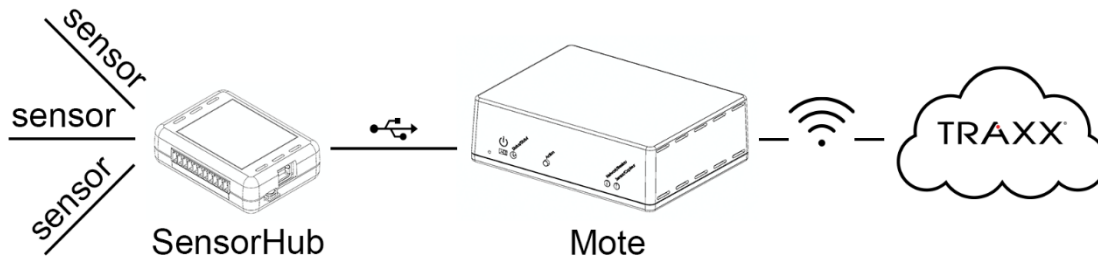


TRAXX[®] SensorHub[™] Installation and Configuration Guide



Overview

TRAXX SensorHubs are USB-connected modules that connect sensors to a PiPerXS 4B mote. Each SensorHub connects multiple sensors through a single device using Phoenix terminal connectors and is configured through the mote configuration interface.



Each SensorHub includes:

- USB port for connection to the mote
- Phoenix terminal connectors for sensor wiring
- Status LED
- Action button (triggers manual data sample)

SensorHub models are labeled to indicate terminal assignments (e.g., RTD, CT, CH1–CH4, DI).

For mote installation instructions, see the [PiPerXS 4B Quick Start Guide](#).

SensorHub Types

SensorHub Lab	SensorHub RS-485	SensorHub 4-20
• RTD temperature sensors • Current transducers (CT) • Digital Inputs (DI) (e.g., door switches)	• CO₂ probes • Temperature / humidity probes • Digital Inputs (DI)	• Up to four 4-20mA input channels • Digital Inputs (DI)

Note: All SensorHub models include an onboard ambient temperature and humidity sensor.

General Installation Guide

SensorHub installation Steps:

- Connect the sensor wires to the SensorHub
- Connect the SensorHub to the mote
- Configure the SensorHub via the mote

These steps do not need to be performed in this order. In most cases, SensorHub settings can be configured on the mote whether or not the SensorHub or sensors are physically connected. The SensorHub only needs to be connected during configuration if multiple SensorHubs of the same type will be used on the same mote.

Connecting Sensors to SensorHub

Sensors are wired to the SensorHub using Phoenix terminal connectors. Each connector on the SensorHub is labeled to indicate the function of each terminal.

Wiring Guidelines

- Fully insert the conductor into the terminal on the Phoenix connector before tightening
- Tighten terminal screws securely. Recommended torque: 0.25 N·m (2.212 in-lb)
- Gently tug each wire after tightening to confirm it is secure
- Ensure no exposed conductor is visible outside the terminal
- Follow the labeling printed on the SensorHub for terminal identification

See the wiring diagrams on the following pages.

Connecting the SensorHub to the Mote

Connect the SensorHub to the mote using a USB-A to USB-B cable.

The SensorHub can be connected to any available USB port and does not need to stay on the same USB port it was configured on.

Note: The SensorHub LED will not illuminate until after the first successful sample, at which point it will turn green and remain green.

Configure SensorHub in the Mote Interface

From the mote configuration interface:

1. Go to the Sensors page
2. Click *Add Sensor* button
3. Use the *Sensor Type* dropdown to select the SensorHub model you are installing
4. Configure additional fields as required. Detailed Configuration Instructions below
5. Click *Submit* to save settings
6. Click *Gather Sample* to verify the sensor connection once all sensors are wired and configured



SensorHub Wiring

Pin diagrams show the connector viewed from the wire entry side.

RTD

The two red wires are interchangeable. Connect the red wires to terminals 1 and 2 and connect the white wire to terminal 3.

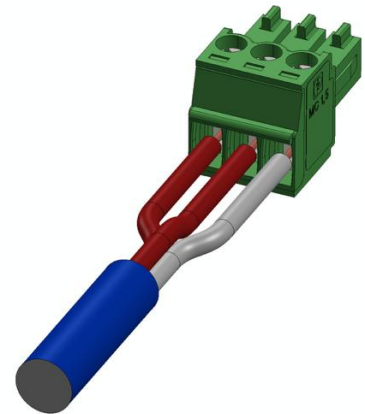
Caution:

The Phoenix connector wiring order for the RTD differs from the Gen2 mote.

If replacing a Gen2 mote with a SensorHub, the wires must be removed and reconnected in the correct order.



