Industrial Monitoring Instrumentation

- Predictive Maintenance
- Energy & Power Generation
- Process Monitoring & Protection

LIFETIME WARRANTY+
Products Guaranteed for Life & More!

IMI SENSORS
A PCB PIEZOTRONICS DIV.

visit us online at www.imi-sensors.com

☎ Toll-Free in USA 800-959-4464 ☎ 716-684-0003

Predictive Maintenance

World-Class Innovation & Construction:

- Durable, stainless-steel housing
- Welded, hermetic sealing
- Electrical case isolation
- 10 mV/g, 100 mV/g, 500 mV/g sensitivities available
- Integral, armored integral, & submersible cable options
- Hazardous area approved versions available

Low-Cost Industrial ICP® Accelerometers

- Ideal for permanent installations & use with continuous, on-line monitoring systems
- Promote safety when installed in hazardous or inaccessible locations
- Connect through switch or junction box for route-based data collection schemes
- NIST traceable, single-point calibration at 100 Hz

Low-Profile, Low Cost
Model 602D01
- Most popular side-exit accelerometer
- Low profile casing
- Ceramic shear, hermetically sealed

Small Size, Low Cost
Model 603C01
- Our most popular accelerometer
- Compact & low cost
- 30 to 600k cpm

Small Size, Low Cost
Model 627A01
- Quartz sensing element
- Temperature stable
- 20 to 600k cpm

Small Size, Low Cost
Model 608A11
- Excellent sensor for submersible applications
- Small size (9/16" footprint)
- Integral cable easily connects to boxes

Precision Industrial ICP® Accelerometers

- Ideal for roving use with route-based data collectors
- Utilize for effective machinery analysis & fault diagnostics
- Velocity output, temperature output, high temperature (325 °F/163 °C), hazardous area approved versions available
- NIST traceable calibration through full frequency range

Ceramic, General Purpose
Model 625B01
- 5% sensitivity tolerance
- Through-hole mounting
- Intrinsically safe, velocity output versions

Ceramic, General Purpose
Model 622B01
- 5% sensitivity tolerance
- Excellent high frequency energy (HFE) response
- Intrinsically safe, velocity output versions

Quartz, General Purpose
Model 624B01
- 5% sensitivity tolerance
- Through-hole mounting
- Intrinsically safe, velocity output versions

Quartz, General Purpose
Model 628F01
- 5% sensitivity tolerance
- Excellent for transient temperature applications
- Intrinsically safe, velocity output versions

High Temp Industrial ICP® Accelerometers

- Kits include charge output accelerometer, charge converter, & high temp cable
- Can survive elevated surface or ambient temperatures (up to 325 °F)
- Ideal for monitoring paper machines, steam handling systems, gas turbines, engines, & in steel mills

Very high temp accelerometers available on page 7

Ceramic, General Purpose
Model HT602D01
- Through-hole mounting
- Temperatures to 325 °F (163 °C)
- Ceramic sensing element

Ceramic, General Purpose
Model HT622A01
- Low noise
- Temperatures to 325 °F (163 °C)
- Ceramic sensing element

Ceramic Sensors = Lower Noise

Quartz, General Purpose
Model HT624B01
- Quartz sensing element
- Temperatures to 325 °F (163 °C)
- Through-hole mounting

Quartz, General Purpose
Model HT628F01
- Quartz sensing element
- Temperatures to 325 °F (163 °C)
- Welded hermetic

Quartz Sensors = Improved Temperature Stability

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Featured Product

Swiveler® & Spindler® Accelerometers

Model 607A11 Model 607A61

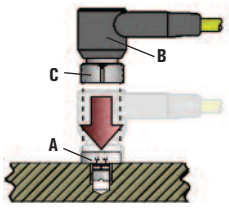
a popular choice for wind turbines (see page 6)

Industry Exclusive!

