

Connected Products and Services

Nexeed Track and Trace

## **Sense I User Guide**

Version 1.2

Bosch Connected Industry



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# 1 Introduction

By being attached to the asset, the Sense I sensor makes the management of assets and material flow transparent and traceable.

Tracking data is transferred to the Bosch IoT Cloud via Bosch Connect gateways or mobile applications.

The Sense I sensor is a battery-operated device for asset tracking use cases.

It uses a 2.4 GHz Low Energy radio to communicate with corresponding receivers for data transmission.



## The Sense I sensor provides

- A unique visual ID (GIAI code) as DMC readable by standard scanner applications
- A unique electronic ID transmitted via 2.4 GHz wireless technology to be captured by Bosch Connect gateways or standard Android smartphone apps

## Application advantages


- Long battery lifetime resulting in less handling effort
- Simple and fast to mount
- Very compact design
- Maintenance-free device
- Extremely robust device
- No configuration required
- Enables tracking transparency within the supply chain

## 2 Radio Frequency Radiation Exposure and Further Information


The radiated output power of the device is far below the FCC radio frequency exposure limits. Nevertheless, the device shall be used in such a manner that the potential for human contact during normal operation is minimized.

## 3 Technical Specifications

### Technical data

TECHNICAL DATA		
Dimension (L x W x H)		33 mm x 23 mm x 6 mm
Weight		approx. 7 g
Power supply		CR2032
Battery life		> 8 years
		 based on ambient temperature conditions (+25°C) and usage in standard transportation use cases
Wireless transmission		
	Technology	IEEE 802.15.1
	Protocol	Proprietary
	Range/Power	> 50 m free line of sight / < 0 dBm
	Transmission interval	15 s
Housing		
	Material	Plastic PA66
	EN 60529 protection category	IPx7, IP67
Certifications		RoHS, CE, FCC further on request

### Operating conditions

OPERATING CONDITIONS		
Operating temperature		-30°C ... +70°C
Storage temperature		+10°C ... +30°C
Storage time		6 months
		 long storage can reduce battery life

## 4 Ordering Information

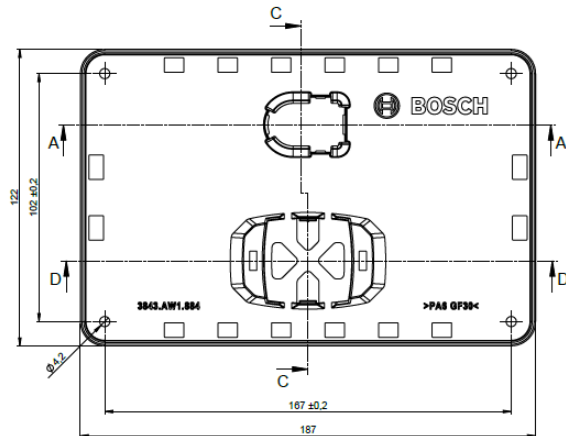
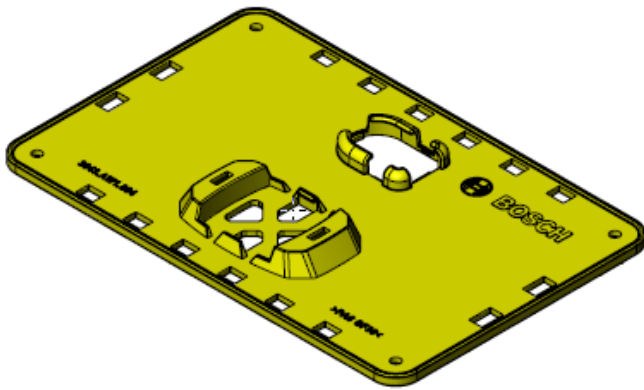
Product number:	Sense I	Order Code: 3843.AW1.474
	Mounting Plate	Order Code: 3843.AW1.884

For any sales information or support, please contact Bosch Connected Industry at [support.tnt@de.bosch.com](mailto:support.tnt@de.bosch.com).

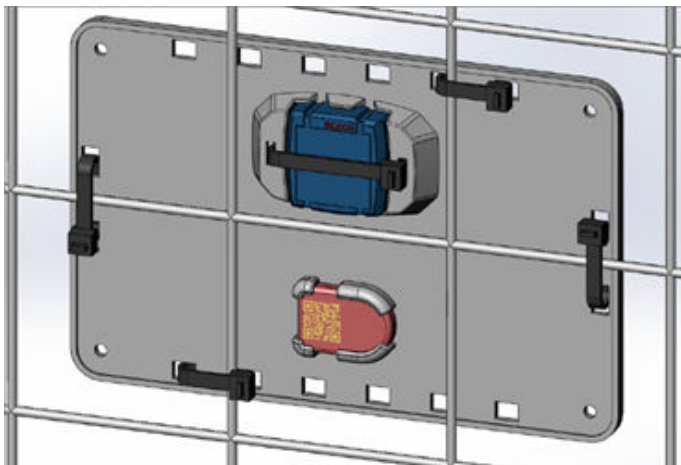
## 5 Mounting

In general, the Sense I sensor can be mounted in any position as required. For a robust attachment of the device to the asset, Bosch Connected Industry recommends:

