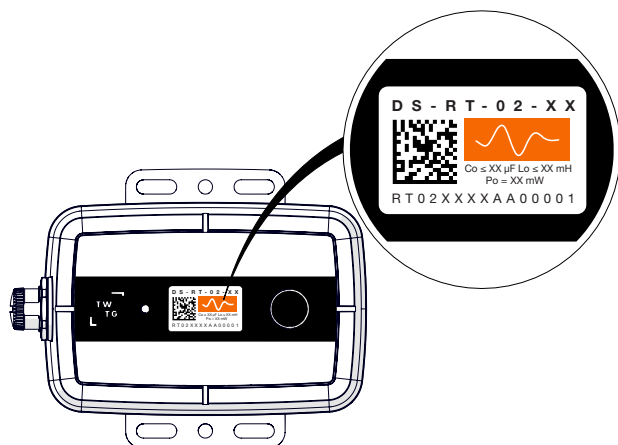




This document applies to version 2 of the:
NEON Ratiometric Transmitter (DS-RT-02-XX)
NEON Pressure Sensor (DS-RT-PS-02-XX)
NEON Pressure Gauge (DS-RT-PG-02-XX)

1 Description

NEON stands for a standardized approach to collecting data points from the operational environment and in doing so, creates a general approach to integrated data collection within existing IT ecosystems.

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

The LoRaWAN network gives industrial operations a secure solution, which scales-up to tens of thousands of sensors, covers complete sites with only a small amount of gateways and best of all, the low-power approach means that the lifetime of the NEON products is extended dramatically.

The NEON Pressure Sensor is available in several pressure ranges and various other options, including one with a Badotherm gauge. The analogue meter addresses an engineer's need for immediate visual feedback when performing manual inspections, delicate maintenance, or possibly emergency procedures. This design is best for digital and analogue workflows, with less failure points than competing installations.

NEON Pressure Sensors provide data for predictive maintenance and monitoring and issue alerts when tolerances are breached. They are retrofittable, with up to ten years of battery life, and communicate wirelessly via a local LoRaWAN network. As with all products in the NEON range, the sensors are IECEx, ATEX certified I-IoT devices.

2 Features

NEON Product Family

- Fully LoRaWAN compatible
- Based on the highest security standards
- 100% ownership of data
- IECEx-ATEX zone 0 certified
- Battery powered for easy deployment
- Installation within live environments-continuous operation
- Integration with existing data backends or DCS
- Visualisation via TWTG's SolidRed Suite or any other IoT platform
- detailed and extensive documentation
- Provision of Life cycle Support

NEON Ratiometric Transmitter

- Sensor:
Digital only: a sensor with digital readout to the transmitter. No visual readout.
- Options:
With gauge: a Badotherm analogue gauge with built in digital readout to the transmitter.
- Range (relative, bar or PSI, $\pm 0.4\%$ fs):
Digital only: -1 bar .. 9 bar or 0 bar .. 1000 bar
Version with gauge: -1 bar .. 600 bar
- Mounting:
Inside and outside UNF, NTP, metric and G thread options
- Wireless protocols:
LoRaWAN 868 MHz, 915 MHz and 923 MHz
- Dimensions:
100 mm $\times$ 70 mm $\times$ 45 mm (L $\times$ W $\times$ H)



Contents

1 Description	1	4 Order Matrix Pressure Sensor	7
2 Features	1	4.1 Pressure Sensor BAR	7
3 Specifications	3	4.2 Pressure Sensor PSI	8
3.1 Product Specifications Transmitter	3	5 Order Matrix Pressure Gauge	9
3.2 Supported Sensors	3	5.1 Pressure Gauge BAR	9
3.3 Certifications	5	5.2 Pressure Gauge PSI	10

