

Dual Output Plug-in Signal Conditioners W-UNIT

FREQUENCY TRANSMITTER

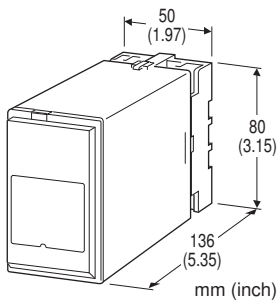
(field-programmable; built-in excitation)

Functions & Features

- Converts the output from a pulse-type transducer into a standard process signal
- Built-in excitation
- Field-selectable input type and range: Open collector, mechanical contact, voltage pulse or two-wire current pulse
- High-density mounting

Typical Applications

- Positive displacement flowmeters, turbine flowmeters and vortex flowmeters
- Measuring rotation speed of a machine generating dry contact signals



MODEL: WJPAD2-[1][2][3]-[4][5]

ORDERING INFORMATION

• Code number: WJPAD2-[1][2][3]-[4][5]
Specify a code from below for each [1] through [5].
(e.g. WJPAD2-7A6-K/Q)

- Special output range (For codes Z & 0)
- Specify the specification for option code /Q
(e.g. /C01/S01)

Use Ordering Information Sheet (No. ESU-2275). Default setting specified below will be used if not otherwise specified.

FACTORY DEFAULT SETTING

Input type	Open collector
Pulse sensing	DC coupled
Pulse amplitude	----
DC offset	----
Input zero frequency	0 Hz
Input span frequency	1000 Hz
Low-end cutout	-15.00 %
Non-uniform pulse compensation	1 (no compensation)
Alarm mode	High alarm
Alarm setpoint	100.00 %
Alarm deadband	1.00 %
Alarm on delay time	3.0 sec.
Linearization	Without

INPUT - Field-selectable

- Open collector
- Mechanical contact
- Voltage pulse
- Two-wire current pulse

[1] EXCITATION

- 1: 5 V DC @ 120 mA
- 4: 12 V DC @ 60 mA
- 7: 24 V DC @ 25 mA

[2] OUTPUT 1

Current

- A: 4 - 20 mA DC (Load resistance 600 Ω max.)
- B: 2 - 10 mA DC (Load resistance 1200 Ω max.)
- C: 1 - 5 mA DC (Load resistance 2400 Ω max.)
- D: 0 - 20 mA DC (Load resistance 600 Ω max.)
- E: 0 - 16 mA DC (Load resistance 750 Ω max.)
- F: 0 - 10 mA DC (Load resistance 1200 Ω max.)
- G: 0 - 1 mA DC (Load resistance 12 kΩ max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

Voltage

- 1: 0 - 10 mV DC (Load resistance 10 kΩ min.)
- 2: 0 - 100 mV DC (Load resistance 100 kΩ min.)
- 3: 0 - 1 V DC (Load resistance 1000 Ω min.)
- 4: 0 - 10 V DC (Load resistance 10 kΩ min.)
- 5: 0 - 5 V DC (Load resistance 5000 Ω min.)
- 6: 1 - 5 V DC (Load resistance 5000 Ω min.)
- 4W: -10 - +10 V DC (Load resistance 10 kΩ min.)
- 5W: -5 - +5 V DC (Load resistance 5000 Ω min.)
- 0: Specify voltage (See OUTPUT SPECIFICATIONS)

[3] OUTPUT 2

Current

- A: 4 - 20 mA DC (Load resistance 350 Ω max.)
- B: 2 - 10 mA DC (Load resistance 700 Ω max.)
- C: 1 - 5 mA DC (Load resistance 1400 Ω max.)
- D: 0 - 20 mA DC (Load resistance 350 Ω max.)
- E: 0 - 16 mA DC (Load resistance 430 Ω max.)
- F: 0 - 10 mA DC (Load resistance 700 Ω max.)
- G: 0 - 1 mA DC (Load resistance 7000 Ω max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

Voltage

Same range availability as Output 1

[4] POWER INPUT

AC Power

K: 85 - 132 V AC

DC Power

S: 12 V DC (under development)