This industry exclusive product is innovative in both its small size and its convenient swiveling mounting method

- 360° swivel mount allows for convenient cable orientation
- Lower cost alternative to through-bolt sensors
- Small footprint & very low profile for installation in tight spaces

Mounting Procedures:



Mounting hold is prepared into machine surface to accept sensor's mounting stud (A). Stud is then tightened to recommended torque w/ hex Allen key. Sensor (B) floating hex nut (C) is threaded onto mounting stud.

Using the 360° capabilities of the Swiveler®, the cable is positioned into desired orientation & temporarily hand tightened. Using a wrench, the hex nut is tightened to the recommended torque while holding the cable or connector in the desired location.

Low Frequency Industrial ICP® Accelerometers

- Ideal for permanently installed vibration measuring on slow-speed rotating machinery & structural monitoring
- Engineered to combine low-frequency response with high output sensitivity
- Common applications for these sensors include:
  - Large fans & air handling equipment
  - Paper machine rolls
  - Structural monitoring

Ceramic, General Purpose
Model 625B02
- Side exit, ring-style
- Ceramic sensing element
- Available with intrinsically safe, velocity output

Ceramic, High Sensitivity
Model 626B01
- High sensitivity
- 12 cpm
- Available with temperature output

Ceramic, High Sensitivity
Model 626B02
- For Buildings, bridges, civil structures
- High sensitivity
- 500 mV/g

Ceramic, High Sensitivity
Model 626A04
- Excellent for seismic monitoring
- 2 cpm, 0.5 µg resolution
- 10 V/g output

High Frequency Industrial ICP® Accelerometers

- Ideal for permanently installed vibration measuring on high-speed rotating machinery
- A variety of casing-sizes ensures the best product for your applications
- Common applications for these sensors include:
  - Gear mesh studs & diagnostics
  - Bearing monitoring
  - Small mechanisms

Ceramic, General Purpose
Model 635A01
- 0.4 to 15 kHz
- 10 mV/g or 100 mV/g
- 1/4-28 thru bolt, 2 pin MIL connector

Ceramic, High Frequency
Model 623C01
- 15 kHz at 3dB
- 10 mV/g or 100 mV/g options
- Intrinsically safe models available

Very High Frequency
Model 600A12 Kit
- 30 kHz, even with magnet
- Very high frequency
- Includes Model 621B40 accelerometer, magnet, & cable assembly

Ceramic, General Purpose
Model 631A80
- 360° orientation
- 32 to 900k cpm
- 1/4-28 thru bolt, 2 pin mini-MIL connector

Multi-Axis Industrial ICP® Accelerometers

- Measure acceleration simultaneously in up to three axes
- Through-bolt mounting for simplified alignment
- Simultaneous radial and axial bearing vibration measurements
- Interface directly with vibration data collectors and FFT analyzers

Triaxial, Low Cost
Model 604B31
- Low cost triaxial option
- 30 to 300k cpm
- Side exit, 4-pin connector

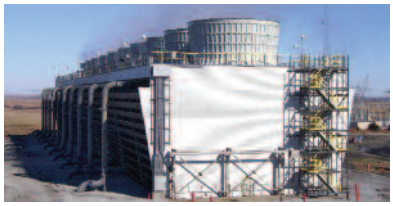
Biaxial, Low Cost
Model 605B01
- Excellent for vertical pumps
- Unique biaxial sensor
- Side exit, 3-pin connector

Precision Triaxial
Model 629A61
- Precision triaxial sensor
- 48 to 480k cpm
- Armored integral cable

Precision Triaxial
Model 629A31
- Precision triaxial sensor
- 48 to 480k cpm
- 4-pin bayonet connector

IMI's 4-20 mA industrial vibration sensors integrate an accelerometer and vibration transmitter within a standard, robust accelerometer housing. This provides a more compact and cost-effective solution than a conventional accelerometer with separate vibration transmitter. Scaled in velocity or acceleration output signals, these 4-20 mA industrial vibration sensors provide 24/7 online protection for critical plant machinery.

All IMI sensors and vibration switches are designed to withstand the rigors of harsh industrial environments.



