IMI

Process Automation

Our product brands:
TWTG

NEON Sonic Steam Trap Monitoring

Datasheet

This document applies to the NEON Sonic Steam Trap Monitoring, Ex Variant (DS-LD-SX-02-00)

Breakthrough engineering for a better world

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1 Description

IMI's Neon technology represents a standardised approach to collecting data points from operational environments. This creates a general approach to integrated data collection within existing IT ecosystems.

The IMI NEON product range supports all industrial customers moving towards LoRaWAN as the Industrial IoT network of the future.

The LoRaWAN network provides industrial operations with a secure solution that can scale up tens of thousands of sensors. It can cover entire sites with only a few gateways while the low-power approach extends the lifetime of our NEON product range.

Knowledge is the basis of good decision making.
The NEON Steam Trap Sensor utilises IMI TWTG innovative firmware integrated in the NEON Sonic hardware to monitor steam trap performance. The solution is designed to be implemented within minutes and uses on-board intelligence to determine the operating state of the of monitored steam trap, either blocked, leaking, healthy.

The NEON Sonic sensor uses non-intrusive acoustic and temperature monitoring for process temperatures up to 450°C. Real time values, and alarms can be analysed using SolidRed or integrated into existing systems.

2 Features

NEON product family

- Fully LoRaWAN compatible
- End-to-End encryption & cryptographic algorithms from field to software
- 100% ownership of data
- IECEx-ATEX zone 0 certified
- Battery powered for easy deployment
- Installation within live environments
- Integration with existing data backends or DCS
- Visualisation via IMI's SolidRed Suite or any other IoT platform
- Detailed and extensive documentation
- Provision of Life cycle Support

NEON Sonic - Steam Trap Monitoring

- Measures Sound Pressure Level (SPL), Sensor Temperature, and Ambient Temperature.
- Determines Steam Trap Condition to be "OK", "Leak", or "Blocked"
- Measuring range:
  15 Hz .. 85 kHz
- Acoustic overload point:
  130 dBSPL
- Wireless protocols:
  LoRaWAN 868 MHz, 915 MHz and 923 MHz

Contents

Revision History

Revision	Date	Description
A1	24-11-2025	Initial version

3 Specifications

Product name	
Product name	NEON Sonic - Steam Trap Monitoring

3.1 Product specifications transmitter

Environmental conditions	
Operating temperature range	–40 °C .. 70 °C (–40 °F .. 158 °F)
Operating humidity range	0% RH .. 100% RH
Storage temperature range	10 °C .. 30 °C (50 °F .. 86 °F)
Water and dust resistance	IP66
Altitude	Up to 3000 m (9842 ft)
Usage	Indoor and outdoor
Mechanical	
Enclosure material	Molded plastic
Weight (including mounting bracket)	330 g (11.64 oz)
Dimensions	106 mm × 86 mm × 57 mm (4.17" × 3.39" × 2.24")
Maximum cable length	Limited by equipment output parameters
Installation	
Transmitter	Band clamp or bolts (not included)
Power supply	
Battery rated voltage	3.6 V
Battery rated capacity	17 Ah
Battery	
Battery type (replaceable)	1x Type D
Battery life	14 years, at 25 °C (77 °F) (Depending on average ambienttemperature, type of sensor and network quality)
Conditions, at 25°C (77°F)	Message interval: 1 message / 12 hours Measurement interval: 12 hours
Connectivity	
Protocol	LoRaWAN (private LoRaWAN)
Frequency band	868 MHz, 915 MHz and 923 MHz compatible
Maximum RF output power	+14 dBm
Provisioning	
Data matrix code/ Serial number	Serial number (read only)
NFC	Serial number (read only)

