

# Thingsee AIR User Guide

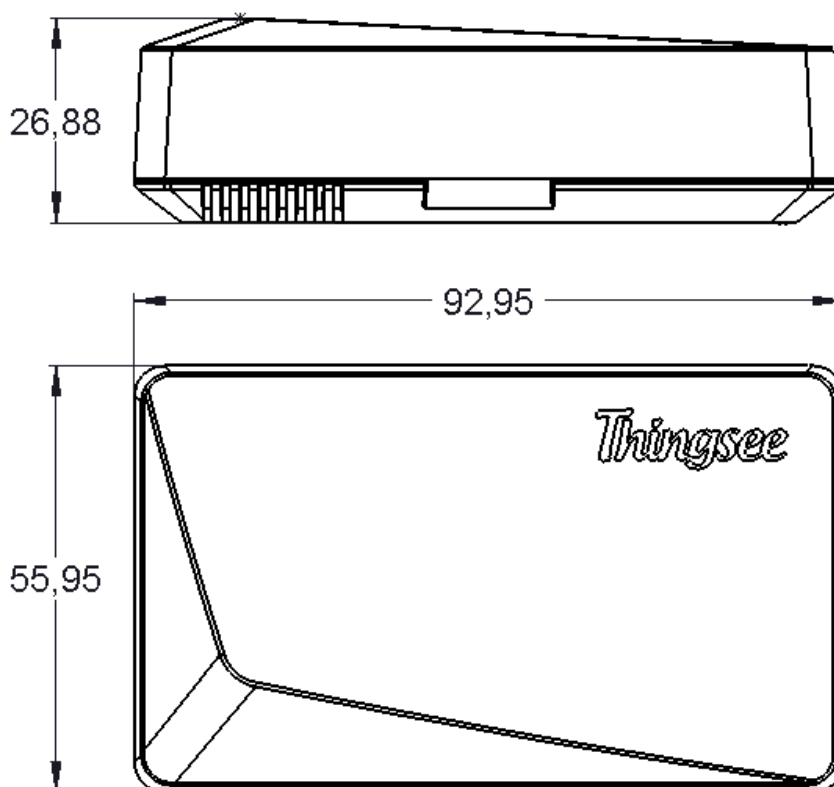
Version 1.0

Thingsee AIR

## Product description

Thingsee AIR is a state of the art battery powered wireless IoT sensor for your indoor air quality monitoring. Together with CO<sub>2</sub>, TVOC, temperature, barometric pressure and humidity sensors, it is a perfect device to provide extensive overlook to both history and present air quality data.

Thingsee AIR is part of Haltian Thingsee IoT solution and product family.



## Product information

Product name	Thingsee AIR
Product description	Indoor AIR quality measurement
Vendor name	Haltian Products Oy
Product type	Wirepas sensor
Internal Model Code (IMC prefix for TUID)	<ul style="list-style-type: none"> <li>• TSAR01</li> <li>• XXAR01</li> </ul>

## Sensor measurement specifications

CO <sub>2</sub>	<ul style="list-style-type: none"> <li>• Measure CO<sub>2</sub> levels indoors</li> <li>• Measurement range 400 ... 5000 ppm</li> <li>• Accuracy is <math>\pm(30\text{ppm} + 3\% \text{ of reading})</math></li> <li>• Automatic baseline calibration takes 8 days, and requires that the CO<sub>2</sub> level drops at least once per day</li> <li>• Possibility for manual baseline calibration</li> <li>• CO<sub>2</sub> sensor is a nondispersive infrared sensor (NDIR)</li> </ul>
TVOC	<ul style="list-style-type: none"> <li>• Total volatile organic compounds</li> <li>• Resolution is 1ppb at range 0ppb-2008ppb</li> <li>• Resolution is 6ppb at range 2008ppb – 11110ppb</li> <li>• Resolution is 32 ppb at range 11110ppb - 60000ppb</li> <li>• Automatic baseline calibration takes 24 hours.</li> </ul>
Temperature	<ul style="list-style-type: none"> <li>• Measurement range -40 ... 85 °C</li> <li>• Accuracy is <math>\pm 0.2^\circ\text{C}</math></li> </ul>
Relative humidity	<ul style="list-style-type: none"> <li>• Accuracy is <math>\pm 2\%</math></li> </ul>
Barometric pressure	<ul style="list-style-type: none"> <li>• Measurement range 300 ... 1200 hPa</li> <li>• Absolute accuracy <math>\pm 1\text{hPa}</math></li> <li>• Barometric sensor precision <math>\pm 0.002\text{hPa}</math></li> </ul>
Ambient light	<ul style="list-style-type: none"> <li>• Measurement is not calibrated</li> <li>• Use only for indicative purposes</li> </ul>