Why Use 4-20 mA Monitoring Systems:

- Cost effective
- Provides 24 / 7 protection
- Operates from loop power
- Outputs acceleration, velocity, or displacement
- Works with PLC, DCS, & SCADA systems
- Intrinsically safe versions available for all models

4-20 mA Industrial Vibration Sensors & Transmitters

4-20 mA Vibration Sensors
Series 640B
- Available in top or side exit casings
- Peak or RMS, acceleration or velocity
- Intrinsically safe / explosion proof versions available

ICP® In-Line Transmitter
Model 682A09
- Converts ICP® sensors to loop powered transmitters
- Outputs 4-20 mA proportional to velocity plus analog raw vibration output
- Interfaces directly with control plant systems

Ultra Low Frequency Displacement Sensor
Model 653A01
- Ideal for slow rotating equipment
- Measures absolute peak to peak displacement
- Accurate down to 90 cpm

Hazardous Area Approvals Available on Many Other 4-20 mA Sensors

Series EX640B71 (pictured)
- Explosion proof conduit elbow
- Outputs 4-20 mA proportional to vibration
- Interfaces directly with plant control systems

4-20 mA USB Programmable Smart Sensors

Reciprocating Machinery Protector
Model 649A01
- Detects faults / mechanical looseness in reciprocating compressors
- Outperforms impact transmitters
- Continuous trending, with alarm & alert levels for early warning

Bearing Condition Transmitter
Model 649A03
- Provides early warning of Rolling Element Bearing (REB) faults
- Works on constant & variable speed drives
- Normalizes output using compensated peak

Programmable 4-20 mA output Sensor
Model 649A04
- Outputs acceleration, velocity, or displacement
- Selectable low & high pass filters
- Integral or armored integral options

USB Programming Kits
- Kits includes 2-Pin MIL to USB cable, Terminal block adapter, magnet & software disc
- Program various parameters in IMI sensors
- Free software updates available at www.imi-sensors.com

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Featured Product

Vibration Switches

Model 686B & Model 685B

Vibration switches are primarily used to protect critical machinery by initiating an alarm or shutdown when excessive vibration is detected. IMI offers various vibration switch options – traditional mechanical switches, as well as higher precision electronic switches.

Series 686B, IMI's revolutionary USB programmable smart switch, is an ideal replacement for traditional mechanical switches. It features the accuracy and a small footprint of a piezoelectric accelerometer along with the simplicity of a two-wire switch.

- Programmable delays eliminate false trips
- Competitive price compared to mechanical switches
- Explosion proof options available

A vibration switch with built-in precision accelerometer, Model 685B features dual output relays, time delays,4-20 mA retransmit, and analog vibration output.

- Lower cost than competitive models
- Dual set points (relays)
- Explosion proof options available

Mechanical Vibration Switches:

Traditional, mechanical vibration switches provide nominal vibration protection utilizing a spring-loaded, magnetically coupled switch. High vibration causes the spring force to overcome the magnet, tripping the switch.

Mechanical Vibration Switch
Series 685A07
- Cost effective protection for less-critical applications
- Utilizes spring-loaded, magnetically coupled mechanism
- Requires no power

Mechanical Vibration Switch
Series 685A08
- Weatherproof & CSA/UL approved, explosions proof
- Cost effective protection for less-critical applications
- Requires no power

4-20 mA DIN Rail Modules

Vibration Transmitter
Model 682B03
- Outputs 4-20 mA signal proportional to acceleration, velocity, or displacement
- ICP® accelerometer input
- Analog vibration output via front BNC

Bearing Fault Detector
Model 682B05
- Powers ICP® accelerometers
- Dual 4-20 mA output
- Overall vibration plus high frequency bearing fault signal

Universal Transmitter
Model 682A06
- 24 VDC loop power for 4-20 mA sensors
- Offers 2 set points with form A relay outputs
- Optional, removable programming / output module

Universal Transmitter
Model 682A16
- Expansion of 682A06 capabilities
- Provides ICP® sensor power
- Accepts mA, ohm, RTD, & thermocouple

Embeddable Accelerometers

- Mountable via adhesive or soldering and choice of either integral cable or solder pin electrical connections
- Variety of sensitivities to accommodate a wide range of applications
- Charge output piezoelectric, voltage output ICP®, & 3-wire low power options

