

BEFORE USE

Thank you for choosing M-System. Before use, please check contents of the package you received as outlined below.

If you have any problems or questions with the product, please contact M-System's Sales Office or representatives.

■ PACKAGE INCLUDES:

Totalized pulse input module(1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

POINTS OF CAUTION**■ POWER INPUT RATING & OPERATIONAL RANGE**

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
24V AC rating: 24V \pm 10%, 50/60 Hz, approx. 130mA
24V DC rating: 24V \pm 10%, approx. 70mA

■ GENERAL PRECAUTIONS

- Before you remove the unit or mount it, turn off the power supply and input signal for safety.
- DO NOT set the switches on the module while the power is supplied. The switches are used only for maintenance without the power.

■ ENVIRONMENT

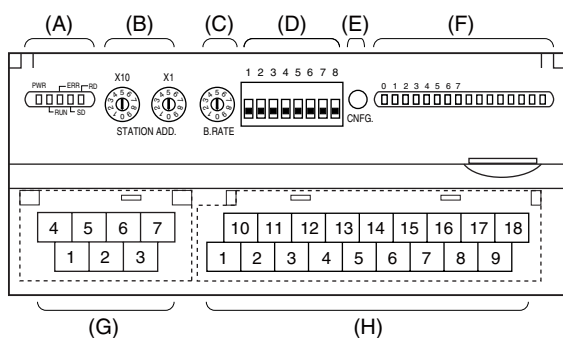
- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -10 to +55°C (14 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

■ WIRING

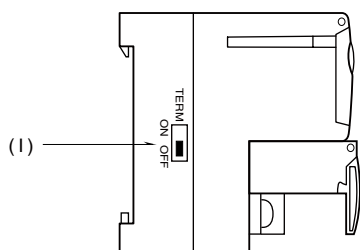
- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

COMPONENT IDENTIFICATION

FRONT VIEW



SIDE VIEW



- (A) Status Indicator LED *1
- (B) Station Address Setting Rotary SW
- (C) Baud Rate Setting Rotary SW
- (D) Operating Mode Setting DIP SW (SW1)
- (E) PC Configurator Jack
- (F) Input Status Indicator LED
- (G) CC-Link, Power Supply Terminals
- (H) Input Terminals
- (I) Terminating Resistor SW

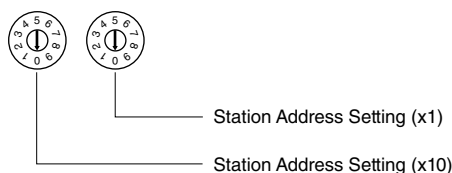
*1. Refer to 'Status Indicator LED' section for detailed information.

STATUS INDICATOR LED

ID	COLOR	FUNCTION
PWR	Red	Turns on when the internal 5V is supplied normally.
RUN	Red	Turns on when the refresh data is received normally.
ERR	Red	Turns on when the received data is abnormal.
SD	Red	Turns on when the module is transmitting.
RD	Red	Turns on when the module is receiving.

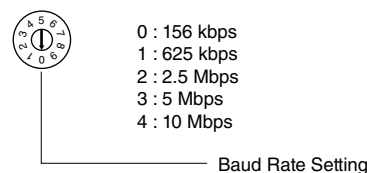
STATION ADDRESS

Station Address is selected between 1 and 64 in decimal. The left switch determines the tenth place digit, while the right switch does the ones place digit of the address.



BAUD RATE

Baud Rate is selected with the rotary switch.



OPERATING MODE

(*) Factory setting

Extension (SW1-1, 1-2)

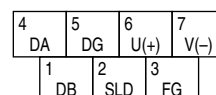
SW1-1	SW1-2	EXTENSION
OFF	OFF	No extension (*)
ON	OFF	Discrete input, 8 or 16 points
OFF	ON	Discrete output, 8 or 16 points

DATA ALLOCATION (SW1-3)

SW1-3	DATA ALLOCATION
OFF	1 (*)
ON	4

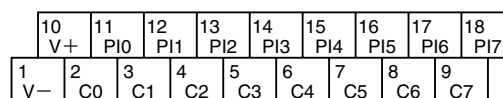
Note: Be sure to unused SW1-4 through 1-8 to OFF.

