INDUSTRIAL STRENGTH

WIRELESS INSTRUMENTATION

Accutech

INSTRUMENTATION SOLUTIONS

TOMORROW'S BEST PRACTICES **TODAY**

Wireless Instrumentation: In 2002, Accutech introduced the first battery powered wireless sensors and wireless instrumentation networks designed for harsh process industry environments.

The entire line of Accutech Wireless Field Instruments are completely tether-free with absolutely no wires for power or signal. Using the best available FHSS transceiver components and drawing heavily on our 20 years+ of experience with smart process instrumentation, Accutech has developed the most qualified, best performing and easiest-to-use wireless sensor network available for industrial applications. Network installations in over 300+ process plants, refineries and pipelines makes Accutech the market leader; setting the standard for wireless instrumentation.

These products are designed to meet strict requirements and to solve tough challenges in difficult environments. Our industry-leading solutions provide powerful tools to reduce costs, save time, enhance safety, improve environmental performance and cut waste. While reliability and security are the cornerstones of our technology; long battery life at high duty cycles and interoperability with existing control and HMI systems are equally important benefits that industrial users derive.

Accutech's wireless instrumentation can be installed in difficult monitoring locations, remote and harsh environments. Our instrumentation was designed to comply with Class I, Div 1, Group A hazardous environments and carry NEMA 4X ratings for weather and corrosion resistance. These instruments can operate in ambient temperatures ranging from -40°F to +185°F. Each and every item we produce is tested in the -40°F to +185°F temperature range to ensure proper operation in the harshest of environments.

Accutech provides solutions for a wide variety of environments and applications, allowing process plants to quickly and cost effectively tie measurements into process control systems or enabling stand-alone applications with compelling economic justifications. Rapid deployment enables OEM's, Engineers and Integrators to achieve new levels of best effective practice.

www.accutechinstruments.com

INDUSTRIAL STRENGTH WIRELESS INSTRUMENTATION BY ACCUTECH

These robust products are truly wireless. And, right out of the box, they perform in harsh — even hazardous — industrial environments.

- → **For long term monitoring of variables in remote locations**
- → **For short term data gathering on process conditions**
- → **For new installations, to test a project's economic viability**
- → **Rated for Class I, Div 1 Areas**
- → **Moderate to fast update rates ~ 1/second**

THE IMPLEMENTATION

No wires. No permits. No licenses. Start-up, configure and test in the shop. Install in the field.

WIRELESS DATA NETWORK

The field units communicate in a secure, digital protocol over a band of frequencies from 902 MHz to 928 MHz. This data communication technique has been the backbone of the military's secure communications protocols for many years. It requires no FCC site license and is scalable. The multiple frequency transmissions, send-receive acknowledgements and built-in data redundancy have proven to be extremely robust. Our industrial wireless sensors communicate through obstructions and are not affected by electrical noise.

RANGE

Accutech's instrumentation has a range of 2 miles with optional antenna and 3,000 feet with standard antenna. Repeater technology to extend the range up to ten miles is also offered.

BATTERY LIFE

In hazardous and/or remote industrial environments it is imperative that the battery life be as long as possible while providing consistently reliable data. Accutech products benefit from extensive battery research and development and typically provides a 5+ year battery life at high duty cycles. Accutech has spent a great deal of time in research and development and currently offers a single C cell size battery with a 5+ year life at high duty cycles.

ONLY ACCUTECH SOLUTIONS OFFER:

