

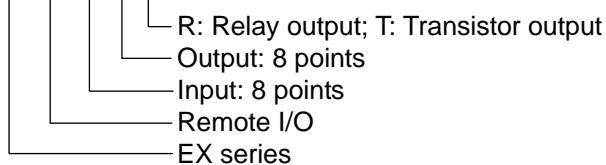
# EX series

## EXRM0808R/T USER'S GUIDE

☛ This manual contains text, diagrams and explanations which will guide the reader in the correct installation and operation of Remote I/O module EXRM0808R/T.

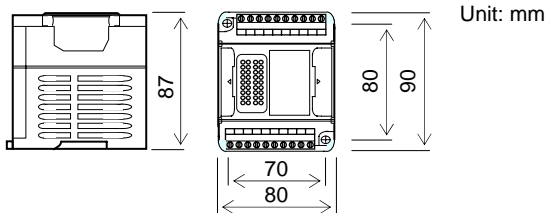
### \*\*\* Introduction \*\*\*

#### EXRM0808R



- This module converts data with PLC main unit by communication method.
- This module read X input status and store it to BFM#00, and output Y output status to external terminal.

### \*\*\* External Dimensions \*\*\*



### \*\*\* Input Specifications \*\*\*

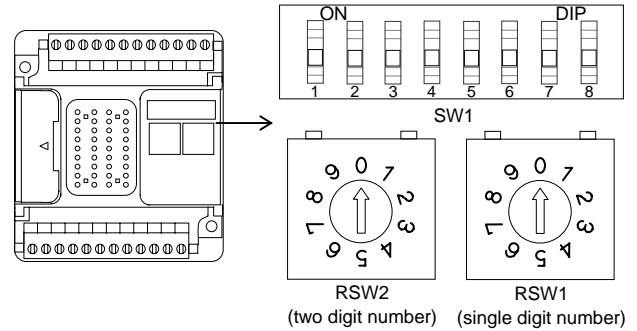
Item	DC input (Sink) NPN	DC input (Source) PNP
Circuit		
Input voltage	DC24V+10%, -15%	DC24V+10%, -15%
Input current	7mA / DC24V	7mA / DC24V
Impedance	3.3KΩ	3.3 KΩ
Response time	About 10 ms(X00~X07 High speed)	About 10 ms(X00~X07 High speed)
Input pattern	No voltage contact or NPN open collector	No voltage contact or PNP open collector
Circuit isolation	Photo coupler	Photo coupler

### \*\*\* Output Specifications \*\*\*

Item	Relay output	Transistor output
Circuit		
Load voltage	Under AC250V DC30V	DC5V ~ 30V
Rated current	2A / 1 point	0.5A / 1 point
Rated capacity	100W	12W
Response time	About 10ms	Under 1 ms
Circuit isolation	Machine isolation	Photo coupler

◆Note: Transistor output module is without high resistor 2.2K

### \*\*\* Switch Indication \*\*\*



- Set station no. of RSW2, RSW1:01~99 (can't set to 00)
- Bit0 (SW1-1: Data length) 0= 7bit ; 1= 8 bit
  - Bit1 (SW1-2) 0= no parity ; 1= with parity
  - Bit2 (SW1-3) 0= odd parity ; 1= even parity
  - Bit3 (SW1-4) 0= 1 stop bit ; 1= 2 stop bit
  - Bit5,4 (SW1-6,5) 00= 9600bps  
01= 19200bps  
10= 38400bps  
11= 57600bps
  - Bit6 (SW1-7) 0= computer link ; 1= Modbus
- When Bit6=0, Bit7=0 Computer Link Format 1  
Bit7=1 Computer Link Format 4
- When Bit6=1, Bit7=0 Modbus Ascii mode  
Bit7=1 Modbus Rtu mode

### \*\*\* BFM List \*\*\*

BFM No.	Content	Initial value
#0	X input relay status	
#1	Reserved	
#2	Reserved	
#3	Reserved	
#4	Y output relay status	
#5	Reserved	
#6	Reserved	
#7	Reserved	

EXRM0808R/T-edoc0610v100

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**\*\*\* Modbus Ascii mode \*\*\***

◆ Command code 03H, read N word

EX.: Read 2 word from BFM#00 of station no. 01H continuously.

