SENTINEL
Marine solutions

Sentinel HUB

Installation Guide

REQUIREMENTS

- Sentinel Boat Monitor device
- Sentinel HUB
- Sentinel Marine solutions app (Android or iOS)

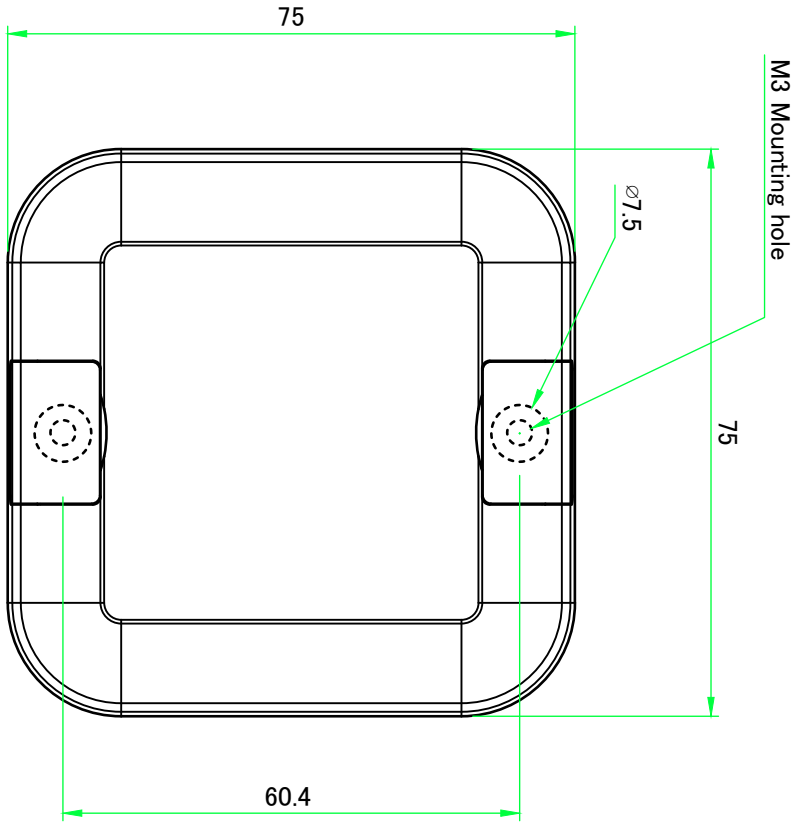
1. Mounting

Sentinel Hub has two mounting holes located under hinged covers on the top of the device. The holes can be accesed by lifting the covers. Please use the drawing below for mounting reference.

We recommend mounting the device to a wooden or plastic panel. Panels made of metal can interfere with the Bluetooth reception and significantly reduce the range of communication.

Also avoid large conductive surfaces between the Sentinel Boat Monitor and Sentinel Hub devices if possible. Conductive surfaces such as engine firewall, metallic cabinets, etc... will reduce range of communication and can make the connection unstable or even disable it completely. If conductive surfaces cannot be avoided, check the signal strength after pairing to make sure that the connection is stable.

Sentinel Hub has a built-in temperature, humidity and pressure sensor. To ensure these measurements are realistic, place the Hub in a shaded area, away from any sources of heat and protected from splashing water and rain.

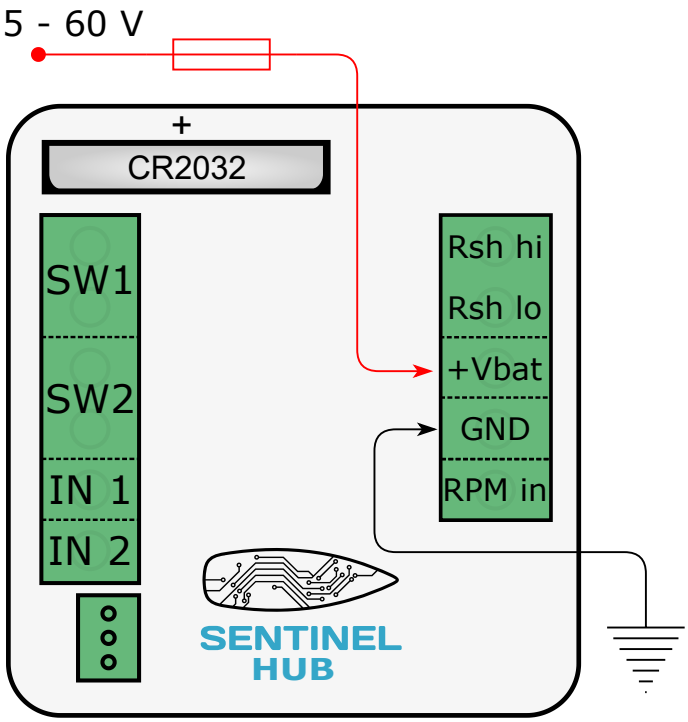


2. Wiring

The Sentinel Hub should be powered with one CR2032 battery and/or external voltage up to 60 V.

