



SENSOR[®]
NETWORKS, INC

Inspection, Testing & Asset-Integrity Solutions



matPIMS
area monitoring

non-intrusive ultrasonic sensors for corrosion/erosion monitoring

Sensor Networks' matPIMS™ non-intrusive corrosion-monitoring sensor array (array, matrix, etc.) collect thickness data over a surface area. Data is transmitted to a SCADA/DCS system via Modbus (RS-485) for frequent polling, or manually offloaded using a PC/laptop. Use matPIMS™ for:

- Large area monitoring post fix/repair (midstream).
- Directly assessing trouble spots (midstream).
- Sand and slurry erosion monitoring (upstream).
- Slurry and mixing asset erosion (mining).
- DOT monitoring requirements.

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 0.125" (3mm)

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



Connects via Modbus (RS-485) to tablet/PC or SCADA/DCS.

Up to 32 matPIMS and/or smartPIMS single units connect on a multi-drop network extending as far as 1000' (305m).

Offloads data to XML/CSV file or directly to webPIMS.

Available in 1×15, 3×5 and custom arrays, each with one reference calibration sensor mounted in head shell.

Transducers rated to -5°F (-20°C) to 150°F (65°C).

Sensors permanently installed, either buried or above-ground.

Powered by laptop or hard-wired.

Not hazardous-location rated.

specifications



matPIMS™ 3x5 matrix permanently installed with RS-485 cable back to surface for data collection, pre-overwrap.



Fully coated and wrapped installation with RS-485 cable mounted in test station for data collection.



matPIMS™ 1x15 array permanently installed using viscoelastic putty to overcoat sensor strip and head before wrapping/backfill.

Modbus

transmitter

model no.	M-PIMS115, M-PIMS35
protocol/communication	Modbus / RS-485, 2-wire, max. 1000' (305m)
power	10-24 VDC
UT system	channels 16 ultrasonic
	pulser voltage ±5V bipolar square wave
	analog frequency 1-10 MHz (-3dB)
	gain -10dB to +70dB
	digitizer frequency 40 Msp/s
enclosure	type custom
	material Delrin
	temperature range -5°F to +150°F (-20°C to +65°C)
	dimensions 3.1×2.6×1.15" (78.7×66×29.2mm)
	weight <1 lbs. (0.45 kg)
	cable standard 25' (7.6m)

tablet datalogger

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	network power, data via RS-485-to-USB adapter
physical	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.

transducers

transducers

model	M-PIMS115	M-PIMS35	Custom
application	general wall loss	general wall loss	general wall loss
frequency	7.5 MHz	7.5 MHz	7.5 MHz
active area (dia.)	0.25"/6.35mm	0.25"/6.35mm	0.25"/6.35mm
overall (w x h)	1.0×9.12" 25.4 × 231.6 mm	2.0×2.7" 50×68 mm	1.0 × up to 100" 25.4 × up to 2540 mm
# of transducers	16 (15 active, 1 ref.)	16 (15 active, 1 ref.)	up to 32
resolution	0.001"/0.025mm	0.001"/0.025mm	0.001"/0.025mm
thickness range†	0.125-6.0" 3.0-150.0mm	0.125-6.0" 3.0-150.0mm	0.125-6.0" 3.0-150.0mm
temp range	-5 to +150°F -20 to +65°C	-5 to +150°F -20 to +65°C	-5 to +150°F -20 to +65°C
attachment	epoxy	epoxy	epoxy

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



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SENSOR[®]
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smart
PIMS[®]

datalogger
transmitter

non-intrusive ultrasonic sensors for corrosion/erosion monitoring

Sensor Networks' smartPIMS[®] Datalogger non-intrusive ultrasonic corrosion/erosion monitoring system is equipped with onboard battery and memory that can store up to 3000 thickness readings. It takes measurements at any user-defined time interval, storing them for manual offload to tablet or PC via RS-485 cable. Use smartPIMS[®] Datalogger for:

