 | | integration time 0:OFF 1～6000 | R/W |
| 0492 | | derivative time 0:OFF 1～3600 | R/W |
| 0493 | | Dead Band -20000～20000 | R/W |
| 0494 | | differential gap Lo 1～10000 | R/W |
| 0495 | | output limiter lower limit 0～999 | R/W |
| 0496 | | output limiter upper limit 1～1000 | R/W |
| 0497 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0498 | OUT2-PID8 | proportional band 0:OFF 1～10000 | R/W |
| 0499 | | integration time 0:OFF 1～6000 | R/W |
| 049A | | derivative time 0:OFF 1～3600 | R/W |
| 049B | | Dead Band -20000～20000 | R/W |
| 049C | | differential gap Lo 1～10000 | R/W |
| 049D | | output limiter lower limit 0～999 | R/W |
| 049E | | output limiter upper limit 1～1000 | R/W |
| 049F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|
| 04C0 | Zone 1SP | R/W |
| 04C1 | Zone 2SP | R/W |
| 04C2 | Zone 3SP | R/W |
| 04C3 | Zone 4SP | R/W |

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|---|---|---|
| 04CA | Zone hysteresis 1～10000 | R/W |
| 04CB | Zone PID Mode 0:OFF 1:SV 2:PV | R/W |

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|---|---|---|---|
| 0500 | EV1 | Event operation mode 0:NON 1:HA 2:LA 3:IA 4:OA<br>5:SO 6:HD 7:LD 8:ID 9:OD<br>10:RUN 11:R_ON 12:R_OF 13:S_ON 14:S_OF<br>15:CT1_B 16:CT1_L 17:CT2_B<br>18:CT2_L 19:CT3_B<br>20:CT3_L 21:STP 22:P_E 23:END 24:HOLD<br>25:PROG 26:U_SL 27:D_SI 28:GUA 29:TS1<br>30:TS2 31:TS3 32:TS4 | R/W |
| 0501 | | Event setting Value -20003:STEP -20002:PTN -20001:SV_N<br>※-20001～-20003 are at HA,LA,HD,LD,ID,OD | R/W |
| 0502 | | Event differential gap 1～10000 | R/W |
| 0503 | | Event standby operation 0:OFF 1～2 | R/W |
| 0504 | | Event setting value 2 (IA & OA can be set) | R/W |
| 0505 | | Event latching ／Output characteristic<br>D15-8 D0-0<br>Latching Output characteristic<br>Upper 8digit ON/OFF of Event latching<br>Lower 8digit NO/NC of Output characteristic<br>Latching OFF:0 ON:1<br>Output characteristic NO:0 NC:1 | R/W |

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|---|---|---|---|
| 0508 | EV2 | Event operation mod 0:NON1:HA 2:LA 3:IA 4:OA<br>5:SO 6:HD 7:LD 8:ID 9:OD<br>10:RUN 11:CT1_B 12:CT1_L 13:CT2_B<br>14:CT2_L 15:CT3_B 16:CT3_L 17:STP 18:P_E<br>19:END 20:HOLD21:PROG 22:U_SL 23:D_SI 24:GUA<br>25:TS1 26:TS2 27:TS3 28:TS4 | R/W |
| 0509 | | Event setting value -20003:STEP -20002:PTN -20001:SV_N<br>※-20001～-20003 are at HA,LA,HD,LD,ID,OD | R/W |
| 050A | | Event differential gap 1～10000 | R/W |
| 050B | | Event standby operation 0:OFF 1～2 | R/W |
| 050C | | Event setting value 2 ※At IA,OA | R/W |
| 050D | | Event latching ／Output characteristic details same as EV1<br>D15-8 D7-0<br><br>Latching characteristic<br>Upper 8digit ON/OFF of Event latching<br>Lower 8digit NO/NC of Output characteristic<br>Latching OFF:0 ON:1<br>Output characteristic NO:0 NC:1 | R/W |

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|---|---|---|---|
| 0510 | EV3 | Event operation mode details same as EV1 | R/W |
| 0511 | | Event setting value details same as EV1 | R/W |
| 0512 | | Event differential gap details same as EV1 | R/W |
| 0513 | | Event standby operation details same as EV1 | R/W |
| 0514 | | Event setting value 2 details same as EV1 | R/W |
| 0515 | | Event latching ／Output characteristic<br>D15-8 D7-0<br><br>Latching characteristic<br>Upper 8digit ON/OFF of Event latching<br>Lower 8digit NO/NC of Output characteristic<br>Latching OFF:0 ON:1<br>Output characteristic NO:0 NC:1 | R/W |

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|---|---|---|---|
| 0518 | EV4 | Event operation mode 0:NON 1:HA 2:LA 3:IA 4:OA<br>5:SO 6:HD 7:LD 8:ID 9:OD<br>10:RUN 11:CT1_B 12:CT1_L 13:CT2_B<br>14:CT2_L 15:CT3_B 16:CT3_L 17:STP 18:P_E<br>19:END 20:HOLD 21:PROG 22:U_SL 23:D_SI 24:GUA<br>25:TS1 26:TS2 27:TS3 28:TS4 | R/W |
| 0519 | | Event setting value -20003:STEP -20002:PTN -20001:SV_N<br>※-20001～-20003 は HA,LA,HD,LD,ID,OD 時のみ | R/W |
| 051A | | Event differential gap 1～10000 | R/W |
| 051B | | Event standby operation 0:OFF 1～2 | R/W |
| 051C | | Event setting value 2 ※At IA,OA | R/W |
| 051D | | Event latching ／Output characteristic<br>D15-8 D7-0<br><br>Latching characteristic<br>Upper 8digit ON/OFF of Event latching<br>Lower 8digit NO/NC of Output characteristic<br>Latching OFF:0 ON:1<br>Output characteristic NO:0 NC:1 | R/W |

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|---|---|---|---|
| 0520 | DO1 | DO operation mode 0:NON 1:HA 2:LA 3:IA 4:OA<br>5:SO 6:HD 7:LD 8:ID 9:OD<br>10:RUN 11:CT1_B 12:CT1_L 13:CT2_B<br>14:CT2_L 15:CT3_B 16:CT3_L 17:STP 18:P_E<br>19:END 20:HOLD21:PROG 22:U_SL 23:D_SI 24:GUA<br>25:TS1 26:TS2 27:TS3 28:TS4 | R/W |
| 0521 | | DO setting value | R/W |
| 0522 | | DO differential gap 1～10000 | R/W |
| 0523 | | DO standby operation 0:OFF 1～2 | R/W |
| 0524 | | DO setting value 2 (IA & OA can be set) | |

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|---|---|---|---|
| 0525 | | Event latching ／Output characteristic<br>D15-8　　D7-0<br>Latching　Output characteristic<br>Upper 8digit ON/OFF of Event latching<br>Lower 8digit NO/NC of Output characteristic<br>Latching OFF:0 ON:1<br>Output characteristic　NO:0　NC:1 | R/W |

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|---|---|---|---|
| 0528 | DO2 | DO mode　Details same as DO1 | R/W |
| 0529 | | DO setting value　Details same as DO1 | R/W |
| 052A | | DO differential gap　Details same as DO1 | R/W |
| 052B | | DO standby operation　Details same as DO1 | R/W |
| 052C | | DO setting value 2　Details same as DO1 | |
| 052D | | DO Latching／Output characteristic　Details same as DO1 | R/W |

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|---|---|---|---|
| 0530 | DO3 | DO mode　Details same as DO1 | R/W |
| 0531 | | DO setting value　Details same as DO1 | R/W |
| 0532 | | DO differential gap　Details same as DO1 | R/W |
| 0533 | | DO standby operation　Details same as DO1 | R/W |
| 0534 | | DO setting value 2　Details same as DO1 | R/W |
| 0535 | | DO Latching／Output characteristic　Details same as DO1 | R/W |

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|---|---|---|---|
| 0538 | DO4 | DO mode　Details same as DO1 | R/W |
| 0539 | | DO setting value　Details same as DO1 | R/W |
| 053A | | DO differential gap　Details same as DO1 | R/W |
| 053B | | DO standby operation　Details same as DO1 | R/W |
| 053C | | DO setting value 2　Details same as DO1 | R/W |
| 053D | | DO Latching／Output characteristic　Details same as DO1 | R/W |

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|---|---|---|---|
| 0540 | DO5 | DO mode　Details same as DO1 | R/W |
| 0541 | | DO setting value　Details same as DO1 | R/W |
| 0542 | | DO differential gap　Details same as DO1 | R/W |
| 0543 | | DO standby operation　Details same as DO1 | R/W |
| 0544 | | DO setting value 2　Details same as DO1 | R/W |
| 0545 | | DO Latching／Output characteristic　Details same as DO1 | R/W |

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|---|---|---|---|
| 0548 | DO6 | DO mode　Details same as DO1 | R/W |
| 0549 | | DO setting value　Details same as DO1 | R/W |
| 054A | | DO differential gap　Details same as DO1 | R/W |
| 054B | | DO standby operation　Details same as DO1 | R/W |
| 054C | | DO setting value 2　Details same as DO1 | R/W |
| 054D | | DO Latching／Output characteristic　Details same as DO1 | R/W |

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|---|---|---|
| 0580 | ＤＩ１　0:NON　1:SV1　2:SV2　3:SV3　4:SV4　5:SV5　6:SV6　7:SV7<br>8:SV8　9:SV_3B 10:RUN　11:PROG 12:MAN　13:AT　14:PTN1 15:PTN2<br>16:PTN3 17:PTN4 18:PTN5 19:PTN6 20:PTN7 21:PTN8 22:PTN3B　23:HOLD<br>24:SKIP 25:L_RS 26:LOCK　255:3B(compulsion occupation) | R/W |
| 0581 | ＤＩ２　same as DI1 | R/W |
| 0582 | ＤＩ３　same as DI1 | R/W |
| 0583 | ＤＩ４ same as DI1 | R/W |
| 0584 | ＤＩ５ same as DI1 | R/W |
| 0585 | ＤＩ６　0:NON　1:SV1　2:SV2　3:SV3　4:SV4　5:SV5　6:SV6　7:SV7<br>8:SV8　9:**** 10:RUN　11:PROG 12:MAN　13:AT　14:PTN1 15:PTN2<br>16:PTN3 17:PTN4 18:PTN5 19:PTN6 20:PTN7 21:PTN8 22:**** 23:HOLD<br>24:SKIP 25:L_RS 26:LOCK　255:3B(compulsion occupation)<br><br>※It basically same as DI1-5, but 9:SV_3B,22:PTN3B can not be allotted. | R/W |
| 0586 | ＤＩ７ same as DI6 | R/W |

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|---|---|---|
| 0595 | ＣＴ１ delay time　1～10000 | R/W |

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| 0597 | ＣＴ１ delay time　0:NON 1:OUT1 2:OUT2 3:EV1 4:EV2 5EV3 6:EV4 | R/W |

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|---|---|---|
| 059D | ＣＴ２ delay time　1～10000 | R/W |

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|---|---|---|
| 059F | ＣＴ２ delay time 0:NON 1:OUT1 2:OUT2 3:EV1 4:EV2 5EV3 6:EV4 | R/W |

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|---|---|---|
| 05A0 | Analogue output mode 0:NON 0:NON 1:PV 2:SV 3:DEV 4:OUT1 5:OUT2 6:CT1 7:CT2 8:SERVO | R/W |
| 05A1 | analogue output scale lower limit | R/W |
| 05A2 | analogue output scale upper limit | R/W |

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|---|---|---|
| 05B0 | communication memory mode 0:RAM 1:MIX 2:EEP | R/W |

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| 05B4 | analogue output limiter lower limit 0～1000 | R/W |
| 05B5 | analogue output limiter upper limit 0～1000 | R/W |

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| 0600 | OUT1 Output characteristic 0:RA 1:DA | R/W |
| 0601 | OUT1 proportional cycle 5～3000 (Multiple of 5) | R/W |

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|---|---|---|
| 0604 | OUT2 proportional cycle 5～3000 (Multiple of 5) | R/W |

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|---|---|---|
| 0607 | OUT2 Output characteristic 0:RA 1:DA | R/W |

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|---|---|---|
| 060A | OUT1 soft start 5～3000 (Multiple of 5) | R/W |
| 060B | OUT2 soft start 5～3000 (Multiple of 5) | R/W |

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|---|---|---|
| 0611 | key lock 0:OFF 1～4 | R/W |

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|---|---|---|
| 0642 | servo FB filter 0～10000 | R/W |
| 064E | Servo AT ON/OFF 0:OFF 1:ON | |

