# Radio unit with LPWAN
# 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 LPWAN 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®, mioty® 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 runtime.

The radio unit receives the data via connected measuring instruments with a 0 ... 10 V or 4 ... 20 mA standard signal 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 LPWAN or Bluetooth®.

The LPWAN technology (“Low Power Wide Area Network”) enables long transmission ranges and a 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 available radio standards, LoRaWAN® and mioty® 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.



Smart in sensing

Data sheets showing similar products and accessories:
Radio unit with LoRaWAN® for WIKA measuring instruments; see data sheet AC 40.03
Radio unit with LoRaWAN®, 4 ... 20 mA input signal; see data sheet AC 40.02
Pressure sensor with wireless transmission, see data sheet PE 87.23
Resistance thermometer with wireless transmission; see data sheet TE 63.04

## Installation examples

### WIKA radio unit, model NETRIS®1

Plastic version

Metal version

## Specifications

| Overview of versions | |
|---|---|
| **Model NETRIS®1 (Lxx)** | Version with LoRaWAN® and Bluetooth® |
| **Model NETRIS®1 (Mxx)** | Version with mioty® and Bluetooth® |
| **Model NETRIS®1 (Bxx)** | Version with Bluetooth® |

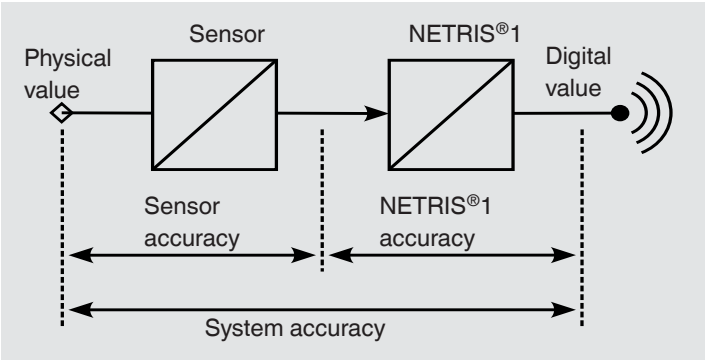
→ The fields marked with xx are the respective regional abbreviations of the permissible radio standards, for further information, see product label or operating instructions.

| 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<br>■ Metal version | |
| **Power supply** | ■ Battery<br>■ 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 |

| Accuracy specifications | |
|---|---|
| Influence of auxiliary power | +0.015 % of span<br>→ 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 | |
| Protocol | 1.0.3 | |
| Protocol functions | ■ Registration<br>■ Configuration<br>■ Sending measured values<br>■ Alarm management<br>■ Battery status | |
| Frequency band | 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 | |
| Transmission power | Max. +14 dBm | |
| Transmission interval | Standard | 30 minutes |
| | Minimum | 1 minute (maximum transmission interval limited per ETSI EN 300 220)<br>→ Limitation of the transmission interval in accordance with ETSI EN 300 220 possible. The maximum transmission frequency and duty cycle comply with the ETSI EN 300 220 standard. |
| | Maximum | 7 days |
| Safety | Full end-to-end encryption<br>→ For details on security, see website: https://lora-alliance.org | |

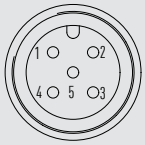
| Radio standard | |
|---|---|
| **mioty®** | |
| Specification | Regional Profile EU1 |
| Functions | ■ Registration<br>■ Sending measured values<br>■ Alarm management<br>■ Battery status |
| Frequency band | 863 ... 870 MHz |
| Range in free field | Typically 10 km [6 mi]<br>→ Depending on the ambient conditions, such as topography and building structures. |
| Antenna | PCB antenna, internal |
| Bandwidth | 60 kHz |
| Transmission power | Max. 14 dBm |
| **Bluetooth®** | |
| Version | Bluetooth® 5.0 or newer |
| | → Compatible with all Bluetooth® Low Energy versions 4.2 or newer |
| Functions | ■ Registration<br>■ Configuration<br>■ Sending measured values<br>■ Alarm management<br>■ Battery status<br>■ Data logger |
| Frequency range | 2.4 GHz |
| Range in free field | Typically 10 m [32.8 ft]<br>→ Depending on the ambient conditions, such as topography and building structures. |
| Antenna | Chip antenna, internal |
| Transmission power | Max. 4 dBm |
| Transmission interval | 1.25 seconds |
| | → An update of the measured value only occurs in the set measurement interval. |

