



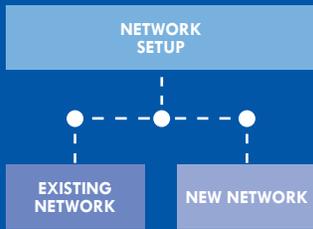
WIRELESS UT

Low Power WirelessHART™ Solution for Remote Thickness Readings

Ultrasonic Thickness Monitoring System



WIRELESSHART CONNECTION



The WirelessHart Smart Wireless connection allows plants and operators to use the 1616 Wireless UT Thickness Node to improve the transfer of information and condition and retrieve data from each monitored asset in a streamlined and connective pattern. Utilizing the data analysis systems to monitor and record data, the WirelessHART network provide sequential reporting features from one asset to another, streamlining the connection using WirelessHART modules.

With a series of built-in features, the wireless connection keeps the WirelessHart network operational and each 1616 Wireless UT Thickness Node connected by re-routing connection signals if a wireless connection line is lost or obstructed.

The 1616 Wireless UT Thickness Node also includes an exclusive online monitoring application and preventative maintenance software using the Plant Condition Management Software™ (PCMS), establishing the centerpiece for a proper mechanical integrity (MI) program.

By incorporating the HART protocol, the connection features two channels of communication, structured as a wireless mesh to allow sensors, routers, and repeaters to operate through a central gateway, with seamless connectivity with network equipment, monitoring analysis capabilities, and available preventative maintenance programs.

The WirelessHART connection also features user controls which are capable of providing diagnostic reports and individual device management functions, allowing the addition of multiple 1616 Wireless UT Thickness Nodes over time.

OVERVIEW

The MISTRAS 1616 Wireless UT Thickness Node establishes a new standard for ultrasonic (UT) wall thickness measurements, condition monitoring, and corrosion management, allowing plant operators to improve the reliability, lifespan, and safety of piping, pressure vessels, and metallurgical assets through one intuitive and cost-saving solution.

The 1616 Wireless UT Thickness Node is a non-intrusive, permanently installed preventative maintenance system, equipped with an industry-leading four channels of ultrasonic connectivity per system, atop of seamless integration within developing & existing WirelessHART networks.

Designed with a plant's needs in mind, 1616 Wireless UT Thickness Node remotely transmits recorded condition data, thickness measurements, temperature, and corrosion information from strategically placed MISTRAS sensors, connected to an exclusive Web Monitoring Software and applicable pairing with MISTRAS' Plant Condition Management Software™ (PCMS) to monitor changes in an asset's health and determine appropriate remedial solutions to ensure an asset's in-market availability.

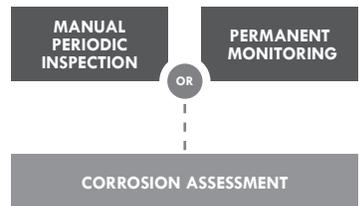
ULTRASONIC THICKNESS MEASUREMENTS

The 1616 Wireless UT Thickness Node is specifically designed to conduct ultrasonic wall thickness measurements (UTM) to determine the structural integrity of monitored piping and pressure vessel assets, reducing costly incidence of damage through optimized safety and improved lifespan.

The system utilizes strategically placed and permanently installed ultrasonic sensors connected to the 1616 Wireless UT Thickness Node's transducers and data analysis software that collects data and generates thickness information, measurements, and damage reports. Thickness measurements can also be uploaded into MISTRAS' Plant Condition Management Software™ (PCMS) to further analyze, optimize, and to recommend appropriate preventative maintenance solutions.

When measurements are conducted, each of the 1616 Wireless UT Thickness Node's ultrasonic sensors emit high-frequency ultrasonic signals directly into pipework, pressure vessel, or metallurgical asset to determine thickness and condition of an asset. The signal is then analyzed, calculating the distance each emitted wave travels to determine thickness, rates of corrosion, erosion, and the corrective action needed to ensure an asset upholds full in-market availability.

When remote thickness data is retrieved, each measurement is compared to an asset's baseline thickness measurement, allowing technicians and specialists to determine the exact rate of corrosion, erosion, and whether an asset can remain in-use. Additionally, use of remote thickness measurements help to eliminate the need for manual periodic inspections and on-site data collections, reducing potential damage to assets and on-site personnel.



SOFTWARE/ ON-LINE MONITORING/PCMS™ INTERACTION

The 1616 Wireless UT Thickness Node is equipped with a combination of advanced software and an exclusive online monitoring suite, allowing plant operators to remotely detect, acquire, and compare real-time/past condition reports to determine the lifetime value of an asset. Additional online capabilities also allow operators to detect the early signs of flaws/damage, its location, and preventative/maintenance solutions.

