

micro
PIMS®

Intrinsically Safe

Ultrasonic Corrosion / Erosion Monitoring System for Energy Assets

- Wireless
- Intrinsically Safe
- Non-Intrusive
- UT Based Sensors



Inspection, Testing & Asset-Integrity Solutions



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webPIMST[™] Data Management



microPIMS SYSTEMS



microPIMS Intrinsically Safe ATEX Zone 0 (CID1)

Sensors: Two models

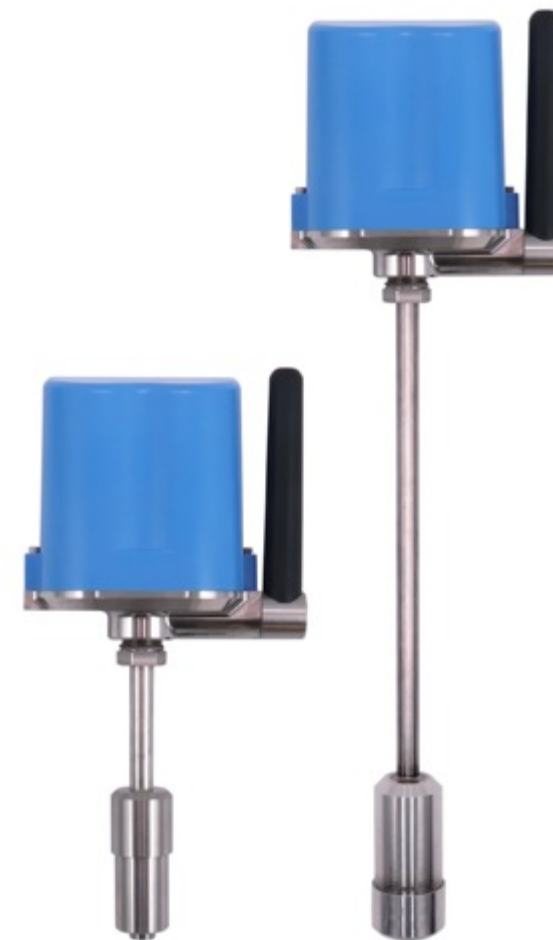
- Conventional Ultrasonic thickness measurement technology
 - -40°F to 950°F (-40°C to 500°C)
- Over-the-air Wireless Sensor Communication
- Temp sensor for temperature-compensated measurements
- 2 D-Cell lithium battery | 15 years at one reading/day

900MHz LoRaWAN Wireless Network

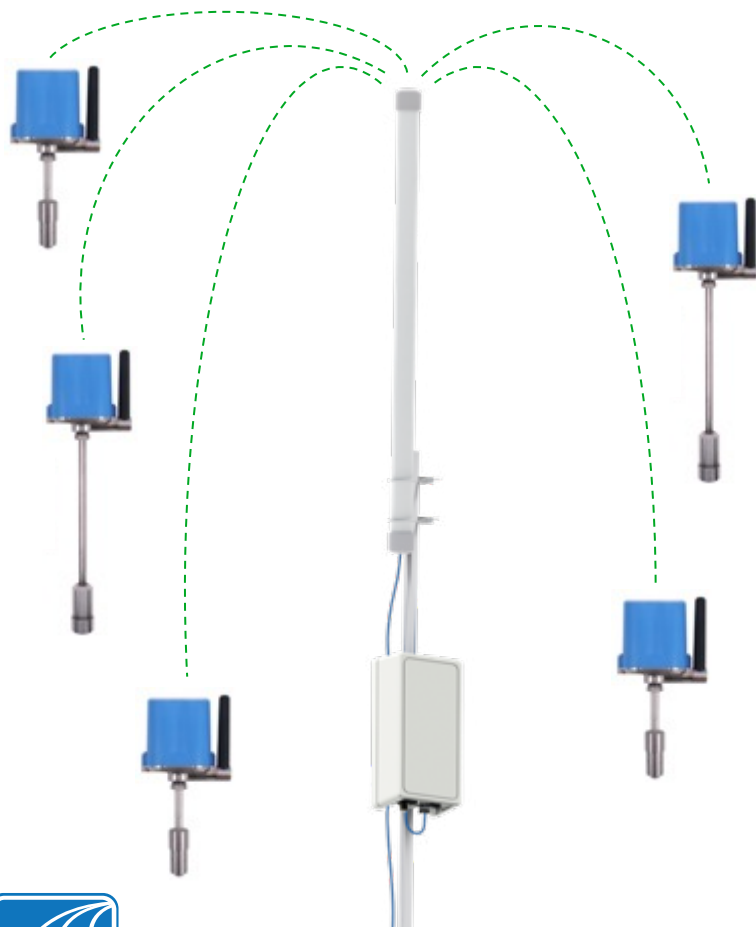
- Long-range bi-directional communication
- Star topology | Point to point – Sensor to gateway
- >1 mile (1.6Km) range | 5,000+ Sensors
- Back-end connectivity: Cellular | Ethernet