R: 24 V DC
V: 48 V DC
P: 110 V DC

[5] OPTIONS

blank: none

/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q

COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

TERMINAL SCREW MATERIAL

/S01: Stainless steel

RELATED PRODUCTS

- JX configurator connection kit (model: JXCON)
- Programming Unit (model: PU-2x)

GENERAL SPECIFICATIONS

Construction: Plug-in

Connection: M3.5 screw terminals

Screw terminal: Chromated steel (standard) or stainless steel

Housing material: Flame-resistant resin (black)

Isolation: Input or alarm output to output 1 to output 2 to power

Overrange output: Approx. -15 to +115 % at 1 - 5 V

Zero adjustment: -5 to +5 % (front)

Span adjustment: 95 to 105 % (front)

Alarm mode: High or Low

Alarm setpoint: -15 - +115 %

Alarm deadband: 0 - 20 %

Linearization: Max. 16 points

Input monitor LED: Red LED blinks according to the input.

Excitation adjustment: 5 - 24 V DC

Software programming: Programming Unit (model: PU-2x);
(Refer to the users manual of JXCON for the adjustments configurable with JXCON.)

- Input frequency range
- Zero and span
- Low-end cutout
- Linearization
- Alarm setpoint
- Output fine adjustment
- Averaging non-uniform pulses
- Others

Adjustments: With DIP and Rotary switches.

- Input Type

- Pulse Sensing
- Noise Filter
- Detecting level

(Refer to the instruction manual for details)

Modular jack: Connecting the PU-2x

Low-end cutout: -15 - +115 % adjustable

(% of the input range determined by the input zero and span frequencies. This unit outputs 0 % for the input below the setting. When the input zero frequency is set to 0 Hz, the low-end cutout setting below 0 % is not valid.)

INPUT SPECIFICATIONS

Excitation: Shortcircuit protection; approx. 300 mA at shortcircuit

Frequency ranges: 0 - 0.01 Hz through 100 kHz (up to 10 Hz for mechanical contact)

Minimum pulse width time requirement: 5 μ sec.; 50 msec. for mechanical contact (for both ON and OFF)

Minimum span: 10 % of the selected frequency range

■ Open Collector & Mechanical Contact

Input requirements

(Excitation: Sensing: OFF: ON)

5 V: Approx. 4 V / 1.0 mA: $\geq 200 \text{ k}\Omega$: $\leq 200 \Omega$

12 V: Approx. 9 V / 2.3 mA: $\geq 200 \text{ k}\Omega$: $\leq 200 \Omega$

24 V: Approx. 16 V / 4.7 mA: $\geq 200 \text{ k}\Omega$: $\leq 200 \Omega$

Detecting level: 2 V (Detecting voltage in the internal circuit.)

Detecting pulse edge: OFF (input monitor LED ON) to ON (input monitor LED OFF)

■ Voltage Pulse

Waveform: Square or sine

Input impedance: 10 k Ω min.

Pulse amplitude: 0.1 - 100 Vp-p

Max. voltage between input terminals: 50 V

Detecting level: 0 - 5 V

(Detecting voltage in the internal circuit.)

Detecting pulse state: A pulse rise detected when the input voltage goes above the detecting level; a pulse sink detected when it goes below the level.

■ Two-wire Current Pulse

Input resistance: Receiving resistor 100 Ω

Input range: 0 - 25 mA

Minimum pulse amplitude: 10 mA

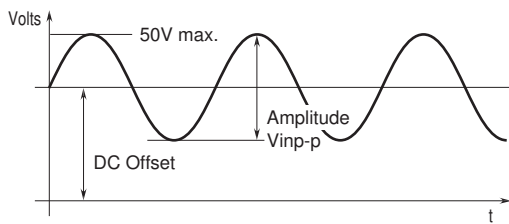
Detecting level: 0 - 5 V

(Detecting voltage in the internal circuit.)

Detecting pulse state: The input resistor (100 Ω) converts the current signal into 0 - 2.5 V. A pulse rise detected when the voltage goes above the detecting level; a pulse sink detected when it goes below the level.



