

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 DC rating: 24V \pm 10%, approx. 80mA

■ GENERAL PRECAUTIONS

- Before you remove the unit or mount it, turn off the power supply and input signal for safety.
- Before you remove the terminal block 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

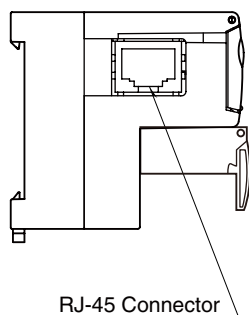
- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.
- Be sure to close the terminal cover for safety.

■ AND

- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

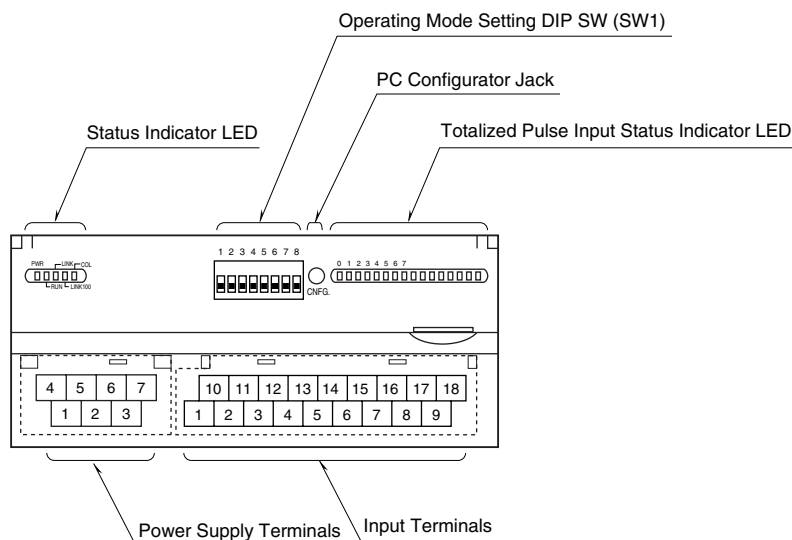
COMPONENT IDENTIFICATION

■ SIDE VIEW



RJ-45 Connector

■ FRONT VIEW



■ STATUS INDICATOR LED

ID	COLOR	FUNCTION
PWR	Green	Turns on when the internal 5V is supplied normally.
RUN	Green	Turns on in normal communications conditions.
LINK	Green	Turns on in LINK status.
LINK100	Green	Turns on when connected in 100 Mbps. *1
COL	Green	Blinks in case of collisions.

*1. Used only in 100BASE link. Dark in 10BASE link.

■ PULSE INPUT STATUS INDICATOR LED

LED indicators showing the signal status.

ON : LED ON

OFF : LED OFF

■ OPERATING MODE

• 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

(*) Factory setting

Note: Be sure to set unused SW1-3 through 1-8 to OFF.

■ POWER SUPPLY TERMINAL ASSIGNMENT

4	5	6	7
NC	NC	+24V	0V
1	2	3	
NC	NC	FG	

NO.	ID	FUNCTION, NOTES
1	NC	----
2	NC	----
3	FG	FG
4	NC	----
5	NC	----
6	+24V	Power input (24V DC)
7	0V	Power input (0V)

■ INPUT TERMINAL ASSIGNMENT

10	11	12	13	14	15	16	17	18
V+	PI0	PI1	PI2	PI3	PI4	PI5	PI6	PI7
1	2	3	4	5	6	7	8	9
V-	C0	C1	C2	C3	C4	C5	C6	C7

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

■ EXTENSION MODULE

Combinations with all extension modules are selectable.

PC CONFIGURATOR

With the configurator software (model: R7CON), parameters shown below are configurable.
Refer to the users manual of R7CON for detailed operation.

■ INTERFACE SETTING

PARAMETER	SETTING RANGE	DEFAULT SETTING
Communication Timeout	0.0 – 3276.7 (sec.)	3.0 (sec.)