The 1616 Wireless UT Thickness Node's software, online monitoring application, and Plant Conditioning Management Software™ (PCMS) allow plant operators to remotely and collectively monitor the condition of assets in real-time, improve an asset's useful life, and cost effective operations. By incorporating preventative maintenance into an asset's health, the PCMS™ helps calculate rates of corrosion, condition rankings, damage reports, remaining life value, and inspection frequencies.

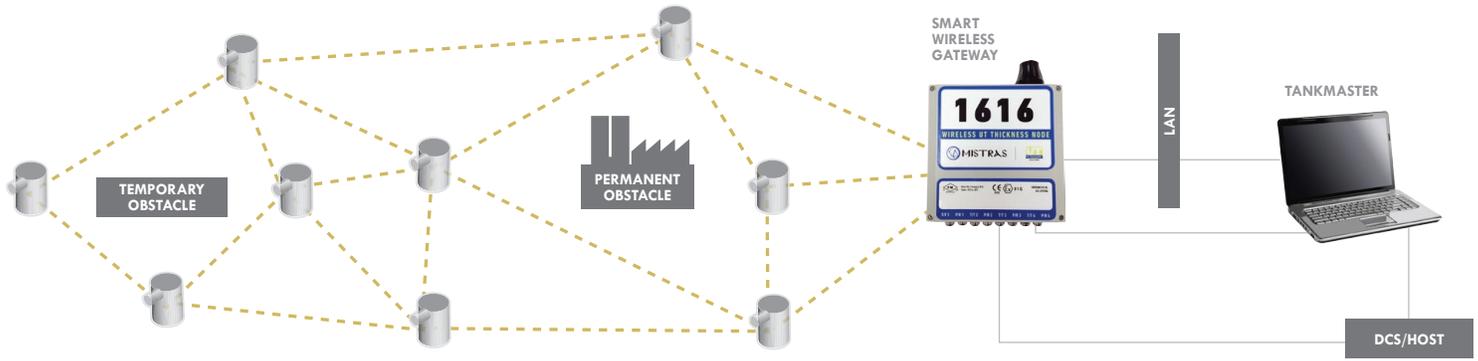
The web application provides users with reporting histories, monitoring trends, and analytic charts, illustrating an assets activity, its improvement, locations of damage, and magnitude of flaws during an alarm event.



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WIRELESS MESH DIAGRAM



TYPICAL INSTALLATION

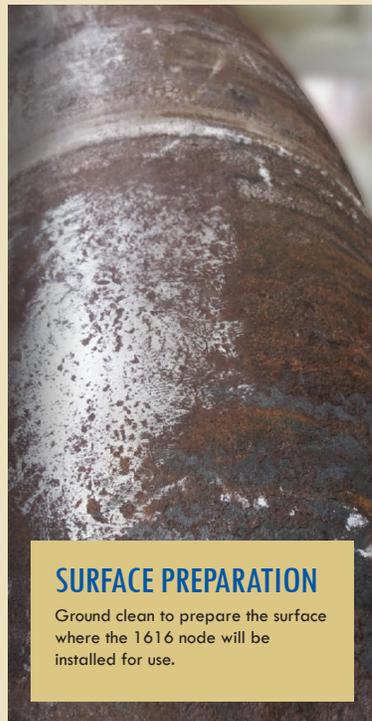
The 1616 Wireless UT Thickness Node is specifically engineered for non-intrusive and permanent installations on piping and pressure vessel assets, which does not require welding or adhesives during installation process. Each system is expertly installed by trained MISTRAS product specialists to ensure its optimal function, reliable use, and WirelessHART connectivity.

Whether a facility has a pre-developing, new, or existing WirelessHart network protocol, the 1616 Wireless UT Thickness Node can be installed to provide thickness and corrosion information for a variety of assets with interconnected communications with monitoring assets across the entire facility.

MISTRAS product specialists is trained on the installation techniques of the UT software, determining sensor locations, and sensor mounting using specialized hardware. MISTRAS' specialists are also trained to connect the 1616 Wireless UT Thickness Node into the WirelessHART network and SmartWireless mesh for continuous monitoring/communication with on-site assets.

