Module Type Controller SRZ

Temperature Control Module [for Host Communication]

Z-TIO Host Communication Quick Instruction Manual

IMS01T02-E3

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

This manual describes the host communication, module address setting of the Z-TIO module. For the address setting of any other module, refer to the Instruction Manual for the respective module. For detailed handling procedures and various function settings, please refer to separate SRZ Instruction Manual (IMS01T04 -E□).

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

1. COMMUNICATION SETTING

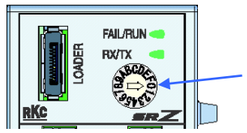
Set communication setting before mounting and wiring of the Z-TIO.

CAUTION

Do not separate the module mainframe from the base with the power turned on. If so, instrument failure may result.

1.1 Module Address Setting

Set an address for the module using a small blade screwdriver.

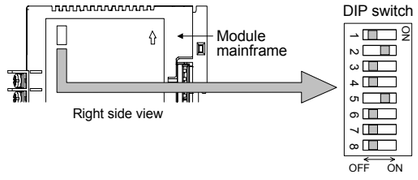


Address setting switch
Setting range: 0 to F [0 to 15: Decimal]
Factory set value: 0

- **For Modbus, the value obtained by adding "1" to the set address corresponds to the address used for the actual program.**
- **To avoid problems or malfunction, do not duplicate an address on the same communication line.**

1.2 Protocol Selections and Communication Speed Setting

Use the DIP switch on the right side of module to select communication speed, data bit configuration and protocol. The data changes become valid when the power is turned on again or when changed to RUN/STOP.



(The above figure is for the terminal type. However, the switch positions are the same for the connector type.)

1	2	Communication speed
OFF	OFF	4800 bps
ON	OFF	9600 bps
OFF	ON	19200 bps
ON	ON	38400 bps

Factory set value: 19200 bps

3	4	5	Data bit configuration
OFF	OFF	OFF	Data 7-bit, without parity, Stop 1-bit *
ON	OFF	OFF	Don't set this one
OFF	ON	OFF	Data 7-bit, Even parity, Stop 1-bit *
ON	ON	OFF	Data 7-bit, Odd parity, Stop 1-bit *
OFF	OFF	ON	Data 8-bit, without parity, Stop 1-bit
ON	OFF	ON	Don't set this one
OFF	ON	ON	Data 8-bit, Even parity, Stop 1-bit
ON	ON	ON	Data 8-bit, Odd parity, Stop 1-bit

* When the Modbus communication protocol is selected, this setting becomes invalid.
Factory set value: Data 8-bit, without parity, Stop 1-bit

6	Protocol
OFF	RKC communication
ON	Modbus

Factory set value: RKC communication

- **Switch No. 7 and 8 must be always OFF. Do not set to ON.**
- **When two or more modules are connected on the same communication line, the DIP switch settings of all modules must be the same.**

2. CONNECTION TO HOST COMPUTER

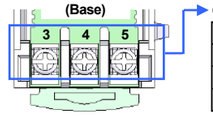
WARNING

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

Connect a termination resistor between the communication terminals (No.3 and No. 4) of the module at the end of the communication line from the host computer.

The cable must be provided by the customer.

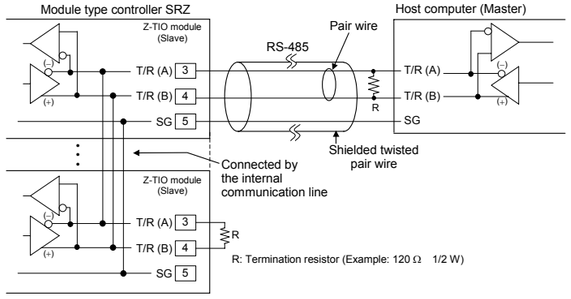
The Z-TIO has RS-485 communication terminals for RKC communication or Modbus/RTU communication protocol. Communication terminals are on the base side.



