smart PIMS® 2.0

Wired or Wireless, Non-Intrusive Ultrasonic Sensors for Corrosion & Erosion Monitoring

Sensor Networks' smartPIMS® 2.0 is the next generation system for non-intrusive ultrasonic corrosion and erosion monitoring of critical assets. The smartPIMS 2.0 boasts a variety of connectivity options for optimal utilization of thickness data via local PC, SCADA/DCS , or wireless transmission to IoT analysis systems.

Choose from:

- Mod-Bus
- Datalogger
- LoRaWAN
- Cellular

- Rugged design for outdoor use and installation in harsh industrial environments.

- Supports up to 8 dual-element sensors (up to 275°F/135°C) or up to 16 Ultra-High-Temp (up to 932°F/500°C) sensors per system.

- Optional single thermocouple connection for temperature-compensated thickness readings.

- Highly stable readings as sensors do not move and thickness measurements made at same exact location time and time again.

- UL/CSA C1D2, ATEX / IECEx Zone 2 and Japanese hazardous-area certified.

Eddyfi Technologies
Remote Monitoring

SENSOR NETWORKS, INC

Modbus

smartPIMS 2.0 Modbus system connects directly to a PC or laptop to take on-demand thickness readings, store them on the local PC in SNI dataPIMS software and optionally upload to SNI webPIMS backend application for databasing of data and predictive analysis.

The system can also be wired directly into a SCADA/DCS system for polling at any user defined time integral. New thickness data can be read via standard Modbus commands and displayed on local consoles or ported to company backend systems. Use 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).

Datalogger

smartPIMS 2.0 Datalogger system is equipped with an onboard battery and system memory enabling the storage of up to 3,000 thickness readings. The system can be programmed to obtain thickness values on a user defined schedule and store all the data onboard. Users connect to the unit's sealed military style connector via DIU adapter and tablet/PC using dataPIMS software. Data is downloaded to the tablet/PC where it is stored and available in XML or CSV (Excel) file format. Data can also be uploaded to SNI webPIMS backend application for databasing of data and predictive analysis. Use Datalogger for:

- Applications where frequent measurements are required, but wireless infrastructure is not available.
- Scheduled measurements are required, and access is difficult or remote.
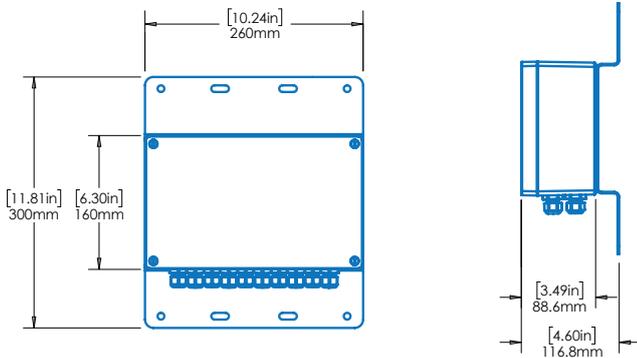
Modbus

model no.	smartPIMS® Modbus
protocol	Modbus / RS-485, 2-wire, max. 1000' (305m)
power	10-24 VDC

Datalogger

model no.	smartPIMS® Datalogger
protocol	Modbus / RS-485, 2-wire, max. 1,000' (305m)
battery type	Li D-cell, 3.6 VDC, qty. 2
battery life	2 years (typical, based on 1 readying/day)
storage capacity	3000 readings (FIFO)

Enclosures

type	instrumentation housing
material	cast aluminum
rating	NEMA 4X, IP66
temperature range	-40°F to + 158°F (-40°C to +70°C)
weight	5.5 lbs. (2.5 kg)

UT Systems

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

LoRaWAN

smartPIMS 2.0 LoRaWAN system is equiped with an onboard battery and LoRaWAN radio modem for data transfer to a LoRaWAN Server via ~900MHz wireless transmission. Sensors can be placed over 1 mile from LoRaWAN gateway receivers in most industrial settings. The system can be programmed to obtain thickness values on a user-defined schedule and transmit data through a LoRaWAN gateway to SNI webPIMS cloud-based backend application for databasing and analysis, or using an on-prem data collection webPIMS system. The system also can be connected to customer provided LoRaWAN systems and networks where data can be routed, decoded, and displayed/stored on corporate systems. Use LoRaWAN for:

- Facilities where multiple systems are used.
- Installations having existing LoRaWAN networks and/or corporate data systems in place.
- Situations where data is to be kept locally using a secure on-prem data management system.