POWER SUPPLY, CC-LINK TERMINAL ASSIGNMENT



NO.	ID	FUNCTION, NOTES
1	DB	White
2	SLD	Shield
3	FG	FG
4	DA	Blue
5	DG	Yellow
6	U(+)	Power input
7	V(-)	Power input

INPUT TERMINAL ASSIGNMENT



NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	V-	Power (-)	10	V+	Power (+)
2	C0	Common	11	PI0	Input 0
3	C1	Common	12	PI1	Input 1
4	C2	Common	13	PI2	Input 2
5	C3	Common	14	PI3	Input 3
6	C4	Common	15	PI4	Input 4
7	C5	Common	16	PI5	Input 5
8	C6	Common	17	PI6	Input 6
9	C7	Common	18	PI7	Input 7

TERMINATING RESISTOR

To use the terminating resistor, turn the switch ON, and OFF to invalidate. (Factory setting OFF)

MODULE COMBINATIONS

Combinations with all extension modules are selectable.

INDICATOR LED

■ STATUS INDICATOR LED

PWR	RUN	ERR	SD *1	RD	STATUS *2
ON	ON	BL	BL	ON	Communicates normally with occasional CRC errors due to noise interference.
ON	ON	BL	BL	ON	Communicates normally but the Baud Rate and/or Station Address switches failed. ERR LED blinks approximately in 0.5 seconds intervals.
ON	ON	BL	BL	OFF	----
ON	ON	BL	OFF	ON	CRC error found in the received data. Unable to respond.
ON	ON	BL	OFF	OFF	----
ON	ON	OFF	BL	ON	Normal communication
ON	ON	OFF	BL	OFF	----
ON	ON	OFF	OFF	ON	Unable to receive data addressed to the station.
ON	ON	OFF	OFF	OFF	----
ON	OFF	BL	BL	ON	Performs the interval-timed responses but CRC error found in receiving the refresh data.
ON	OFF	BL	BL	OFF	----
ON	OFF	BL	OFF	ON	CRC error found in the data addressed to the station.
ON	OFF	BL	OFF	OFF	----
ON	OFF	OFF	BL	ON	Link is not started.
ON	OFF	OFF	BL	OFF	----
ON	OFF	OFF	OFF	ON	No data addressed to the station. Or unable to receive data addressed to the station due to noise interference. (Missing parts of the data sent from the master)
ON	OFF	OFF	OFF	OFF	Unable to receive data due to wire breakdown
ON	OFF	ON	OFF	ON/OFF	Faulty Baud Rate and/or Station Address setting
OFF	OFF	OFF	OFF	OFF	Power input removed. Or power supply failure.

OFF = OFF, ON = ON, BL = Blinking

*1. SD LED may look not blinking but ON with high baud rate and fewer connected modules.

*2. LEDs indicated with "----" in STATUS rarely occurs in normal operation (LED failure or the like as possible cause).

■ PULSE INPUT STATUS INDICATOR LED

Totalized pulse modules have LED indicators showing input signal status.

ON : LED ON

OFF : LED OFF

PC CONFIGURATOR

With configurator software, settings shown below are available.

Refer to the software manual of R7CON for detailed operation.

■ INTERFACE MODULE SETTING

PARAMETER	AVAILABLE RANGE	DEFAULT SETTING
Communication Timeout	0.0 – 3276.7 (sec.)	1.0 (sec.)