Communication terminals (RS-485)

Terminal No.	Signal name	Symbol
3	Send data/Receive data	T/R (A)
4	Send data/Receive data	T/R (B)
5	Signal ground	SG

● **Connection to the RS-485 port of the host computer (master)**

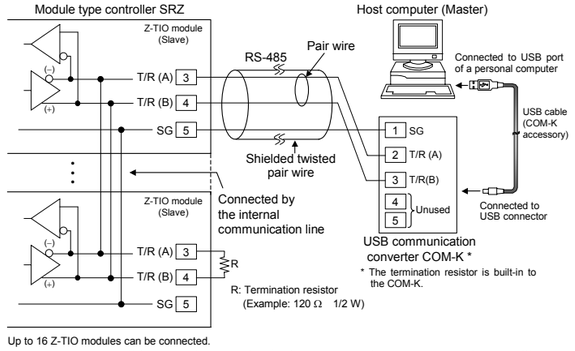


Up to 16 Z-TIO modules can be connected.
The maximum number of SRZ modules (including other function modules) on the same communication line is 31.

● **Connection to the RS-232C port of the host computer (master)**

Up to 16 Z-TIO modules can be connected.
The maximum number of SRZ modules (including other function modules) on the same communication line is 31.

● **Connection to the USB of the host computer (master)**



Up to 16 Z-TIO modules can be connected.
The maximum number of SRZ modules (including other function modules) on the same communication line is 31.

3. COMMUNICATION REQUIREMENTS

■ Processing times during data send/receive

When the host computer is using either the polling or selecting procedure for communication, the following processing times are required for controller to send data:
- Response wait time after controller sends BCC in polling procedure
- Response wait time after controller sends ACK or NAK in selecting procedure

RKC communication (Polling procedure)

Procedure details	Time
Response send time after controller receives ENQ	50 ms max.
Response send time after controller receives ACK	50 ms max.
Response send time after controller receives NAK	50 ms max.
Response send time after controller sends BCC	2 ms max.

RKC communication (Selecting procedure)

Procedure details	Time
Response send time after controller receives BCC	50 ms max.
Response wait time after controller sends ACK	2 ms max.
Response wait time after controller sends NAK	2 ms max.

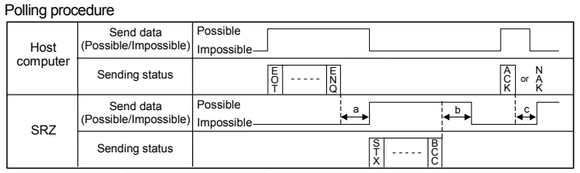
Modbus

Procedure details	Time
Read holding registers [03H] Response send time after the slave receives the query message	50 ms max.
Preset single register [06H] Response send time after the slave receives the query message	30 ms max.
Diagnostics (loopback test) [08H] Response send time after the slave receives the query message	30 ms max.
Preset multiple registers [10H] Response send time after the slave receives the query message	100 ms max.

■ RS-485 (2-wire system) send/receive timing

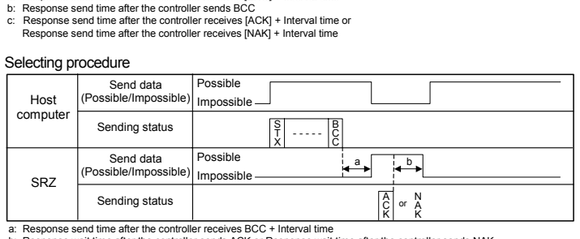
RS-485 communication is conducted through two wires, therefore the transmission and reception of data requires precise timing.

Polling procedure



a: Response send time after the controller receives [ENQ] + Interval time
b: Response send time after the controller sends BCC
c: Response send time after the controller receives [ACK] + Interval time or Response send time after the controller receives [NAK] + Interval time

Selecting procedure



a: Response send time after the controller receives BCC + Interval time
b: Response wait time after the controller sends ACK or Response wait time after the controller sends NAK

To switch the host computer from transmission to reception, send data must be on line.

The following processing times are requires for the controller to process data.
- In Polling procedure, Response wait time after the controller sends BCC
- In Selecting procedure, Response wait time after the controller sends ACK or NAK

■ Fail-safe

A transmission error may occur with the transmission line disconnected, shorted or set to the high-impedance state. In order to prevent the above error, it is recommended that the fail-safe function be provided on the receiver side of the host computer. The fail-safe function can prevent a framing error from its occurrence by making the receiver output stable to the MARK (1) when the transmission line is in the high-impedance state.

