Radio unit with LoRaWAN® for mV/V-instruments For general industrial applications Model NETRIS®F

For further approvals, see page 8

Applications

- Preventive maintenance
- Remote monitoring of machinery, plants and buildings
- Opening up new application areas
- Monitoring of machines, plants and buildings

Special features

- Low operating costs through intelligent measurement control
- Easy integration thanks to several radio standards
- Numerous application possibilities – also as retrofit
- Robustly built, permanently reliable force measurement and weighing
- Risk minimisation through condition monitoring

Radio unit, model NETRIS®F

Description

The model NETRIS®F is a radio unit to which a mV/V-instrument is connected. The assembly of measuring instrument and radio unit is used for wireless data transmission. It uses the licence-free radio standards LoRaWAN® and mioty® as well as Bluetooth®, which, for example, are used at remote measuring locations. Thanks to intelligent measurement and transmission control and a replaceable battery, the radio unit can be operated for years without maintenance.

Low operating costs through intelligent measurement control
Individual configuration allows customer-specific measurement and transmission intervals. All data is available digitally in a cost-efficient way and allows automated analyses.

Easy integration thanks to several radio standards
Thanks to the two available standards LoRaWAN® (long range wide area network) and mioty® for the kilometre range as well as Bluetooth® for the metre range, every measuring instrument can be configured flexibly. The data obtained is continuously and reliably transmitted to a cloud via configurable data packets. The processed data can be visualised individually in the online dashboard.

Numerous application possibilities – also as retrofit
Every measuring location can be made smart with the radio unit – without having to plan and document cable routing. Particularly when no continuous measurement is needed, cost advantages can be realised.

Robustly built, permanently reliable force measurement and weighing
The model NETRIS®F is built to be robust and shock-resistant. Thanks to IP65, it is well protected against dust and splash water. The battery is preassembled and can be replaced easily. It is not necessary to replace the entire radio module.

Risk minimisation through condition monitoring
The radio unit enables simple condition monitoring. A temperature indication, in addition to the force or weighing value, reveals possible environmental influences at an early stage and thus increases the measurement accuracy of the total system.

The radio unit NETRIS®F is part of the WIKA IIoT solutions. With this, WIKA offers a holistic solution for every digitalisation strategy. With measurement data evaluation, machinery and consumption can be analysed sustainably.

Smart in sensing

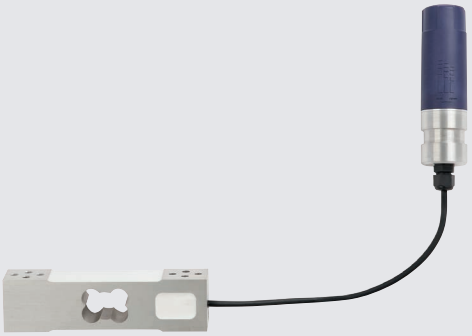
Data sheets showing similar products:
WIKA radio unit with LoRaWAN® for WIKA measuring instruments; model NETRIS®1; see data sheet AC 40.01

Installation examples

Radio unit with mounted strain transducer or single point load cell.

Strain transducer, model F9846

Single point load cell, model F4818

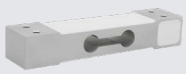
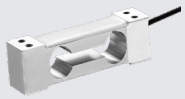
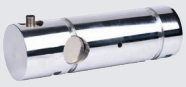


The radio unit model NETRIS®F can only be combined with a force transducer or load cell, as the assembly must be adjusted at the factory.

Specifications

Overview of versions of suitable instruments		
Model		**Description**
	**F1222**	Miniature compression force transducer up to 5,000 N [1,124 lbf] → see data sheet FO 51.11
	**F1224**	Miniature compression force transducer up to 500 kN [112,404 lbf] → see data sheet FO 51.12
	**F1226**	Miniature compression force transducer up to 225 kN [50,582 lbf] → see data sheet FO 51.41
	**F1227**	Compression force transducer up to 2,200 kN [500,000 lbf] → see data sheet FO 51.62
	**F1811**	Compression force transducer up to 300 kN [67,443 lbf] → see data sheet FO 51.56
	**F1814**	Miniature compression force transducer up to 1,000 N [224.81 lbf] → see data sheet FO 51.57
	**F1818**	Miniature compression force transducer up to 5 kN [1,124 lbf] → see data sheet FO 51.58
	**F1821**	Compression force transducer up to 100 kN [22,481 lbf] → see data sheet FO 51.59
	**F1861**	Compression force transducer with bilateral spherical force introduction up to 50 t [110,231 lb] → see data sheet FO 51.61