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

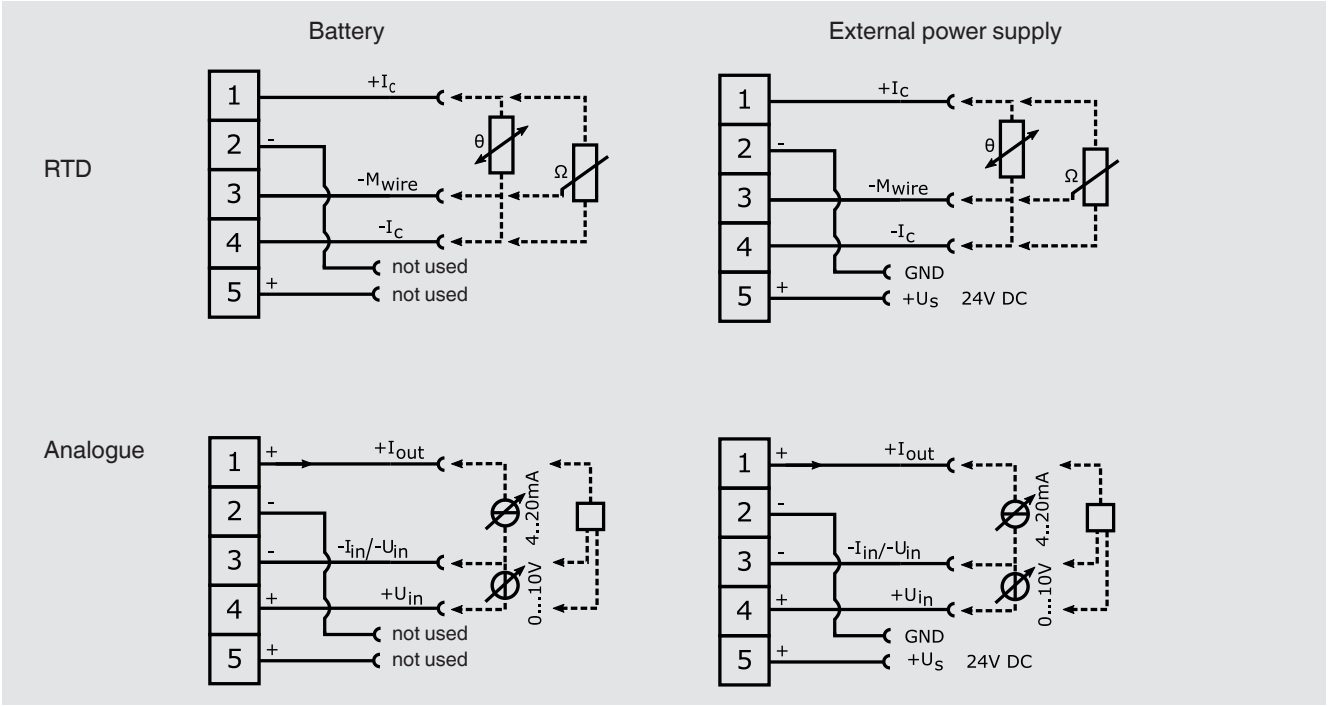
| Voltage supply and performance data | |
|---|---|
| **Battery** | |
| Battery pack | Lithium thionyl chloride battery and hybrid layer capacitor (model Tadiran HLC1020L) as an assembly with connection cable assembled, see „Ersatzteile“ on page 9. |
| | ■ Model Tadiran SL861/S<br>■ Model Tadiran SL860/S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




**Legend**

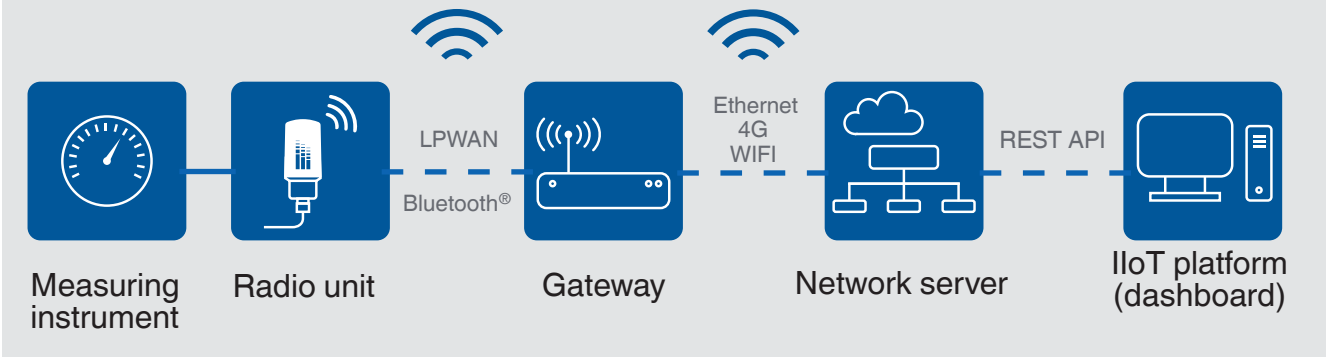
| | |
|---|---|
| $+I_{out}$ | Current loop output (loop supply) |
| $-I_{in}$ | Current loop input (analogue input for measuring the current) |
| $+U_{in}$ | Input voltage positive (analogue input for measuring the voltage) |
| $-U_{in}$ | Input voltage negative (reference potential for $+U_{in}$) |
| $+I_c$ | 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 [-4 … +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 | |
| **Operating altitude** | 2,000 m [6,562 ft] above sea level | |
| **Pollution degree per EN 61010-1** | 2 | |
| **Overvoltage category** | I | |
| **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<br>■ IP67 (only for plastic version) | |