Even when the device is connected to external power supply, you can install the CR2032 battery if operation without external supply is requred.

When connecting any input line (analog or digital), always protect the battery and electrical circuit from potential damages with a fuse. Install a fuse holder with 1 A fuse on the positive (+) power cable as close as possible to the battery terminal.



2 **Basic wiring**

2.1 Digital inputs/outputs

Sentinel hub has two general purpose digital inputs, one dedicated digital input for engine speed (RPM) measurement and two relay outputs. It also provides an interface to connect an external temperature probe (optional, not included).

Digital inputs indicate presence of a voltage connected between each input and GND terminal. Voltages lower than 5 V are displayed as logical 0 (“off”), higher are displayed as 1 (“on”). See magnetic switch on Fig. 3 (page 6, example drawing).

Relay outputs work as a switch, connecting both terminals of each output together. Both relay outputs are »latching«, which means that each output keeps its state, even after supply and battery was removed.

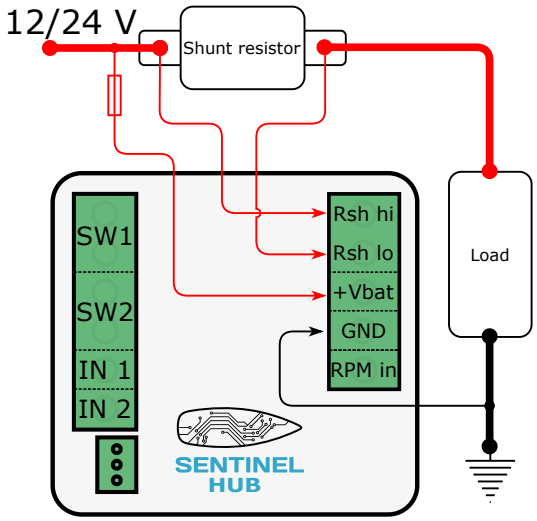
Maximum switching current is 2 A per each output. To switch high power loads, use an external DC power relay of sufficient capacity. The nominal voltage of the relay should match the system voltage (12/24 V). See power relay on Fig. 3 (page 6, example drawing).

2.2 External power supply, voltage/current measurement

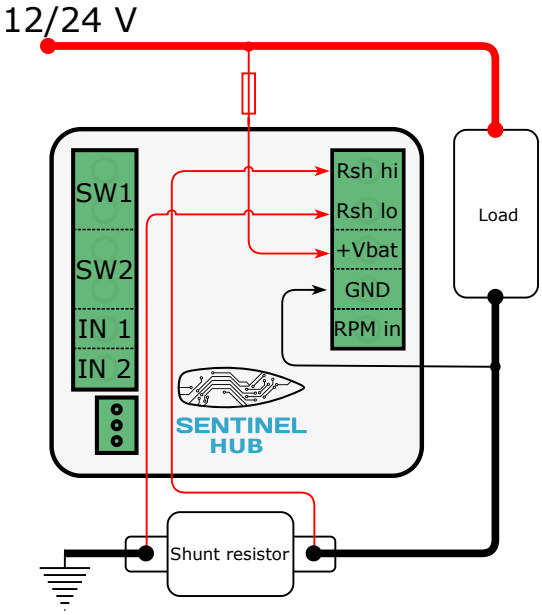
The device can be supplied from one CR2032 battery and/or from Vbat terminal. When Vbat terminal is connected, the batteries are only used as a backup power source in case external voltage is disconnected.

Vbat input (referenced to the GND terminal) is also used as an analog voltage input. The input can measure voltages from 0 V to 60 V.

Current measurement can be achieved by measuring the dropout voltage on an external shunt resistor. The shunt resistor can be placed either in positive (high-side) or negative (low-side) terminal of the measured circuit. Select a shunt resistor which at maximum current does not exceed the shunt input differential voltage range of ±80 mV. The current measurement is bi-directional, showing current flow in both directions. Figures 2.2A and 2.2B show high-side and low-side current measurement.



