



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

Inspection, Testing & Asset-Integrity Solutions



smart  
**PIMS**<sup>®</sup>

**Modbus**  
transmitter

## Non-Intrusive Ultrasonic Sensors for Corrosion/Erosion Monitoring

Sensor Networks' smartPIMS<sup>®</sup> 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<sup>™</sup>, a cloud based back-end for analysis and trending, or simply exported to XML or CSV as necessary for reporting purposes. Use smartPIMS<sup>®</sup> 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).

### monitor corrosion rate

resolution to 0.001" (0.025mm) • high-risk areas • historically problematic locations

### monitor "low spots"

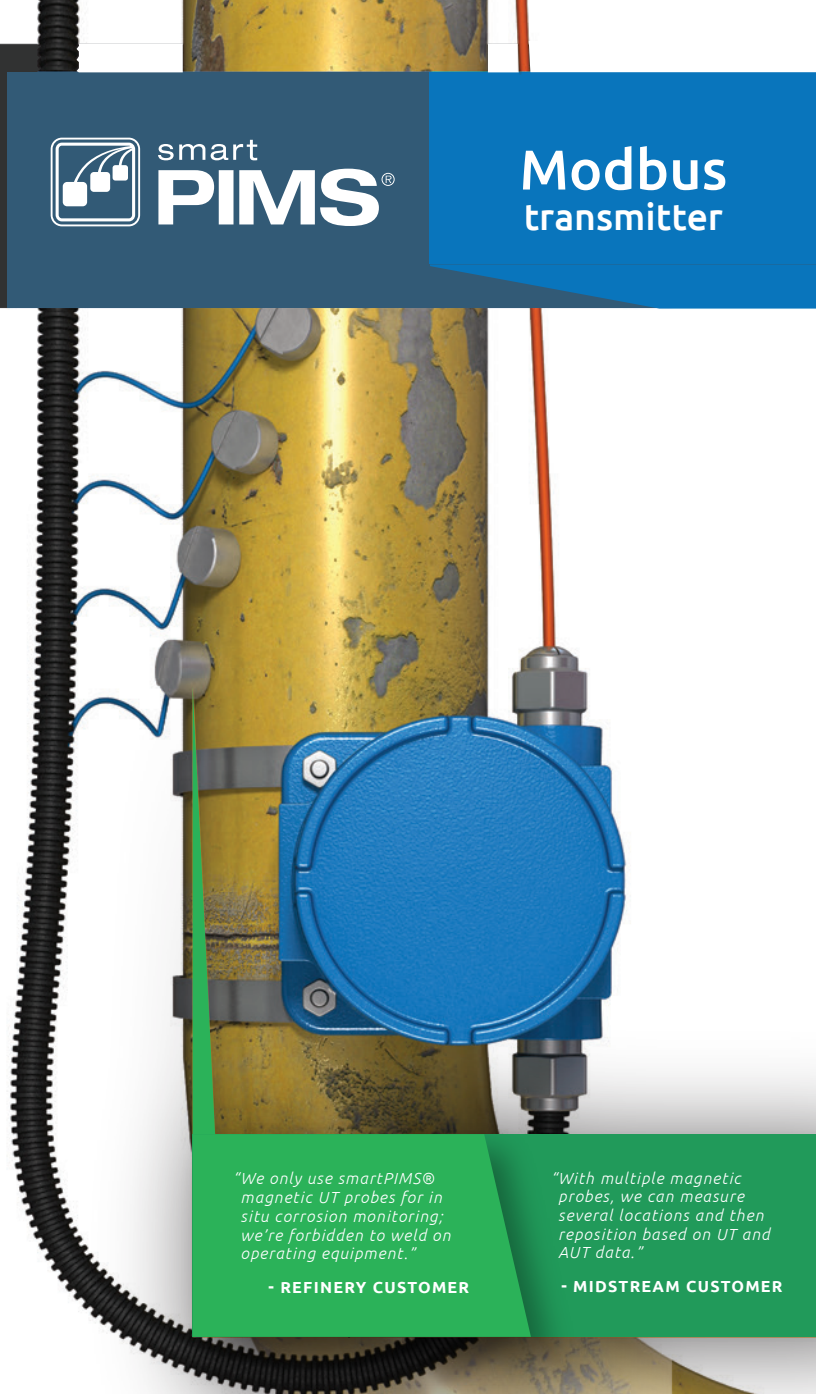
post-NDE screening of pits to monitor remaining thickness • measures down to 0.040" (1.02mm)

### 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<sup>®</sup> 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

**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.**





Multi-drop systems with up to 32 smartPIMS® DSIs and/or matPIMS™ connect to control room or directly to laptop/PC.



Buried probes attached to pipe and connected to a smartPIMS® Modbus DSI in an above-ground enclosure.



Multiple smartPIMS® Modbus DSIs networked for monitoring dozens of TMLs.

# specifications

## digital sensor interface

### transmitter

<b>model no.</b>	smartPIMS® Modbus
<b>protocol/communication</b>	Modbus / RS-485, 2-wire, max. 1000' (305m)
<b>power</b>	10-24 VDC
<b>UT system</b>	channels . . . . . 16 ultrasonic, 1 temperature pulsar 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 Ex II 3G, Ex ec IIC T4 Gc, T <sub>amb</sub> -20°C to +60°C
<b>enclosure</b>	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" × 5.63" × 5.13" (138.1 × 142.9 × 130.2mm) weight . . . . . 5.2 lbs. (2.36 kg)
<b>performance</b>	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
<b>connections</b>	network power, data via RS-485-to-USB adapter
<b>physical</b>	drop/shock resistance . . . . . MIL-STD-810G environmental . . . . . IP65, 14–131°F (-10 to +55 °C) dimensions/weight . . . . . 11.4" × 7.48" × 0.78" / 2.73 lbs.

### tablet datalogger

### transducer cable

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

### transducers

	single-element contact	dual-element contact	delay-line contact
<b>model</b>	XD-101	XD-301	XD-201
<b>application</b>	general purpose	severe pitting	ultra-high-temp
<b>frequency</b>	5 MHz	5 MHz	7 MHz
<b>active area (dia.)</b>	0.25"/6.35mm	0.375"/10mm	0.375"/10mm
<b>overall (dia. x h)</b>	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
<b># of transducers</b>	1–16	1–8	1–16
<b>resolution</b>	0.001"/0.025mm	0.001"/0.025mm	0.001"/0.025mm
<b>thickness range<sup>†</sup></b>	0.200–6.0" 5.1–150.0mm	0.040–6.0" 1.0–150.0mm	0.125–1.0" 3.0–25.0mm
<b>temp range</b>	-22 to +150°F -30 to +65°C	-22 to +275°F -30 to +132°C	-22 to +932°F -30 to +500°C
<b>attachment</b>	magnet/adhesive	magnet/adhesive	mechanical clamp/ gold foil

<sup>†</sup>minimum resolutions stated as typical values, but will vary with pipe condition

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0.31" (7.9mm) diameter mounting holes

