WIKA radio unit with LoRaWAN® for WIKA measuring instruments
For applications in areas with standard signals
Model NETRIS®1

Applications

- ■ Preventive maintenance
- ■ Remote monitoring of machinery and plants
- ■ Machine building

Special features

- ■ IIoT-capable with LoRaWAN® transmission
- ■ High transmission range for the measured values (up to 10 km [6 mi]) with long battery life (up to 10 years)
- ■ Battery-operated or external power supply for wireless transmission possible
- ■ Easy integration thanks to several radio standards

WIKA radio unit, model NETRIS®1

Description

The model NETRIS®1 is a WIKA radio unit to which standard sensors can be connected in order to bring the measured data wirelessly to a cloud for big-data analysis. It uses the licence-free LoRaWAN® and Bluetooth® radio standards and is used, for example, on mobile equipment and remote measuring points. Thanks to intelligent measurement and transmission control and a replaceable battery, the radio unit can be operated over a long battery life.

The radio unit receives the data via connected measuring instruments with a standard signal of 0 ... 10 V or 4 ... 20 mA or an RTD in accordance with the Pt100/Pt1000 standard in 2- or 3-wire technology. The fully encapsulated instrument with IP65 ingress protection transmits the received data continuously to a cloud via configurable data packets with LoRaWAN® or Bluetooth®.

Wireless transmission via LoRaWAN® ("Long Range Wide Area Network") is based on LPWAN technology ("Low Power Wide Area Network") to enable high transmission ranges and long battery life. A version made of stainless steel is available for applications with harsh ambient conditions.

The instrument can be easily configured via the cloud and the LoRaWAN network or via the Bluetooth® interface.

Thanks to the compatibility with numerous WIKA measuring instruments and the two available radio standards, LoRaWAN® for the kilometre range, and Bluetooth® for the metre range, the radio unit can be flexibly configured. Configuration is possible both via the cloud and on-site using Bluetooth® and the "myWIKA wireless device" app.

The WIKA radio unit NETRIS®1 is part of the WIKA IIoT solution. With this, WIKA offers a holistic solution for your digitalisation strategy.

WIKA

Smart in sensing

Installation examples

WIKA radio unit, model NETRIS®1

Plastic version   Metal version

Specifications

Basic information		
Supported sensors		
RTD	Pt100/Pt1000	°C [°F]
	Potentiometer (1 ... 50 kΩ)	%
Analogue signal	0 ... 20 mA	mA
	4 ... 20 mA	-
	0 ... 10 V	V
Case	■ Plastic version ■ Metal version	
Power supply	■ Battery ■ External power supply	

Accuracy specifications

RTD sensor (Pt100/Pt1000)

Accuracy	≤ ±0.1 % of span
Compensation of lead resistance	Max. 10 Ω

RTD sensor (potentiometer)

Accuracy	≤ ±10 % of span

Sensor 0 ... 10 V

Accuracy	≤ ±0.1 % of span
Influence of auxiliary power	+0.015 % of span → Per mA when the sensor supply is switched on

Sensor 0 ... 20 mA

Accuracy	≤ ±0.1 % of span
Input resistance	Typically 45 Ω, max. 65 Ω
Load	Max. 500 Ω
Reference conditions	Per IEC 62828-1

Total probable error
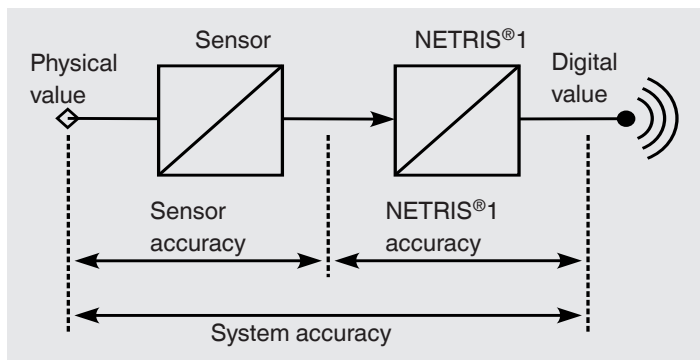
The total probable error must always be considered for the entire system. To do this, the entire chain must be considered, from measuring the physical quantity to obtaining the digital value. The low error entry of the NETRIS®1 must be considered here.