Revision History

Revision	Date	Description
A1	28-10-2022	Concept version
A2	24-11-2022	Updated FCC/ISED declaration
A3	13-12-2022	Updated after review/ draft version
A4	21-02-2023	Updated UI
A5	15-05-2023	Updated warnings and control drawing
A6	12-06-2023	Updated Product dimensions
A7	19-09-2023	Added magnet kit & updated output power
A8	21-09-2023	Added UK DoC reference
B1	02-10-2023	Added PG items & updated after review
B2	23-11-2023	Updated FM Certificate info
C1	07-11-2024	Unified user manuals
C2	09-12-2024	Updated pressure options

3 Specifications

Product name

Product name NEON Ratiometric Transmitter

Type identification transmitter DS-RT-02-00

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 10 years, at 25 °C (77 °F)
(Depending on average ambient temperature and network quality)

Conditions, at 25 °C (77 °F) Message interval: 1 message / hour
Measurement interval: 1 measurement / 5 min

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

NEON Ratiometric Transmitter

Datasheet - C2



Supported Sensor

Product name	NEON Pressure Gauge
Type identification	DS-PG-02-XX

Functionality

Independent event-based message triggers	1. Above 2. Below 3. Increasing 4. Decreasing
--	--

Adjustable measurement interval	1 min .. 240 min
---------------------------------	------------------

Adjustable Message interval	0 .. 1008 measurements
-----------------------------	------------------------

Sensor

Independent event-based message triggers	0-14.5 PSI .. 0-3625.9 PSI (0-1 Bar .. 0-250 Bar) Relative, other ranges and types on request
--	--

Accuracy

Characteristic line a	±0.3 %fs (full scale)
Resolution	±0.1 %fs (full scale)
Thermal characteristic 2 max.	±0.2 %fs (full scale) per 18 °F (10 °C)
Long term stability acc. EN 60700-1 max.	±0.25 %fs (full scale)

Connection

Male thread	Standard: G ½" A or NPT ½" (Optional: 1/4" or 3/8") other types on request
Wetted materials	Pressure connection: Stainless steel AISI 316(L) Sensing element: TP 316 Measuring cell: Ceramic Sensor seal: FPM

Pressure Connection

Tolerable overload / Rupture pressure	2.5 x fs
---------------------------------------	----------

Mechanical

Connector Sensor	M12 Connector (4 Pins, A coded, male)
Diameter gauge	100 mm
Case material	AISI 316
Bezel material	AISI 316
Mounting flange material	AISI 316 (L)

Supported Sensor

Product name	NEON Pressure Sensor
Type identification	DS-PS-02-XX

Functionality

Independent event-based message triggers	1. Above 2. Below 3. Increasing
--	---------------------------------------

Continues on next page

	4. Decreasing
Adjustable measurement interval	1 min .. 240 min
Adjustable Message interval	0 .. 1008 measurements
Sensor	
Pressure range	-14.5-130.5 PSI .. 0-14,503.8 PSI (-1-9 Bar .. 0-1000 Bar) Relative, other ranges and types on request
Accuracy	
Characteristic line a	±0.3 %fs (full scale)
Resolution	±0.1 %fs (full scale)
Thermal characteristic 2 max.	±0.2 %fs (full scale) per 18 °F (10 °C)
Long term stability acc. EN 60700-1 max.	±0.25 %fs (full scale)
Connection	
Male thread	Standard: G ½" (other types on request)
Wetted materials	Pressure connection: Stainless steel 1.4404/ AISI 316L Sensor material: Stainless steel
Pressure connection	
Tolerable overload / Rupture pressure	2.5 x fs
Mechanical	
Connector Sensor	M12 Connector (4 Pins, A coded, male)

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	IS Class I, Division 1, Group ABCD T4 Class I, Zone 0 AEX/Ex ia IIC T4 Ga
cFMus standards	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	FM22US0061X / FM22CA0043X
CE	EN 300 220-1 V3.1.1 EN 300 220-2 V3.2.1 EN 301 489-1 V2.2.3

