



**SENSOR<sup>TM</sup>**  
NETWORKS, INC

Installed ultrasonic sensors for asset-integrity monitoring







## Installed ultrasonic sensors for asset-integrity monitoring

Traditionally, hand-held inspection devices such as ultrasonic thickness gages & flaw detectors, eddy current equipment and x-ray systems are deployed into plant facilities during routine outages and turn-arounds or during normal plant operations. These techniques take a “snap-shot” of the localized condition of plant infrastructure including pipes, tanks, vessels and heat exchangers for issues such as loss of wall thickness due to corrosion/erosion, cracking and other material degradation.

While this is common and industry-accepted practice, asset owners are seeing the cost of this approach increasing due to rising labor costs, reduced manpower

and stricter health and safety requirements. Managing and trending the data, along with assuring its quality & integrity has also become cumbersome and challenging. Clearly, a better technology solution is needed that addresses many of the short-comings of today’s approach.

SNI is developing a next generation solution that creates a brand new paradigm for ultrasonic inspection and monitoring of plant assets. Our products take advantage of the latest solid-state electronics, wireless technology, cloud based software solutions and ultrasonic transducer designs to offer a cost effective and robust asset monitoring solution.

## The unique, patent-pending, multi-drop digital system distributes the ultrasound to the area of need:

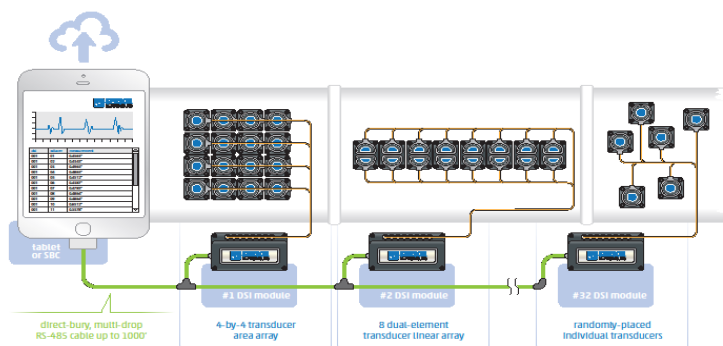
- Up to 32 UT Modules or “Digital Sensor Interfaces, DSIs” per cable drop
- 16 single or 8 dual-element transducers per UT module (DSI). Over 512 single-element or 256 dual UT sensors per cable drop
- Cost-effective, industry standard RS-485 twisted pair cable with distances of up to 1,000 feet
- Thickness range from 0.040” – 2” (1 – 50 mm)
- Thickness resolution of 0.0001” (0.0025mm)
- Temperature-compensated thickness calculations
- Ultra-high temperature transducers (932° F / 500° C)
- Commercial tablet PC with Windows SW for easy data-file transfer



## Wired Solutions

### Wired systems are best suited for:

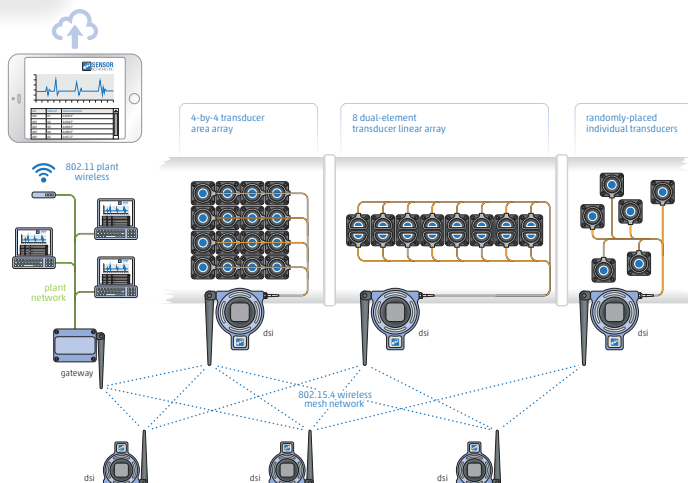
- Buried installations
- Integration with plant control systems through Modbus / RS485
- Lowest hardware cost per TML
- Manual, automated, and integrated data collection options
- Best solution for high data collection frequency (>2X per day)
- No battery replacement required
- Resistant to RF interference



## Wireless Solutions

### Wireless systems become the better choice when:

- Wiring cost is prohibitive or impractical
- Fully-automated and integrated data collection solutions are required
- Typically,  $\leq 2X$  per day measurement frequency
- DSI and transducers need to be periodically repositioned







