Ethernet Communication Converter

COM-ML-1 [For SRZ] Quick Instruction Manual

IMR02E14-E1

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Thank you for purchasing this RKC product. In order to achieve maximum performance and ensure proper operation of the instrument, carefully read all the instructions in this manual. Please place the manual in a convenient location for easy reference.
This manual describes the basic operation method of the COM-ML-1. For the installation, the communication data, the detailed handling procedures and various function settings, please refer to the following separate manuals.

- COM-ML-1 [For SRZ] Installation Manual (IMR02E13-E□): Enclosed with COM-ML
- COM-ML-1 [For SRZ] Host Communication Data List (IMR02E15-E□): Enclosed with COM-ML
- COM-ML-1 [For SRZ] PLC Communication Data List (IMR02E16-E□): Enclosed with COM-ML
- COM-ML-1 [For SRZ] Instruction Manual (IMR02E17-E□): Separate (Download or sold separately)

These manuals can be downloaded from the official RKC website:
http://www.rkcinst.com/english/manual_load.htm

1. HANDLING PROCEDURES

Host communication settings → Refer to **2. HOST COMMUNICATION SETTINGS**

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Installation and wiring
- Refer to **COM-ML-1 [For SRZ] Installation Manual (IMR02E13-E□)**.
- For information on the SRZ, refer to **Z-TIO Instruction Manual (IMS01T01-E□)**, **Z-DIO Instruction Manual (IMS01T03-E□)** or **Z-CT Instruction Manual (IMS01T16-E□)**.

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Function module settings
- Refer to **3. COMMUNICATION SETTING OF FUNCTION MODULES**
- Refer to **Z-TIO Host Communication Quick Instruction Manual (IMS01T02-E□)**, **Z-DIO Instruction Manual (IMS01T03-E□)** or **Z-CT Instruction Manual (IMS01T16-E□)**.

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IP address settings → Refer to **4. IP ADDRESS SETTINGS**.

↓

PLC communication environment settings → Refer to **5. PLC COMMUNICATION ENVIRONMENT SETTINGS** [Only PLC communication]

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Other communication data settings → Refer to **6. OTHER COMMUNICATION DATA SETTINGS**.

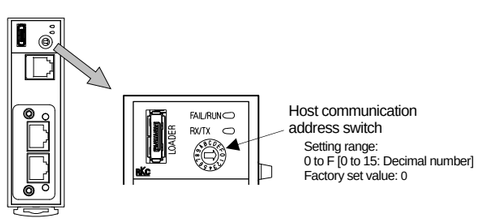
2. HOST COMMUNICATION SETTINGS

⚠ WARNING
- To prevent electric shock or instrument failure, always turn off the power before setting the switch.
- To prevent electric shock or instrument failure, never touch any section other than those instructed in this manual.

2.1 Address Settings

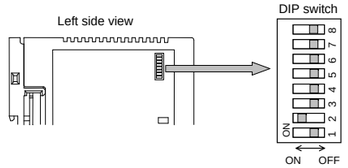
Set the address for host communication. Use a small flat-blade screwdriver to configure the setting.

Set the address such that it is different to the other addresses on the same line. Otherwise, problems or malfunction may result.



2.2 DIP Switch Settings

Use the DIP switch to set the speed and protocol of host communication, default IP address setting, and DIP switch enable/disable.



1	2	Host communication speed	
OFF	OFF	4800 bps	
ON	OFF	9600 bps	
OFF	ON	19200 bps	← Factory set value: 19200 bps
ON	ON	38400 bps	

3	Communication protocol/Data bit configuration	
OFF	RKC communication (Data 8-bit, Without parity, Stop 1-bit)	← Factory set value: RKC communication *
ON	Modbus (Data 8-bit, Without parity, Stop 1-bit)	

* Factory set value when the Host communication protocol is not specified at the time of ordering.

4	5	
OFF	OFF	Fixed

6	7	Default IP address setting	
OFF	OFF	Do not execute the default IP address setting	← Factory set value: Do not execute the default IP address setting
ON	OFF	**Do not set this one**	
OFF	ON	**Do not set this one**	
ON	ON	Execute the default IP address setting *	

* Refer to **4.2 Default IP Address Setting**.

8	DIP switch enable/disable	
OFF	Enable (enable the DIP switch settings)	← Factory set value: Enabled
ON	Disable (enable the host communication or loader communication settings)*	

* The only host communication or loader communication settings that are enabled are the host communication speed and protocol and the data bit configuration.

When the communication protocol is set with the DIP switch, the data bit configuration is automatically set to "Data 8-bit, Without parity, Stop 1-bit." To change to another data bit configuration, set the configuration in host communication or loader communication.