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|---|---|---|
| 064F | servo close - open time 5～300 | R/W |
| 0650 | servo FB characteristic 0:OP_CL 1:CL_OP | R/W |
| 0651 | servo FB existing 0:NON 1:FB | R/W |
| 0652 | servo dead band 1～1000 | R/W |
| 0653 | servo differential gap 1～1000 | R/W |

| | | |
|---|---|---|
| 065C | Dead band 1～1000 | R/W |
| 065D | inching band 0～1000 | R/W |
| 065E | inching cycle 5～50 | R/W |
| 065F | inching duty 1～1000 | R/W |

| | | |
|---|---|---|
| 0700 | PV gain -5000～5000 | R/W |
| 0701 | PV offset -5000～5000 | R/W |
| 0702 | PV filter 0～10000 | R/W |

| | | |
|---|---|---|
| 0704 | input temperature unit 0:℃ 1:F 2:K | R/W |
| 0705 | mesuring range refer to measuring code table | R/W |
| 0706 | Reference junction compensation 0:Internal 1:External | R/W |

| | | |
|---|---|---|
| 0707 | Decimal point position 0:****0 1:***0.0 2:**0.00 3:*0.000 4:0.0000 | R/W |
| 0708 | input scaling lower limit | R/W |
| 0709 | input scaling upper limit | R/W |

| | | |
|---|---|---|
| 070D | PV limiter Lo | R/W |
| 070E | PV limiter Hi | R/W |

| | | |
|---|---|---|
| 0720 | PV-SV correction point1 | R/W |
| 0721 | PV-SV correction value1 | R/W |
| 0722 | PV-SV correction point2 | R/W |
| 0723 | PV-SV correction value2 | R/W |
| 0724 | PV-SV correction point3 | R/W |
| 0725 | PV-SV correction value3 | R/W |
| 0726 | PV-SV correction point4 | R/W |
| 0727 | PV-SV correction value4 | R/W |
| 0728 | PV-SV correction point5 | R/W |
| 0729 | PV-SV correction value5 | R/W |
| 072A | PV-SV correction point6 | R/W |

| | | |
|---|---|---|
| 072B | PV-SV correction value6 | R/W |
| 072C | PV-SV correction point7 | R/W |
| 072D | PV-SV correction value7 | R/W |
| 072E | PV-SV correction point8 | R/W |
| 072F | PV-SV correction value8 | R/W |
| 0730 | PV-SV correction point9 | R/W |
| 0731 | PV-SV correction value9 | R/W |
| 0732 | PV-SV correction point10 | R/W |
| 0733 | PV-SV correction value10 | R/W |
| 0734 | PV-SV correction point11 | R/W |
| 0735 | PV-SV correction value11 | R/W |
| 0736 | PV-SV correction mode 0:OFF 1:LINEA 2:PV_PV 3:SV_PV 4:AI_SV | R/W |

| | | |
|---|---|---|
| 0800 | program mode FIX/PROG 0:FIX 1:PROG | R/W |

| | | |
|---|---|---|
| 0802 | program pattern No, selection 1～8 | R/W |

| | | |
|---|---|---|
| 0818 | program pattern number 1,2,3,4,6,8 | R/W |
| 0819 | time unit 0:MMSS 1:HHMM 2:HHHH | R/W |
| 081A | power failure compensation 0:OFF 1:ON | R/W |

| | | |
|---|---|---|
| 0820 | ＦＩＸ mode ＳＶ１ PID No. 1～8 | R/W |
| 0821 | ＦＩＸ mode ＳＶ２ PID No. 1～8 | R/W |
| 0822 | ＦＩＸ mode ＳＶ３ PID No. 1～8 | R/W |
| 0823 | ＦＩＸ mode ＳＶ４ PID No. 1～8 | R/W |
| 0824 | ＦＩＸ mode ＳＶ５ PID No. 1～8 | R/W |
| 0825 | ＦＩＸ mode ＳＶ６ PID No. 1～8 | R/W |
| 0826 | ＦＩＸ mode ＳＶ７ PID No. 1～8 | R/W |
| 0827 | ＦＩＸ mode ＳＶ８ PID No. 1～8 | R/W |

| | | |
|---|---|---|
| 0830 | SV1-EV1 | R/W |
| 0831 | SV1-EV2 | R/W |
| 0832 | SV1-EV3 | R/W |
| 0833 | SV1-EV4 | R/W |

| | | |
|---|---|---|
| 0834 | SV2-EV1 | R/W |
| 0835 | SV2-EV2 | R/W |
| 0836 | SV2-EV3 | R/W |
| 0837 | SV2-EV4 | R/W |

| | | |
|---|---|---|
| 0838 | SV3-EV1 | R/W |
| 0839 | SV3-EV2 | R/W |
| 083A | SV3-EV3 | R/W |
| 083B | SV3-EV4 | R/W |

| | | |
|---|---|---|
| 083C | SV4-EV1 | R/W |
| 083D | SV4-EV2 | R/W |
| 083E | SV4-EV3 | R/W |
| 083F | SV4-EV4 | R/W |

| | | |
|---|---|---|
| 0840 | SV5-EV1 | R/W |
| 0841 | SV5-EV2 | R/W |
| 0842 | SV5-EV3 | R/W |
| 0843 | SV5-EV4 | R/W |

| | | |
|---|---|---|
| 0844 | SV6-EV1 | R/W |
| 0845 | SV6-EV2 | R/W |
| 0846 | SV6-EV3 | R/W |
| 0847 | SV6-EV4 | R/W |

| | | |
|---|---|---|
| 0848 | SV7-EV1 | R/W |
| 0849 | SV7-EV2 | R/W |
| 084A | SV7-EV3 | R/W |
| 084B | SV7-EV4 | R/W |

| | | |
|---|---|---|
| 084C | SV8-EV1 | R/W |
| 084D | SV8-EV2 | R/W |
| 084E | SV8-EV3 | R/W |
| 084F | SV8-EV4 | R/W |

| | | |
|---|---|---|
| 0900 | Pattern No. (RAM) 1～8 | R/W |
| 0901 | Step No. (RAM) 1～96 | R/W |

| | | |
|---|---|---|
| 0903 | end step setup 1～96 (MAX value same as STEP No,) | R/W |

| | | |
|---|---|---|
| 0906 | Start SV | R/W |
| 0907 | Gurantee soak zone 0:OFF 1:ON | R/W |

| | | |
|---|---|---|
| 0909 | start mode setup 0:SV 1:PV | R/W |

| | | |
|---|---|---|
| 090C | Number of excution pattern setup 1～30000 30001 : Infinity | R/W |

| | | |
|---|---|---|
| 0910 | PTN-EV1 | R/W |
| 0911 | PTN-EV2 | R/W |
| 0912 | PTN-EV3 | R/W |
| 0913 | PTN-EV4 | R/W |

| | | |
|---|---|---|
| 0950 | step SV value | R/W |
| 0951 | step time 000:00～300:00 infinity:30001 (Unit MMSS,HHMM)<br>0000.0～3000.0 infinity:30001 (Unit HHHH)<br>＊MMSS,HHMM<br>Display upper 3digt and lower 2digt at 5digit on decimal system<br><br>*HHHH<br>Display upper 3digt and lower 1digt at 4digit on decimal system | R/W |
| 0952 | Step out1 PIDNo. 1～8 | R/W |

| | | | |
|---|---|---|---|
| 0960 | Time signal 1 | ON time -1:OFF ＊Besides same as Step time | R/W |
| 0961 | | OFF time -1:OFF ＊Besides same as Step time | R/W |
| 0962 | Time signal 2 | ON time -1:OFF ＊Besides same as Step time | R/W |
| 0963 | | OFF time -1:OFF ＊Besides same as Step time | R/W |
| 0964 | Time signal 3 | ON time -1:OFF ＊Besides same as Step time | R/W |
| 0965 | | OFF time -1:OFF ＊Besides same as Step time | R/W |
| 0966 | Time signal 4 | ON time -1:OFF ＊Besides same as Step time | R/W |
| 0967 | | OFF time -1:OFF ＊Besides same as Step time | R/W |

| | | | |
|---|---|---|---|
| 0A00 | OUT1-PID1 | A parameter 0～100 | R/W |
| 0A01 | | B parameter 0～100 | R/W |
| 0A02 | | C parameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A08 | OUT1-PID2 | Aparameter 0～100 | R/W |
| 0A09 | | Bparameter 0～100 | R/W |
| 0A0A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A10 | OUT1-PID3 | Aparameter 0～100 | R/W |
| 0A11 | | Bparameter 0～100 | R/W |
| 0A12 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A18 | OUT1-PID4 | Aparameter 0～100 | R/W |
| 0A19 | | Bparameter 0～100 | R/W |
| 0A1A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A20 | OUT1-PID5 | Aparameter 0～100 | R/W |
| 0A21 | | Bparameter 0～100 | R/W |
| 0A22 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A28 | OUT1-PID6 | Aparameter 0～100 | R/W |
| 0A29 | | Bparameter 0～100 | R/W |
| 0A2A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A30 | OUT1-PID7 | Aparameter 0～100 | R/W |
| 0A31 | | Bparameter 0～100 | R/W |
| 0A32 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A38 | OUT1-PID8 | Aparameter 0～100 | R/W |
| 0A39 | | Bparameter 0～100 | R/W |
| 0A3A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A60 | OUT2-PID1 | Aparameter 0～1.00 | R/W |
| 0A61 | | Bparameter 0～100 | R/W |
| 0A62 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A68 | OUT2-PID2 | Aparameter 0～100 | R/W |
| 0A69 | | Bparameter 0～100 | R/W |
| 0A6A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A70 | OUT2-PID3 | Aparameter 0～100 | R/W |
| 0A71 | | Bparameter 0～100 | R/W |
| 0A72 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A78 | OUT2-PID4 | Aparameter 0～100 | R/W |
| 0A79 | | Bparameter 0～100 | R/W |
| 0A7A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A80 | OUT2-PID5 | Aparameter 0～100 | R/W |
| 0A81 | | Bparameter 0～100 | R/W |
| 0A82 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A88 | OUT2-PID6 | Aparameter 0～100 | R/W |
| 0A89 | | Bparameter 0～100 | R/W |
| 0A8A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A90 | OUT2-PID7 | Aparameter 0～100 | R/W |
| 0A91 | | Bparameter 0～100 | R/W |
| 0A92 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A98 | OUT2-PID8 | Aparameter 0～100 | R/W |
| 0A99 | | Bparameter 0～100 | R/W |
| 0A9A | | Cparameter 0～100 | R/W |

| | | |
|---|---|---|
| 0B00 | selection of PID method 1～2 | R/W |
| 0B01 | Input sampling period 0:50msec 1:167msec 2:250msec 3:500msec | R/W |
| 0B02 | Bar graph LED allotment selection 0:NON 1:DEV 2:OUT1 3:OUT2 4:S_TIM 5:P_STP 6:P_CNT 7:SERVO | R/W |
| 0B03 | LED Brightness selection 1～4 | R/W |
| 0B04 | LED Contrast selection 1～3 | R/W |

★The additional address by which below can access only the time of infrared rays communication

| | | | |
|---|---|---|---|
| 8000 | Board rate | 0:1200 2:2400 3:4800 4:9600 5:19200 6:38400 | R/W |
| 8001 | Data lenght | 7～8 | R/W |
| 8002 | Data parity | 0:NON 1:ODD 2:EVE | R/W |
| 8003 | Stop bit | 1～2 | R/W |
| 8004 | Start character | 0:STX 1:ATT | R/W |
| 8005 | BCC Mode | 0:NON 1:ADD 2:ADD2 3:XOR 4:LRC 5:CR16 | R/W |
| 8006 | Address | -1:MAST2 0:MAST1 1～255 | R/W |
| 8007 | Delay time | 1～500 | R/W |
| 8008 | Memory mode | 0:RAM 1:MIX 2:EEP | R/W |

| | | | |
|---|---|---|---|
| 8010 | HOST Mode | 0:SV 1:OUT1 2:O1SC 3:OUT2 4:O2SC | R/W |
| 8011 | HOST Address area L | 0:BCAS 1～255 | R/W |
| 8012 | HOST Address area H | 1～255 | R/W |
| 8013 | HOST Write-in Data Address | 0x0000～0xFFFF(16bitDat ALL Acceptable) | R/W |