## Features

### Installed Ultrasound is:

**Non-intrusive** and attaches to the pipe-wall O.D. thereby avoiding breaching the system's pressure boundary.

**Absolute** in its ability to directly measure remaining wall thickness.

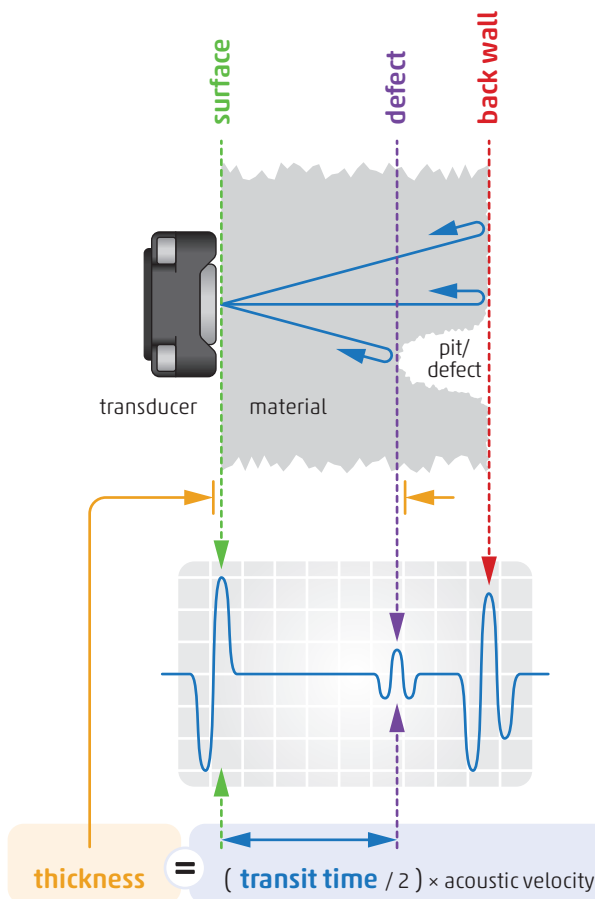
**Extremely accurate** and can resolve metal losses down to 0.0001" (0.0025mm).

**Rugged and reliable** with very long life. Removes human-error factors.

**ATEX Zone 0 (Class I, Division 1) Certified** for use in hazardous environments.

**Cost effective & versatile** for low, medium & high temp environments. Can be buried and placed under insulation and in tight areas.

**Capable of monitoring metal degradation mechanisms** including corrosion, erosion and crack propagation.





# The Power of Data

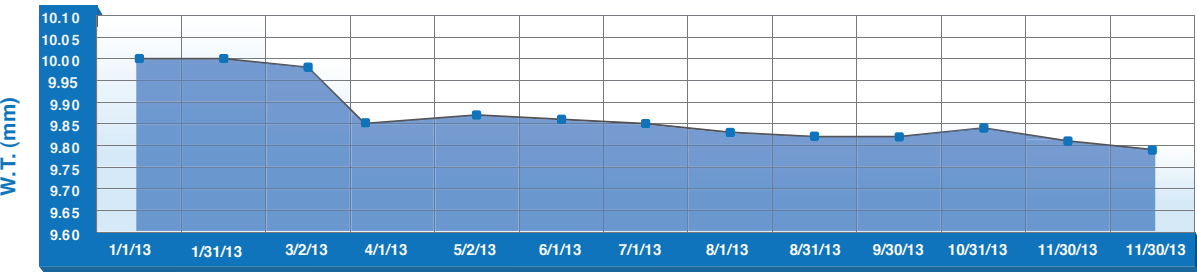
Permanently-installed ultrasonic sensors have several unique advantages over manually-taken, occasional “snap-shot” measurements:

- Data quality and integrity are significantly increased by the sensor’s signal coming from the same exact location thereby allowing very precise subsequent measurements with extremely accurate corrosion rate measurement and trending.
- Additionally, since the sensor’s exact location, serial number, and optional tag number, are stored in the DSI, there is never any chance of thickness data getting corrupted by misalignment or misassignment of TMLs.
- The rate at which TML data can be captured ( hourly, daily, weekly, etc) allows very cost-effective data streams for more sophisticated statistical analysis.

## Digital data can be auto-populated

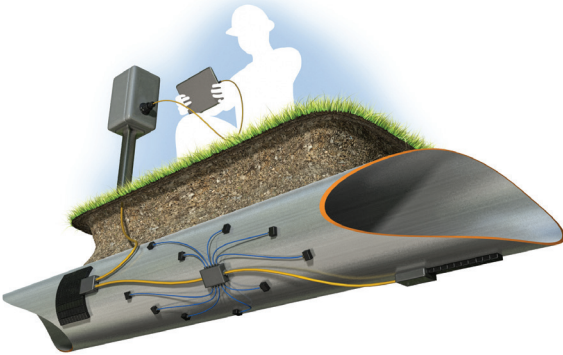
Plant	Unit	TML #	Thickness	Delta T	Rate	Waveform
Bayview	Cat-Cracker Unit	XT-377	0.2454"	25.0 mils	5 mpy	
Bayview	Cat-Cracker Unit	XT-378	0.2250"	10.0 mils	8 mpy	
Bayview	Overhead Line	XT-379	0.3365"	15.0 mils	10 mpy	
Bayview	Overhead Line	XT-380	0.3220"	10.0 mils	6 mpy	

## Precise corrosion/erosion trending

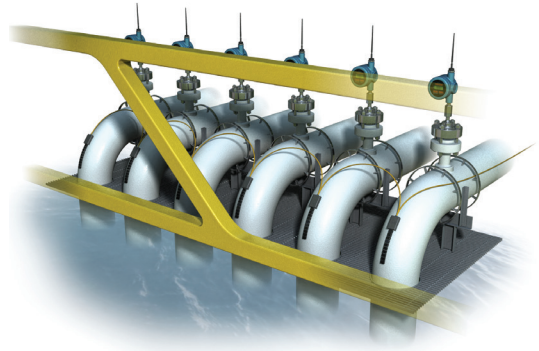


# Applications

Manual wired system for buried pipe



Fully-automated wired system for offshore production platform



Fully-automated system, wired or wireless for refineries or chemical plants



Manual wired or wireless for refinery or plant applications



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