- → **PRODUCTIVITY:** AUTOMATE MANUAL MONITORING
- → **EFFICIENCY:** FOCUS YOUR HUMAN RESOURCES WHERE THEY ARE REALLY NEEDED
- → **SAFETY:** REDUCE HAZARDS BY CONTINUOUS MONITORING
- → **IMPROVED END-PRODUCT:** ELIMINATE POOR QUALITY BY BETTER PROCESS MANAGEMENT
- → **ENVIRONMENTAL BENEFITS:** REDUCE SPILLS AND EMISSIONS
- → **EASY TO INSTALL:** FAST, FLEXIBLE, NONINVASIVE
- → **COMPLETE PACKAGE:** EVERYTHING YOU NEED, OUT OF THE BOX AND READY TO GO
- → **RELIABLE:** FREQUENCY HOPPING SPREAD SPECTRUM (FHSS), FCC APPROVED
- → **ROBUST:** DESIGNED AND CERTIFIED FOR INDUSTRIAL ENVIRONMENTS, AND HAZARDOUS LOCATIONS
- → **LONG-RANGE:** WIRELESS TRANSMISSION UP TO 3,000 FEET CAN BE EXTENDED TO 2 MILES WITH OPTIONAL ANTENNA
- → **COST-EFFECTIVE:** NO CONDUITS, NO WIRES, MINIMAL PREPARATION, FAST INSTALLATION AND A RAPID ROI
- → **VERSATILE:** USE FOR LONG-TERM MONITORING, SHORT-TERM DATA GATHERING, OR TO TEST ECONOMIC VIABILITY OF A NEW PROJECT
- → **CONVENIENT:** MONITORS PARAMETERS THAT ARE INACCESSIBLE
- → **PORTABLE:** TETHER FREE; CAN BE READILY MOVED IF CONDITIONS CHANGE

On-Off Valve Monitoring

TEMPERATURE FIELD UNIT

The Temperature Field Unit comes in both an RTD and a Thermocouple package for integrated or remote sensors.

PRESSURE FIELD UNIT

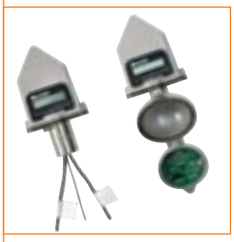
The Pressure Field Unit comes in both a Gauge Pressure and an Absolute Pressure package.

DIFFERENTIAL PRESSURE FIELD UNIT

The Differential Pressure Field Unit comes complete with an integrated differential pressure sensor, signal conditioner and RF transceiver.

MULTI-INPUT FIELD UNIT

The Multi-Input Field Unit comes in either a dual 4-20 mA or a dual 0-10 V input. This unit allows you to integrate any transmitter or sensor on the market into your wireless system.



SWITCH INPUT FIELD UNIT

The Switch Input Field Unit is ideal for determining the state of contact switches. Each contact is sampled eleven times a second to determine its state and if it has experienced a change of state.

LEVEL FIELD UNIT

The Level Field Unit is designed to measure hydrostatic level in a vented tank. The Level Field Unit is available with an integrated sensor or an extended sensor.

ACOUSTIC FIELD UNIT

The Acoustic Field Unit is noninvasive and monitors ultrasound in the 40 kHz frequency range.

WIRELESS INSTRUMENTATION HIGH GAIN ANTENNAS

High Gain antennas available for the Base Radio and most Field Units extend the transmission range for hard-to-reach areas.

BASE RADIO

Each Base Radio communicates with up to 100 field units, and provides various output options including RS-485, RS-232 and Modbus. Up to 16 Base Radios can be deployed in a plant network accommodating up to 3200 field measurements.

ANALOG AND SWITCH OUTPUT MODULES

The Analog, Digital and Analog/Digital Output Modules are Base Radio accessories providing four 4-20 mA outputs and/or eight switch closure outputs. Several modules can be daisy-chained to provide up to 100 4-20 mA outputs and/or 200 switch closure outputs.

WIRELESS INSTRUMENTATION MANAGER

The Wireless Instrumentation Manager provides real-time monitoring, configuration management and provides network management capability, including remote configuration and diagnostics. The data management feature provides light duty server based data logging, suitable for stand alone monitoring or portable PC diagnostic data gathering.