Overview of versions of suitable instruments

Model		Description
	**F2220**	Miniature tension/compression force transducer up to 5,000 N [1,124 lbf] → see data sheet FO 51.16
	**F2221**	Miniature tension/compression force transducer up to 50 kN [11,240 lbf] → see data sheet FO 51.26
	**F2222**	Tension/compression force transducer for material testing up to 2,200 kN [500,000 lbf] → see data sheet FO 51.29
	**F2226**	Tension/compression force transducer with external thread up to 3,300 kN [741,870 lbf] → see data sheet FO 51.51
	**F2229**	Tension/compression force transducer up to 890 kN [200,000 lbf] → see data sheet FO 51.52
	**F2802**	Tension/Compression force transducer s-type up to 50 kN [1,240.45 lbf] → see data sheet FO 51.48
	**F2808**	Tension/Compression force transducer up to 2,000 N [449.62 lbf] → see data sheet FO 51.68
	**F2812**	Tension/Compression force transducer up to 1,000 N [224.81 lbf] → see data sheet FO 51.49
	**F2822**	Tension/Compression force transducer for material tests up to 500 kN [112,404 lbf] → see data sheet FO 51.50
	**F3831**	Shear beam up to 10 t [22,046 lb] → see data sheet FO 51.21
	**F3833**	Bending beam up to 500 kg [1,102 lb] → see data sheet FO 51.22
	**F4801**	Single point load cell up to 250 kg [551.2 lb] → see data sheet FO 53.10
	**F4802**	Single point load cell up to 10 kg [22 lb] → see data sheet FO 53.13
	**F4818**	Single point load cell up to 500 kg [1,102 lb] → see data sheet FO 53.14
	**F5802**	Load pin up to 10,000 kN [1,020 tf] → see data sheet FO 51.55

Overview of versions of suitable instruments

Model		Description
	**F6804**	Ring force transducer for screw forces up to 450 kN [101,164 lbf] → see data sheet FO 51.60
	**F9204**	Wire rope force transducer up to 40 t [88,185 lb] → see data sheet FO 51.25
	**F9846**	Strain transducer up to ±1,000 µε → see data sheet FO 54.17

Basic informations

Overview of maximum values of the suitable instruments	Force	0 ... 10,000 kN	0 ... 2,248,090 lbf
	Weight	0 ... 600 t	0 ... 1,323,000 lb
	Strain	0 ... 2,000 µε	
	→ For further detailed information see relevant data sheet for the respective measuring instrument. For this, see table “Overview of versions of suitable instruments”		
Radio unit	Aluminium, PBT (case)		
Case	Grilamid TR 90 UV		
Mounting	Fastening clip for NETRIS®F, all mounting variants (included in delivery).		

Accuracy specifications

Non-linearity per BFSL per IEC 62828-1	≤ ±0.25 % of span	
Accuracy	→ See “Maximum measured error per IEC 62828-1”	
Maximum measured error per IEC 62828-1	≤ ±0.5 % of span	
Zero point setting	±3 % of span	
Signal noise	≤ 0.2 % of span	
Non-repeatability per IEC 62828-1	≤ 0.1 % of span	
Total probable error per IEC 62828-2	→ See data sheet of the mounted force transducer	
Long-term drift per IEC 62828-1	≤ ±0.2 % of span	
Reference conditions	Per IEC 62828-1	
Accuracy specifications of the temperature value		
Measuring range	-20 ... +80 °C [-4 ... +176 °F]	
Accuracy	→ See “Max. measured deviation”	
Max. measured deviation	For measuring range -20 ... +60 °C [-4 ... +140 °F]	±3.5 K
	For measuring range 60 ... 80 °C [140 ... 176 °F]	±4.75 K

Radio standards

LoRa®	
Specifications	■ LoRaWAN® 868 MHz EU ■ LoRaWAN® 915 MHz US
Protocol	Version 1.0.3
Functions	■ Registration ■ Configuration ■ Sending measured values ■ Alarm management ■ Battery status

