

SECTION 4

FINS Message Communications

FINS message communications are used to read and write for the E5ZE's measurement values and set values that cannot be read or written using remote I/O communications.

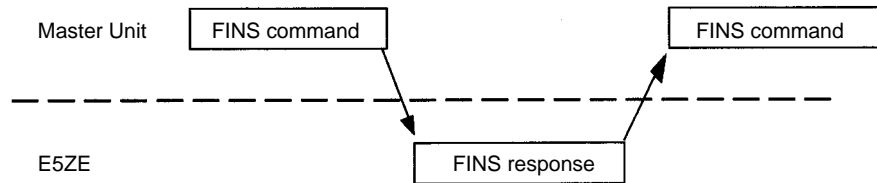
This section provides details on FINS messages, including command and response formats, the instructions used by the PC to execute FINS message communications, and tables of set values and measurement values showing setting ranges, default values, data types, and addresses.

4-1	Transmitting FINS Messages
4-1-1	Commands
4-1-2	Remote I/O and FINS Messages
4-2	Command Configuration
4-3	Instruction Execution Precautions
4-3-1	CMND(194): CVM1/CV-series PCs
4-3-2	IOWR(223): C200HX/C200HE/C200HG PCs
4-4	FINS Messages Set Values and Measurement Values
4-4-1	Commonly Used Set Values
4-4-2	Reading/Writing using Variable Type 90
4-4-3	Operation Variables
4-4-4	Relationship between Operating Status and Operating Commands
4-4-5	Set Values in Memory Banks
4-4-6	Measurement Values for Individual Control Points
4-4-7	Set Values for all Control Points
4-4-8	Set Values for All Control Points

4-1 Transmitting FINS Messages

FINS messages are executed from the user program using the CMND(194), SEND(192), and RECV(193) instructions for a CV-series PC, and the IOWR(223) instruction with a C200HX, C200HG, or C200HE PC.

The transmission procedure involves the Master sending a FINS command to the E5ZE and the E5ZE returning a FINS response to the command back to the Master.



Refer to the *CompoBus/D (DeviceNet) Operation Manual (W267)* for details on the transmission methods.

Details on the format of commands and responses used for transmission, and the set values and measurement values specific to the E5ZE are provided here.

4-1-1 Commands

There are only two FINS commands that can be used with the E5ZE.

Command type	Command code
MEMORY AREA READ	0101
MEMORY AREA WRITE	0102

Note The SEND(192) instruction for the CVM1/CV-series PC operates in the same way as sending the CIO AREA WRITE command with the CMND(194) instruction and the RECV(193) instruction operates in the same way as sending the CIO AREA READ command with the CMND(194) instruction.

4-1-2 Remote I/O and FINS Messages

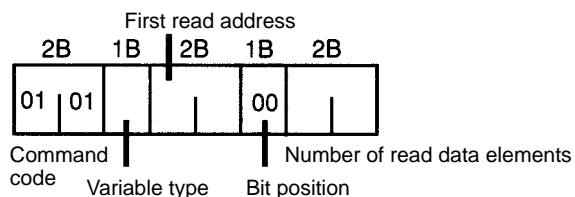
Data written with the remote I/O allocated in the CompoBus/D Network is updated in the E5ZE every 200 ms. Data written with FINS messages is updated when the command is executed. If different settings are made with the FINS messages and remote I/O communications, the settings made with the FINS messages will last only until the next time the value is refreshed for remote I/O communications.

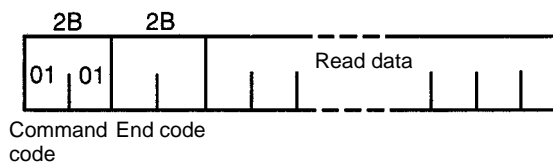
4-2 Command Configuration

Reading PC Memory

The following diagram shows the format of command data and response data when FINS messages are used to read set values and measurement values from the PC to which the Master Unit is mounted.

Command Format

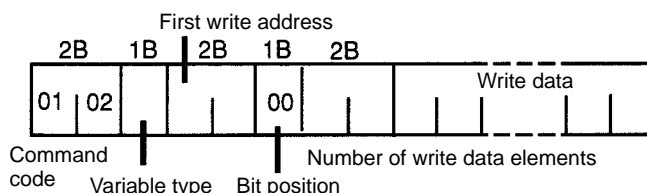
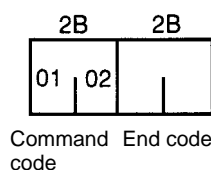


Response Format

- The total number of read data bytes is $2 \times \text{Number of read data elements}$.
- Refer to the table of FINS messages set values and measurement values for details on addresses and variable types for read set values and measurement values.

