

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 0.040" (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



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 1x15, 3x5 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
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 Msps
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) / max 1,000' (305m)

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)	1.0x9.12" 25.4 × 231.6 mm	2.0x2.7" 50x68 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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