Pin	Wire
1	Red
2	Red
3	White



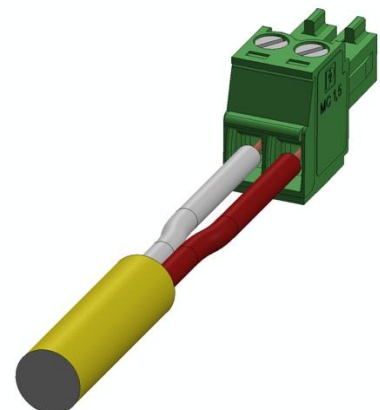
CT

2-wire configuration.

The second wire may be red or black depending on the unit; in either case, connect it to pin 2.



Pin	Wire
1	White
2	Red or Black



DI

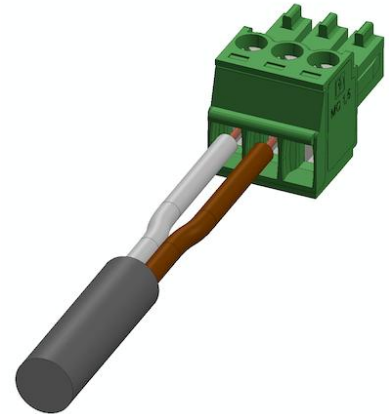
Supports 1 or 2 DI sensors.

Terminal 2 is common between both sensors.

If using two DI sensors, connect both brown wires into terminal 2.



Pin	Wire
1	White (sensor 1)
2	Brown (common between sensor 1 and sensor 2)
3	White (sensor 2)



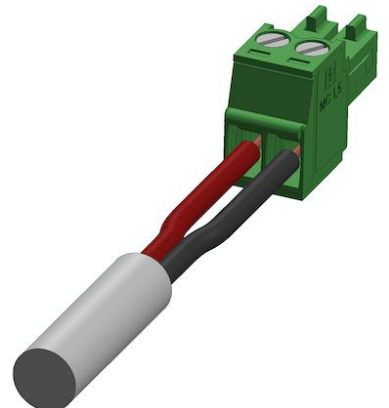
4-20mA

Supports up to four 4-20mA connections on a single 8-pin Phoenix connector.

Each channel uses two adjacent pins: positive (+) followed by negative (-), and the pattern repeats across all four channels (pins 1-2, 3-4, 5-6, 7-8).



Channel	Pin	Wire
1	1	+
1	2	-
2	3	+
2	4	-
3	5	+
3	6	-
4	7	+
4	8	-



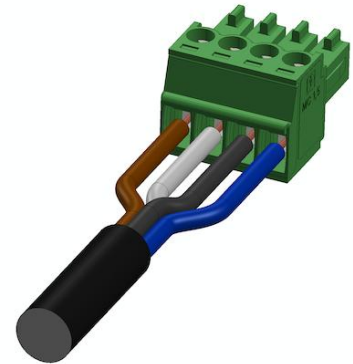
RS-485

Supports up to two Vaisala Probes: GMP251 (CO₂) or HMP (Temperature and Humidity).

Connect each probe to one of the two 4-pin RS-485 terminals (485-1 or 485-2).



Pin	Wire
1	Brown
2	White
3	Black
4	Blue



SensorHub Configuration

After you add a new sensor through the mote configuration interface and select the SensorHub type you are installing, a set of configuration options will appear. The configuration options are different depending on which SensorHub type you are installing.

The SensorHub Serial number is only required if you will be connecting multiple SensorHubs of the same type to the mote. In that case, the SensorHub must be physically connected to the mote to configure. Use the dropdown menu to select the serial number of the SensorHub. Otherwise, leave the serial number set to 'Default Hub'.

Sample Frequency should be set to Every Minute.

For the DI, select Normally Open or Normally Closed based on the normal state of the alarm contact.

The KLATU door switch (Part number: SENS-DOOR-1002) is “Normally Closed”.