MONITORING APPLICATIONS


Safety Valve Monitoring


Safety Shower

STEAM TRAP MONITORING

It is estimated that between 10 and 20% of steam traps malfunction annually even with a regular inspection program. Problems range from "cold" traps that will not open and create poor quality, hazardous wet steam; to "blowing" traps that waste energy and also cause a hazard. Conventional, manual inspection of steam traps is a labor-intensive, costly, and error-prone task; nevertheless, it's been the accepted monitoring method, until wireless technology from Accutech developed an efficient alternative.

RELIEF VALVE MONITORING

The wireless answer to 24/7 leak monitoring. In the petrochemical and refining fields, process gas is expensive, and often dangerous to the environment. Continuous monitoring is the only way to identify leaks as soon as they occur, so maintenance can be performed right away. The expense of running conventional, wire-based 24/7 monitoring, plus the difficulties involved in reaching hazardous locations, pose a challenge that has been hard to solve until now.

ROTATING EQUIPMENT

Continuous monitoring of process parameters on rotating machinery is difficult with conventional, wired devices. Wireless instrumentation is a natural application for rotating equipment where the revolving speeds are low, such as rotary kilns, tumble vacuum dryers and rotating heat exchangers.

TANK LEVEL MONITORING

Wireless instrumentation can be advantageously deployed in tank level applications. Continuous level sensors include submersible and gauge level. Point level switches also provide necessary information for impending overfill or tank empty alarms. With wireless level devices, environmental mandates can be easily and quickly accommodated where it is not unusual to see a single base radio covering level applications for an entire tank farm.

REFINERY & PETROCHEMICAL LDAR

Our wireless capabilities in Leak Detection and Remission instrumentation mean that we can tell you where and when to prevent leaks at any one of the 300 refineries or petrochemical plants in the United States. Accutech's LDAR Acoustic and Pressure Monitors deliver tomorrow's best practices today by reducing expensive product loss at the source while achieving full compliance with environmental emission-reduction standards.

GAS PIPELINE LEAK DETECTION

Accutech's wireless acoustic, pressure and PRV instruments let operators of the 3,000+ natural gas compressor stations nationwide prevent losses early - or eliminate them altogether. Accutech's proven technology combined with our industry-leading affiliations with the Natural Gas Association and DOT's Office of Pipeline Safety will help you mitigate risk, property damage and product loss quickly and at low cost.

SAFETY SHOWERS MONITORING

Getting help to an injured employee can often make the difference between a serious injury and a minor incident. Unfortunately, the cost to install wired monitoring switches to multiple safety-showers in a major production plant can be extremely expensive. Wiring monitoring switches entails the cost of running the wires to the switches in the field, often through areas classified as Class I, Div 1 or Class I, Div 2. Wired switches also entail the expense of dedicating individual discrete inputs into plant DCS systems and these costs rapidly add up. Wireless monitoring solves the economic roadblocks.

ON/OFF VALVE MONITORING

Monitoring the position of process blocking valves is critical in the prevention of potentially hazardous conditions. Wireless switch monitor devices confirm the position of the valves and can be used to trigger a safety shut-down system if blocking valves do not move to their proper positions as instructed by the control system.


Well Head Pressue Monitoring


Relief Valve Monitor

MEASURING APPLICATIONS

DIFFERENTIAL PRESSURE MEASUREMENT

The Differential Pressure Field Unit comes complete with an integrated differential pressure sensor, signal conditioner and RF transceiver with self-contained power operating in the 902 MHz to 928 MHz ISM license-free band.

The Differential Pressure Field Unit may be operated in any one of four modes:

- → **Differential Pressure**
- → **Orifice Flow in steady liquid or gas flow applications**
- → **Open Channel Flow**
- → **Level**