**Measuring code table**

| Thermo couple | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Character | Code | ℃ | | Centigrade | ℉ | | Fahrenheit | K | | Kelvin |
| r 1 | 01 | −50. 0 | ～ | 1760. 0 | −50. 0 | ～ | 3200. 0 | 220. 0 | ～ | 2030. 0 |
| r 1 | 02 | −270. 0 | ～ | 1370. 0 | −450. 0 | ～ | 2500. 0 | 0. 0 | ～ | 1640. 0 |
| r2 | 03 | 0. 0 | ～ | 800. 0 | 0. 0 | ～ | 1500. 0 | 270. 0 | ～ | 1070. 0 |
| r3 | 04 | −200. 0 | ～ | 400. 0 | −300. 0 | ～ | 700. 0 | 70. 0 | ～ | 670. 0 |
| r4 | 05 | 0. 0 | ～ | 300. 0 | 0. 0 | ～ | 600. 0 | 270. 0 | ～ | 570. 0 |
| J 1 | 06 | −200. 0 | ～ | 1200. 0 | −320. 0 | ～ | 2200. 0 | 70. 0 | ～ | 1470. 0 |
| J2 | 07 | 0. 0 | ～ | 600. 0 | 0. 0 | ～ | 1100. 0 | 270. 0 | ～ | 870. 0 |
| t 1 | 08 | −270. 0 | ～ | 400. 0 | −450. 0 | ～ | 700. 0 | 0. 0 | ～ | 670. 0 |
| E 1 | 09 | −270. 0 | ～ | 1000. 0 | −450. 0 | ～ | 1800. 0 | 0. 0 | ～ | 1270. 0 |
| S 1 | 10 | −50. 0 | ～ | 1760. 0 | −50. 0 | ～ | 3200. 0 | 220. 0 | ～ | 2030. 0 |
| U 1 | 11 | −200. 0 | ～ | 400. 0 | −300. 0 | ～ | 700. 0 | 70. 0 | ～ | 670. 0 |
| n 1 | 12 | −270. 0 | ～ | 1300. 0 | −450. 0 | ～ | 2300. 0 | 0. 0 | ～ | 1570. 0 |
| b 1 | 13 | 0. 0 | ～ | 1820. 0 | 0 | ～ | 3300 | 270. 0 | ～ | 2090. 0 |
| S-26 | 14 | 0. 0 | ～ | 2320. 0 | 0 | ～ | 4200 | 270. 0 | ～ | 2590. 0 |
| PL2 | 15 | 0. 0 | ～ | 1390. 0 | 0. 0 | ～ | 2500. 0 | 270. 0 | ～ | 1660. 0 |
| RTD | | | | | | | | | | |
| P 1 | 16 | −200. 0 | ～ | 850. 0 | −300. 0 | ～ | 1500. 0 | 70. 0 | ～ | 1120. 0 |
| P2 | 17 | −200. 00 | ～ | 300. 00 | −300. 0 | ～ | 600. 0 | 70. 00 | ～ | 570. 0 |
| P3 | 18 | −100. 00 | ～ | 300. 00 | −150. 0 | ～ | 600. 0 | 170. 0 | ～ | 570. 0 |
| P4 | 19 | −100. 00 | ～ | 200. 00 | −150. 0 | ～ | 400. 0 | 170. 0 | ～ | 470. 0 |
| P5 | 20 | −100. 00 | ～ | 100. 00 | −150. 00 | ～ | 200. 00 | 170. 0 | ～ | 370. 0 |
| P6 | 21 | 0. 00 | ～ | 200. 00 | 0. 0 | ～ | 400. 0 | 270. 0 | ～ | 470. 0 |
| P7 | 22 | 0. 00 | ～ | 100. 00 | 0. 00 | ～ | 200. 00 | 270. 0 | ～ | 370. 0 |
| P8 | 23 | −50. 00 | ～ | 50. 00 | −60. 00 | ～ | 120. 00 | 220. 00 | ～ | 320. 00 |
| P9 | 24 | −20. 000 | ～ | 30. 000 | 0. 00 | ～ | 100. 00 | 250. 00 | ～ | 300. 00 |
| JP 1 | 25 | −200. 0 | ～ | 500. 0 | −300. 0 | ～ | 900. 0 | 70. 0 | ～ | 770. 0 |
| JP2 | 26 | −20. 000 | ～ | 300. 00 | −300. 0 | ～ | 600. 0 | 70. 00 | ～ | 570. 0 |
| JP3 | 27 | −100. 00 | ～ | 300. 00 | −150. 0 | ～ | 600. 0 | 170. 0 | ～ | 570. 0 |
| JP4 | 28 | −100. 00 | ～ | 200. 00 | −150. 0 | ～ | 400. 0 | 170. 0 | ～ | 470. 0 |
| JP5 | 29 | −100. 00 | ～ | 100. 00 | −150. 00 | ～ | 200. 00 | 170. 00 | ～ | 370. 0 |
| JP6 | 30 | 0. 00 | ～ | 200. 00 | 0. 0 | ～ | 400. 0 | 270. 0 | ～ | 470. 0 |
| JP7 | 31 | 0. 00 | ～ | 100. 00 | 0. 00 | ～ | 200. 00 | 270. 0 | ～ | 370. 0 |
| JP8 | 32 | −50. 00 | ～ | 50. 00 | −60. 00 | ～ | 120. 00 | 220. 0 | ～ | 320. 00 |
| JP9 | 33 | −20. 000 | ～ | 30. 000 | 0. 00 | ～ | 100. 00 | 250. 00 | ～ | 300. 00 |
| Liner input | | | | | | | | | | |
| n 1 | 34 | −100 | ～ | 100 | mV | | Scaling−20000～32000<br>Span<br>10～50000 or less<br>Decimal point<br>Non 0. 1～0. 0001 | | | |
| n2 | 35 | 0 | ～ | 100 | | | | | | |
| n3 | 36 | 0 | ～ | 50 | | | | | | |
| n4 | 37 | 10 | ～ | 50 | | | | | | |
| n5 | 38 | 0 | ～ | 20 | | | | | | |
| n6 | 39 | −10 | ～ | 10 | | | | | | |
| n7 | 40 | 0 | ～ | 10 | | | | | | |
| U 1 | 41 | −10 | ～ | 10 | V | | | | | |
| U2 | 42 | 0 | ～ | 10 | | | | | | |
| U3 | 43 | 0 | ～ | 5 | | | | | | |
| U4 | 44 | 1 | ～ | 5 | | | | | | |
| U5 | 45 | 0 | ～ | 2 | | | | | | |
| U6 | 46 | −1 | ～ | 1 | | | | | | |
| U7 | 47 | 0 | ～ | 1 | | | | | | |
| nA 1 | 48 | 0 | ～ | 20 | mA | | | | | |
| nA2 | 49 | 4 | ～ | 20 | | | | | | |

### 9-2. Event Code Table

| function | | No, | Note |
|---|---|---|---|
| No allotment | non | 0 | |
| Upper limit absolute value alarm | HA | 1 | |
| Lower limit absolute value alarm | LA | 2 | |
| Within Absolute Value alarm | -A | 3 | |
| Without Absolute Value alarm | oA | 4 | |
| Scale over alarm | So | 5 | |
| Upper limit deviation value alarm | Hd | 6 | |
| Lower limit deviation value alarm | Ld | 7 | |
| Within deviation alarm | -d | 8 | |
| Without deviation alarm | od | 9 | |
| RUN signal | run | 10 | |
| CT1 Control loop alarm(heater braking) | ct1_b | 11 | CT |
| CT1 Control loop alarm (loop) | ct1_L | 12 | CT |
| CT2 Control loop alarm (Heater braking) | ct2_b | 13 | CT |
| CT2 Control loop alarm (loop) | ct2_L | 14 | CT |
| 3 phases Control loop alarm(Heater braking) | ct3_b | 15 | CT |
| 3 phases Control loop alarm (loop) | ct3_L | 16 | CT |
| Step signal | StP | 17 | Program |
| Pattern end signal | P_E | 18 | Program |
| Program end | End | 19 | Program |
| Step hold signal | HoLd | 20 | Program |
| Program signal | ProG | 21 | Program |
| Up slope signal | u_SL | 22 | Program |
| Down slope signal | d_SL | 23 | Program |
| Guarantee signal | GuA | 24 | Program |
| Time signal 1 | tS1 | 25 | Program |
| Time signal 2 | tS2 | 26 | Program |
| Time signal 3 | tS3 | 27 | Program |
| Time signal 4 | tS4 | 28 | Program |



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PRINTED IN JAPAN

# MAC6/MAP6 SERIES
# Digital Controller
# Infra-red ray Communication Instruction Manual

**Thank you for purchasing SHIMAX product. Please check that the product is the one you ordered. Please operate after you read the instruction manual and fully understand it.**

This instructions manual describes the communication interface, or option function of digital controller MAC6/MAP6. See the attached main body's instructions manual about operation of MAC6/MAP6 , and the details of each parameter.

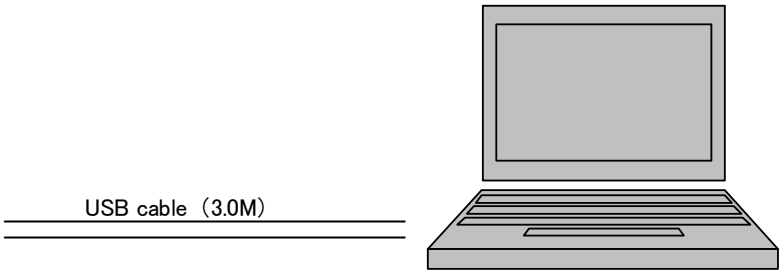
Table of Contents

## 1. Outline

MAC6/MAP6 Infra-red ray communication can be change parameter of MAC6/MAP6 from infra-red ray port from front panel.

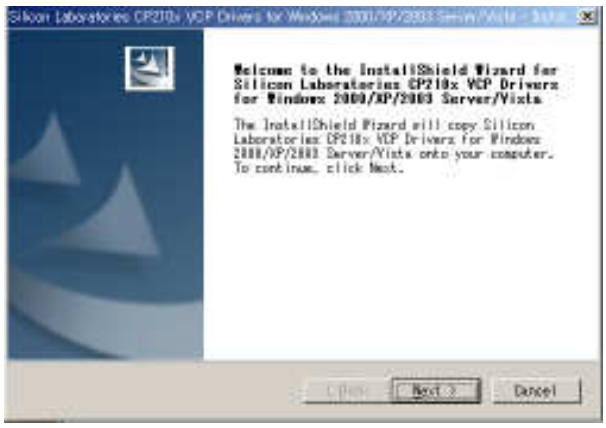
I is very easy to change the parametr that you want.

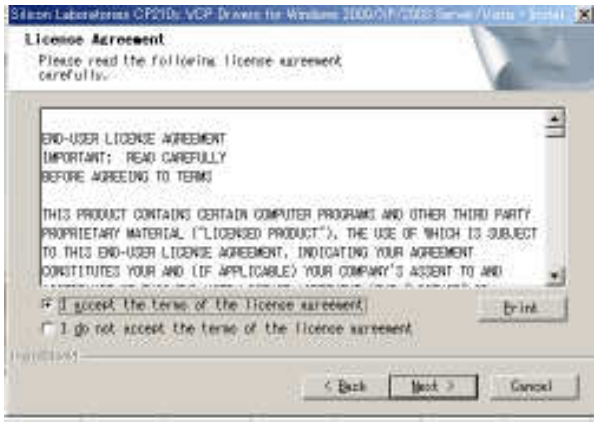
## 2 How to connect between Infra red ray adoptor and PC

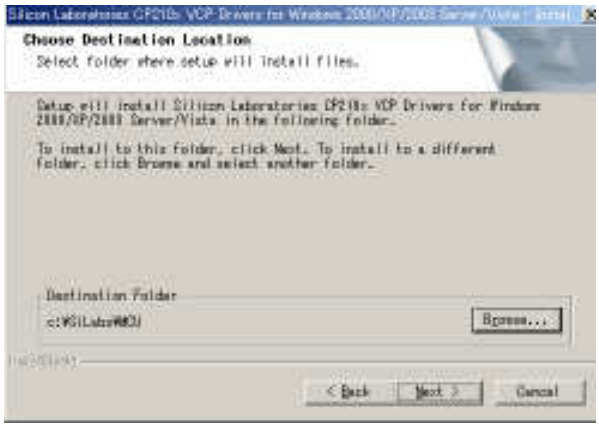


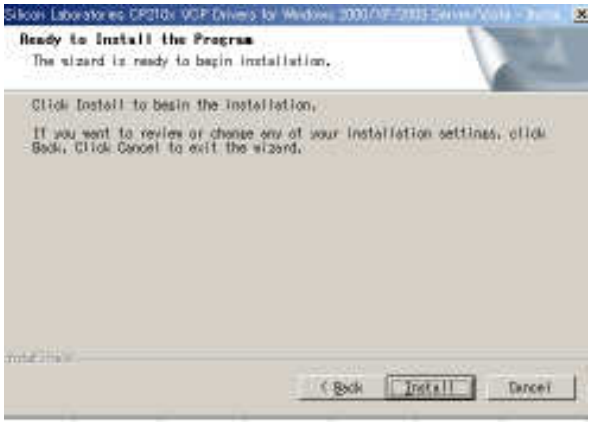

## 3 Installation of USB Driver

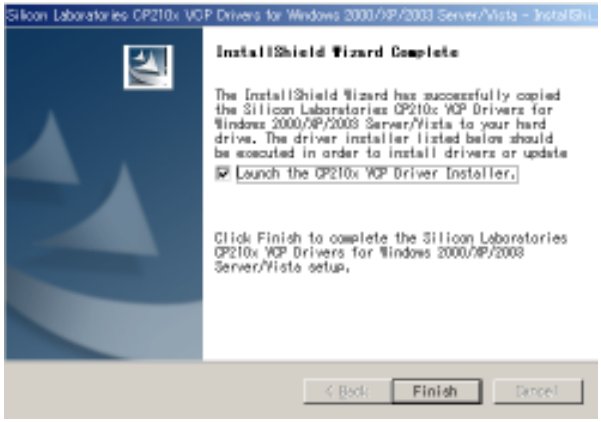
2 kind of driver both for win 98 and Win 2K, XP, VISTA , choose the driver to your P/C and install.