■ ETHERNET SETTING

PARAMETER	SETTING RANGE	DEFAULT SETTING
IP Address	0.0.0.0 – 255.255.255.255	192.168.0.1
Subnet Mask	0.0.0.0 – 255.255.255.255	255.255.255.0
TCP Socket	0 – 32767	502
Linger	0.0 – 3276.7 (sec.)	180.0 (sec.)

■ CHANNEL INDIVIDUAL SETTING

PARAMETER	SETTING RANGE	DEFAULT SETTING
Max	1 000 – 4 294 967 295	9 999 999
Carry	0, 1	0
Preset	0 – 4 294 967 295	

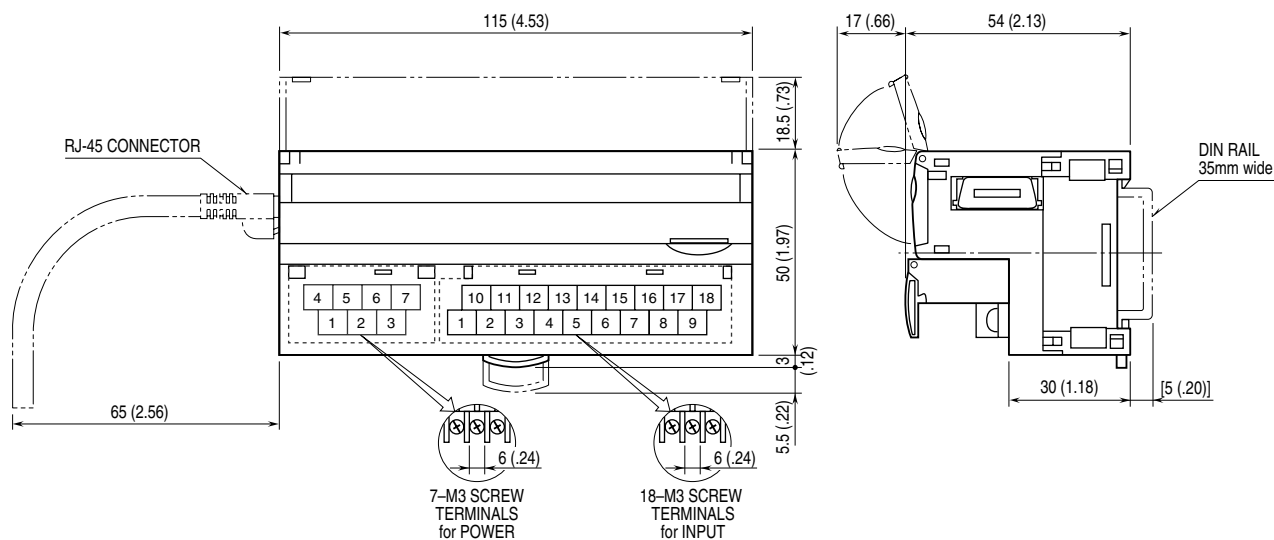
■ EXTENSION MODULE SETTING

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

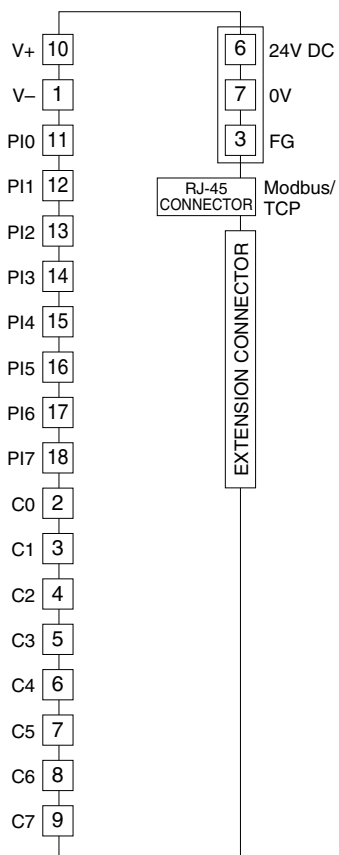
TERMINAL CONNECTIONS

Connect the unit as in the diagram below.

