



Our Products Include:

- Load Cells
 - Custom
 - High Capacity
 - Multiaxes
 - Underwater
- Torque Sensors
 - Custom Torque
 - OEM
 - High Capacity
 - Underwater
- Calibration Kits

Our In-House and Field Services Include:

- In-House Services
 - Sensor Design
 - Calibration and Gaging Services
- Field Services
 - Measurement of torque and horsepower in rotating equipment
 - Stress/Strain Measurements of Plant Components
 - Measurements in Harsh Environments
 - MOV and AOV Strain Gage Instrumentation
 - Measurement of Thrust and Torque on Valves and Rotating Equipment
 - Structural Integrity Tests (SITs)
 - Permanent and Temporary Monitoring Systems
 - Design and Manufacture of Custom Sensors

Our measurement services are used to quantify operating parameters, aid with diagnostics and preventive maintenance, and troubleshoot causes for equipment failure.

Sensing Systems specializes in conducting measurements and manufacturing sensors to operate in harsh environments such as:

- High Temperature
- Low / Cryogenic Temperature
- Underwater / High Humidity
- High Magnetic Fields
- Chemical / Corrosive

Instruments / Electronics

Sensing Systems offers a wide range of Instrument and Electronic solutions to interface our sensors to meet the requirements of any application. All our sensors may be interfaced to electronic equipment to display, monitor, log and analyze the desired measurements. Electronics include stand alone digital indicators and data loggers. It also includes other equipment such as analog to digital computer boards, voltage and current amplifiers, digital communication boards (Ethernet, USB, RS-232, RS-485) and wireless systems. Other applications require that sensors be interfaced to control equipment such as computers and programmable loop controllers (PLC). Sensing Systems provides all of these electronics using our own designs and through arrangements with several well known manufacturers. We also setup and calibrate our sensors and electronics together to produce a system calibration that is traceable to NIST standards.

Sensing Systems provides instruments and electronics in the following categories:

- Digital Displays
- Amplifiers
- Digital Communication Cards
- Intrinsically Safe Barriers/Modules
- Wireless Systems
- Data Loggers
- Computers
- Customer Supplied Instruments / Electronics

Digital Displays

Digital displays are usually stand alone instruments displaying load or torque directly in engineering units. They can also be used to interface sensors to computers and PLCs. These units come in all sizes and shapes with every option imaginable including:

- Digital outputs including Ethernet, USB, RS-232 and RS-485
- Analog outputs including voltage (5 & 10 VDC, bi-polar outputs) and current (4-20 mA)
- Submersible operation
- Peak detection and display
- Relays
- Portable / Battery Operated
- We set up and calibrate

We setup and calibrate Sensing Systems' or customers supplied digital displays with any sensor and calibrate them as a system. NIST certificates are provided detailing system components and performance.

Amplifiers

We routinely interface our sensors to Sensing Systems' amplifiers or third party amplifiers. Amplifiers may be integral to the sensor (located inside) or housed externally. Available outputs include

- Voltage: 0-5 VDC, 0-10 VDC, ±5 VDC, ±10 VDC filtered or unfiltered
- Current: 4-20 mA, 0-20 mA filtered or unfiltered

CONTACT US FOR YOUR CUSTOM APPLICATIONS

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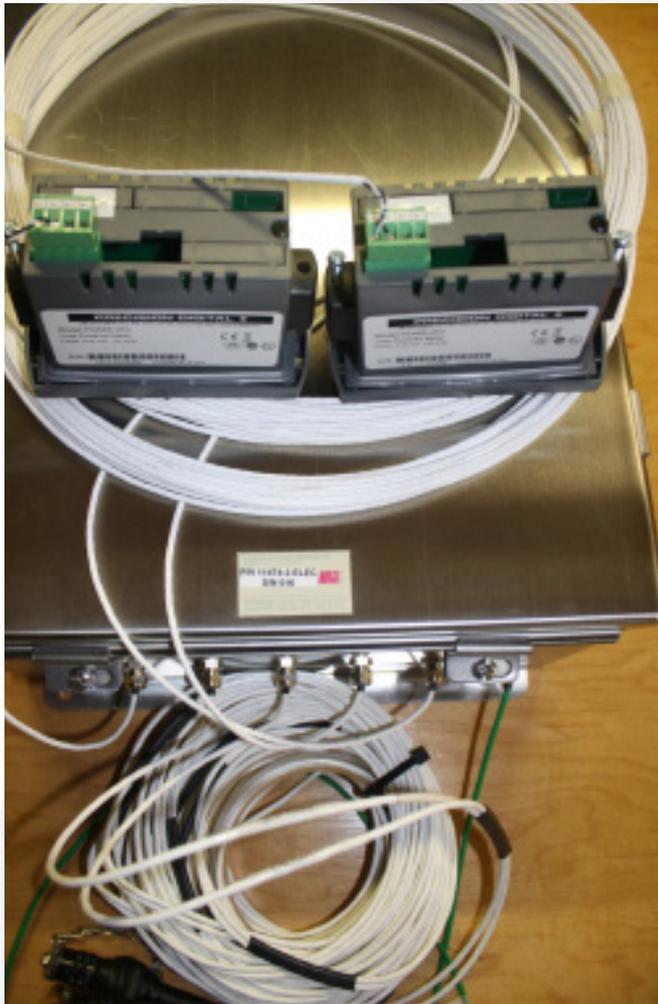
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Junction Boxes and various housing options are available for all amplifiers. We setup and calibrate Sensing Systems' or customers supplied amplifiers with any sensor and calibrate them as a system. NIST certificates are provided detailing system components and performance.