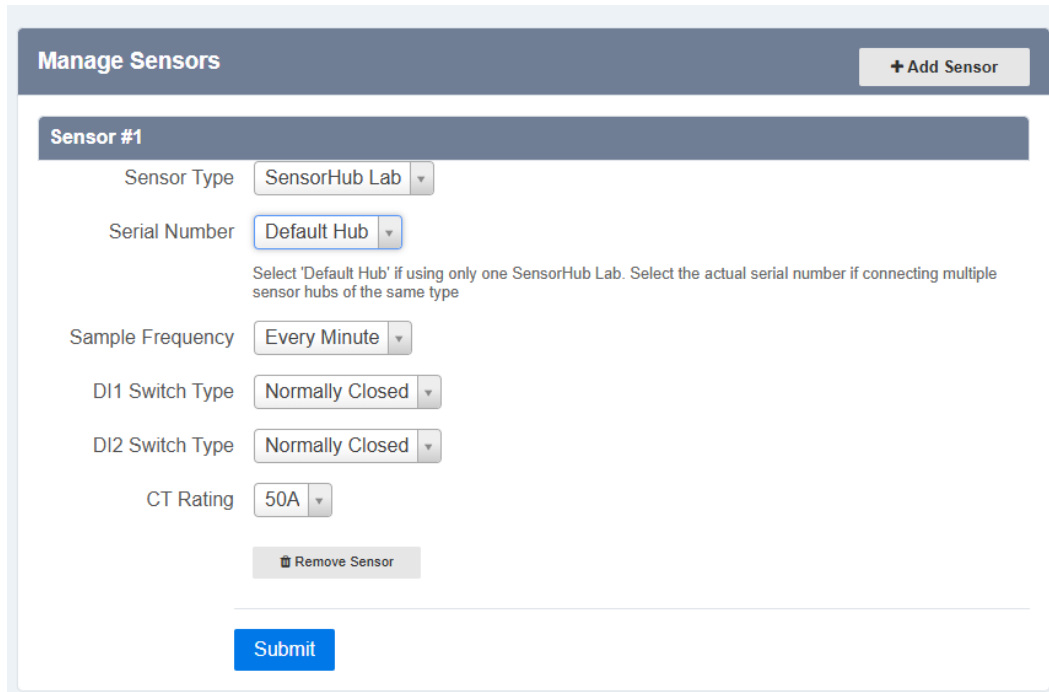
Ambient temperature and humidity are included on all SensorHubs by default and do not need to be configured.

SensorHub Lab Configuration

Select the CT rating that matches your installed sensor.
The KLATU CT (Part number: SENS-SPLCT-1002) uses a 50A rating.

No additional configuration is required for the RTD sensors.

Typical configuration:

A screenshot of a web-based configuration interface for "SensorHub Lab". The interface has a dark blue header bar with the title "Manage Sensors" and a "+ Add Sensor" button. Below the header, there is a section for "Sensor #1" with several configuration options: "Sensor Type" (set to "SensorHub Lab"), "Serial Number" (set to "Default Hub" with a note below it: "Select 'Default Hub' if using only one SensorHub Lab. Select the actual serial number if connecting multiple sensor hubs of the same type"), "Sample Frequency" (set to "Every Minute"), "DI1 Switch Type" (set to "Normally Closed"), "DI2 Switch Type" (set to "Normally Closed"), and "CT Rating" (set to "50A"). At the bottom of the form, there is a "Remove Sensor" button with a trash icon and a blue "Submit" button.

Manage Sensors + Add Sensor

Sensor #1

Sensor Type: SensorHub Lab

Serial Number: Default Hub
Select 'Default Hub' if using only one SensorHub Lab. Select the actual serial number if connecting multiple sensor hubs of the same type

Sample Frequency: Every Minute

DI1 Switch Type: Normally Closed

DI2 Switch Type: Normally Closed

CT Rating: 50A

Remove Sensor

Submit

SensorHub 4-20 Configuration

Use the *Channel Enabled* and *Output Metric* dropdown menus to enable and configure each channel you are using.

For each 4-20mA channel you are using, define the scaling values:

- **Value at 4 mA** — The minimum of the measurement range (e.g., 0 for a 0–100% humidity sensor).
- **Value at 20 mA** — The maximum of the measurement range (e.g., 100).
- **Value when < 4 mA** — Depends on the device. Some devices use a sub-4mA signal to indicate a sensor fault; others simply report the floor value (e.g., 0). Consult your device documentation.
- **Value when > 20 mA** — Same as above. Some devices use a signal above 20 mA to indicate an out-of-range or fault condition; others report the ceiling value (e.g., 100). Consult your device documentation.

Finding the scaling values for your device

The 4 mA and 20 mA values are specific to the sensor or equipment you are monitoring. Check the device documentation for a signal output or analog output specification. It will typically look something like this:

Signal (mA)	Temperature (0–80°C)	Humidity (0–100% rH)	Speed (0–500 rpm)	CO ₂ (0–5000 ppm)
4 mA	0.0°C	0% rH	0 rpm	0 ppm
8 mA	20.0°C	25% rH	125 rpm	1250 ppm
12 mA	40.0°C	50% rH	250 rpm	2500 ppm
16 mA	60.0°C	75% rH	375 rpm	3750 ppm
20 mA	80.0°C	100% rH	500 rpm	5000 ppm

In this example, the humidity channel would be configured with Value at 4 mA = 0 and Value at 20 mA = 100. Each channel is configured independently.

