



SMART VIBRATION SENSORS

- Fully USB programmable
- Selectable measurement parameters
- Hazardous area approved versions available
- Hermetically sealed
- Increases monitoring reliability

TYPICAL APPLICATIONS

- Motors & Pumps
- Reciprocating Machinery
- Cooling Towers & Fin Fans
- Mixers
- Gearboxes
- Wind Turbines



PROGRAMMABLE SENSORS UTILIZING MICROPROCESSOR TECHNOLOGY AND APPLICATION SPECIFIC ALGORITHMS

Most industrial machinery exhibit a measurable warning sign that a fault, such as a worn bearing, cracked gear, loss of lubrication, or an unbalance condition is developing. Continuous vibration monitoring of critical machinery is widely regarded as an effective means of detecting such faults before a failure occurs. Smart vibration sensors combine traditional vibration sensors, specialized circuitry, advanced microprocessor technology, and targeted algorithms to provide useful, accurate, and timely information regarding a machine's health.

Smart vibration sensors are USB programmable (using an optional USB Programmer) and have 2-pin connections. The transmitters are 2-wire, loop-powered and are completely compatible with most existing plant monitoring systems such as PLC, DCS, or other plant information systems that accept a 4-20 mA input. Intrinsic safety approvals are available for some models.



RECIPROCATING MACHINERY PROTECTOR

MODELS (EX) 649AX1

- Outperforms impact transmitters by providing earlier warnings of mechanical looseness and faults, including loose/broken bolts/rod nuts, cracked rods and cylinder debris.
- Provides peak acceleration output signal when no impacts are detected above the threshold levels.
- Counts impacts based on two threshold levels with their own independent weightings.



SMART VIBRATION SWITCH

SERIES 686

- Field-programmable with use of PC for precise setting of vibration threshold and other parameters.
- Customizable time delays prevent false trips from errant vibration spikes during start-up and operation.
- Measurement range in velocity provides more effective monitoring for equipment with low running speeds.



Reciprocating compressors can develop devastating faults in a short period of time. Mechanical looseness caused by a cracked rod nut, loose bolt, or excessive clearance can deteriorate quickly resulting in catastrophic failure of the compressor. In extreme cases, this can happen in a matter of minutes.

The patented Reciprocating Machinery Protector (RMP) detects true peak acceleration, counts impacts above specific thresholds, and processes the data based on compressor speed to quantify the machine's health in terms of 4-20 mA signal.

MODELS (EX)649AX1 SPECIFICATIONS

Output	4-20 mA
Machinery Speed	240 to 10,000 RPM
Sampling Time	0.1 to 4.0 sec
Threshold Range	2 to 50 g
Weighting Factor Range	0.2 to 16 mA

The Smart Vibration Switch is USB programmable with two-wire operation, universal power and a single stud mount. The product has an embedded precision accelerometer, a solid state relay and adjustable time delays to provide accurate, repeatable results. Smart Switches monitor vibration in velocity and are in a robust stainless steel housing that is hermetically-sealed for use in the harshest environments.

SERIES 686 SMART VIBRATION SWITCH SPECIFICATION

Relay (Programmable)	Normally Open or Normally Closed, Latching or Non-Latching
Power	24 to 240 V DC/AC, 50-60 Hz
Alarm Threshold Level (Programmable)	0.25 to 5.0 in/sec pk (6.35 to 127.00 mm/sec pk)
Operational Delay (Programmable)	1 to 60 sec
Operating Temperature	-40 to +185 °F (-40 to +85 °C)



BEARING FAULT DETECTOR PLUS

MODELS (EX)649AX3

- Provides early warning of rolling element bearing faults
- Has five output signal options
- Works on constant and variable speed machines
- Normalizes output using compensated peak
- Effective on large, slow speed roll bearings



The Bearing Condition Transmitter is a smart, microprocessor- based sensor that is specifically designed to provide early warning of typical rolling element bearing faults such as: cracked races, spalling, brinelling, looseness, and even loss of lubrication. It has five modes of detection that are user selectable for optimum performance: RMS acceleration, true peak acceleration, compensated peak (using bearing diameter and speed to normalize output), Crest Factor, and Crest Factor Plus for improved detection on variable speed machinery.

