

Super-mini Signal Conditioners *Mini-M Series*

FREQUENCY TRANSMITTER
(PC programmable)

MODEL **M2XPA2**

MODEL & SUFFIX CODE SELECTION

M2XPA2-□□□-□□

MODEL _____

INPUT _____

0 : User-calibrated
(Factory default: open collector, 0 – 100 kHz)

If the unit is to be factory-calibrated to a specific input type, please select from the following:

- A1** : Open collector
- A2** : Mechanical contact
- B** : Voltage pulse
- G** : Two-wire current pulse
- J** : RS-422 line driver pulse

EXCITATION _____

0 : User-calibrated
(Factory default: 12V DC / 5mA)

If the unit is to be factory-calibrated to a specific voltage value, please select from the following:

- 2** : 4V DC / 5mA
- 3** : 8V DC / 5mA
- 4** : 12V DC / 5mA

OUTPUT _____

0 : User-calibrated (Factory default: 4 – 20mA)

If the unit is to be factory-calibrated to a specific output type, please select from the following:

Current

Z1 : Range 0 – 20mA DC

Voltage

V1 : Range -2.5 – +2.5V DC

V2 : Range -10 – +10V DC

POWER INPUT _____

AC Power

M2 : 100 – 240V AC

DC Power

R : 24V DC

P : 110V DC

STANDARDS & APPROVALS _____

/N : Without CE

/CE: CE marking

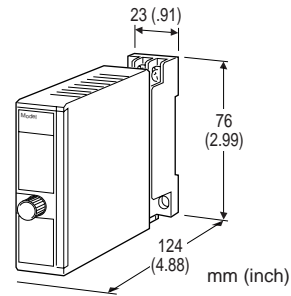
ORDERING INFORMATION

Non-specified orders will be shipped at default factory settings (M2XPA2-000: open collector input/12V excitation/4 – 20mA output). However, a power suffix code **must** be specified.

If you specify a full code number without specific calibration ranges, the input frequency is factory set to the maximum range available for the selected input code and the output is set to the default range (table to the right). Use Ordering Information Sheet (No. ESU-5060).

Ordering example:

- Code number (e.g. M2XPA2-000-M2/CE)



Functions & Features

- Converting the output from a pulse-type transducer into a standard process signal
- PC programmable
- Sensor excitation
- Direct RS-422 input

Typical Applications

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

INPUT CODE	DEFAULT
A1	0 Hz – 100 kHz
A2	0 Hz – 10 Hz
B	0 Hz – 100 kHz
G	0 Hz – 100 kHz
J	0 Hz – 100 kHz
OUTPUT CODE	DEFAULT
Z1	4 – 20mA DC
V1	0 – 1V DC
V2	1 – 5V DC

RELATED PRODUCTS

- JX configurator connection kit (model: JXCON)

GENERAL SPECIFICATIONS

Construction: Plug-in

Connection: M3 screw terminals (torque 0.8 N·m)

Housing material: Flame-resistant resin (black)

Isolation: Input to output to power

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

Configuration: Via PC Configurator Software

(model: JXCON) on the Windows PC connected to the front jack.

Programmable features include:

- I/O type and range
- Zero and span adjustments
- Low-end cutout

INPUT & OUTPUT**INPUT**

Measurable frequencies: Minimum span 10% of the frequency range selected among:
 0 – 10 Hz, 0 – 100 Hz,
 0 – 1 kHz, 0 – 10 kHz, 0 – 100 kHz

Pulse width time requirement: Min. 5 μ sec.,
 max. 10 sec.

•Open Collector

Maximum frequency: 0 – 100 kHz
Input amplitude: Min. 4V, max. 12V
Sensing voltage/current: Approx. 12V, 8V or 4V DC
 @1mA
Detecting levels: $\leq 200\Omega$ for ON; $\geq 200k\Omega$ for OFF

•Mechanical Contact

Maximum frequency: 0 – 10 Hz
Input amplitude: Min. 4V, max. 12V
Sensing voltage/current: Approx. 12V, 8V or 4V DC
 @1mA
Detecting levels: $\leq 200\Omega$ for ON; $\geq 200k\Omega$ for OFF

•Voltage Pulse

Maximum frequency: 0 – 100 kHz
Waveform: Square or sine
Input impedance: 10k Ω minimum
Input amplitude: Min. 0.1V p-p, max. 100V p-p
Max. voltage between input terminals: See the table below. Max. 70V** for CE conformance.

AMPLITUDE	MAXIMUM VOLTAGE
50 – 100V p-p	100V **
25 – 50V p-p	50V
10 – 25V p-p	25V
5 – 10V p-p	10V
1 – 5V p-p	5V
0.5 – 1 V p-p	1V
0.1 – 0.5V p-p	0.5V *

*Max. input frequency limited to 50 kHz.

