



AL-431-00-921 series (TAIWAN)

**EnOcean Sensor “EnoSense® Wall & Desk”
for vibration detection / desk occupancy
EnOcean 921.7 MHz / TAIWAN**

Part names:

AL-431-00-921 beige / AL-431-00-921 black / AL-431-00-921 white

Version 1.01

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DEUTA Controls GmbH

Paffrather Straße 140
51465 Bergisch Gladbach
Phone: +49 5734 51466 -15
Fax: +49 5734 51466 -28
E-Mail: info@deuta-controls.de
Web: www.deuta-controls.net

Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

E-Mail: info@deuta-controls.de

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1 Validity of this documentation

This documentation is only applicable to the products

AL-431-00-921 series

Three products (only difference is the color of the housing) are certified:

- **AL-431-00-921 white**
- **AL-431-00-921 beige**
- **AL-431-00-921 black**

In this document, the reference for all three models is always the same, i.e.

AL-431-00-921 series

The device must only be installed and operated according to the instructions in these operating instructions.

2 Intended use

The **AL-431-00-921 series** must not be used in any relation with equipment that supports, directly or indirectly, human health or life or with applications that can result in danger for people, animals or real value.

The **AL-431-00-921 series** can be mounted on top or on the bottom of a table, or can be mounted on any other smooth surface using a double-sided adhesive tape.

The sensor element inside the device must be able to detect a vibration, caused by the occupancy. If this is not possible due to the construction of the table, this sensor type is not the best choice.

3 Disposal



Electrical and electronic equipment may not be disposed of with household waste. This also applies to products without this symbol.

Electrical and electronic equipment contain materials and substances that can be harmful to the environment and health. Electrical and electronic equipment must be disposed of properly after use.

Note only for EU: WEEE 2012/19/EU applies throughout Europe. Directives and laws may vary nationally.

4 Device description

4.1 Functionality

The **AL-431-00-921 series** contains a high sensitive vibration sensor that detects even small movements and sends a message via radio (EnOcean). The sensor electronics, which are built into a plastic housing, is usually attached with a double-sided adhesive pad to a desk's surface. Depending on your requirements, the sensor is available in a black, white or beige housing.

Best case, the sensor is supplied with energy by the integrated solar cell in the front. In situations where the ambient light is not sufficient, an internal battery supplies the sensor energy storage for typically 5 years or longer.

The information is transmitted via the EnOcean wireless standard (EEP: A5-14-05).

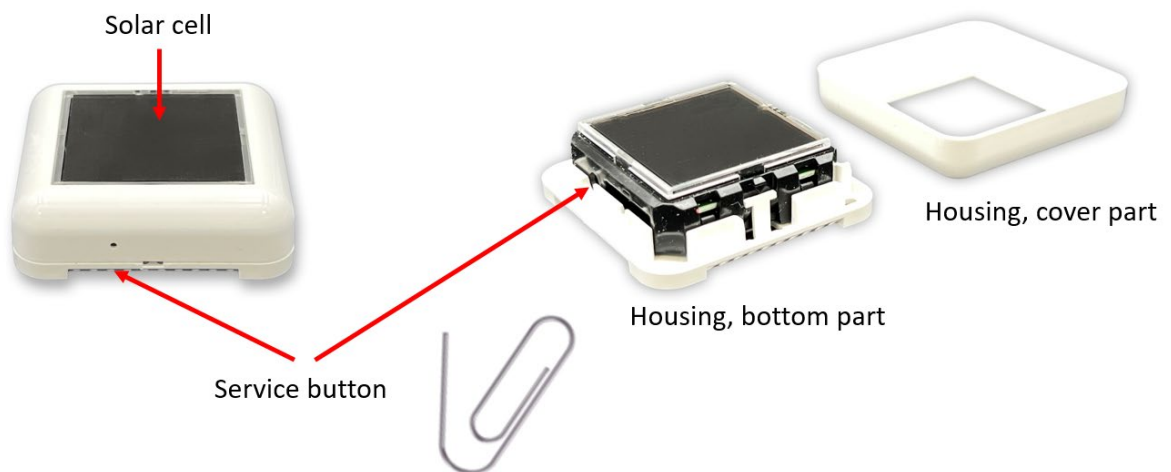
The following information is currently available for the evaluation:

- Vibration detected, 0..1
- Battery voltage: 8 bit, 0 .. 250 [mV/20]

4.2 External product interface

The external product interface consists of the following items:

- Solar cell (for energy harvesting)
- Service button to send teach in / learn telegram
- Access to battery holder when housing is opened



4.3 Observe intended use

The **AL-431-00-921 series** must not be used in any relation with equipment that supports, directly or indirectly, human health or life or with applications that can result in danger for people, animals or real value.

