

# openSenseMap

## Dokumentation



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# Table of Contents

Introduction	1.1
Registration	1.2
Luftdaten.info Airrohr	1.2.1
MQTT Client	1.2.2
Editing a station	1.3
Data download	1.4
Data analysis	1.5
REST API	2.1
Community Applications	2.2
HTML Widget	2.3



## openSenseMap

The openSenseMap (OSeM) is a webplatform which provides upload, visualisation and analysis of location-specific sensordata.

Stations may be registered on the platform, which host one or more Sensors on a specific location. Data up- & download is done via the restful [API](#)<sup>1</sup>.

## Features

- timeseries visualization for each phenomenon
- filtering by various parameters
- spatial interpolation
- data download with bounding box

All sensor data is available for download under the [Public Domain Dedication and License 1.0](#)<sup>1</sup>.

openSenseMap and it's API is open source software. Sourcecode and issuetracker are located here:

- [openSenseMap](#)<sup>2</sup>
- [openSenseMap API](#)<sup>3</sup>

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<sup>1</sup>. See [2.1 REST API](#) ↩

<sup>1</sup>. <http://opendatacommons.org/licenses/pddl/summary/> ↩

<sup>2</sup>. <https://github.com/sensebox/OpenSenseMap> ↩

<sup>3</sup>. <https://github.com/sensebox/OpenSenseMap-API> ↩

## Registration on the OSeM

# Register a Luftdaten.info Particulate Matter Sensor on the openSenseMap

You can send the data of your particulate matter sensor to the openSenseMap if you follow these steps.

## 1. Look up your sensor configuration and [register](#)<sup>1</sup> a new senseBox

- Using the web interface of your device, you can find out which sensors are attached ([Fig. 1](#)<sup>1</sup>).
- Go to <https://opensensemap.org/register><sup>2</sup>, fill out your name, location and exposure.
- In the section Hardware select luftdaten.info. Now select the correct sensor configuration matching your local sensor configuration ([Fig. 2](#)<sup>2</sup>).
- Finish the registration.
- Attention: Copy your senseBox ID. This is a 24 character long string looking like this: 58a88c6b650831d8a3625e01
- If you registered with a correct mail address, the senseBox ID will also be sent via mail.

## 2. Configure your device

- Go to the web interface of your device
- Open the configuration page
- Paste your senseBox ID in the field next to Send to openSenseMap and check the box.
- Save the configuration with the button on the bottom of the page.

## Done

Your device should now send its data to the openSenseMap!

## Figure 1: Webinterface particulate matter sensor

**Sensoren**

- ☒ SDS011 (Feinstaub)
- ☒ DHT22 (Temp., Luftfeuchte)
- ☐ PPD42NS
- ☐ BMP180
- ☐ BME280
- ☐ GPS (NEO 6M)

Die Auswahl der Sensoren an dieser Stelle ist entscheidend für die Registrierung auf <https://openSenseMap.org/>  
Sollte vor der Registrierung nachgesehen werden.

**Weitere Einstellungen**

- ☐ Auto Update
- ☐ Display

Debug Level

**Weitere APIs**


☒ An OpenSenseMap senden  
senseBox-ID:

Nach der Registrierung auf <https://openSenseMap.org/> hier die zugewiesene senseBox ID angeben

☐ An eigene API senden  
Server:   
Pfad:   
Port:   
Benutzer:   
Passwort:

☐ Senden an InfluxDB  
Server:   
Pfad:   
Port:   
Benutzer:   
Passwort:

Figure 2: Registration on openSenseMap

 **openSenseMap** 391 senseBoxen  
174352668 Messungen

Suche nach Boxen und Orten

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### Hardware

Wähle den Typ deiner senseBox aus.

senseBox:home

luftdaten.info

☐ Luftdaten.info Feinstaubsensor ohne Temperatur/Feuchtesensor

☐ Luftdaten.info Feinstaubsensor mit DHT11

☒ Luftdaten.info Feinstaubsensor mit DHT22

☐ Luftdaten.info Feinstaubsensor mit BMP180

☐ Luftdaten.info Feinstaubsensor mit BME280

Manuelle Konfiguration

### Erweitert

MQTT

Zurück

Weiter

<sup>1</sup>. <https://opensensemap.org/register> ↩

<sup>1</sup>. See [1.2.1 Luftdaten.info Airrohr](#) > figure-1-webinterface-particulate-matter-sensor ↩

<sup>2</sup>. <https://opensensemap.org/register> ↩

<sup>2</sup>. See [1.2.1 Luftdaten.info Airrohr](#) > figure-2-registration-on-opensensemap ↩

# Submitting data through MQTT

The openSenseMap is able to receive measurements through its internal MQTT client. There is no openSenseMap MQTT broker, connections are made with a 13 character long client id with `osem_` as prefix.