Radio standard

LoRaWAN®

Specification	LoRaWAN® 868 MHz EU
Version	1.0.3
Protocol functions	■ Registration ■ Configuration ■ Sending measured values ■ Alarm management ■ Battery status
Frequency range	863 ... 870 MHz
Range in free field	Typically 10 km [6 mi] → Depending on the ambient conditions, such as topography and building structures.
Antenna	PCB antenna, internal
Channel spacing	200 kHz
Bandwidth	125 kHz
Max. transmission power	+14 dBm

Radio standard		
Transmission interval	Standard	30 minutes
	Minimum	1 minute (maximum transmission rate limited per ETSI EN 300 220) → Limitation of the transmission interval per ETSI EN 300 220 possible. The maximum transmission frequency and duty cycle comply with the standard ETSI EN300 220.
	Maximum	7 days
Security		Full end-to-end encryption → For details on security, see website: https://lora-alliance.org
Bluetooth®		
Version		Bluetooth® 5.0 or newer
		→ Compatible with all Bluetooth® Low Energy versions 4.2 or newer
Protocol functions		■ Registration ■ Configuration ■ Sending measured values ■ Alarm management ■ Battery status ■ Data logger
Frequency range		2.4 GHz
Range in free field		Typically 10 m [32.8 ft] → Depending on the ambient conditions, such as topography and building structures.
Antenna		Chip antenna, internal
Max. transmission power		+4 dBm
Transmission interval		1.25 seconds
		→ Update of the measured value only occurs in the set measurement interval.

→ For further information on the radio protocols, see www.wika.com.

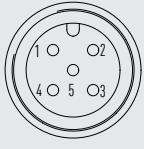| Voltage supply and performance data	
Battery	
Battery pack	Lithium thionyl chloride battery and hybrid layer capacitor (model Tadiran HLC1020L) as an assembly with connection cable assembled, see „Ersatzteile" on page 9.
	■ Model Tadiran SL861/S ■ Model Tadiran SL860/S
Battery voltage	DC 3.6 V
Battery life	> 10 years → At reference conditions
Current supply	Max. 250 mA
External power supply	
Voltage supply	DC 18 ... 30 V
Current supply	Max. 250 mA
Power supply connected sensors	
Voltage supply	DC 14 V
Current supply	Max. 21 mA