Cellular

smartPIMS 2.0 Cellular system is equipped with an onboard battery and an LTE-M/Cat M1 cellular modem for data transfer to the interenet via cellular data connectivity. The system can be programmed to obtain thickness values on a user defined schedule and transmit data to SNI webPIMS backend application for databasing of data and predictive analysis. *Adequate cellular network coverage is required. Use Cellular for:

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

## *LoRaWAN*

model No. . . . . smartPIMS LoRaWan
type . . . . Standard LoRaWAN communication protocol
loRa channel bands . . . . US/EU/AS/AU/JP and others
connectivity . . . . Gateway to cloud
loRaWAN Networks . . . . .   webPIMS, On-Prem, or private network
battery Life . . . . 5yrs @ 1 reading/day (68°F/20°C)

Cellular

model no. . . . . smartPIMS Cellular
type   . . . . cellular (3G/CAT M1-LTE)
encryption type . . . . secure socket layer (SSL)
battery type . . . . Li D-cell, 3.6 VDC, qty. 2
battery life . . . . 5yrs @ 1 reading/day (68°F/20°C)
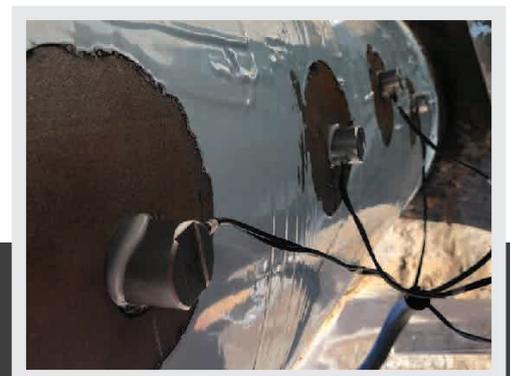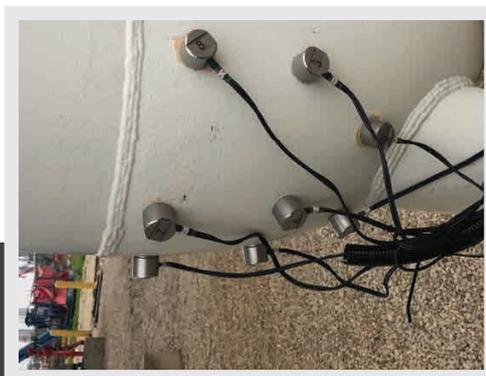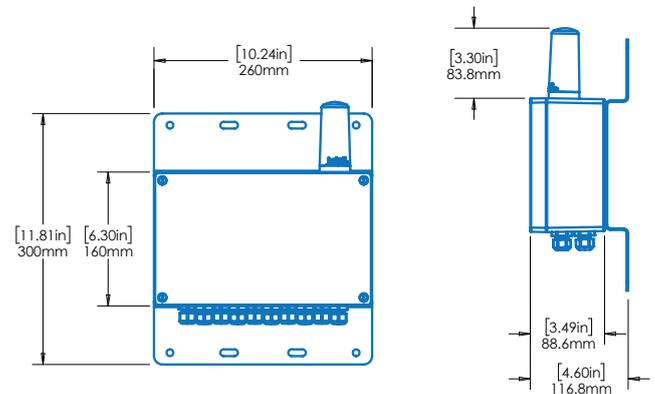
Sensor Networks dataPIMS software connects to the smartPIMS instrument and provides users the ability to commission the system for accurate ultrasonic thickness measurements, setting shot time intervals and system hierarchy naming. dataPIMS also includes basic data management capabilities for modbus and datalogger smartPIMS units with storing of thickness data in XML or common CSV file format for easy use in MS-Excel software.
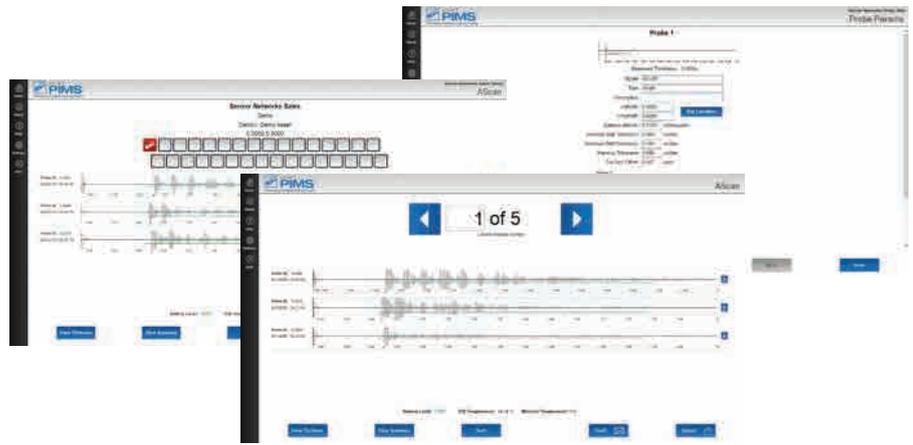
smartPIMS Sensors

