INSTALLATION GUIDE

mBox Sentinel

Outdoor monitor

MMS - 171

meersens

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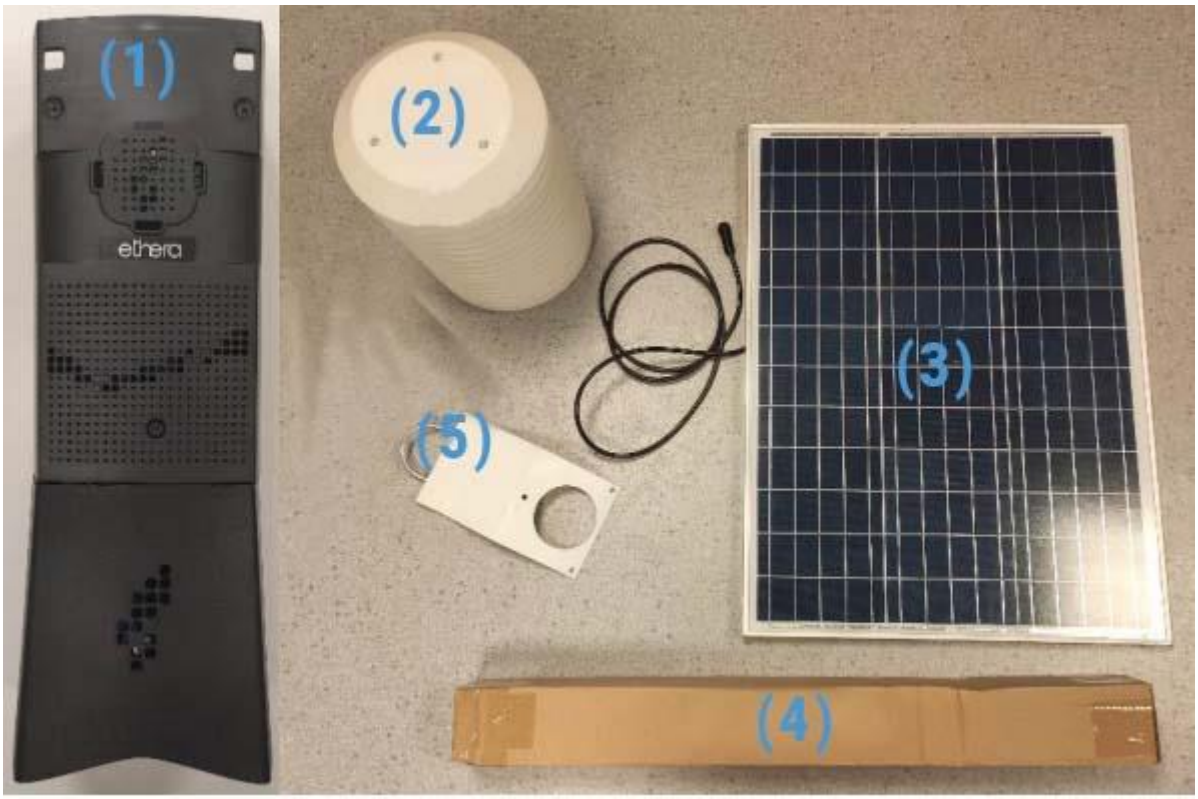
Kit content:

- (1) mBox Sentinel MMS-171 outdoor air quality measuring station
- 1 Magnet
- 1 USB//µUSB cable + power adapter
- (2) Heat shield with power connector
- (3) Solar panel (or 10m power cable (12-24V; 300mA max, not shown)
- (4) Solar panel mounting rails (1 long rail, 1 medium rail, 1 short rail) and screws (6 screws, 6 nuts, 6 grower washers, 6 thrust washers)
- (5) 2 brackets for wall / pole connection



Product:

The **mBox Sentinel MMS-171** is a station for measuring the quality of ambient (outdoor) air. The latter is modular and can, depending on the configuration chosen, continuously measure: temperature, humidity, pressure, light organic compounds (COVL), fine particles (PM1 / PM2.5 / 10), nitrogen (NO2), ozone (NO3), sulfur dioxide, carbon monoxide, ammonia, hydrogen sulfide.

