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weidmuller US67-V1T-BLE Smart Sensor U-sense Vibration Instruction Manual

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Product Information

The u-sense vibration smart sensor is a device designed for the condition monitoring of rotating machines in an industrial environment. It is intended to be attached to the stator of the machine to be monitored in accordance with DIN ISO 10816. The sensor is IP66 rated for protection against dust and water ingress. Multiple sensors can be used on a single system. The sensor requires a computer connected to the same network as the IoT gateway for commissioning.

Product Usage Instructions

Decide on installation locations for sensor and IoT gateway

When installing the sensor and IoT gateway, ensure that they are mounted in the same axis alignment. The sensor has a coordinate cross on the hood to assist with axis alignment.

Installing and commissioning the IoT gateway

During operation, do not remove the Bluetooth stick from the IoT gateway as it will interrupt Bluetooth communication. If communication is interrupted, the IoT gateway must be restarted.

Commissioning the sensor

To connect the sensor to the IoT gateway:

1. Ensure that the LED on the sensor flashes blue 5 times.
2. Within 60 minutes of the sensor being energized, initiate the coupling process between the sensor and the IoT gateway.
3. To reset the sensor, press and hold the reset button for at least 5 seconds until the LED flashes green 2 times. After resetting, re-coupling between the sensor and the IoT gateway is possible.

Adding and configuring the sensor in u-sense vibration configurator

To add and configure the sensor:

1. Refer to the sensor PIN included in the scope of delivery or printed on the PCB of the sensor.
2. Locate the MAC address on the cap of the sensor.
3. Use the u-sense vibration configurator to add and configure the sensor using the sensor PIN and MAC address.

Note: Please refer to the product manual for proper battery replacement and disposal instructions.

Intended use

- The u-sense vibration smart sensor is inten-ded for the condition monitoring of a rotating machine in an industrial environment. The sensor must be attached to the stator of the machine to be monitored in accordance with DIN ISO 10816. Several sensors can be used on a single system.
- The device conforms to the degree of protec-tion IP66.
- The following devices and software are requi-red to operate the sensor:
    - Weidmüller IoT gateway with the integra-ted u-create web and u-sense vibration configurator web applications
    - a Bluetooth-compatible USB stick (e.g. Weidmüller Stick US67-USB-STICK-BLE 2874720000)

A computer located in the same network as the IoT gateway is required for commissio-ning the sensor.

Functional description

At user-defined time intervals, the sensor wa-kes up from energy-saving mode and mea-sures the local acceleration in three spatial axes and temperature. From the raw data, the sensor calculates characteristic data fea-tures and transmits them to the IoT gateway via Bluetooth. The IoT gateway transmits the data to the u-create web application. The operating state can be determined and visu-alised from the transmitted device data. War-ning messages can be generated according to predefined parameters. The sensor can be configured with the u-sense vibration configu-rator software.

Accesorios

- US67-BAT-COSL 2757620000
- US67-PLATE64-STD 2811910000
- US67-USB-STICK-BLE 2874720000

Safety notices

- The device may be installed only by qualified experts.
- The device must not be modified or converted. Repairs may only be carried out by Weidmüller.

### Decide on installation locations for sensor and IoT gateway

Requirements for the installation locations:
Within the common radio range of both units

Mounting options

- 1 A: The sensor can be mounted directly on the machine using an M8 x 8 mm threaded pin
- 1 B: The sensor can be attached using a Weidmüller adapter plate (US67-PLATE64-STD 2811910000).

Positioning of the sensors

- The specifications of DIN ISO 10816 must be observed.
- Each sensor must be aligned radially to the axis of the rotor (see figure 1.1).
- If several sensors are mounted on one machine, they must be mounted in the same axis alignment.
  A coordinate cross is located on the hood for the axis alignment of the sensor.
- If several sensors are mounted on several machines of the same type, they must be mounted at the same position and in the same axis alignment (see figure 1.2).
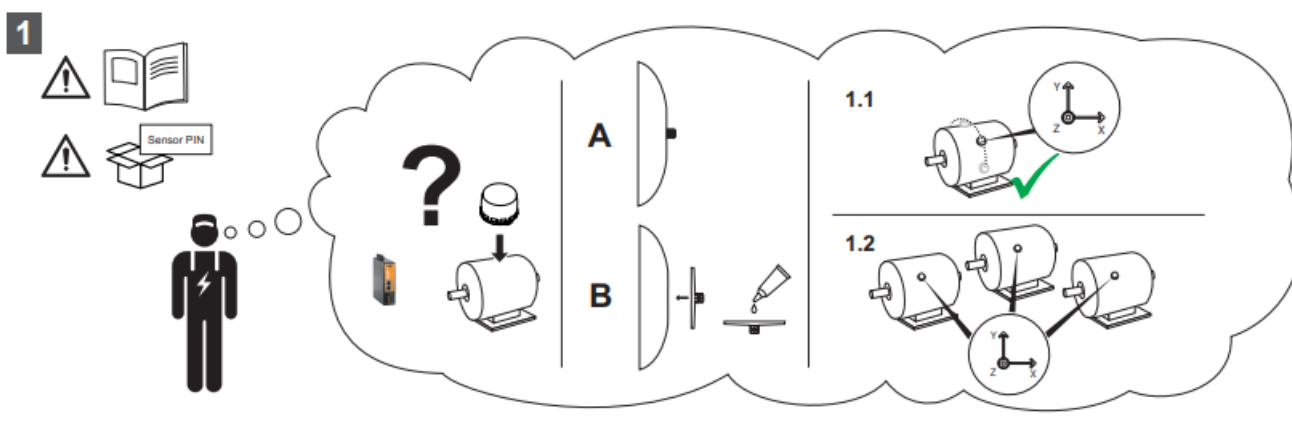