Low Profile TO-5 Embeddable Accelerometer

TO-5 Embeddable Accelerometer

TO-8 Embeddable Accelerometer

Alarm Modules

Indicator/Alarm
Series 683A
- Provides loop power for two-wire 4-20 mA sensors
- 4 field programmable set points
- Relay option available

Indicator/Alarm Enclosure
Series 684A
- Designed for use with 683A modules
- Available with up to 24 channels
- Rugged, NEMA 4X enclosure, available in fiberglass, stainless steel, or painted steel

ENERGY & Power Generation

- Gas Turbines
- Compressors
- Oil & Gas
- Wind Turbines

IMI Sensors specializes in the design and manufacture of innovative sensors and associated signal conditioning instrumentation to meet the demanding requirements of the energy, power generation, reciprocating equipment, oil & gas, and petrochemical industries. Whether involved with design evaluations, field testing, critical component or process monitoring, IMI provides comprehensive condition monitoring solutions for all rotating machinery applications.

Gas Pipeline - Pumps & Motors

4-20 mA Vibration Sensor
Model EX64XB71

- Available in velocity or acceleration output
- ATEX / CSA approved with explosion proof conduit
- Top exit, 2-pole terminal block

Natural Gas / Petrochemical Pressure Sensors (Hazardous Area)

- Detect / monitor dynamic pressure spikes on gas & oil well heads, supply lines, natural gas power engines, multi-stage gas compressors, & other machinery
- Control engine balancing & emissions
- Suitable for walk-around or permanent monitoring applications

ICP® Pressure Sensor
Series 121A4X

- Mounts on well head & supply lines
- Rugged, case isolated sensor
- 1/4" NPT process fitting

4-20 mA Pressure Sensor
Series 1503

- Mounts on the compressor
- Withstands sour gas environments
- 1/2" NPT fitting

Wind Turbine Monitoring & Maintenance

- Ideal for permanent installation on wind turbine bearings, gear boxes & generators
- Diagnose potential problems at an early stage to increase life of the system
- Sensors can also be used for monitoring the motor in the yaw assembly

Low Cost ICP® Accelerometer
Model 607A11

- Unique 360° Swivel Design
- Allows for easy cable orientation
- Integral or Armored Integral Cable options available

Low Cost ICP® Accelerometer
Model 603C01

- Most popular accelerometer
- Low cost
- 0.5 Hz to 10 kHz
- Hazardous area options available

Torque Wrenches, Model HT7000

IMI Sensors offers a wide range of electronic hand torque wrenches, from The RS Technologies Division of PCB Load & Torque, Inc., designed for wind turbine tensioning applications.

- Ergonomic design for comfort
- Durable construction, yet light weight
- Excellent accuracy & compatible with data collectors

Portable Recorders

Torque wrenches also interface with RS Technologies Model 920 and Model 960 data collectors to measure and record torque, angle, and clamp load characteristics of threaded fastener joints used in wind turbines. Model 920 and 960 are also ideal for auditing and certifying hand torque wrenches.

Portable Transducer
Model 920

- Collects up to 300 peak data points
- Cost-effective & easy to operate
- Battery operated

