

WIKA radio unit with LoRaWAN® for WIKA measuring instruments

For applications in areas with standard signals

Model NETRIS®1

WIKA data sheet AC 40.01



Applications

- Wireless data transmission from measuring instruments for preventive maintenance and also monitoring of machinery for big-data analysis in a cloud
- Machine building

Special features

- IIoT-capable with LoRaWAN® transmission
- High transmission range for the measured values (up to 10 km [6.2 mi]) with long battery life (up to 10 years)
- Battery-operated or external power supply for radio 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®.

Battery-operated radio 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 simple web configuration via the cloud and the LoRaWAN® network enables the complete end-to-end encryption with bidirectional communication for safe IIoT applications.

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 via the cloud as well as 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.

Installation examples

WIKA radio unit, model NETRIS®1



Specifications

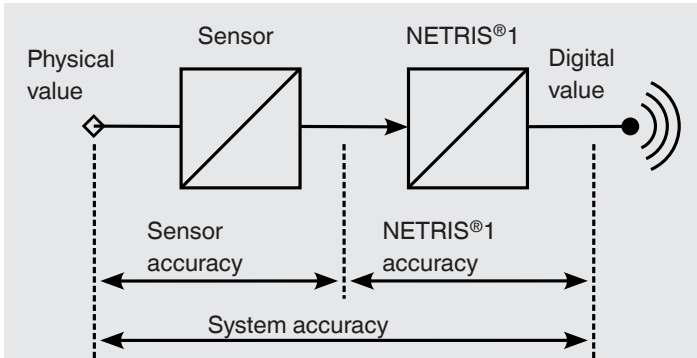
Overview of versions		
Supported sensors		
RTD	Pt1000/Pt100	°C [°F]
	Potentiometer (50 ... 100 kΩ)	%
Analogue signal	0 ... 20 mA	mA
	4 ... 20 mA	
	0 ... 10 V	V

Basic information	
Case	<ul style="list-style-type: none"> ■ Plastic version ■ Metal version
Power supply	<ul style="list-style-type: none"> ■ Battery ■ External power supply

Accuracy specifications	
Sensor RTD (Pt100, Pt1000, potentiometer)	
Accuracy	≤ ±0.1 % of span
Compensation lead resistance	Max. 10 Ω
Sensor RTD (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

Accuracy specifications	
Sensor 0 ... 20 mA	
Accuracy	$\leq \pm 0.1\%$ of span
Input resistance	Typically 45 Ω , max. 65 Ohm Ω
Load	500 Ω
Reference conditions	Per IEC 62828-1

Total probable error



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

Radio standard		
LoRaWAN®		
LoRaWAN® specification	LoRaWAN® 868 MHz EU	
LoRaWAN® protocol version	1.0.3	
Protocol functions	<ul style="list-style-type: none"> ■ Registration ■ Configuration ■ Sending measured values ■ Alarm management ■ Battery status 	
Frequency range	863 ... 870 MHz	
Range in free field	Typically 10 km [6.2 mi] → Under reference conditions, a measurement interval takes place every 30 minutes, a transmission interval every 60 minutes, with a spreading factor of 7.	
Antenna	Internal	
Channel spacing	200 kHz	
Bandwidth	125 kHz	
Max. output power	+ 14 dBm	
Transmission interval	Standard	30 minutes
	Minimum	1 minute (maximum transmission rate limited per ETSI EN300 220) → Limitation of the transmission interval in accordance with ETSI EN300 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://loro-alliance.org	

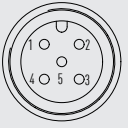
Radio standard	
Bluetooth®	
Bluetooth® specification	Acc. Bluetooth® SIG
Protocol	Bluetooth® 5.0 or newer
	Compatible with all Bluetooth® Low Energy versions 4.2 or newer
Protocol functions	<ul style="list-style-type: none"> ■ Registration ■ Configuration ■ Sending measured values ■ Alarm management ■ Battery status ■ Data logger
Frequency range	2.4 GHz
Range in free field	Typically 10 m [32,8 ft] , free field
Max. output power	+ 4 dBm
Antenna	Internal
Transmission interval	1.25 seconds
	→ An update of the measured value only occurs in the set measuring interval.