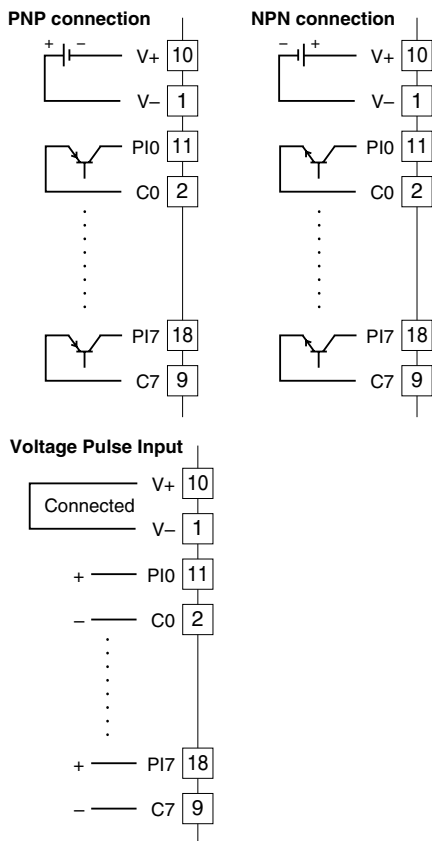
■ EXTERNAL DIMENSIONS unit: mm (inch)



■ CONNECTION DIAGRAM



■ Input Connection Examples



CHECKING ETHERNET CONNECTION

■ IP ADDRESS

The R7E does not support BootP Table Software. The IP Address and Subnet Mask can be configured using the R7CON Configurator Software.

The Modbus/TCP Port No. is fixed at 502.

■ CHECK WIRING

Connect an Ethernet cable to the RJ-45 connector.

■ CHECK LED

When wiring is correct, LINK is turned on. When the module is connected in 100 Mbps, LINK100 is blinking.

■ CHECK R7E CONNECTION

Enter “ping command” on the Windows MS-DOS as follows:

```
C:\WINDOWS>ping ***.***.***.***
(***.***.***.***, Enter IP address in decimal.)

ping ***.***.***.*** with 32 bytes of data:
Reply from ***.***.***.*** : bytes=32 time<10ms TTL=64
Reply from ***.***.***.*** : bytes=32 time<10ms TTL=64
Reply from ***.***.***.*** : bytes=32 time<10ms TTL=64
Reply from ***.***.***.*** : bytes=32 time<10ms TTL=64

Ping statistics for ***.***.***.***
Packets:Sent=4,Received=4,Lost=0(0% loss)
```

Replies in case of normal connection are as shown above. If the connection cannot be established normally due to e.g. wrong IP address, other replies such as ‘timeout’ will be received.

■ CHECK CONNECTION TO THE APPLICATION SOFTWARE

Check Point 1: LINK LEDs

When normal connection with PC, PLC or hub is established, the front LINK and LINK100 (when connected in 100 Mbps) is/are turned on regardless of data sending/receiving status. Check power supply to the switch/hub in case that these LEDs are not on.

Check Point 2: RUN Indicator LED

A green LED turns on at the RUN Indicator LED in normal data sending/receiving with an application.

DATA ACQUISITION & SETTING

R7E-PA8 data is allocated as described on the table below. Write the data on the corresponding area for reading data. The integrated value of each channel is a non-signed 2-word integer. Be sure to perform writing and reading by 2 word units. The return value at overflow is "0" or "1" (default setting: 0). The maximum range available is 1 000 to 4 294 967 295 (default setting: 9 999 999).

