

IMI

Process Automation

IMI TWTG NEON Sensors & Software

Nodes.sh community Treffen Oct. ´26

LoRaWAN® in maritimen Anwendungen / Vibration Monitoring

Digital Twin
Solving Pain Points

Unplanned Downtime: Digital twins enable predictive maintenance, minimizing unplanned downtime by delivering proactive interventions based on real-time data and predictive analytics.

Inefficient Maintenance Practices: Digital twins optimize traditional maintenance practices by streamlining schedules and reducing costs through predictive maintenance strategies.

Reducing Potential Safety Issues: Digital twins lessen the need for manual rounds by providing real-time monitoring and analysis of equipment and processes, thus mitigating potential safety risks.

Missed Energy Transition Insight and Data: Digital twins facilitate energy transition initiatives by optimizing insights into energy consumption patterns and resource utilization, enabling stakeholders to make informed decisions and collaborate effectively



Built for **hazardous locations** — and everywhere else

Six sensors, four measurements. One wireless protocol. LoRaWAN enabled. ATEX certified.





Vibration

LoRaWAN · Non-ATEX · ATEX · Zone 0





Temperature

LoRaWAN · Non-ATEX · ATEX · Zone 0/1





Pressure

LoRaWAN · Non-ATEX · ATEX · Zone 0





Acoustic

LoRaWAN · Non-ATEX · ATEX · Zone 0

NEON Contact Sensor
Specification

Technology:

- Working Principle: Provide remote insight in the position of various assets
- Safety alerts
- LoRaWAN 868, 915, 923 MHz Wireless Protocols
- Only available as NEON Ex Variant.

Business Benefits:

- Knowing the correct position of assets in its designated location makes processes safer and more efficient (i.e. Safety showers, Fire extinguishers, Jetty ladders)

Roll-out quantity & Locations:

- International roll-out (EU, North America, Africa)



USE CASE · MARINE JETTY

IMI

Stop jetty collisions.

A contact sensor knows if the **jetty is parked** and alerts before a ship **departs on it**.





01 The Problem

- **Ships depart** with the jetty still down
- Collisions cost **~$100k a year** in repairs
- Nothing tells the **control room it moved**

02 Our Solution

- **Magnet-sensing contact sensor** confirms position
- **Instant alert** to the control room when it moves
- **Wireless, battery** — fits any jetty, no wiring

03 The Impact

$100k	~$30k/day	Instant
Collision repairs avoided / yr	Demurrage on a held tanker	Alert to control room

INDUSTRIES Marine terminals · Ports · Oil & Gas · Chemical · Bulk logistics

NEON Vibration Sensor
One sensor — ATEX & Non-ATEX variants



Non-ATEX · ATEX · Zone 0

Same sensor either way — the ATEX housing adds the certification, the Non-ATEX is available at a lower price.

- **Three-axis measurement** — velocity, acceleration, envelope
  → Nothing develops unseen — one fitting covers every failure mode of the machine
- **0.5 Hz – 6.6 kHz** extended frequency range
  → Slow agitators and fast gearboxes get the same sensor — no special-case purchases
- **Full-spectrum FFT — 8,192 lines, on demand via LNS**
  → Your specialist diagnoses from their desk — no site visit for a spectrum
- **Machine Fault Indicator** — on-device fault detection
  → The sensor says 'bearing, stage 2' — no vibration analyst needed for first investigation
- **Time synchronization** for digital-twin time stamps
  → On a trip you see the whole drive train at the same instant — root cause, not guesswork
- **–40 °C to +80 °C** · fast mounting on live assets
  → Monitored this afternoon, not during the next shutdown

Wired-sensor performance, LPWAN economics | LoRaWAN · 868 / 915 / 923 MHz | SolidRed integrated

USE CASE · INDUSTRIAL COOLING

Predict bearing failure.

Vibration flags **bearing wear** months before a compressor trips — so the fix is **planned**.





01 The Problem

- **Wear stays silent** until the bearing is failing
- A seized compressor **trips the whole cooling loop**
- Emergency swaps risk **rotor & gearbox damage**

02 Our Solution

- **Envelope spectrum to 6.6 kHz** surfaces bearing defect bands
- **Machine Fault Indicator** — automatic early fault detection
- **SolidRed** flags the early alarm signs automatically

03 The Impact

-45%	€50–250k	Weeks
Unplanned downtime	Saved per rotating asset	Earlier warning to plan the fix

INDUSTRIES Refining · Petrochemical · Chemical · Power · HVAC & Utilities · Food & Beverage

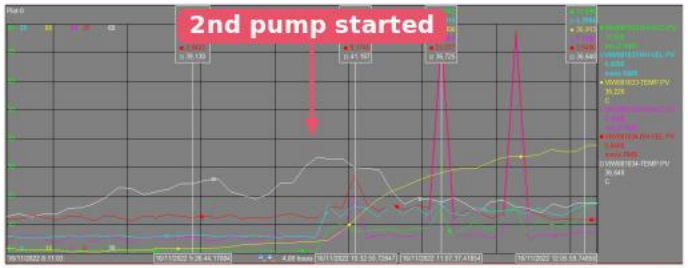
USE CASE · VACUUM PUMPS

Stop pump cavitation.

Monitoring caught **cavitation** that appears only with **two pumps running** — missed by spot checks.



Trend two pumps — cavitation appears once the 2nd pump starts



01 The Problem

- **Starting the 2nd pump** tips the skid into cavitation
- **Spot checks** rarely caught both pumps running
- So the fault **stayed invisible for years**

02 Our Solution

- **Near-continuous measurement** — both pumps, all the time
- Sees cavitation **the moment it happens**, not by luck
- **Acceleration + velocity** pinpoint each transient

03 The Impact

€300k+
Saved per year (electricity)

~40%
Efficiency saved vs. cavitating pump

≈500 t
CO_2 avoided per year

INDUSTRIES: Refining · Chemical · Water & Wastewater · Power · Oil & Gas