TEMPERATURE MEASUREMENT

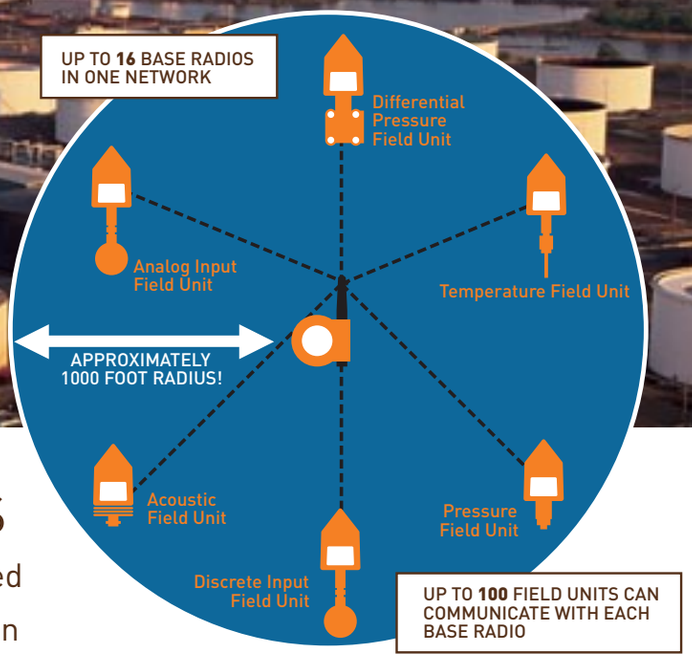
Combine our Wireless Instrumentation Temperature Field Unit with your control system, PLC or PC for a fully functional temperature monitor or switching application. The Temperature Field Unit comes in both a RTD and a thermocouple version. The Field Unit comes in integrated (-I) and split architecture(-S) packages. The split architecture package also includes one or two discrete contact closure inputs (for simple apparatus); one input with the split RTD package and two inputs with the split TC package.

MULTI-INPUT MEASUREMENT

Use the Wireless Instrumentation Multi-Input Field Unit for monitoring and transmitting electrical signals from any sensory electrical output or switch closure. Monitor all types of sensors without running wires. The Multi-Input Field Unit is ideal for adding wireless capabilities to existing or new wired measurement sensors such as flow meters, pH meters, or any other device that has voltage or current outputs. The Multi-Input Field Unit comes in current (4-20 mA) or voltage (0-10 V) packages, each accepting up to two inputs. Each model also includes two discrete contact closure inputs (for simple apparatus).

PRESSURE MEASUREMENT

With an overall accuracy to +/-0.1%, the Wireless Instrumentation Pressure Field Unit alerts you of any pressure-triggered event requiring attention. The Pressure Field Unit comes in both a gauge pressure and an absolute pressure version.



WIRELESS INSTRUMENTATION

INDUSTRIAL WIRELESS NETWORKS

Accutech offers a turnkey approach that let's you get started easily with your first application right out of the box. You can expand and grow your wireless instrumentation network to meet your future needs because Accutech's wireless solutions are not just instruments. We offer you a complete system — the wireless products as well as the support that is key to successful networks.

FIELD UNIT SELECTION

Select Temperature, Pressure, Differential Pressure, Acoustic, Multi-input, level and switch field units for your needs. Wireless field instruments offer versatility and flexibility in monitoring various applications, providing immediate confirmation on process condition – even in hazardous atmospheres.

NETWORK TOPOLOGY

The available Base Radio communicates with up to 100 field units. The Base Radio provides various output options including RS-485, RS-232, or Modbus. Up to 16 Base Radios using different hopping sequences can be installed in the same plant, providing a scalable network of up to 3200 measurements.

Each wireless Field Unit is assigned a unique identification code, and communicates with a Base Radio. For added reliability, all communications are acknowledged by the Base Radio.

CONNECTIVITY

Accutech's data management solution, Wireless Instrumentation Manager (WIM) is a client-server architecture that provides a management console for real-time monitoring, configuration and management.

An OPC Server converts Accutech's DMMP protocol to the standards-based OPC and provides a standard interface that is compatible with most industrial software packages. On start-up, the server automatically determines the layout of the wireless network and configures itself appropriately.

Modbus RTU is also a widely used and well understood protocol. The wireless Base Radios have an available Modbus RTU output that can be directly input into most DCS or PLC systems.

