

Radio unit with LoRaWAN® for WIKA measuring instruments

For applications in hazardous areas

Model NETRIS®3

WIKI data sheet AC 40.03



For further approvals,
see page 5



Applications

- Data transmission from measuring instruments for preventive maintenance and also monitoring of machinery for big-data analysis in a cloud
- Process industry: oil and gas, chemical and petrochemical industries, water and wastewater as well as power generation
- For use in hazardous areas

Special features

- IIoT-capable with LoRaWAN® transmission
- Battery-operated LoRa® wireless transmission based on LPWAN technology
- High transmission range for the measured values (up to 10 km) with long battery life (up to 10 years)
- Exchange of the radio unit possible in ATEX zones



Radio unit, model NETRIS®3

Description

The model NETRIS®3 IIoT-capable radio unit is used wherever centralised, web-based remote monitoring of measuring instrument data is required.

The Ex radio unit already receives the data digitally from a WIKI measuring instrument via the intrinsically safe interface. The fully encapsulated instrument with IP65 ingress protection transmits the received data continuously to a cloud via configurable data packets with LoRaWAN®.

Battery-operated wireless transmission via LoRa® ("long range") is based on LPWAN technology ("low-power wide-area network") to enable high transmission ranges and long battery life.

The radio unit is connected to a suitable WIKI measuring

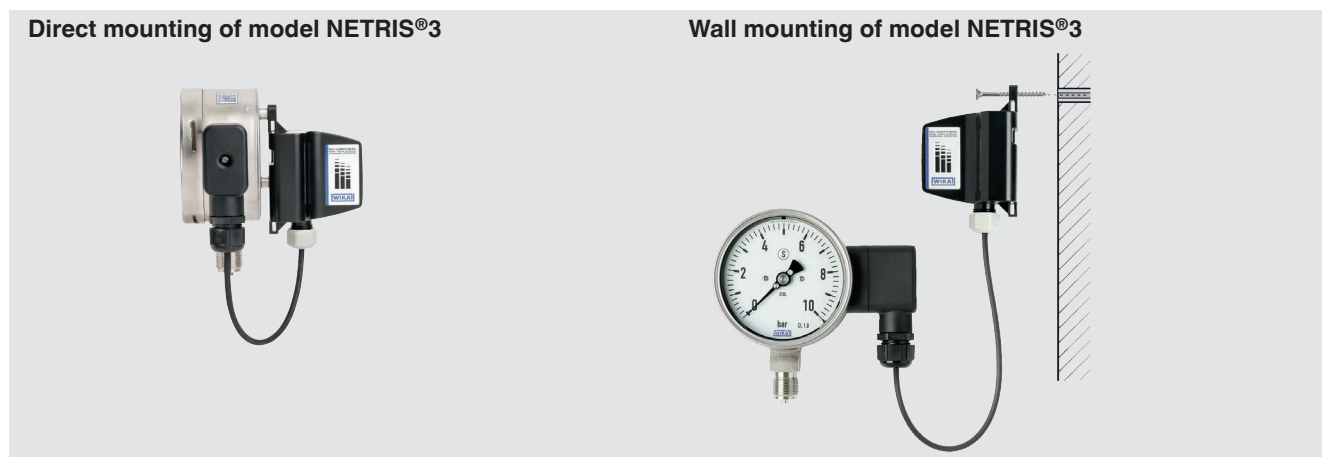
instrument via the attached plug connector (M12 or angular connector). Exchanging the radio unit during operation is also possible within the ATEX zone.

The simple web configuration via the cloud and the LoRaWAN® network ("long range wide area network") enables complete end-to-end encryption with bidirectional communication for secure IIoT applications.

The NETRIS®3 radio unit is part of the WIKI IIoT solution. With this, WIKI offers a holistic solution for your digitalisation strategy.

Installation example

Radio unit, model NETRIS®3 with mounted model PGU2x.100 pressure gauge



Mounting variants for the model NETRIS®3 radio unit

The radio unit can be mounted either by direct mounting to the WIKA measuring instrument or remotely in a more suitable location.