- Applications where frequent measurements are required, but wireless infrastructure is not available.
- Situations where wireless infrastructure is not available or not permitted.

monitor corrosion rate

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

monitor "low spots"

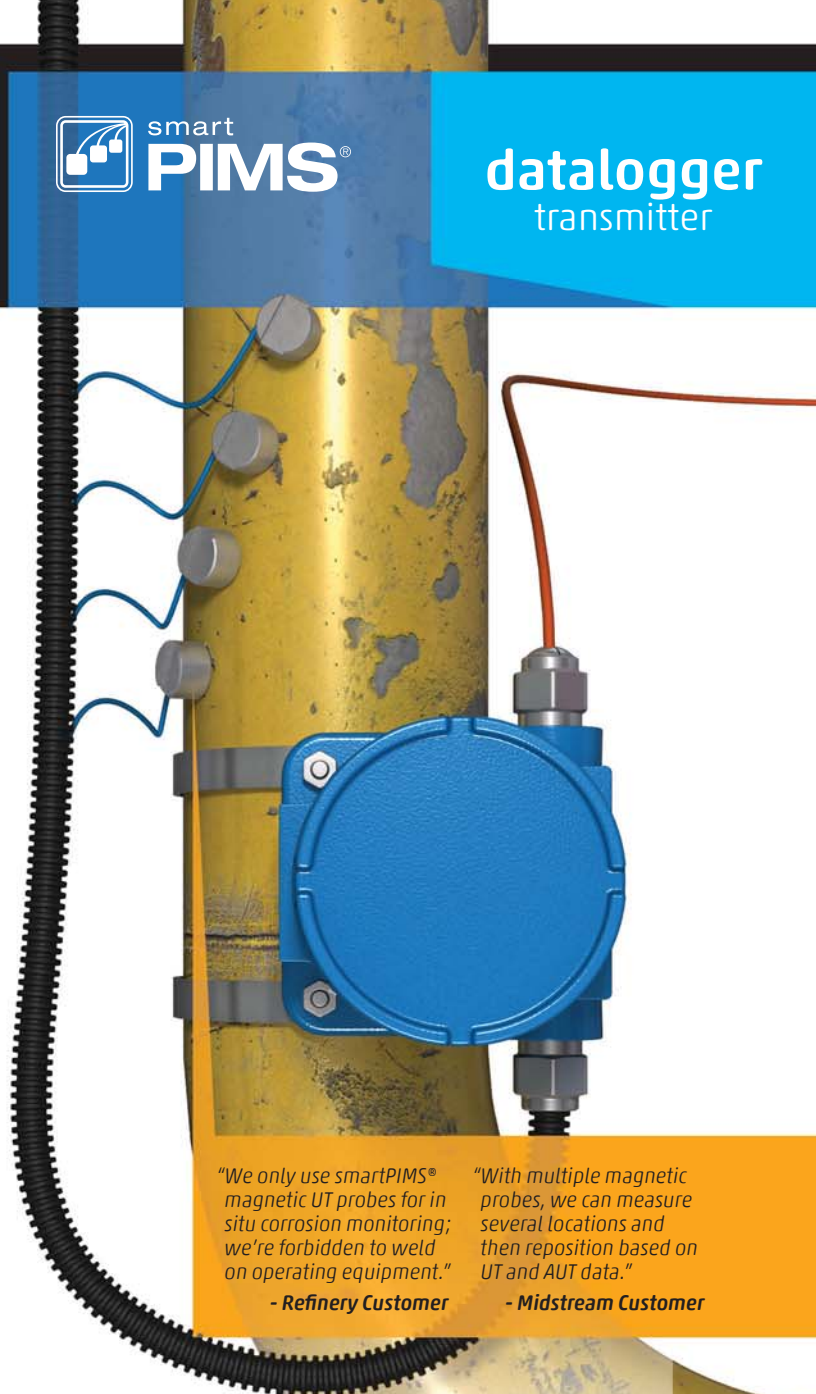
post-NDE screening of pits to monitor remaining thickness • measures down to 0.040" (1.02mm)

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 (2 years at 1 reading/day).

