

## PULSE ADDER (field-programmable)

MODEL

**JPS3**

### 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:

Signal conditioner (body + base socket).....(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, hardware setting, operation of the Programming Unit (model: PU-2x)\* specific to this model and basic maintenance procedures.

This unit is factory adjusted and calibrated according to the Ordering Information included in the product package. If you don't need to change the pre-adjusted setting, you can skip the sections on hardware setting and calibration and Software Setting in this manual.

\*When you need to change software settings, please refer to the Operation Manual for Model PU-2x (EM-9255), Section B: (B-1) Introduction, (B-2) General Operation Description, (B-3) Operation Flow chart for general information.

### 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:  
85 – 132V AC rating: 85 – 132V, 47 – 66 Hz, approx. 6VA  
12, 24 and 48V DC ratings: Rating  $\pm 10\%$ , approx. 3.3W  
110V DC rating: 85 – 150V DC, approx. 3.3W

#### ■ GENERAL PRECAUTIONS

- Before you remove the unit from its base socket or mount it, turn off the power supply and input signal for safety.

#### ■ 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 -5 to +60°C (23 to 140°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

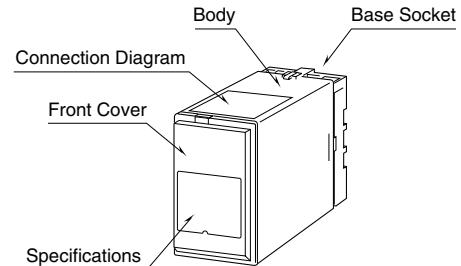
#### ■ WIRING

- 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.

#### ■ AND ....

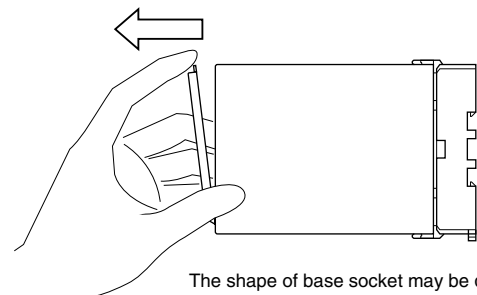
- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

### COMPONENT IDENTIFICATION



#### ■ HOW TO OPEN THE FRONT COVER:

Hang your finger on the hook at the top of the front cover and pull.

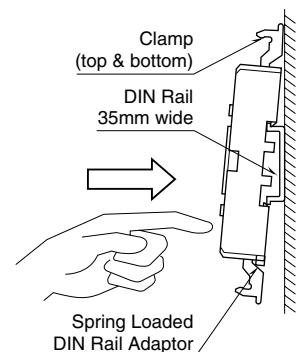


### INSTALLATION

Detach the yellow clamps located at the top and bottom of the unit for separate the body from the base socket.

#### ■ DIN RAIL MOUNTING

Set the base socket so that its DIN rail adaptor is at the bottom. Hang the upper hook at the rear side of base socket on the DIN rail and push in the lower. When removing the socket, push down the DIN rail adaptor utilizing a minus screwdriver and pull.



#### ■ WALL MOUNTING

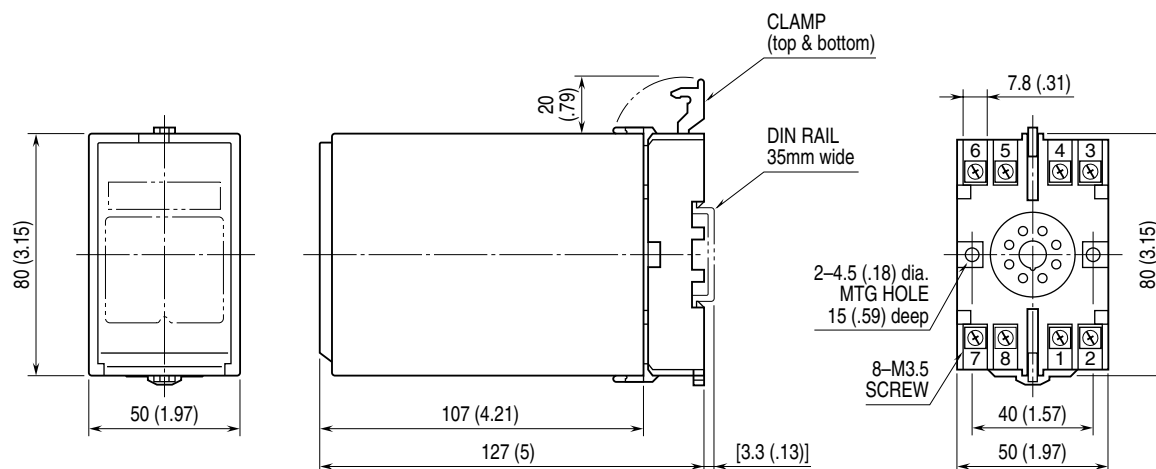
Refer to "EXTERNAL DIMENSIONS."

Shape and size of the base socket are slightly different with various socket types.

