Sentrius™ RS1xx Series

External RTD Temperature Probe (+450°C)

SECURE, SCALABLE WIRELESS SENSORS FOR LONG RANGE IOT APPLICATIONS

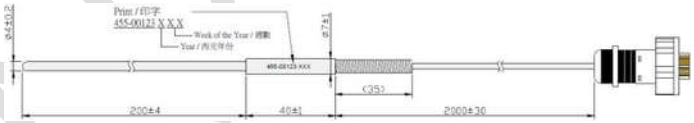


Laird Connectivity's Sentrius RS1xx external RTD temperature probe is a **battery-powered**, **long range** sensor platform that leverages the benefits of LoRaWAN and Bluetooth Low Energy (LE) connectivity.

Packaged in a small, rugged form factor containing **superior RF performance** and connected via a 2-meter control cable to a stainless-steel probe measuring 200 millimeters (4 inches) in length, housing a **PT100 RTD** with a measurement temperature range of -50°C to +450°C (-58°F to +842°F). Towards the high end of the supported range, the external temperature probe is ideally designed for **monitoring temperatures** of commercial kitchen pizza ovens, deep fryers, or even more industrial applications, then transmitting your **data over LoRaWAN.**

At its core, the RS1xx external RTD temperature sensor utilizes Laird Connectivity's field-proven and reliable RS1xx Series hardware, providing **LoRaWAN** options in **868, 915, and 923 MHz** frequencies. The RS1xx works with Laird Connectivity's Sentrius RG1xx Gateway for simple out-of-the-box integration and is compatible with third-party Cloud and LoRa network ecosystem partners.

- **Multi-wireless**: LoRaWAN (868/915/923 MHz) and Bluetooth v4.2 (Central/Peripheral) with fully integrated high-performance antennas
- **External Sensor Probe:** PT100 RTD temperature sensor within SS probe
- **Fully certified** for FCC/IC/CE/ASNZS/NCC/IMDA and Bluetooth SIG
- **Simple wireless configuration** using mobile application over BLE
- **Harsh Environments:** Robust IP65 enclosure to serve many varied installation needs
- **Integrated out of the box networks:** Default configuration with Laird Connectivity's RG1xx gateway for simple, out-of-the-box cloud connectivity



FEATURES AT A GLANCE

YOUR WIRELESS NETWORK

Develop a fully owned private LoRaWAN network to capture, route, and process IoT data for your application. Choose from RM1xx modules, RS1xx finished sensors, or RG1xx Gateways

RUGGED DURABILITY WITH A BROAD SENSOR ARRAY

Robust enclosures provide a robust and resilient platform for recording and delivering sensor data from a range of harsh environments

COMPREHENSIVE SECURITY AND RELIABILITY

Robust multi-layer security at each interface to safeguard your network at every level

BROAD CERTIFICATION AND APPROVALS

Ready for deployment in multiple regulatory domains – FCC, ISED, EU, ASNZ, NCC, IMDA, and Bluetooth SIG listing

PLATFORM FOR BUILDING ACTIONABLE IOT INTELLIGENCE

Route sensor data to the Cloud with Laird Connectivity's simplified wireless connectivity deployment

PERSONAL SUPPORT FOR YOUR IMPLEMENTATION

Our Tier-2 support and engineering teams work to help configure and deploy your application

APPLICATION AREAS



Monitoring commercial kitchens

Food safety management

Industrial heating applications

PRELIMINARY

Contact Sales - Americas: +1 262 375 4400
Europe: +44 1628 940 ext. 958
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For documentation, software, sample apps and more visit:
https://www.lairdconnect.com/wireless-modules/lorawan-solutions/sentrius-rs1xx-lora-enabled-sensors

KEY SPECIFICATIONS

CATEGORY	FEATURE	SPECIFICATION
Chipset	LoRa®	Semtech SX1272
	Bluetooth®	Nordic nRF51822 – 256 k/32 k
LoRa	Frequencies	863 – 870 MHz (EU), 902 – 928 MHz (US), 915 – 928 MHz (AU + AS923)
Temperature Probe	Type	PT100-M222 RTD
	Interface	Resistance Temperature Detector (RTD) using three-wire interface
	Operating Range and Variance	-50°C (-58°F) to +450°C (+842°F) Variance of reported temperature data can be calculated taking the following uncertainties into account; i) Where t = -50°C to +300°C, BS EN 60751:2008 / IEC 60751 standards for class A PT100 applies, which state accuracy of measurements to be: ± (0.15°C + 0.002 |t|) **OR** Where t ≥ +300°C to +450°C Accuracy of measurement will be: ± (0.75°C + 0.012 x |t-300|) **PLUS** ii) RTD-to-Digital conversion, utilizing the MAX31865 with a Total Accuracy Over All Operating Conditions of 0.5°C As such, max. variance at -50°C = ±0.75°C or max. variance at +450°C = ±3.05°C
	Dimensions and Connector	Cable length – 2000 mm (±20 mm); stainless-steel shaft - 4.0 mm (±0.2 mm) (dia.) x 200 mm (±2 mm) (length); shaft/cable collar* – 7.0 mm (±1 mm) (dia.) x 40 mm (+1 mm) (length) (*see illustration above) RJ45C Connector (IP66~68 rated), user connected
Antenna	Integrated	Custom Laird Connectivity antenna for 868, 915, or 923 MHz. Ceramic chip antenna for 2.4 GHz
Power	Battery	2 x AA - replaceable
LED	Status	3 – Bluetooth LE and LoRa status
Button	User Input	Multi-use – default Bluetooth LE pairing
Physical	Enclosure Dimensions	116 x 131 x 34 mm
	Connector	RJ45C Jack (IP66~68 rated), user connected
Environmental	Enclosure Operating Temp	-25° to +50°C (temperature range dictated by AA battery chemistry, Alkaline/Lithium)
	Storage Temperature	-40° to +50°C
Regulatory	Approvals	FCC, ISED, EU, ASNZ, NCC, IMDA, and Bluetooth SIG
Warranty		One-year warranty