The continuous measurement of these parameters, associated with our Meersens solution allows a more accurate analysis of the exposure to pollutants and the identification of pollution peaks.

Once the campaign has been carried out, a few clicks are enough to collect all the data and generate a comprehensive, highly visual report making it possible to understand the environment studied and identify possible sources of pollution. Remote data visualization and intelligent management can be done through SaaS and the Meersens app.

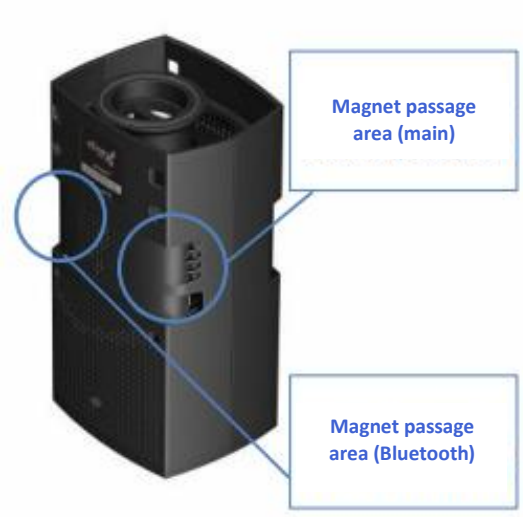
Assembly and installation:

Preamble to the measurement process:

Important information about sensor warm-up time:

Some sensors need a heating time to display reliable values. Among these are electrochemical sensors (VOC, NO2, O3, CO...) which require a heating time of several tens of minutes to several hours. Depending on the sensor, the starting signal is saturated or zero and then evolves to find a stable value after the heating time.

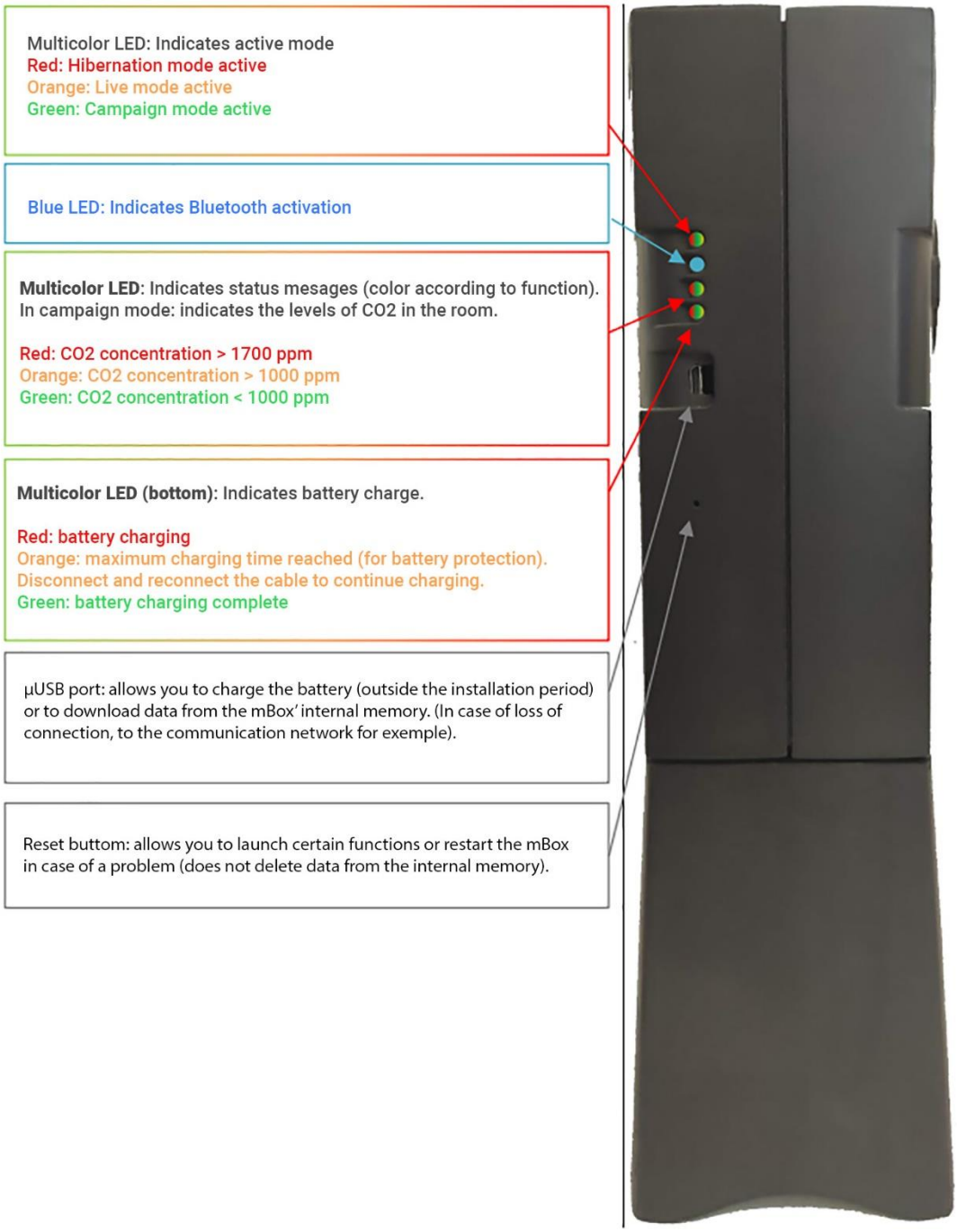
The mBox Sentinel has 3 operating modes. Each mode is associated with a color of the mode LED on the edge of the device (1 LED for mode information, 1 LED for Bluetooth function, 1 LED for status messages and 1 LED indicating the charge). Before installation in the weather shield, it is possible to check the station to know its operating mode. To do this, pass a single stroke of the magnet over the main area of the magnet. The LED lights up in the color of the mode, then flashes and goes out.