■ Modbus data processing precautions

- Data with decimal point is treated as data without decimal point on the Modbus protocol.
- With Modbus protocol, the maximum number of channels per slave address is 4.
- Do not write data to any address which is not described in a list of data maps.
- If data range or address error occurs during data writing, the data written before error is in effect.
- When communication data is sent to the controller that does not correctly match the connected module or selected functions on the modules, the data will be invalid. If the data is within a setting range, no error message is sent from the controller. The read data is "0".
- Send the next command message at time intervals of 24 bits after the master receives the response message.

4. HOST COMMUNICATION DATA MAP

Explanation of items shown in the communication data maps are as follows.

- Modbus register address (HEX: Hexadecimal DEC: Decimal)
  For a 4CH type, follow the chart exactly. For the 2CH type, the register addresses for Channel 3 and 4 are unused. For communication parameters for heat/cool control, the register addresses for Channel 2 and 4 are unused.

  Example: The register addresses of 0092 (HEX) to 0095 (HEX)

CH#	Address	
	⋮	
CH1	0092	
CH2	0093	(This address is unused with heat/cool control.)
CH3	0094	(This address is unused with 2CH type.)
CH4	0095	(This address is unused with heat/cool control or 2CH type.)
	⋮	

- Digits
  The number of communication data digits in RKC communication
- Attribute
  RO: Read only data (Host computer ← The controller)
  R/W: Read and Write data (Host computer ↔ The controller)
- Data

Symbols used in MAP
- ♣: Parameters only used for heat/cool control or position proportioning control, therefore data for CH2 and CH4 are unused.
- ★: Parameters which can be used in multi-memory area function.
- ♦: Data for each module ▲: Data for each channel

For details on the data, see the **SRZ Instruction Manual** (IMS01T04-E□).

■ Communication data (RKC communication/Modbus)

Name	RKC Identifier	Modbus register address HEX	Modbus register address DEC	Digits	Attribute	Data range	Factory set value
Model code ♦	ID	—	—	32	RO	Model code (character)	—
ROM version ♦	VR	—	—	8	RO	ROM version	—
Measured value (PV) ▲	M1	0000 ⋮ 0003	0 ⋮ 3	7	RO	Input scale low to Input scale high	—
Comprehensive event state ♦	AJ	0004 ⋮ 0007	4 ⋮ 7	7	RO	RKC communication Least significant digit to 4th digit: Event 1 state to Event 4 state 5th digit: Heater break alarm state 6th digit: Temperature rise completion 7th digit: Burnout Data 0: OFF 1: ON	—
						Modbus b0 to b3: Event 1 state to Event 4 state b4: Heater break alarm state b5: Temperature rise completion b6: Burnout b7 to b15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 127]	—
Operation mode state monitor ♦	L0	0008 ⋮ 000B	8 ⋮ 11	7	RO	RKC communication Least significant digit: Control STOP 2nd digit: Control RUN 3rd digit: Manual mode 4th digit: Remote mode 5th digit to Most significant digit: Unused Data 0: OFF 1: ON	—
						Modbus b0: Control STOP b1: Control RUN b2: Manual mode b3: Remote mode b4 to b15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 15]	—
Error code ♦	ER	000C	12	7	RO	RKC communication 1: Adjustment data error 2: Data back-up error 4: A/D conversion error 32: Logic output data error	—
						Modbus b0: Adjustment data error b1: Data back-up error b2: A/D conversion error b3: Unused b4: Unused b5: Logic output data error b6 to b15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 63]	—

(Continued on the next page ➔)