- Double-sided adhesive tape 3M VHB Tape 5952F
- Available mounting plate 3843.AW1.884
- Available mounting cover 3843.AW3.381



Mounting Plate 3843.AW1.884



Mounting Plate with Sensor on a Lattice Box



Mounting Cover 3843.AW3.381





When mounting the device, consider the following information.

- To enable wireless transmission, do not place the device inside metal enclosures and do not cover the device with metal.
- To enable wireless transmission, do not place the device inside liquids.
- Avoid positions that hinder logistics operation in a warehouse, terminal etc.
- Avoid positions that prevent wireless transmissions (e.g. coverings with metal parts).
- Avoid positions hotter than allowed for this device (refer to [Technical Specifications](#)).
- Avoid covering barcodes on any labels attached to the logistic asset.
- Ensure robust attachment of the device to the asset by using recommended mounting fixtures or adhesive tape.

## 6 Operation

The 2.4 GHz Low Energy radio is a 802.15.1-compatible wireless communication interface. The device is transmitting information packages in constant intervals (every 15 s) on following frequencies:

- 2.402 GHz
- 2.426 GHz
- 2.480 GHz

### Activation

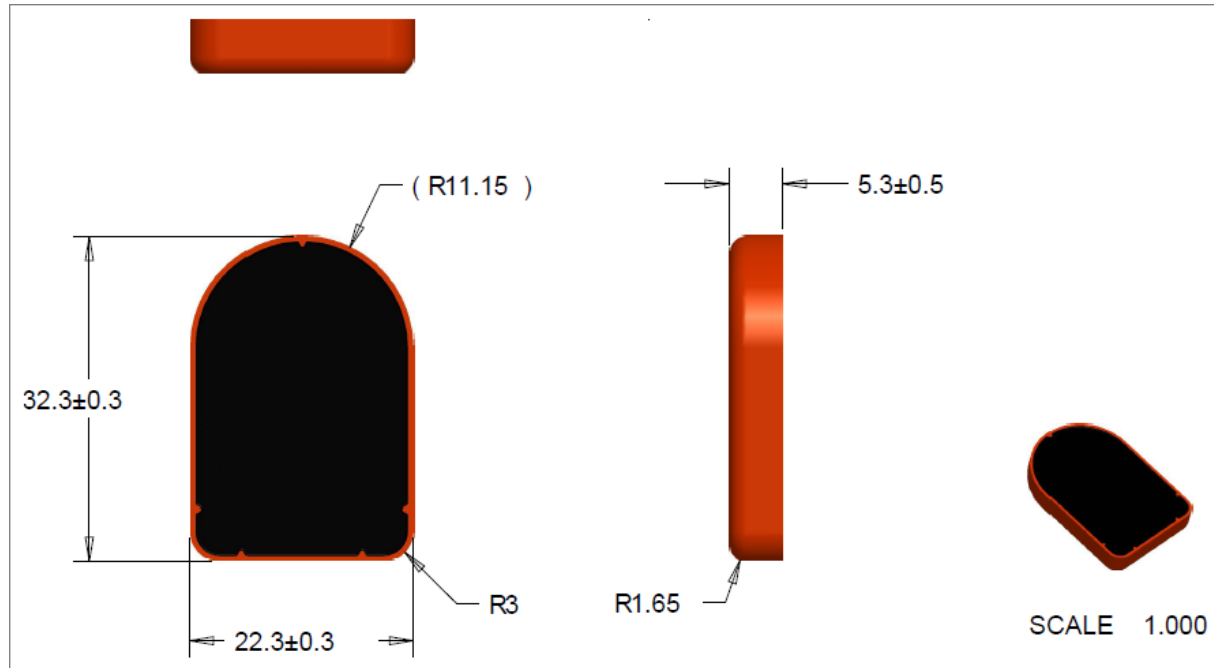
The Sense I sensor is delivered with activated wireless transmission. An activation or configuration is not required.

### Operation

Within the Nexeed Track and Trace solution, the data is received and processed by Bosch Connect gateways. The gateways transfer the received data with additional gateway data to the Bosch IoT Cloud.

## 7 Dimensions

The following figure shows the dimensions of the Sense I sensor.