SECURE, ROBUST & RELIABLE COMMUNICATIONS

When dealing with wireless communications, reliability and security are important concerns. The robust, reliable Accutech Wireless Instrumentation network is designed to provide peace-of-mind in industrial environments.

TRANSCEIVER COMMUNICATIONS

All devices are both transmitters and receivers, i.e. transceivers. Each message is sent and verified. If communications are not properly acknowledged, the message is re-sent.

FREQUENCY HOPPING SPREAD SPECTRUM

The communication spectrum is spread over different frequencies. All messages require multiple bit-matching on frequency synchronization, device identification and location before the communication is initiated. Both the transmitter and the receiver are synchronized to hop to different frequencies as the communications continue. This technique has been the backbone of the military's communication security techniques because it adds security and ensures that noise interference at any one frequency does not block the communications.

NETWORK DIAGNOSTICS

Full network diagnostics accompany every transmission. The base station continuously monitors and reports signal strength, bit error rates, battery life and other indicators of network health.

COMMUNICATIONS ERROR CORRECTING

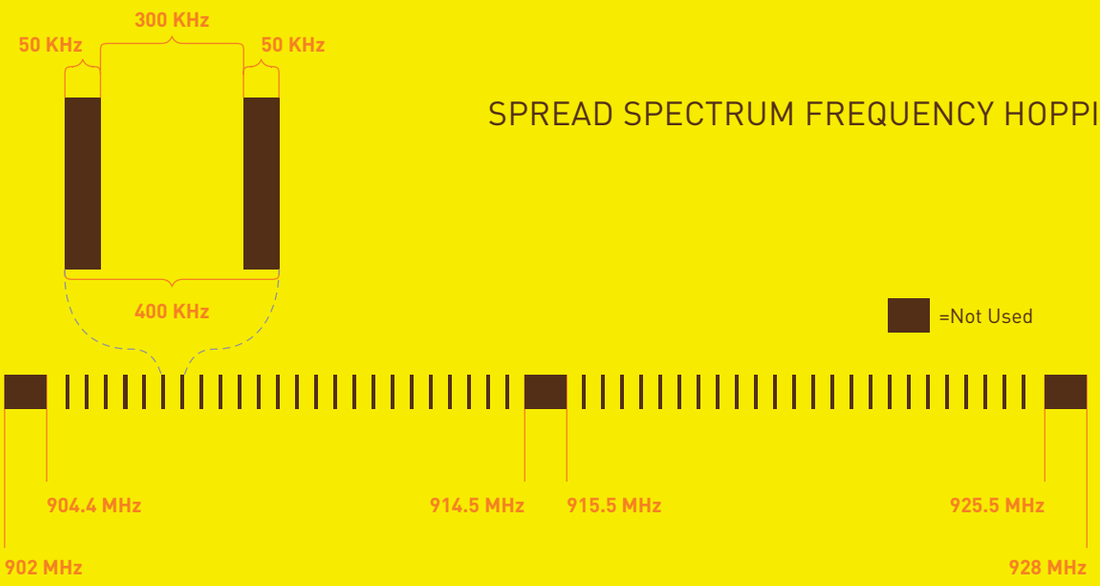
All messages contain error-checking bits to ensure error-free transmission. Messages received with errors are re-sent at different frequencies as necessary to complete the communication.