Radio standards		
Frequency band	→ Additional operating instructions for radio frequencies, LoRaWAN® and mioty®, item number 14683336	
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	1 hour
	Minimum	20 minutes (maximum transmission intervals limited per ETSI EN 300 220). → The maximum transmission frequency and duty cycle comply with ETSI EN 300 220.
	Maximum	7 days
Measurement interval	Standard	5 minutes
	Minimum	1 second
	Maximum	7 days
Security	Full end-to-end encryption per AES-128	
mioty®		
Specification	Regional Profile EU1	
Functions	■ Registration ■ Sending measured values ■ Alarm management ■ Battery status	
Frequency band	→ Additional operating instructions for radio frequencies, LoRaWAN® and mioty®, item number 14683336	
Range in free field	Typically 10 km [6 mi] → Depending on the ambient conditions, such as topography and building structures.	
Antenna	PCB antenna, internal	
Bandwidth	60 kHz	
Transmission power	Max. 14 dBm	
Security	Full end-to-end encryption per AES-128	
Bluetooth®		
Version	In accordance with Bluetooth SIG	
Protocol	Bluetooth 4.2	
Functions	■ Registration ■ Configuration ■ Sending measured values ■ Alarm management ■ Battery status	
Frequency band	2.4 GHz	
Range in free field	Typically 20 m [787.4 ft] → 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 pack	Lithium thionyl chloride battery and hybrid layer capacitor (model Tadiran HLC1020L) as an assembly with connection cable assembled. ■ Model Tadiran SL860/S ■ Model Tadiran SL861/S	
Battery voltage	DC 3.6 V	
Battery life		
Model Tadiran SL860/S for	Bluetooth®	> 3 years (measurement interval 1 minute)
	LoRaWAN® and mioty®	> 5 years (measurement interval 1 minute, transmission interval 1 hour, spreading factor 10)
		→ At reference conditions
Model Tadiran SL861/S for	Bluetooth®	> 2 years (measurement interval 1 minute) → At reference conditions
Auxiliary power		
Current supply	Max. 50 mA	

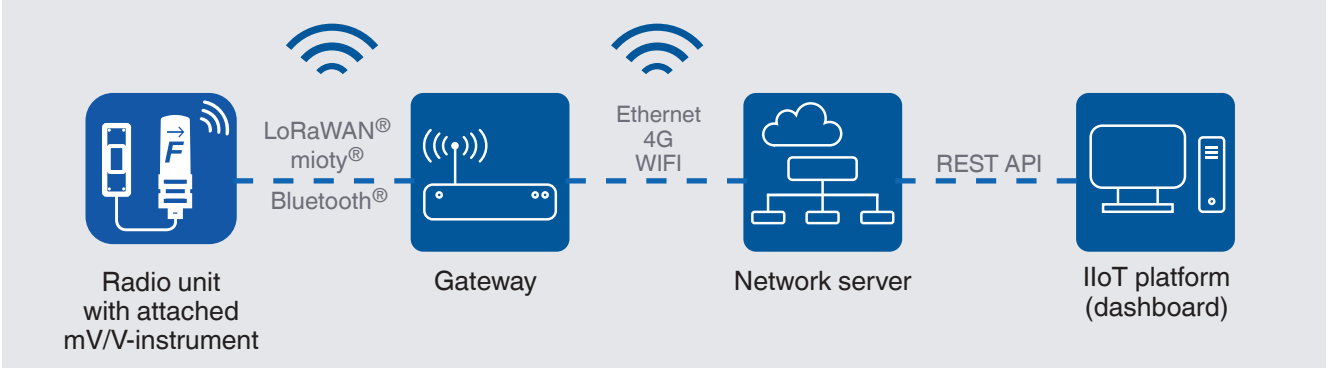
Operating conditions	
Operating temperature range $B_{T, G}$	-20 ... +80 °C [-4 ... +176 °F]
Ambient temperature range	-40 ... +60 °C [-40 ... +140 °F]
Storage temperature range	-40 ... +70 °C [-40 ... +158 °F]
Humidity	20 ... 90 % relative humidity (non-condensing)
Altitude in accordance with EN 61010-1	≤ 2,000 m [6,562 ft] above sea level
Pollution degree per EN 61010-1	4
Enclosure rating per CSA C22.2 No, 94.2 and UL 50E	Type 4
Vibration resistance per IEC 60068-2-6	a = 1g (7 ... 18 Hz)
	A = 0.8 mm (18 ... 50 Hz)
	a = 5g (10 ... 200 Hz)
Shock resistance per IEC 60068-2-27	10g, 11 ms
Free fall per IEC 60068-2-31	
Individual packaging	1.2 m [3.94 ft]
Ingress protection in acc. with EN 60529	IP65

Alarms	
Settable alarms	Various alarms can be set. → Additional operating instructions for radio frequencies in IIoT solutions for devices with LoRaWAN® and mioty®, item number 14683336.