Name	RKC Identifier	Modbus register address HEX	Modbus register address DEC	Digits	Attribute	Data range	Factory set value
Manipulated output value (MV) monitor [heat-side] ♣	O1	000D ⋮ 0010	13 ⋮ 16	7	RO	PID control or heat/cool PID control: −5.0 to +105.0 % Position proportioning control (FBR input): 0.0 to 100.0 %	—
Manipulated output value (MV) monitor [cool-side] ♣	O2	0011 ⋮ 0014	17 ⋮ 20	7	RO	−5.0 to +105.0 %	—
Current transformer (CT) input value monitor ♠	M3	0015 ⋮ 0018	21 ⋮ 24	7	RO	CTL-6-P-N: 0.0 to 30.0 A CTL-12-S56-10L-N: 0.0 to 100.0 A	—
Set value (SV) monitor ♠	MS	0019 ⋮ 001C	25 ⋮ 28	7	RO	Setting limiter (low) to Setting limiter (high)	—
Remote setting (RS) input value monitor ♠	S2	001D ⋮ 0020	29 ⋮ 32	7	RO	Setting limiter (low) to Setting limiter (high)	—
Burnout state monitor ♠	B1	0021 ⋮ 0024	33 ⋮ 36	1	RO	0: OFF 1: ON	—
Event 1 state monitor ♠	AA	0025 ⋮ 0028	37 ⋮ 40	1	RO	0: OFF 1: ON	—
Event 2 state monitor ♠	AB	0029 ⋮ 002C	41 ⋮ 44	1	RO		—
Event 3 state monitor ♠	AC	002D ⋮ 0030	45 ⋮ 48	1	RO		—
Event 4 state monitor ♠	AD	0031 ⋮ 0034	49 ⋮ 52	1	RO		—
Heater break alarm (HBA) state monitor ♠	AE	0035 ⋮ 0038	53 ⋮ 56	1	RO	0: OFF 1: ON	—
Output state monitor ♦	Q1	0039	57	7	RO	RKC communication Least significant digit to 4th digit: OUT1 to OUT4 5th digit to Most significant digit: Unused Data 0: OFF 1: ON	—
						Modbus b0 to b3: OUT1 to OUT4 b4 to b15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 15]	—
Memory area soak time monitor ♠	TR	003A ⋮ 003D	58 ⋮ 61	7	RO	0 minutes 00 seconds to 199 minutes 59 seconds: RKC communication: 0:00 to 199:59 (min:sec) Modbus: 0 to 11999 seconds 0 hours 00 minutes to 99 hours 59 minutes: RKC communication: 0:00 to 99:59 (hrs:min) Modbus: 0 to 5999 minutes	—
Integrated operating time monitor ♦	UT	003E	62	7	RO	0 to 19999 hours	—
Holding peak value ambient temperature monitor ♠	Hp	003F ⋮ 0042	63 ⋮ 66	7	RO	−10.0 to +100.0 °C or 14 to 212 °F	—
Backup memory state monitor ♦	EM	0043	67	1	RO	0: The content of the backup memory does not coincide with that of the RAM. 1: The content of the backup memory coincides with that of the RAM.	—
Logic output monitor 1 ♦	ED	—	—	7	RO	RKC communication Least significant digit to 4th digit: Logic output 1 to 4 5th digit to Most significant digit: Unused Data 0: OFF 1: ON	
Logic output monitor 2 ♦	EE	—	—	7	RO	RKC communication Least significant digit to 4th digit: Logic output 5 to 8 5th digit to Most significant digit: Unused Data 0: OFF 1: ON	
Logic output monitor ♦	—	0044	68	—	RO	Modbus b0 to b7: Logic output 1 to 8 b8 to b15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 255]	
Unused	—	0045 ⋮ 0060	69 ⋮ 96	—	—	—	—
PID/AT transfer ♠	G1	0061 ⋮ 0064	97 ⋮ 100	1	R/W	0: PID control 1: Autotuning (AT)	0
Auto/Manual transfer ♠	J1	0065 ⋮ 0068	101 ⋮ 104	1	R/W	0: Auto mode 1: Manual mode	0
Remote/Local transfer ♠	C1	0069 ⋮ 006C	105 ⋮ 108	1	R/W	0: Local mode 1: Remote mode	0
RUN/STOP transfer ♦	SR	006D	109	1	R/W	0: STOP (Control stop) 1: RUN (Control start)	0
Memory area transfer ♠	ZA	006E ⋮ 0071	110 ⋮ 113	7	R/W	1 to 8	1
Interlock release ♠	AR	0072 ⋮ 0075	114 ⋮ 117	7	R/W	0: Normal state 1: Interlock release execution	0
Event 1 set value (EV1) ★ ♠	A1	0076 ⋮ 0079	118 ⋮ 121	7	R/W	Deviation action, Deviation action between channels, Temperature rise completion range*: −Input span to +Input span Process action, SV action: Input scale low to Input scale high MV action: −5.0 to +105.0 % *When temperature rise completion is selected at Event 3 action type.	50
Event 2 set value (EV2) ★ ♠	A2	007A ⋮ 007D	122 ⋮ 125	7	R/W		50
Event 3 set value (EV3) ★ ♠	A3	007E ⋮ 0081	126 ⋮ 129	7	R/W		50
Event 4 set value (EV4) ★ ♠	A4	0082 ⋮ 0085	130 ⋮ 133	7	R/W		50