Detecting levels: -2 – +4V

•Two-wire Current Pulse

Maximum frequency: 0 – 100 kHz
Input resistance: Receiving resistor 100 Ω
Input range: 0 – 25mA
Input amplitude: Min. 4mA, max. 20mA
Detecting levels: -2 – +4V

•RS-422 Line Driver Pulse

Maximum frequency: 0 – 100 kHz
Receiver: Conforms to RS-422

OUTPUT

•DC Current: 0 – 20mA DC
Operational range: 0 – 24mA DC
Minimum span: 1mA
Offset: Lower range can be any specific value within the input range provided that the minimum span is maintained.
Load resistance: Output drive 12V maximum
 (e.g. 4 – 20mA: 600 Ω [12V/20mA])

•DC Voltage: -2.5 – +2.5V DC for V1;
 -10 – +10V DC for V2
Operational range: -3 – +3V DC for V1;
 -11.5 – +11.5V DC for V2
Minimum span: 250mV for V1; 1V for V2
Offset: Lower range can be any specific value within the input range provided that the minimum span is maintained.
Load resistance: Output drive 1mA maximum
 (e.g. 1 – 5V: 5000 Ω [5V/1mA])

INSTALLATION**Power input**

AC: Operational voltage range 85 – 264V AC;
 47 – 66 Hz; approx. 4VA at 100V
 approx. 5VA at 200V
 approx. 6VA at 264V

DC: Operational voltage range for R: 24V $\pm 10\%$
 or P: 85 – 150V;
 approx. 3W (ripple 10% p-p max.)

Operating temperature: -5 to +55°C (23 to +131°F)
Operating humidity: 30 to 90% RH (non-condensing)
Mounting: Surface or DIN rail
Dimensions: W23×H76×D124 mm (0.91"×2.99"×4.88")
 See General Spec. Sheet Figure A-2.
Weight: 150 g (0.33 lbs)
Terminal assignment: See General Spec. Sheet Figure B-1.

PERFORMANCE

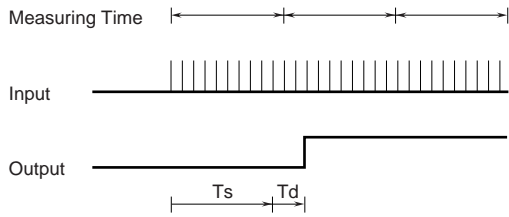
Accuracy: Input accuracy + output accuracy
Input accuracy: $\leq \pm 0.03\%$ of the selected freq. range
Output accuracy: $\leq \pm 0.03\%$ of the selected output range
 The input accuracy is inversely proportional to the input span; while the output accuracy is likewise inversely proportional to the output span.
 [Example] Open collector input, 0 – 50 kHz; 1 – 5V output.

$$\frac{\text{Selected Freq. Range (100 kHz)}}{\text{Input Span (50 kHz)}} \times \text{Accuracy (0.03\%)} = 0.06\% \text{ (Input Accuracy)}$$

$$\frac{\text{Selected Output Range (20V)}}{\text{Output Span (4V)}} \times \text{Accuracy (0.03\%)} = 0.15\% \text{ (Output Accuracy)}$$
 Overall Accuracy = 0.06 + 0.15 = 0.21%

Temp. coefficient: $\pm 0.015\%/^{\circ}\text{C}$
 at -5 to +55°C (23 to 131°F) of I/O range

Response time: $T_s + T_d$



T_s : Measuring Time = Sampling time x Moving average samples (6)
 T_d : Delay caused by internal processing (50 – 100 ms)

[Example] Sampling time 50 msec. (standard setting)
 Delay time 100 msec.

When the input cycle is shorter than the sampling time, the response time is calculated as: 50 msec. x 6 + 100 msec. = 400 msec.

When the input cycle is longer than the sampling time, the response time becomes longer accordingly.

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

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

Dielectric strength: 2000V AC @1 minute
 (input to output to power to ground)

STANDARDS & APPROVALS

CE conformity: EMC Directive (89/336/EEC)

EMI EN61000-6-4

EMS EN61000-6-2

Low Voltage Directive (73/23/EEC)