■ DATA ALLOCATION 1

Master→Slave (R7E-PA8)		
Coil Status (0X)	Unused	
	17 through 32	Extension output unit data
Holding Register (4X)	1	CH 0 Preset value (upper)
	2	CH 0 Preset value (lower)
	3	CH 1 Preset value (upper)
	4	CH 1 Preset value (lower)
	5	CH 2 Preset value (upper)
	6	CH 2 Preset value (lower)
	7	CH 3 Preset value (upper)
	8	CH 3 Preset value (lower)
	9	CH 4 Preset value (upper)
	10	CH 4 Preset value (lower)
	11	CH 5 Preset value (upper)
	12	CH 5 Preset value (lower)
	13	CH 6 Preset value (upper)
	14	CH 6 Preset value (lower)
	15	CH 7 Preset value (upper)
	16	CH 7 Preset value (lower)
	17	CH 0 Return value write data (upper)
	18	CH 0 Return value write data (lower)
	19	CH 1 Return value write data (upper)
	20	CH 1 Return value write data (lower)
	21	CH 2 Return value write data (upper)
	22	CH 2 Return value write data (lower)
	23	CH 3 Return value write data (upper)
	24	CH 3 Return value write data (lower)
	25	CH 4 Return value write data (upper)
	26	CH 4 Return value write data (lower)
	27	CH 5 Return value write data (upper)
	28	CH 5 Return value write data (lower)
	29	CH 6 Return value write data (upper)
	30	CH 6 Return value write data (lower)
	31	CH 7 Return value write data (upper)
	32	CH 7 Return value write data (lower)
	33	CH 0 Max. value write data (upper)
	34	CH 0 Max. value write data (lower)
	35	CH 1 Max. value write data (upper)
	36	CH 1 Max. value write data (lower)
	37	CH 2 Max. value write data (upper)
	38	CH 2 Max. value write data (lower)
	39	CH 3 Max. value write data (upper)
	40	CH 3 Max. value write data (lower)
	41	CH 4 Max. value write data (upper)
	42	CH 4 Max. value write data (lower)
	43	CH 5 Max. value write data (upper)
	44	CH 5 Max. value write data (lower)
	45	CH 6 Max. value write data (upper)
	46	CH 6 Max. value write data (lower)
	47	CH 7 Max. value write data (upper)
	48	CH 7 Max. value write data (lower)

Slave (R7E-PA8)→Master		
Input Status (1X)	Unused	
	17 through 32	Extension input unit data
Input Register (3X)	1	CH 0 Parameter data (upper)
	2	CH 0 Parameter data (lower)
	3	CH 1 Parameter data (upper)
	4	CH 1 Parameter data (lower)
	5	CH 2 Parameter data (upper)
	6	CH 2 Parameter data (lower)
	7	CH 3 Parameter data (upper)
	8	CH 3 Parameter data (lower)
	9	CH 4 Parameter data (upper)
	10	CH 4 Parameter data (lower)
	11	CH 5 Parameter data (upper)
	12	CH 5 Parameter data (lower)
	13	CH 6 Parameter data (upper)
	14	CH 6 Parameter data (lower)
	15	CH 7 Parameter data (upper)
	16	CH 7 Parameter data (lower)
	17	CH 0 Return value read data (upper)
	18	CH 0 Return value read data (lower)
	19	CH 1 Return value read data (upper)
	20	CH 1 Return value read data (lower)
	21	CH 2 Return value read data (upper)
	22	CH 2 Return value read data (lower)
	23	CH 3 Return value read data (upper)
	24	CH 3 Return value read data (lower)
	25	CH 4 Return value read data (upper)
	26	CH 4 Return value read data (lower)
	27	CH 5 Return value read data (upper)
	28	CH 5 Return value read data (lower)
	29	CH 6 Return value read data (upper)
	30	CH 6 Return value read data (lower)
	31	CH 7 Return value read data (upper)
	32	CH 7 Return value read data (lower)
	33	CH 0 Max. value read data (upper)
	34	CH 0 Max. value read data (lower)
	35	CH 1 Max. value read data (upper)
	36	CH 1 Max. value read data (lower)
	37	CH 2 Max. value read data (upper)
	38	CH 2 Max. value read data (lower)
	39	CH 3 Max. value read data (upper)
	40	CH 3 Max. value read data (lower)
	41	CH 4 Max. value read data (upper)
	42	CH 4 Max. value read data (lower)
	43	CH 5 Max. value read data (upper)
	44	CH 5 Max. value read data (lower)
	45	CH 6 Max. value read data (upper)
	46	CH 6 Max. value read data (lower)
	47	CH 7 Max. value read data (upper)
	48	CH 7 Max. value read data (lower)