Name	RKC Identifier	Modbus register address HEX	Modbus register address DEC	Digits	Attribute	Data range	Factory set value
Control loop break alarm (LBA) time ★ ♠	A5	0086 ⋮ 0089	134 ⋮ 137	7	R/W	0 to 7200 seconds (0: Unused)	480
LBA deadband ★ ♠	N1	008A ⋮ 008D	138 ⋮ 141	7	R/W	0 (0.0) to Input span	0 (0.0)
Set value (SV) ★ ♠	S1	008E ⋮ 0091	142 ⋮ 145	7	R/W	Setting limiter (low) to Setting limiter (high)	TC/RTD: 0 V/I: 0.0
Proportional band [heat-side] ♣ ★ ♠	P1	0092 ⋮ 0095	146 ⋮ 149	7	R/W	TC/RTD inputs: 0 (0.0) to Input span (Unit: °C [°F]) Voltage (V)/current (I) inputs: 0.0 to 1000.0 % of Input span 0 (0.0): ON/OFF action	TC/RTD: 30 (30.0) V/I: 30.0
Integral time [heat-side] ♣ ★ ♠	I1	0096 ⋮ 0099	150 ⋮ 153	7	R/W	PID control or heat/cool PID control: 0 to 3600 seconds or 0.0 to 1999.9 seconds (0, 0.0: PD action) Position proportioning control: 1 to 3600 seconds or 0.1 to 1999.9 seconds	240
Derivative time [heat-side] ♣ ★ ♠	D1	009A ⋮ 009D	154 ⋮ 157	7	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds (0, 0.0: PI action)	60
Control response parameter ♣ ★ ♠	CA	009E ⋮ 00A1	158 ⋮ 161	1	R/W	0: Slow 1: Medium 2: Fast When the P or PD action is selected, this setting becomes invalid.	PID control, Position proportioning control: 0 Heat/cool PID control: 2
Proportional band [cool-side] ♣ ★ ♠	P2	00A2 ⋮ 00A5	162 ⋮ 165	7	R/W	TC/RTD inputs: 1 (0.1) to Input span (Unit: °C [°F]) Voltage (V)/current (I) inputs: 0.1 to 1000.0 % of Input span	TC/RTD: 30 (30.0) V/I: 30.0
Integral time [cool-side] ♣ ★ ♠	I2	00A6 ⋮ 00A9	166 ⋮ 169	7	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds (0, 0.0: PD action)	240
Derivative time [cool-side] ♣ ★ ♠	D2	00AA ⋮ 00AD	170 ⋮ 173	7	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds (0, 0.0: PI action)	60
Overlap/ Deadband ♣ ★ ♠	V1	00AE ⋮ 00B1	174 ⋮ 177	7	R/W	TC/RTD inputs: −Input span to +Input span (Unit:°C [°F]) Voltage (V)/current (I) inputs: −100.0 to +100.0 % of Input span	0
