4-20 mA vibration transmitter modules - metric

iT100M / iT200M series

The intelligent transmitter (iT) series from Wilcoxon is a complete family of 4-20 mA units providing signal conditioning for simplified online vibration monitoring. The iT series lowers the total cost of condition monitoring and predictive maintenance programs deployed by industrial, commercial and municipal facilities.

Each transmitter is custom-designed for individual applications. High- and low-pass filters can also be selected by the user. iT transmitters support accelerometers and piezovelocity transducers and can be configured to output 4-20 mA signal proportional to acceleration, velocity or displacement. The 4-20 mA output can be sent directly to the facility's existing PLC or DCS for cost-effective continuous vibration monitoring.

iT vibration transmitter modules operate from a 24 Volt DC (nominal) power supply, accepting input directly from IEPE sensors and processing the signal to produce a 4-20 mA loop current proportional to the overall in-band vibration. The input dynamic vibration signal is buffered and presented as an output at the BNC connector and on one set of terminals.
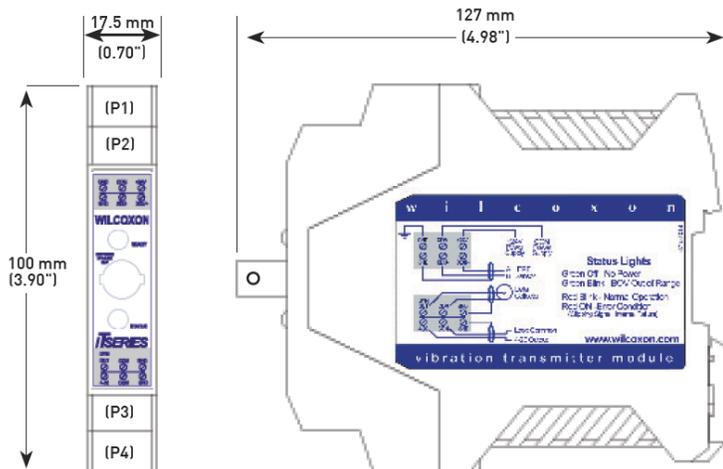
Key features

- Front panel BNC for dynamic signal output
- Communicates with other iT series modules through integrated communication bus
- Dynamic signal available for portable data collectors or online systems
- Slim 17.5 mm case
- ESD protected
- Reverse wiring protection
- Manufactured in an approved ISO 9001 facility

Certifications

CE

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SPECIFICATIONS

OUTPUT, 4-20 MA LOOP CURRENT

Full scale ±2%	see chart on page 4
Output type	peak (equivalent) or true RMS, true peak or true peak-peak
Frequency response, without filtering, –3 dB **Acceleration** **Velocity**	0.3 Hz to 20 kHz 2.0 Hz to 5 kHz[1]
Repeatability	2%
Maximum 4-20 mA loop load resistance	600 Ω
Zero (4 mA) accuracy	± 0.25 mA
Reading accuracy	± 2% of full scale
High-pass filtering, 2 pole, pre-set[2] **Low-pass filtering, 8 pole, pre-set[2]**	see chart on page 4 see chart on page 4
Temperature offset, maximum	0.1%/°C
Turn-on time	120 seconds

OUTPUT, BUFFERED DYNAMIC

Gain, RTI sensor	1.0 ± 2%
Noise RTO, broadband, 1 Hz - 10 kHz, RMS	$\leq$0.0001 volts

Frequency response
     Amplitude ± 3 dB
     Phase shift at 1 kHz
	
	 $\leq$0.3 Hz to 20 kHz
	 0° ± 1°

Output type	AC-AC/DC coupled
Sensor types	IEPE accelerometers and IEPE piezovelocity transducers

Sensor sensitivities accepted
     Accelerometer
     Piezovelocity[4]
	
	 1.02 mV/m/s², 10.2 mV/m/s², 51.0 mV/m/s²
	 0.39 mV/mm/sec, 3.9 mV/mm/sec, 19.7 mV/mm/sec

Sensor powering
     Open circuit voltage[3]
     Constant current
	
	 V_{in} - 2 ± 1 volts
	 3.6 mA ± 20%

Maximum dynamic signal input for linear response	±7 volts peak

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Notes:

[1] Values with 100 mV/g accelerometer.

[2] In "Manual Set" mode the filters are continuously variable. LF: 2 Hz to 1 kHz, HF: 200 Hz to 20 kHz.

[3] Determined at powering voltage of 24V.

[4] Under all conditions the input vibration should not exceed 50 ips.