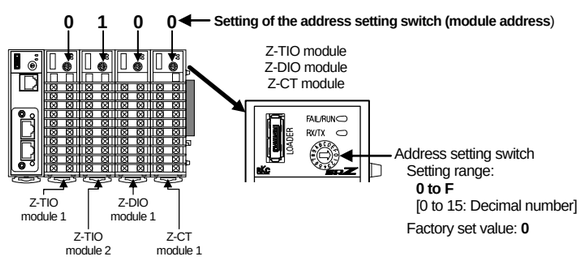
If you wish to set the data bit configuration, host communication speed, and communication protocol in host communication or loader communication, first set DIP switch No. 8 to ON.

3. COMMUNICATION SETTING OF FUNCTION MODULES

3.1 Address Setting of Function Modules

Only make the module address setting to make the function module (Z-TIO, Z-DIO and Z-CT) communication settings.
The SRZ unit performs internal communication (RS-485) between the COM-ML-1 (hereafter called COM-ML) and the function module (Z-TIO, Z-DIO and Z-CT), so the communication protocol, communication speed and data bit configuration do not need to be set.
A module address is set for each function module type. In this example, the module address is set to the address shown below.

To avoid problems or malfunction, do not duplicate an address in a function module of the same type on the same communication line.



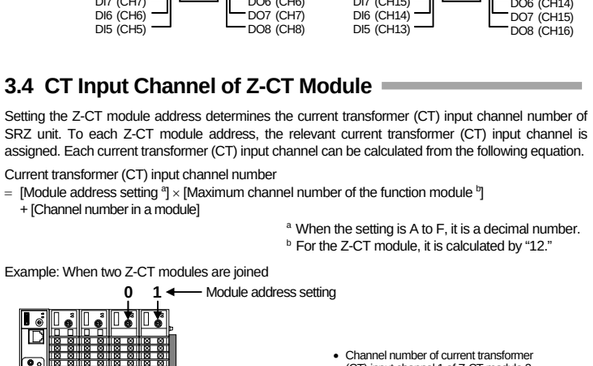
3.2 For the SRZ Unit's Temperature Control Channel

Setting the Z-TIO module address determines the temperature control channel number used for communication. To each Z-TIO module address, the relevant temperature control channel is assigned. Each temperature control channel number can be calculated from the following equation.

Temperature control channel number of communication
= [Module address setting [a]] × [Maximum channel number of the function module [b]]
+ [Channel number in a module]

[a] When the setting is A to F, it is a decimal number.
[b] For the Z-TIO module, it is calculated by "4."

Example: When three Z-TIO modules (4-channel type) are joined



3.3 Digital Input/Output Channel of Z-DIO Module

Setting the Z-DIO module address determines the digital input/output channel number of SRZ unit. To each Z-DIO module address, the relevant digital input/output channel is assigned. Each digital input/output channel can be calculated from the following equation.

Digital input (or output) channel number
= [Module address setting [a]] × [Maximum channel number of the function module [b]]
+ [Input (or output) channel number in a module]

[a] When the setting is A to F, it is a decimal number.
[b] For the Z-DIO module, it is calculated by "8."

Example: When two Z-DIO modules are joined

3.4 CT Input Channel of Z-CT Module

Setting the Z-CT module address determines the current transformer (CT) input channel number of SRZ unit. To each Z-CT module address, the relevant current transformer (CT) input channel is assigned. Each current transformer (CT) input channel can be calculated from the following equation.

Current transformer (CT) input channel number
= [Module address setting [a]] × [Maximum channel number of the function module [b]]
+ [Channel number in a module]

[a] When the setting is A to F, it is a decimal number.
[b] For the Z-CT module, it is calculated by "12."

Example: When two Z-CT modules are joined

4. IP ADDRESS SETTINGS

To use the COM-ML on Ethernet [MODBUS/TCP or PLC communication (MAPMAN)], IP address setting is necessary.
The IP address can be set in host communication or loader communication.

4.1 Host Communication Settings

When setting via host communication, refer to the following RKC communication identifiers and Modbus register addresses to set the IP address.
The set IP address is enabled by turning OFF the power and then turning it ON again.

Name	RKC identifier	Modbus register address		Data range	Factory set value
		HEX	DEC		
First-byte of IP address	QB	801B	32795	0 to 255	192
Second-byte of IP address	QC	801C	32796	0 to 255	168
Third-byte of IP address	QD	801D	32797	0 to 255	1
Fourth-byte of IP address	QE	801E	32798	0 to 255	1

(Factory set value for COM-ML IP address: 192.168.1.1)

For the IP address, check with the administrator of the network (LAN) to which the COM-ML is connected.