Continues on next page

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 Pressure Sensor

4.1 Pressure Sensor BAR

Ordermatrix Pressure sensor BAR	DS-RT-PS-02-	X	03	X	X	X	X	X
Region	Global	00						
Cable length	3 m		03					
Pressure range (relative)	0... 2,5 bar			b06				
	0... 4 bar			b07				
	0... 6 bar			b08				
	0... 10 bar			b09				
	0... 16 bar			b10				
	0... 25 bar (3)			b11				
	0... 40 bar			b12				
	0... 60 bar			b13				
	0... 100 bar			b14				
	0... 160 bar			b15				
	0... 250 bar			b16				
	0... 400 bar			b17				
	0... 600 bar			b18				
	0... 1000 bar			b19				
	-1... 9 bar			b20				
Connection (inside thread F)	7/16 - 20 UNF				1			
	1/2 - 14 NPT (1)				2			
	G ¼ with O-Ring seal FPM				3			
Connection (Outside thread M)	7 /16 -20 UNF sealing cone				4			
	¼ -18 NPT				5			
	G ¼ sealed at back DIN EN ISO 1179-2 with profile seal ring in FPM				6			
	G ¼ sealed at back and manometer with profile seal ring in FPM				7		Y1	
	R ¼ acc. to EN 10226				8			
	G ½ sealed at back and manometer with profile seal ring in FPM (3)				9	X1		
	7 /16 -20 UNF sealed at back SAE 4 with O-Ring seal FPM				10	X1		
	1/8 - 27 NPT (1)				11			
	G 1/8 sealed at front (1)				12			
	G 1/8 sealed at back DIN EN ISO 1179-2 with Profile seal ring in FPM (2)				13	X1		
	M10x1 sealed at back DIN EN ISO 1179-2 with profile seal ring in FPM (1)				14	X1		
	M20x1.5 sealed at front and manometer (combi)				15			
	G ¼ sealed at front				16			
	G ½ sealed at front				17			
Application	Standard (3)				1			
	Drinking water approval NSF/ANSI 61/372, WRAS				2		Y1	
Pressure orifice	Without orifice (inclusive pressure tip orifice from 100 bar on) (3)						1	
	With pressure orifice						2	
Custom Options	No							1
	Yes							C

DS-RT-PS-02-R & 03-VWXYZ	
DS-RT	Transmitter
PS	Pressure Sensor
02	Series
R	Region
03	Cable length
V	Pressure range (relative)
W	Connection
X	Application
Y	Pressure orifice
Z	Custom options

(1) Pressure range ≤ 60 bar / (2) Pressure range ≤ 250 bar (max. rupture pressure 1000 bar) / (3) Standard pressure sensor

4.2 Pressure Sensor PSI

Ordermatrix Pressure sensor PSI	DS-RT-PS-02-	X	03	X	X	X	X	X
Region	Global	00						
Cable length	3 m		03					
Pressure range (relative)	0... 30 psi			p05				
	0... 60 psi			p06				
	0... 100 psi			p07				
	0... 200 psi			p09				
	0... 300 psi			p10				
	0... 500 psi			p11				
	0... 750 psi			p12				
	0... 1000 psi			p13				
	0... 2000 psi			p14				
	0... 3000 psi			p15				
	0... 5000 psi			p16				
	0... 7500 psi			p17				
	0... 14500 psi			p18				
	-15... 310 psi			p19				
Connection (inside thread F)	7/16 - 20 UNF				1			
	1/2 - 14 NPT (4)				2			
	G 1/4 with O-Ring seal FPM				3			
Connection (Outside thread M)	7 /16 -20 UNF sealing cone				4			
	1/4 -18 NPT				5			
	G 1/4 sealed at back DIN EN ISO 1179-2 with profile seal ring in FPM				6			
	G 1/4 sealed at back and manometer with profile seal ring in FPM				7		Y1	
	R 1/4 acc. to EN 10226				8			
	G 1/2 sealed at back and manometer with profile seal ring in FPM				9	X1		
	7 /16 -20 UNF sealed at back SAE 4 with O-Ring seal FPM				10	X1		
	1/8 - 27 NPT (4)				11			
	G 1/8 sealed at front (4)				12			
	G 1/8 sealed at back DIN EN ISO 1179-2 with Profile seal ring in FPM (5)				13	X1		
	M10x1 sealed at back DIN EN ISO 1179-2 with profile seal ring in FPM (4)				14	X1		
	M20x1.5 sealed at front and manometer (combi)				15			
	G 1/4 sealed at front				16			
	G 1/2 sealed at front				17			
Application	Standard				1			
	Drinking water approval NSF/ANSI 61/372, WRAS				2		Y1	
Pressure orifice	Without orifice						1	
	With pressure orifice						2	
Custom Options	No							1
	Yes							C