Specifications

Overview of versions of suitable WIKA measuring instruments		
Model	Description	
	PGU2x.100	Bourdon tube pressure gauge → See data sheet PV 42.03
	TGU	Gas-actuated thermometer → See data sheet TV 17.13
	TRU	Miniature resistance thermometer → See data sheet TE 63.03
	FLRU-SFI	Reed level transmitter → See data sheet LM 20.13
	PEU-2x	Pressure sensor → See data sheet PE 87.24

Basic information	
Case	Grilamid TR 90 UV
Mounting	Mounting kit for NETRIS®3, all mounting variants → Included in the scope of delivery

Radio standard	
LoRa®	
LoRaWAN® specification	Version 1.0.3
Functions	■ Registration ■ Configuration of measuring and transmission rate ■ Transmitting measured values ■ Alarm management
Range in free field ¹⁾	Typically 10 km [6,21 mi]
Antenna	Internal
Measurement interval	60 seconds to transmission rate, max. 48 hours
Transmission interval	1 minute to 7 days (maximum transmission rate limited by ETSI EN300 220)
Max. output power	14 dBm
Security	Full end-to-end encryption → For details on security, see website: https://loro-alliance.org

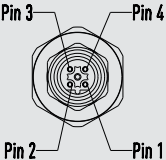
1) The range depends on the topography. 10 km [6,21 mi] can be achieved in free field conditions with a spreading factor of 12.

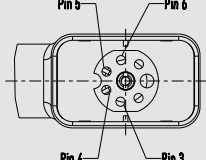
Voltage supply and performance data	
LoRa®	
Battery	Lithium thionyl chloride battery (model SAFT LM17500), potted
Battery voltage	DC 3 V
Battery life ¹⁾	< 10 years

1) At reference conditions a measurement and a transmission every hour (24 x a day) takes place at spreading factor 10.

Electrical connection	
Connection type	Cable length
Angular connector	■ 0.19 m [0.623 ft] ■ 2.85 m [9.35 ft]
Circular connector M12 x 1 (4-pin)	■ 0.5 m [1.64 ft] ■ 2.85 m [9.35 ft]

Pin assignment

Circular connector M12 x 1 (4-pin)		
	1	GND
	2	UWI: SSM → CM
	3	VCC
	4	UWI: CM → SSM

Angular connector		
	3	UWI: SSM → CM
	4	UWI: CM → SSM
	5	GND
	6	VCC

Legend

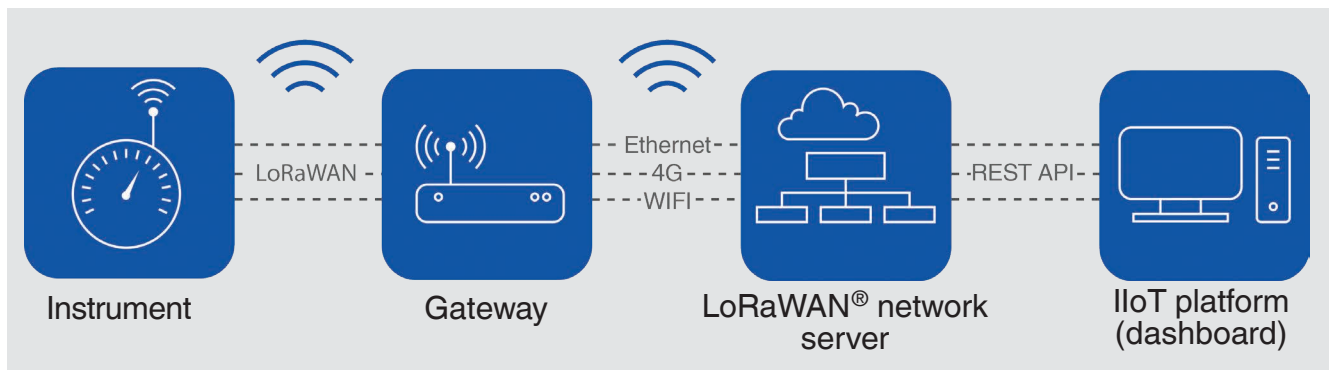
UWI	Unified Wika Interface (UWI)
GND	Ground
VCC	Supply voltage
SSM	Sensor model
CM	Communication module