- **Hibernation mode (red LED):** In this mode, the mBox Sentinel is in sleep mode. It does not take any measurements and does not communicate with the computer in order to save battery power while the mBox Sentinel is in storage. The change of mode is done by successive strokes of the magnet.

- **Live mode (orange LED):** This mode allows to configure the device. This mode also allows to make measurements on a short time step (15 seconds by default). These measurements are directly sent to the computer and displayed on the screen. In this mode, the measurements are neither saved in the internal memory of the mBox Sentinel (unless the appropriate mode is activated), nor on the computer. If the connection is lost (e.g. USB cable disconnected), the data will be lost (unless the user has made a manual backup using the appropriate procedure). In this mode, the temperature data (except for the external sensor option) and humidity data may be altered by the heating of the case due to the intensive use of the sensors.

- **Campaign mode (green LED):** This mode allows measurements to be taken over a long-time step (10 minutes (CO2/COVLs/T/P/HR) and 2 hours for formaldehyde by default). These measurements are stored in the internal memory of the Sentinel mBox during the whole measurement period and sent to the Meersens SaaS automatically.



Procedure and mode change:

The change of mode is done by passing several strokes of magnets successively on the area reserved for this purpose. Each mode is symbolized by a color of the mode LED indicating the active mode (**hibernation =** red; **campaign =** green; **live =** orange). The flashing of the mode LED corresponds to the action performed (slow flashing = information on active mode; steady LED = second magnet stroke taken into account; fast flashing = mode change possible by passing a magnet stroke). The procedure for changing modes is circular **(Hibernation > Campaign > Live > Hibernation etc...)** and involves the following operations:

a) Strike a magnet on the area where the main magnet passes

b) The LED flashes slowly (the LED indicates the active mode).

c) While the LED is flashing slowly, move the magnet a second time to the area where the magnet passes through.

d) The LED then flashes rapidly (change of mode possible with a magnet stroke)

e) While the LED is flashing rapidly, move the magnet to the area where the magnet passes through for a third time.

f) The LED flashes slowly in the color of the new active mode and then flashes faster

g) At this point, you have two possibilities:

- If no magnet stroke is given, the diode goes out, the new active mode is started.
- If a magnet stroke is given during the rapid flashing, the mBox Sentinel switches to the next mode (back to step f).