Electrical connection
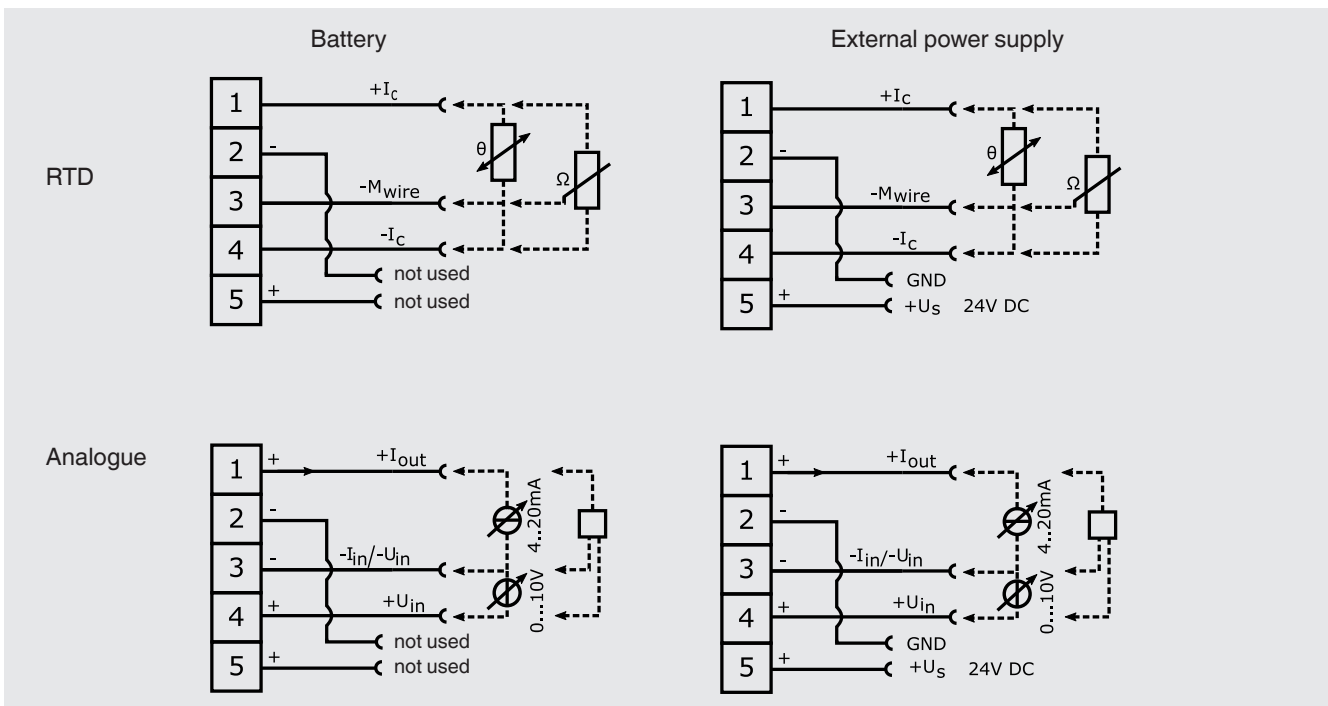
Connection type

M12 x 1 circular connector (5-pin), A-coded

Pin assignment, M12 x 1 female connector (5-pin), A-coded

M12 x 1 female connector (5-pin), A-coded	
	Pinning
	1
	2
	3
	4
	5

Pin assignment of free cable ends

Battery   External power supply

RTD

Analogue

Legend

$+I_{out}$	Current loop output (loop supply)
$-I_{in}$	Current loop input (analogue input for measuring the current)
$+U_{in}$	Input voltage positive (analogue input for measuring the voltage)
$-U_{in}$	Input voltage negative (reference potential for $+U_{in}$)
$+I_c$	Continuous current positive
$-I_c$	Continuous current negative
$-M_{wire}$	Measuring line negative (measuring the lead resistance)
$+U_s$	Supply voltage (DC 24V recommended)
GND	Mass (ground)

Operating conditions

Ambient temperature range			
Plastic version	Battery	-20 ... +60 °C [-4 ... +140 °F]	
	External power supply	-20 ... +60 °C [-40 ... +140 °F]	
Metal version	Battery	-20 ... +60 °C [-4 ... +140 °F]	
	External power supply	-40 ... +60 °C [-40 ... +140 °F]	
Storage temperature range	-40 ... +70 °C [-40 ... +158 °F]		
Relative humidity	20 ... 90 %, non-condensing		
Permissible pollution degree per EN 61010-1	2		
Vibration resistance per IEC 60068-2-6	a = 1 g (7 ... 18 Hz)		
	A = 0.8 mm (18 ... 50 Hz)		
	a = 5 g (10 ... 200 Hz)		
Shock resistance per IEC 60068-2-27	10 g, 11 ms		
Free fall per IEC 60068-2-31			
Individual packaging	1.2 m [3.94 ft]		
Ingress protection	■ IP65 ■ IP67 (only for plastic version)		

Alarms

Settable alarms	Various alarms can be set. → See WIKA radio unit operating instructions; article number 14614412

Packaging and instrument labelling

Packaging	Individual packaging
Instrument labelling	■ WIKA product label, lasered ■ Customer-specific product label on request

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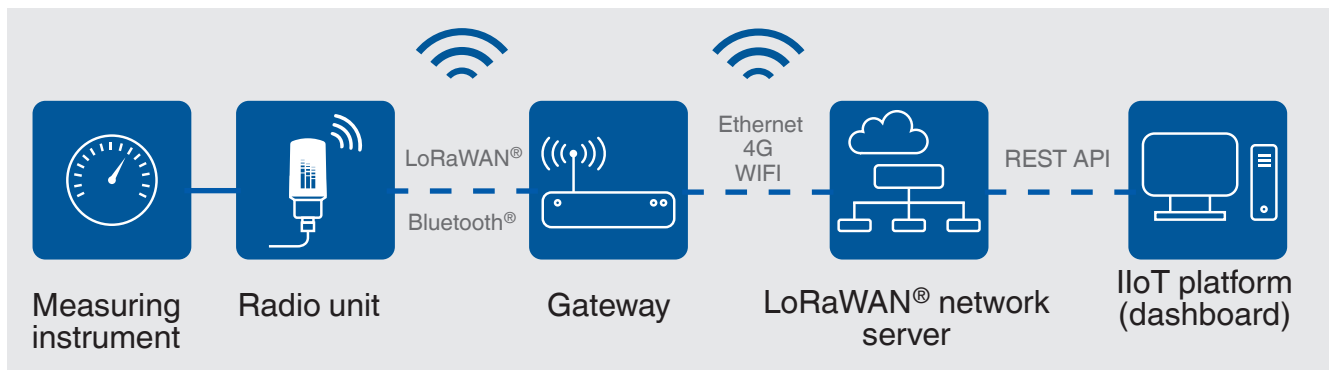
A measuring instrument that allows remote monitoring via radio must be integrated into the IIoT infrastructure. The following schematic illustration shows a typical LPWAN infrastructure:

Data is transmitted wirelessly via the NETRIS®1 to the gateway. It is ensured that only authorised end devices may communicate with the network server (e.g. LoRaWAN®). 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 mi]. The ranges are dependent on factors such as topography, placement of the gateway or environmental influences.