MODBUS FUNCTION CODES & SUPPORTED CODES

■ DATA AND CONTROL FUNCTIONS

CODE	NAME	
01	Read Coil	Status Digital output from the slave (read/write)
02	Read Input Status	Status of digital inputs to the slave (read only)
03	Read Holding Registers	General purpose register within the slave (read/write)
04	Read Input Registers	Collected data from the field by the slave (read only)
05	Force Single Coil	Digital output from the slave (read/write)
06	Preset Single Register	General purpose register within the slave (read/write)
08	Diagnostics	
11	Fetch Comm. Event Counter	Fetch a status word and an event counter
12	Fetch Comm. Event Log	A status word, an event counter, a message count and a field of event bytes
15	Force Multiple Coils	Digital output from the slave (read/write)
16	Preset Multiple Registers	General purpose register within the slave (read/write)
17	Report Slave ID	Slave type/'RUN' status

■ EXCEPTION CODES

CODE	NAME	
01	Illegal Function	Function code is not allowable for the slave
02	Illegal Data Address	Address is not available within the slave
03	Illegal Data Value	Data is not valid for the function

■ DIAGNOSTIC SUBFUNCTIONS

CODE	NAME	
00	Return Query Data	Loop back test

MODBUS I/O ASSIGNMENT

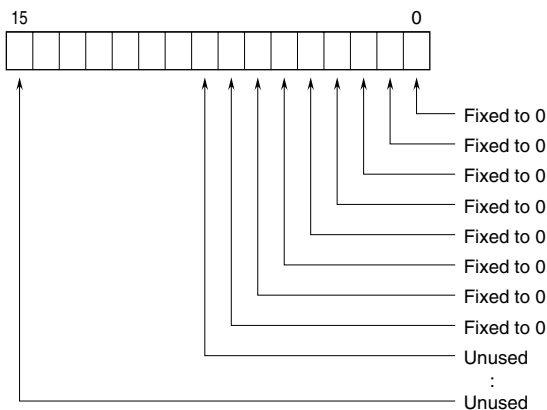
	ADDRESS	DATA TYPE	DATA
Coil (0X)	1 – 16		Digital Output (discrete output of the basic module)
	17 – 32		Digital Output (discrete output of the extension module)
Inputs (1X)	1 – 16		Digital Input (discrete input of the basic module)
	17 – 32		Digital Input (discrete input of the extension module)
	33 – 48		Reserved (unused)
	49 – 64		Module Status
	65 – 80		Reserved (unused)
Input Registers (3X)	1 – 4	I	Analog Input
	5 – 16	----	Reserved (unused)
	17 – 24	F	Analog Input
	25 – 48	----	Reserved (unused)
Holding Registers (4X)	1 – 2	I	Analog Output
	3 – 16	----	Reserved (unused)
	17 – 20	F	Analog Output
	21 – 48	----	Reserved (unused)

I: Integer, -1500 – +11500 (-15 – +115%)

F: Floating

Note: DO NOT access addresses other than mentioned above. Such access may cause problems such as inadequate operation.

■ STATUS



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