Choose Destination Location
Select folder where setup will install files.
Setup will install Silicon Laboratories CP210x VCP Drivers for Windows 2000/XP/2003 Server/Vista in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
Browse...
< Back
Next >
Cancel


Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
< Back
Install
Cancel


InstallShield Wizard Complete
The InstallShield Wizard has successfully copied the Silicon Laboratories CP210x VCP Drivers for Windows 2000/XP/2003 Server/Vista to your hard drive. The driver installer listed below should be executed in order to install drivers or update
Launch the CP210x VCP Driver Installer.
Click Finish to complete the Silicon Laboratories CP210x VCP Drivers for Windows 2000/XP/2003 Server/Vista setup.
< Back
Finish
Cancel

## 4 How to attach adoptor to MAC6/MAP6

Hung end of the adaptor to MAC6/MAP6

Clip the other side to MAC6/MAP6 and fix.

## 2. Outline of MODBUS Communication Protocol

### 2-1 Specification of MODBUS RTU

| | |
|---|---|
| protocol | Modbus RTU |
| Start bit | 1 (fix) |
| Data bit | 8 (fix) |
| Parity bit | none |
| Stop bit | 1 |
| Error checking | CRC-16 (Cycle redundancy check) |
| Time interval of data | Less than 28bit |
| Function code | 03(Read) ／ 06(Write) |
| Address | None |
| Transmission speed | 9600bps(fix) |
| R/W memory address | HEX4digits |
| Start character /end character | none |
| The number of simultaneous reading data | 1～10 |
| The number of simultaneous writing in data | 1 (fix) |
| Communication delay | 0 |

*MODBUS is a registered trademark of Schneider Electric.

### 2-2. Communication Procedure

1) Relation between master and slave
- A personal computer side is master side.
- MAC6/MAP6 is slave side.
- Communication is started by communication command from master side, and completed by communication answer from slave side. However, a communication answer is not performed when abnormalities, such as communication format error or BCC error etc., have been recognized.

2) Communication procedure
The slave side answers the master side, a transmitting right is transferred by turns, and a communication procedure is performed.

3) Communication data
RTU mode is 8-bit binary transmission.

| | | | |
|---|---|---|---|
| 01H | 23H | 45H | ABH |

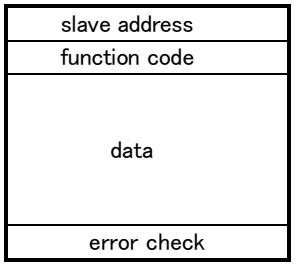
4) Message frame composition
RTU mode consists of only messages.

| |
|---|
| message |

5) Timeout
- RTU mode
When message stops during time equivalent to 28 bits, it is regarded as the end of message.
When a blank arises during time equivalent to 28 bits in the middle of message transmitting, it is judged as the end of message. It is an imperfect message, therefore slave performs no response.
* Reference: time equivalent to 28 bits (unit = msec)
9600bps:3.0

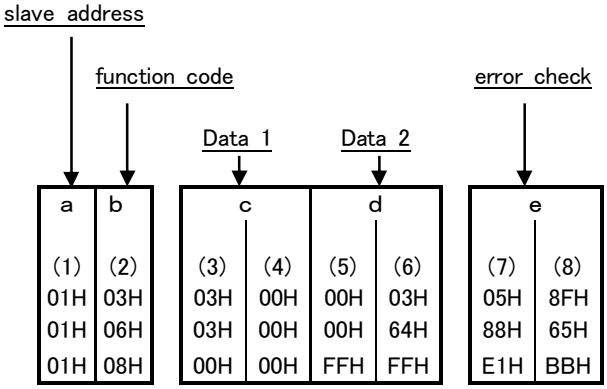
### 2-2. Communication Format

1) Composition of message
The MODBUS message has the following composition in RTU.
All the message components are treated not by a decimal number but by a hexadecimal number.




2) Communication command format (MODBUS:　Described by RTU because RTU is foundation)

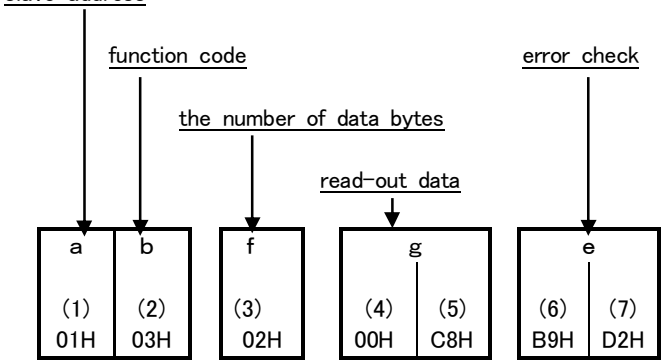
– As for the message from master, message length is being fixed regardless of the function code.



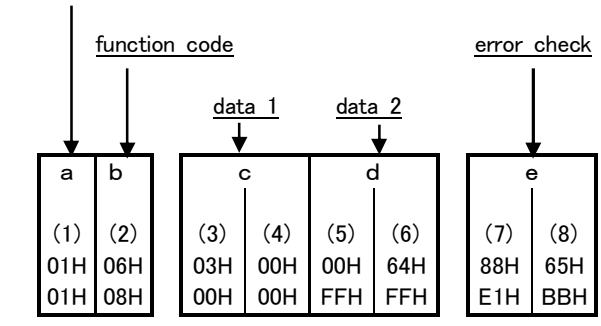

3)　Communication answer format (MODBUS: Described by RTU because RTU is foundations)

– The answer from a slave differs in message length along with a function code.

function code　03H




function code　06H.08H




a: Slave address

– The message which the master sent is received by all the connected equipment. Only the slave congruous with message's slave address answers the message.

– In MAC6/MAP6, 1～255 (01 H～FFH) can be appointed as slave address.

Note: In MODBUS specification, address which can be appointed to slave is 1～247 (01 H～F 7H)

b: Function code

- A code number shows the function to perform.

| function code | function |
|---|---|
| 03H | data read-out |
| 06H | data writing |
| 08H | loopback test |

c: Data 1
- Composition of data differs along with function code.

d: Data 2
- Composition of data differs along with function code.

| function code | data 1 content | data 2 content |
|---|---|---|
| 03H | data address | the number of read-out |
| 06H | data address | write-in data |
| 08H | fixed as 0000H | arbitrary data |

e: Error checking : CRC-16

f: The number of data bytes
- The number of read-out data bytes at the time of data read-out.
- Read-out demand is word unit; therefore it is twice of the number of read-out.

| the number of read-out | | the number of data bytes | |
|---|---|---|---|
| decimal number | hexa-decimal number | decimal number | hexa-decimal number |
| 1 | 01H | 2 | 02H |
| 2 | 02H | 4 | 04H |
| 3 | 03H | 6 | 06H |
| 4 | 04H | 8 | 08H |
| 5 | 05H | 10 | 0AH |
| 6 | 06H | 12 | 0CH |
| 7 | 07H | 14 | 0EH |
| 8 | 08H | 16 | 10H |
| 9 | 09H | 18 | 12H |
| 10 | 0AH | 20 | 14H |

g: Read-out data
- The data along with read-out demand is inserted.
- Along with the number of read-out, data length varies and there is no data breaking.
  The number of read-out is: 1 = 2 bytes, 3 = 6 bytes, and 10 = 20 bytes.

## 2-3. Error Checking

Error checking is calculated by the sending side and the result is attached to the end of outgoing message.
Error checking of incoming message is calculated by the reception side.
The result is checked if it is the same as received error checking.
If the check results met, incoming message is judged to be right, and answer operation to reception is started.
If it differs, data is judged as abnormal, and slave performs no response.

(1)CRC-16

CRC-16 is 2 bytes (16 bits) of error-checking code.
CRC-16 is calculated in the following procedures from slave address to the end of data.

1. to initialize CRC register by FFFFH.
2. Exclusive OR with CRC register and the first 1 byte of message.
   A calculation result is written in CRC register.
3. Shift 1 bit of CRC registers to the right.
4. If carry fragment (shift-out bit) is 1, exclusive OR with CRC register and A001H.
   The calculation result is written in CRC register.
5. Repeat 3. and 4. until it shifts eight times.

6. Exclusive OR with CRC register and 1 byte next to message.
   The calculation result is written in CRC register.
7. 3.～ 6. is repeated to all the data except CRC.
8. Data byte is calculated to the end. The computed CRC register value is assigned to a message in order of low rank and high rank.

## 2-4. Data Read-out (Function Code 03H) Details

Function code 03H is used on occasions when it reads (takes in) various data from a personal computer, etc.

(1) Data read-out format

- The format at the time of data read-out is as follows.

| a | b | c | | d | | e | |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 01H | 03H | 04H | 00H | 00H | 03H | 04H | FBH |

a: Slave address
b: Data read-out function code
c: Read-out lead data address
d: The number of read-out data from lead data address
＊The numbers of data which can be read is 1～10.
Therefore, binary code permitted here is 0001H～000AH, and error code is returned if value other than the above is appointed.
e: Error checking

- The above-mentioned command is as follows.
  Read-out lead data address = 0400H (hexadecimal number)
  The number of read-out data = 0003H (hexadecimal number)
  Three data read-out is appointed from data address 0400H

(2) The normal answer format at the time of data read-out

- The normal answer format to function code 03H is as follows.

| a | b | f | g | | | | | | e | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0400H | | 0401H | | 0402H | | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| 01H | 03H | 06H | 00H | 1EH | 00H | 78H | 00H | 1EH | 89H | 66H |

a: Slave address
b: Function code
f: The number of read-out data bytes
＊three data read-out, so 6 bytes read-out. Therefore, it is 06H.
g: Read-out data
1. The same number of data as that of read-out data is inserted from read-out's data of lead data address, in order.
2. Nothing is inserted between data.
3. One data consists of binary digit 16 bits data(1 word) except for a decimal point.
4. Each data has position of peculiar decimal point.

e: Error checking

read-out lead data address (0400H) → number of read-out data (0003H:3)

| data address 16 bits (1 word) | data 16 bits (1 word) | |
|---|---|---|
| hexadecimal number | hexadecimal number | decimal number |
| 0400 | 001E | 30 |
| 0401 | 0078 | 120 |
| 0402 | 001E | 30 |

(3) The abnormal answer format at the time of data read-out

| a | b | h | e | |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| 01H | 83H | 03H | 01H | 31H |

a: Slave address
b: Function code
　＊ At the time of error, reception function code +80H is shown. It informs abnormal answer.
h: Error code
　＊ See **6-8. Error Message Details** about details of error code.
e: Error checking

### 2-5. Data Write-in (Function Code 06H) Details

Function code 06H is used on occasions when it writes in (changes) various data from a personal computer, etc.

(1) Data write-in format
　- The format at the time of data writing is as follows.

| a | b | c | | d | | e | |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 01H | 06H | 03H | 00H | 00H | 64H | 88H | 65H |

a: Slave address
b: Data write-in function code
c: A write-in data address
d: Write-in data
　1. Data consists of binary digit 16 bits data (1 word) except for a decimal point.
　2. Each data has position of peculiar decimal point.
e: Error checking

　- The above-mentioned command is as follows.
　　write-in lead data address　= 0300H　(hexadecimal number)
　　write-in data　= 0064H　(hexadecimal number)
　　= 100　(decimal number)
　Writing of the data addresses, 0300H (100:10 decimal numbers), is appointed.

address (0300H) →
write-in data (0064H)

| data address 16 bits (1 word) | data 16 bits (1 word) | |
|---|---|---|
| hexadecimal number | hexadecimal number | decimal number |
| 0300 | 0064 | 100 |
| 0301 | 0000 | 0 |
| 0302 | 0000 | 0 |

(2) The normal answer format at the time of data writing
　- The normal answering format to function code 06H is as follows.

| a | b | c | | d | | e | |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 01H | 06H | 03H | 00H | 00H | 64H | 88H | 65H |

　＊ The same one as the outgoing message from master is answered.

(3) The abnormal answer format at the time of data writing

| a | b | h | e | |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| 01H | 86H | 02H | C3H | A1H |

a: Slave address

b: Function code
＊ At the time of error, reception function code +80H is shown. It informs abnormal answer.
h: Error code
＊ See **6-8. Error Message Details** about error code details.
e: Error checking

## 2-6 Loopback Test (Function Code 08H) Details

The function code 08H returns the message from master as response massage as it is.
It is used as communication diagnosis between master and slave.

(1) Loopback format
- The format at the time of a loopback test is as follows.

| a | b | c | | d | | e | |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 01H | 08H | 00H | 00H | FFH | FFH | E1H | BBH |

a: Slave address
b: Data write-in function code
c: Test code
＊ Fixed as 0000H
d: Arbitrary data
＊ arbitrary 16 bit data of 0000H～FFFFH
e: Error checking

(2) Loopback normal answer format
- The normal answer format to the function code 08H is as follows.

| a | b | c | | d | | e | |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 01H | 08H | 00H | 00H | FFH | FFH | E1H | BBH |

＊ The same one as the outgoing message from master is answered.

