User Guide

External Temperature Sensor

Version 1.0

Americas: +1-800-492-2320
Europe: +44-1628-858-940
Hong Kong: +852 2923 0610

REVISION HISTORY

Version	Date	Notes	Contributors	Approver
1.0	07 Jan 2019	Initial Release	Robert Gosewehr	Chris Hofmeister

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1 Introduction

This User Guide explains how to properly install the Laird External Temperature Probe kit for the Sentrius Sensor series and view sampled data using the Sentrius Sensor Mobile App.

This variant of the Sentrius RS1xx series of LoRa / BLE Sensors enables use of an external cabled temperature probe, in place of the integrated temperature sensor. The kit includes an IP67 rated cabled temperature probe that is 200mm in length and 6.35mm in diameter at the stainless-steel probe end. The external temperature probe utilizes a One Wire digital interface and supports a general temperature range of -55° to +125°C (+/-0.9°C). The cabled probe connects into the main body of the Sentrius Sensor via a CAT5 IP67 rated RJ45 connector.

Note: This guide only contains a brief walkthrough. Refer to the RS1xx Guide for further details on sensor functionality and the mobile app capabilities. To access the RS1xx Guide, navigate to the RS1xx product page, click Documentation, and select the *Sentrius RS1xx User Guide*.

2 Part Numbers

Reference	Description
1	IP67 Rated, 1520 mm overall length, 200 mm Probe length, 6.35 mm diameter stainless steel temperature probe CAT5 RJ45 connector
2	External port Sentrius Sensor (915 MHz or 868 MHz)

Figure 1: Sentrius sensor with external temperature probe

The external temperature probe is available separately or included with an external Sentrius Sensor kit. Sentrius Sensors are also available separately either for single or bulk packaging.

Table 1: Ordering Info

Part Number	Description
455-0009	Sentrius™ RS1xx External Sensor – 915 MHz external temperature probe including LoRa and BLE
455-0010	Sentrius™ RS1xx External Sensor – 868 MHz external temperature probe including LoRa and BLE
455-0012	Sentrius™ RS1xx External Sensor – 915 MHz external temperature probe including LoRa and BLE (Bulk)
455-0013	Sentrius™ RS1xx External Sensor – 868 MHz external temperature probe including LoRa and BLE (Bulk)
455-0011	Stainless Steel External Temperature Probe Kit (Probe Only) Probe length – 200 mm Probe diameter – 6.35 mm

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3 INSTALLATION

To install the external temperature sensor, refer to Figure 2 and follow these steps:

1. Unscrew the Ethernet cap (1) from the Sentrius Sensor.
2. Connect the RJ45 connector from the cable assembly into the external port of the Sentrius Sensor.
3. Screw on (by hand) the top portion of the cable gland – the screw nut (3) – until tight.
4. Visually check to ensure the lower portion of the cable gland – the pressing screw (2) – is also tight.

Figure 2: Installing the external temperature sensor

Note: Ensure that references (2) and (3) in Figure 2 are tight when installing the external temperature probe into the Sentrius Sensor. If these areas are not sufficiently tightened, this could lead to a potential leak and cause damage to the sensor's external port connector or to the temperature probe cable assembly.