Operating conditions	
Ambient temperature range	-40 ... +60 °C [-40 ... +140 °F]
Storage temperature range	-40 ... +70 °C [-40 ... +158 °F]
Humidity	20 ... 90 % relative humidity
Condensation	Non-condensing
Vibration resistance per IEC 60068-2-6	a = 1g (7 ... 18 Hz)
	10 ... 14.53 Hz
	A = 0.8 mm (18 ... 50 Hz)
	a = 5g (50 ... 200 Hz) ¹⁾
Shock resistance per IEC 60068-2-31 ¹⁾	25g, 6 ms
Free fall per IEC 60068-2-31	
Individual packaging	1.2 m [3.94 ft]
Multiple packaging	0.5 m [1.6 ft]
Operating altitude per IEC 61010-1	≤ 2,000 m [6,562 ft]
Ingress protection per IEC/EN 60529	IP65
Pollution degree per EN 61010-1	4

1) Mounting with cable ties can only be made under vibration-free conditions.

LPWAN infrastructure

A measuring instrument that allows wireless remote monitoring must be integrated into the IIoT infrastructure. The following schematic illustration shows a typical LPWAN infrastructure:



Data from an IIoT-capable measuring instrument is transmitted wirelessly to the gateway. It is ensured that only authorised devices may communicate with the network server. For this, the measuring instrument must first be coupled with the network server. In LoRaWAN®, the wireless transmission can be up to 10 km [6,21 mi]. The ranges are dependent on factors such as topography, placement of the gateway and environmental influences.

Measured values from several hundred LoRaWAN®-enabled IIoT instruments, e.g. model PGU23.100 with NETRIS®3, can be collected by a gateway and transmitted to the network server via cable (e.g. Ethernet) or over-the-air (e.g. 4G or WLAN).

In a web-based IIoT platform, the measured data can be stored, alarms can be set and configurations can be made on the instrument. If the limit values are exceeded, alarm messages can be sent as notification via e-mail from the cloud. The measured data can be analysed via the visualisation in the dashboard, thus enabling remote monitoring of the measured values. Customers using a WIKA cloud solution are provided with the “myWIKa wireless device” app to support commissioning the measuring instrument.