2.2A **High side current measurement**



2.2B **Low side current measurement**

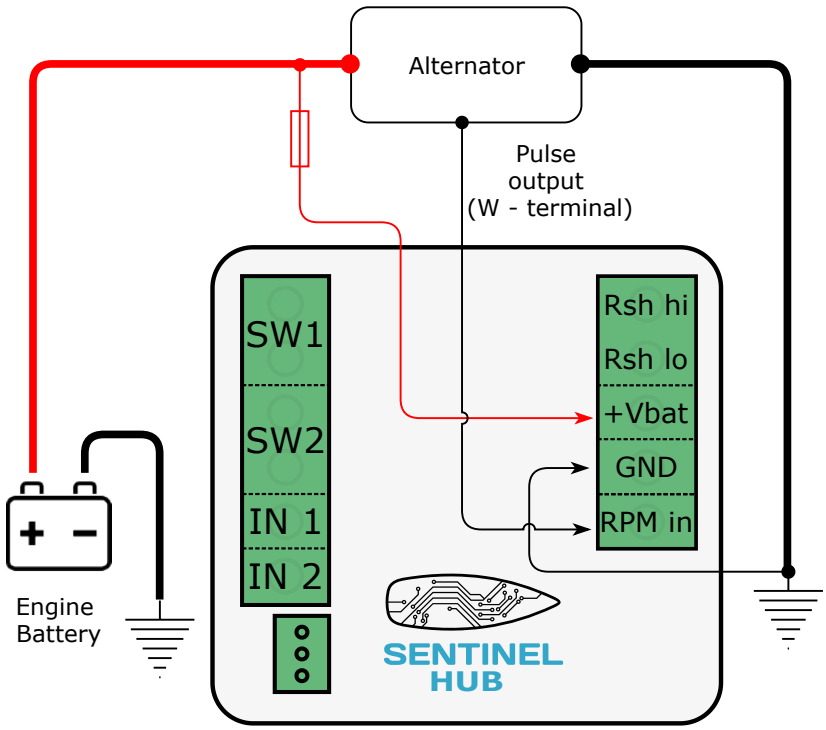
The system is pre-configured for 500A/50mV shunts. If you install a different value, please report your shunt value to support@sentinelmarine.net.

2.3 Engine RPM input

RPM input is designed to work with an alternator's RPM pulse ouptut, most commonly marked "W". Alternator's pulse ouptut is a scaled representation of actual RPM, which is often called a "pulse code". Default engine pulse code is set to 10.7. In case your alternator has a different pulse ratio, please contact support.

RPM input is also used as an engine hours counter, counting the cumulative time the engine was operating.

When using the Hub to measure RPM, please connect the +Vbat supply line as well in order to ensure the correct operation.



2.3 **Engine RPM**

2.4 Wired temperature probe

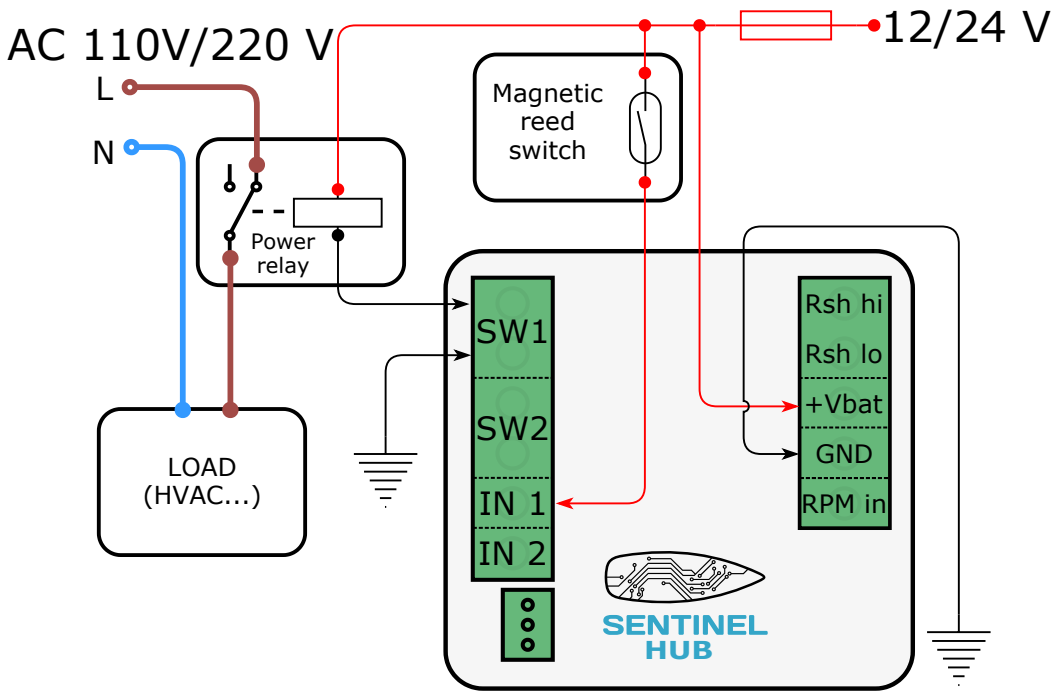
A wired temperature probe can also be used to measure temperature in ducts, on different surfaces, etc... A probe with 3m cable can be purchased separately.