Voltage pulse waveform



Line voltage effect: $\pm 0.1\%$ over voltage range

Insulation resistance: $\geq 100\text{ M}\Omega$ with 500 V DC

Dielectric strength: 2000 V AC @1 minute

(input or alarm output to output 1 or output 2 to power to ground)

1000 V AC @ 1 minute (output 1 to output 2)

OUTPUT SPECIFICATIONS

■ **DC Current:** 0 - 20 mA DC

Minimum span: 1 mA

Offset: Max. 1.5 times span

Load resistance: Output drive 12 V max. for Output 1;

7 V max. for Output 2

■ **DC Voltage:** -10 - +10 V DC

Minimum span: 10 mV

Offset: Max. 1.5 times span

Load resistance: Output drive 1 mA max.; at $\geq 0.5\text{ V}$

■ **Alarm Output:** Relay contact

Rated load: 30V DC @ 1 A (resistive load)

Maximum switching voltage: 110 V DC

Maximum switching power: 30 W

Minimum load: 10 mV DC @ 0.1 mA

Mechanical life: 5×10^7 cycles (180 cycles/minute)

For maximum relay life with inductive loads, external protection is recommended.

INSTALLATION

Power input

• **AC:** Operational voltage range 85 - 132 V,

47 - 66 Hz, approx. 6.6 VA

• **DC:** Operational voltage range: Rating $\pm 10\%$, or 85 - 150 V for 110 V rating; ripple 10 %p-p max.; Approx. 3.9 W (145 mA at 24 V)

Operating temperature: -5 to +60°C (23 to 140°F)

Operating humidity: 30 to 90 %RH (non-condensing)

Mounting: Surface or DIN rail

Weight: 300 g (0.66 lb)

PERFORMANCE in percentage of span

Accuracy: Input accuracy + output accuracy

Input accuracy: $\pm 0.05\%$ of the selected freq. range

Inversely proportional to the input span.

[Example] Open collector input, 0 - 50 kHz

Selected Freq. Range 100 kHz \div Input Span 50 kHz \times

Accuracy 0.05 % + Output Accuracy 0.05 % = $\pm 0.15\%$

Output accuracy: $\pm 0.05\%$ of the output range

Alarm setpoint accuracy: $\pm 0.1\%$ (or $\pm 0.2\%$ at $\geq 10\text{ kHz}$)

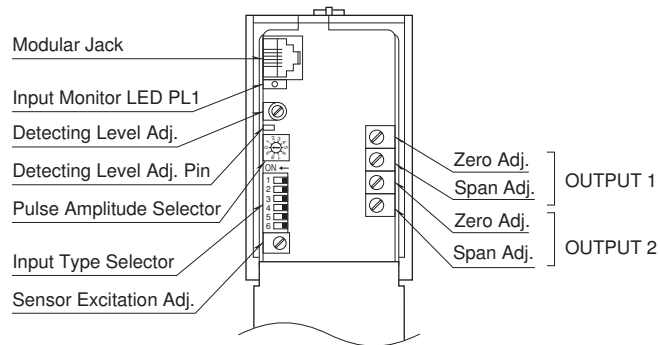
Temp. coefficient: $\pm 0.015\%/^{\circ}\text{C}$ ($\pm 0.008\%/^{\circ}\text{F}$)

Response time: 0.5 sec. + 1 pulse cycle (0 - 90 %)