## Hardware info

Northbound interfaces	nRF52832 (Wirepas)
Battery type	2 x AA (replaceable)

## Dimensions

Width	55.95mm
Height	26.88mm
Length	92.95mm
Weight	100 g

## Environment info

Environment	<ul style="list-style-type: none"><li>• Operating temperature 5°C ... +50°C</li><li>• Operating humidity 0% ... 85% RH non-condensing</li><li>• Storage temperature 5°C ... +25°C</li><li>• Storage humidity 45% ... 85% RH non-condensing</li><li>• IP rating IP30</li></ul>
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## Certifications

CE	Available
FCC	Not yet available
ISED	Not yet available

# Thingsee AIR installation instructions

## Using Thingsee AIR sensor

- Thingsee AIR is for indoor use only
- Environment humidity should be <85% RH at all time.
- Usage temperature range: +5 °C to +50 °C, non-condensing environments only.

Please note that the correct TVOC and CO<sub>2</sub> data are available only after the sensor device has conducted baseline calibration for the environment.

- TVOC sensor conducts baseline calibration for the TVOC levels and valid data is available after 24h of continuous use.
- Accurate CO<sub>2</sub> baseline level is set by autocalibration during the first 8 days of usage. The autocalibration is based on the outdoor CO<sub>2</sub> level. CO<sub>2</sub> level in normal air pressure is 400 ppm.
- There must be “free of people” moments with full ventilation in the space, so the device works best in locations where there are no people 24h.

Note: Thingsee AIR requires ‘free of people’ moments in the space, when the indoor air is fully changed, to set the correct 400 ppm baseline. This is why places such as schools and offices are good places to use the sensor, as the baseline can be set during the night.

## Note before installation

Please make sure the Thingsee GATEWAY is installed before you install the sensor.

To ensure strong enough signal strength for data delivery, keep the maximum distance between installed sensors under 20 m.

If the distance between a measuring sensor and the Gateway is > 20m or if the sensors are separated by a fire door or other thick building materials, use extra sensors as routers to ensure adequate signal strength.

## Things to avoid in installation

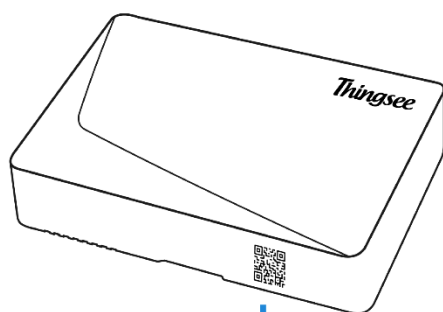
Avoid installing Thingsee products near the following

- Thick concrete structures or thick fire doors
- Thick electrical wires
- Electrical transformers
- Escalators
- Nearby heating or cooling devices and/or vents
- Direct sun light
- Nearby halogen lamps, fluorescent lamps or similar lamps with hot surface
- Nearby radio equipment like WiFi routers or any other similar high power RF transmitters.
- Avoid installing the sensor in close proximity to a spot where there's people presence constantly, such as right next to workstations.