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3.1 Illustrations

3.1.1 Stainless Steel Temperature Probe with RJ45 Cable Assembly

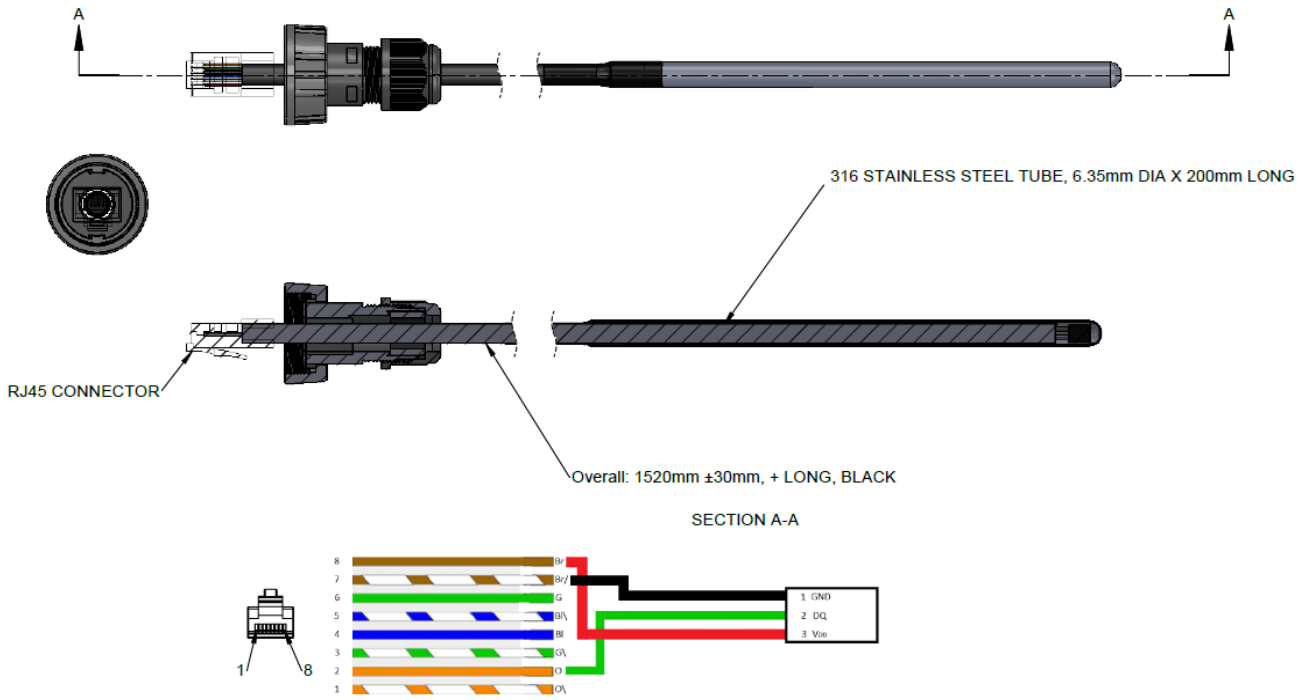

Figure 3: Stainless steel temperature probe with RJ45 cable assembly

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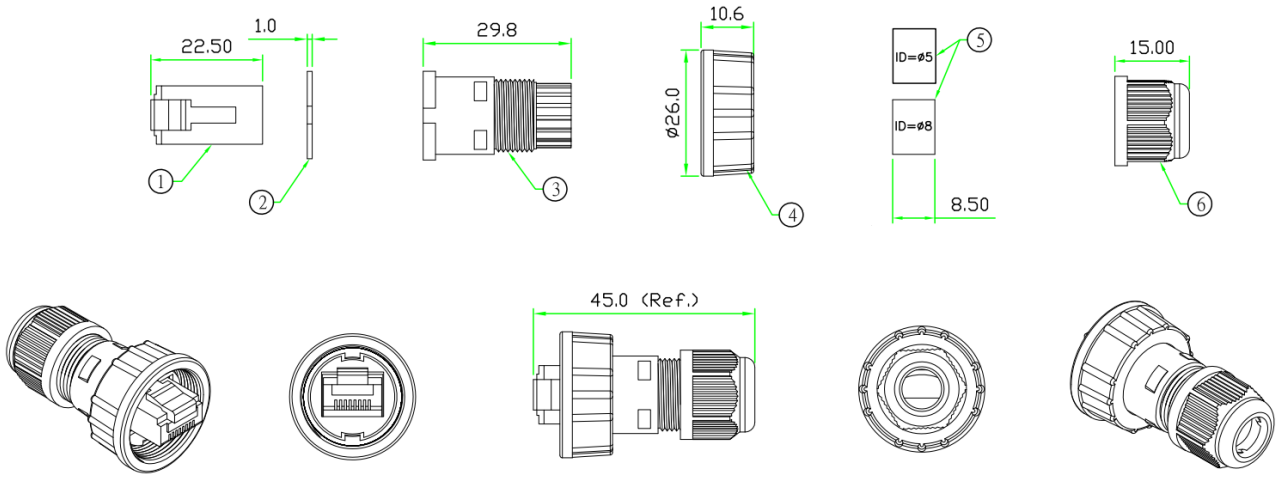
3.1.2 RJ45 Cable Gland

(DIM in millimeters)



6	SCREW	PRESSING SCREW, NYLON.	BLACK	1
5	SEAL	SANTOPRENE. for cable OD: 3~5mm & 5~8mm.	BLACK	2
4	SCREW NUT	SCREW NUT, NYLON+GF.	BLACK	1
3	SLEEVE	CABLE SLEEVE, NYLON.	BLACK	1
2	GASKET	RUBBER	BLACK	1
1	RJ-45 PLUG	RJ-45 8P8C SHIELDED PLUG.		1

Figure 4: RJ45 cable gland

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4 Connection Status

When the external probe is connected properly to the sensor, the sensor will operate “normally” once powered up. Normal operation of the sensor is indicated by the left LED will flashing either “orange” or “green” color to indicate the connection status to a network.