■ CHANNEL INDIVIDUAL SETTING

PARAMETER	AVAILABLE RANGE	DEFAULT SETTING
Max	1 000 – 4 294 967 295	4 294 967 295
Carry	0, 1	0
Preset	0 – 4 294 967 295	

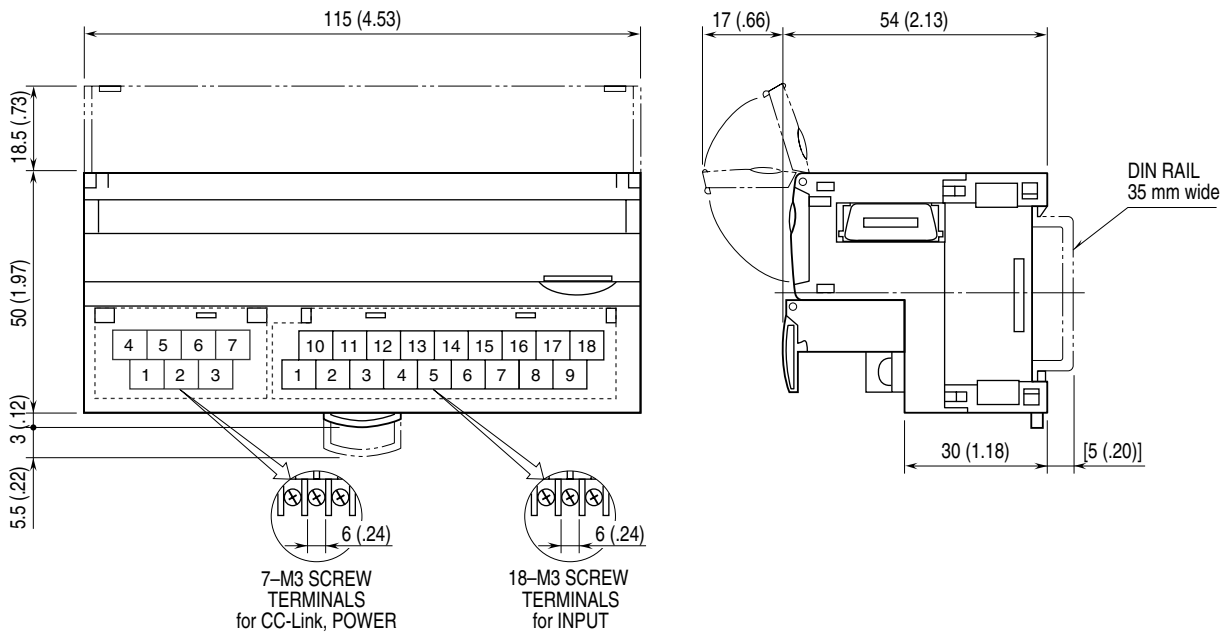
■ EXTENSION MODULE SETTING

PARAMETER	AVAILABLE RANGE	DEFAULT SETTING
Output Hold/Clear	Output Hold Output Clear	Output Hold

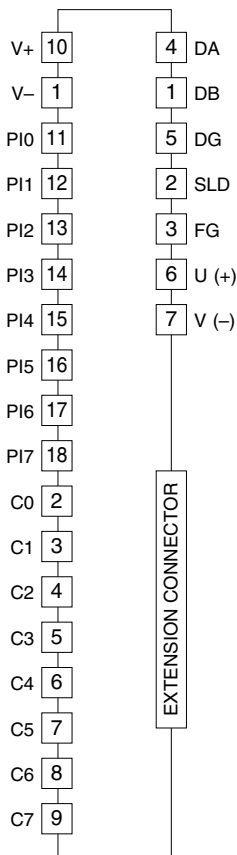
TERMINAL CONNECTIONS

Connect the unit as in the diagram below.