It is possible to check the active mode before installing the mBox Sentinel MMS-171 in the weather shield. To do this, when the LED is off, move a magnet across the mBox Sentinel's magnet area. The LED will slowly flash the color of the active mode and then turn off. If no magnet stroke is made during the flashing, the mBox Sentinel does not change modes.

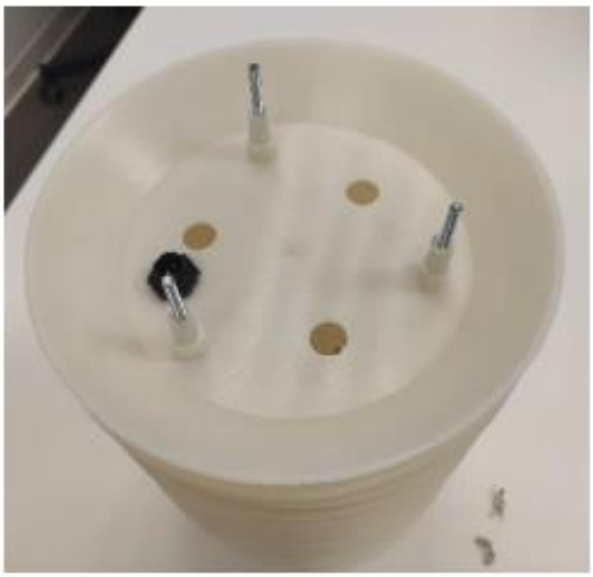
Starting and mounting the mBox Sentinel MMG-171

Before the first use, the mBox Sentinel must be installed in its shield. To do this:

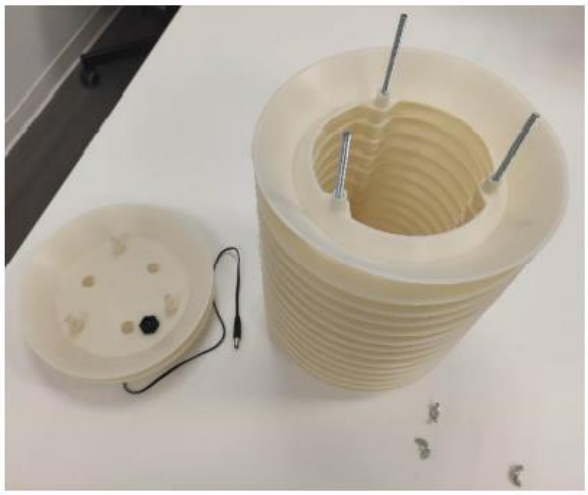
• Indoors, fully charge your mBox Sentinel's battery with the included USB/µUSB cable and AC adapter.

• Start the mBox Sentinel by putting it in campaign mode (green LED) thanks to the magnet *(see procedure in the previous paragraph).*

• Open the shield by removing the three wing nuts located under the shield



• Remove the last stage of the heat shield (double level of fins).



• For mounting with two brackets for wall / post connection, remove the 3 threaded rods and install the top bracket. Then put the three threaded rods back in place.