Typical SensorHub 4-20 configuration:

Manage Sensors

+ Add Sensor

Sensor #1

Sensor Type

SensorHub 4-20

Serial Number

Default Hub

Select 'Default Hub' if using only one SensorHub 4-20. Select the actual serial number if connecting multiple sensor hubs of the same type

Sample Frequency

Every Minute

DI1 Switch Type

Normally Closed

DI2 Switch Type

Normally Closed

Channel #1 Configuration

Channel Enabled

Enabled

Output Metric

HUMIDITY

Value when < 4 mA

0

Enter what the sensor value should be if the input is less than 4mA.

Value when = 4 mA

0

Enter what the sensor value should be if the input is equal to 4mA.

Value when = 20 mA

100

Enter what the sensor value should be if the input is equal to 20mA.

Value when > 20 mA

100

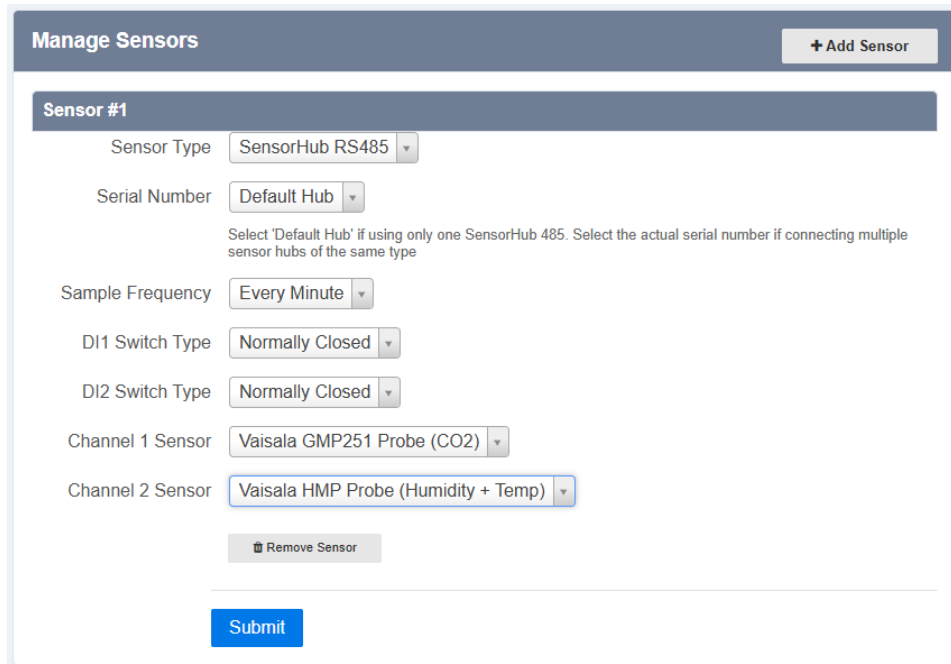
Enter what the sensor value should be if the input is greater than 20mA.

SensorHub RS-485 Configuration

Use the *Channel 1 Sensor* and *Channel 2 Sensor* dropdown menus to select the type of sensor connected to each channel.

Currently, the SensorHub RS-485 supports Vaisala CO₂ and temperature/humidity probes. Support for additional sensors may be added in the future. Contact KLATU Support if you have a specific sensor requirement.

Typical configuration:



The screenshot shows the 'Manage Sensors' web interface. At the top right is a '+ Add Sensor' button. Below is a section for 'Sensor #1'. The configuration options are as follows:

- Sensor Type:** SensorHub RS485 (dropdown)
- Serial Number:** Default Hub (dropdown). Below this is a note: "Select 'Default Hub' if using only one SensorHub 485. Select the actual serial number if connecting multiple sensor hubs of the same type".
- Sample Frequency:** Every Minute (dropdown)
- DI1 Switch Type:** Normally Closed (dropdown)
- DI2 Switch Type:** Normally Closed (dropdown)
- Channel 1 Sensor:** Vaisala GMP251 Probe (CO2) (dropdown)
- Channel 2 Sensor:** Vaisala HMP Probe (Humidity + Temp) (dropdown)

At the bottom of the configuration section is a 'Remove Sensor' button with a trash icon. Below the entire configuration area is a blue 'Submit' button.

Verification

After configuring all sensors, click *Submit* on the Sensors page to save your settings.

When the sensors are physically connected, you can use the *Gather Sample* button at the top of the page to test the connection to the sensors. Sensor readings should appear in the mote interface.

 If the sensor is reporting unexpected values, check the sensor wiring to make sure the wires are securely connected to the proper pins.

The SensorHub LED will turn green and remain green after the first successful sample. All sensor data will be reported to TRAXX.

For support, contact support@klatunetworks.com.