4.4 Observe statutory provisions for operating frequency range.

The **AL-431-00-921 series** must only be operated in compliance with the country-specific provisions regarding operation of radio equipment.

4.5 Non-conduction mounting surface

A non-conductive mounting surface is necessary.

Ensure the **AL-431-00-921 series** is mounted on a non-conductive surface. If it is not, performance may be adversely affected.

5 Technical data

5.1 Communication / EnOcean wireless interface

Type	EnOcean
Number	1
Operating frequency	921.7 MHz
Transmission power	0 dBm
Modulation type	FSK
Number of channels	Ch 24 (921,7 MHz)
Transfer / data rate	125 kbit/s

Table 1: Technical data / communication

5.2 Sensor: Accelerometer / Vibration

Measuring range	+/- 2g
Sensitivity	0.03 g

Table 2: Technical data / Vibration sensor

5.3 User interfaces

Service button	Yes
Service LED	-

Table 3: Technical data / User interfaces

5.4 Housing / connection technology

Connection technology	-
Housing	Plastic, PC, white / black / beige

Table 4: Technical data / housing

5.5 Power supply

Supply voltage	Integrated solar cell
Backup battery	CR 1632

Table 5: Technical data / power supply

5.6 Environmental conditions

Operating temp.	-5°.. 40 °C
Storage temp.	-20 ..+70 °C
Rel. humidity	0..99 % rel. humidity, non condensing
Protection class	IP20

Table 6: Technical data / environmental conditions

5.7 Dimensions and weight

Weight	29 g
Dimensions	50 x 50 x 17 mm

Table 7: Technical data / dimensions and weight

5.8 Standards and approvals

NCC, AL-431-00-921 beige	 CCXXxxYYyyyZzW Will be updated finally
NCC, AL-431-00-921 white	 CCXXxxYYyyyZzW Will be updated finally
NCC, AL-431-00-921 black	 CCXXxxYYyyyZzW Will be updated finally

Table 8: Technical data / Approval / Label

6 Functional description in detail

6.1 Vibration sensing

The **AL-431-00-921 series** will detect people working on a desk, based on an integrated 3-axis accelerometer.

Quality of sensing mainly depends on the construction and the materials used for the table. The more stable the table is, the lower the accuracy of the sensors detection will be.

6.2 Send learn telegram

To connect the **AL-431-00-921 series** to any building automation system, a so called learn telegram can be send by the device.

Simply push the service button. The **AL-431-00-921 series** will immediately send a learn telegram.



6.3 Table of supported EEP's (EnOcean Equipment Profiles)

6.3.1 Transmit / TX

The EnOcean wireless standard defines so called EnOcean Equipment Profiles (EEP).

Each EnOcean based product sends data according to at least one standardized data format. The **AL-431-00-921 series** transmits data described as follows:

Cons. nr.	EEP	Description	Tx-ID
1	00-A5-14-05	Vibration detection (BYTE1) + Power supply voltage, 8 bit (BYTE 3)	EURID

Table 9: Technical data / EnOcean EEP for TX

The following table describes in detail data send by the **AL-431-00-921 series** according to the EEP A5-14-05:

Offset	Size	Bitrange	Data	Shortcut	Description	Valid range	Scale	Unit
0	8	DB3.7...DB3.0	Supply voltage	SVC	Battery voltage	0..250	0...5.0	V
8	23	DB2.7...DB1.0	Not used (= 0)					
28	1	DB0.3	LRN Bit	LRNB	Learn Bit	0: Teach in tel. 1: Data tel.		
29	1	DB0.2	Not used (= 0)					
30	1	DB0.1	Vibration	VIB	Vibration	0: no Vibration det. 1: Vibration detected		
31	1	DB0.0	Not used (= 0)					

Table 10: EnOcean transmit data

6.3.2 Vibration detection / data transmission rules

The sensor works on the basis of a three axis accelerometer.

It continuously monitors the sampled analogue data of the internal sensor. Once the signal is above a configured threshold, i.e. a certain amplitude of vibration, the sensor will send a message with content "Vibration detected".

After a sending a message, the sensor will send no data for approx.240 seconds.

After this period the sensor will send "Vibration detected" all 240 seconds as long as vibration is still detected.

Instead, if no vibration is detected, the sensor will send "No vibration detected" all 240 seconds.