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

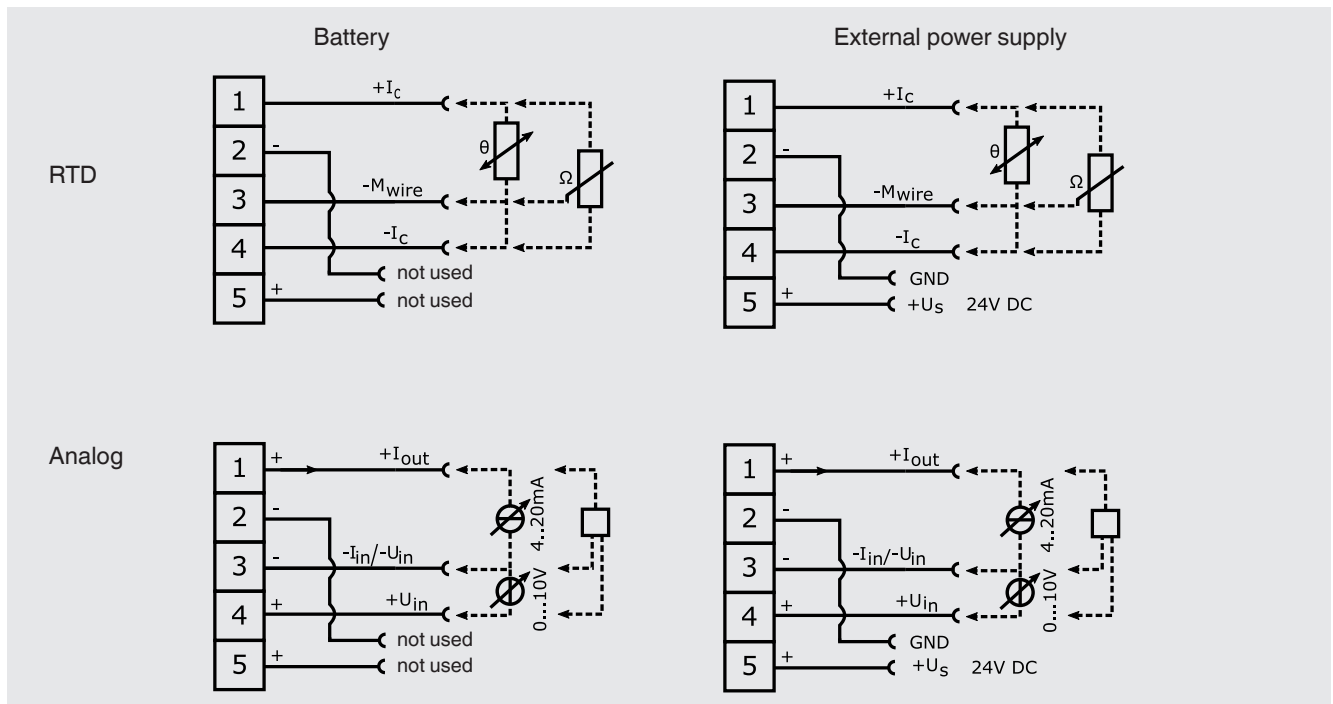
Voltage supply and performance data	
Battery	
Battery pack	Lithium thionyl chloride battery and hybrid layer capacitor (model Tadiran HLC1020L) as an assembly with connection cable assembled, see „Accessories and spare parts“ on page 9. <ul style="list-style-type: none"> ■ Model Tadiran SL861/S ■ Model Tadiran SL860/S
Battery voltage	DC 3.6 V
Battery current supply	Max. 250 mA
Battery life	> 5 years
	→ At reference conditions
External power supply	
Voltage supply	DC 18 ... 30 V
Current supply	Max. 250 mA
Power supply connected sensor	
Voltage supply	DC 14 V
Current supply	Max. 21 mA

Electrical connection
Connection type
Circular connector M12 x 1 (5-pin)

Pin assignment

Female connector M12 x 1 (5-pin)	
	Pinning
	1
	2
	3
	4
	5

Pin assignment of free cable ends



Legende

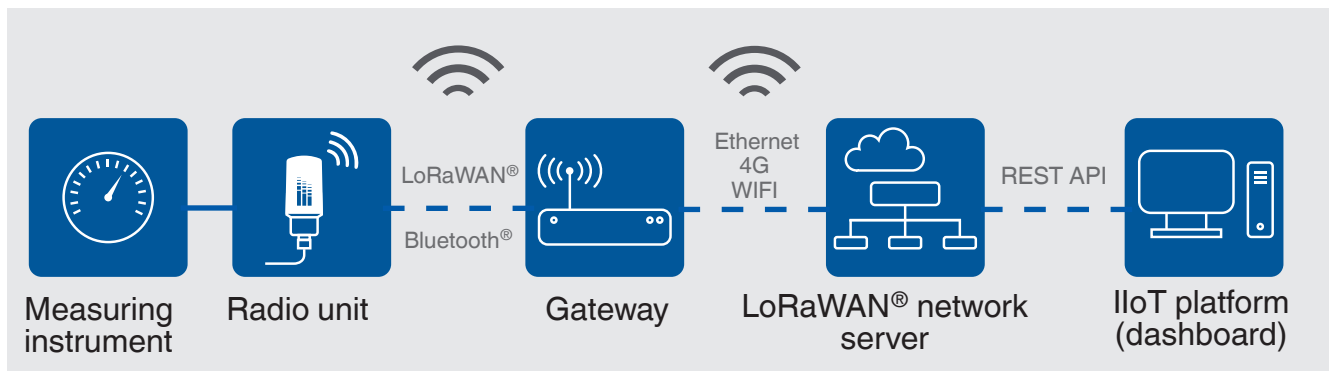
- $+I_{out}$ Current loop output (supply of loop)
- $-I_{in}$ Current loop input (analogue input for current measurement)
- $+U_{in}$ Positive input voltage (analogue input for voltage measurement)
- $-U_{in}$ Negative input voltage (reference potential for $+U_{in}$)
- $+I_c$ Positive constant current
- $-I_c$ Negativ constant current
- $-M_{wire}$ Negative measuring line (lead resistance measurement)
- $+U_s$ Supply voltage (DC 24V recommended)
- GND 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	<ul style="list-style-type: none"> ■ IP65 ■ IP67 (only for plastic version) 	