EN61010-1

Installation category II

Pollution degree 2

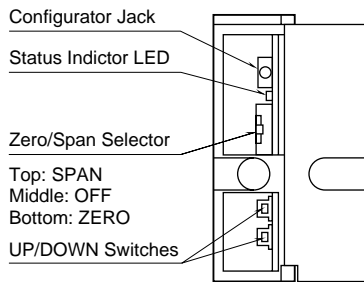
Max. operating voltage 300V

Input or output to power – Reinforced insulation

Input to output – Basic insulation

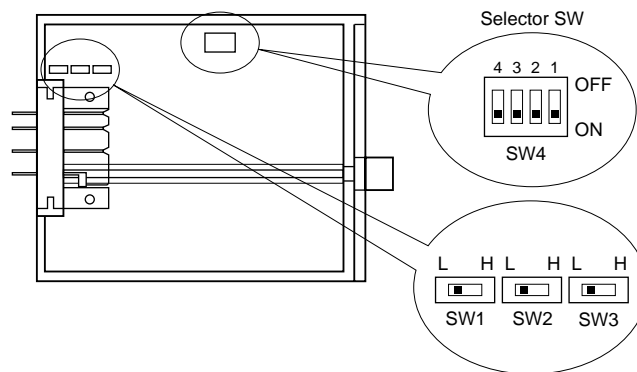
FRONT & SIDE VIEW

FRONT VIEW (with cover open)



The front cover cannot be opened to 180 deg. when flush with neighboring units.

LEFT SIDE VIEW (with cover removed)



DIP SWITCH SETTINGS

Input Type

Table 1

INPUT	SW1	SW2	SW3
Open Collector	H	H	H
Mechanical Contact	H	H	H
Voltage Pulse	H	H	H
Two-wire Current Pulse	H	H	H
RS-422 Line Driver Pulse	L	L	L

Pulse Sensing

Table 2

SENSING	SW4-3
Capacitor Coupled	OFF
DC Coupled	ON

Noise Filter

Table 3

FILTER	SW4-2	SW4-1
Large (time constant 50 ms)	ON	OFF
Small (time constant 10 ms)	OFF	ON
Without	OFF	OFF

MANUAL ZERO/SPAN ADJUSTMENTS

Zero/span selector

ZERO: UP/DOWN switches usable for zero adjustment.

OFF: UP/DOWN switches unavailable.

SPAN: UP/DOWN switches usable for span adjustment.

UP/DOWN switches

UP: Pressing UP increases adjusted values.

DOWN: Pressing DOWN decreases adjusted values.

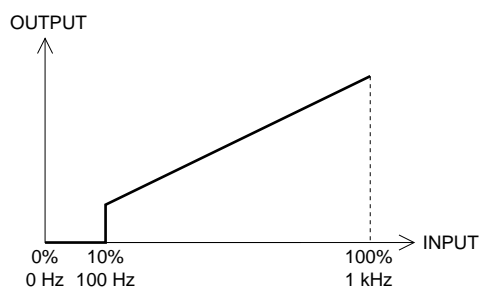
(Press both switches at once for resetting zero/span adjustments.)

EXPLANATION OF TERMS

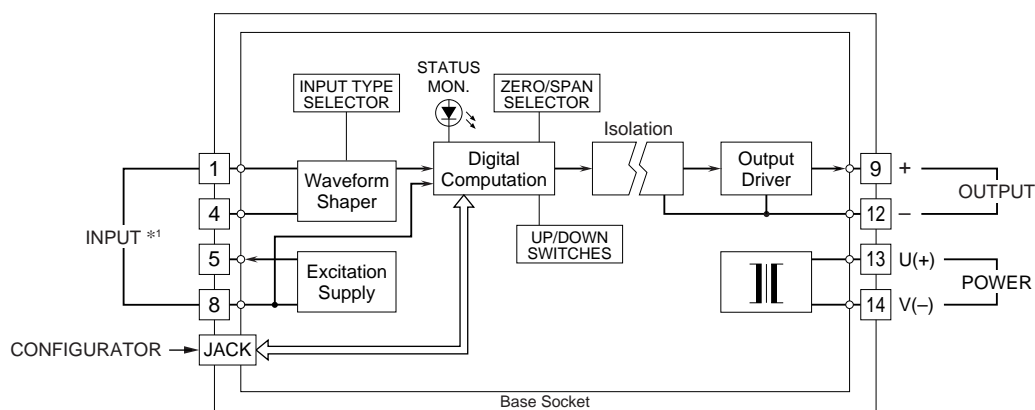
Low-end cutout:

The function where the output signal is forced to 0% below the setpoint input.

[Example] Input zero frequency 0 Hz
 Input span frequency 1 kHz
 Low-end cutout 10%

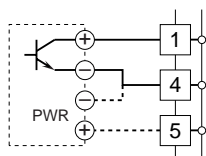


SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

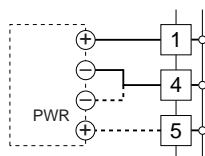


*1. Input Connection Examples

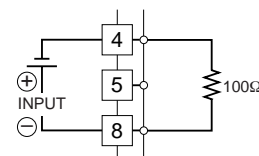
■ Dry Contact



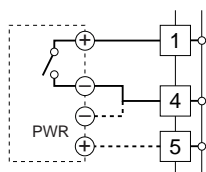
■ Voltage Pulse



■ 2-Wire Current Pulse



■ Mechanical Contact



■ RS-422 Line Driver Pulse