Data Management

- webPIMS
- Cloud | AWS
- On-Premise | In-the-fence Server
- Private LoRaWAN Networks



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Network	Wi-HART	LoRaWAN
Technology Concept	Operational	Informational
Network Topology	Mesh	Star Point to point
Radio Frequency (Interference)	2.4 GHz (as phone, Wifi, BlueTooth)	900 MHz (Region specific)
Application	Process Control Bi-directional	Sensor data Uni-directional
Response Time	Demand Fast Response Heavy Traffic	Less time critical Light Traffic
System End Component	Vibration, Flow meters, Pressure Sensors, etc.	Wall-thickness, Temperature, etc.
System Performance	Performance affected by every node	Performance independent
System Expansion Scalable	Days to weeks Difficult: Adding node	Hours to days Simple: Adding sensor
Data Purpose	DCS PLS Control	IoT Big data
Power Consumption	Always High Power: Scan/Upload/Standby for Data Relay	High power in scan/upload 99% sleep until next cycle
Sensor Battery Loading	Power consumption unpredictable Uneven loading	Even loading
Battery	Custom battery ~\$400 (USD)	Standard D Size Battery ~\$20 (USD)



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Single-Point, Long-Range (LoRaWAN) Wireless

Wireless Protocol

LoRaWAN STAR network from sensor to gateway

Gateway & Antennae

>1 mile (1.6 km) range with no repeaters needed*

Gateway Capacity

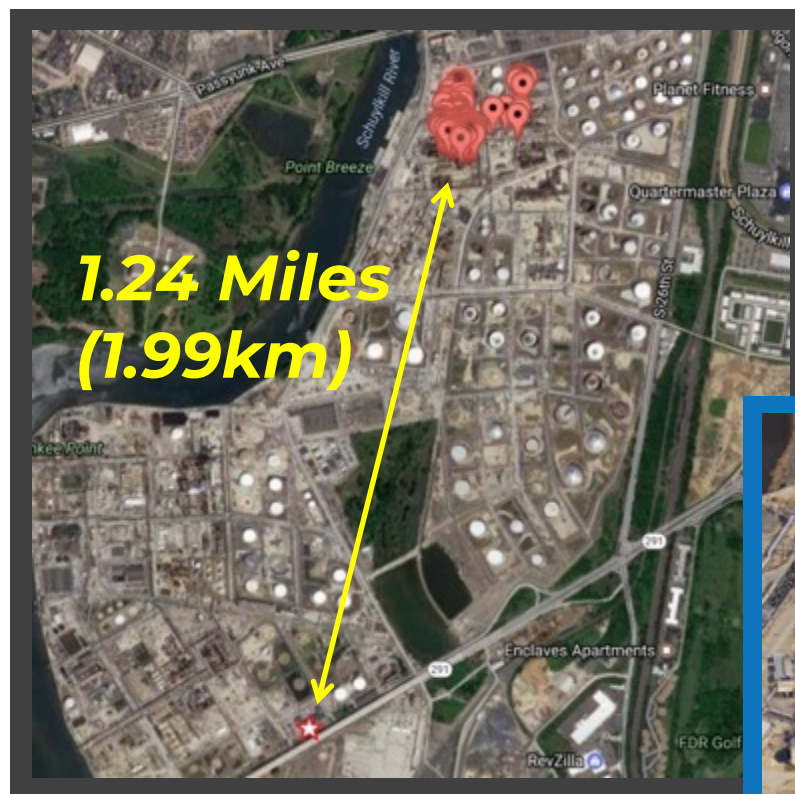
5,000+ sensors

Data Backhaul

Cellular/Ethernet to cloud OR on-premise server

Sensor Battery Life

15+ years at 1-reading per day



**ZOOMED
IN VIEW** ↓



* Wireless range will vary by site depending on topography, antennae positioning & RF interference



HIGH-TEMP DUAL-ELEMENT

-40 to 275°F (-40°C to 135°C)

0.040" (1mm) to 4.0" (101mm)

Permanent or Temporary
Installed with Clamp or magnet

CID0, A-D, T4 | ATEX Zone 0

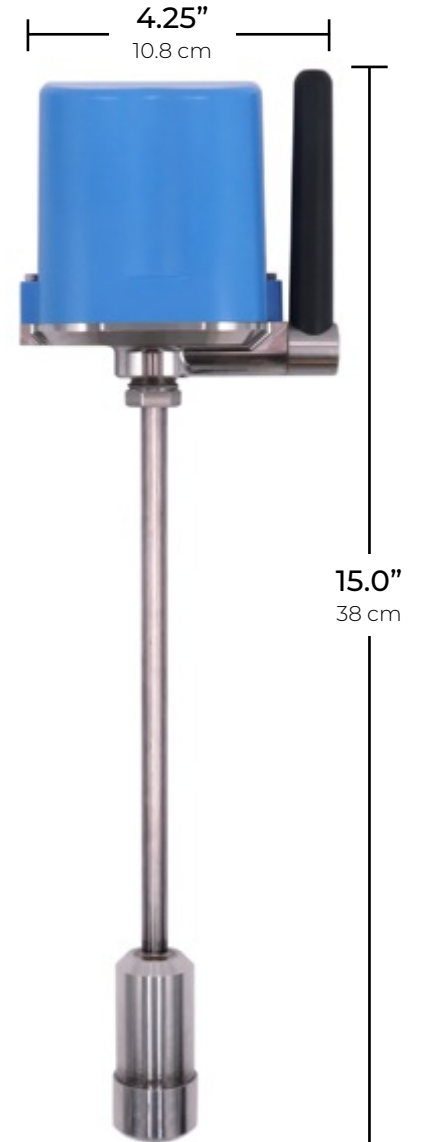
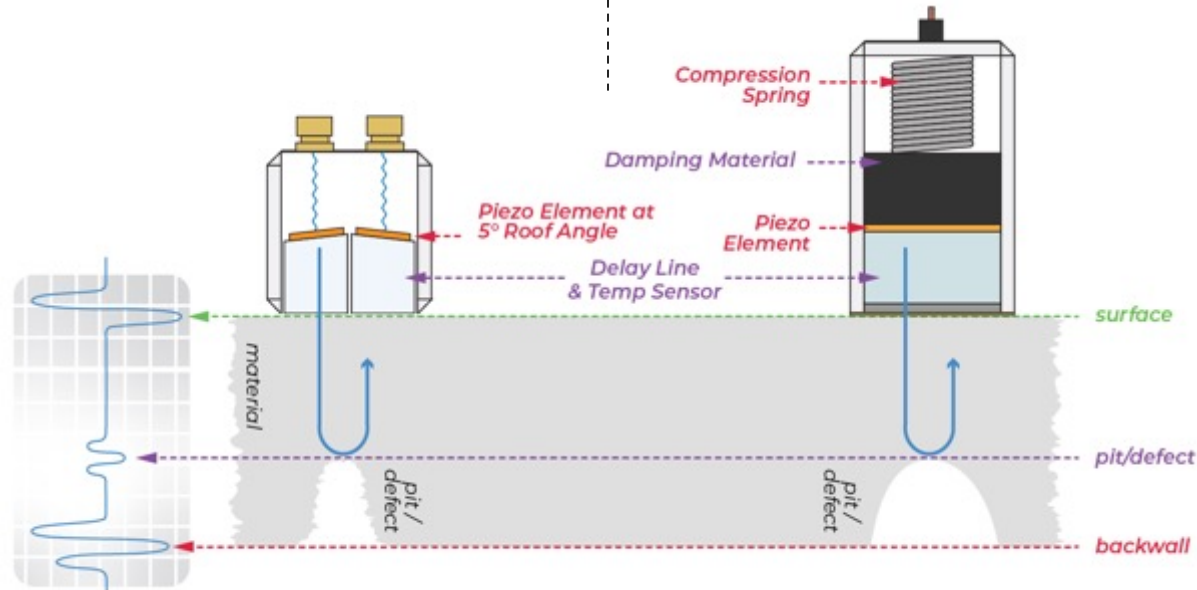
ULTRA-HIGH-TEMP SINGLE-ELEMENT