## TERMINAL CONNECTIONS

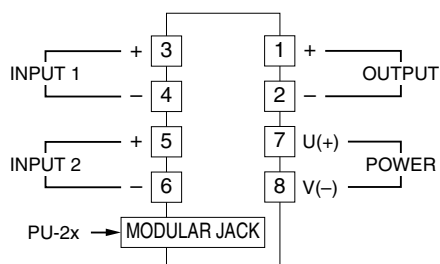
Connect the unit as in the diagram below or refer to the connection diagram on the top of the unit.

### EXTERNAL DIMENSIONS unit: mm (inch)



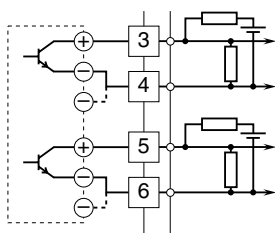
• When mounting, no extra space is needed between units.

### CONNECTION DIAGRAM

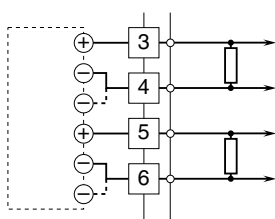


#### Input Connection Examples

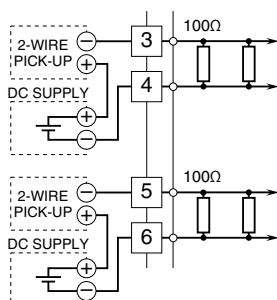
##### Open Collector or Mechanical Contact



##### Voltage Pulse

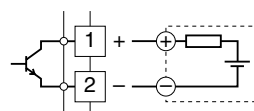


##### 2-Wire Current Pulse • External DC Supply

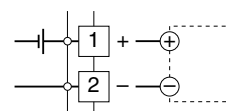


#### Output Connection Examples

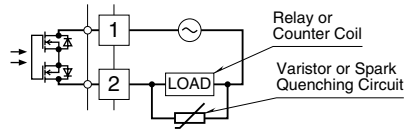
##### Open Collector



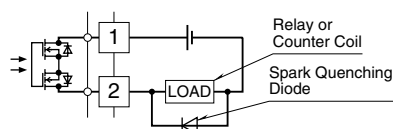
##### Voltage Pulse



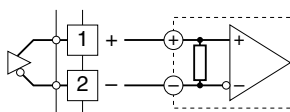
##### Noncontact AC/DC Switch • AC Powered



##### • DC Powered



##### RS-422 Line Driver Pulse



## EXPLANATIONS OF TERMS & FUNCTIONS

### ■ SCALING FACTOR, INPUT PULSE SET COUNT & OUTPUT PULSE SET COUNT

The scaling factor, rate of number of output pulses divided by number of input pulses, is determined by two parameters: input pulse set count and output pulse set count.

The JPS3 output is designed to be proportional in number of pulses relative to the input. For example, when the pulse rate is set to 0.0583, the JPS3, provided with 10000 input pulses (input 1 and 2 added), outputs 583 pulses. However, the output is not supplied in a constant frequency. The JPS3 counts the number of input pulses during the sampling time (period) and stores it in the internal buffer counter, and provides the number of output pulses multiplied by the scaling factor for the number of input pulses, by the end of next sampling cycle. With the maximum output frequency limit, those pulses exceeding the limit are still in the buffer and output only in the following cycle.

### ■ SAMPLING TIME

The sampling time is defined as a time period required by the JPS3 to count the input signals for one cycle. With its factory default setting (0.1 sec.), the output is refreshed every 100 milliseconds.

This setting is not usually be changed unless for a specific purpose.









### ■ MAXIMUM OUTPUT FREQUENCY LIMIT

You can limit the maximum output frequency from the JPS3.

The JPS3 multiplies the number of input pulses by the scaling factor. However when the output pulses are supplied to a low-speed response counter, the number of output pulses (output frequency of the JPS3) may have to be limited within a certain level.

Those surplus pulses remains in the buffer and are output in the following sampling cycles within the limit.

