non-intrusive ultrasonic sensors for corrosion/erosion monitoring

Sensor Networks’ smartPIMS® Modbus non-intrusive ultrasonic corrosion/erosion monitoring system connects directly to a PC or laptop to take isolated measurements, or integrates with your SCADA/DCS system for polling at any user-defined time interval. Data can be readily transmitted to webPIMS™, a cloud based back-end for analysis and trending, or simply exported to XML or CSV as necessary for reporting purposes. Use smartPIMS® Modbus for:

- Infrequent data collection (mid-stream applications).
- Hardwiring to a plant’s control system (downstream or offshore).
- Service companies collecting data (refineries).
- Manual data collection (power generation).

Connects via Modbus (RS-485) to tablet/PC or SCADA/DCS.
Outputs data to XML or CSV file, or directly to webPIMS.
Up to 32 units connect on multi-drop network extending as far as 1000’ (305m).
Offers 16 single- or 8 dual-element UT probe channels.
Transducers available to withstand -22°F (-30°C) to 932°F (500°C).
Maintains 1 mil (0.001” / 0.025mm) precision and 0.040” (1mm) minimum wall thickness.
Sensors install buried or above-ground, temporarily or permanently.
ATEX, IECEx, UL/CSA and Japanese hazardous-area certifications.

monitor corrosion rate
resolution to 0.001” (0.025mm) • high-risk areas • historically problematic locations

monitor “low spots”
post-NDE screening of pits to monitor remaining thickness • measures down to 0.040” (1.02mm)

replace/augment intrusive methods
validation of coupons, ER probes, etc.

reduce costs
reduce scaffolding and insulation removal/retfitting for internal corrosion monitoring • more accurate/reliable data improving operations

“We only use smartPIMS® magnetic UT probes for in situ corrosion monitoring; we’re forbidden to weld on operating equipment.”
- Refinery Customer

“We with multiple magnetic probes, we can measure several locations and then reposition based on UT and AUT data.”
- Midstream Customer
specifications

transmitter

- model no.: smartPIMS® Modbus
- protocol/communication: Modbus / RS-485, 2-wire, max. 1000' (305m)
- power: 10-24 VDC

UT system

- channels: 16 ultrasonic, 1 temperature
- pulser voltage: ±5V bipolar square wave
- analog frequency: 1 – 10 MHz (-3dB)
- gain: -10dB to +70dB
- digitizer frequency: 40 Msps

enclosure

- type: instrumentation housing
- material / rating: cast aluminum / NEMA 4X, IP66
- temperature range: -4°F to +140°F (-20°C to +60°C)
- dimensions: 5.44" x 5.63" x 5.13" (138.1 x 142.9 x 130.2mm)
- weight: 5.2 lbs. (2.36 kg)

performance

- processor: Intel i5-4200U 1.6GHz w/ 3MB L3 cache (dual-core)
- memory / storage: 8 GB RAM / M2-SATA SSD, 64 GB
- operating system: Windows 10

connections

- drop/shock resistance: MIL-STD-810G
- environmental: IP65, -14 to +131°F (-10 to +55°C)
- dimensions/weight: 11.4" x 7.48" x 0.78" / 2.73 lbs.

tablet datalogger

- type: coaxial, 1/4" dia.
- maximum length to transducer: standard 10' (3.0m) and 25' (7.6m), custom to 50' (15.2m)

transducer cable

- type: coaxial, 1/4" dia.
- maximum length to transducer: standard 10' (3.0m) and 25' (7.6m), custom to 50' (15.2m)

digital sensor interface

- power: 10-24 VDC
- network power, data via RS-485-to-USB adapter

physical

- drop/shock resistance: MIL-STD-810G
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transducers

- type: single-element contact
- frequency: 5 MHz
- active area (dia.): 0.25/0.35mm
- overall (dia. x h): 1.0 x 1.0
- resolution: 0.001/0.025mm
- thickness range: 0.200-1.300" (5.1-33.0mm)
- temp range: -22 to +150°F (-30 to +65°C)
- attachment: magnet/adhesive

- type: dual-element contact
- frequency: 7 MHz
- active area (dia.): 0.375/10mm
- overall (dia. x h): 0.8 x 2.25
- resolution: 0.001/0.025mm
- thickness range: 0.325-3.250" (8.2-82 mm)
- temp range: -22 to +500°F (-30 to +260°C)
- attachment: mechanical clamp/gold foil

- type: delay-line contact
- frequency: 5 MHz
- active area (dia.): 0.375/10mm
- overall (dia. x h): 0.8 x 2.25
- resolution: 0.001/0.025mm
- thickness range: 0.325-3.250" (8.2-82 mm)
- temp range: -22 to +500°F (-30 to +260°C)
- attachment: mechanical clamp/gold foil

Minimum resolutions stated as typical values, but will vary with pipe condition.

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