

TYPICAL APPLICATIONS

- Asset monitoring
- Asset tracking
- Cold chain monitoring
- Building/HVAC monitoring
- Manufacturing automation
- Supply chains
- Spare parts management
- Warehousing
- Container & IBC tracking & monitoring

Features

- Wireless Sensor Device supporting a wide range of applications
- Multiple on-board sensors¹: ambient temperature, relative humidity, accelerometer, gyroscope, magnetic (proximity), light, sound
- Low-power mesh network protocol (Wirepas)
- Configurable sensor parameters
- Remote Functions API to control and diagnose Wireless Sensor Devices from the gateway
- Smartphone app for configuration and diagnostics using NFC interface
- Programmer friendly data encoding for easy cloud-ingestion
- Connects to any Wirepas-capable gateway²
- Over-the-Air-Programmable (OTAP)
- Long-life (up to 10 years) industrial-grade rechargeable battery
- Operating in license-free 2.4GHz ISM band
- Indoor Positioning capable



Description



The RL03 family of Wireless Sensor Devices can be used in a wide variety of applications. Each RL03 variant (see next page) packs a number of sensors that are aimed towards certain applications. On request custom variants can be made to meet specific application needs or to reduce cost. The sensing parameters (e.g. sampling rate) can be changed to suit the application needs.



Sensor data is serialized over language/platform neutral Protocol Buffers for easy ingestion by the customer's platform of choice. OTAP (Over-the-Air-Programming) enables wireless and remote reprogramming of the Device firmware.



The Wireless Sensor Device contains a long-life industrial-grade and replaceable LiSOCI2 battery pack (2400mAh) for up to 10 years³ of battery life.



The RL03 has the Wirepas Mesh Network Communication protocol built in: Every Device is a wireless router and can act as a repeater for other Devices. As a result very large physical networks with 1000's of Devices can be built as long as every Device can connect to a Device which is closer to the gateway. At the same time every Device remains low power and can work uninterruptedly for years on a small battery.



The accompanying Android Smartphone app connects through the built-in NFC 'tap'-interface, allowing configuration and diagnostics of a Device. The same functions are available from the gateway using the Remote Functions API.



All devices have built-in capability for indoor location tracking. A device can be configured either as a *fixed position device* – to assist in tracking the location through the positioning engine – or as an *asset tag*, whose location is tracked.

Footnotes

1. Available sensors varies depending on the device variant.
2. Please contact RedLore for support on gateway selection.
3. Battery life depends on sensor settings and network architecture. RedLore can support in estimating the battery life-time in your application.

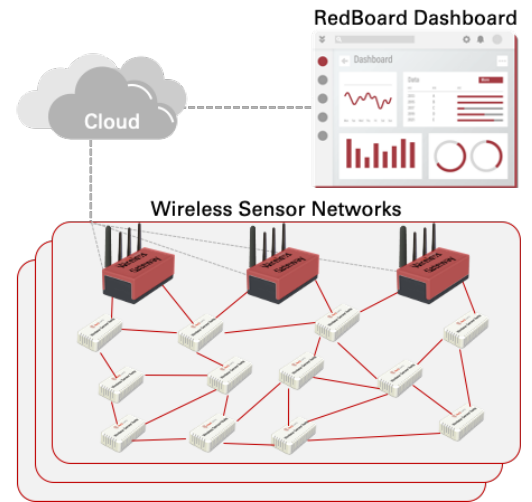
Network

The Devices send the sensor data to one or more gateways on site or in the building. The gateways in turn forward the data to the cloud via a cellular (4G/LTE) connection, WIFI or Ethernet.

A single gateway supports over 1000 Devices. Multiple gateways per site optimizes message latency and Device battery life time.

Wireless Sensor Devices needn't have a direct link to the gateway but can hop their messages across other Devices.

The configurable and expandable RedBoard dashboard platform visualizes the cloud data.



Variants

Variants	A Full	C Comfort	D HVAC	E Temper- ature	G Asset monitoring
Sensors					
Temperature	✓	✓	✓	✓	✓
Relative humidity	✓	✓	✓		
Air pressure	✓	✓	✓		
Light intensity	✓	✓			✓
Sound level	✓	✓			✓
Acceleration 3-axis	✓				✓
Gyroscope 3-axis	✓				✓
Magnetic	✓				✓
Other features					
NFC 'tap' interface			✓		
RGB LED for network status and application use			✓		
Wirepas communication protocol			✓		
Battery	LiSOC12- 2400mAh – Up to 10 years life-time ¹ – replaceable				
Dimensions	80 x 40 x 20mm 3.2 x 1.6 x 0.8"				
Ingress Protection	IP20 (IP65 available on demand)				

Footnotes

- Battery life depends on sensor settings and network architecture. RedLore is able to help you to estimate the battery life-time in your application.