Measured values from several hundred LoRaWAN®-enabled IIoT devices of the NETRIS®1 can be collected by a gateway and transmitted to the network server via cable (e.g. via 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. The measured data can be analysed via the visualisation in the dashboard, thus enabling remote monitoring of the measured values. WIKA provides the "myWIKA wireless device" app to support commissioning and local status inquiries of the measuring instrument.

"myWIKA wireless device" app

Via the "myWIKA wireless device" app, the radio unit can be activated and deactivated through a mobile device. Furthermore, the instrument data and the current measured values can be read.
The app functions are used via Bluetooth® and a Bluetooth®-capable mobile device.

Functions of the app:
- Indication of the instrument information
- Indication of the instrument status
- Readout of the current measured values
- Manual join request for the LoRaWAN® network
- Configuration such as measuring and transmission rate, alarm values, etc.

For iOS-based end devices, the app is available in the Apple Store via the link below.

[Download here](#)

For Android-based end devices, the app is available in the Play Store via the link below.

[Download here](#)

Approvals

| Logo	Description	Region
CE	**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	
UKCA	**UKCA**	United Kingdom
	Electromagnetic compatibility regulations	
	Restriction of hazardous substances (RoHS) regulations	

→ For approvals and certificates, see website

Dimensions in mm [in]