Connection settings must be configured per senseBox.

The following settings can be made:

## URL

The address of the MQTT broker. Should look like this: `mqtt://username:password@hostname.of.mqtt.broker`

## Topic

The MQTT topic. Example: `home/temperatures/outside`

## Messageformat

Either `json` or `csv`. Formats are documented [here](#)<sup>1</sup>.

## Decode Options

A JSON object. Allows to specify a `jsonPath` expression to specify the position of the json encoded message. Example: `{"jsonPath": "$.payload_fields"}`

## Connection Options

A JSON object. Allows to configure the mqtt client. Keys `keepAlive`, `reschedulePings`, `clientId`, `username` and `password` of <https://github.com/mqttjs/MQTT.js#client><sup>2</sup> are allowed.

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<sup>1</sup>. <https://docs.opensensemap.org/#api-Measurements-postNewMeasurements> ↩

<sup>2</sup>. <https://github.com/mqttjs/MQTT.js#client> ↩

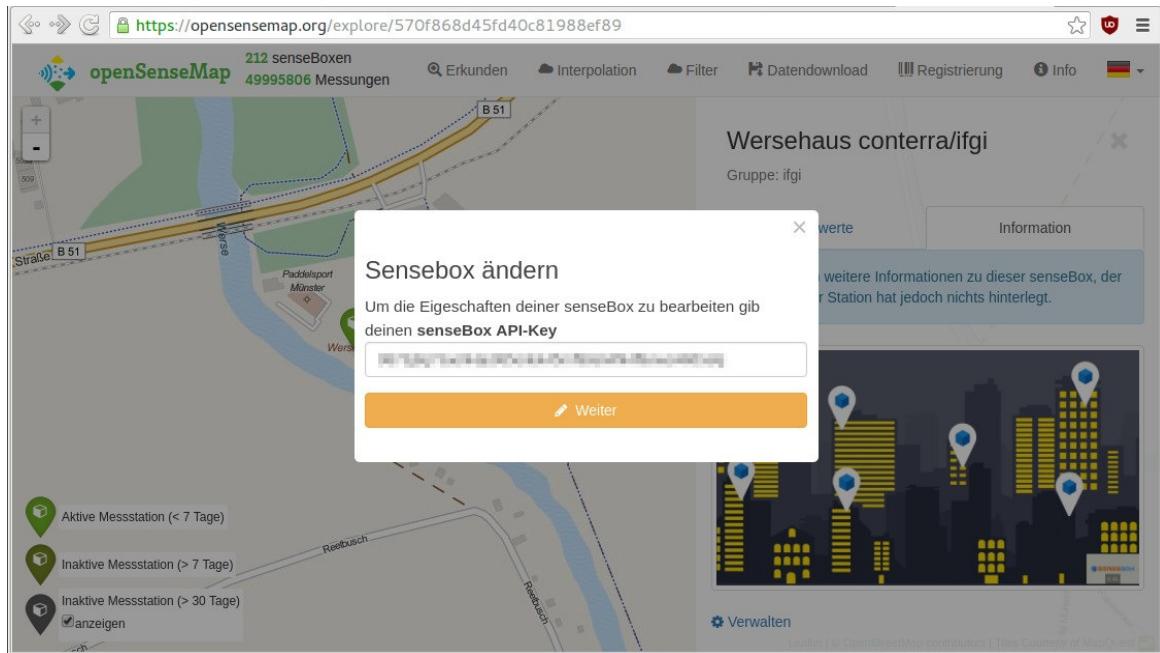


## Modifying a station

All properties of a station may be changed after the registration.

To do this, authorization with the API-key is required, which was sent to you in the registration e-mail!

1. Select your station on the map by clicking on the marker on the map.
2. Select the tab "Info" in the sidebar and click "Manage".
3. Enter your API-key in the dialog.