3.2 Supported sensors

Supported sensor	
Product name	NEON Sonic Ex Variant
Application	Steam Trap Monitoring
Type identification	DS-SX-02-00
Functionality	
Independent event-based message triggers	1. Timer 2. Button press 3. Steam trap condition alert
Adjustable measurement interval	Flexible, 1 minute resolution (relative or absolute)
Adjustable message interval	Always, or on condition
Time synchronisation	Time synchronisation for multiple sensors Accuracy 12mSec
Steam trap fault indicator	Edge Intelligence spectral analysis 1. Blocked Trap 2. Leaking Trap
Firmware update over air	In accordance with LoRa Alliance specifications: TS006 - 1.0.0 TS005 - 2.0.0 TS004 - 2.0.0
Measurements	
Measuring range	15 kHz ...85 kHz (3 dB points)
Acoustic overload point	130 dBSPL
Temperature range	Sensor: –40 °C .. 260 °C (–40 °F .. 500 °F) Sensor + Extension: –40 °C .. 450 °C (–40 °F .. 842 °F) Ambient: –40 °C .. 70 °C (–40 °F .. 158 °F)
Installation	
Sensor Sensor + Extension	Pipe mount waveguide Pipe mount waveguide, with modularly extendable thermal riser

3.3 Certifications

Certifications	
ATEX/IECex rating	Ex II 1G Ex ia IIC T4 Ga
ATEX/IECEx standards	EN/IEC 60079-0:2018 EN 60079-11:2012 IEC 60079-0:2017 IEC 60079-11:2011
ATEX/IECEx certificates	22ATEX0004X / DEK22.0004X
cFMus Rating (pending)	IS Class I, Division 1, Group ABCD T4 Class I, Zone 0 AEX/Ex ia IIC T4 Ga
cFMus standards (pending)	FM Class 3600 FM Class 3610 FM Class 3810 ANSI/UL 60079-0 ANSI/UL 60079-11 CAN/CSA-C22.2 No. 61010-1 CAN/CSA-C22.2 No. 60079-0 CAN/CSA-C22.2 No.60079-11
cFMus certificates (pending)	FM22US0061X / FM22CA0043X
CE	EN 300 220-1 V3.1.1 EN 300 220-2 V3.2.1 EN 301 489-1 V2.2.3 EN 301 489-3 V2.1.1 EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019 EN 62311:2020 EN 60529:1911+A1:2000+A2:2013
UKCA	Radio Equipment Regulation 2017
WEEE	Directive 2033/108/EC
RoHS	2011/65/EU

4 Order matrix

Steam Trap Sensor		STS	X	0	X	X
Use case	Steam Trap Sensor	STS				
Transmitter connection	Remote mount - transmitter connected to sensor via remote cable		W			
	Direct mount- transmitter mounted on to sensor		D			
Ex approval	Yes			0		
LoRa Region	EU868				1	
	US915				2	
	AS923-1				3	
	AS923-2				4	
	AS923-3				5	
	AS923-4				6	
	AU915				7	
	IN865				8	
Temperature Variant	-40 °C .. 260 °C (-40 °F .. 500 °F)					0
	-40 °C .. 450 °C (-40 °F .. 842 °F)					1

4.1 Accessories

Description	Order code
Waveguide - DN15-20 (Pipe diameter range ø21.3mm - ø26.7mm) - including 1 waveguide set, 2 bolts	WG15-STS
Waveguide - DN25-32 (Pipe diameter range ø33.4mm - ø42.2mm) - including 1 waveguide set, 2 bolts	WG25-STS
Waveguide - DN40-50 (Pipe diameter range ø48.3mm - ø60.3mm) - including 1 waveguide set, 2 bolts	WG40-STS
Extension - 50mm (Temp. range 260 °C .. TBD °C (500 °F .. TBD °F)) - including 1 extension	EX50-STS
Extension - 100mm (Temp. range 260 °C .. TBD °C (500 °F .. TBD °F)) - including 1 extension	EX100-STS
Extension - 150mm (Temp. range 260 °C .. TBD °C (500 °F .. TBD °F)) - including 1 extension	EX150-STS

4.2 Spare parts

Description	Order code
Battery replacement kit - including 1 battery assembly, 4 O-rings, 1 gasket	BATT-DS-02
Bracket set installation (Direct mount for Transmitter) - including 1 bracket, 2 washers, 2 screws	BRKT-STS-DSD

Process Automation

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