Manual reset ★ ♠	MR	00B2 ⋮ 00B5	178 ⋮ 181	7	R/W	−100.0 to +100.0 %	0.0
Setting change rate limiter (up) ★ ♠	HH	00B6 ⋮ 00B9	182 ⋮ 185	7	R/W	0 (0.0) to Input span/unit time 0 (0.0): Unused	0 (0.0)
Setting change rate limiter (down) ★ ♠	HL	00BA ⋮ 00BD	186 ⋮ 189	7	R/W	Unit time: 60 seconds (factory set value)	0 (0.0)
Area soak time ★ ♠	TM	00BE ⋮ 00C1	190 ⋮ 193	7	R/W	0 minutes 00 seconds to 199 minutes 59 seconds: RKC communication: 0:00 to 199:59 (min:sec) Modbus: 0 to 11999 seconds 0 hours 00 minutes to 99 hours 59 minutes: RKC communication: 0:00 to 99:59 (hrs:min) Modbus: 0 to 5999 minutes	RKC communication: 0:00 Modbus: 0
Link area number ★ ♠	LP	00C2 ⋮ 00C5	194 ⋮ 197	7	R/W	0 to 8 (0: No link)	0
Heater break alarm (HBA) set value ♠	A7	00C6 ⋮ 00C9	198 ⋮ 201	7	R/W	When CT is CTL-6-P-N: 0.0 to 30.0 A (0.0: Not used) When CT is CTL-12-S56-10L-N: 0.0 to 100.0 A (0.0: Not used)	0.0
Heater break determination point ♠	NE	00CA ⋮ 00CD	202 ⋮ 205	7	R/W	0.0 to 100.0 % of HBA set value (0.0: Heater break determination is invalid)	30.0
Heater melting determination point ♠	NF	00CE ⋮ 00D1	206 ⋮ 209	7	R/W	0.0 to 100.0 % of HBA set value (0.0: Heater melting determination is invalid)	30.0
PV bias ♠	PB	00D2 ⋮ 00D5	210 ⋮ 213	7	R/W	−Input span to +Input span	0
PV digital filter ♠	F1	00D6 ⋮ 00D9	214 ⋮ 217	7	R/W	0.0 to 100.0 seconds (0.0: Unused)	0.0
PV ratio ♠	PR	00DA ⋮ 00DD	218 ⋮ 221	7	R/W	0.500 to 1.500	1.000
PV low input cut-off ♠	DP	00DE ⋮ 00E1	222 ⋮ 225	7	R/W	0.00 to 25.00 % of input span	0.00
RS bias * ♠	RB	00E2 ⋮ 00E5	226 ⋮ 229	7	R/W	−Input span to +Input span	0
RS digital filter * ♠	F2	00E6 ⋮ 00E9	230 ⋮ 233	7	R/W	0.0 to 100.0 seconds (0.0: Unused)	0.0
RS ratio * ♠	RR	00EA ⋮ 00ED	234 ⋮ 237	7	R/W	0.001 to 9.999	1.000
Output distribution selection ♠	DV	00EE ⋮ 00F1	238 ⋮ 241	1	R/W	0: Control output 1: Distribution output	0