-40 to 932°F (-40°C to 500°C)

0.1" (2.5mm) to 1.0" (25mm)

Permanent or Temporary
Installed with Clamp

CID0, A-D, T4 | ATEX Zone 0



microPIMS SENSOR INSTALLATION



High Temp Band Clamp

Same probe holder for all sizes.

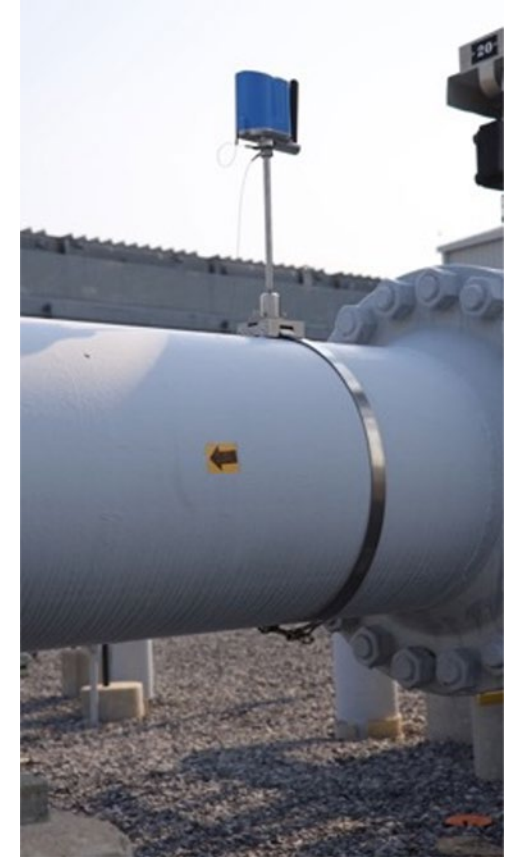
Different size bands and clamps for pipe sizes (1" to 36")



Magnetic Clamp

Large-dia. (>36") pipe to tanks & vessels

Optimal for temporary installation



DEPLOYMENT EXAMPLES



Dual-Element Sensors

Temporarily installed using magnetic bases on a vessel to monitor pitting



2"-dia. Pipe Installation

Ultra-high-temp unit installed using small diameter clamp



DATA MANAGEMENT & INTEGRATION

Cloud Based

Purchase hardware and subscription-based cloud software from SNI, no server or IT investment required



On-Premise

Purchase hardware, software, network server from SNI and have everything run on-premises



Private Network Integration

Purchase sensors/hardware only from SNI and integrate to your own LoRaWAN private network and server



Historian Integration

Pull data from webPIMS
Into historian



IDMS Management

Import data from selected
dates in IDMS application



Excel Reporting

Export data from webPIMS
and archive locally, report,
trending, etc.