## 8 Handling and Shipping Information

### Battery

Battery Type	Lithium Metal Battery (Coin cell)
Battery Model	CR2032 MFR
Energy Content	0.675 Wh
Weight of Battery	approx. 2.8 g
Lithium Content	< 0.25 g
Transport Test	according to part III, section UN38.3

### Additional documents (on request)

- Datasheet of battery
- Article Safety Data Sheet of battery
- UL registration at MH14002

### Regulations for shipping of one or multiple Sense I and usage of Sense I as tracking device on assets

#### Road/Rail/Ocean transport

UN classification	Road: UN 3091 Lithium Metal Batteries contained in equipment, 9 (E) Rail: 90 UN 3091 Lithium Metal Batteries contained in equipment, 9 Ocean: UN 3091 Lithium Metal Batteries contained in equipment, 9
Instructions	ADR/RID SV 188 IMDG Code SP 188 Application of SV188 / SP188, because Lithium contained is < 2 g
Packaging	Protection of battery by housing of device and potting of battery. No special packaging requirements.
Marking	No marking required due to coin cell battery type contained in equipment.
Documentation	n/a

## 9 Support

For any questions or inquiries, please contact Nexeed Track and Trace support at [support.tnt@de.bosch.com](mailto:support.tnt@de.bosch.com).

## 10 Disposal

Disposing this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

Take into account the respective national regulations, since improper disposal may otherwise be subject to penalties.

For the return of devices within the EU, follow the instructions below.

### Disposal according to the WEEE Directive 2012/19/EU



WEEE-Reg.-No. DE 80087893

The unit, accessories, and packaging should be sorted for environmental-friendly recycling. Do not dispose of the device into the household waste! According to the European Guideline 2012/19/EU, electric and electronic devices that are no longer usable must be collected separately and disposed of in an environmentally correct manner.

Bosch Connected Industry will collect, reuse, or recycle all used Bosch Connected Industry devices.

To have your device collected, please contact us at: [support.tnt@de.bosch.com](mailto:support.tnt@de.bosch.com).

## 11 Regulatory Notes

### EU Declaration of Conformity



Hereby, Robert Bosch Manufacturing Solutions GmbH – Bosch Connected Industry declares that the radio equipment type Sense I is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:

<http://eu-doc.bosch.com>

Model Search: *Sense*

### Operating the device in countries out of the EU

The Sense I carries the CE mark and is certified for operation in the European Union. For countries out of the EU validate that local legal regulation allows the operation of the Sense I.

### Export Restrictions

Due to legal regulations, the device must not be exported into the following countries or regions: Cuba, Crimea, Iran, North Korea, Syria, and Ukraine.

### Federal Communications Commission (FCC) Notice

FCC has issued an EQUIPMENT AUTHORIZATION to Robert Bosch Manufacturing Solutions GmbH – Bosch Connected Industry for Sense I according to FCC rule parts 15 C with the FCC ID: 2AOSY-SENSE03.

FCC warning statement:

- This device complies with Part 15 of the FCC Rules.  
Operation is subject to the following two conditions:
  - (1) This device may not cause harmful interference, and
  - (2) This device must accept any interference received, including interference that may cause undesired operation.
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

### Note:

This device has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## Canada

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.



## 12 Intended Use

The Sense I sensor is designed according to the information provided in section [Technical Specifications](#) of this document. Any use or operation which requires specific requirements and standards which are not explicitly mentioned in this document must be validated and tested on the customer's own responsibility.

The housing of the Sense I sensor is not to be opened or tampered with. The Sense I sensor is designed for use within environmental conditions as further detailed in the technical specifications in section [Technical Specifications](#). Any intent to use or operate the product under deviating environmental conditions must be subject to renewed validation and testing by the customer.

Neither the Sense I sensor nor a potential product derivation, are designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Bosch product could create a situation in which personal injury or death may occur. The same applies for any kind of weapon, any device, or application which is potentially dangerous to human life.

The Sense I sensor is designed for monitoring and tracking purposes and shall not be used as an element of control and safety in machines under the scope of the Machinery Directive 2006/42/EC.

Bosch Connected Industry shall not hold liable for any damages resulting from any use of the Sense I sensor outside/ beyond the certified types of operation and/or defined field of application.

Radio frequency radiation exposure information: this equipment complies with the radiation exposure limits prescribed for an uncontrolled environment for fixed and mobile use conditions.

## 13 Safety Notes



CAUTION: Lithium Battery!



Do only use this device if mounting does not harm any persons or objects.

The device contains a lithium battery. Handling the battery incorrectly could cause fire. Read and follow the valid transportation regulations.

- Do not damage or cut the device.
- Do not dispose of the device in fire.
- Do not expose the device to higher temperatures than defined in this datasheet.
- Do not expose the device to direct sunlight.
- Do not mount the device on exposed positions on logistics assets that can cause detachment of the product.

Your feedback helps us to continuously improve our products and components. Please submit any questions, comments or suggestions for improvement via our [Contacts](#) web page.

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