| Alarms | |
|---|---|
| **Settable alarms** | Various alarms can be set.<br>→ See WIKA radio unit operating instructions; item number 14614412 |

| Packaging and instrument labelling | |
|---|---|
| **Packaging** | Individual packaging |
| **Instrument labelling** | ■ WIKA product label, lasered<br>■ 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 devices may communicate with the network server (e.g. LoRaWAN®). For this, the measuring instrument must first be coupled with the network server. With LPWAN, the wireless transmission can be up to 10 km [6 mi]. The ranges are dependent on factors such as topography, placement of the gateway and environmental influences.

Measured values from several hundred LPWAN 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 enquiries 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:**

- Display 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 devices, the app is available in the Apple Store via the link below.

Download here

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

Download here

## Approvals

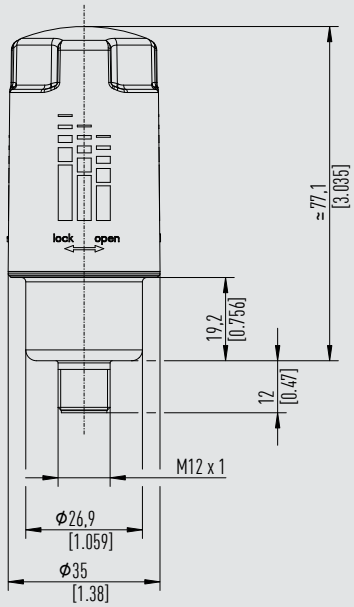
| Logo | Description | Region |
|---|---|---|
| CE | **EU declaration of conformity** | European Union |
| | RED – Radio Equipment Directive<br>The instrument may be used without restriction in the following areas: EU and UK, CH, NO, LI | |
| | RoHS directive | |

→ For approvals and certificates, see website

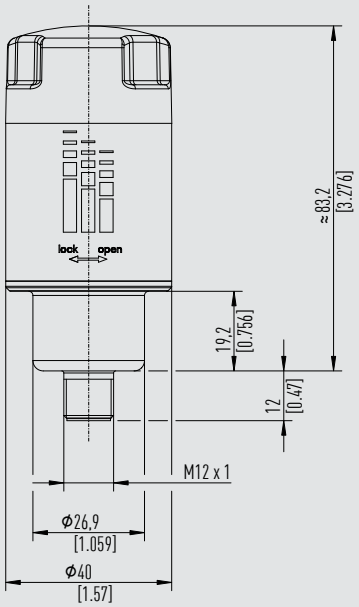
## Dimensions in mm [in]

### With model Tadiran SL861/S battery pack

Plastic version

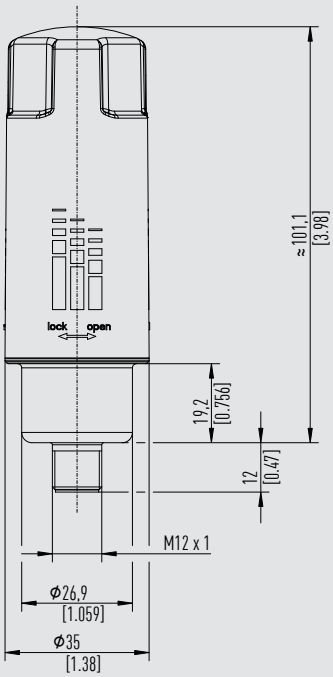



Metal version

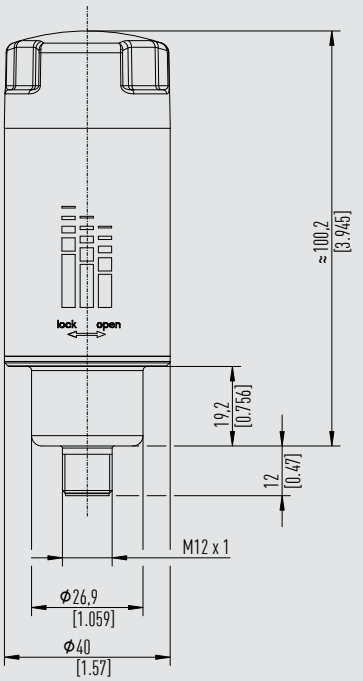



### With model Tadiran SL860/S battery pack

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. | |
|  | Model Tadiran SL861/S | 14395532 |
|  | Model 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 [0.98 ... 1.77 in] | 14492926 |
| | Pipe diameter 70 ... 92 mm [2.76 ... 3.62 in] | 14492927 |
| | Pipe diameter 146 ... 168 mm [5.75 ... 6.61 in] | 14492933 |

### Ordering information

Model / Connection to platform / Electrical connection





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