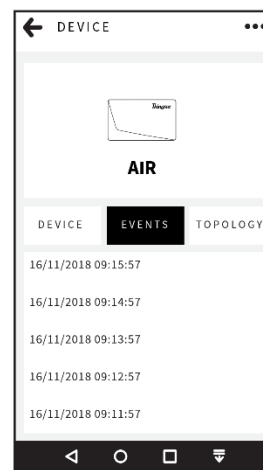
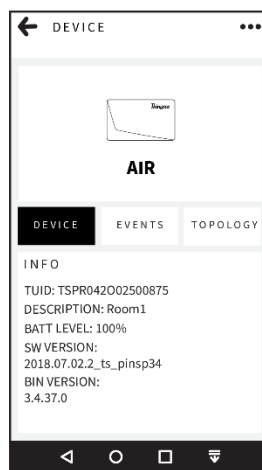


## Installation

Open the box and follow the instructions of this user and installation guide. Take product from the box and open it with the opening key. Select a place where to install Thingsee AIR (see 'Things to avoid in installation' before) - recommended height 1,4 m – 1,8 m.



QR code



Take the B-cover and place it on the wall on the decided location. Screw the B-cover to the wall (use anchor with concrete wall or gypsum board. Place the batteries inside the A-cover.

Take A-cover and identify the product by reading the QR code in the side of the A-cover. To identify the device over Thingsee API, please follow the link for further information: <https://support.haltian.com/api/open-services-api/api-sequences/>

Attach the A-cover to the B-cover attached to the wall. (Make sure the Thingsee logo is right way).

Note: Make sure the sensor is installed max. 20 meters form the next sensor or gateway. This is to ensure full coverage mesh network between the sensors and the gateway.

## Detection Capability

- CO<sub>2</sub> measurement range 400 – 5 000 ppm; extended range up to 10 000 ppm. Accuracy  $\pm 3\%$  (In extended range  $\pm 10\%$ )
- TVOC measurement range 0 – 600000 ppb. Resolution 1ppb at range 0ppb-2008ppb, 6ppb at range 2008ppb – 11110ppb, 32 ppb at range 11110ppb - 60000ppb
- Temperature -40 °C to + 85 °C. Please note recommended operation temperature -0° C to +50 °C. Accuracy  $\pm 0,2C$ .
- Relative humidity can be measured between 0-100% RH. Accuracy  $\pm 2\%$ . • Barometric pressure can be measured between 300-1200hPa. Absolute accuracy is  $\pm 1hPa$ . Pressure sensor precision is  $\pm 0.002hPa$  in high precision mode.
- Ambient light sensing between 0-100k lux. Light level measurement not calibrated. Only for indicative purposes.

## Default measurement and reporting

### Event based reporting

- Measures every 5 minutes:
  - CO<sub>2</sub>
  - TVOC
  - Temperature
  - Humidity
  - Barometric pressure
  - Ambient light
- Reports immediately when measured value has changed more than the set threshold value from previous reported measurement
  - CO<sub>2</sub> default threshold value 10 ppm
  - TVOC default threshold value 30 ppb
  - Temperature when absolute change 0,5 °C
  - Humidity when absolute change 2 %
  - Barometric pressure when absolute change 20 hPa
  - Ambient light when absolute change 10000

### Time based reporting

- Reports all measurement values every 1 hours
- Reports battery-level every 6 hour

## Other default settings

- Battery reporting interval 6 hours • Sensor is in routing mode

## Changing the default settings

The following parameters are configurable remotely over Thingsee Operations Cloud

- Measurement interval
- Reporting interval
- Event based reporting thresholds
- Mesh network node role configuration
- Routing • Non-routing

## CERTIFICATION INFORMATION EU DECLARATION OF CONFORMITY

Hereby, Haltian Products Oy declares that the radio equipment type Thingsee AIR is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: [thingsee.com](http://thingsee.com)

Haltian Products Oy vakuuttaa, että radiolaitetyyppi Thingsee AIR on direktiivin 2014/53/EU mukainen. EU-vaatimustenmukaisuusvakuutuksen täysimittainen teksti on saatavilla seuraavassa internetosoitteessa: [thingsee.com](http://thingsee.com)

Thingsee AIR operates at Bluetooth® 2.4 GHz frequency band. Maximum radio-frequency power transmitted is +4.0 dBm.