RS TECHNOLOGIES

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A PCB GROUP COMPANY

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Featured Product

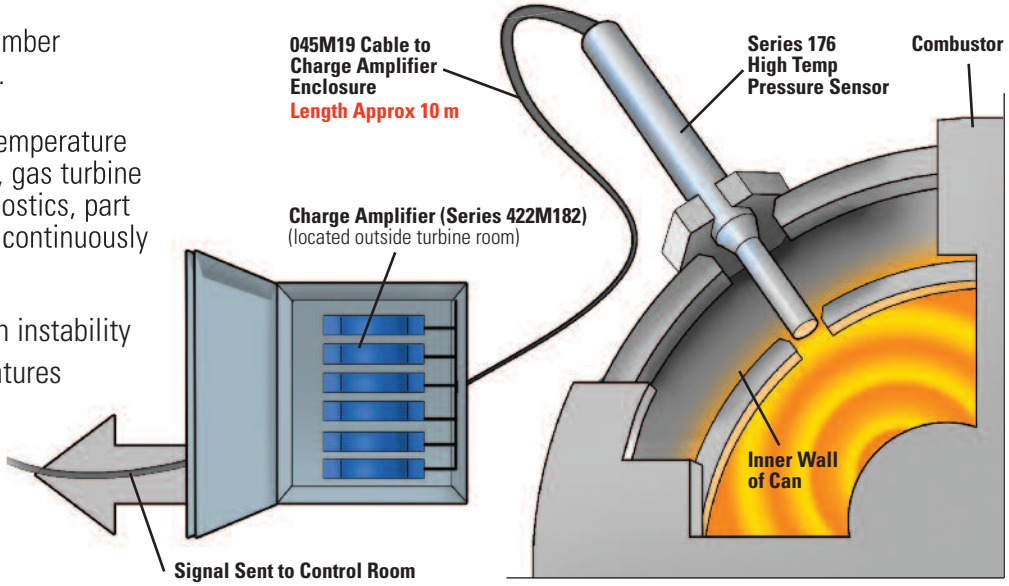
High Temp Pressure Sensor

Series 176

When directly mounted to a gas turbine's combustor, IMI's Series 176 high-temperature pressure sensors provide 24/7, consistent, reliable combustion dynamics data monitoring to help control instability which can damage components in the combustion chamber as well as downstream equipment.

By mounting the Series 176 high-temperature pressure sensors to the combustor, gas turbine operators can rely on critical diagnostics, part fatigue analysis, and the ability to continuously monitor and control emissions.

- Detect / Measure combustion instability
- Operates in extreme temperatures up to 986 ºF (530 ºC)
- ATEX & CSA approved for hazardous areas



Pressure Sensors for Gas Turbine Monitoring

IMI's high-temperature pressure sensors have three basic applications for detecting and measuring dynamic pressure phenomena and combustion instability in gas turbines:

- Remote Sensors
- Close Coupled Sensors
- On-Turbine Instability Sensors

High Temp (up to 986º F)

986 ºF

High Temp Pressure Sensor Series 176

- On-turbine instability sensor
- Temperatures to 986 ºF (530 ºC)
- Various configurations available

Med. Temp (up to 500º F)

500 ºF

High Sensitivity Pressure Sensor Series 171

- Close coupled sensor
- Temperatures to 500 ºF (260 ºC)
- Rugged, case isolated

ICP® (up to 275º F)

275 ºF

ICP® Pressure Sensor Series 102

- Remote sensor
- Temperatures to 275 ºF (135 ºC)
- 3/8-24 UNF fitting

ICP® (up to 250º F)

250 ºF

ICP® Pressure Sensor Series 121

- Remote sensor
- Temperatures to 250 ºF (121 ºC)
- 1/4" NPT fitting

Accelerometers for Gas Turbine Monitoring

- Avoids machinery failure through early diagnosis of gas turbine problems
- Take vibration measurements in extreme heat environments
- Integral charge amplifiers allow usage of standard data acquisition equipment

More high temp ICP® accelerometers available on page 2

High Temp (up to 1200º F)

1200 ºF

High Temp Accelerometer Kit Model 357C90

- Resonant frequency over 14 kHz
- Temperatures to 1200 ºF (649 ºC)
- 10 ft integral, hardline cable

Med. Temp (up to 900º F)

900 ºF

Accelerometer Kit Model 600A13

- Sensor, integral cable, & charge converter
- Temperatures to 900 ºF (482 ºC)
- 10 mV/g model available

Med. Temp (up to 500º F)

500 ºF

Charge Output Accelerometer Series 612

- Base isolated, hermetic
- Temperatures to 500 ºF (260 ºC)
- 26 pC/g sensitivity

ICP®(up to 325º F)

325 ºF

ICP® Accelerometer Series HT62X

- Base isolated, hermetic
- Temperatures to 325 ºF (163 ºC)
- Piezoelectric sensor