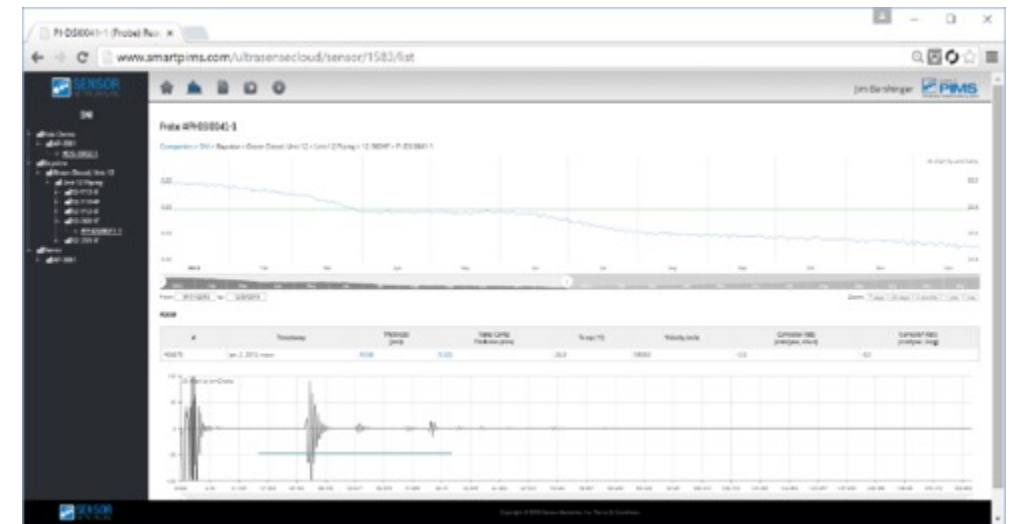
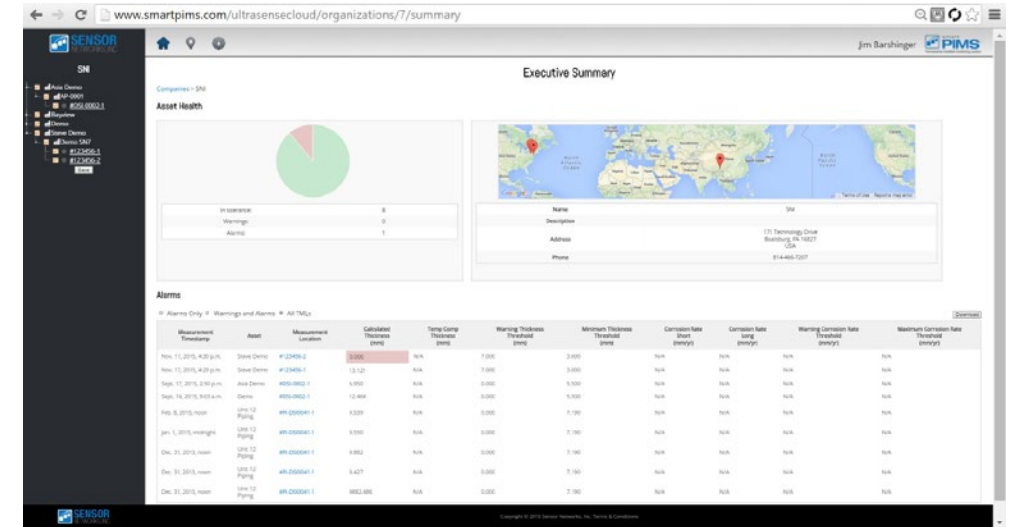