Connect the wires labled GND, DATA and POWER of the temperature probe into the designated holes in the Temp. probe connector.

3. Example use case

In the following example the Sentinel Hub will be used to monitor one (magnetic) switch, used as a door sensor and switch one AC load line as shown in fig 3.

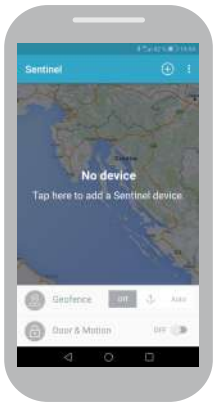
1. Connect the wires for magnetic switch to IN 1 and power relay coil to terminal SW 1.
2. Attach the ground wire to the terminal labeled GND.
3. It is recommended to connect the 12/24 V power line to +Vbat input to supply the hub and monitor the battery supply voltage.



3 **Example use case**

4. Pairing and configuring the Sentinel Hub

1



Tap the + sign at the top of the screen.

2

Scan the QR code on the HUB.

3

Nearby device will be shown. Select the device.

4

Please make sure the Sentinel HUB and the Boat Monitor are close enough to each other, then press Continue.

5

Wait for report of pairing status.

6

You will be notified when pairing is successful.

5. Using the system

NOTE!

If your Boat Monitor is not yet registered to your Sentinel account, follow the steps in the “Boat Monitor Installation guide” before proceeding.

To begin, open the “Sentinel Marine solutions” app and login. In the Sensors tab, several new sensors will appear (Temperature, humidity, air pressure, current, battery voltage, ...). Press the “Edit” button to change which sensors are shown.

Open the Switches tab. Here you will be able to toggle Hub outputs ON or OFF. You can rename the switches by pressing the “Edit” button.

NOTE!

The Sentinel HUB adds several additional sensorts to the system, which may require a change in your Boat Monitor subscription.
For more information, please contact us at support@sentinelmarine.net.

6. Technical specification

Parameter	Value
Absolute maximum voltage on terminals IN 1, IN 2, RPM IN, +Vbat	60V
Vbat measurement voltage range	0 - 60V
Shunt input common mode voltage	0 - 30V maximum
Shunt input differential voltage range	-80mV to +80mV
Digital output type	Relay contact
Output switch current	2 A maximum
RPM IN maximum input frequency	20 kHz
IN 1, IN 2, IN 3 threshold voltage	5V
Internal environmental sensor	
Full range temperature accuracy	± 1°C
Full range humidity accuracy	± 3% RH
Full range pressure accuracy	± 1 hPa at 0-65°C
Temperature probe (optional)	
Temperature probe accuracy	± 0.5°C
Temperature range	-20°C to 105°C
Power supply	1 x CR2032 battery and/or external analog voltage
Operating temperature	-25°C to 60°C
Operating humidity	0 - 100%
Wireless operating range	Up to 30 m indoor(1) Up to 50 m outdoor
Wireless communication protocol	Bluetooth low energy (BLE)
Dimensions	65 mm x 65 mm x 28 mm
Battery life	More than two years(2)

(1) Depends on wall materials and thicknesses.
(2) Only battery operation, no external voltage applied.

Sentinel HUB compliance

CE This product is marked with logo and uses radio frequency bands that are harmonized throughout the European Community and others. Declaration of conformity is located in the box together with warranty list.

CONTACT

support@sentinelmarine.net

www.sentinelmarine.net