# smartPIMS® Modbus

## non-intrusive ultrasonic sensors for corrosion/erosion monitoring

Metal Samples along with Sensor Networks Inc., offers the smartPIMS® Modbus non-intrusive ultrasonic corrosion/erosion monitoring system which 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. The smartPIMS® Modbus is used 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*
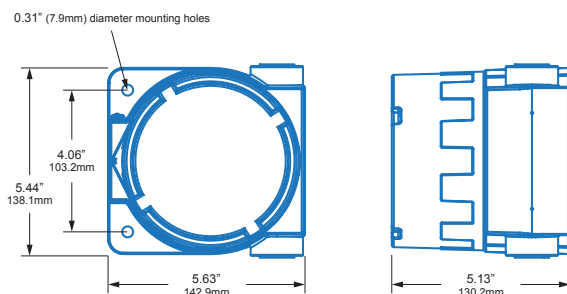
**monitor "low spots"**
*post-NDE screening of pits to monitor remaining thickness • measures down to 0.040" (1.02mm)*

**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*



Modbus
transmitter

- 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) 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.



0.31" (7.9mm) diameter mounting holes

4.06"
103.2mm

5.44"
138.1mm

5.63"
142.9mm

5.13"
130.2mm

# Technical Specifications

## Digital Sensor Interface

**Transmitter:**

| | |
|---|---|
| **Model:** | smartPIMS® Modbus |
| **Protocol/Communication:** | Modbus / RS-485, 2-wire, max. 1000' (305m) |
| **Power:** | 10-24 VDC |

**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, Tamb -20°C to +60°C |

**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 × 5.63 × 5.13" (138 × 143 × 130mm) |
| Weight: | 5.2 lb (2.36 kg) |

**Tablet Datalogger:**

**Performance:**

| | |
|---|---|
| Processor: | Intel i5-4200U 1.6GHz w/ 3MB L3 cache (dual-core) (min.) |
| Memory / Storage: | 8 GB RAM / M2-SATA SSD, 64 GB (min.) |
| Operating System: | Windows 10 |

**Connections:** Network power, data via RS-485-to-USB adapter

**Physical:**

| | |
|---|---|
| Environmental ratings: | IP65, MIL-STD-810G, 14 to 131°F (-10 to +55 °C) * |
| Dimensions: | 11.4" × 7.48" × 0.78" * |
| Weight: | 2.73 lbs. * |

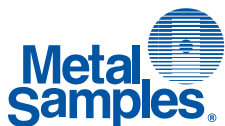\* due to model changes, actual size/weight may change

## Transducers

**Transducer Cable:**

| | |
|---|---|
| **Type:** | Coaxial, ¼" dia. |
| **Max. Length to Transducer:** | Standard 10' (3.0m) and 25' (7.6m), custom to 50' (15.2m) |

| Transducers: | Dual-Element Contact | Delay-Line Contact |
|---|---|---|
| Model: | XD-301 | XD-201 |
| Application: | Severe pitting | Ultra-High-Temp |
| Frequency: | 5 MHz | 7 MHz |
| Active Area (dia.): | 0.375" (10mm) | 0.375" (10mm) |
| Overall (dia. x h): | 0.75" x 0.75" (19 x 19mm) | 0.8" x 2.25" (20.3 x 57.2mm) |
| # of transducers: | 1-8 | 1-16 |
| Resolution: | 0.001" (0.025mm) | 0.001" (0.025mm) |
| Thickness range*: | 0.040 - 6.0" (1.0 - 150.0mm) | 0.125 - 1.0" (3.0 - 25.0mm) |
| Temp. range: | -22 to +275°F (-30 to + 135°C) | -22 to +932°F (-30 to 500°C) |
| Attachment: | magnet / adhesive | mechanical clamp |

\* minimum resolutions stated as typical values, but will vary with pipe condition

**Metal Samples**®

**SENSOR**® NETWORKS, INC