Writing PC Memory

The following diagram shows the format of command data and response data when FINS messages are used to write set values and measurement values from the PC to which the Master Unit is mounted.

Command Format**Response Format**

- The total number of write data bytes is $2 \times \text{Number of write data elements}$.
- Refer to the table of FINS messages set values and measurement values for details on addresses and variable types of write set values and measurement values.
- If there is an error in even one part of the data being written, all of the data written at the same time will not be saved in the E5ZE.

4-3 Instruction Execution Precautions

When FINS message communications are used with the E5ZE, there are settings that are specific to the control data for CMND(194) and IOWR(223) instructions that must be set, as shown next.

For details on both instructions and their applications, refer to the *CompoBus/D (DeviceNet) Operation Manual (W267)*.

4-3-1 CMND(194): CVM1/CV-series PCs

The control data for the CMND(194) instructions is as follows:

Word	Bit									
	15	12	11	08	07	06	05	04	03	00
C	Number of command data bytes									
C+1	Number of response data bytes									
C+2	0		0			Destination network address				
C+3	Destination node address (E5ZE node address)					00				
C+4	0 (response required)		Communica- tions port No. (0 to 7)			0			Number of retries (0 to F)	
C+5	Response monitoring time (0000 to FFFF), in 0.1 s increments (except 0000 that is 2 s)									

4-3-2 IOWR(223): C200HX/C200HE/C200HG PCs

The control data for the IOWR(223) instruction is as follows:

Word	Bit									
	15			08		07				00
C	0/1	0	Destination address			0	0	0	0	0

Bit 15 is used to set whether a response is required or not. If bit 15 is set to 0, a response is required and if the bit is set to 1, a response is not required. Set this bit to 0 (response required).

Bits 8 to 13 are used to set the destination node address (E5ZE node address).

4-4 FINS Messages Set Values and Measurement Values

This section provides tables that can be used when setting and monitoring the set values for all control points. The tables are given by variable type.

4-4-1 Commonly Used Set Values

Variable Type: 90

No.	Address	Set value or measurement value	Data setting or monitoring range	Data type
1	0000	Control point 0 process value	Range: Depends on sensor type used. (See note 4.) Unit: Depends on setting (either 0.1°C/°F or 1°C/°F)	Numeric Read only
2	0001	Control point 1 process value		
3	0002	Control point 2 process value		
4	0003	Control point 3 process value		
5	0004	Control point 4 process value		
6	0005	Control point 5 process value		
7	0006	Control point 6 process value		
8	0007	Control point 7 process value		
9	000C	Alarm 1 status	Range: 0000 to 80FF	Status
10	000D	Alarm 2 status	Range: 0000 to 80FF	Read only
11	000E	Auto-tuning status	Range: 0000 to 80FF	Bit contents same as remote I/O contents.
12	000F	HB alarm status	Range: 0000 to 80FF	
13	0010	HS alarm status	Range: 0000 to 80FF	
14	0011	Temperature control status (See note 7.)	Range: 0000 to 811F	Status Read only
15	0012	Operation start/stop (See notes 3 and 6.)	Range: 0000 to 00FF (Default: 0000)	Status Read/write