**< command message >**

3Ah	01h	03h	00h	00h	00h	02h	FAh	0Dh	0Ah			
STX	ADR1	ADR0	CMD1	CMD0	Start Address		Word Count		CHK1	CHK0	END1	END0
01	01	03	00	00	00	02	FA	0D	0A			

Note: calculation of command message of CHK(check sum)

01H+03H+00H+00H+00H+02H=06H

2's complement of 06H : FFH-06H+1=FAH

**< response message >**

STX	ADR1	ADR0	CMD1	CMD0	Byte Count	Data BFM#00		Data BFM#01		CHK1	CHK0	END1	END0
01	01	03	00	04	00	00	00	00	00	F8	0D	0A	0A

Note: calculation of response message of CHK(check sum)

01H+03H+04H+00H+00H+00H+00H=08H

2's complement of 08H : FFH-08H+1=F8H

◆ Command code 06H write one word

EX.: Write data 0084H to BFM#04 of station no. 01H.

**< command message >**

3Ah	01h	06h	00h	04h	00h	84h	71h	0Dh	0Ah		
STX	ADR1	ADR0	CMD1	CMD0	Data Address	Data Content	CHK1	CHK0	END1	END0	
01	01	06	00	04	00	84	71	0D	0A		

**< response message >**

STX	ADR1	ADR0	CMD1	CMD0	Data Address	Data Content	CHK1	CHK0	END1	END0	
01	01	06	00	04	00	84	71	0D	0A		

◆ CHK (check sum) description

Ascii mode use LRC (Longitudinal Redundancy Check) check sum. The calculation method of LRC check sum is that add up ADR to content of last data (only get binary from result), and get 2's complement result, then it is LRC check sum.

◆ Command code 10H write N word

EX.: Write data 8765H and 4321H to BFM#05 and BFM#04 of station no. 01H

**< command message >**

3Ah	01h	10h	00h	04h	00h	02h	04h	43h	21h		
STX	ADR1	ADR0	CMD1	CMD0	Start Address		Quantity		Byte Count	The content of BFM#04	
01	01	10	00	04	00	02	04	43	21		

87h	65h	95h	0Dh	0Ah	
87	65	95	0D	0A	
The content of BFM#05		CHK1	CHK0	END1	END0

**< response message >**

STX	ADR1	ADR0	CMD1	CMD0	Start Address		Quantity		CHK1	CHK0	END1	END0
01	01	10	00	04	00	02	E9	0D	0A			

◆ Exception response

In normal situation, Remote I/O device receive command message from Master Device, and send back a normal response message (exclude broadcast message). If because of communication error, Remote I/O is unable to receive correct message, or receive correct message but is unable to handle it, then it will send back an exception response to Master Device. (In the exception response, the most significant bit of the original command code is set to 1).

Following is communication command 06H and response of exception code 02H

**< command message >**

3Ah	01h	06h	00h	00h	00h	00h	F9h	0Dh	0Ah			
STX	ADR1	ADR0	CMD1	CMD0	Start Address		The content of data		CHK1	CHK0	END1	END0
01	01	06	00	00	00	00	F9	0D	0A			

**< response message >**

STX	ADR1	ADR0	CMD1	CMD0	Exception code	CHK1	CHK0	END1	END0	
01	01	08	06	02	07	07	0D	0A		

◆ Exception code list

Exception code	content
01	False command code
02	False data address
03	False data value
09	Check sum Error
13	Receive buffer overflow
14	Defective receive character (Ascii only)
15	Parity error; overrun error, framing error

\*\*\* Modbus Rtu mode \*\*\*

◆ Command code 03H; read N word

EX.: Read 2 word from BFM#00 of station no. 01H continuously.

< command message >

	01h	03h	00h	00h	00h	02h	XXh	XXh	
STOP above 10ms	A D R	C M D	Start Address		Word Count		CRC CHK Low	CRC CHK High	STOP above 10ms

< response message >

				Data BFM#00		Data BFM#01		CRC CHK Low	CRC CHK High	STOP above 10ms
STOP above 10ms	A D R	C M D	Byte Count	00h	00h	00h	00h	XXh	XXh	

Note : Calculation of CRC check sum

Rtu mode use CRC (Cyclical Redundancy Check) check sum. Calculation method as follows,

- (1) Input content is 16bit register of FFFFH(CRC register) ◦
- (2) Use first byte of command message and lower byte of 16bit to do Exclusive OR operation, and store result to CRC register.
- (3) Move content of CRC register 1bit to the right. Maximum bit is filled 0.
- (4) Check value of CRC register's lowest bit. If it is 0, then repeat (3). If it is not 0, then use CRC register and A001H to do Exclusive OR operation, and store result to CRC register.
- (5) Repeat (3) and (4) until content of CRC register is moved 8 bit to the right. At this time, this byte is finished.
- (6) Repeat (2) to (5) to byte of next command message until all bytes are finished. Content of CRC register is check sum.
- (7) When sending CRC value, send lower bit first and then send high bit.

