

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 to a stainless-steel probe measuring just 50 millimeters (1.96 inches) in length, housing a **Class A tolerance PT100 RTD** with a measurement temperature range of -100°C to +100°C (-148°F to +212°F). At the low end of the supported range the external temperature probe is ideally designed for **monitoring temperatures** of shipped food products (ice cream / frozen steaks) or for **transportation of vaccines** and 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:** Class A PT100 RTD temperature sensor contained within a stainless-steel probe housing
- **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, ISDE, 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



Product transportation monitoring



Food safety management



Industrial heating and cooling

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	Class A tolerance PT100-202 RTD
	Interface	Resistance Temperature Detector (RTD) using 3-wire interface
Operating Range and Variance		-100°C (-148°F) to +100°C (+212°F)
		Variance of reported temperature data can be calculated taking the following uncertainties into account:
		i) Where $t = -100^{\circ}\text{C}$ to -90°C , Accuracy of measurement is $\pm (0.33^{\circ}\text{C} + 0.047 t)$ OR
		ii) Where $t = >-90^{\circ}\text{C}$ to $+100^{\circ}\text{C}$ BS EN 60751:2008 / IEC 60751 standards for class A PT100 applies, which state accuracy of measurements to be $\pm (0.15^{\circ}\text{C} + 0.002 t)$ PLUS
Dimensions and Connector		iii) RTD-to-Digital conversion, utilizing the MAX31865 with a 'Total Accuracy Over All Operating Conditions' of 0.5°C
		As such, max. variance at $-100^{\circ}\text{C} = \pm 1.3^{\circ}\text{C}$ or max. variance at $+100^{\circ}\text{C} = \pm 0.85^{\circ}\text{C}$
Antenna	Integrated	Cable – length: 2000 mm (± 30 mm); cable dia. 2 mm (± 0.2 mm), color: black/grey.
	Battery	Stainless-steel shaft – 3.3 mm (± 0.2 mm) (dia.) x 50 mm (± 2 mm) (length). RJ45C connector (IP66~68 rated) user connects to sensor body
Power	Status	Custom Laird Connectivity antenna for 868, 915, or 923 MHz. Ceramic chip antenna for 2.4 GHz
LED	User Input	2 x AA - replaceable
Button	Enclosure Dimensions	3 – Bluetooth LE and LoRa status
Physical	Enclosure Connector	Multi-use – default Bluetooth LE pairing
	Enclosure Operating Temp	116 x 131 x 34 mm
Environmental	Storage Temperature	RJ45C Jack (IP66~68 rated), user connected
		-25° to +50°C (temperature range dictated by AA battery chemistry, Alkaline/Lithium)
Regulatory	Approvals	-40° to +50°C
Warranty		FCC, ISSED, EU, ASNZ, NCC, IMDA, and Bluetooth SIG
		One-year warranty

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)
455-00124	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.)

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.)
455-00123	RTD Temp Sensor, -50°C ~ +450° C, 200 mm x 4 mm SS Probe, 2000 mm cable, cable assembly ONLY (SINGLE)
455-00123B	RTD Temp Sensor, -50°C ~ +450° C, 200 mm x 4 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 and each part must be ordered individually. It's a 1:1 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.