No.	Address	Set value or measurement value	Data setting or monitoring range	Data type
16	0013	Control point 0 set point	Range: Depends on sensor type used. (See notes 1 and 4.) Unit: Depends on setting (either 0.1°C/°F or 1°C/°F)	Numeric Read/write
17	0014	Control point 1 set point		
18	0015	Control point 2 set point		
19	0016	Control point 3 set point		
20	0017	Control point 4 set point		
21	0018	Control point 5 set point		
22	0019	Control point 6 set point		
23	001A	Control point 7 set point		
24	001F	Auto-tuning start/stop (See note 2.)	Range: 0000 to 00FF Default: 0000	Status Write only
25	0020	Control point 0 alarm 1 temperature	Range: D8F1 to 7350 (–999.9 to 3000.0) when setting unit is 0.1°C/°F. (See note 4.) Range: D8F1 to 270F (–9999 to 9999) when setting unit is 1°C/°F. Default: 0000 (0.0 or 0)	Numeric Read/write
26	0021	Control point 1 alarm 1 temperature		
27	0022	Control point 2 alarm 1 temperature		
28	0023	Control point 3 alarm 1 temperature		
29	0024	Control point 4 alarm 1 temperature		
30	0025	Control point 5 alarm 1 temperature		
31	0026	Control point 6 alarm 1 temperature		
32	0027	Control point 7 alarm 1 temperature		
33	002C	Control point 0 alarm 2 temperature	Range: D8F1 to 7530 (–999.9 to 3000.0) when setting unit is 0.1°C/°F. (See note 4.) Range: D8F1 to 270F (–9999 to 9999) when setting unit is 1°C/°F. Default: 0000 (0.0 or 0)	Numeric Read/write
34	002D	Control point 1 alarm 2 temperature		
35	002E	Control point 2 alarm 2 temperature		
36	002F	Control point 3 alarm 2 temperature		
37	0030	Control point 4 alarm 2 temperature		
38	0031	Control point 5 alarm 2 temperature		
39	0032	Control point 6 alarm 2 temperature		
40	0033	Control point 7 alarm 2 temperature		
41	0038	Control point 0 input shift value	Range: FC19 to 03E7 (–99.9 to 99.9) (See note 1.) Unit: 0.1°C or °F Default: 0000 (0.0)	Numeric Read/write
42	0039	Control point 1 input shift value		
43	003A	Control point 2 input shift value		
44	003B	Control point 3 input shift value		
45	003C	Control point 4 input shift value		
46	003D	Control point 5 input shift value		
47	003E	Control point 6 input shift value		
48	003F	Control point 7 input shift value		
49	0044	Control point 0 proportional band	Range: 0000 to 270F (0.0 to 999.9) (See note 1.) Unit: 0.1°C or °F Default: 0000 (0.0)	Numeric Read/write
50	0045	Control point 1 proportional band		
51	0046	Control point 2 proportional band		
52	0047	Control point 3 proportional band		
53	0048	Control point 4 proportional band		
54	0049	Control point 5 proportional band		
55	004A	Control point 6 proportional band		
56	004B	Control point 7 proportional band		

No.	Address	Set value or measurement value	Data setting or monitoring range	Data type
57	0050	Control point 0 integral time	Range: 0000 to 0F9F (0 to 3999) (See note 1.) Unit: 1 s Default: 0000 (0)	Numeric Read/write
58	0051	Control point 1 integral time		
59	0052	Control point 2 integral time		
60	0053	Control point 3 integral time		
61	0054	Control point 4 integral time		
62	0055	Control point 5 integral time		
63	0056	Control point 6 integral time		
64	0057	Control point 7 integral time		
65	005C	Control point 0 derivative time	Range: 0000 to 0F9F (0 to 3999) (See note 1.) Unit: 1 s Default: 0000 (0)	Numeric Read/write
66	005D	Control point 1 derivative time		
67	005E	Control point 2 derivative time		
68	005F	Control point 3 derivative time		
69	0060	Control point 4 derivative time		
70	0061	Control point 5 derivative time		
71	0062	Control point 6 derivative time		
72	0063	Control point 7 derivative time		
73	0068	Control point 0 heating output variable	Range: 0000 to 03EB (0.0 to 100.0) Unit: 0.1%	Numeric Read only
74	0069	Control point 1 heating output variable		
75	006A	Control point 2 heating output variable		
76	006B	Control point 3 heating output variable		
77	006C	Control point 4 heating output variable		
78	006D	Control point 5 heating output variable		
79	006E	Control point 6 heating output variable		
80	006F	Control point 7 heating output variable		
81	0074	Control point 0 heater current	Range: 0000 to 0226 (0.0 to 55.0) (See note 8.) Unit: 0.1 A	Numeric Read only
82	0075	Control point 1 heater current		
83	0076	Control point 2 heater current		
84	0077	Control point 3 heater current		
85	0078	Control point 4 heater current		
86	0079	Control point 5 heater current		
87	007A	Control point 6 heater current		
88	007B	Control point 7 heater current		