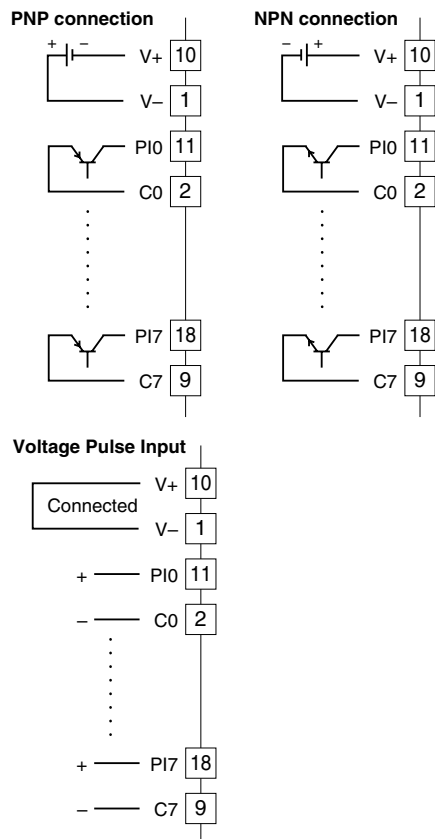
EXTERNAL DIMENSIONS unit: mm (inch)



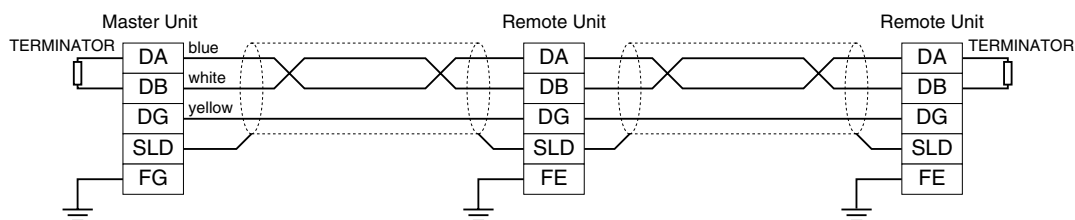
CONNECTION DIAGRAM



Input Connection Examples



COMMUNICATION CABLE CONNECTIONS



Be sure to connect the terminating resistor across DA and DB at both ends of communication line.
When this unit is located at an end, turn the terminating resistor SW ON.
The Master Unit can be located at not only both ends but also any node of the of communication line.

DATA ACQUISITION & SETTING

Parameter reset, preset and reading of each channel is available with command setting of R7C-PA8.

The command setting method differs depending on whether the data allocation is 1 or 4. Set the commands according to the procedure explained next.

Parameter of each channel is two word integer not signed.

When overflowing, the value to which response can be set is "0" or "1". (factory setting: 0)

The maximum range available is 1 000 to 4 294 967 295. (factory setting: 4 294 967 295)

■ DATA ALLOCATION 1

Master → Slave (R7C-PA8)		
Bit Data	RY0_0	CH0 set
	RY0_1	CH1 set
	RY0_2	CH2 set
	RY0_3	CH3 set
	RY0_4	CH4 set
	RY0_5	CH5 set
	RY0_6	CH6 set
	RY0_7	CH7 set
	RY0_8	Command setting 0: Read data 1: Write data
	RY0_9 through RY0_A	Write data selection 00: Preset value 01: Overflow response value 10: Maximum value
	RY0_B through RY0_F	Unused
Word Data	RWw0	Extension output (0 through F)
	RWw1	Unused
	RWw2	Data to write (lower)
	RWw3	Data to write (upper)

Slave (R7C-PA8) → Master		
Bit Data	RX0_0	CH0 acknowledge
	RX0_1	CH1 acknowledge
	RX0_2	CH2 acknowledge
	RX0_3	CH3 acknowledge
	RX0_4	CH4 acknowledge
	RX0_5	CH5 acknowledge
	RX0_6	CH6 acknowledge
	RX0_7	CH7 acknowledge
	RX0_8	Command acknowledge 0: Read data 1: Write data
	RX0_9 through RX0_A	Write data acknowledge 00: Preset value 01: Overflow response value 10: Maximum value
	RX0_B	Ready
	RX0_C through RX0_D	Setting command error code 10: Normal operating 01: Setting overrange (Maximum value etc.)
	RX0_E through RX0_F	Unused
Word Data	RWr0	Extension input (0 through F)
	RWr1	Unused
	RWr2	Data to read (lower)
	RWr3	Data to read (upper)