Installing and commissioning the IoT gateway
The Bluetooth stick must not be removed during operation. Otherwise, Bluetooth communication is interrupted and the IoT gateway must be restarted.

Commissioning the sensor

- Once the LED flashes blue 5 times, connect the sensor to the IoT gateway (see figure 4).
- If the LED flashes red, contact the Weidmüller Service.
  The coupling between the sensor and the IoT gateway must take place within 60 minutes of the sensor being energised, otherwise the sensor must be reset.
- To reset the sensor, press the reset button for at least 5 seconds until the LED flashes green 2 times.
  Re-coupling between the sensor and the IoT gateway is now possible.
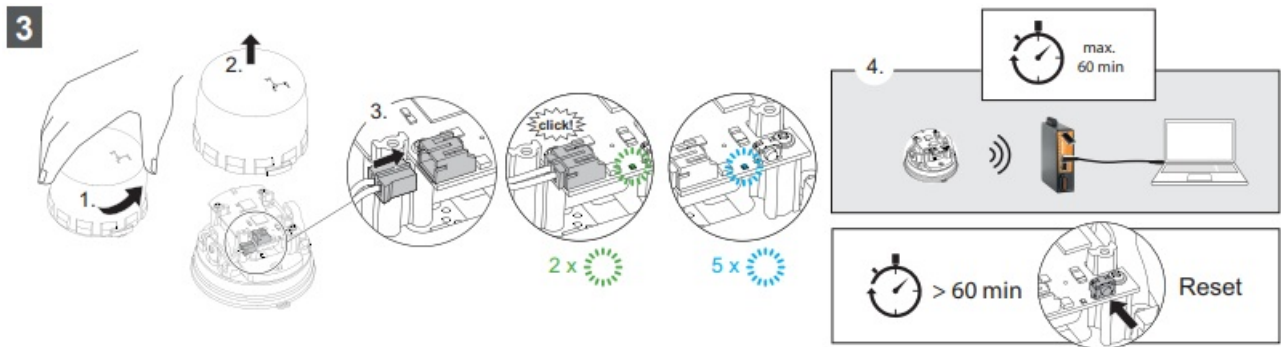
## Adding and configuring the sensor in u-sense vibration configurator

The sensor PIN is included in the scope of delivery. The sensor PIN is also printed on the PCB of the sensor. The MAC address is located on the cap of the sensor.
Once the LED flashes blue quickly, the sensor is coupled to the IoT gateway.
If the LED is illuminated red, the wrong sensor PIN was entered 5 times.

- To reset the sensor, press the reset button for at least 5 seconds until the LED flashes green 2 times.

Detailed instructions for the software can be found in the online help.
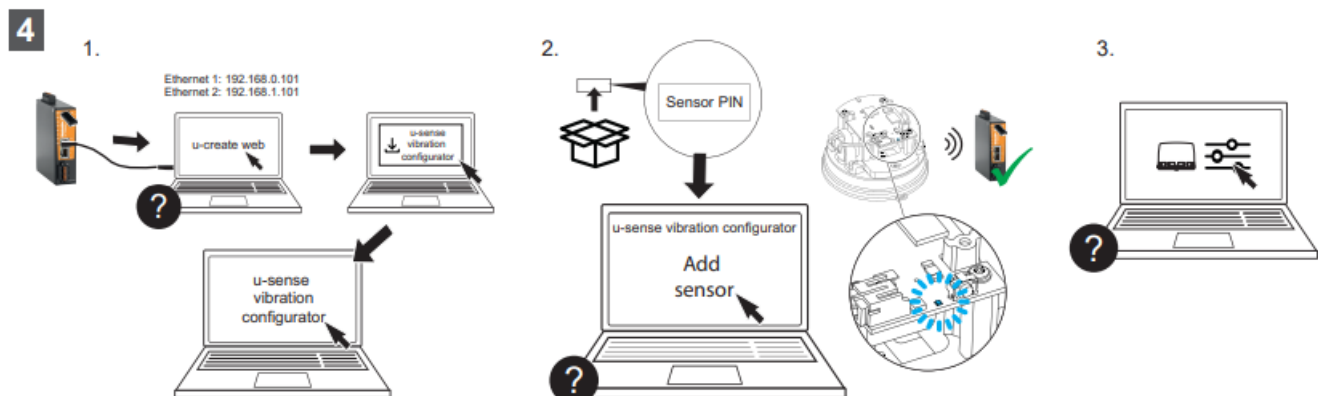
Installing the sensor

