

non-intrusive ultrasonic sensors for corrosion/erosion monitoring

Sensor Networks' smartPIMS[®] Cellular non-intrusive ultrasonic corrosion/erosion monitoring system is battery powered with integral SIM card and cellular radio. The Digital Sensor Interface (DSI) unit is programmed to take thickness measurements at any user-defined time interval, then send the data to webPIMS[™], a cloud based back-end for analysis, trending and more. Use smartPIMS[®] Cellular for:

- Frequent data collection to resolve corrosion-rate or pitting issues.
- Quick, easy installation—temporary or permanent.
- Areas difficult or expensive to access and not conducive to manual data collection.

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/refitting 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

"With multiple magnetic probes, we can measure several locations and then reposition based on UT and AUT data."

- MIDSTREAM CUSTOMER

Operates on battery (5-7 years at 1 reading/day).

Cellularly transmits data to webPIMS[™].

Offers 16 single- or 8 dual-element UT sensor channels.

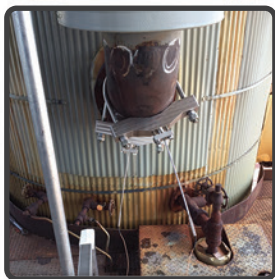
Transducers available to withstand -22°F (-30°C) to 932°F (500°C).

Maintains 1 mil (0.001" / 0.025mm) resolution 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.





Ultra-high-temp probes with mounting bracket.



smartPIMS® Cellular with 8 dual-element sensors installed inside CML ports.



smartPIMS® Cellular with 3 dual-element sensors installed on overhead line.



Dual-element sensor attachment can be either magnetic housing, or via strap with temporary or permanent couplant.

specifications

digital sensor interface

transmitter

- type** cellular (3G/4G-LTE)
- encryption type** secure socket layer (SSL)
- model no.** smartPIMS® Cellular
- battery type** Li D-cell, 3.6 VDC, qty. 2
- battery life** 5 years (typical, based on 1 reading/day)
- ultrasonic 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
 - certification** Class I, Div. 2, Groups A-D, T4, Class 1, Zone 2, IIC, T4
Ⓢ II 3G, Ex ec IIC T4 Gc, T_{amb} -20°C to +60°C

enclosure

- type** instrumentation housing
- material** cast aluminum
- rating** NEMA 4X, IP66
- temperature range** -4°F to +140°F (-20°C to +60°C)
- dimensions (without antenna)** 5.44" × 5.63" × 5.13" (138.1 × 142.9 × 130.2mm)
- weight** 5.5 lbs. (2.5 kg)

transducer cable

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

transducers

transducers

	single-element contact	dual-element contact	delay-line contact
<i>model</i>	XD-101	XD-301	XD-201
<i>application</i>	general purpose	severe pitting	ultra-high-temp
<i>frequency</i>	5 MHz	5 MHz	7 MHz
<i>active area (dia.)</i>	0.25"/6.35mm	0.375"/10mm	0.375"/10mm
<i>overall (dia. x h)</i>	1.0 × 1.0" 25.4 × 25.4 mm	0.75 × 0.75" 19 × 19 mm	0.8 × 2.25" 20.3 × 57.2 mm
<i># of transducers</i>	1–16	1–8	1–16
<i>resolution</i>	0.001"/0.025mm	0.001"/0.025mm	0.001"/0.025mm
<i>thickness range^f</i>	0.200–6.0" 5.1–150.0mm	0.040–6.0" 1.0–150.0mm	0.125–1.0" 3.0–25.0mm
<i>temp range</i>	-22 to +149 °F -30 to +65 °C	-22 to +275 °F -30 to +132 °C	-22 to +932 °F -30 to +500 °C
<i>attachment</i>	magnet/adhesive	magnet/adhesive	mechanical clamp

^fminimum resolutions stated as typical values, but will vary with pipe condition

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