No.	Address	Set value or measurement value	Data setting or monitoring range	Data type
89	0080	Control point 0 memory bank No.	Range: 0000 to 0007 (See note 1.) Default: 0000 (0)	Numeric Read/write
90	0081	Control point 1 memory bank No.		
91	0082	Control point 2 memory bank No.		
92	0083	Control point 3 memory bank No.		
93	0084	Control point 4 memory bank No.		
94	0085	Control point 5 memory bank No.		
95	0086	Control point 6 memory bank No.		
96	0087	Control point 7 memory bank No.		
97	008C	Control point 0 heater burnout detection current	Range: 0000 to 01F4 (0.0 to 50.0) Unit: 0.1 A Default: 0000 (0.0)	Numeric Read/write
98	008D	Control point 1 heater burnout detection current		
99	008E	Control point 2 heater burnout detection current		
100	008F	Control point 3 heater burnout detection current		
101	0090	Control point 4 heater burnout detection current		
102	0091	Control point 5 heater burnout detection current		
103	0092	Control point 6 heater burnout detection current		
104	0093	Control point 7 heater burnout detection current		
105	0098	Control point 0 cooling coefficient	Range: 0000 to 0064 (0.0 to 10.0) (See note 1.) Unit: 0.1 Default: 000A (1.0)	Numeric Read/write
106	0099	Control point 1 cooling coefficient		
107	009A	Control point 2 cooling coefficient		
108	009B	Control point 3 cooling coefficient		
109	009C	Control point 4 cooling coefficient		
110	009D	Control point 5 cooling coefficient		
111	009E	Control point 6 cooling coefficient		
112	009F	Control point 7 cooling coefficient		
113	00A4	Control point 0 dead band	Range: FC19 to 03E7 (–999 to 999) (See note 1.) Unit: 1°C or °F Default: 0000 (0)	Numeric Read/write
114	00A5	Control point 1 dead band		
115	00A6	Control point 2 dead band		
116	00A7	Control point 3 dead band		
117	00A8	Control point 4 dead band		
118	00A9	Control point 5 dead band		
119	00AA	Control point 6 dead band		
120	00AB	Control point 7 dead band		

No.	Address	Set value or measurement value	Data setting or monitoring range	Data type
121	00B0	Control point 0 fuzzy strength	Range: 0000 to 0063 (0 to 99) (See note 1.) Unit: 1% Default: 0032 (50)	Numeric Read/write
122	00B1	Control point 1 fuzzy strength		
123	00B2	Control point 2 fuzzy strength		
124	00B3	Control point 3 fuzzy strength		
125	00B4	Control point 4 fuzzy strength		
126	00B5	Control point 5 fuzzy strength		
127	00B6	Control point 6 fuzzy strength		
128	00B7	Control point 7 fuzzy strength		

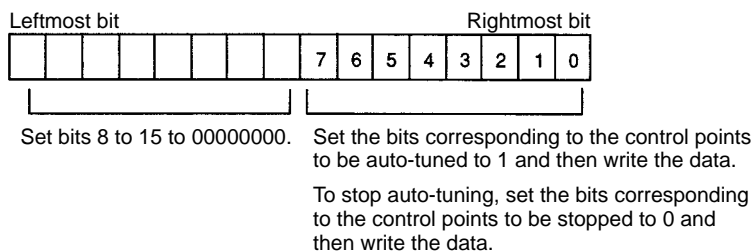
Numeric data for the values in the above table is all expressed as 16-bit signed binary (two's complement for negative values)

- Note**
1. Numeric data cannot be modified during auto-tuning.
 2. Auto-tuning cannot be executed when operation is stopped. Auto-tuning cannot be started in sequence using CompoBus/D communications.
 3. If an instruction to stop operation is executed during auto-tuning, operation will stop after auto-tuning is cancelled.
 4. The setting ranges vary depending on the setting unit used, as shown in the following table.