NOTICE

Observe the torque!
Too low a torque can result in too weak a coupling between the sensor and the machine. Too high a torque can damage the screw.
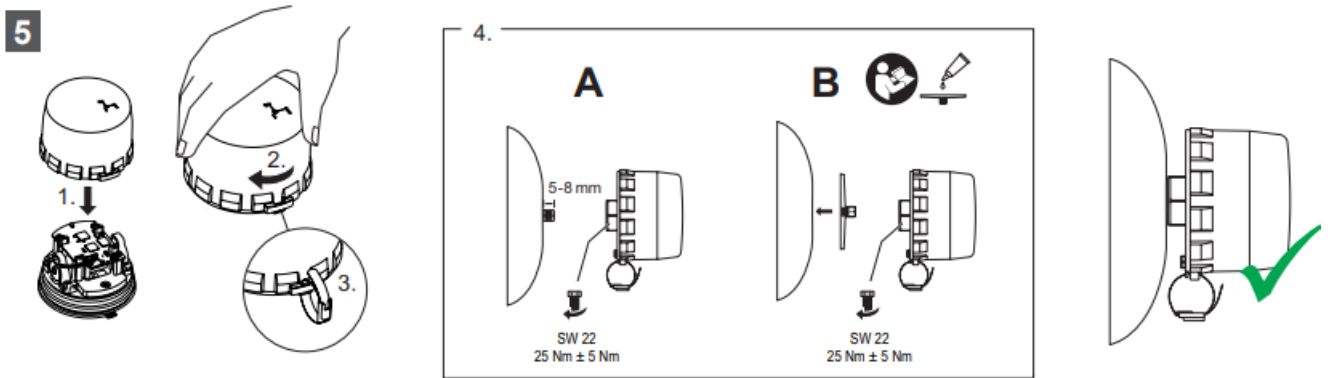The sensor is now ready for operation.

Cleaning
The device may only be cleaned with a cloth slightly moistened with water.

Changing the battery

- A used battery can only be replaced by a Weidmüller battery (US67-BAT-COSL 2757620000).
- Observe the documentation supplied.

- Dispose of the battery correctly.

Disposal

- Dismount the sensor.
- Before disposing of the product, remove the battery for separate disposal.
- Observe the notes for proper disposal of the product. You can find the notes here:

  www.weidmueller.com/disposal.

Technical specifications

Wireless communication	
Technology	2.4 GHz RF Transceiver, Bluetooth 5.0 Low Energy
Distance range1), line-of-sight / shop floor	90 m / 30 m
Acceleration sensor	
Acceleration sensor type	tri-axial MEMS
Mechanical vibration monitoring / Frequency range	DIN ISO 10816 / 10 Hz … 1 kHz
Frequency analysis (FFT)	10 Hz… 3.3 kHz
Amplitude range	±16 g
Sampling frequency	6.6 kHz
Temperature sensor	
Measurement range	-20 °C …+80 °C
Accuracy	±1 °C
Power supply	
Battery type	Lithium
Battery size	AA / Mignon / R6
Battery voltage	3.6 V
Battery capacity	2200 mAh
Battery life time2)	> 2 years
General data	
Diameter	66 mm
Height	55.5 mm
Degree of protection	IP66
Ambient conditions	
Mounting location	indoor
Operating temperature	-20 °C…+80 °C
Storage temperature	-40 °C…+80 °C
Relative humidity (non-condensation)	5…95 %
Max. operating altitude	2000 m

EU Declaration of conformity

Hereby, Weidmüller Interface GmbH & Co. KG, declares that the radio equipment type US67-V1T-BLE is in compliance with Directive 2014/53/EU.
The full text of the EU declaration of conformity is available at the fol-lowing internet address:
www.weidmueller.com

FCC

This device complies with Part 15 of the FCC Rules. Operation is sub-ject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interfer-ence that may cause undesired operation.

Any change or modification to the product not expressly approved by Weidmueller Interface GmbH & Co. KG could void the user's authority to operate the device.
This device complies with FCC RF exposure requirements in accord-ance with FCC §2.1091

ISED

This device contains licence-exempt transmitter(s)/receiver(s) that com-ply with Innovation, Science and Economic Development Canada's li-cence-exempt RSS(s).
Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with ISED RF exposure requirements in accord-ance with RSS-102 Section 2.5.2

Documents / Resources

	weidmuller US67-V1T-BLE Smart Sensor U-sense Vibration [pdf] Instruction Manual US67-V1T-BLE, 2BAKG-US67-V1T-BLE, 2BAKGUS67V1TBLE, US67-V1T-BLE Smart Sensor U-sense Vibration, Smart Sensor U-sense Vibration, Sensor U-sense Vibration, U-sense Vibration, Vibration