The 1616 Wireless UT Thickness Node provides applicable monitoring for:

- Crude Overhead Lines
- Injection Points
- Piping Elbows
- Reducers
- Tees
- Pressure Vessels
- Other Areas of Concern



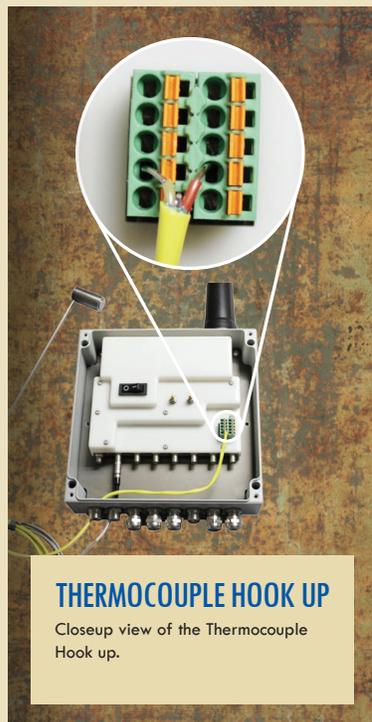
SURFACE PREPARATION

Ground clean to prepare the surface where the 1616 node will be installed for use.



INSTALLATION

Unit sensors are mounted on the prepared surface.



THERMOCOUPLE HOOK UP

Closeup view of the Thermocouple Hook up.



COMPLETED INSTALL

System mounted and installed on horizontal (top) and vertical (bottom) piping.

WIRELESS MESH

The wireless mesh is the connection between the WirelessHART Network and the SmartWireless Gateway, granting the 1616 Wireless UT Thickness Node the ability to seamlessly merge with on-site and remote network equipment within a defined and self-organized system of communication.

Each network is designed to provide systematic safeguards to ensure continual monitoring and reliable access to on-site information for optimal asset readings and measurements across an entire facility.

The SmartWireless gateway is comprised of measurement devices within a self-organizing and repairing network, allowing the 1616 Wireless UT Thickness Node to adapt within variety of environments and facilities, conducting real-time condition monitoring and damage reports.

The WirelessHART network's SmartWireless Gateway provides an industry standard for producing encoded wireless communication and the scalable management of devices for on-site condition assessments and transmitted data between multiple 1616 Wireless UT Thickness Nodes and the Smart Wireless Gateway Module.

KIT INCLUDES



TRANSDUCERS -
Single or dual-element, high-temperature, with built-in Type-K thermocouple



TRANSDUCER MOUNTING KITS -
(holders, clamps, foil)



INSTALLATION KIT & DEVICE DRIVER PACKAGE -
Device description installation kit for Emerson AMS Suite (on flash drive)



MONITORING SOFTWARE -
For installations that do not have an existing HART™ Network



USER MANUAL -
Printed or on flash drive

CALL TO SCHEDULE A LIVE DEMO!

WORLD HEADQUARTERS

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BENEFITS & CAPABILITIES

The 1616 Wireless UT Thickness Node is designed to provide customers with a considerable cost savings and enhanced operations to avoid major incidents.

With particular goals in mind, the 1616 Wireless UT Thickness Node enhances maintenance and planning schedules, allowing plants to implement a corrosion management and preventative maintenance programs to help plants realize a considerable cost savings by minimizing repairs and downtime, unnecessary maintenance, costly incidents, and injury to personnel.

The 1616 Wireless UT Thickness Node also includes an industry leading 4 channels of ultrasonic connectivity for optimal thickness measurements and operations in high temperatures, up to 350°C (662°F), with support from preconfigured thickness readings, using single-element and dual-element transducers.

The 1616 Wireless UT Thickness Node supports a WirelessHART network, granting seamless operation with any WirelessHART Gateway. The Gateway can connect with MISTRAS' UTwin™ software, Emerson's AMS Suite, or a PCS or pi computer, to monitor and analyze thickness and corrosion data. The 1616 Wireless UT Thickness Node has an internal maintenance port for configuration, which operates in conjunction with a HART Modems or Emerson 475 Field Communicator interface. The Wireless UT Thickness Node seamlessly integrates within WirelessHART networks using Federal Communications Commission (FCC) certified 2.4 GHz radio band for reliable sensor-to-sensor and sensor-to-monitoring system communication.

WIRELESS UT THICKNESS NODE

ADVANTAGES	KEY FEATURES
Non-intrusive design and installation	Single Channel Pulser and Receiver
Highly precise readings	Four Channel Multiplexer for 4 Single or Dual Crystal Transducers
High temperature functionality	Receiver: 20 – 70 dB Gain, 1 MHz –8 MHz Bandwidth
Self-organizing and self-healing network	Pulser: Square Wave
Increased reading intervals	Wireless Communication with WirelessHART network systems.
Improved corrosion management & detection equipment	Ultra Low Power – 5 year Battery Life
Reduced installation costs (no welding or wires required)	Intrinsically Safe Certified