■ DATA ALLOCATION 4

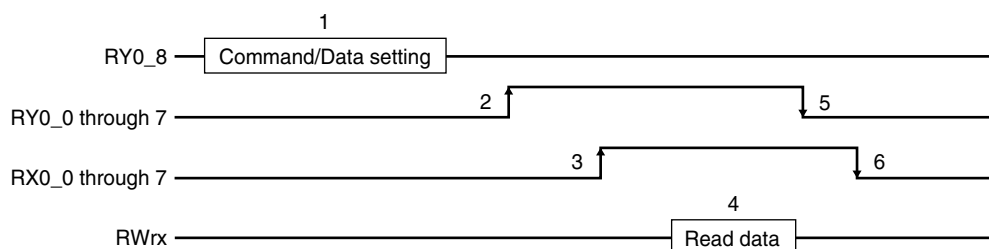
Master → Slave (R7C-PA8)			
Bit Data	RY0_0	CH0 set	
	RY0_1	CH1 set	
	RY0_2	CH2 set	
	RY0_3	CH3 set	
	RY0_4	CH4 set	
	RY0_5	CH5 set	
	RY0_6	CH6 set	
	RY0_7	CH7 set	
	RY0_8	Command setting 0: Read data 1: Write data	
	RY0_9 through RY0_A	Write data selection 00: Preset value 01: Overflow response value 10: Maximum value	
	RY0_B through RY0_F	Unused	
	RY1_0 through RY1_F	Extension output unit data	
	Word Data	RWw0	CH0 data to write (lower)
		RWw1	CH0 data to write (upper)
		RWw2	CH1 data to write (lower)
		RWw3	CH1 data to write (upper)
RWw4		CH2 data to write (lower)	
RWw5		CH2 data to write (upper)	
RWw6		CH3 data to write (lower)	
RWw7		CH3 data to write (upper)	
RWw8		CH4 data to write (lower)	
RWw9		CH4 data to write (upper)	
RWw10		CH5 data to write (lower)	
RWw11		CH5 data to write (upper)	
RWw12		CH6 data to write (lower)	
RWw13		CH6 data to write (upper)	
RWw14		CH7 data to write (lower)	
RWw15		CH7 data to write (upper)	

Slave (R7C-PA8) → Master			
Bit Data	RX0_0	CH0 acknowledge	
	RX0_1	CH1 acknowledge	
	RX0_2	CH2 acknowledge	
	RX0_3	CH3 acknowledge	
	RX0_4	CH4 acknowledge	
	RX0_5	CH5 acknowledge	
	RX0_6	CH6 acknowledge	
	RX0_7	CH7 acknowledge	
	RX0_8	Command acknowledge 0: Read data 1: Write data	
	RX0_9 through RX0_A	Write data acknowledge 00: Preset value 01: Overflow response value 10: Maximum value	
	RX0_B	Ready	
	RX0_C through RX0_D	Setting command error code 10: Normal operating 01: Setting overrange (Maximum value etc.)	
	RX0_E through RX0_F	Unused	
	RX1_0 through RX1_F	Extension input unit data	
	Word data	RWr0	CH0 data to read (lower)
		RWr1	CH0 data to read (upper)
RWr2		CH1 data to read (lower)	
RWr3		CH1 data to read (upper)	
RWr4		CH2 data to read (lower)	
RWr5		CH2 data to read (upper)	
RWr6		CH3 data to read (lower)	
RWr7		CH3 data to read (upper)	
RWr8		CH4 data to read (lower)	
RWr9		CH4 data to read (upper)	
RWr10		CH5 data to read (lower)	
RWr11		CH5 data to read (upper)	
RWr12		CH6 data to read (lower)	
RWr13		CH6 data to read (upper)	
RWr14		CH7 data to read (lower)	
RWr15		CH7 data to read (upper)	

■ DATA ACQUISITION

• Data allocation 1

In case of data allocation 1, reading data from 8 channels at once is not available. Read data channel by channel. Step 1 through 6 in the figure shown below are process to read one channel. To read data continuously, repeat the step 1 through 6.