• Get your mBox Sentinel and plug in the power connector of the shield.
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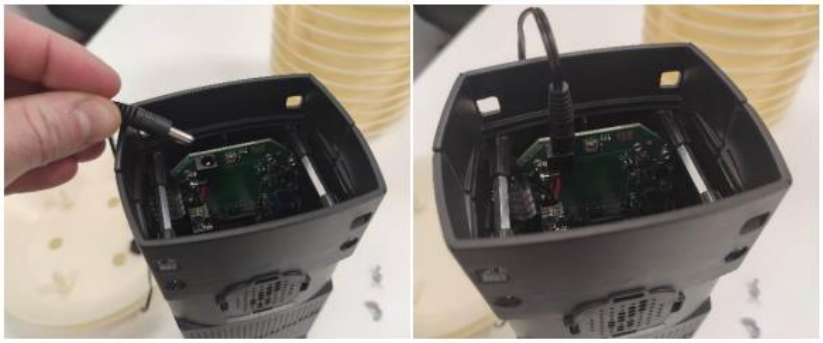
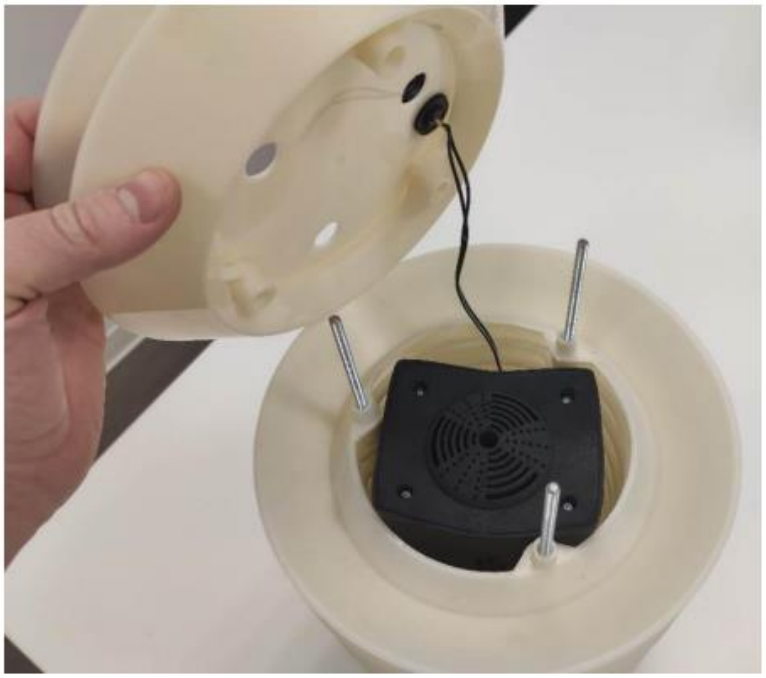
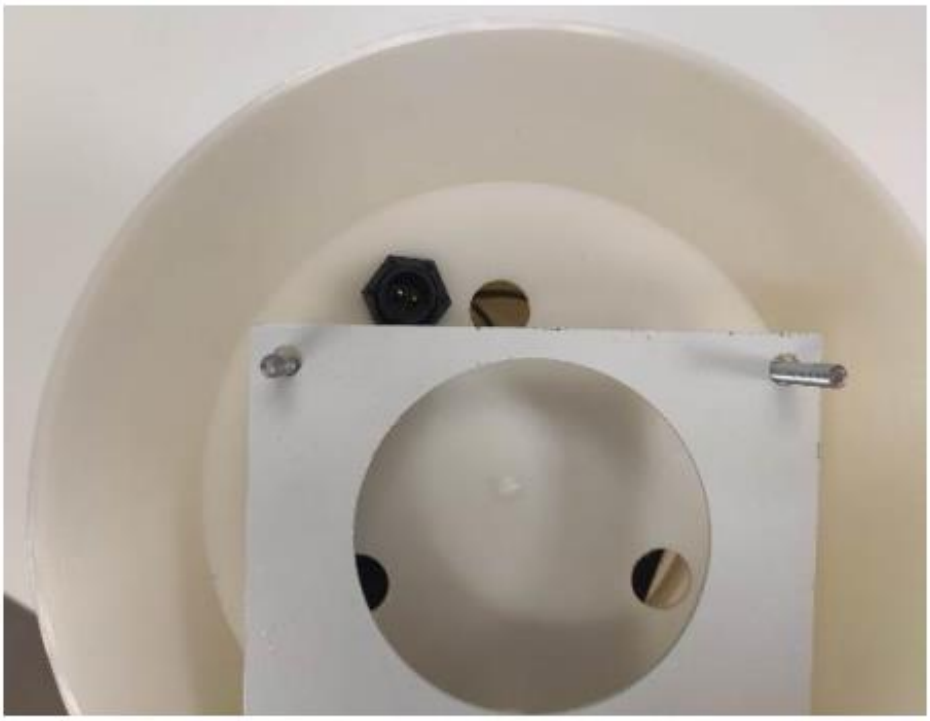


• Insert the mBox Sentinel into the shield. The top part of the station (power connector side) must be positioned at the bottom of the shield.