Our **Communication tool "PROTEM 2"** can be used for the communication setup. This tool can be downloaded from the official RKC website:
http://www.rkcinst.com/

For information on connecting the COM-ML to a host computer, refer to **COM-ML-1 [For SRZ] Installation Manual (IMR02E13-E□)**.

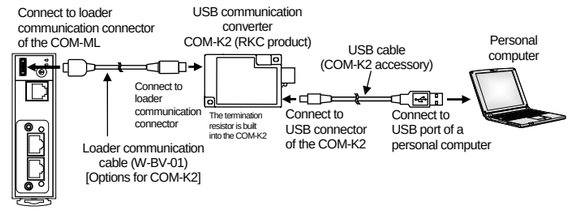
4.2 Loader Communication Settings

To perform Loader communication, our converter and a communication cable are required.

- USB communication converter COM-K2 (With USB cable)
  To use the Loader communication, USB driver for COM-K2 must be installed on the personal computer. The USB driver for COM-K2 can be downloaded from the official RKC website: http://www.rkcinst.com/
- Loader communication cable W-BV-01 [Options for COM-K2]
- Communication tool PROTEM 2
  This tool can be downloaded from the official RKC website: http://www.rkcinst.com/

■ Connection method

Connect the COM-ML, the COM-K2, and the personal computer with a USB cable and a loader communication cable.



During the loader communication, the COM-ML requires an external power source. The COM-ML will not function on the USB power from a personal computer alone.

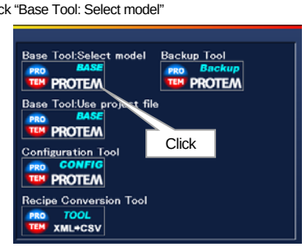
■ Setting of loader communication

The device address, the communication speed and the data bit configuration are fixed as follows for the loader communication.

- Device address: 0
- Communication speed: 38400 bps
- Data bit configuration: Data 8-bit, Without parity, Stop 1-bit

■ Setting of PROTEM 2

1. Turn on the power of the COM-ML (SRZ unit).
2. Start PPROTEM 2
   If you use the PROTEM 2 for the first time, you have to create a new project and set a communication port.
3. Click "Base Tool: Select model"



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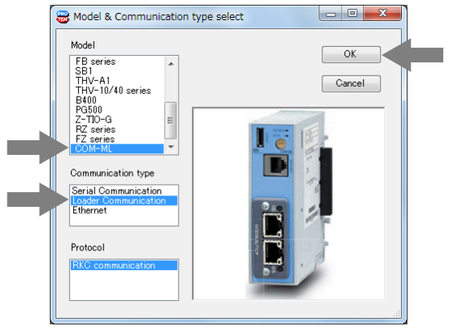
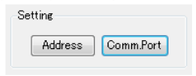
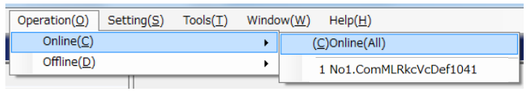
4. Select the “COM-ML” and “Loader Communication,” and click “OK”



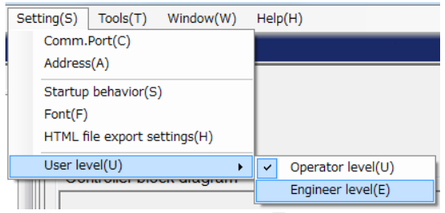
5. Set “Address” setting “0” and “Comm. Port” setting “38400 bps, Data 8-bit, Without parity, Stop 1-bit.” (The COM port number depends on the connected personal computer.)



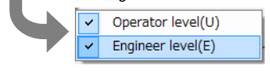
6. Click the menu bar in order of “Operation,” “Online,” and “Online(All).”



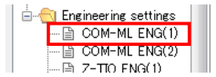
7. Click the menu bar in order of “Setting” and “User level” to activate the “Engineer level.”



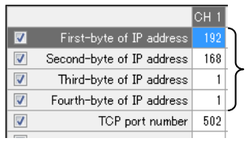
The Engineer level is enabled.



8. Select “COM-ML ENG(1)” under the “Engineering settings.”



9. Set IP address.



IP address
Factory set value: 192.168.1.1

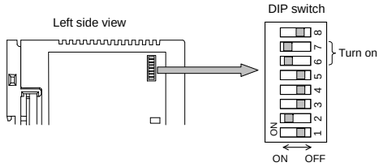
10. The set IP address is enabled by turning OFF the power and then turning it ON again.

4.3 Default IP Address Setting

The IP address can be set to the factory set value using the DIP switches.