	Dual-Element Contact	Delay-Line Contact	Temperature Sensor
Application	XD-301	XD-201	N/A
Application	Sever Pitting	Ultra-High-Temp	N/A
Frequency	5 MHz	7 MHz	N/A
Active Area (diameter)	0.375 in. (10mm)	0.375 in. (10mm)	N/A
Dimensions (dia. x H)	0.75 x 0.75" / 19 x 19 mm	0.8 x 2.25" / 20.3 x 57.2 mm	0.062 x 18" / 1.57 x 457.2 mm
# of Transducers	1-8	1-16	N/A
Resolution	0.001" / 0.025 mm	0.001" / 0.025 mm	N/A
Thickness Range	0.040-4.0" / 1.0-100 mm	0.125-1.0" / 3.0-25.0 mm	N/A
Temperature Range	-40 to 275°F -40 to 132°C	-40 to 932°F -40 to 500°C	-40 to 932°F -40 to 500°C
Attachment	magnet/adhesive or temporary	mechincal clamp/ gold foil	N/A

Cable

type . . . . coaxial, ⅛" dia. or dual coax cable ¼" dia.
max length to transducer . . . . . standard 10' (3.0m) and 25' (7.6m), custom to 50' (15.2m)

PC/Tablet Requirements

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 10/11
connections . . . . network power, data via RS-485-to-USB adapter
drop/shock resistance MIL-STD-810G

CE ⟨Ex⟩ II3G Ex ec ic IIC T4 Gc, Ta = -40°C to +70°C
CML 17ATEX3309X | IECEx CML17.0172X

MET Class I, Div 2, T4, Grps A-D
Class I, Zone 2, AEx/Ex ec ic IIC T4 Gc
Ambient Range -40°C to +70°C
E114158 - Hazardous Location

WARNING: USE ONLY TADIRAN TL-5930, SL-2780 OR XENO XL-205F BATTERIES
WARNING: SPECIAL CONDITIONS FOR SAFE USE, SEE INSTRUCTIONS
WARNING: DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT
AVERTISSEMENT: UTILISEZ UNIQUEMENT DES ACCUMULATEURS TADIRAN TL-5930, SL-2780 OU XENO XL-205F
AVERTISSEMENT: CONDITIONS PARTICULIÈRES POUR UNE UTILISATION SÉCURISÉE, VOIR LES DIRECTIVES
AVERTISSEMENT: NE PAS OUVRIR LORSQU'UNE ATMOSPHÉRE EXPLOSIVE EST PRÉSENTE

IP 66
DC POWER OPTIONS: 10-30 Vdc ▬▬ 2W
BATTERY OPTION: 7.2Vdc ▬▬▬

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