4. Make your desired changes in the appearing form. You may edit metadata, geolocation, photo, as well as the stations sensor configuration.

Hint: If you have added a new sensor and want to download the updated arduino-sketch, a page-reload after saving is required.

5. Click "save" or "cancel" in the top of the dialog to apply or discard your changes.

## Deleting a station

Follow the steps under "[Modifying a station](#)"<sup>1</sup>, then type `DELETE` in the textfield "Delete senseBox" and confirm.

warning: All associated sensor data will be permanently deleted!

<sup>1</sup>. See [1.3 Editing a station](#) > modifying-a-station ↩

## Data download

Data analysis

Filter

Interpolation

## openSenseMap RESTful API

The openSenseMap provides a REST API, which can be used to query & post senseBox metadata and measurements. The endpoint is <https://api.opensensemap.org/>.

The API documentation can be found [here](https://docs.opensensemap.org)<sup>1</sup>.

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<sup>1</sup>. <https://docs.opensensemap.org> ↩

# Applications using the openSenseMap API

There already are a couple of tools and integrations for the openSenseMap that made by the community.

If you know about an integration that is not listed here, let us know!

## Visualization

- [DevelopmentSeed Dashboard<sup>1</sup>](#): great looking dashboard for measurements of a senseBox
- [HPI Makerclub Dashboard<sup>2</sup>](#) ([demo<sup>3</sup>](#))
- [senseBox Dashboard<sup>4</sup>](#): shows current sensor values of a senseBox
- [senseBox Widget<sup>1</sup>](#)
- [Open Sense<sup>5</sup>](#): Android widget for displaying measurements from opensensemap.org ([code on GitHub<sup>6</sup>](#))

## Data Analysis

- [opensensmapr R client<sup>9</sup>](#): package for analysis of observations within the R statistical environment
- [senseBox openSenseMap R client<sup>10</sup>](#): An R API for the senseBox project. Download and analyse environmental data provided by <https://sensebox.de/en/>.

## Sensor Firmware

- [Raspi cloud coverage sensor<sup>11</sup>](#)
- [GSM water sensor<sup>12</sup>](#)
- [mobile GPS senseBox<sup>13</sup>](#)
- [BigGIS LoRa senseBox<sup>14</sup>](#)

## Misc

- [Alexa senseBox-Skill<sup>15</sup>](#)
- [openhab2 smart home senseBox Integration<sup>16</sup>](#)
- [openSenseMap Game<sup>17</sup>](#): score points for guessing the location of current weather conditions correctly!

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<sup>1</sup>. <https://github.com/developmentseed/sense> ↩

<sup>2</sup>. <https://github.com/HPIMakerKlub/sensebox> ↩

<sup>3</sup>. <http://rawgit.com/HPIMakerKlub/sensebox/master/statistics/sensor.html?senseBoxID=5719c4037514d05c121e317c> ↩

<sup>4</sup>. <https://github.com/sensebox/sensebox-dashboard> ↩

<sup>1</sup>. See [2.3 HTML Widget](#) ↩

<sup>5</sup>. <https://play.google.com/store/apps/details?id=de.codefor.karlsruhe.opensense> ↩