* Data on RS bias, RS ratio and RS digital filter is that in cascade control or ratio setting.

Name	RKC Identifier	Modbus register address HEX	Modbus register address DEC	Digits	Attribute	Data range	Factory set value
Output distribution bias ♠	DW	00F2 ⋮ 00F5	242 ⋮ 245	7	R/W	−100.0 to +100.0 %	0.0
Output distribution ratio ♠	DQ	00F6 ⋮ 00F9	246 ⋮ 249	7	R/W	−9.999 to +9.999	1.000
Proportional cycle time ♠	T0	00FA ⋮ 00FD	250 ⋮ 253	7	R/W	0.1 to 100.0 seconds M: Relay contact output V: Voltage pulse output T: Triac output D: Open collector output	M output: 20.0 V, T, D output: 2.0
Minimum ON/OFF time of proportioning cycle ♠	VI	00FE ⋮ 0101	254 ⋮ 257	7	R/W	0 to 1000 ms	0
Manual manipulated output value ♣ ♠	ON	0102 ⋮ 0105	258 ⋮ 261	7	R/W	PID control: Output limiter (low) to Output limiter (high) Heat/cool PID control: −Cool-side output limiter (high) to +Heat-side output limiter (high) Position proportioning control (with FBR input): Output limiter (low) to Output limiter (high) Position proportioning control (without FBR input): 0: Close-side output OFF, Open-side output OFF 1: Close-side output ON, Open-side output OFF 2: Close-side output OFF, Open-side output ON	0.0
Area soak time stop function ♠	RV	0106 ⋮ 0109	262 ⋮ 265	1	R/W	0: No function 3: Event 3 1: Event 1 4: Event 4 2: Event 2	0
EDS mode (for disturbance 1) ♠	NG	010A ⋮ 010D	266 ⋮ 269	1	R/W	0: No function 1: EDS function mode 2: Learning mode 3: Tuning mode	0
EDS mode (for disturbance 2) ♠	NX	010E ⋮ 0111	270 ⋮ 273	1	R/W	EDS function: External disturbance suppression function	0
EDS value 1 (for disturbance 1) ♠	NI	0112 ⋮ 0115	274 ⋮ 277	7	R/W	−100.0 to +100.0 %	0.0
EDS value 1 (for disturbance 2) ♠	NJ	0116 ⋮ 0119	278 ⋮ 281	7	R/W		0.0
EDS value 2 (for disturbance 1) ♠	NK	011A ⋮ 011D	282 ⋮ 285	7	R/W		0.0
EDS value 2 (for disturbance 2) ♠	NM	011E ⋮ 0121	286 ⋮ 289	7	R/W		0.0
EDS transfer time (for disturbance 1) ♠	NN	0122 ⋮ 0125	290 ⋮ 293	7	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds	0
EDS transfer time (for disturbance 2) ♠	NO	0126 ⋮ 0129	294 ⋮ 297	7	R/W		0
EDS action time (for disturbance 1) ♠	NQ	012A ⋮ 012D	298 ⋮ 301	7	R/W	1 to 3600 seconds	600
EDS action time (for disturbance 2) ♠	NL	012E ⋮ 0131	302 ⋮ 305	7	R/W		600
EDS action wait time ♠ (for disturbance 1)	NR	0132 ⋮ 0135	306 ⋮ 309	7	R/W	0.0 to 600.0 seconds	0.0
EDS action wait time ♠ (for disturbance 2)	NY	0136 ⋮ 0139	310 ⋮ 313	7	R/W		0.0
EDS value learning times ♠	NT	013A ⋮ 013D	314 ⋮ 317	7	R/W	0 to 10 times (0: No learning mode)	1
EDS start signal ♠	NU	013E ⋮ 0141	318 ⋮ 321	1	R/W	0: EDS start signal OFF 1: EDS start signal ON (for disturbance 1) 2: EDS start signal ON (for disturbance 2)	0
Operation mode ♠	EI	0142 ⋮ 0145	322 ⋮ 325	1	R/W	0: Unused 1: Monitor 2: Monitor + Event function 3: Control	3
Startup tuning (ST) ♠	ST	0146 ⋮ 0149	326 ⋮ 329	1	R/W	0: ST unused 1: Execute once 2: Execute always	0
Automatic temperature rise learning ♠	Y8	014A ⋮ 014D	330 ⋮ 333	1	R/W	0: Unused 1: Learning	0
Communication switch (for logic) ♦	EF	014E	334	7	R/W	RKC communication Least significant digit to 4th digit: Communication switch 1 to 4 5th digit to Most significant digit: Unused Data 0: OFF 1: ON	0
						Modbus b0 to b3: Communication switch 1 to 4 b4 to b15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 15]	0
Unused	—	014F ⋮ 0175	335 ⋮ 373	—	—	—	—

For communication data (Engineering setting), refer to the **SRZ Instruction Manual (IMS01T04-E□)**.

■ Communication data for multi-memory area data (only for Modbus)

Use the register addresses of 0500H to 0553H to confirm or change set values of parameters in multi-memory areas which are not selected. For example, when memory area 1 is selected, set values of parameters in memory-area 2 to 7 can be changed by these register addresses. [For RKC communication, communication parameter is used to do the same operation. Refer to **SRZ Instruction Manual (IMS01T04-E□)**.]