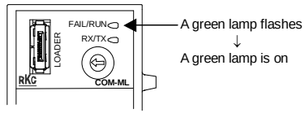
1. Turn off the power of COM-ML.

2. Turn on No. 6 and No. 7 of DIP switch.



3. Turn on the power of COM-ML.

4. The FAIL/RUN lamp will flash green for about 5 seconds and then light solidly.
At this point, the IP address changes to the factory set value “192.168.1.1.”



A green lamp flashes
↓
A green lamp is on

5. Turn off the power of the COM-ML once again and return DIP switches No. 6 and No. 7 to OFF.

If DIP switches No. 6 and No. 7 are left ON, the set IP address will revert to the factory set value every time the power is turned on.

6. Turn the power of the COM-ML back on. This completes the procedure.

5. PLC COMMUNICATION ENVIRONMENT SETTINGS

The PLC communication environmental (system data) settings must be made to perform PLC communication. The System data settings are made by the Loader communication (System data settings can also be made in the Host communication).
The System data contains setting items (refer to the **Setting item table** of below) and monitor items. The monitor items require space (corresponding to 8 words) in the PLC register.

For the monitor items, refer to **COM-ML-1 [For SRZ] PLC Communication Data List (IMR02E16-E□)**.

5.1 Setting of System Data (setting items)

Set the items in the same way as “**4.2 Loader Communication Settings**” (same procedures up to Step 8 of “**Setting of PROTEM 2**.” (Refer to the **Setting item table** for details)

This item is not used

System Data (setting items)

Setting item table R/W: Read/Write

Name	RKC Iden-tifier	Modbus Register address HEX	Modbus Register address DEC	Digits	Attri-bute	Data range	Factory set value
PC number (CPU number)	QW	8009	32777	7	R/W	This item is not used Setting will be ignored, even if it is set.	1
System data register type [1]	QZ	800A	32778	7	R/W	MIRSUBISHI MELSEC series 0: D register (Data register) 1: R register (File register) 2: W register (Link register) 3: ZR register (Method of specifying consecutive numbers when 32767 of R register is exceeded.) 4 to 29: Unused	0
System data register start number [1, 2] (High-order 4 bit)	QS	800B	32779	7	R/W	0 to 15	0
System data register start number [1] (Low-order 16 bit)	QX	800C	32780	7	R/W	0 to 65535	1000
System data address bias [1, 3]	QQ	800D	32781	7	R/W	0 to 65535	0

[1] Usable register ranges and types vary depending on used CPU types. For register ranges and types that can actually be used, see the PLC instruction manual.
[2] Only enabled when the ZR register is selected.
[3] Used in the factory setting when the SRZ unit is connected to the PLC by 1 to 1 (1:1) connection.

6. OTHER COMMUNICATION DATA SETTINGS

Set each communication data (PID constants and event set values of the Z-TIO modules and DO manual outputs of the Z-DIO modules, etc.) using loader communication or host communication.

Host communication or loader communication is used to configure the IP address setting, and thus it is possible to continue configuring other communication data settings after the IP address setting.

For each of the communication setting items, **COM-ML-1 [For SRZ] Host Communication Data List (IMR02E15-E□)** or **COM-ML-1 [For SRZ] Instruction Manual (IMR02E017-E□)**.

■ Host communication settings by loader communication

Communication protocol, communication speed and data bit configuration can be set by loader communication.

Set switch No.8 to “ON” when performing communication by the communication settings set via Host communication or Loader communication. When set to “ON,” the DIP switch settings are disabled.

Set the items in the same way as “**4.2 Loader Communication Settings**” (same procedures up to Step 7 of “**Setting of PROTEM 2**.”
Select “COM-ML ENG(2)” under the “Engineering settings.”

R/W: Read/Write

Name	RKC iden-tifier	Modbus register address HEX	Modbus register address DEC	Digits	Attri-bute	Data range	Factory set value
Host communication Protocol	VP	8004	32772	1	R/W	0: RKC communication 1: Modbus	0
Host communication Communication speed	VU	8005	32773	1	R/W	0: 4800 bps 1: 9600 bps 2: 19200 bps 3: 38400 bps	2
Host communication Data bit configuration	VW	8006	32774	7	R/W	Modbus: 0 to 2 RKC communication: 0 to 5 Refer to Data bit configuration table	0
Host communication Interval time	VX	8007	32775	7	R/W	0 to 250 ms	10

Data bit configuration table

Set value	Data bit	Parity bit	Stop bit	Modbus	RKC communication
0	8	Without	1	Can be set	Can be set
1	8	Even	1		
2	8	Odd	1		
3	7	Without	1	Cannot be set	
4	7	Even	1		
5	7	Odd	1		

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