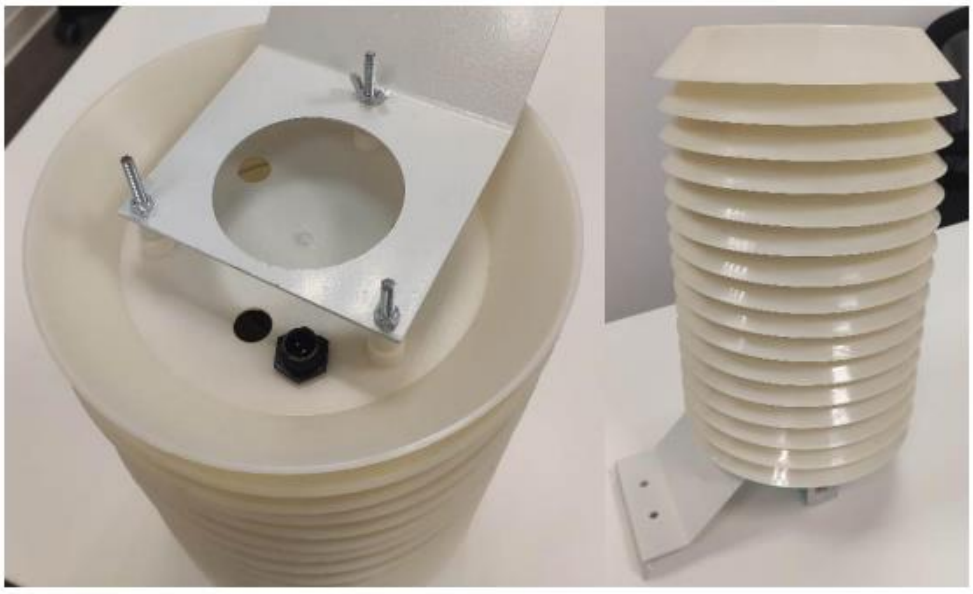


• Reposition the last stage of the shield

• Position the wall / pole mount so that the waterproof power connector remains accessible



• Replace the 3 wing nuts and carefully turn the mBox Sentinel over



• The mBox Sentinel is now ready to be installed.

Installing the mBox Sentinel:

The mBox Sentinel should be positioned so that the water flow is on the outside of the unit. The mBox Sentinel can be mounted on a wall or a post. To do this:

• Install one or two wall/pole mount brackets on your mBox Sentinel. Adding a second bracket allows for a more stable installation of your mBox Sentinel. We recommend this installation if your wall allows it.

• For a wall installation, attach your mBox Sentinel with a fastener that is appropriate for the material in which the device will be mounted and the holes in the bracket. For information, the mBox Sentinel weighs about 2kg. In the case of a single bracket installation, the fasteners must be oversized to take into account the overhang generated by this configuration.

• For installation on a pole (maximum diameter: 6cm), install the fasteners provided for this purpose on the mounting bracket(s).

Connecting to a solar panel:

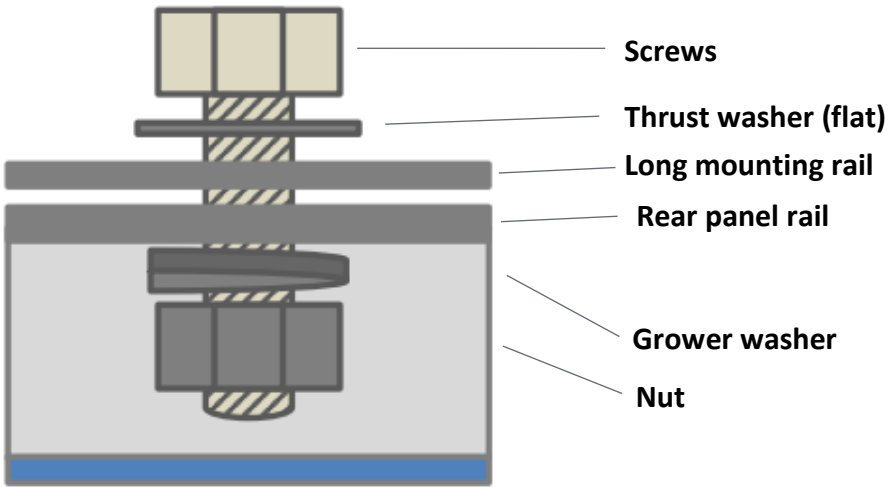
Mounting the panel

To mount your solar panel, take the panel and the associated fixing rails and proceed as described below.