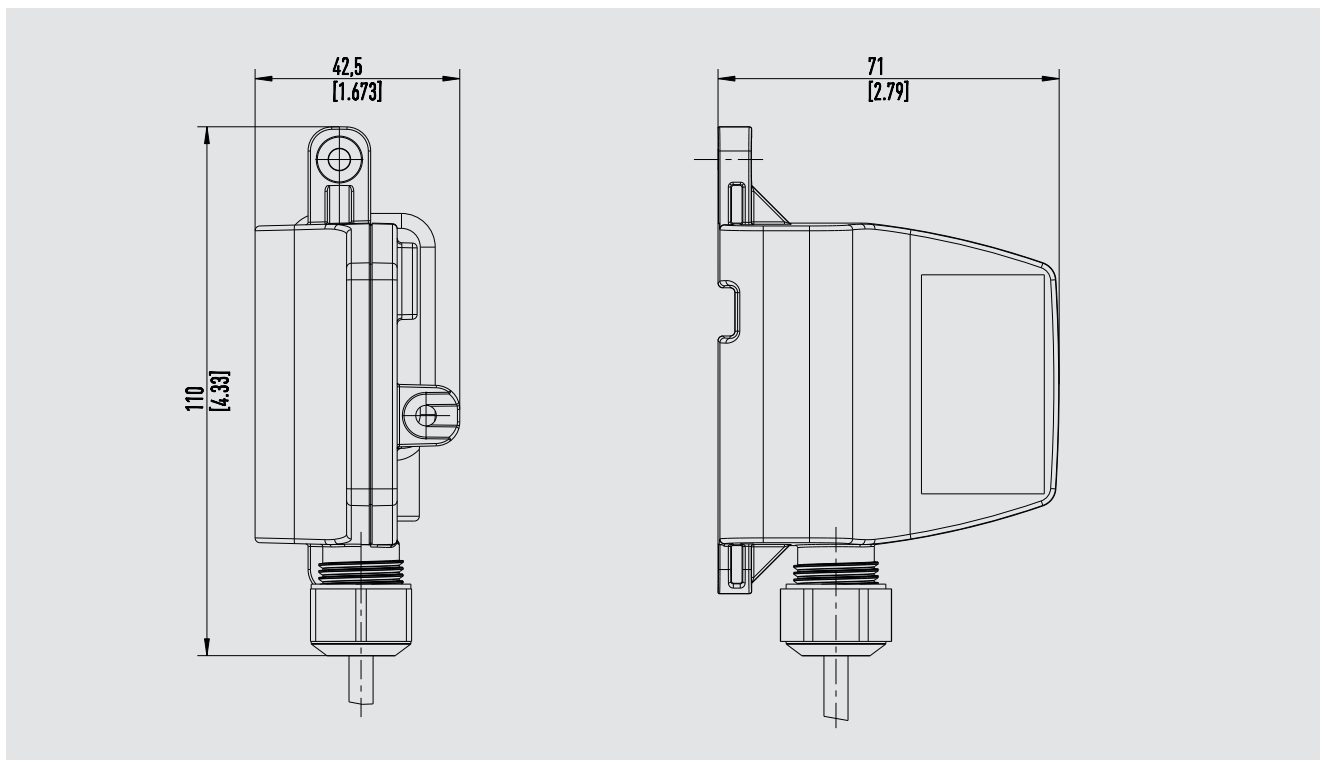
Approvals

Logo	Description	Region
	EU declaration of conformity	European Union
	RED – Radio Equipment Directive The instrument may be used without restriction in the following areas: EU and UK, CH, NO, LI	
	RoHS directive	
	EU declaration of conformity	European Union
	ATEX directive Hazardous areas - Ex i Zone 0 gas II 1(1)G Ex ia [ia Ga] IIC T4 Ga Zone 20 dust II 1(1)D Ex ia [ia Da] IIIB T ₂₀₀ 135 °C Da	
	IECEx (option) Hazardous areas - Ex i Zone 0 gas Ex ia [ia Ga] IIC T4 Ga Zone 20 dust Ex ia [ia Da] IIIB T ₂₀₀ 135 °C Da	International
	CSA	USA and Canada
	Hazardous areas - Ex i Gas Ex ia [ia Ga] IIC T4 Ga Cl. I, Zn 0, AEx ia [ia Ga] IIC T4 Ga Cl. I, Div. 1, Gp A, B, C, D; T4 Ex ia [ia] Dust Ex ia [ia Da] IIIB T ₂₀₀ 135°C Da Zn 20, AEx ia [ia Da] IIIB T ₂₀₀ 135°C Da Cl. II, Div. 1, Gp F, G, T135°C Ex ia [ia]	

Safety-related characteristic values (Ex)

Safety-related characteristic values (Ex)			
Ex marking			
Short-term input parameters			
Duration	≤ 1 s		
Max. voltage U _i	≤ 8 V		
Max. current I _i	≤ 500 mA		
Output parameters			
Max. voltage U ₀	≤ 5.88 V		
Max. current I ₀	≤ 200 mA		
Max. power P ₀	≤ 295 mW		
Gases of group IIB	Max. external inductance L ₀	5 mH	0.002 mH
	Max. external capacitance C ₀	10 μF	1,000 μF
Gases of group IIC	Max. external inductance L ₀	1.6 mH	0.001 mH
	Max. external capacitance C ₀	1.3 μF	43 μF
Temperature ranges			
Temperature class	T4		

Dimensions in mm [in]



Ordering information

Model / Connection to platform / Electrical connection / Cable length

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We reserve the right to make modifications to the specifications and materials.



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