Ordering information

FP.B.RL.03.____ Example – Comfort sensors with 2400mAh battery: FP.B.RL.03.C

↑ Sensor variant

Operating parameters and tolerances

General

Operating temperature range	-25°C and +85°C (versions with light sensor) -40°C and +85°C (all other versions)
Battery (nominal)	2400mAh, 3.6V at 25°C
Data update rate	10 seconds to 10 days
Configuration	Remotely through remote functions or through Android App (not all configuration options are available from the App)

Temperature sensor

Operating range	-40°C and +85°C
Accuracy tolerance	±1.0°C between 0..65°C ±1.25°C between -20..0°C ±1.5°C between -40..-20°C
Measurement procedure	single measurement at update rate interval

Humidity sensor

Operating range	0..100%RH between 0°C and 60°C 0..68%RH at -40°C 0..87%RH at +85°C
Accuracy tolerance	±3 %RH between 20%..80 %RH and at 25°C
Long term stability	0.5 %RH/year between 10%..90 %RH and at 25°C
Measurement procedure	single measurement at update rate interval

Air Pressure sensor

Operating range	300..1100 hPa between 0°C and 65°C
Accuracy tolerance	±1.7 hPa
Measurement procedure	single measurement at update rate interval

Light level sensor

Operating range	0..20,000 Lux
Accuracy tolerance	Depends on sensor orientation. Needs to be calibrated case-by-case for tolerance-sensitive applications.
Measurement procedure	single measurement at update rate interval

Sound level sensor

Operating range	30..75 dB
Accuracy tolerance	Depends on sensor orientation. Needs to be calibrated case-by-
Measurement procedure	average of burst measurements, configurable 1 per s to 1 per min

Accelerometer

Operating range	$\pm 2/\pm 4/\pm 8/\pm 16$ g for all 3 axes (configurable)
Accuracy tolerance	$\pm 3\%$ of full scale operating range
Measurement procedure	12Hz measurement, reporting min, avg, and max at update rate interval

Gyroscope

Operating range	$\pm 125/\pm 250/\pm 500/\pm 1000/\pm 2000$ dps for all 3 axes (configurable)
Accuracy tolerance	$\pm 3\%$ of full scale operating range
Measurement procedure	12Hz measurement, reporting min, avg, and max at update rate interval

Magnetic sensor

Operating range	20 mT and 200 mT (configurable) Note: 1 Gauss = 0.1 mT
Measurement procedure	single measurement of magnetic field at update rate interval, or, switch-mode (message sent when magnet presented), or, count-mode (pulse counting,...)

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Wireless Sensor Network IoT Accelerator Kit

Designed from the ground up to enable you to test & validate IoT applications with unlimited scale, coverage, and density

Objectives

Test & validate your IoT wireless sensor application in a real-world environment

Sensors

- Demonstrate a Proof of Concept
- Set performance requirements
- Identify installation challenges
- Determine if polled or event driven sensors

Connectivity

- Test network in realistic environment
- Prove scalability
- Set performance expectations
- Determine power budget

Accelerator Kit

A kit designed to get answers, fast



Asset Tracking & Advanced Monitoring nodes feature multiple sensors per device



Wirepas Mesh: connectivity for unlimited scale, coverage & density with battery powered mesh routing nodes

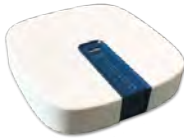


Out-of-box experience: Pre-configured sensors, gateway and cloud get you results



Enables rapid evaluation & documentation of sensor & connectivity performance

What's Included?



- 20 Wireless Sensor Nodes with a large variety of sensors enable test-driving many applications:
 - 4 x RL.03.A "Full": accelerometer, gyroscope, temperature, relative humidity, air pressure, sound, ambient light and magnetic (proximity), RGB LED
 - 16 x RL.03.E "Temperature": temperature, RGB LED
 - See *RL03 Product Sheet.pdf* for more details
- Each Wireless Sensor Node has a built-in NFC interface for wireless sensor monitoring and configuration
- Indoor positioning-capable: Any Node can be used as part of the positioning reference network. Indoor positioning shall be launched in Q1 2020.
- 1 Pre-configured Gateway connects wireless sensors to the cloud via WIFI and Ethernet
- Sensor network connectivity using low-power Wirepas Mesh
- Cloud-based Time Series Database
- Ready-made example dashboards, configurable to your applications and use cases
- NFC smartphone app for direct Wireless Sensor Node monitoring & configuration
- 3 months of data and dashboard hosting included (extendable)
- 3 months of support (not including custom development)

Next Steps

Get started with the IOT Accelerator Kit today, determine options and get in touch...

Options

- Add additional nodes in blocks of 25
- Online or on-site training
- Test & validation services
- Sensor development or customization

Contact

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