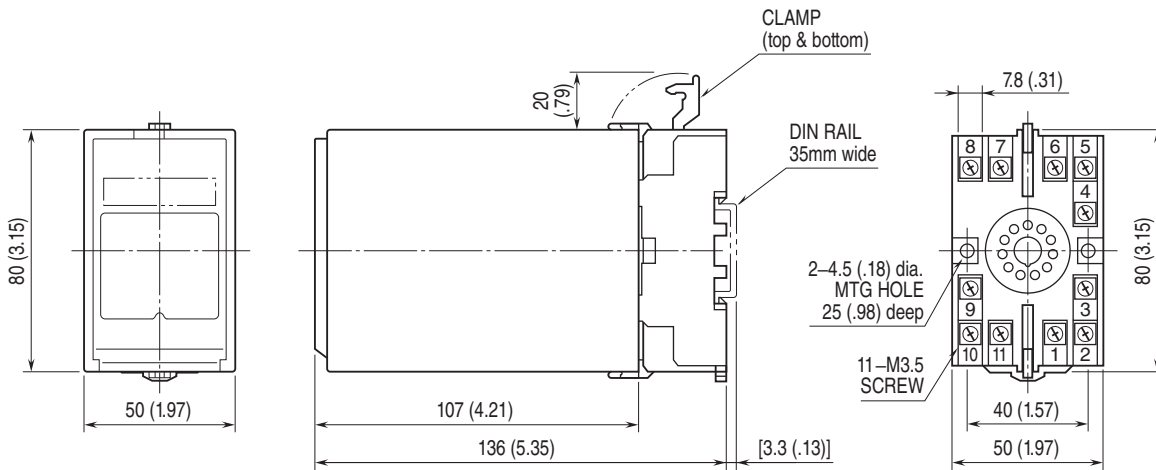


EXTERNAL VIEW

This unit is factory calibrated according to the Ordering Information. If you need to change hardware & software setting, refer to the instruction manuals of the transmitter and Programming Unit.



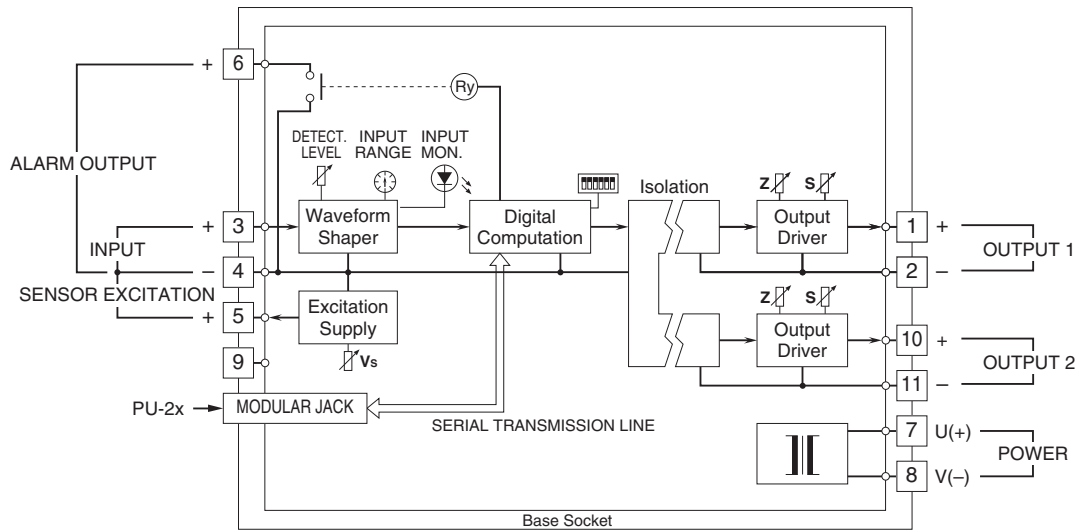
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



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

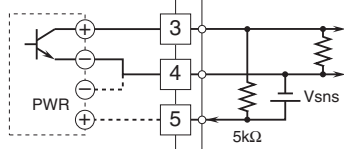


SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

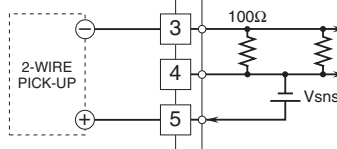


Input Connection Examples

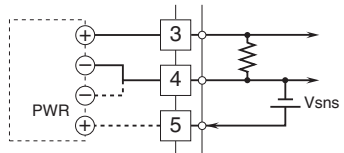
■ Open Collector or Mechanical Contact



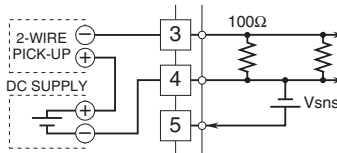
■ 2-Wire Current Pulse •Built-in Excitation



■ Voltage Pulse



■ External DC Supply



Specifications are subject to change without notice.