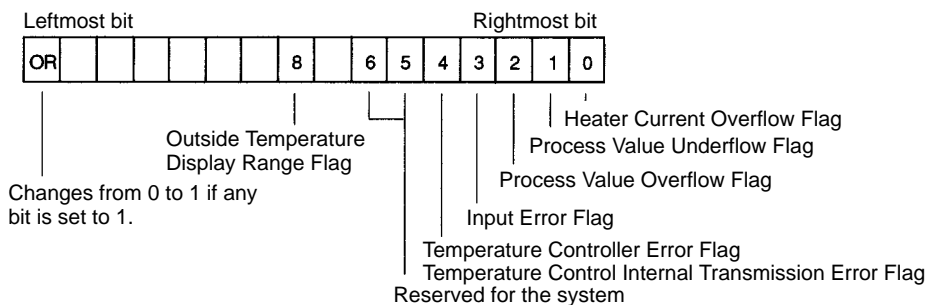
Temperature sensor	Setting range			
	Setting unit (1)		Setting unit (0.1)	
	°C	°F	°C	°F
K	FF38 to 0514 (-200 to 1300)	FED4 to 08FC (-300 to 2300)	F830 to 32C8 (-200.0 to 1300.0)	F448 to 59D8 (-300.0 to 2300.0)
J	FF9C to 0352 (-100 to 850)	FF9C to 05DC (-100 to 1500)	FC18 to 2134 (-100.0 to 850.0)	FC18 to 3A98 (-100.0 to 1500.0)
R	0000 to 06A4 (0 to 1700)	0000 to 0BB8 (0 to 3000)	0000 to 4268 (0.0 to 1700.0)	0000 to 7530 (0.0 to 3000.0)
S	0000 to 06A4 (0 to 1700)	0000 to 0BB8 (0 to 3000)	0000 to 4268 (0.0 to 1700.0)	0000 to 7530 (0.0 to 3000.0)
T	FF38 to 0190 (-200 to 400)	FED4 to 02BC (-200 to 700)	F830 to 0FA0 (-200.0 to 400.0)	F448 to 1B58 (-300.0 to 700.0)
E	0000 to 0258 (0 to 600)	0000 to 044C (0 to 1100)	0000 to 1770 (0.0 to 600.0)	0000 to 2AF8 (0.0 to 1100.0)
B	0064 to 0708 (100 to 1800)	012C to 0BB8 (300 to 3000)	03E8 to 4650 (100.0 to 1800.0)	0BB8 to 7530 (300.0 to 3000.0)
N	0000 to 0514 (0 to 1200)	0000 to 08FC (0 to 2300)	0000 to 32C8 (0.0 to 1300.0)	0000 to 59D8 (0.0 to 2300.0)
L	FF9C to 0352 (-100 to 850)	FF9C to 05DC (-100 to 1500)	FC18 to 2134 (-100.0 to 850.0)	FC18 to 3A98 (-100.0 to 1500.0)
U	FF38 to 0190 (-200 to 400)	FED4 to 02BC (-300 to 700)	F830 to 0FA0 (-200.0 to 400.0)	F448 to 1B58 (-300.0 to 700.0)
W/Re5-26	0000 to 08FC (0 to 2300)	0020 to 1004 (0 to 4100)	0000 to 59D8 (0.0 to 2300.0)	0140 to 7D00 (32 to 3200.0)
PL II	0000 to 0514 (0 to 1300)	0000 to 08FC (0 to 2300)	0000 to 32C8 (0.0 to 1300.0)	0000 to 59D8 (0.0 to 2300.0)
Pt	FF9C to 01F4 (-100 to 500)	FF9C to 0384 (-100 to 900)	FC18 to 1388 (-100.0 to 500.0)	FC18 to 2328 (-100.0 to 900.0)
JPt	FF9C to 01F4 (-100 to 500)	FF9C to 0384 (-100 to 900)	FC18 to 1388 (-100.0 to 500.0)	FC18 to 2328 (-100.0 to 900.0)
Alarm setting range	D8F1 to 270F (-9999 to 9999)		D8F1 to 7530 (-999.9 to 3000.0)	

- If an E5ZD-SDL Setting Display Unit is used with the E5ZE, and the setting unit is 0.1°C/°F, the setting range will be limited to F831 to 270F (-199.9 to 999.9).

- If the alarm temperature that is read is more than 7530 (Hex), the temperature will be read as 7FFF (Hex), and if the alarm temperature is less than D8F1 (Hex), then the temperature will be read as 8000 (Hex).
5. The meaning of the Auto-tuning Start/Stop Bits is as follows:

Auto-tuning Start/Stop

6. The contents of the Operation Start/Stop Bit is the same as that for the remote I/O, as shown here.
- Read: 0: Operation stopped.
1: Controlling temperature or operating manually.
- Write: 0: Stop operation.
1: Start or continue temperature control or continue manual operation. (Even if 1 is written to a control point that is being operated manually it will not start temperature control.)
7. The meaning of the operating status bits is as follows:

Operating Status

8. Control points that have been set to disable the HB and HS alarms, and control points that are not operating will be read as 0000 (hex).

4-4-2 Reading/Writing using Variable Type 90

The table for variable type 90 shows that the addresses are not continuous when the type of set value or measurement value changes. Groups of set values and measurement values that are not in consecutive addresses and include different types of data, however, can be read or written together.

Example: To read the data from the proportional band of control point 0 to the derivative time of control point 7 in one operation, set the data elements as shown here. The data for the addresses in between will also be read

First read address: 0044 (hex) (control point 0 proportional band address)

Number of elements: 0018 (hex) (24 elements)

If, however, there are write-only set values within the range to be read in succession, or read-only set values and measurement values within the range to be written, an error will occur.

The limit on the number of set values for which communications can be performed at one time varies depending on the Master Unit being used. Refer to the

CompoBus/D (DeviceNet) Operation Manual (W267) for details on set value limitations.