FIELD SURVEY

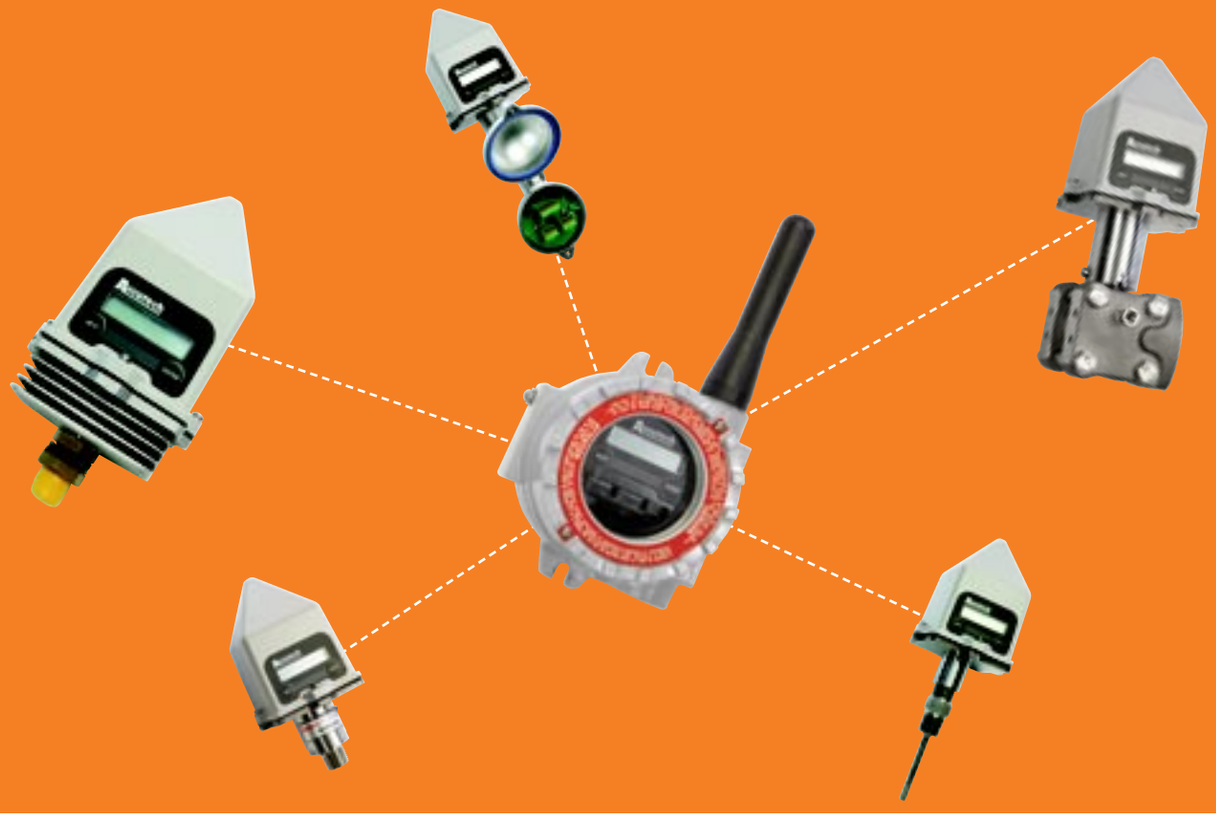
Service providers are available for field survey work.

FIXED, LOW LATENCY NETWORK

In Accutech's star network configuration, the amount of time it takes for a measurement to be taken and communicated back to a system is fixed and deterministic. The result is a faster and more predictable response from the field units at a defined and low transmission rate.



SPREAD SPECTRUM FREQUENCY HOPPING



Accutech, a division of Adaptive Instruments Corp., is a leading edge, technology-driven developer, manufacturer and supplier of embedded microprocessor-based electronics. Based in Hudson, Massachusetts, Accutech is the leading independent producer of wireless instrumentation on the market today.

Accutech customers include large national companies in the oil and gas, chemicals, pharmaceutical, food and beverage, primary materials processing, and energy industries. In addition to the wireless product line, Accutech also offers a traditional wired line of temperature, pressure and differential pressure instrumentation.

In the process control field, where quality is taken for granted and new technology is announced daily, we have deliberately concentrated our efforts on the development of instrumentation that makes business sense. The result is a product range that is rugged, secure, and reliable and works in even the most hazardous environments. We give companies the tools to reduce costs, save time, enhance safety, improve environmental performance and cut waste.

The next industrial revolution is right now. Let Accutech show you how to realize gains in operating efficiency.

www.accutechinstruments.com

TOUGH.
TESTED.
TRUSTED.

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