Wilcoxon Sensing Technologies
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SPECIFICATIONS

Power

Voltage (V_{in})	24 ±4 VDC	
Absolute maximum voltage	32 VDC	
Current draw	$\leq$130 mA	

Operating temperature	–40 to +85° C
Humidity, non-condensing	$\leq$95%
Altitude limit, operating	3,000 meters
Mounting	snap fit 35 mm DIN rail
Width	17.5 mm
Depth, front of BNC to back of DIN rail	127 mm
Height	100 mm

Wiring		
Terminal designations		
P1	+24V	Positive power input for iT module
	COM	Common for power input
	GND	Earth ground connection (to ground iT module)
P2	XDU+	Sensor power/signal input
	XDU–	Sensor common input
	SHD	Sensor shield wiring termination
P3	DYN OUT	Dynamic signal out
	COM	Common of dynamic signal out
	SHD	Shield point termination of dynamic out
P4	4-20	4-20 mA loop return signal
	COM	Common reference for 4-20 mA return
	SHD	Shield point termination for loop wiring
Front panel		
BNC connector	Output BNC connection for buffered dynamic signal (for data collector)	
Green LED	"On" indicates 24 V power applied and sensor connection OK	
	"Off" indicates no 24V power applied or unit not ready	
	Flashing indicates BOV out of OK range (5V to 18V)	
Red LED	Blinking every 2 seconds indicates normal operation	
	"ON" error condition indicates signal clipping or internal circuit failure	

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Ordering information

iT☐☐☐– F☐☐– S☐☐☐– L☐☐☐☐.☐–H☐☐☐☐☐

Contact

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iT	iT model type	
	Input	Output
111M	Acceleration	Acceleration 4-20 mA, m/s^2 peak
112M	Acceleration	Acceleration 4-20 mA, m/s^2 RMS
113M	Acceleration	Acceleration 4-20 mA, m/s^2 true peak
114M	Acceleration	Acceleration 4-20 mA, m/s^2 true peak-peak
121M	Acceleration	Velocity 4-20 mA, mm/s peak
122M	Acceleration	Velocity 4-20 mA, mm/s RMS
221M	Piezovelocity	Velocity 4-20 mA, mm/s peak
222M	Piezovelocity	Velocity 4-20 mA, mm/s RMS
223M	Piezovelocity	Velocity 4-20 mA, mm/s true peak
224M	Piezovelocity	Velocity 4-20 mA, mm/s true peak-peak
231M	Piezovelocity	Displacement 4-20 mA, mm peak
232M	Piezovelocity	Displacement 4-20 mA, mm RMS

F	Full-scale output		
	Acceleration	Velocity	Displacement
02			0.2 mm
05	50 m/s^2		0.5 mm
10	100 m/s^2		1.0 mm
		15 mm/s	
20	200 m/s^2	20 mm/s	2.0 mm
25		25 mm/s	
30	300 m/s^2	30 mm/s	3.0 mm
40		40 mm/s	4.0 mm
50	500 m/s^2	50 mm/s	5.0 mm
99		99 mm/s	

S	Input sensor sensitivity	
	Accelerometers	Piezovelocity transducers
010	1.02 $mV/m/s^2$	0.39 mV/mm/s
100	10.2 $mV/m/s^2$	3.9 mV/mm/s
102		4.0 mV/mm/s
500	51.0 $mV/m/s^2$	19.7 mV/mm/s
510		20.0 mV/mm/s

L	Low frequency corner* (high-pass)
0000.3	0.3 Hz (acceleration models only)
0001.0	1 Hz (lowest freq. velocity or displacement, S=500)
0002.0	2 Hz (lowest freq. velocity or displacement, S≥100)
0005.0	5 Hz (lowest freq. velocity or displacement, S≥010)
0010.0	10 Hz
0020.0	20 Hz
0030.0	30 Hz
0050.0	50 Hz
0080.0	80 Hz
0100.0	100 Hz
0200.0	200 Hz
0300.0	300 Hz
0500.0	500 Hz
1000.0	1000 Hz

H	High frequency corner* (low-pass)
00200	200 Hz
00300	300 Hz
00500	500 Hz
00800	800 Hz
01000	1000 Hz
02000	2000 Hz (highest frequency for displacement models)
03000	3000 Hz
05000	5000 Hz (highest frequency for velocity models)
10000	10000 Hz (highest frequency for true peak or true peak-peak)
20000	20000 Hz (acceleration models only)

* High frequency corner must be at least 10 times low frequency corner

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