Name	Modbus register address HEX	Modbus register address DEC	Attribute	Data range	Factory set value
Setting memory area number	0500 ⋮ 0503	1280 ⋮ 1283	R/W	1 to 8	1
Event 1 set value (EV1)	0504 ⋮ 0507	1284 ⋮ 1287	R/W	Deviation action, Deviation action between channels, Temperature rise completion range: −Input span to +Input span Process action, SV action: Input scale low to Input scale high MV action: −5.0 to +105.0 %	50
Event 2 set value (EV2)	0508 ⋮ 050B	1288 ⋮ 1291	R/W		50
Event 3 set value (EV3)	050C ⋮ 050F	1292 ⋮ 1295	R/W		50
Event 4 set value (EV4)	0510 ⋮ 0513	1296 ⋮ 1299	R/W		50
Control loop break alarm (LBA) time	0514 ⋮ 0517	1300 ⋮ 1303	R/W	0 to 7200 seconds (0: Unused)	480
LBA deadband	0518 ⋮ 051B	1304 ⋮ 1307	R/W	0 (0.0) to Input span	0 (0.0)
Set value (SV)	051C ⋮ 051F	1308 ⋮ 1311	R/W	Setting limiter (low) to Setting limiter (high)	TC/RTD: 0 V/I: 0.0
Proportional band [heat-side]	0520 ⋮ 0523	1312 ⋮ 1315	R/W	TC/RTD inputs: 0 (0.0) to Input span (Unit: °C [°F]) Voltage (V)/current (I) inputs: 0.0 to 1000.0 % of Input span 0 (0.0): ON/OFF action	TC/RTD: 30 (30.0) V/I: 30.0
Integral time [heat-side]	0524 ⋮ 0527	1316 ⋮ 1319	R/W	PID control or heat/cool PID control: 0 to 3600 seconds or 0.0 to 1999.9 seconds (0, 0.0: PD action) Position proportioning control: 1 to 3600 seconds or 0.1 to 1999.9 seconds	240
Derivative time [heat-side]	0528 ⋮ 052B	1320 ⋮ 1323	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds (0, 0.0: PI action)	60
Control response parameter	052C ⋮ 052F	1324 ⋮ 1327	R/W	0: Slow 1: Medium 2: Fast When the P or PD action is selected, this setting becomes invalid.	PID control, Position proportioning control: 0 Heat/cool PID control: 2
Proportional band [cool-side]	0530 ⋮ 0533	1328 ⋮ 1331	R/W	TC/RTD inputs: 1 (0.1) to Input span (Unit: °C [°F]) Voltage (V)/current (I) inputs: 0.1 to 1000.0 % of Input span	TC/RTD: 30 (30.0) V/I: 30.0
Integral time [cool-side]	0534 ⋮ 0537	1332 ⋮ 1335	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds (0, 0.0: PD action)	240
Derivative time [cool-side]	0538 ⋮ 053B	1336 ⋮ 1339	R/W	0 to 3600 seconds or 0.0 to 1999.9 seconds (0, 0.0: PI action)	60
Overlap/Deadband	053C ⋮ 053F	1340 ⋮ 1343	R/W	TC/RTD inputs: −Input span to +Input span (Unit:°C [°F]) Voltage (V)/current (I) inputs: −100.0 to +100.0 % of Input span	0
Manual reset	0540 ⋮ 0543	1344 ⋮ 1347	R/W	−100.0 to +100.0 %	0.0
Setting change rate limiter (up)	0544 ⋮ 0547	1348 ⋮ 1351	R/W	0 (0.0) to Input span/unit time 0 (0.0): Unused	0 (0.0)
Setting change rate limiter (down)	0548 ⋮ 054B	1352 ⋮ 1355	R/W	Unit time: 60 seconds (factory set value)	0 (0.0)
Area soak time	054C ⋮ 054F	1356 ⋮ 1359	R/W	0 to 11999 seconds or 0 to 5999 minutes	0
Link area number	0550 ⋮ 0553	1360 ⋮ 1363	R/W	0 to 8 (0: No link)	0

☞ For the Modbus data mapping function, see the **SRZ Instruction Manual (IMS01T04-E□)**.

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