• Attach the long rail to the back of the panel using the screws provided (2 screws, 2 thrust washers, 2 grower washers, 2 nuts). Follow the indications of the following pictures and diagram:

Warning: To protect the front face (active face) of the solar panel well so that this one is not damaged during the assembly. In particular during the stages where this one is in contact with the table of assembly.

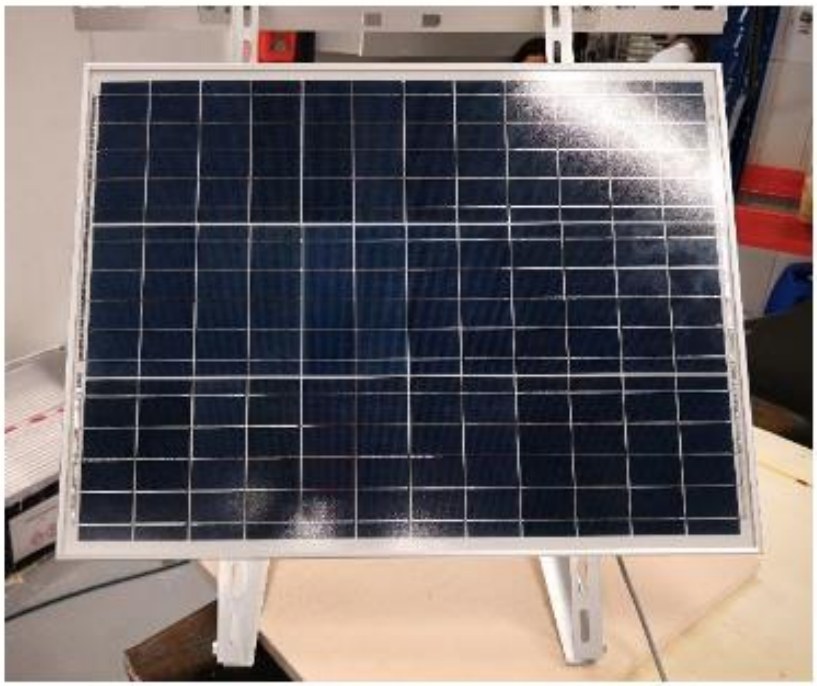
Exemple:



- Get the medium rail, 2 screws, 2 thrust washers, 2 grower washers, 2 nuts to join with the long rail.

- Take the short rail, 2 screws, 2 thrust washers, 2 grower washers, 2 nuts and assemble the short rail to the medium and long rail.
- Mount the short rail to the free ends of the medium and long rail as shown in the picture below:

- The assembly of your panel is now complete.



Connecting the mBox Sentinel to the panel

- Take the Sentinel mBox and the photovoltaic panel.
- Connect the two poles of the waterproof connector. To do this:

  o Align the two poles with the polarizer
  o Lower the clamping ring
  o Turn the ring to lock the connection

Data visualization

The data can be visualized on our SaaS or our Meersens Pro Application.

Switching off the mBox Sentinel station

To shut down the mBox Sentinel:

- Unplug the power supply (or solar panel).
- When indoors, remove the station from the shield.
- Switch the mBox Sentinel to hibernation mode (red LED) to turn off the station.

Maintenance

Most of the sensors on board the mBox Sentinel require annual maintenance (except for the fine particle sensor) in order to continue to give usable values beyond this period. You can contact the Meersens sales department to find out about the terms of this maintenance.

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#HealthGuardian

Meersens is a DeepTech artificial intelligence company specialized in the aggregation and processing of exposome data in order to help and support communities, companies involved in CSR issues and health professionals in taking into account the impact of the environment on the medical condition of individuals. Through its solution, Meersens acts for Public Health and is part of a virtuous process for the implementation of advice, prevention actions and decision support in close collaboration with specialists in the fields concerned.

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