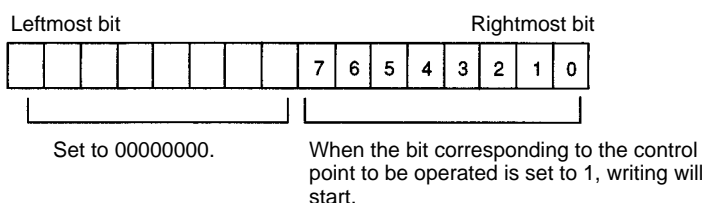
4-4-3 Operation Variables

The following table shows the variable types that are used for operating the E5ZE. If the set value is also in the table for variable type 90, either variable type can be used. to change values.

Variable Type: 83

Address	Set value	Data setting or monitoring range	Data type
0000	Temperature Control Start (See note 1.)	Range: 0001 to 00FF	Status Write only
0001	Operation Stop		
0002	Auto-tuning Start (See note 2.)		
0003	Auto-tuning Stop		
0004	Manual Operation Start (See notes 3 and 6.)		
0005	Write Set Values	0001	
0006	Initialize Set Values (See notes 4 and 5.)		

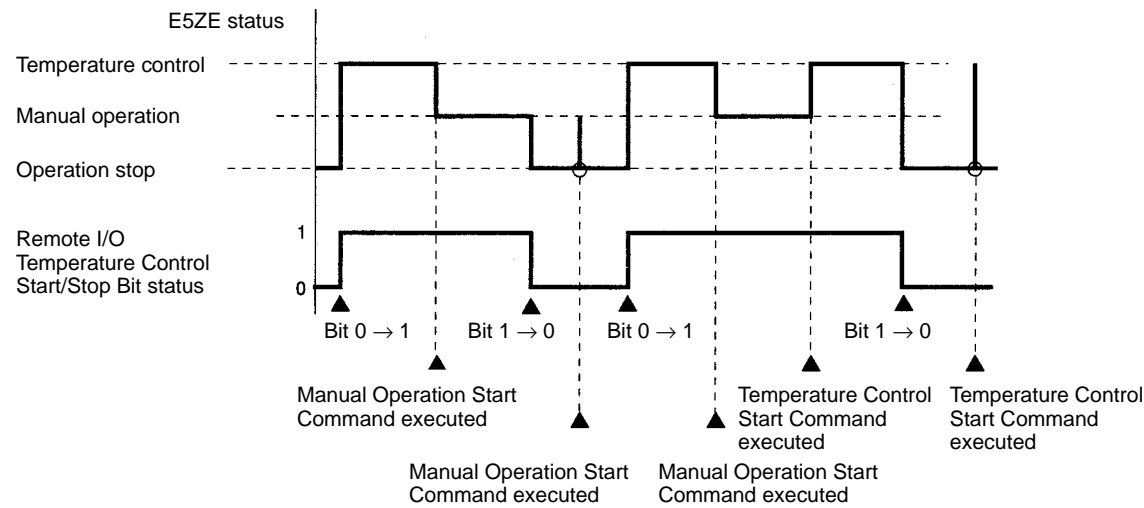
Operation Command Data Contents



- Note**
1. The Temperature Control Start Command cannot be executed while auto-tuning is being executed.
 2. The Auto-tuning Start Command cannot be executed while operation is stopped or the Unit is being manually operated.
 3. The Manual Operation Start Command cannot be executed while auto-tuning is being executed.
 4. The Initializing Setting Data Command can be executed only when the Unit is stopped.
 5. When the Initializing Setting Data command is executed, the parameters in the storage area will be reset to the factory-set default values even if the E5ZE is in RAM write mode.
 6. Set the Temperature Control Start/Stop Bit for the applicable control point to 1 before starting manual operation. (Refer to the graph in the next section.)

4-4-4 Relationship between Operating Status and Operating Commands

The relationship between operating commands from the remote I/O Temperature Control Start/Stop Bit and operating commands from FINS messages or the RS-232C auxiliary setting jack is represented in the following graph. Remote I/O data is refreshed every 200 ms. Operating commands that are different from the status of the remote I/O Temperature Control Start/Stop Bit will, therefore, be momentarily effective and will then immediately change to the commands from the remote I/O.



4-4-5 Set Values in Memory Banks

The following variable type table shows the information required to monitor or change the settings for the control points in memory banks 0 to 7.