Stores 3000 readings (each w/ time, date, waveform).

Connects via Modbus (RS-485) to tablet/PC.

Offloads data to XML/CSV file or directly to webPIMS.

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

Transducers maintain 1 mil (0.001" / 0.025mm) resolution and **0.040"** (1mm) minimum wall thickness.

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

Sensors install buried or above-ground, temporarily or permanently.

ATEX, IECEx, UL/CSA and Japanese hazardous-area certifications.



specifications

digital sensor interface

transmitter

model no. smartPIMS® Datalogger
protocol/communication Modbus / RS-485, 2-wire, max. 1000' (305m)
battery type Li D-cell, 3.6 VDC, qty. 2
battery life 2 years (typical, based on 1 reading/day)
storage capacity 3000 readings (FIFO)
UT system
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
 Ⓜ II 3G, Ex ec IIC T4 Gc, T_{amb} -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)
dims./wt. 5.44×5.63×5.13" (138×143×130mm) / 5.2 lb (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 network power, data via RS-485-to-USB adapter
physical
environ. ratings IP65, MIL-STD-810G, 14–131°F (-10 to +55 °C)
dimensions/weight 11.4" × 7.48" × 0.78" / 2.73 lbs.

tablet datalogger

transducer cable

type coaxial, ¼" dia.
maximum length to transducer standard 10' (3.0m) and 25' (7.6m), custom to 50' (15.2m)

transducers

transducers

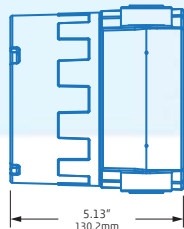
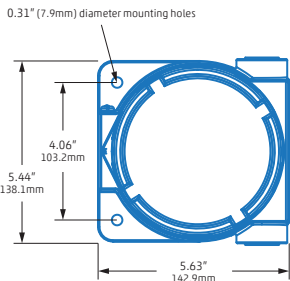
	single-element contact	dual-element contact	delay-line contact
<i>model</i>	XD-101	XD-301	XD-201
<i>application</i>	general purpose	severe pitting	ultra-high-temp
<i>frequency</i>	5 MHz	5 MHz	7 MHz
<i>active area (dia.)</i>	0.25"/6.35mm	0.375"/10mm	0.375"/10mm
<i>overall (dia. x h)</i>	1.0 × 1.0" 25.4 × 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†</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 +150°F -30 to +65°C	-22 to +300°F -30 to +150°C	-22 to +932°F -30 to +500°C
<i>attachment</i>	magnet/adhesive	magnet/adhesive	mechanical clamp/ gold foil

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

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Clamped high-temp probe monitors ~640°F line. • Dual-element probes monitor individual pits. • Datalogger cable runs to enclosure for data collection.





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smart
PIMS[®]

Modbus
transmitter

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).

monitor corrosion rate

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

monitor "low spots"