DS-RT-PS-02-R & 03-VWXYZ	
DS-RT	Transmitter
PS	Pressure Sensor
02	Series
R	Region
03	Cable length
V	Pressure range (relative)
W	Connection
X	Application
Y	Pressure orifice
Z	Custom options

(4) Pressure range $\leq$ 870 psi / (5) Pressure range $\leq$ 3000 psi (max. rupture pressure 14500 psi)

5 Order Matrix Pressure Gauge

5.1 Pressure Gauge BAR

Ordermatrix Pressure Sensor& Gauge BAR	DS-RT-PG-02-	X	03	X	X	X	X	X
Region	Global	00						
Cable length	3 m		03					
Pressure range (relative)	-1... 0 bar			b01				
	-0,6... 0 bar			b02				
	0... 0,6 bar			b03				
	0... 1,0 bar			b04				
	0... 1,6 bar			b05				
	0... 2,5 bar			b06				
	0... 4 bar			b07				
	0... 6 bar			b08				
	0... 10 bar			b09				
	0... 16 bar			b10				
	0... 25 bar (1)			b11				
	0... 40 bar			b12				
	0... 60 bar			b13				
	0... 100 bar (1)			b14				
	0... 160 bar			b15				
	0... 250 bar			b16				
Connection	G ½				18			
	1/2 - NPT (1)				19			
	R 1/2				20			
	M20x1.5				21			
	Custom				C			
Mounting	Bottom - Direct mounting (1)					1		
	Custom					C		
Pointer	Adjustable slotted pointer (1)						1	
	Micro adjustable pointer						2	
	Custom						C	
Custom Options	No							1
	Yes							C

(1) Standard pressure gauge

DS-RT-PG-02-R & 03-VWXYZ	
DS-RT	Transmitter
PG	Pressure Sensor with Gauge
02	Series
R	Region
03	Cable length
V	Pressure range (relative)
W	Connection
X	Mounting
Y	Pointer
Z	Custom options

5.2 Pressure Gauge PSI

Ordermatrix Pressure Sensor& Gauge PSI	DS-RT-PG-02-	X	03	X	X	X	X	X
Region	Global	00						
Cable length	3 m		03					
Pressure range (relative)	0... 30 psi			p01				
	0... 60 psi			p02				
	0... 100 psi			p03				
	0... 200 psi			p04				
	0... 300 psi			p05				
	0... 500 psi			p06				
	0... 1000 psi			p07				
	0... 2000 psi			p08				
Connection	G 1/2				18			
	1/2 - NPT				19			
	R 1/2				20			
	M20x1.5				21			
	Custom				C			
Mounting	Bottom - Direct mounting					1		
	Custom					C		
Pointer	Adjustable slotted pointer						1	
	Micro adjustable pointer						2	
	Custom						C	
Custom Options	No							1
	Yes							C

DS-RT-PG-02-R & 03-VWXYZ	
Product	
DS-RT	Transmitter
PG	Pressure Sensor with Gauge
02	Series
R	Region
03	Cable length
V	Pressure range (relative)
W	Connection
X	Mounting
Y	Pointer
Z	Custom options