A connection problem is indicated by both LEDs on the front panel both being constantly on. This is a visual indicator to the user that there is a communication issue between the sensor and the probe. The sensor will not function properly in this state.

To remedy this, follow these steps:

1. Retry the steps from the Installation section. Make sure the sensor has the latest firmware installed to ensure the sensor has all the latest capabilities. The firmware can be updated using the mobile app. Reference the RS1xx guide for more details RS1xx product page on this process.

2. The time it takes for the sensor to detect a probe depends on the sensor’s settings, in particular, the read period and aggregate count. This means that the time to auto detect a probe can fluctuate between 30 seconds or likely much longer.

   To speed up the auto detect process of the sensor, press and hold the Bluetooth button on the top of the sensor for five seconds after reconnecting the external probe. This will restart the sensor, and on startup the Sentrius sensor will check for the sensor.

3. If you continue to experience an issue, contact Laird Support. There could be damage to the Sentrius sensor or probe.

Figure 5: Front panel LEDs are lit

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5 Data Visualization

5.1 Sentrius Sensor Mobile App

The Sentrius mobile application allows a user to configure a device, troubleshoot a device, see real-time sensor data, and update firmware. Search the appropriate app store (Google Play Store, Apple Store, or the Microsoft Store) for the Sentrius Sensor App and install it on your device.

Note: This guide only contains a brief walkthrough. Refer to the RS1xx Guide for further details on sensor functionality and the mobile app capabilities. To access the RS1xx Guide, navigate to the RS1xx product page, click Documentation, and select the *Sentrius RS1xx User Guide*.

The Sentrius sensor mobile app displays real-time sensor data from the external temperature probe and sensor once a good cable connection is established.

To view real-time sensor data, follow these steps:

1. Press and hold the BLE button on the front panel of the sensor to start BLE advertising on the device.
2. Select the corresponding DEV EUI on the connection screen of the mobile app. The DEV EUI of the sensor can be found on the back label of the sensor.
3. Once connected to the mobile app, click the Temperature Reading icon under the Temperature/Humidity section to see real-time sensor data from the temperature probe.

   From this screen, the temperature probe can be validated by confirming the temperature measurements are accurate. Place your hand on the probe to fluctuate the temperature.

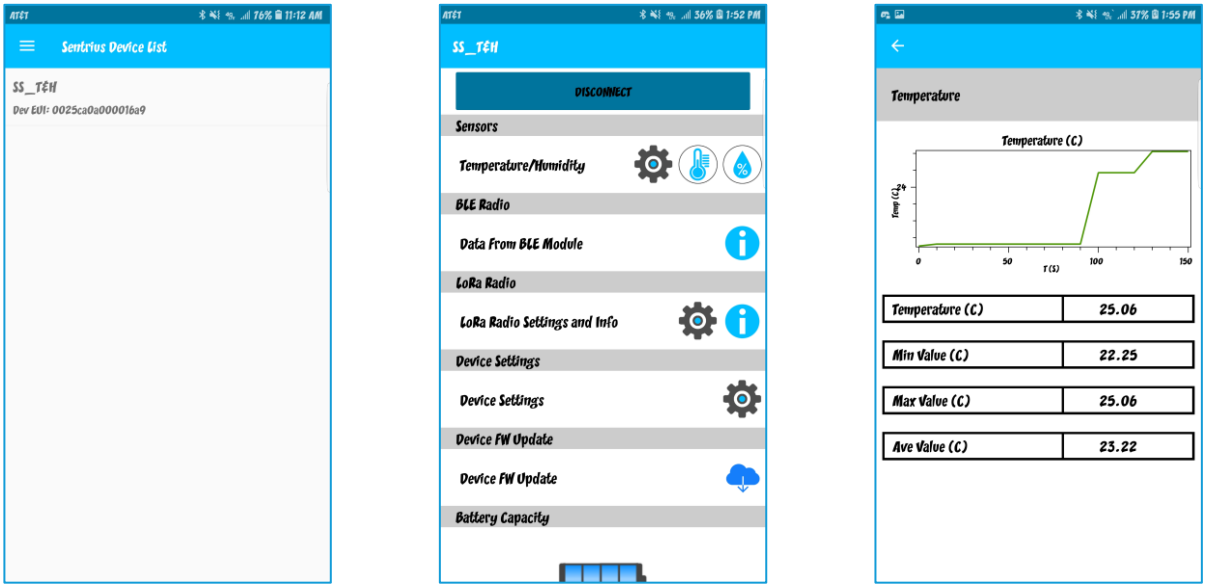

Figure 6: Sentrius sensor mobile app displays

Update the sensor settings on the main screen to get a faster reading period if the temperature readings are taking too long to update on the graph. The fastest read period a sensor can have is thirty seconds.