Packaging and instrument labelling	
Packaging	■ Individual packaging ■ Multiple packaging (up to 20 pieces possible)
Instrument labelling	■ WIKA product label, glued ■ Customer-specific product label on request

LPWAN infrastructure

A mV/V-measuring instrument that allows remote transmission via radio 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 via radio 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® and mioty® the wireless transmission is typically 10 km [6 mi], for Bluetooth® 20 m [787 in]. The ranges depend on the topography.
Measured values from several hundred LPWAN-enabled IIoT devices 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. 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:
- Display of the instrument information
- Display 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.

Laden im App Store

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

Download here

JETZT BEI Google Play

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
	Radio Equipment Directive EN 61326 emission (group 1, class B) and immunity (industrial application). This wireless device may be used without restriction in the member states of the EU and in the countries of the EFTA. Use in other countries is not permitted.	
	RoHS directive	
FC	**Federal Communications Commission (FCC) for US** Radio approval	USA
C SP US	**CSA** Safety (e.g. electr. safety, overpressure, ...)	USA and Canada

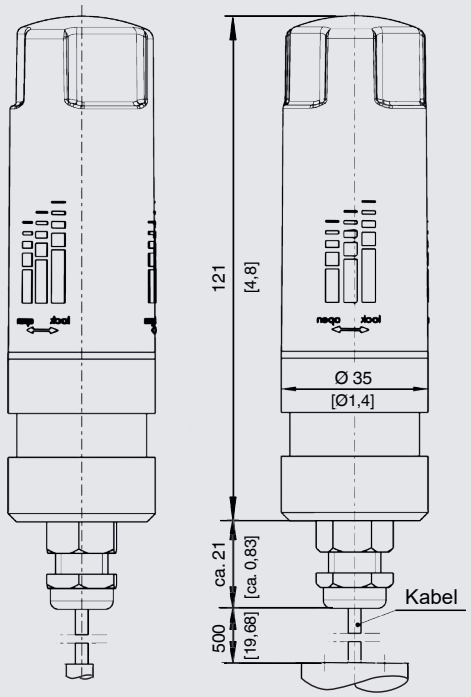
Manufacturer's information and certificates

Logo	Description
-	China RoHS directive
-	MTTF: > 100 years

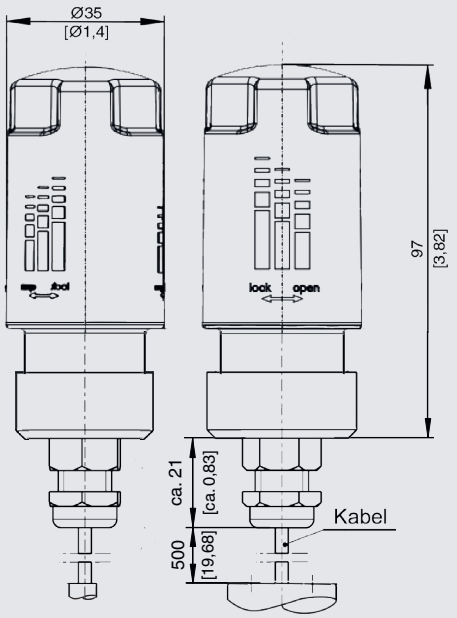
→ For approvals and certificates, see website.

Dimensions in mm [in]

With battery pack model Tadiran SL860/S



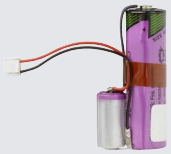
With battery pack model Tadiran SL861/S



Accessories

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

Spare parts

Logo	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

Ordering information

Model / Measuring instrument mounting / Radio standard / Voltage supply and performance data / Material / Certificates / Accessories / Spare parts

WIKA Alexander Wiegand SE & Co. KG
Alexander-Wiegand-Straße 30
63911 Klingenberg/Germany
Phone +49 9372 132-0
info@wika.de
www.wika.com