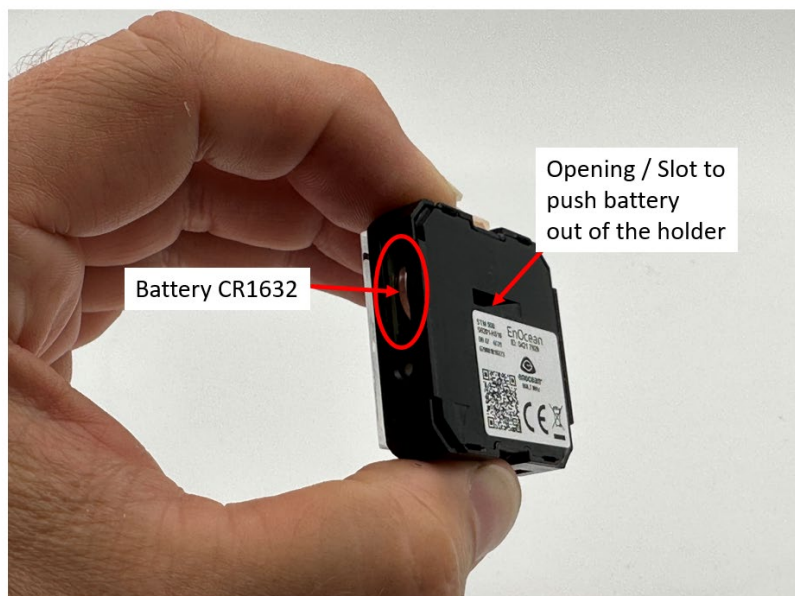
7 Service / changing batteries



Caution: When handling the device, you have to take care of electrostatic discharge. Otherwise, electronics can be damaged.

In case of a discharged battery, it can be replaced with a new CR 1632 battery.

You have to open the housing with your fingers.



8 Safety remarks



CAUTION: Risk of damage or explosion if a battery of incorrect type is used.



This product contains AA type batteries. If a battery is swallowed, it can cause severe internal burns in just 2 hours and can lead to death.

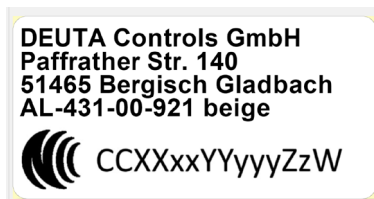


Keep new and used batteries away from children.

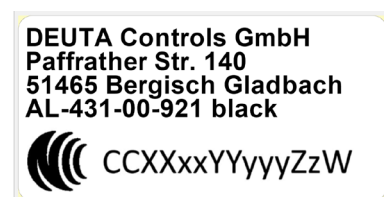
9 Device labels

The following labels are placed on the bottom side of the **AL-431-00-921**:

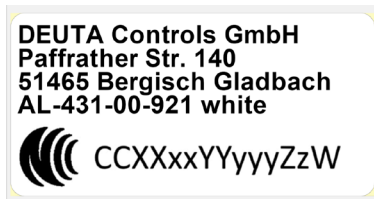
9.1 AL-431-00-921 beige



9.2 AL-431-00-921 black



9.3 AL-431-00-921 white



10 NCC statement

取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

11 Ordering information

Part name	Part nr.	Description
AL-431-00-921 beige	12768	EnOcean sensor "EnoSense Wall & Desk NCC / TAIWAN", for mounting on walls and table surfaces; Measuring range acceleration: +/- 2 g; Ambient temp.: -5° ..+45° C / 0 .. 90% r.h.; Dimensions: 50 x 50 x 15 mm; EEP: A5-14-05; Power supply: Integrated solar cell, backup battery CR1632; EnOcean 921 MHz; Housing: PC, Color: beige (similar to RAL 9010 / pure white);
AL-431-00-921 black	12769	EnOcean sensor "EnoSense Wall & Desk NCC / TAIWAN", for mounting on walls and table surfaces; Measuring range acceleration: +/- 2 g; Ambient temp.: -5° ..+45° C / 0 .. 90% r.h.; Dimensions: 50 x 50 x 15 mm; EEP: A5-14-05; Power supply: Integrated solar cell, backup battery CR1632; EnOcean 921 MHz; Housing: PC, Color: Signal black (RAL 9004);
AL-431-00-921 white	12515	EnOcean sensor "EnoSense Wall & Desk NCC / TAIWAN", for mounting on walls and table surfaces; Measuring range acceleration: +/- 2 g; Ambient temp.: -5° ..+45° C / 0 .. 90% r.h.; Dimensions: 50 x 50 x 15 mm; EEP: A5-14-05; Power supply: Integrated solar cell, backup battery CR1632; EnOcean 921 MHz; Housing: PC, Color: Signal white (RAL 9003)

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12 Revision history

Version	Author	Reviewer	Date	Major changes
1.00	Lehzen	Pohl	21.07.2023	Initial release
1.01	Lehzen	Pohl	7.8.2023	Added NCC statement

----- End of document -----