(3) The abnormal answer format at the time of loopback

| a | b | h | e | |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| 01H | 88H | 02H | C7H | C1H |

a: Slave address
b: Function code
＊ At the time of error, reception function code +80H is shown. It informs abnormal answer.
h: Error code
＊ See **6-8. Error Message Details** about error code details.
e: Error checking

## 2-7. No Response Conditions

Slave does not answer when the following abnormalities have been recognized.
- when hardware error takes place (overrun, framing, parity error)
- when slave address differs from its own address
- when the data interval of message is long.
  (RTU: time to be equivalent to 28 bits or more )
- when the message from master is not regulated one (Message is too long etc.,)

## 2-8. Error Message Details

Error code corresponding to the type of error is answered, when error other than no response condition is detected.

(1) Abnormal answer format

| a | b | h | e | |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| 01H | 83H | 03H | 01H | 31H |

a: Slave address
b: Function code
1. At the time of error, reception function code +80H is shown. It informs abnormal answer.
2. +80H is not shown at the time of function code beyond 80H, and returned as it is.
h: Error code
＊See the following table.
e: Error checking

| Error Code | Content of Errors |
|---|---|
| 01H | Function code error<br>– when function code other than regulated one is received<br>(All other than three sorts,< 03H, 06H, 08H>, correspond to this category) |
| 02H | Address error<br>– when it is written in the address only for reading<br>– when the address only for writing is read<br>– when a test code is not 0000H at the time of loopback test<br>– when non-existing address is appointed in the lead of read-out or write-in address.<br>(not yet added option etc. is included) |
| 03H | Data error<br>– when write-in data exceeds the writable data range (when ones other than 0 and 1 are written in AUTO/MANU switching etc.)<br>– when the written-in value had been already filled by other one, in the item only for an exclusion setup (DI corresponds to this)<br>– when the number of read-out data and the number possible to read-out is different.(In MAC6/MAP6, read-out is permitted between 1～10.)<br>An error code is answered when read-out is 0, or over 11.<br>– when the number of read-out data and the number possible to read-out is different.(In MAC6/MAP6, read-out is permitted between 1～10.)<br>– when parameter is rewritten under circumstances a change is not permitted (Items such as:at the time of change by key operation, a screen displays nothing or a change is impossible) |

(2) The priority of error code

The priority of error code becomes high as the value of error code becomes small. On occasions when plural error codes occur, the high priority error code is returned.

Example: Even if there are data error and address errors, 01H is returned when function code error is detected.

**2-9. Communication Data Address Details**

(1) Data address
– As for data address, binary digit (16 bit data) is expressed with hexadecimal number every 4 bits.

(2) About read-out (read)/write-in (write).
– R/W is the data in which read-out and writing are possible
– R is read-only data
– W is data only for writing.
– when the data address only for writing is appointed in data read-in (Function code 03H),
– when the read-only data address is appointed in data write-in (Function code 06H), it becomes address error and error code 02H is answered.

(3) Data address and the number of data

- When the data address, which is not described in data address, is appointed as lead data address,it becomes address error and error code 02H is answered.
- When the data address, to which the number of data is added, becomes outside of listed data address, in the area of outside-address, as data 0000 H is answered always.

(4) Data

- Since each data does not have a decimal point (16 bit data), the check of data type and decimal point is needed. (See the instruction manual of main body)
- In the case of the data whose unit is UNIT, measuring range determines the position of a decimal point.
- All the data is treated as binary digit with a code (16 bit data: −32768 ～ 32767).

Example: Method to express data with a decimal point

| | | Hexadecimal data |
|---|---|---|
| 20.0 | → 200 | → 00C8 |
| 100.00 | → 10000 | → 2710 |
| −40.00 | → −4000 | → F060 |

Example: Method to express 16 bit data

| data with code | |
|---|---|
| decimal number | hexadecimal number |
| 0 | 0000 |
| 1 | 0001 |
| ≈ | ≈ |
| 32767 | 7FFF |
| −32768 | 8000 |
| −32767 | 8001 |
| ≈ | |
| −2 | FFFE |
| −1 | FFFF |

(5) An option-related parameter

- When the data address of the parameter, which is not listed as an option, is appointed, it results in an error both at Read command (R) and Write command (W).And error code 02H is answered

(6) The parameter which is not displayed in an operator display because of operation specification or setting specification

-The parameter, which is not displayed (not used) in an operator display because of operation specification and setup specification, is possible to read-out in communication.
However, write-in becomes data error and error code 03H is answered.

Data address table

| Adress | Parameter | R/W |
|---|---|---|
| 0040 | Series 1 'M' 'A' | R |
| 0041 | Series 2 PROG '*' '6' *:C P | R |
| 0042 | Series 3 'A' 'O' | R |
| 0043 | Series 4 OUT1 'M' '#' #:C S I V Y X | R |
| 0044 | Software ver1 'O' '1' | R |
| 0045 | Software ver2 'O' 'O' | R |
| 0046 | Option 1 EV+OUT2 '*' '#' *:N E #:N C S I V E | R |
| 0047 | Option 2 DI+DO '*' '#' *:N D #:N J | R |
| 0048 | Opton 3 DO+AI '*' '#' *:N J H P #:N I V | R |
| 0049 | Option 4 AO+COM '*' '#' *:N T V #:N R W | R |
| 004A | NOTE No, | R |

| | | |
|---|---|---|
| 0050 | Device ID PV Ten thousand or one thousand digits ASCII code | R |
| 0051 | Device ID PV Ten thousand or one thousand digits ASCII code | R |
| 0052 | Device ID PV —, SV Ten thousand digits ASCII code | R |
| 0053 | Device ID SV One thousand or one hundred digits ASCII code | R |
| 0054 | Device ID SV Ten or one digits ASCII code | R |

★For example 6730460426

| Address | 0x0050 | 0x0051 | 0x0052 | 0x0053 | 0x0054 |
|---|---|---|---|---|---|
| Data | 0x36, 0x37 | 0x33, 0x30 | 0x34, 0x36 | 0x30, 0x34 | 0x32, 0x36 |

It overflows LONG as a result of the check parity function, so I make them read by an ASCII code.

| | | |
|---|---|---|
| 0100 | Mesuring value HHHH, CJHH, b---:0x7FFF LLLL, CJLL:0x8000 | R |
| 0101 | Excution SV value, within SV limiter | R |
| 0102 | Control Output 1 Value 0.0 ～100.0 | R |
| 0103 | Control Output 2 Value 0.0 ～100.0 | R |
| 0104 | Operation flagument<br>D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0<br>0 0 0 0 0 0 AT/W 0 0 0 0 0 0 STBY MAN AT<br>※On at the time AT/W:AT standby On at the time STBY:STBY(RST)<br>On at the time of MAN:MAN On at the time of AT:AT | R |
| 0105 | Event out flagment<br>D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0<br>0 0 0 0 0 0 DO6 DO5 DO4 DO3 DO2 DO1 EV4 EV3 EV2 EV1<br>※On at the time of EV3:EV3LED lighting On at the time of EV2:EV2LED lighting<br>On at the time of EV1:EV1LED lighting | R |
| 0106 | FIX Excution SV No. 1～8 | R |
| 0107 | Excution PID No. | R |
| 0108 | AI monitor | R |
| 0109 | CT 1 electric-current value | R |
| 010A | CT2 electric-Current value | R |
| 010B | DI input state flagment<br>D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0<br>0 0 0 0 0 0 0 0 0 DI7 DI6 DI5 DI4 DI3 DI2 DI1 | R |

| | | |
|---|---|---|
| 010D | Lacthing state Flagment<br>D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0<br>0 0 0 0 0 0 DO6 DO5 DO4 DO3 DO2 DO1 EV4 EV3 EV2 EV1<br>※In latching operating state, applicable bit turns ON at the time of event retention | R |
| 010E | Relay ON/OFF Flagment<br>D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0<br>0 0 0 0 0 0 DO6 DO5 DO4 DO3 DO2 DO1 EV4 EV3 EV2 EV1<br>※NO/NC setting availavle therefore it will not be event on = relay on.<br>At the time of Relay is ON , Flagment is ON | R |

| | | |
|---|---|---|
| 0120 | Program operation Flagment<br>D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0<br>PRG 0 0 0 0 UP LVL DW 0 0 0 0 SKIP 0 HOLD RUN<br>ON at the time of PRG:PROG OFF at the time of FIX<br>UP: ON during program is ascending LVL: ON during program flatness<br>DW: ON during program is descending SKIP:ON at the time of SKIP execution<br>HOLD: ON at the time of HOLD execution RUN: ON at the time of RUN | R |
| 0121 | Program excution No, No. 1～8 | R |

| | | |
|---|---|---|
| 0123 | Number of excution pattern ※Count the excution pattern 1～30001(Infinity Up to 30000 it clipped 30001 more than 30000) | R |
| 0124 | Excution step No, 1～96 | R |
| 0125 | Excution step time MM:SS ,HH:MM 000:00 ～300:00 HHH.H 0000.1 ～3000.0<br>Infinity 30001 | R |
| 0126 | Excution PID No. | R |

| | | |
|---|---|---|
| 0133 | Remaining Excution pattern No, 0～29999(Infinity 30001) | R |

| | | |
|---|---|---|
| 0135 | Remaining Excution step time MM:SS ,HH:MM 000:00 ～300:00 HHH.H 0000.1 ～3000.0<br>Infinity 30001 | R |

| | | |
|---|---|---|
| 0142 | servo position monitor | R |

| | | |
|---|---|---|
| 0180 | FIX excution SV No. 1～8 | W |

| | | |
|---|---|---|
| 0182 | Control output 1 manual setting value ※Only at the time of manual | W |
| 0183 | Control output 2 manual setting value ※Only at the time of manual | W |
| 0184 | ＡＴ excution OFF:0 ON:1 | W |
| 0185 | AUTO/MANU switching AUTO:0 MANU:1 | W |
| 0186 | RUN/STBY switching RUN:0 STBY:1 | W |

| | | |
|---|---|---|
| 0191 | Hold excution OFF:0 ON:1 | W |
| 0192 | Skip excution OFF:0 ON:1 | W |

| | | |
|---|---|---|
| 0198 | Latching release OFF:0 EV1:1 EV2:2 EV3:3 EV4:4<br>DO1:5 DO2:6 DO3:7 DO4:8 DO5:9 DO6:10 | W |

| | | |
|---|---|---|
| 0300 | ＦＩＸ Mode ＳＶ１ | R/W |
| 0301 | ＦＩＸ Mode ＳＶ２ | R/W |
| 0302 | ＦＩＸ Mode ＳＶ３ | R/W |
| 0303 | ＦＩＸ Mode ＳＶ４ | R/W |
| 0304 | ＦＩＸ Mode ＳＶ５ | R/W |
| 0305 | ＦＩＸ Mode ＳＶ６ | R/W |
| 0306 | ＦＩＸ Mode ＳＶ７ | R/W |
| 0307 | ＦＩＸ Mode ＳＶ８ | R/W |

| | | |
|---|---|---|
| 030A | ＳＶ limiter lower limit value | R/W |
| 030B | ＳＶ limiter upper limit value | R/W |

| | | |
|---|---|---|
| 030C | RAMP mode 0,1,10,11,100,101,110,111,200,201,210,211 | R/W |
| 030D | RAMP Start SV | R/W |
| 030E | RAMP time Unit 0:MMSS 1:HHMM 2:HHHH | R/W |
| 030F | RAMPtime 000:01～300:00 (At time unit MMSS,HHMM)<br>0000.1～3000.0 (At time unit HHHH) | R/W |

| | | |
|---|---|---|
| 0314 | AI scaling L | R/W |
| 0315 | AI scaling H | R/W |
| 0316 | AI offset -5000～5000 | R/W |
| 0317 | AI filter 0～10000 | R/W |

| | | |
|---|---|---|
| 031A | AI Mode 0:NON 1:SV 2:PV OF 3:OUT1L 4:OUT1H 5:MANU 1 6:OUT2L 7:OUT2H 8:MANU 2<br>9:EV1 10:EV2 11:EV3 12:EV4 13:DO1 14:DO2 15:DO3 16:DO4 17:DO5<br>18:DO6 | R/W |