Alarms	
Settable alarms	Various alarms can be set. → See operating instructions for details

Packaging and instrument labelling	
Packaging	Individual packaging
Instrument labelling	<ul style="list-style-type: none"> ■ 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 IloT 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 radio transmission can be up to 10 km [6.2 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 instruments 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. 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
- Read-out 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 smartphones, the app is available in the App Store under the link below.

[Download here](#)



For smartphones with an Android operating system, the app is available in the Play Store under the link below.

[Download here](#)



Approvals

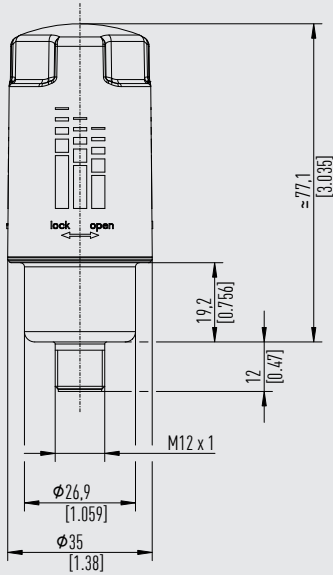
Logo	Description	Region
CE	EU declaration of conformity	European Union
	RED - Radio Equipment Directive	
	The instrument may be used without restriction in the following areas: EU and UK, CH, NO, LI	
	RoHS directive	
UK CA	UKCA	United Kingdom
	Electromagnetic compatibility regulations	
	Restriction of hazardous substances (RoHS) regulations	

→ For approvals and certificates, see website

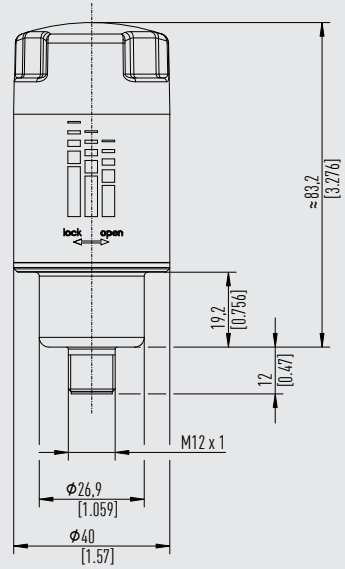
Dimensions in mm [in]

Bluetooth® radio standard

Plastic version

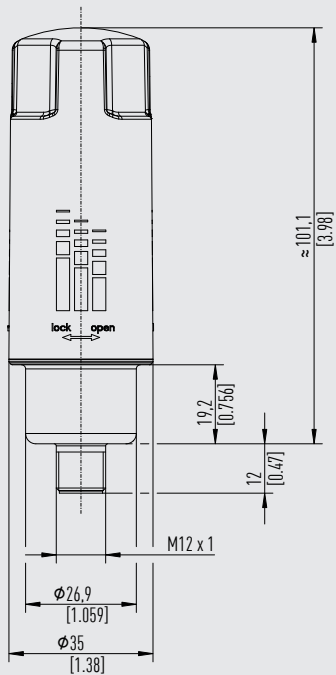


Metal version

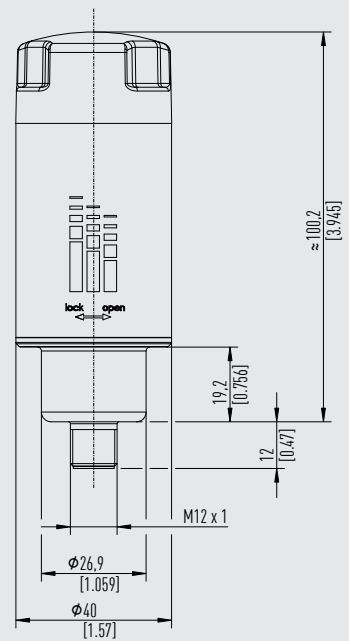


LoRaWAN® radio standard / Bluetooth® with extended battery

Plastic version



Metal version



Accessories and spare parts

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	Lithium thionyl chloride battery and hybrid layer capacitor (model Tadiran HLC1020L) as an assembly with connection cable assembled.
	■ Model Tadiran SL861/S SL861/S (PA-TLP6.R001 - size: 2/3 AA) 14392747
	■ Model Tadiran SL860/S SL860/S (PA-TLP8.R001 - size: AA) 14395532
Y cable	1 m [39 in] 14495101
	3 m [118 in] 14495102
Direct cable	1 m [39 in] 14468149
	3 m [118 in] 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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We reserve the right to make modifications to the specifications and materials.

In case of a different interpretation of the translated and the English data sheet, the English wording shall prevail.