webPIMS SOFTWARE

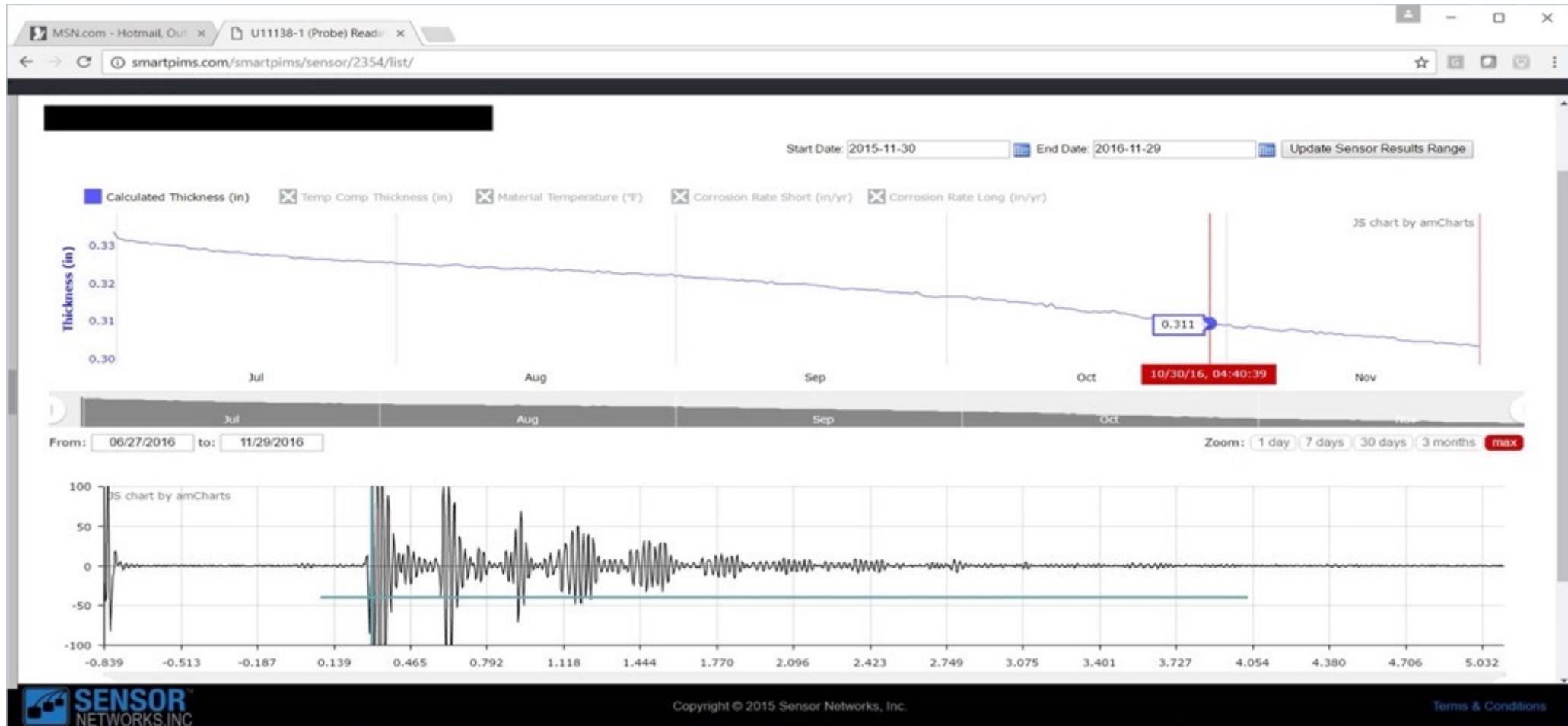
Data Analytics | Trending | Reporting

webPIMS Corrosion Monitoring Software

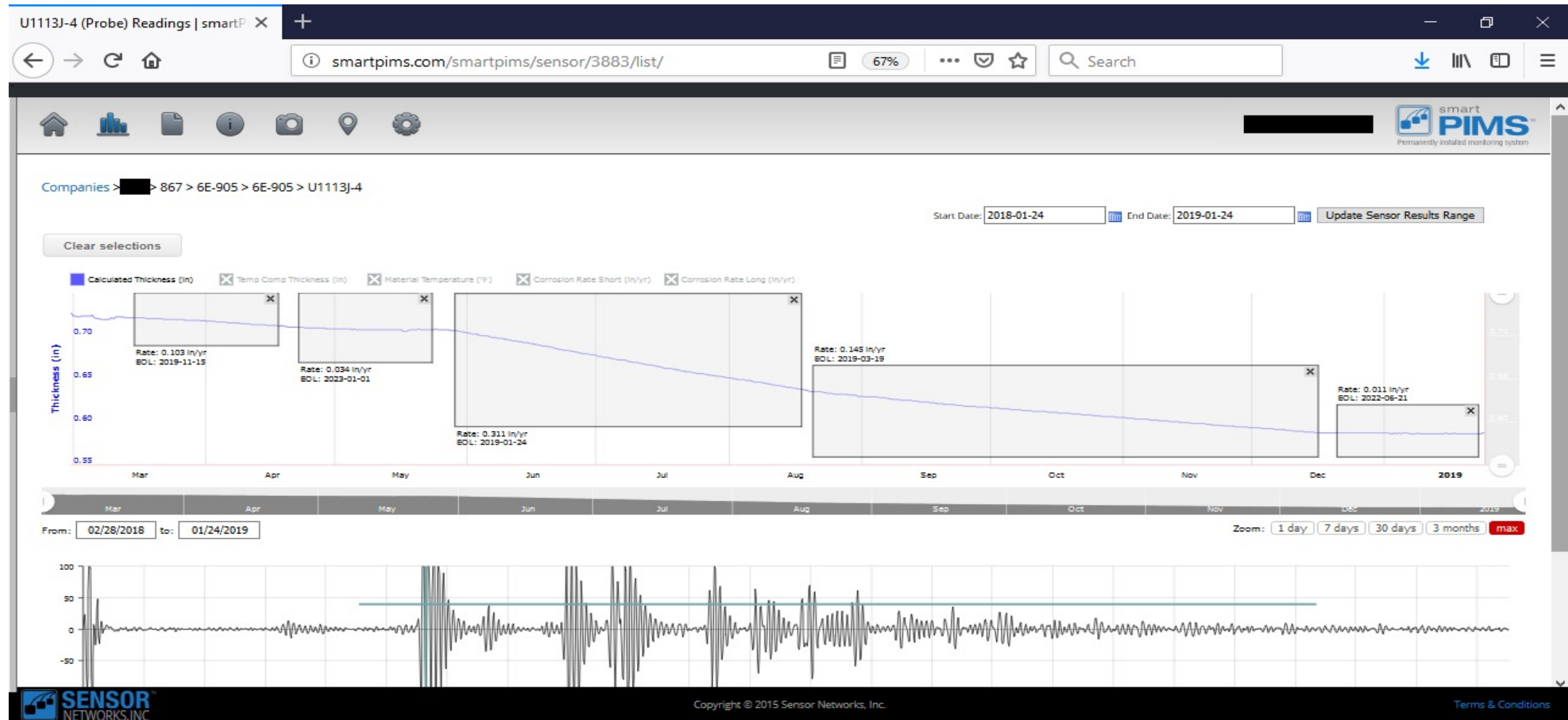
- Data – Time, date, location, thickness, UT waveform, temperature
- Alarms & Warnings – Min T and Max rate
- Corrosion-rate calculation
- Automated reporting and e-mail alerts
- Google Maps & GPS asset location