OPERATIONAL GUIDANCE

As per Figure 1 below, only the probe body shall be immersed in liquid, from the probe collar all the way through to the RJ45 connector, the cable assembly is **not** IP rated

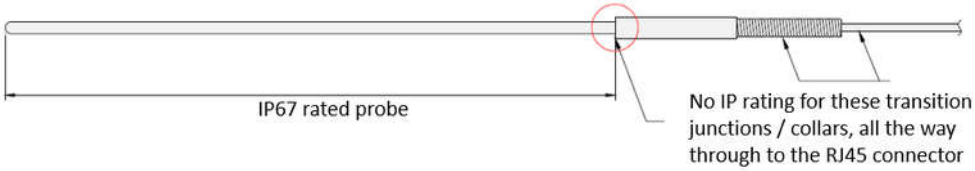

Figure 1: Probe collar guidance

As per Figure 2 below, the probe shall never be fully inserted into the heat source at temperatures greater than +250°C.

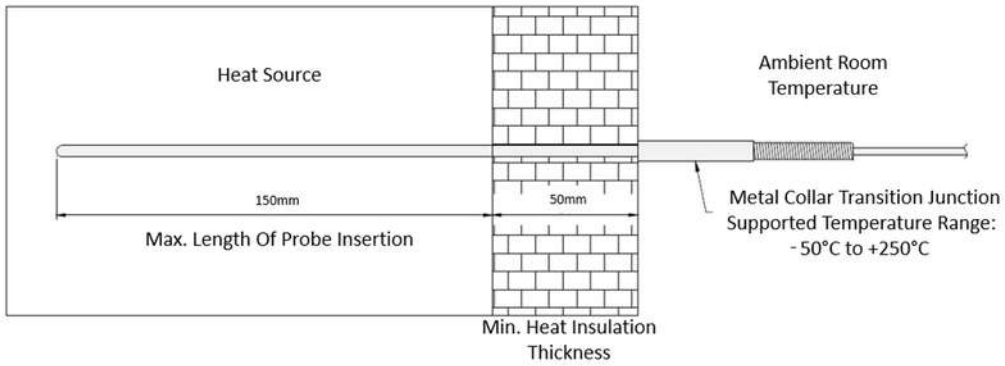

Figure 2: Probe and heat source

PRELIMINARY

Ordering Information

PART NUMBER	DESCRIPTION
455-00103	Sentrius™ RS1xx LoRaWAN – 915 MHz Ext. RTD Temperature Enclosure - North America
455-00104	Sentrius™ RS1xx LoRaWAN – 868 MHz Ext. RTD Temperature Enclosure - Europe
455-00105	Sentrius™ RS1xx LoRaWAN – 923 MHz Ext. RTD Temperature Enclosure - Taiwan
455-00106	Sentrius™ RS1xx LoRaWAN – 923 MHz Ext. RTD Temperature Enclosure - New Zealand (AS923)
455-00108	Sentrius™ RS1xx LoRaWAN – 923 MHz Ext. RTD Temperature Enclosure - Singapore
455-00109	Sentrius™ RS1xx LoRaWAN – 923 MHz Ext. RTD Temperature Enclosure - Hong Kong
455-00110	Sentrius™ RS1xx LoRaWAN – 915 MHz Ext. RTD Temperature Enclosure - Australia (AU915)
455-00111	Sentrius™ RS1xx LoRaWAN – 923 MHz Ext. RTD Temperature Enclosure - Australia (AS923)
455-00123	RTD Temp Sensor, -50°C ~ +450°C, 200 mm x 4.0 mm SS Probe, 2000 mm cable, ***cable assembly ONLY*** (**SINGLE**)
455-00123B	RTD Temp Sensor, -50°C ~ +450°C, 200 mm x 4.0 mm SS Probe, 2000 mm cable, ***cable assembly ONLY*** (**BULK** - Carton qty. 50 pcs.)

Alternative RTD cable assemblies also available:

455-00112	RTD Temp Sensor, -40° C ~ +180° C, 100 mm x 4 mm SS Probe, 1320 mm cable, ***cable assembly ONLY*** (**SINGLE**)
455-00112B	RTD Temp Sensor, -40° C ~ +180° C, 100 mm x 4 mm SS Probe, 1320 mm cable, ***cable assembly ONLY*** (**BULK** - Carton qty. 50 pcs.)
455-00124	RTD Temp Sensor, -100° C ~ +100° C, 50 mm x 3.3 mm SS Probe, 2000 mm cable, ***cable assembly ONLY*** (**SINGLE**)
455-00124B	RTD Temp Sensor, -100° C ~ +100° C, 50 mm x 3.3 mm SS Probe, 2000 mm cable, ***cable assembly ONLY*** (**BULK** - Carton qty. 50 pcs.)

Note: The RTD external temperature probe cable assembly is **not** included with the Sentrius sensor enclosure; each part must be ordered individually. It's a 1-to-1 ratio of region-specific sensor enclosure to sensor cable assembly.
Additionally, sensor cable assemblies available as part of the Sentrius product range are **not** interchangeable between Sentrius sensor enclosures (blue housing) with RJ45 port. The user must connect the appropriate sensor cable assembly with the intended enclosure. Please check the product description on the sensor label/part number on the packaging if in doubt.

PRELIMINARY