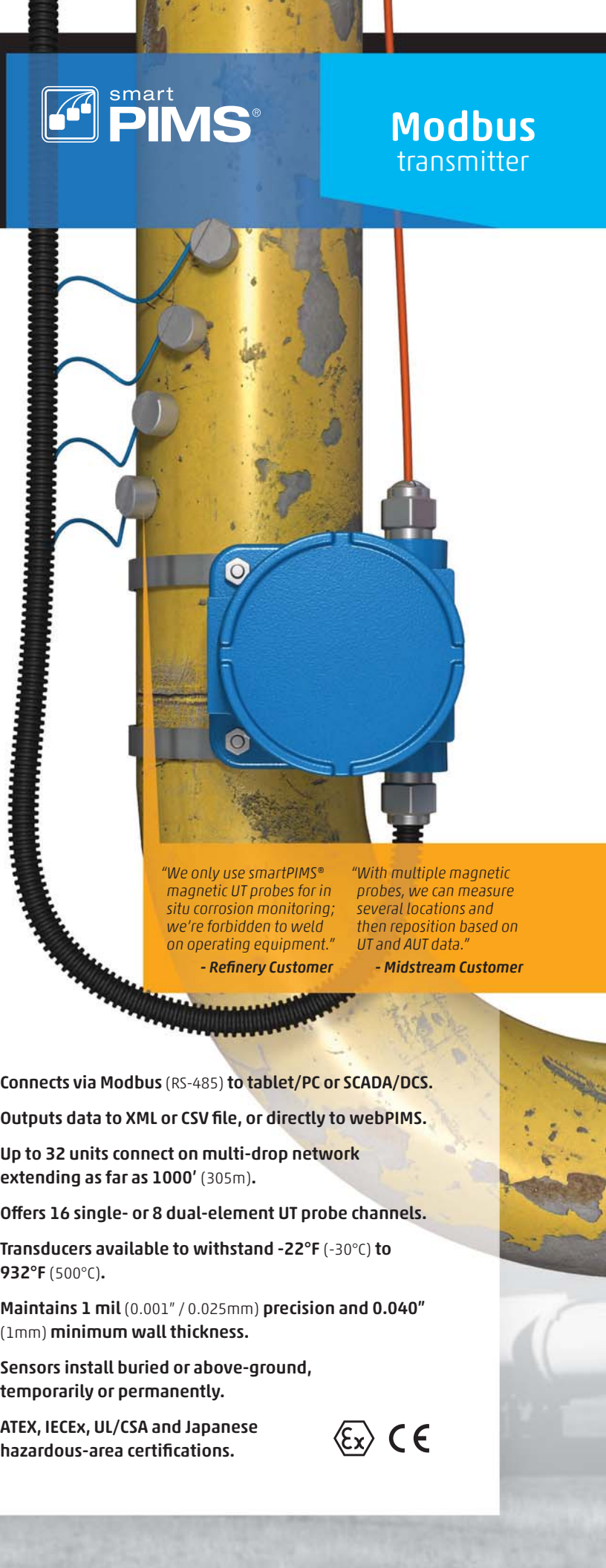
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"We only use smartPIMS[®] magnetic UT probes for in situ corrosion monitoring; we're forbidden to weld on operating equipment."

- Refinery Customer

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

- Midstream Customer

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® DSI 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 DSI networked for monitoring dozens of TMLs.

specifications

digital sensor interface

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
certification	Class I, Div. 2, Groups A-D, T4, Class 1, Zone 2, IIC, T4 <small>Ex</small> II 3G, Ex ec IIC T4 Gc, T _{amb} -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" (138.1 × 142.9 × 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	network power, data via RS-485-to-USB adapter
physical	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

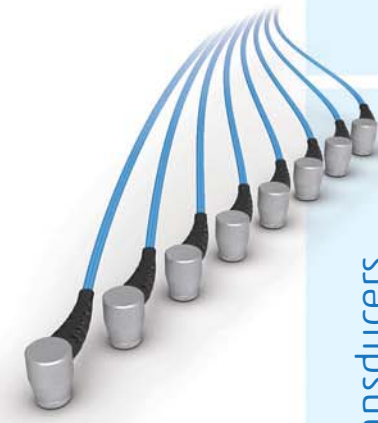
type	coaxial, ¼" dia.
maximum length to transducer	standard 10' (3.0m) and 25' (7.6m), custom to 50' (15.2m)

transducers

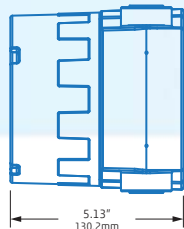
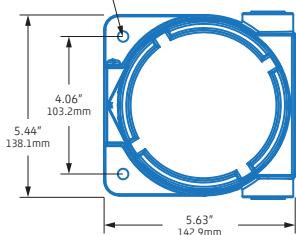
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<i>attachment</i>	magnet/adhesive	magnet/adhesive	mechanical clamp/ gold foil

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0.31" (7.9mm) diameter mounting holes



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