◆ Command code 06H write one word

EX.: Write data 0084H to BFM#04 of station no. 01H.

< command message >

	01h	06h	00h	04h	00h	84h	XXh	XXh	
STOP above 10ms	A D R	C M D	Start Address		Data Content		CRC CHK Low	CRC CHK High	STOP above 10ms

< response message >

			Start Address		Data Content		CRC CHK Low	CRC CHK High	STOP above 10ms
STOP above 10ms	A D R	C M D	00h	04h	00h	84h	XXh	XXh	

◆ Command code 10H write N word

EX.: Write data 8765H and 4321H to BFM#05 and BFM#04 of station no. 01H

< command message >

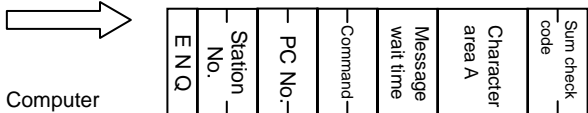
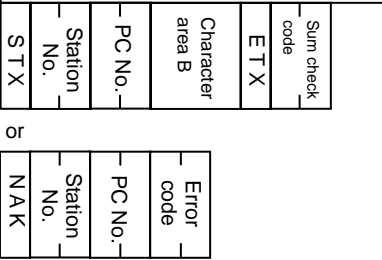

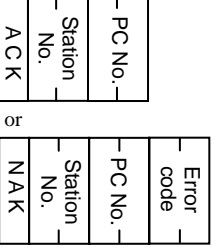
	01h	10h	00h	04h	00h	02h	04h	43h	21h
STOP above 10ms	A D R	C M D	Start Address		Quantity		Byte Count	Content of BFM#04	

	87h	65h	XXh	XXh	
	Content of BFM#05		CRC CHK Low	CRC CHK High	STOP above 10ms

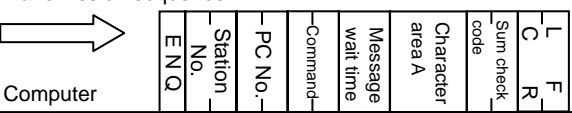
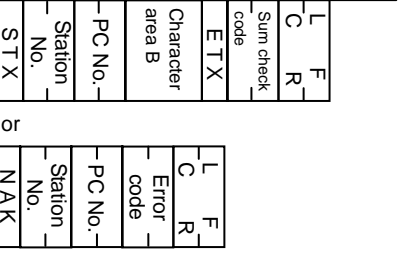

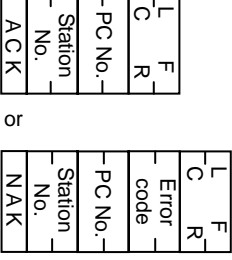
< response message >

			Start Address		Quantity		CRC CHK Low	CRC CHK High	STOP above 10ms
STOP above 10ms	A D R	C M D	00h	04h	00h	02h	XXh	XXh	

<< Protocol format of Computer link >> Format 1

Description	Control protocol
<p>To read data from the programmable controller to the computer</p>	<p>Transmission sequence</p>  <p>Computer</p> <p>Programmable controller</p> <p>Note:            ♦ Command code: only BR, BW, BT, WR, WW, WT, and TT are effective            ♦ Character area: only D, X, and Y are effective</p> 
<p>To write data from the computer to the programmable controller</p>	 <p>Computer</p> <p>Programmable controller</p> <p>Transmission sequence</p> 

<< Protocol format of Computer link >> Format 4

Description	Control protocol
<p>To read data from the programmable controller to the computer</p>	<p>Transmission sequence</p>  <p>Computer</p> <p>Programmable controller</p> 
<p>To write data from the computer to the programmable controller</p>	 <p>Computer</p> <p>Programmable controller</p> <p>Transmission sequence</p> 

Note: About more detailed information, please refer to user's manual of Computer Link.