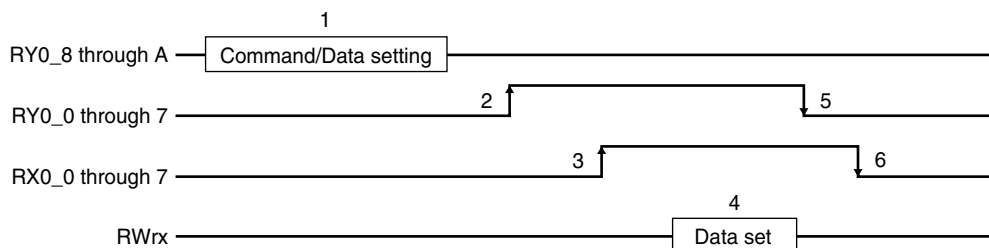
- 1) Set read command:0 in RY0_8.
- 2) Specify the read channels to RY0_7 to RY0_8. For channel 0, set "1" in RY0_0. When "1" is set, the command for specified channel is executed.
- 3) When the command is received, the bit of specified channel (RX0_0 for channel 0) turns ON and then the data of specified channel is set in RWr2 and RWr3.
- 4) Read the data. By reading RX0_C and RX0_D, confirm that read data is correctly done. In case of normal, RX0_C is "0", RX0_D is "1". In case of error, RX0_C is "1", RX0_D is "0".
- 5) After read data is completed, turn the bit of specified channel OFF. Also in case of error, turn the bit of specified channel OFF for the next acquisition.
- 6) The bit of specified channel turns OFF after confirming, then the data of RX0_8 through RX0_A and RWr2 through RWr3 turn OFF at the same time.

• Data allocation 4

For data allocation 4, allocate 8 channel data to RWr0 through RWr15.

■ DATA SETTING

Data allocation 1 and 4 in setting data process is similar. Step 1 through 6 in the figure shown below are process to set. To set data continuously, repeat the step 1 through 6.



- 1) Write setting command:1 to RY0_8.

• Data allocation 1

Write the channel number to specify in RWw0. For channel 0, write "0".

Write the data selection in RY0_9 and RY0_A. For preset value, write "00".

Write the data in RWw2 and RWw3. For 1 000 000 (decimal), write "000F" in RWw3 and "4240" in RWw2

• Data allocation 4

Write the data selection in RY0_9 and RY0_A. For preset value, write "00".

Write the data in RWw0 through RWw15. Write for 8 channels at once. Write the data for all 8 channels.

To set 1 000 000 (decimal) to channel 0, write "000F" in RWw1 and "4240" in RWw0.

- 2) Turn RY0_0 OFF, then execute the command.
- 3) When the command is received and setting data is completed, RX0_0 is turned ON.
- 4) By reading RX0_C and RX0_D, confirm that setting is correctly done. In case of normal, RX0_C is "0", RX0_D is "1". In case of error, RX0_C is "1", RX0_D is "0".
- 5) After data setting is completed, turn RY0_0 OFF. In case of error, turn RY0_0 OFF for the next data setting.
- 6) The bit of specified channel turns OFF after confirming RY0_0, RX0_0 is OFF. At the same time, the data of RX0_1 through RX0_3, RX0_6 and RX0_7 turn OFF.

DATA ALLOCATION

■ R7C-PA8

• Data allocation 1

Interval-timed Response (X)	
RX (n+0)	RX (n+0) D – RX (n+0) 0: Command
RX (n+1)	Unused

Refresh Data (Y)	
RY (n+0)	RY (n+0) A – RY (n+0) 0: Command
RY (n+1)	Unused

Interval-timed Response (X)	
RWr (n+0)	Input extension
RWr (n+1)	Unused
RWr (n+2)	Count data (LSB)
RWr (n+3)	Count data (MSB)