Digital Communication Cards

Sensing Systems supplies high performance digital signal conditioners that can be interfaced to any sensor for direct communications with a PC based data acquisition system. The digital communication cards output digital data in any of the standard serial communication protocols such as Ethernet, USB, RS-232 and RS-485. Depending on sensor size, the digital communication card may be incorporated inside the sensor or housed separately.



Intrinsically Safe Systems

Sensing Systems supplies sensors and measurement systems for operation in Hazardous Environments. We interface our sensors to intrinsically safe modules to allow operation in hazardous environments up to Class I, Division 1, Groups C, D, E, F and G. The modules we utilize also conform to ATEX requirements for operation in European Community countries.

There are very specific requirements regarding the location and housing of intrinsically safe modules. Each application must be fully described and analyzed to insure compliance with all requirements.

Wireless Systems

Sensing Systems incorporates wireless systems into its sensors including the newest and smallest transmitters with low power requirements. Depending on the system, receivers may be placed adjacent to the transmitter (i.e. rotating shafts), several feet, or hundreds of feet away.

Data Loggers

Sensing Systems has setup and interfaced data loggers to all sensors for continuous data acquisition and monitoring of test and process variables. The data loggers we use are capable of communicating with computers either directly or through wireless telephone or internet links when installed in remote locations.

Computers

All of our sensors are capable of communicating or interfacing with computer based data acquisition systems. Sensing Systems provides the hardware (i.e. A/D cards, "black boxes") and data acquisition software to interface any sensor to PC based systems.

Sensing Systems can also provide a turnkey system to accomplish any desired measurement task including acquisition, storage, display and analysis.

Customer Supplied Instruments / Electronics

When available, we encourage our customers to provide their existing Instruments and/or Electronics for use with Sensing Systems sensors. We will setup and calibrate customer supplied Instruments and/or Electronics with any sensor and calibrate them as a system. NIST certificates are provided for the complete system detailing its components and performance.

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Intrinsically Safe Systems

Operation of sensors and electronics in Hazardous Environments requires the use of Intrinsically Safe Systems that are rated and approved for the specific environment. Sensing Systems supports the use of its sensors in Hazardous Environments by using Intrinsically Safe sensors, barriers, devices and electronics.

We interface our sensors to intrinsically safe barriers/electronics to allow operation in hazardous environments up to Class I, Division 1, Groups C, D, E, F and G. The barriers we utilize also conform to ATEX requirements for operation in European Community countries.

Safe and approved operation in Hazardous Environments can be achieved by the following methods:

- Use of Intrinsically Safe Sensors
- Use of Intrinsically Safe Electronics
- Use of Positive Pressure Cabinets / Junction Boxes

Sensing Systems utilizes any or a combination of all of these methods when applications involve Hazardous Environments.

Hazardous Environments vs. Safe Environments

Most Hazardous Environment applications fall into two types:

- Hazardous/Safe Areas
- Hazardous Area Only

The first type, Hazardous/Safe Areas, involves applications where two distinct sections of a building are available, a Hazardous area and a Safe area. In this application, each area is separated from the other by a physical barrier such as a wall. Measurements for this type of application are achieved by placing the sensor(s) in the Hazardous area and the intrinsically safe barriers/electronics in the Safe area. The two sets of components are connected by cables that must breach the physical barrier between areas. Proper seals must be used wherever a breach of a physical barrier is made.

The second type, Hazardous Areas only, involves applications where the only space available for all the measurement components (i.e. sensors, electronics) is the Hazardous area. Measurements for this type of application are achieved by placing the sensor(s) in the Hazardous area and any required electronics inside of a Positive Pressure Cabinet or Junction Box also in the Hazardous area. The sensor(s) and the electronics are connected by cables that must breach the Positive Pressure Cabinet. Proper seals must be used wherever a breach of a physical barrier is made.

Intrinsically Safe Sensors

The use of a certified intrinsically safe sensor permits operation in an area equal to the rating of the sensor (e.g. Class II, Division 1, Groups D and E). Using certified sensors is a good approach; however, it is limited by the type of available sensors. In many cases the certified sensors available do not match the application requirements.

Intrinsically Safe Electronics

Numerous applications require the use of sensors that have not been certified for Hazardous Environment operation. In these instances sensors appropriate to the application may be used by interfacing them to Intrinsically Safe barriers or modules. With this approach, the sensors do not have to be certified to be intrinsically safe.

Positive Pressure Cabinets / Junction Boxes

Positive Pressure Cabinets and Junction Boxes are used in Hazardous Environments where a Safe area is not available. The Cabinets and/or Junction Boxes are used to house the Intrinsically Safe Barriers and any other electronics necessary to obtain the desired measurements.

In order to maintain a higher pressure than the surrounding environment, the Cabinets and/or Junction Boxes must be supplied with air under pressure. In addition, any openings or breaches of the cabinet enclosure must be fitted with an approved seal to maintain the required high pressure.

Most cabinets are fitted with a transparent window to allow operators to view any displays contained inside. Additionally, the cabinet must be fitted with switches that operate alarms whenever the cabinet is opened and/or loss of pressure occurs.

Technical Assistance

There are very specific requirements regarding the location and housing of intrinsically safe modules. Each application must be fully described and analyzed to insure compliance with all requirements. Sensing Systems engineers will analyze your project requirements and recommend the sensors, barriers and electronics to accomplish your objectives.

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