### Manufacturer name and address:

Haltian Products Oy

Yrttpellontie 1 D

90230 Oulu

Finland

## FCC REQUIREMENTS FOR OPERATION IN THE UNITED STATES

### FCC Information for the User

This product does not contain any user serviceable components and is to be used with approved, internal antennas only. Any product changes or modifications will invalidate all applicable regulatory certifications and approvals.

### FCC Guidelines for human Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 5 mm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

### FCC compliance 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.

### Industry Canada:

This device complies with RSS-247 of the Industry Canada 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.

Ce dispositif est conforme à la norme RSS-247 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable

### Radiation Exposure Statement :



This device complies with ISED radiation exposure limits set forth for an uncontrolled environment.

**NOTE IMPORTANTE: Déclaration d'exposition aux radiations:**

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 5 mm entre le radiateur et votre corps.

**FCC ID:** 2AEU3TSAIR

**IC:** 20236-TSAIR

#### Safety guide and Warranty

Read these simple guidelines. Not following them may be dangerous or against local laws and regulations. For further information, read the user guide and visit [www.haltian.com](http://www.haltian.com)

#### Usage

For indoor use only.

Usage prohibited in moisture condensing environments.

Do not cover the device as it prevents the device from operating properly.

Remove the batteries from the device if you are taking it inside an airplane (unless you have the pre-installed pull-out tape still in place). The device has a Bluetooth LE receiver/transmitter which must not be operational during a flight.

- Please take care that the used batteries are recycled by taking them to appropriate collection point.
- When changing batteries, replace both of them at the same time using identical brand and type.
- Do not swallow batteries.
- Do not throw batteries into water or fire.
- Do not short-circuit batteries.
- Do not try to charge primary batteries.
- Do not open or disassemble batteries.
- Batteries should be stored in a dry place and at room temperature. Avoid large temperature changes and direct sunlight. At higher temperature the electrical performance of the batteries may be reduced.
- Keep batteries away from children.

#### Care and maintenance

Handle your device with care. The following suggestions help you keep your device operational.

- Do not open the device other than as instructed in the user guide.
- Unauthorized modifications may damage the device and violate regulations governing radio devices.
- Do not drop, knock, or shake the device. Rough handling can break it.
- Only use a soft, clean, dry cloth to clean the surface of the device. Do not clean the device with solvents, toxic chemicals or strong detergents as they may damage your device and void the warranty.
- Do not paint the device. Paint can prevent proper operation.

#### Damage

If the device is damaged contact [support@haltian.com](mailto:support@haltian.com). Only qualified personnel may repair this device.

#### Small children

Your device is not a toy. It may contain small parts. Keep them out of the reach of small children.

## RECYCLING

Check the local regulations for proper disposal of electronic products. The Directive on Waste Electrical and Electronic Equipment (WEEE), which entered into force as European law on 13th February 2003, resulted in a major change in the treatment of electrical equipment at end-of-life. The purpose of this Directive is, as a first priority, the prevention of WEEE, and in addition, to promote the reuse, recycling and other forms of recovery of such wastes so as to reduce disposal. The crossed-out wheellie-bin symbol on your product, battery, literature, or packaging reminds you that all electrical and electronic products and batteries must be taken to separate collection at the end of their working life. Do not dispose of these products as unsorted municipal waste: take them for recycling. For info on your nearest recycling point, check with your local waste authority.