| | | |
|---|---|---|
| 031F | AI gain -5000～5000 | R/W |

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|---|---|---|---|
| 0400 | OUT1-PID1 | proportional band 0:OFF 1～10000 | R/W |
| 0401 | | integration time 0:OFF 1～6000 | R/W |
| 0402 | | derivative time 0:OFF 1～3600 | R/W |
| 0403 | | manual reset -500～500 | R/W |
| 0404 | | differential gap Lo 1～10000 | R/W |
| 0405 | | output limiter lower limit 0～999 | R/W |
| 0406 | | output limiter upper limit 1～1000 | R/W |
| 0407 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0408 | OUT1-PID2 | proportional band 0:OFF 1～10000 | R/W |
| 0409 | | integration time 0:OFF 1～6000 | R/W |
| 040A | | derivative time 0:OFF 1～3600 | R/W |
| 040B | | manual reset -500～500 | R/W |
| 040C | | differential gap Lo 1～10000 | R/W |
| 040D | | output limiter lower limit 0～999 | R/W |
| 040E | | output limiter upper limit 1～1000 | R/W |
| 040F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0410 | OUT1-PID3 | proportional band 0:OFF 1～10000 | R/W |
| 0411 | | integration time 0:OFF 1～6000 | R/W |
| 0412 | | derivative time 0:OFF 1～3600 | R/W |
| 0413 | | manual reset -500～500 | R/W |
| 0414 | | differential gap Lo 1～10000 | R/W |
| 0415 | | output limiter lower limit 0～999 | R/W |
| 0416 | | output limiter upper limit 1～1000 | R/W |
| 0417 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0418 | OUT1-PID4 | proportional band 0:OFF 1～10000 | R/W |
| 0419 | | integration time 0:OFF 1～6000 | R/W |
| 041A | | derivative time 0:OFF 1～3600 | R/W |
| 041B | | manual reset -500～500 | R/W |
| 041C | | differential gap Lo 1～10000 | R/W |
| 041D | | output limiter lower limit 0～999 | R/W |
| 041E | | output limiter upper limit 1～1000 | R/W |
| 041F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0420 | OUT1-PID5 | proportional band 0:OFF 1～10000 | R/W |
| 0421 | | integration time 0:OFF 1～6000 | R/W |
| 0422 | | derivative time 0:OFF 1～3600 | R/W |
| 0423 | | manual reset -500～500 | R/W |
| 0424 | | differential gap Lo 1～10000 | R/W |
| 0425 | | output limiter lower limit 0～999 | R/W |
| 0426 | | output limiter upper limit 1～1000 | R/W |
| 0427 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0428 | OUT1-PID6 | proportional band 0:OFF 1～10000 | R/W |
| 0429 | | integration time 0:OFF 1～6000 | R/W |
| 042A | | derivative time 0:OFF 1～3600 | R/W |
| 042B | | manual reset -500～500 | R/W |
| 042C | | differential gap Lo 1～10000 | R/W |
| 042D | | output limiter lower limit 0～999 | R/W |
| 042E | | output limiter upper limit 1～1000 | R/W |
| 042F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0430 | OUT1-PID7 | proportional band 0:OFF 1～10000 | R/W |
| 0431 | | integration time 0:OFF 1～6000 | R/W |
| 0432 | | derivative time 0:OFF 1～3600 | R/W |
| 0433 | | manual reset -500～500 | R/W |
| 0434 | | differential gap Lo 1～10000 | R/W |
| 0435 | | output limiter lower limit 0～999 | R/W |
| 0436 | | output limiter upper limit 1～1000 | R/W |
| 0437 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0438 | OUT1-PID8 | proportional band 0:OFF 1～10000 | R/W |
| 0439 | | integration time 0:OFF 1～6000 | R/W |
| 043A | | derivative time 0:OFF 1～3600 | R/W |
| 043B | | manual reset -500～500 | R/W |
| 043C | | differential gap Lo 1～10000 | R/W |
| 043D | | output limiter lower limit 0～999 | R/W |
| 043E | | output limiter upper limit 1～1000 | R/W |
| 043F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0460 | OUT2-PID1 | proportional band 0:OFF 1～10000 | R/W |
| 0461 | | integration time 0:OFF 1～6000 | R/W |
| 0462 | | derivative time 0:OFF 1～3600 | R/W |
| 0463 | | Dead Band -20000～20000 | R/W |
| 0464 | | differential gap Lo 1～10000 | R/W |
| 0465 | | output limiter lower limit 0～999 | R/W |
| 0466 | | output limiter upper limit 1～1000 | R/W |
| 0467 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0468 | OUT2-PID2 | proportional band 0:OFF 1～10000 | R/W |
| 0469 | | integration time 0:OFF 1～6000 | R/W |
| 046A | | derivative time 0:OFF 1～3600 | R/W |
| 046B | | Dead Band -20000～20000 | R/W |
| 046C | | differential gap Lo 1～10000 | R/W |
| 046D | | output limiter lower limit 0～999 | R/W |
| 046E | | output limiter upper limit 1～1000 | R/W |
| 046F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0470 | OUT2-PID3 | proportional band 0:OFF 1～10000 | R/W |
| 0471 | | integration time 0:OFF 1～6000 | R/W |
| 0472 | | derivative time 0:OFF 1～3600 | R/W |
| 0473 | | Dead Band -20000～20000 | R/W |
| 0474 | | differential gap Lo 1～10000 | R/W |
| 0475 | | output limiter lower limit 0～999 | R/W |
| 0476 | | output limiter upper limit 1～1000 | R/W |
| 0477 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0478 | OUT2-PID4 | proportional band 0:OFF 1～10000 | R/W |
| 0479 | | integration time 0:OFF 1～6000 | R/W |
| 047A | | derivative time 0:OFF 1～3600 | R/W |
| 047B | | Dead Band -20000～20000 | R/W |
| 047C | | differential gap Lo 1～10000 | R/W |
| 047D | | output limiter lower limit 0～999 | R/W |
| 047E | | output limiter upper limit 1～1000 | R/W |
| 047F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0480 | OUT2-PID5 | proportional band 0:OFF 1～10000 | R/W |
| 0481 | | integration time 0:OFF 1～6000 | R/W |
| 0482 | | derivative time 0:OFF 1～3600 | R/W |
| 0483 | | Dead Band -20000～20000 | R/W |
| 0484 | | differential gap Lo 1～10000 | R/W |
| 0485 | | output limiter lower limit 0～999 | R/W |
| 0486 | | output limiter upper limit 1～1000 | R/W |
| 0487 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0488 | OUT2-PID6 | proportional band 0:OFF 1～10000 | R/W |
| 0489 | | integration time 0:OFF 1～6000 | R/W |
| 048A | | derivative time 0:OFF 1～3600 | R/W |
| 048B | | Dead Band -20000～20000 | R/W |
| 048C | | differential gap Lo 1～10000 | R/W |
| 048D | | output limiter lower limit 0～999 | R/W |
| 048E | | output limiter upper limit 1～1000 | R/W |
| 048F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0490 | OUT2-PID7 | proportional band 0:OFF 1～10000 | R/W |
| 0491 | | integration time 0:OFF 1～6000 | R/W |
| 0492 | | derivative time 0:OFF 1～3600 | R/W |
| 0493 | | Dead Band -20000～20000 | R/W |
| 0494 | | differential gap Lo 1～10000 | R/W |
| 0495 | | output limiter lower limit 0～999 | R/W |
| 0496 | | output limiter upper limit 1～1000 | R/W |
| 0497 | | differential gap Hi 1～10000 | R/W |

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|---|---|---|---|
| 0498 | OUT2-PID8 | proportional band 0:OFF 1～10000 | R/W |
| 0499 | | integration time 0:OFF 1～6000 | R/W |
| 049A | | derivative time 0:OFF 1～3600 | R/W |
| 049B | | Dead Band -20000～20000 | R/W |
| 049C | | differential gap Lo 1～10000 | R/W |
| 049D | | output limiter lower limit 0～999 | R/W |
| 049E | | output limiter upper limit 1～1000 | R/W |
| 049F | | differential gap Hi 1～10000 | R/W |

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|---|---|---|
| 04C0 | Zone 1SP | R/W |
| 04C1 | Zone 2SP | R/W |
| 04C2 | Zone 3SP | R/W |
| 04C3 | Zone 4SP | R/W |

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|---|---|---|
| 04CA | Zone hysteresis 1～10000 | R/W |
| 04CB | Zone PID Mode 0:OFF 1:SV 2:PV | R/W |

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|---|---|---|---|
| 0500 | EV1 | Event operation mode 0:NON 1:HA 2:LA 3:IA 4:OA<br>5:SO 6:HD 7:LD 8:ID 9:OD<br>10:RUN 11:R_ON 12:R_OF 13:S_ON 14:S_OF<br>15:CT1_B 16:CT1_L 17:CT2_B<br>18:CT2_L 19:CT3_B<br>20:CT3_L 21:STP 22:P_E 23:END 24:HOLD<br>25:PROG 26:U_SL 27:D_SI 28:GUA 29:TS1<br>30:TS2 31:TS3 32:TS4 | R/W |
| 0501 | | Event setting Value -20003:STEP -20002:PTN -20001:SV_N<br>※-20001～-20003 are at HA,LA,HD,LD,ID,OD | R/W |
| 0502 | | Event differential gap 1～10000 | R/W |
| 0503 | | Event standby operation 0:OFF 1～2 | R/W |
| 0504 | | Event setting value 2 (IA & OA can be set) | R/W |
| 0505 | | Event latching ／Output characteristic<br>D15-8 D0-0<br>Latching Output characteristic<br>Upper 8digit ON/OFF of Event latching<br>Lower 8digit NO/NC of Output characteristic<br>Latching OFF:0 ON:1<br>Output characteristic NO:0 NC:1 | R/W |

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|---|---|---|---|
| 0508 | EV2 | Event operation mod 0:NON1:HA 2:LA 3:IA 4:OA<br>5:SO 6:HD 7:LD 8:ID 9:OD<br>10:RUN 11:CT1_B 12:CT1_L 13:CT2_B<br>14:CT2_L 15:CT3_B 16:CT3_L 17:STP 18:P_E<br>19:END 20:HOLD21:PROG 22:U_SL 23:D_SI 24:GUA<br>25:TS1 26:TS2 27:TS3 28:TS4 | R/W |
| 0509 | | Event setting value -20003:STEP -20002:PTN -20001:SV_N<br>※-20001～-20003 are at HA,LA,HD,LD,ID,OD | R/W |
| 050A | | Event differential gap 1～10000 | R/W |
| 050B | | Event standby operation 0:OFF 1～2 | R/W |
| 050C | | Event setting value 2 ※At IA,OA | R/W |
| 050D | | Event latching ／Output characteristic details same as EV1<br>D15-8 D7-0<br><br>Latching characteristic<br>Upper 8digit ON/OFF of Event latching<br>Lower 8digit NO/NC of Output characteristic<br>Latching OFF:0 ON:1<br>Output characteristic NO:0 NC:1 | R/W |

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|---|---|---|---|
| 0510 | EV3 | Event operation mode details same as EV1 | R/W |
| 0511 | | Event setting value details same as EV1 | R/W |
| 0512 | | Event differential gap details same as EV1 | R/W |
| 0513 | | Event standby operation details same as EV1 | R/W |
| 0514 | | Event setting value 2 details same as EV1 | R/W |
| 0515 | | Event latching ／Output characteristic<br>D15-8 D7-0<br><br>Latching characteristic<br>Upper 8digit ON/OFF of Event latching<br>Lower 8digit NO/NC of Output characteristic<br>Latching OFF:0 ON:1<br>Output characteristic NO:0 NC:1 | R/W |

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|---|---|---|---|
| 0518 | EV4 | Event operation mode 0:NON 1:HA 2:LA 3:IA 4:OA<br>5:SO 6:HD 7:LD 8:ID 9:OD<br>10:RUN 11:CT1_B 12:CT1_L 13:CT2_B<br>14:CT2_L 15:CT3_B 16:CT3_L 17:STP 18:P_E<br>19:END 20:HOLD 21:PROG 22:U_SL 23:D_SI 24:GUA<br>25:TS1 26:TS2 27:TS3 28:TS4 | R/W |
| 0519 | | Event setting value -20003:STEP -20002:PTN -20001:SV_N<br>※-20001～-20003 は HA,LA,HD,LD,ID,OD 時のみ | R/W |
| 051A | | Event differential gap 1～10000 | R/W |
| 051B | | Event standby operation 0:OFF 1～2 | R/W |
| 051C | | Event setting value 2 ※At IA,OA | R/W |
| 051D | | Event latching ／Output characteristic<br>D15-8 D7-0<br><br>Latching characteristic<br>Upper 8digit ON/OFF of Event latching<br>Lower 8digit NO/NC of Output characteristic<br>Latching OFF:0 ON:1<br>Output characteristic NO:0 NC:1 | R/W |

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|---|---|---|---|
| 0520 | DO1 | DO operation mode 0:NON 1:HA 2:LA 3:IA 4:OA<br>5:SO 6:HD 7:LD 8:ID 9:OD<br>10:RUN 11:CT1_B 12:CT1_L 13:CT2_B<br>14:CT2_L 15:CT3_B 16:CT3_L 17:STP 18:P_E<br>19:END 20:HOLD21:PROG 22:U_SL 23:D_SI 24:GUA<br>25:TS1 26:TS2 27:TS3 28:TS4 | R/W |
| 0521 | | DO setting value | R/W |
| 0522 | | DO differential gap 1～10000 | R/W |
| 0523 | | DO standby operation 0:OFF 1～2 | R/W |
| 0524 | | DO setting value 2 (IA & OA can be set) | |

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|---|---|---|---|
| 0525 | | Event latching ／Output characteristic<br>D15-8　　D7-0<br>Latching　Output characteristic<br>Upper 8digit ON/OFF of Event latching<br>Lower 8digit NO/NC of Output characteristic<br>Latching OFF:0 ON:1<br>Output characteristic　NO:0　NC:1 | R/W |

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|---|---|---|---|
| 0528 | DO2 | DO mode　Details same as DO1 | R/W |
| 0529 | | DO setting value　Details same as DO1 | R/W |
| 052A | | DO differential gap　Details same as DO1 | R/W |
| 052B | | DO standby operation　Details same as DO1 | R/W |
| 052C | | DO setting value 2　Details same as DO1 | |
| 052D | | DO Latching／Output characteristic　Details same as DO1 | R/W |