Featured Product

Break Away Safety Cable

Keep your personnel & equipment safe with this innovative safety feature

- Rugged & reliable with EMI / RFI shielding
- Connectors available for most major data collector manufacturers
- Coiled cables available in 6 or 10ft lengths, straight cables in custom lengths

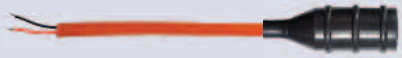
Cables & Connectors

- General purpose polyurethane or high-temperature FEP
- Rugged military-style connectors in metal or plastic
- Wide selection of sensor & data collector cables
- Custom cable assemblies available for permanent or portable applications

052 Cabling - Polyurethane Jacketed
Polyurethane cable, 2-conductor twisted pair w/ drain, shielded (-50 to +121 °F). Shown with BNC connector to 2-pin MIL

048 Cabling - Armor Jacketed
High temp FEP Cable, Armor Jacketed, 2-conductor twisted pair w/ drain, shielded (90 to +392 °F). Shown with Right Angle 2-Pin MIL connector

055 Cabling - FEP Jacketed
High temp FEP cable, 2-conductor twister pair, shielded (-85 to +392 °F) Shown with 2-pin MIL connector

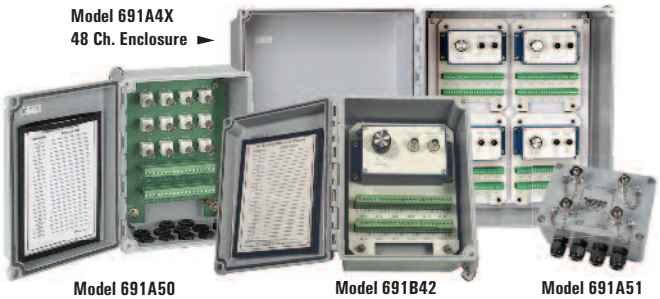


050 Cabling - Coiled Cable
Coiled Polyurethane cable, 2-conductor twister pair, shielded Shown with BNC to 7-pin connector

Enclosures

- Consolidate up to 48 channels of outputs into a convenient, centralized location
- Helps extend cable life by reducing number of connections needed for measurements
- Improve efficiency with temperature & vibration outputs in the same enclosure

Model 691A4X
48 Ch. Enclosure ►



Model 691A50
BNC Termination Box

Model 691B42
Rotary Swith Box

Model 691A51
Switch Box

Model 691B41 & 691B42 Rotary Switch Boxes

- For use with data collectors that supply ICP® sensor power
- 691B41 features 6 input channels, 691B42 features 12 input channels
- BNC output connectors for switched vibration & temperature signal

691A51 Series Switch Box

- For use with data collectors that supply ICP® sensor power
- 1 to 4 input channels via terminal strip
- 1 to 4 output channels via BNC

Accessories & Specialty Products

Epoxy Kits

- Industrial grade adhesive for installing mounting pads
- Proven to withstand the demands of factory uses
- Applicator syringe helps decrease mess around measurement point

Spot Face Tools

- Do-it-yourself installation method to help keep costs low
- Multiple end-mill diameters to suit your specific application
- Easily use with any standard drill

Magnetic Bases

- Magnetic temporary installations during route data collection
- Mounting pads for permanent installation
- Styles for flat or curved surface mounting

Mounting Pads

- Easily mounts to most convenient measurement point
- Improves accuracy & consistency of readings
- Allows for easy switching of permanently mounted sensors

Motor Fin Mounts

- Easily take accurate measurements even in narrow spaces
- For use in both portable & permanent monitoring applications
- Multiple widths & lengths to fit your specific application

"Don't Leave Home Without it!"

Portable Reference Shaker

Industry Exclusive!

New Model 699A02

- Calibrates permanently mounted accelerometers at the machine
- Verifies system performance
- Confirms operation of cables, switching devices & monitoring systems
- Outputs 1g pk or rms; operates at 159.2 Hz
- Can perform up to 1,600 operating cycles without loss of battery power

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