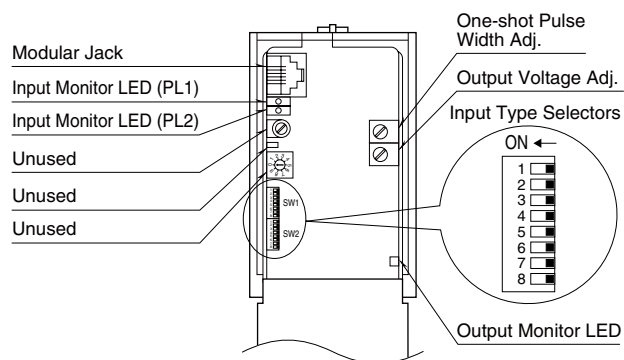
## OUTPUT LOGIC

INPUT 1 & 2 WAVEFORM			Voltage Pulse 2-wire Current Pulse	Open Collector or Mechanical Contact
OUTPUT WAVEFORM			H L	OFF ON
Voltage Pulse or RS-422 Line Driver Pulse	Non Inverted *1	No conversion to one-shot	H L	H L
		One-shot, detecting input pulse rise 	H L	H L
		One-shot, detecting input pulse drop 	H L	H L
	Inverted *1	No conversion to one-shot	H L	H L
		One-shot, detecting input pulse rise 	H L	H L
		One-shot, detecting input pulse drop 	H L	H L
Open collector or Noncontact AC/DC Switch	Non Inverted *1	No conversion to one-shot	OFF ON	OFF ON
		One-shot, detecting input pulse rise 	OFF ON	OFF ON
		One-shot, detecting input pulse drop 	OFF ON	OFF ON
	Inverted *1	No conversion to one-shot	OFF ON	OFF ON
		One-shot, detecting input pulse rise 	OFF ON	OFF ON
		One-shot, detecting input pulse drop 	OFF ON	OFF ON

The pulse width in one-shot means the bold lined section of a pulse waveform.

\*1. Specified by model number suffix code.

## HARDWARE SETTING



The JPS3 is programmed and calibrated at the factory according to the Ordering Information Sheet.

Please refer to the instruction manual for the model under "Software Setting" when you need to modify certain specifications.

DO NOT change setting of unused switches and potentiometers.

### • Noise Filter

'High' setting is used for the input frequency  $\leq 10$  Hz.

'Low' setting is used for the input frequency  $\leq 500$  Hz.

For mechanical contact input, 'High' setting is recommended to prevent typical chattering from counting.

DO NOT change the factory settings of SW1-1 through SW1-6 and SW2-1 through SW2-6.

NOISE FILTER	INPUT 1		INPUT 2	
	SW1-7	SW1-8	SW2-7	SW2-8
High	ON	OFF	ON	OFF
Low	OFF	ON	OFF	ON
None	OFF	OFF	OFF	OFF

The switches in the table are set at the factory according to the Ordering Information Sheet.

## SOFTWARE SETTING

Please refer to the Operation Manual for Model PU-2x (EM-9255), Section B: (B-1) Introduction, (B-2) General Operation Description, (B-3) Operation Flowchart for general information.

### [GROUP 01]

ITEM	MDFY.	DATA INPUT	DISPLAY	DEFAULT	CONTENTS
01	S			N/A	MAINTENANCE SWITCH
		0	MTSW : MON.MODE		0 : Data indication only.
		1	MTSW : PRG.MODE		1 : All 'P' marked parameters are modifiable.
02	P	Alphabets & No	TG : XXXXXXXXXX	N/A	Tag name entry (10 characters max.)
03	P	Numeric	CT1 : XXXXXX	0*1	Total input 1 pulses (any count selectable)
04	P	Numeric	CT2 : XXXXXX	0*1	Total input 2 pulses (any count selectable)
05	P	Numeric	IN : XXXXXX	1	Input pulse set count (1 to 1 000 000)
06	P	Numeric	OUT : XXXXXX	1	Output pulse set count (1 to 1 000 000)
07	P	Numeric (Hz)	FRQ : XXXX.XHz	10.0	Max. output frequency limit (0.5 to 100000.0 Hz)
08	P	Numeric (s)	SMP : X.XXs	0.10	Sampling time (0.01 to 100.00 s)
09	D	No input	SW : IN_V 1/20	N/A	Input specifications
			SW : IN_V 1/10		SW = 0, Voltage pulse input, Sensitivity scale = 1/20
			SW : IN_V 1/5		SW = 1, Voltage pulse input, Sensitivity scale = 1/10
			SW : IN_V 1/2		SW = 2, Voltage pulse input, Sensitivity scale = 1/5
			SW : IN_V 1/1		SW = 3, Voltage pulse input, Sensitivity scale = 1/2
			SW : IN_V 5/1		SW = 4, Voltage pulse input, Sensitivity scale = 1/1
			SW : IN_V 10/1		SW = 5, Voltage pulse input, Sensitivity scale = 5/1
			SW : IN_OC, mA		SW = 6, Voltage pulse input, Sensitivity scale = 10/1
			SW : no use		SW = 7, Open collector, mechanical contact or two-wire current pulse input
			SW : no use		SW = 8, (not used)
10	P			*2	Count mode
		0	IN_EDGE : 0		Count at pulse rise
		1	IN_EDGE : 1		Count at pulse sink

\*1. Reset to 0 when the power is lost.

\*2. Factory set. DO NOT change this setting.

### Modification Code

D: No modification (writing) possible. Used only for monitoring (reading).

S: Modifiable at any time.

P: Modifiable only when the MAINTENANCE SWITCH is in the "PRG" mode.

### ROM Version Indication

[GROUP 00] [ITEM 99]

---

## CHECKING

- 1) Terminal wiring: Check that all cables are correctly connected according to the connection diagram.
- 2) Power input voltage: Check voltage across the terminal 7 – 8 with a multimeter.
- 3) Check the input signal.
- 4) Check the output signal.

---

## LIGHTNING SURGE PROTECTION

M-System offers a series of lightning surge protector for protection against induced lightning surges. Please contact M-System to choose appropriate models.