Variable Type: 88

No.	Address	Set value or measurement value	Default	Data setting or monitoring range	Data type
1	XY00	Set point	0000	Depends on the input type and setting unit. (Refer to page 20.)	Numeric Read/write
2	XY01	Alarm 1 temperature (See note 1.)	0000	Depends on setting unit. (Refer to page 20.)	
3	XY02	Alarm 2 temperature (See note 1.)	0000		
4	XY03	Proportional band	0000	Range: 0000 to 270F (0.0 to 999.9) Unit: 0.1°C/°F	
5	XY04	Integral time	0000	Range: 0000 to 0F9F (0 to 3999)	
6	XY05	Derivative time	0000	Unit: 1 s	
7	XY06	Heating hysteresis	See note 3	Range: 0000 to 03E7 (0.0 to 99.9) Unit: 0.1°C/°F	
8	XY07	Input shift value	0000	Range: FC19 to 03E7 (–99.9 to 99.9) Unit: 0.1°C/°F	
9	XY08	Heater burnout detection current	0000	Range: 0000 to 01F4 (0.0 to 50.0) Unit: 0.1 A	
10	XY09	Control period (heating)	0002	Range: 0001 to 0063 (0 to 99) Unit: 1 s	
11	XY0A	Manual reset value	01F4	Range: 0000 to 03E8 (0.0 to 100.0)	
12	XY0B	Heating output variable lower limit	0000	Unit: 0.1%	
13	XY0C	Heating output variable upper limit	03E8		
14	XY0D	Ramp value (See note 1.)	0000	Range: 0000 to 03E7 (0.0 to 99.9) Unit: 0.1	
15	XY0E	Ramp time unit (See note 1.)	0000	0000: s, 0001: min, or 0002: hr	
16	XY0F	Output variable change rate limit	0000	Range: 000 to 03E8 (0.0 to 100.0) Unit: 0.1% per sampling period	
17	XY10	Dead band	0000	Range: FC19 to 03E7 (–999 to 999) Unit: 1°C/°F	
18	XY11	Cooling coefficient	000A	Range: 0000 to 0064 (0.0 to 10.0) Unit: 0.1	
19	XY12	Cooling hysteresis	See note 3	Range: 0000 to 03E7 (0.0 to 99.9) Unit: 0.1°C/°F	
20	XY13	Cooling control period	0002	Range: 0001 to 0063 (0 to 99) Unit: 1 s	
21	XY14	Cooling output variable lower limit	0000	Range: 0000 to 03E8 (0.0 to 100.0)	
22	XY15	Cooling output variable upper limit	03E8	Unit: 0.1%	
23	XY16	Fuzzy strength	0032	Range: 0000 to 0063 (0 to 99) Unit: 1%	
24	XY17	Fuzzy scale 1	270F	Range: 0002 to 270F (0.2 to 999.9) Unit: 0.1°C/°F	
25	XY18	Fuzzy scale 2	270F	Range: 0014 to 270F (0.20 to 99.99) Unit: 0.01	

- Set the values of X and Y in the addresses as follows:

X: Control point number (0 to 7). Set “A” for all control points.

Y: Memory bank number (0 to 7). Set “8” for the current memory bank or “A” for all memory banks. The setting A is valid for writing only.

Example: To set the alarm 1 temperature in memory bank 3 for control point 5, the address would be 5301 (hex).

- Set values cannot be written while auto-tuning is being executed.
- Numeric values are expressed as 16-bit signed binary (two's complement for negative values).

- Note**
1. These parameters can be written while auto-tuning is being executed.
 2. The following settings are not possible
 Heating output variable lower limit > Heating output variable upper limit
 Cooling output variable lower limit > Cooling output variable upper limit
 3. The default is 0008 hexadecimal (0.8°C) when the temperature unit is degrees Celsius, and 000F hexadecimal (1.5°F) when it is degrees Fahrenheit.

4-4-6 Measurement Values for Individual Control Points

The following variable type is used to monitor various measurement values at the same time for each control point.