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|---|---|---|---|
| 0530 | DO3 | DO mode　Details same as DO1 | R/W |
| 0531 | | DO setting value　Details same as DO1 | R/W |
| 0532 | | DO differential gap　Details same as DO1 | R/W |
| 0533 | | DO standby operation　Details same as DO1 | R/W |
| 0534 | | DO setting value 2　Details same as DO1 | R/W |
| 0535 | | DO Latching／Output characteristic　Details same as DO1 | R/W |

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|---|---|---|---|
| 0538 | DO4 | DO mode　Details same as DO1 | R/W |
| 0539 | | DO setting value　Details same as DO1 | R/W |
| 053A | | DO differential gap　Details same as DO1 | R/W |
| 053B | | DO standby operation　Details same as DO1 | R/W |
| 053C | | DO setting value 2　Details same as DO1 | R/W |
| 053D | | DO Latching／Output characteristic　Details same as DO1 | R/W |

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|---|---|---|---|
| 0540 | DO5 | DO mode　Details same as DO1 | R/W |
| 0541 | | DO setting value　Details same as DO1 | R/W |
| 0542 | | DO differential gap　Details same as DO1 | R/W |
| 0543 | | DO standby operation　Details same as DO1 | R/W |
| 0544 | | DO setting value 2　Details same as DO1 | R/W |
| 0545 | | DO Latching／Output characteristic　Details same as DO1 | R/W |

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|---|---|---|---|
| 0548 | DO6 | DO mode　Details same as DO1 | R/W |
| 0549 | | DO setting value　Details same as DO1 | R/W |
| 054A | | DO differential gap　Details same as DO1 | R/W |
| 054B | | DO standby operation　Details same as DO1 | R/W |
| 054C | | DO setting value 2　Details same as DO1 | R/W |
| 054D | | DO Latching／Output characteristic　Details same as DO1 | R/W |

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|---|---|---|
| 0580 | ＤＩ１　0:NON　1:SV1　2:SV2　3:SV3　4:SV4　5:SV5　6:SV6　7:SV7<br>8:SV8　9:SV_3B 10:RUN　11:PROG 12:MAN　13:AT　14:PTN1 15:PTN2<br>16:PTN3 17:PTN4 18:PTN5 19:PTN6 20:PTN7 21:PTN8 22:PTN3B　23:HOLD<br>24:SKIP 25:L_RS 26:LOCK　255:3B(compulsion occupation) | R/W |
| 0581 | ＤＩ２　same as DI1 | R/W |
| 0582 | ＤＩ３　same as DI1 | R/W |
| 0583 | ＤＩ４ same as DI1 | R/W |
| 0584 | ＤＩ５ same as DI1 | R/W |
| 0585 | ＤＩ６　0:NON　1:SV1　2:SV2　3:SV3　4:SV4　5:SV5　6:SV6　7:SV7<br>8:SV8　9:**** 10:RUN　11:PROG 12:MAN　13:AT　14:PTN1 15:PTN2<br>16:PTN3 17:PTN4 18:PTN5 19:PTN6 20:PTN7 21:PTN8 22:**** 23:HOLD<br>24:SKIP 25:L_RS 26:LOCK　255:3B(compulsion occupation)<br><br>※It basically same as DI1-5, but 9:SV_3B,22:PTN3B can not be allotted. | R/W |
| 0586 | ＤＩ７ same as DI6 | R/W |

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|---|---|---|
| 0595 | ＣＴ１ delay time　1～10000 | R/W |

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|---|---|---|
| 0597 | ＣＴ１ delay time　0:NON 1:OUT1 2:OUT2 3:EV1 4:EV2 5EV3 6:EV4 | R/W |

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|---|---|---|
| 059D | ＣＴ２ delay time　1～10000 | R/W |

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|---|---|---|
| 059F | ＣＴ２ delay time 0:NON 1:OUT1 2:OUT2 3:EV1 4:EV2 5EV3 6:EV4 | R/W |

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|---|---|---|
| 05A0 | Analogue output mode 0:NON 0:NON 1:PV 2:SV 3:DEV 4:OUT1 5:OUT2 6:CT1 7:CT2 8:SERVO | R/W |
| 05A1 | analogue output scale lower limit | R/W |
| 05A2 | analogue output scale upper limit | R/W |

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|---|---|---|
| 05B0 | communication memory mode 0:RAM 1:MIX 2:EEP | R/W |

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|---|---|---|
| 05B4 | analogue output limiter lower limit 0～1000 | R/W |
| 05B5 | analogue output limiter upper limit 0～1000 | R/W |

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|---|---|---|
| 0600 | OUT1 Output characteristic 0:RA 1:DA | R/W |
| 0601 | OUT1 proportional cycle 5～3000 (Multiple of 5) | R/W |

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|---|---|---|
| 0604 | OUT2 proportional cycle 5～3000 (Multiple of 5) | R/W |

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|---|---|---|
| 0607 | OUT2 Output characteristic 0:RA 1:DA | R/W |

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|---|---|---|
| 060A | OUT1 soft start 5～3000 (Multiple of 5) | R/W |
| 060B | OUT2 soft start 5～3000 (Multiple of 5) | R/W |

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|---|---|---|
| 0611 | key lock 0:OFF 1～4 | R/W |

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|---|---|---|
| 0642 | servo FB filter 0～10000 | R/W |
| 064E | Servo AT ON/OFF 0:OFF 1:ON | |

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|---|---|---|
| 064F | servo close - open time 5～300 | R/W |
| 0650 | servo FB characteristic 0:OP_CL 1:CL_OP | R/W |
| 0651 | servo FB existing 0:NON 1:FB | R/W |
| 0652 | servo dead band 1～1000 | R/W |
| 0653 | servo differential gap 1～1000 | R/W |

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|---|---|---|
| 065C | Dead band 1～1000 | R/W |
| 065D | inching band 0～1000 | R/W |
| 065E | inching cycle 5～50 | R/W |
| 065F | inching duty 1～1000 | R/W |

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|---|---|---|
| 0700 | PV gain -5000～5000 | R/W |
| 0701 | PV offset -5000～5000 | R/W |
| 0702 | PV filter 0～10000 | R/W |

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|---|---|---|
| 0704 | input temperature unit 0:℃ 1:F 2:K | R/W |
| 0705 | mesuring range refer to measuring code table | R/W |
| 0706 | Reference junction compensation 0:Internal 1:External | R/W |

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|---|---|---|
| 0707 | Decimal point position 0:****0 1:***0.0 2:**0.00 3:*0.000 4:0.0000 | R/W |
| 0708 | input scaling lower limit | R/W |
| 0709 | input scaling upper limit | R/W |

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|---|---|---|
| 070D | PV limiter Lo | R/W |
| 070E | PV limiter Hi | R/W |

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|---|---|---|
| 0720 | PV-SV correction point1 | R/W |
| 0721 | PV-SV correction value1 | R/W |
| 0722 | PV-SV correction point2 | R/W |
| 0723 | PV-SV correction value2 | R/W |
| 0724 | PV-SV correction point3 | R/W |
| 0725 | PV-SV correction value3 | R/W |
| 0726 | PV-SV correction point4 | R/W |
| 0727 | PV-SV correction value4 | R/W |
| 0728 | PV-SV correction point5 | R/W |
| 0729 | PV-SV correction value5 | R/W |
| 072A | PV-SV correction point6 | R/W |

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|---|---|---|
| 072B | PV-SV correction value6 | R/W |
| 072C | PV-SV correction point7 | R/W |
| 072D | PV-SV correction value7 | R/W |
| 072E | PV-SV correction point8 | R/W |
| 072F | PV-SV correction value8 | R/W |
| 0730 | PV-SV correction point9 | R/W |
| 0731 | PV-SV correction value9 | R/W |
| 0732 | PV-SV correction point10 | R/W |
| 0733 | PV-SV correction value10 | R/W |
| 0734 | PV-SV correction point11 | R/W |
| 0735 | PV-SV correction value11 | R/W |
| 0736 | PV-SV correction mode 0:OFF 1:LINEA 2:PV_PV 3:SV_PV 4:AI_SV | R/W |

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|---|---|---|
| 0800 | program mode FIX/PROG 0:FIX 1:PROG | R/W |

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|---|---|---|
| 0802 | program pattern No, selection 1～8 | R/W |

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|---|---|---|
| 0818 | program pattern number 1,2,3,4,6,8 | R/W |
| 0819 | time unit 0:MMSS 1:HHMM 2:HHHH | R/W |
| 081A | power failure compensation 0:OFF 1:ON | R/W |

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|---|---|---|
| 0820 | ＦＩＸ mode ＳＶ１ PID No. 1～8 | R/W |
| 0821 | ＦＩＸ mode ＳＶ２ PID No. 1～8 | R/W |
| 0822 | ＦＩＸ mode ＳＶ３ PID No. 1～8 | R/W |
| 0823 | ＦＩＸ mode ＳＶ４ PID No. 1～8 | R/W |
| 0824 | ＦＩＸ mode ＳＶ５ PID No. 1～8 | R/W |
| 0825 | ＦＩＸ mode ＳＶ６ PID No. 1～8 | R/W |
| 0826 | ＦＩＸ mode ＳＶ７ PID No. 1～8 | R/W |
| 0827 | ＦＩＸ mode ＳＶ８ PID No. 1～8 | R/W |

| | | |
|---|---|---|
| 0830 | SV1-EV1 | R/W |
| 0831 | SV1-EV2 | R/W |
| 0832 | SV1-EV3 | R/W |
| 0833 | SV1-EV4 | R/W |

| | | |
|---|---|---|
| 0834 | SV2-EV1 | R/W |
| 0835 | SV2-EV2 | R/W |
| 0836 | SV2-EV3 | R/W |
| 0837 | SV2-EV4 | R/W |

| | | |
|---|---|---|
| 0838 | SV3-EV1 | R/W |
| 0839 | SV3-EV2 | R/W |
| 083A | SV3-EV3 | R/W |
| 083B | SV3-EV4 | R/W |

| | | |
|---|---|---|
| 083C | SV4-EV1 | R/W |
| 083D | SV4-EV2 | R/W |
| 083E | SV4-EV3 | R/W |
| 083F | SV4-EV4 | R/W |

| | | |
|---|---|---|
| 0840 | SV5-EV1 | R/W |
| 0841 | SV5-EV2 | R/W |
| 0842 | SV5-EV3 | R/W |
| 0843 | SV5-EV4 | R/W |

| | | |
|---|---|---|
| 0844 | SV6-EV1 | R/W |
| 0845 | SV6-EV2 | R/W |
| 0846 | SV6-EV3 | R/W |
| 0847 | SV6-EV4 | R/W |

| | | |
|---|---|---|
| 0848 | SV7-EV1 | R/W |
| 0849 | SV7-EV2 | R/W |
| 084A | SV7-EV3 | R/W |
| 084B | SV7-EV4 | R/W |

| | | |
|---|---|---|
| 084C | SV8-EV1 | R/W |
| 084D | SV8-EV2 | R/W |
| 084E | SV8-EV3 | R/W |
| 084F | SV8-EV4 | R/W |

| | | |
|---|---|---|
| 0900 | Pattern No. (RAM) 1～8 | R/W |
| 0901 | Step No. (RAM) 1～96 | R/W |

| | | |
|---|---|---|
| 0903 | end step setup 1～96 (MAX value same as STEP No,) | R/W |

| | | |
|---|---|---|
| 0906 | Start SV | R/W |
| 0907 | Gurantee soak zone 0:OFF 1:ON | R/W |

| | | |
|---|---|---|
| 0909 | start mode setup 0:SV 1:PV | R/W |

| | | |
|---|---|---|
| 090C | Number of excution pattern setup 1～30000 30001 : Infinity | R/W |

| | | |
|---|---|---|
| 0910 | PTN-EV1 | R/W |
| 0911 | PTN-EV2 | R/W |
| 0912 | PTN-EV3 | R/W |
| 0913 | PTN-EV4 | R/W |

| | | |
|---|---|---|
| 0950 | step SV value | R/W |
| 0951 | step time 000:00～300:00 infinity:30001 (Unit MMSS,HHMM)<br>0000.0～3000.0 infinity:30001 (Unit HHHH)<br>＊MMSS,HHMM<br>Display upper 3digt and lower 2digt at 5digit on decimal system<br><br>*HHHH<br>Display upper 3digt and lower 1digt at 4digit on decimal system | R/W |
| 0952 | Step out1 PIDNo. 1～8 | R/W |

| | | | |
|---|---|---|---|
| 0960 | Time signal 1 | ON time -1:OFF ＊Besides same as Step time | R/W |
| 0961 | | OFF time -1:OFF ＊Besides same as Step time | R/W |
| 0962 | Time signal 2 | ON time -1:OFF ＊Besides same as Step time | R/W |
| 0963 | | OFF time -1:OFF ＊Besides same as Step time | R/W |
| 0964 | Time signal 3 | ON time -1:OFF ＊Besides same as Step time | R/W |
| 0965 | | OFF time -1:OFF ＊Besides same as Step time | R/W |
| 0966 | Time signal 4 | ON time -1:OFF ＊Besides same as Step time | R/W |
| 0967 | | OFF time -1:OFF ＊Besides same as Step time | R/W |