<sup>6</sup>. <https://github.com/CodeforKarlsruhe/opensense> ↩

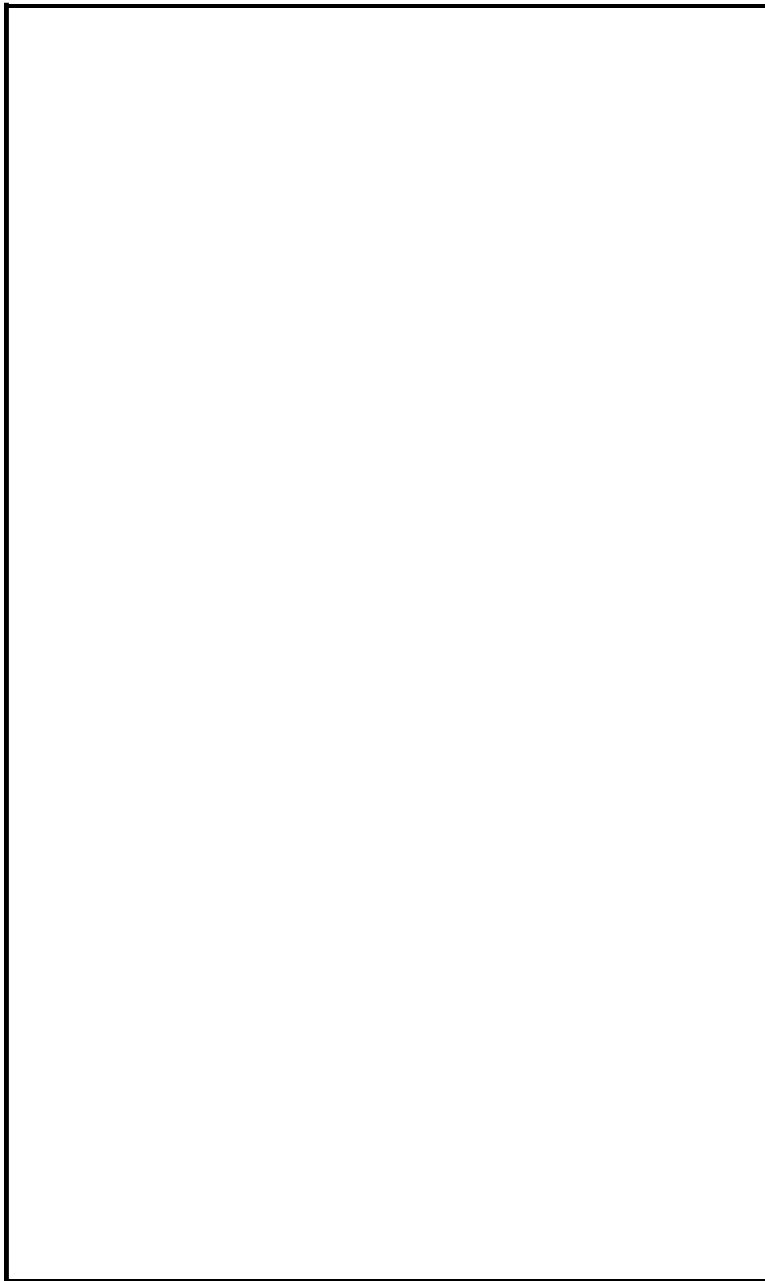
<sup>7</sup>. <https://github.com/Avipsa1/Sensebox> ↩

8. <https://github.com/sensebox/Innotruck> ↩
9. <https://github.com/noerw/opensensmapR> ↩
10. <https://github.com/JohannesFriedrich/senseBox> ↩
11. <https://github.com/felixerdy/senseBox-cloud> ↩
12. <https://github.com/felixerdy/GSM-Temperature-senseBox> ↩
13. <https://github.com/noerw/mobile-sensebox> ↩
14. <https://github.com/biggis-project/sensebox-station> ↩
15. <https://github.com/Zeygon/alexa-sensebox> ↩
16. <https://github.com/hakan42/openhab2-addons/tree/sensebox-binding/addons/binding/org.openhab.binding.sensebox> ↩
17. <https://github.com/MaxMoody/Senseboxgamification> ↩

## openSenseMap Widget

To display the data of a senseBox not only on `opensensemap.org`, but for example also on your own website, you may use our widget.

### Example



### Usage

To include the widget, you just need to add an `iframe` to your page.

## Step 1: Find your senseBox ID

Go to <https://opensensemap.org/><sup>1</sup> and open a senseBox of your choice. Now copy the last portion of the address bar of your browser. This is your senseBox ID.

## Step 2: Insert HTML into your page

In order to include the widget into your web page, just include the following html into your page at the desired location.

Replace the `YOUR-SENSEBOX-ID` in the `src` attribute with the senseBox ID from step 1.

```
<iframe
  src="https://sensebox.github.io/opensensemap-widget/iframe.html?senseboxId=YOUR-SENSEBOX-ID"
  width="400"
  height="600"
  marginwidth="8" marginheight="8"
  hspace="0" vspace="0"
  frameborder="0"
  scrolling="no"
></iframe>
```

You can play around with the `height` and `width` attributes.

You can find the source code of this widget on [GitHub](https://github.com/sensebox/opensensemap-widget)<sup>2</sup>.

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<sup>1</sup>. <https://opensensemap.org/> ↩

<sup>2</sup>. <https://github.com/sensebox/opensensemap-widget> ↩