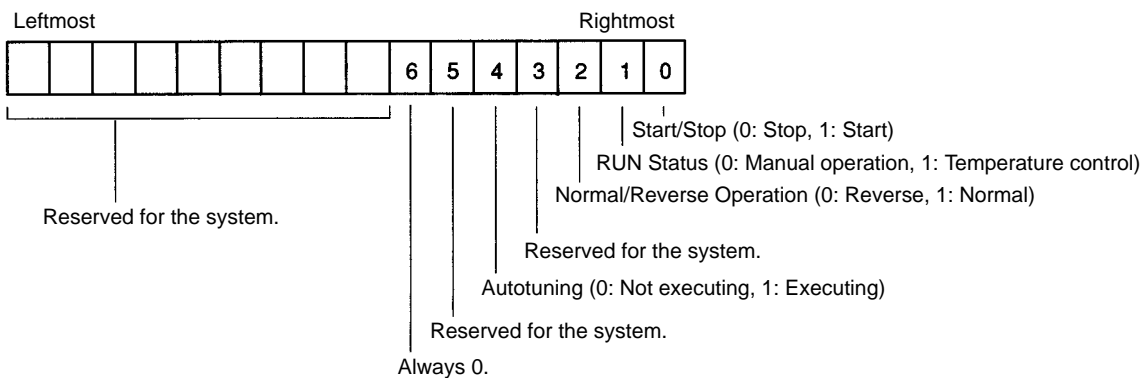
Variable Type: 80

No.	Address	Set value or measurement value	Data setting or monitoring range	Data type
1	X001	Status (See note.)	Range: 0000 to FFBF	Numeric Read only
2	X002	Heating output variable	Range: 0000 to 03EB (0.0 to 100.0) Unit: 0.1%	
3	X003	Heater current	Range: 0000 to 0226 (0.0 to 55.0) Unit:	
4	X004	Cooling output variable	Range: 0000 to 03EB (0.0 to 100.0) Unit: 0.1%	
5	X005	Current set point	Depends on the input type, setting unit, and temperature unit	
6	X006	Current memory bank	Range: 0000 to 0007	
7	X007	SSR failure current value	Range: 0000 to 0226 (0.0 to 55.0) Unit: 0.1 A	

Set the value of X in the address to the applicable control point number (0 to 7).

- Note** The following diagram shows the status contents. Treat the bits specified as reserved for the system as being any status.

Status



4-4-7 Set Values for all Control Points

The following variable table is used for setting and monitoring the same set values for all control points.

Variable Type: 88

No.	Address	Set value or measurement value	Default	Data setting or monitoring range	Data type
1	XF00	Memory bank (See note 3.)	0000	Range: 0000 to 0007 (See note 5.)	Numeric Read/write
2	XF01	Alarm 1 mode (See note 1.)	0000	Range: 0000 to 000C	
3	XF02	Alarm 2 mode (See note 1.)	0000		
4	XF03	Output operation (direct/reverse)(See note 1.)	0000	0000: Reverse operation 0001: Direct operation	
5	XF04	Heating manual output variable (See note 4.)	0000	Range: 0000 to 03E8 (0.0 to 100.0) Unit: 0.1%	
6	XF05	HB/HS alarm enable setting (See note 1.)	0000	0000: HB/HS alarm disabled 0001: HB/HS alarm enabled	Status Read/write
7	XF06	Heater burnout detection current value (See note 2.)	0000	Range: 0000 to 01F4 (0.0 to 50.0) Unit: 0.1 A	Numeric Read/write
8	XF07	SSR failure detection current value (See note 2.)	0000		
9	XF08	Cooling manual output variable (See note 4.)	0000	Range: 0000 to 03E8 (0.0 to 100.0) Unit: 0.1%	

- Set the value of X in the addresses as follows:
X: Control point number (0 to 7). Set "A" all control points. The setting A is valid for writing only.
- Set values cannot be changed while auto-tuning is being executed.

Note

1. These parameters can be set only when operation is stopped.
2. These parameters can be set while auto-tuning is being executed.
3. When external contact inputs are used to set the memory bank, the memory banks cannot be switched using communications.
4. The manual output variable can be set only during manual operation. This applies to both heating and cooling control.
5. The relationship between the set point and alarm mode is as shown below.

Set point	Alarm mode
0000	No alarm
0001	Upper- and lower-limit alarm
0002	Upper-limit alarm
0003	Lower-limit alarm
0004	Upper- and lower-limit range alarm
0005	Upper- and lower-limit alarm with standby sequence
0006	Upper-limit alarm with standby sequence
0007	Lower-limit alarm with standby sequence
0008	Absolute-value upper-limit alarm
0009	Absolute-value lower-limit alarm
000A	Absolute-value upper-limit alarm with standby sequence
000B	Absolute-value lower-limit alarm with standby sequence
000C	HB alarm and HS alarm (general alarm)

4-4-8 Set Values for All Control Points

The following variable table is used for setting and monitoring set values that are used for all control points.

Variable Type: 88

Address	Set value or measurement value	Data setting or monitoring range	Data type
F000	Specification temperature range lower limit (See note.)	Depends on the temperature sensor type used.	Numeric Read only
F001	Specification temperature range upper limit (See note.)		
F002	Temperature unit	0: °C or 1: °F	
F003	Setting unit	0: 1°C/°F or 1: 0.1°C/°F Default: 0	Numeric Read/write

Note When a W sensor is used with the setting unit set to 0.1°C/°F, the upper limit will be read as CCCC.