| | | | |
|---|---|---|---|
| 0A00 | OUT1-PID1 | A parameter 0～100 | R/W |
| 0A01 | | B parameter 0～100 | R/W |
| 0A02 | | C parameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A08 | OUT1-PID2 | Aparameter 0～100 | R/W |
| 0A09 | | Bparameter 0～100 | R/W |
| 0A0A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A10 | OUT1-PID3 | Aparameter 0～100 | R/W |
| 0A11 | | Bparameter 0～100 | R/W |
| 0A12 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A18 | OUT1-PID4 | Aparameter 0～100 | R/W |
| 0A19 | | Bparameter 0～100 | R/W |
| 0A1A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A20 | OUT1-PID5 | Aparameter 0～100 | R/W |
| 0A21 | | Bparameter 0～100 | R/W |
| 0A22 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A28 | OUT1-PID6 | Aparameter 0～100 | R/W |
| 0A29 | | Bparameter 0～100 | R/W |
| 0A2A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A30 | OUT1-PID7 | Aparameter 0～100 | R/W |
| 0A31 | | Bparameter 0～100 | R/W |
| 0A32 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A38 | OUT1-PID8 | Aparameter 0～100 | R/W |
| 0A39 | | Bparameter 0～100 | R/W |
| 0A3A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A60 | OUT2-PID1 | Aparameter 0～1.00 | R/W |
| 0A61 | | Bparameter 0～100 | R/W |
| 0A62 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A68 | OUT2-PID2 | Aparameter 0～100 | R/W |
| 0A69 | | Bparameter 0～100 | R/W |
| 0A6A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A70 | OUT2-PID3 | Aparameter 0～100 | R/W |
| 0A71 | | Bparameter 0～100 | R/W |
| 0A72 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A78 | OUT2-PID4 | Aparameter 0～100 | R/W |
| 0A79 | | Bparameter 0～100 | R/W |
| 0A7A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A80 | OUT2-PID5 | Aparameter 0～100 | R/W |
| 0A81 | | Bparameter 0～100 | R/W |
| 0A82 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A88 | OUT2-PID6 | Aparameter 0～100 | R/W |
| 0A89 | | Bparameter 0～100 | R/W |
| 0A8A | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A90 | OUT2-PID7 | Aparameter 0～100 | R/W |
| 0A91 | | Bparameter 0～100 | R/W |
| 0A92 | | Cparameter 0～100 | R/W |

| | | | |
|---|---|---|---|
| 0A98 | OUT2-PID8 | Aparameter 0～100 | R/W |
| 0A99 | | Bparameter 0～100 | R/W |
| 0A9A | | Cparameter 0～100 | R/W |

| | | |
|---|---|---|
| 0B00 | selection of PID method 1～2 | R/W |
| 0B01 | Input sampling period 0:50msec 1:167msec 2:250msec 3:500msec | R/W |
| 0B02 | Bar graph LED allotment selection 0:NON 1:DEV 2:OUT1 3:OUT2 4:S_TIM 5:P_STP 6:P_CNT 7:SERVO | R/W |
| 0B03 | LED Brightness selection 1～4 | R/W |
| 0B04 | LED Contrast selection 1～3 | R/W |

★The additional address by which below can access only the time of infrared rays communication

| | | | |
|---|---|---|---|
| 8000 | Board rate | 0:1200 2:2400 3:4800 4:9600 5:19200 6:38400 | R/W |
| 8001 | Data lenght | 7～8 | R/W |
| 8002 | Data parity | 0:NON 1:ODD 2:EVE | R/W |
| 8003 | Stop bit | 1～2 | R/W |
| 8004 | Start character | 0:STX 1:ATT | R/W |
| 8005 | BCC Mode | 0:NON 1:ADD 2:ADD2 3:XOR 4:LRC 5:CR16 | R/W |
| 8006 | Address | -1:MAST2 0:MAST1 1～255 | R/W |
| 8007 | Delay time | 1～500 | R/W |
| 8008 | Memory mode | 0:RAM 1:MIX 2:EEP | R/W |

| | | | |
|---|---|---|---|
| 8010 | HOST Mode | 0:SV 1:OUT1 2:O1SC 3:OUT2 4:O2SC | R/W |
| 8011 | HOST Address area L | 0:BCAS 1～255 | R/W |
| 8012 | HOST Address area H | 1～255 | R/W |
| 8013 | HOST Write-in Data Address | 0x0000～0xFFFF(16bitDat ALL Acceptable) | R/W |

**Measuring code table**

| Thermo couple | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Character | Code | ℃ | | Centigrade | ℉ | | Fahrenheit | K | | Kelvin |
| r 1 | 01 | −50. 0 | ～ | 1760. 0 | −50. 0 | ～ | 3200. 0 | 220. 0 | ～ | 2030. 0 |
| r 1 | 02 | −270. 0 | ～ | 1370. 0 | −450. 0 | ～ | 2500. 0 | 0. 0 | ～ | 1640. 0 |
| r2 | 03 | 0. 0 | ～ | 800. 0 | 0. 0 | ～ | 1500. 0 | 270. 0 | ～ | 1070. 0 |
| r3 | 04 | −200. 0 | ～ | 400. 0 | −300. 0 | ～ | 700. 0 | 70. 0 | ～ | 670. 0 |
| r4 | 05 | 0. 0 | ～ | 300. 0 | 0. 0 | ～ | 600. 0 | 270. 0 | ～ | 570. 0 |
| J 1 | 06 | −200. 0 | ～ | 1200. 0 | −320. 0 | ～ | 2200. 0 | 70. 0 | ～ | 1470. 0 |
| J2 | 07 | 0. 0 | ～ | 600. 0 | 0. 0 | ～ | 1100. 0 | 270. 0 | ～ | 870. 0 |
| t 1 | 08 | −270. 0 | ～ | 400. 0 | −450. 0 | ～ | 700. 0 | 0. 0 | ～ | 670. 0 |
| E 1 | 09 | −270. 0 | ～ | 1000. 0 | −450. 0 | ～ | 1800. 0 | 0. 0 | ～ | 1270. 0 |
| S 1 | 10 | −50. 0 | ～ | 1760. 0 | −50. 0 | ～ | 3200. 0 | 220. 0 | ～ | 2030. 0 |
| U 1 | 11 | −200. 0 | ～ | 400. 0 | −300. 0 | ～ | 700. 0 | 70. 0 | ～ | 670. 0 |
| n 1 | 12 | −270. 0 | ～ | 1300. 0 | −450. 0 | ～ | 2300. 0 | 0. 0 | ～ | 1570. 0 |
| b 1 | 13 | 0. 0 | ～ | 1820. 0 | 0 | ～ | 3300 | 270. 0 | ～ | 2090. 0 |
| S-26 | 14 | 0. 0 | ～ | 2320. 0 | 0 | ～ | 4200 | 270. 0 | ～ | 2590. 0 |
| PL2 | 15 | 0. 0 | ～ | 1390. 0 | 0. 0 | ～ | 2500. 0 | 270. 0 | ～ | 1660. 0 |
| RTD | | | | | | | | | | |
| P 1 | 16 | −200. 0 | ～ | 850. 0 | −300. 0 | ～ | 1500. 0 | 70. 0 | ～ | 1120. 0 |
| P2 | 17 | −200. 00 | ～ | 300. 00 | −300. 0 | ～ | 600. 0 | 70. 00 | ～ | 570. 0 |
| P3 | 18 | −100. 00 | ～ | 300. 00 | −150. 0 | ～ | 600. 0 | 170. 0 | ～ | 570. 0 |
| P4 | 19 | −100. 00 | ～ | 200. 00 | −150. 0 | ～ | 400. 0 | 170. 0 | ～ | 470. 0 |
| P5 | 20 | −100. 00 | ～ | 100. 00 | −150. 00 | ～ | 200. 00 | 170. 0 | ～ | 370. 0 |
| P6 | 21 | 0. 00 | ～ | 200. 00 | 0. 0 | ～ | 400. 0 | 270. 0 | ～ | 470. 0 |
| P7 | 22 | 0. 00 | ～ | 100. 00 | 0. 00 | ～ | 200. 00 | 270. 0 | ～ | 370. 0 |
| P8 | 23 | −50. 00 | ～ | 50. 00 | −60. 00 | ～ | 120. 00 | 220. 00 | ～ | 320. 00 |
| P9 | 24 | −20. 000 | ～ | 30. 000 | 0. 00 | ～ | 100. 00 | 250. 00 | ～ | 300. 00 |
| JP 1 | 25 | −200. 0 | ～ | 500. 0 | −300. 0 | ～ | 900. 0 | 70. 0 | ～ | 770. 0 |
| JP2 | 26 | −20. 000 | ～ | 300. 00 | −300. 0 | ～ | 600. 0 | 70. 00 | ～ | 570. 0 |
| JP3 | 27 | −100. 00 | ～ | 300. 00 | −150. 0 | ～ | 600. 0 | 170. 0 | ～ | 570. 0 |
| JP4 | 28 | −100. 00 | ～ | 200. 00 | −150. 0 | ～ | 400. 0 | 170. 0 | ～ | 470. 0 |
| JP5 | 29 | −100. 00 | ～ | 100. 00 | −150. 00 | ～ | 200. 00 | 170. 00 | ～ | 370. 0 |
| JP6 | 30 | 0. 00 | ～ | 200. 00 | 0. 0 | ～ | 400. 0 | 270. 0 | ～ | 470. 0 |
| JP7 | 31 | 0. 00 | ～ | 100. 00 | 0. 00 | ～ | 200. 00 | 270. 0 | ～ | 370. 0 |
| JP8 | 32 | −50. 00 | ～ | 50. 00 | −60. 00 | ～ | 120. 00 | 220. 0 | ～ | 320. 00 |
| JP9 | 33 | −20. 000 | ～ | 30. 000 | 0. 00 | ～ | 100. 00 | 250. 00 | ～ | 300. 00 |
| Liner input | | | | | | | | | | |
| n 1 | 34 | −100 | ～ | 100 | mV | | Scaling−20000～32000<br>Span<br>10～50000 or less<br>Decimal point<br>Non 0. 1～0. 0001 | | | |
| n2 | 35 | 0 | ～ | 100 | | | | | | |
| n3 | 36 | 0 | ～ | 50 | | | | | | |
| n4 | 37 | 10 | ～ | 50 | | | | | | |
| n5 | 38 | 0 | ～ | 20 | | | | | | |
| n6 | 39 | −10 | ～ | 10 | | | | | | |
| n7 | 40 | 0 | ～ | 10 | | | | | | |
| U 1 | 41 | −10 | ～ | 10 | V | | | | | |
| U2 | 42 | 0 | ～ | 10 | | | | | | |
| U3 | 43 | 0 | ～ | 5 | | | | | | |
| U4 | 44 | 1 | ～ | 5 | | | | | | |
| U5 | 45 | 0 | ～ | 2 | | | | | | |
| U6 | 46 | −1 | ～ | 1 | | | | | | |
| U7 | 47 | 0 | ～ | 1 | | | | | | |
| nA 1 | 48 | 0 | ～ | 20 | mA | | | | | |
| nA2 | 49 | 4 | ～ | 20 | | | | | | |

### 9-2. Event Code Table

| function | | No, | Note |
|---|---|---|---|
| No allotment | non | 0 | |
| Upper limit absolute value alarm | HA | 1 | |
| Lower limit absolute value alarm | LA | 2 | |
| Within Absolute Value alarm | -A | 3 | |
| Without Absolute Value alarm | oA | 4 | |
| Scale over alarm | So | 5 | |
| Upper limit deviation value alarm | Hd | 6 | |
| Lower limit deviation value alarm | Ld | 7 | |
| Within deviation alarm | -d | 8 | |
| Without deviation alarm | od | 9 | |
| RUN signal | run | 10 | |
| CT1 Control loop alarm(heater braking) | ct1_b | 11 | CT |
| CT1 Control loop alarm (loop) | ct1_L | 12 | CT |
| CT2 Control loop alarm (Heater braking) | ct2_b | 13 | CT |
| CT2 Control loop alarm (loop) | ct2_L | 14 | CT |
| 3 phases Control loop alarm(Heater braking) | ct3_b | 15 | CT |
| 3 phases Control loop alarm (loop) | ct3_L | 16 | CT |
| Step signal | StP | 17 | Program |
| Pattern end signal | P_E | 18 | Program |
| Program end | End | 19 | Program |
| Step hold signal | HoLd | 20 | Program |
| Program signal | ProG | 21 | Program |
| Up slope signal | u_SL | 22 | Program |
| Down slope signal | d_SL | 23 | Program |
| Guarantee signal | GuA | 24 | Program |
| Time signal 1 | tS1 | 25 | Program |
| Time signal 2 | tS2 | 26 | Program |
| Time signal 3 | tS3 | 27 | Program |
| Time signal 4 | tS4 | 28 | Program |



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