MODELS (EX)649AX3 SPECIFICATIONS

Output	4-20 mA
RMS Acceleration Measurement Range	0-2 to 0-50 g pk
True Peak Acceleration Measurement Range	0-2 to 0-50 RMS
Compensated Peak Measurement Range	1 to 16
Crest Factor Measurement Range	1 to 16
Crest Factor Plus Measurement Range	1 to 16



USB PROGRAMMABLE 4-20 mA OUTPUT SENSOR

MODEL 649A04

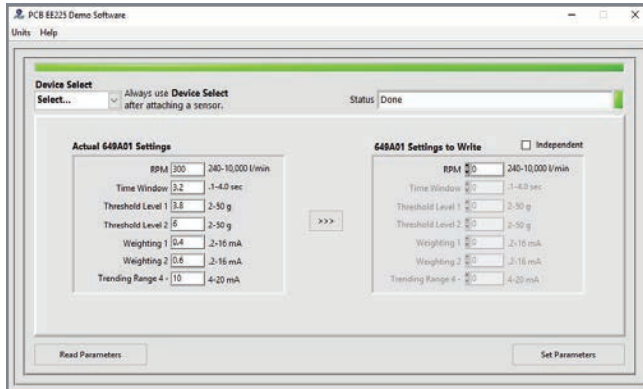
- Outputs acceleration, velocity, or displacement
- Selectable low and high pass filters
- Selectable full scale range
- English or metric units

Model 649A04 is a fully USB programmable, integrated vibration sensor and transmitter. It is housed in a hermetically sealed industrial sensor housing and mounts with a standard 1/4-28 stud. It can be programmed to output a 4-20 mA signal proportional to peak acceleration, velocity, or peak-peak displacement in either English or SI units. The sensor also has three selectable low pass filters and two high pass filters.

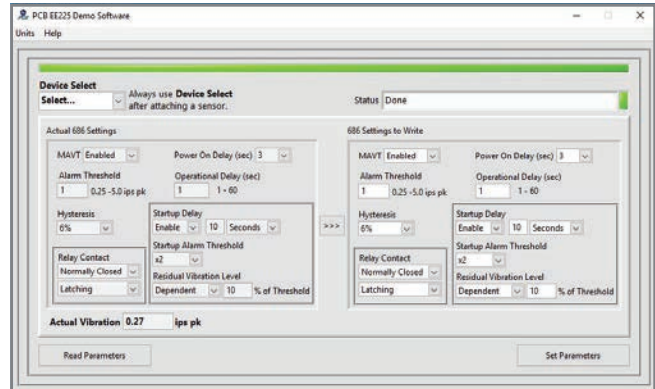
MODEL 649A04 SPECIFICATIONS

Output	4-20 mA
Measurement Range (Velocity)	0.5 to 3 in/sec pk
Measurement Range (Acceleration)	1 to 10 g pk
Measurement Range (Displacement)	4 to 20 mil pk - pk

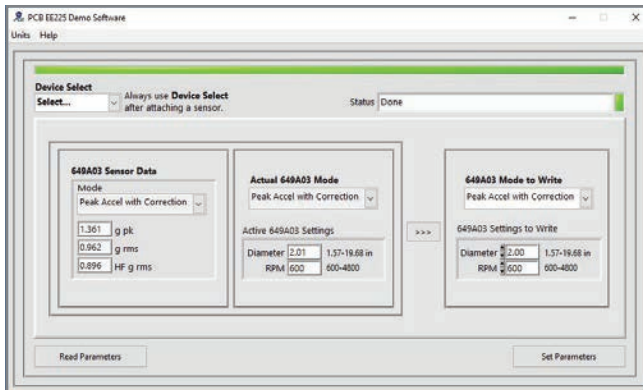
PROGRAM SOFTWARE



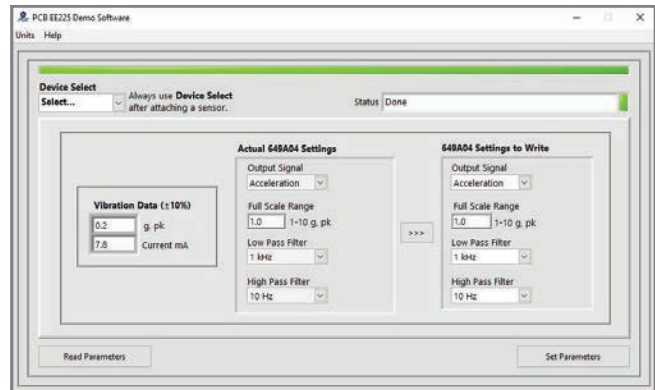
RECIPROCATING MACHINERY PROTECTOR



SMART VIBRATION SWITCH



BEARING FAULT DETECTOR PLUS



USB PROGRAMMABLE 4-20 MA OUTPUT SENSOR



IMI Sensors, a division of PCB Piezotronics, Inc. manufactures industrial vibration monitoring instrumentation, such as accelerometers, vibration transmitters and switches that feature rugged stainless steel housings and survive in harsh environments like paper and steel mills, mines, gas turbines, water treatment facilities and power plants. Integrating with portable analyzers and PLC's, IMI instrumentation helps maintenance departments reduce downtime and protect critical machinery. Visit IMI Sensors at www.pcb.com. PCB Piezotronics, Inc. is a wholly owned subsidiary of MTS Systems Corporation. Additional information on MTS can be found at www.mts.com.

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