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6 Battery Consumption

A RS186 was configured for a read period of 300 seconds with an aggregate of three.

A power analysis was performed for 32 minutes to ensure two LoRa transmit events were captured.

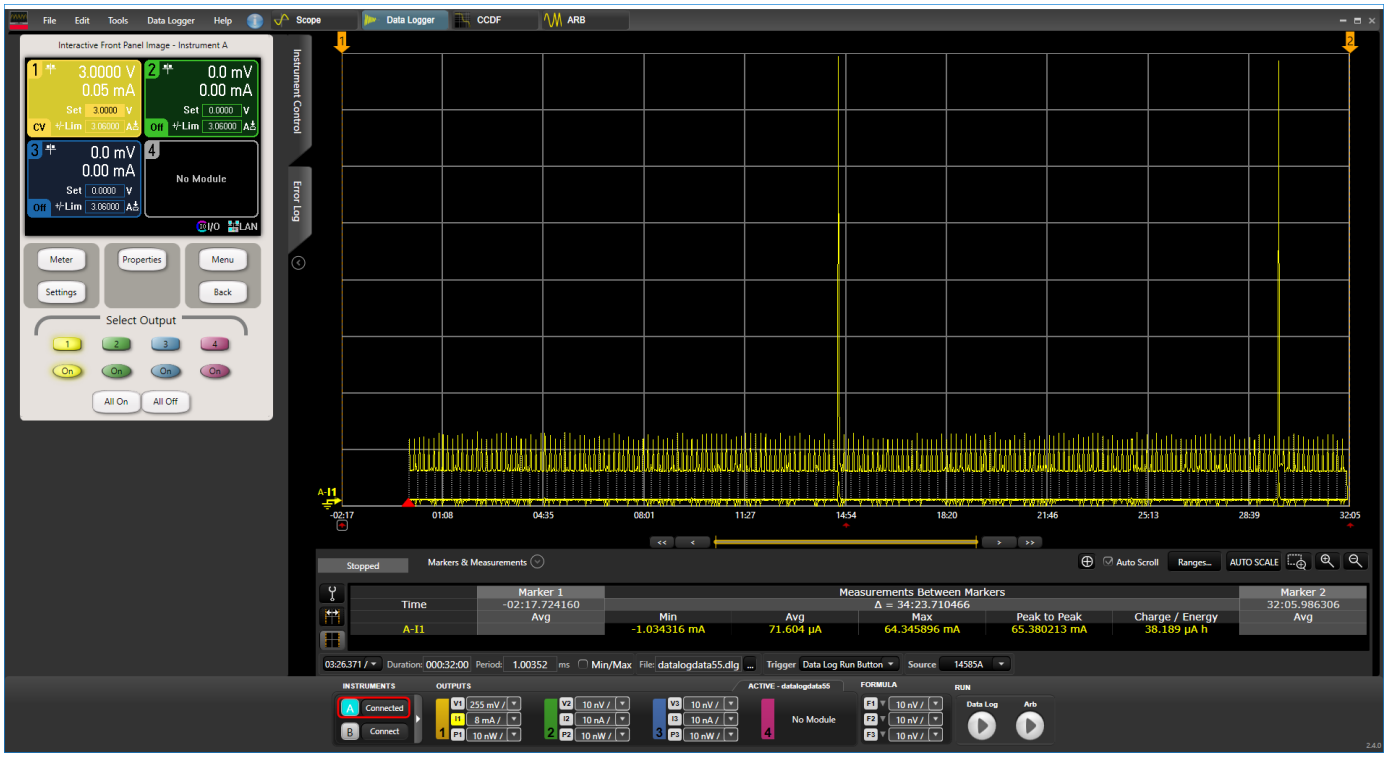

Figure 7: RS186 power consumption

The average current consumption was 72 uA over 32 minutes. The data rate that the RS186 transmitted at was SF7BW125.

7 Sanitation and Cleanliness

Every external temperature probe is cleaned with an alcoholic wipe and placed in an individual bag before leaving the supplier. A label is included with every bag warning the end-user to clean the probe before use. It is up to the end-user to ensure that every temperature probe is cleaned and sanitary for consumer use before using the temperature probes. Laird will not be held liable for any issues pertaining to the cleanliness of the probes.

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