DATA ANALYTICS, TRENDING, & REPORTING



TIME-GATED CORROSION RATE MANAGEMENT



TEMPERATURE COMPENSATED THICKNESS

Companies >

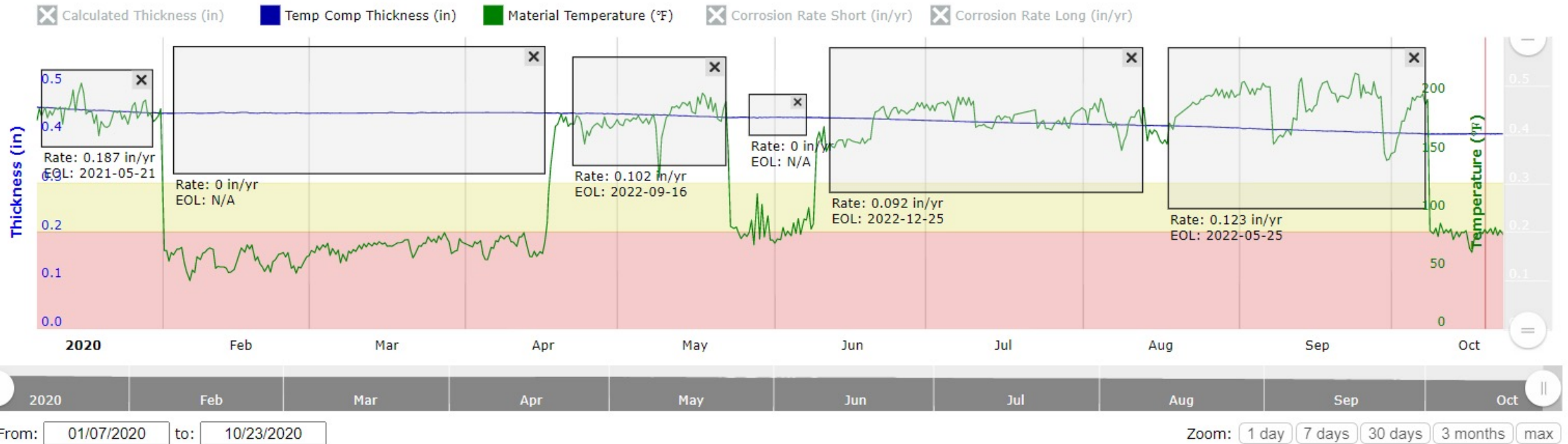
> > VCM > DWG 61-535 CML 29 > U117PS > U117PS-1

Start Date: 2019-10-27

End Date: 2020-10-26

Update Sensor Results Range

Clear selections



12 COMPELLING REASONS TO USE microPIMS

1. Industry standard 900 MHz LoRaWAN industrial wireless connectivity
2. Star-network topology with >5,000 sensor nodes per gateway
3. 15-year battery life at 1 reading per day
4. Commercially available D-cell batteries
5. Two sensor types: standard temp dual-element and ultra-high temp delay line -40°F – 932°F (-40°C to 500°C)
6. Material range: 0.040" (1mm) up to 4.0" (100 mm) with accuracy of 0.001" (0.025 mm)
7. Built in thermo-couple for temperature-compensated thickness data
8. Fast and easy install – ~15 mins with simple band straps for pipes and magnetic base for tanks & vessels
9. Permanently or temporarily installed
10. Sensors rated for ATEX Zone 0 Certification / Class 1, Div. 1 hazardous atmospheres
11. Three data-management options: Cloud, private network or on-premise HW/SW solution Monthly subscription model available
12. Access to data is simple and secure for trending, analysis, export or reporting



20,000+ SENSORS INSTALLED

ACROSS OVER 150 CUSTOMERS WORLDWIDE



ExxonMobil



COSASCO





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02.09.2022*

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