Refresh Data (Y)	
RWw (n+0)	Output extension
RWw (n+1)	Unused
RWw (n+2)	Preset data (LSB)
RWw (n+3)	Preset data (MSB)

• Data allocation 4

Interval-timed Response (X)	
RX (n+0)	RX (n+0) D – RX (n+0) 0: Command
RX (n+1)	Input extension

Refresh Data (Y)	
RY (n+0)	RY (n+0)A – RY (n+0) 0: Command
RY (n+1)	Output extension

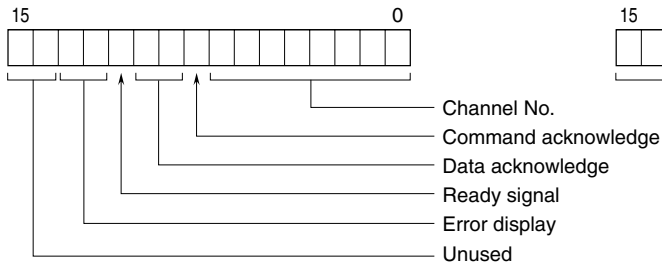
Interval-timed Response (X)	
RWr (n+0)	ch0 Count data (LSB)
RWr (n+1)	ch0 Count data (MSB)
RWr (n+2)	ch1 Count data (LSB)
RWr (n+3)	ch1 Count data (MSB)
RWr (n+4)	ch2 Count data (LSB)
RWr (n+5)	ch2 Count data (MSB)
RWr (n+6)	ch3 Count data (LSB)
RWr (n+7)	ch3 Count data (MSB)
RWr (n+8)	ch4 Count data (LSB)
RWr (n+9)	ch4 Count data (MSB)
RWr (n+10)	ch5 Count data (LSB)
RWr (n+11)	ch5 Count data (MSB)
RWr (n+12)	ch6 Count data (LSB)
RWr (n+13)	ch6 Count data (MSB)
RWr (n+14)	ch7 Count data (LSB)
RWr (n+15)	ch7 Count data (MSB)

Refresh Data (Y)	
RWw (n+0)	ch0 Preset data (LSB)
RWw (n+1)	ch0 Preset data (MSB)
RWw (n+2)	ch1 Preset data (LSB)
RWw (n+3)	ch1 Preset data (MSB)
RWw (n+4)	ch2 Preset data (LSB)
RWw (n+5)	ch2 Preset data (MSB)
RWw (n+6)	ch3 Preset data (LSB)
RWw (n+7)	ch3 Preset data (MSB)
RWw (n+8)	ch4 Preset data (LSB)
RWw (n+9)	ch4 Preset data (MSB)
RWw (n+10)	ch5 Preset data (LSB)
RWw (n+11)	ch5 Preset data (MSB)
RWw (n+12)	ch6 Preset data (LSB)
RWw (n+13)	ch6 Preset data (MSB)
RWw (n+14)	ch7 Preset data (LSB)
RWw (n+15)	ch7 Preset data (MSB)

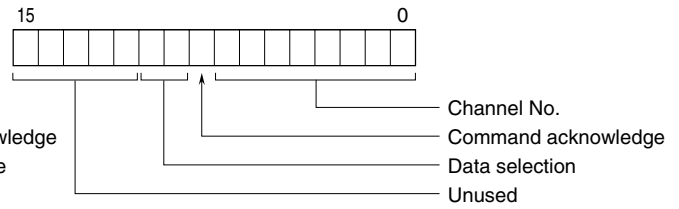
I/O DATA DESCRIPTIONS

■ R7C-PA8

• RX (n+0)



• RY (n+0)



WIRING INSTRUCTIONS

■ SCREW TERMINAL

Torque: 0.5 N·m

■ SOLDERLESS TERMINAL

Refer to the drawing below for recommended ring tongue terminal size. Spade tongue type is also applicable.

Applicable wire size: 0.25 to 1.65 mm² (AWG 22 to 16)

Recommended manufacturer: Japan Solderless Terminal MFG. Co., Ltd, Nichifu Co., Ltd