With battery pack model Tadiran SL861/S

Plastic version	Metal version

With battery pack model Tadiran SL860/S

Plastic version	Metal version
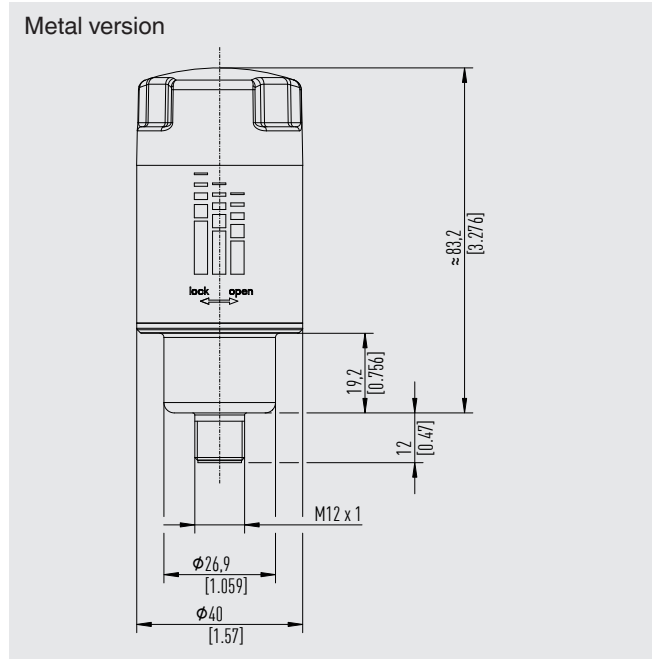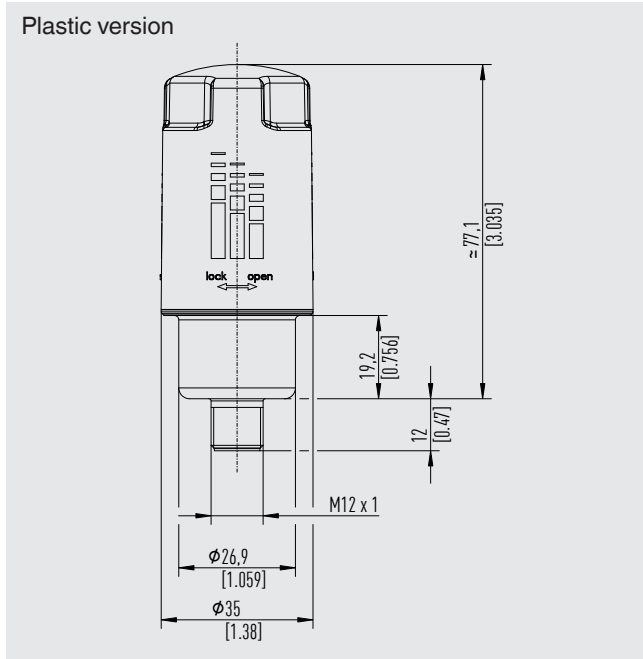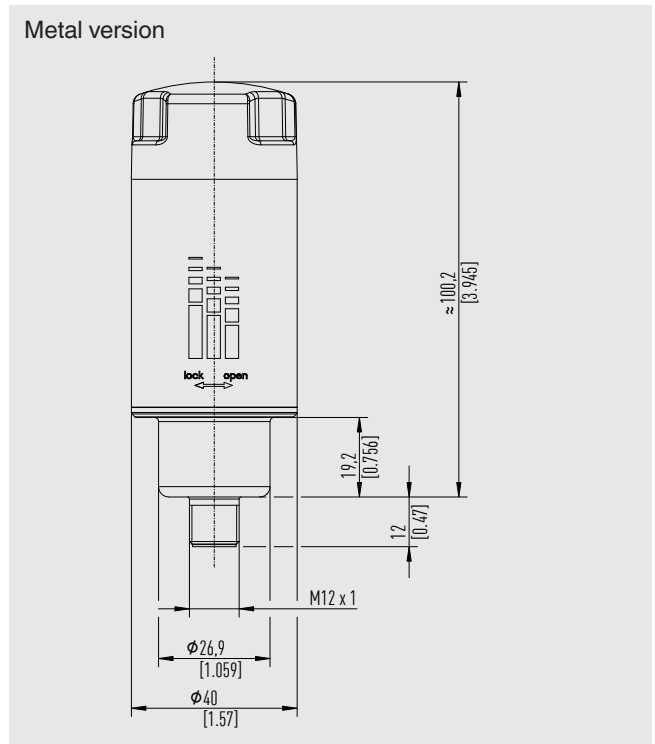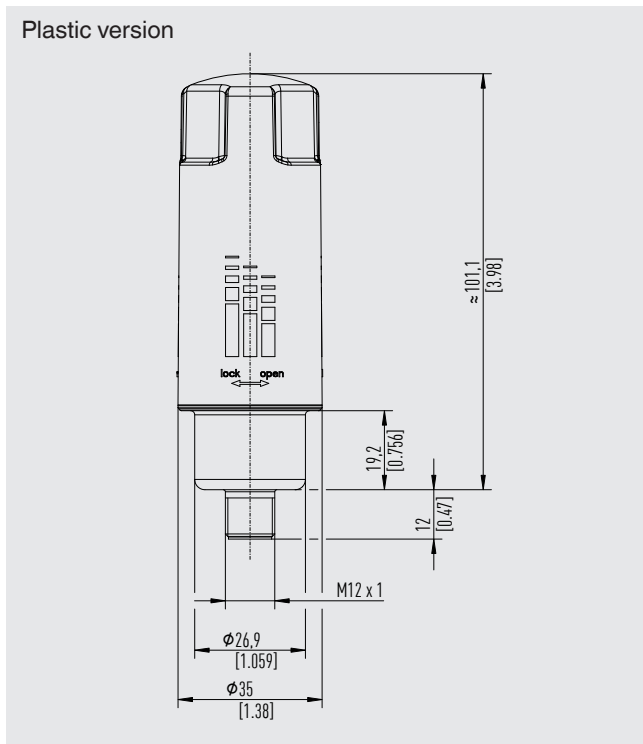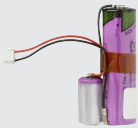
Accessories

Description	Order number
LoRaWAN® gateway, preconfigured for WIKA network server	
Gateway for indoor use	On request
Gateway for outdoor use	On request

Spare parts

Description		Order number
Battery pack	Lithium thionyl chloride battery and hybrid layer capacitor (model Tadiran HLC1020L) as an assembly with connection cable assembled.	
	Typ Tadiran SL861/S	14395532
	Typ Tadiran SL860/S	14392747
Y cable	1 m [3.23 ft]	14495101
	3 m [9.84 ft]	14495102
Direct cable	1 m [3.23 ft]	14468149
	3 m [9.84 ft]	14468303
Mounting kit	Wall mounting	14492895
	Pipe diameter 25 ... 45 mm [0.10 ... 1.8 in]	14492926
	Pipe diameter 70 ... 92 mm [2.8 ... 3.6 in]	14492927
	Pipe diameter 146 ... 168 mm [8.7 ... 6.6 in]	14492933

Ordering information

Model / Connection to platform / Electrical connection

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