

Temperature Node

- ▶ **Low Power Wireless Sensor Node.**
- ▶ **Compatible with The Things Network LoRaWAN**
- ▶ **±0.5°C accuracy 0.1°C resolution**
- ▶ **Long battery life.**
- ▶ **Suitable for outdoor and industrial applications**
- ▶ **Data and status information displayed on the rpr-LoT dashboard.**
- ▶ **Range of plug-in sensor options.**



Overview

The rpr-LoT-T01 is a battery powered temperature sensor node that communicates using long range radio compatible with LoRaWAN and the Things Network. The low power electronics are housed in a rugged IP67 enclosure suitable for outdoor and industrial applications. A sealed connector is used for the temperature probe allowing a number of probe options.

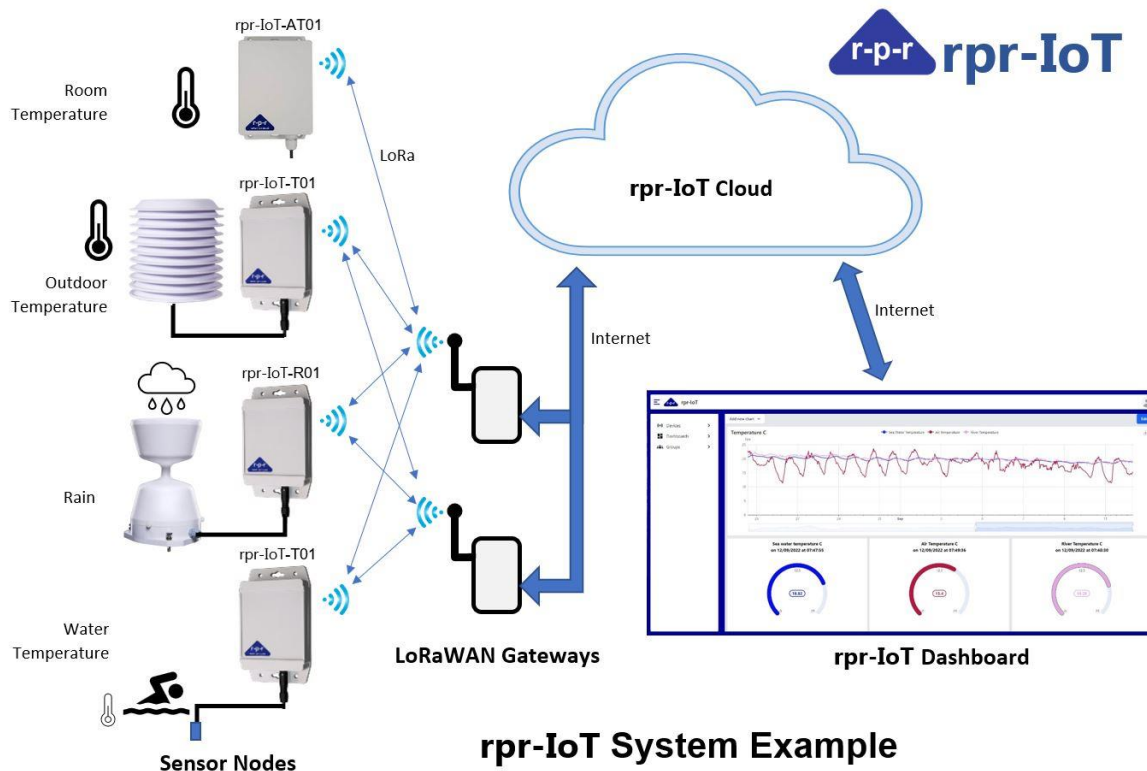
Data is stored on the rpr-LoT cloud and or the RPR WeatherFile.com cloud for long-term storage and access. Readings and status information is displayed on the rpr-LoT dashboard (subscription required). The dashboard enables data from several nodes to be plotted and displayed in a flexible manner to suit the user.

The unit uses a long life 4000mAh A size Lithium Thionyl Chloride (LiSOCl₂) battery which is user replaceable.

Applications

The rpr-LoT-T01 has a wide range of applications where temperature must be monitored.

- ✓ Building energy management
- ✓ Goods storage
- ✓ Warehousing
- ✓ Working conditions
- ✓ Food Production
- ✓ Personnel safety and comfort
- ✓ Education and research projects
- ✓ Sports halls
- ✓ Museums
- ✓ Agriculture and Horticulture
- ✓ Fish farms
- ✓ Monitoring in remote buildings



rpr-IoT System Example

IoT LoRaWAN

rpr-IoT sensor nodes are LoRaWAN compatible class A devices which ensure secure interoperability between the sensor node, gateways and the cloud. They communicate using the LoRa wireless modulation technique based on chirp spread spectrum technology which allows data transfer over long distances at a very low power. It is possible for a single gateway to connect to many nodes and/or a node to connect to multiple gateways over a large area. This could be many nodes within a building or nodes spread over several km line of sight in open land. To help with deployment and monitoring of an IoT application the received signal strength and signal to noise ratio for each node is available on rpr-IoT dashboard. By default, the rpr-IoT sensor nodes use the Things Network. If operation with other networks is required, please contact Richard Paul Russell Ltd.

Simple to Use

The rpr-IoT-T01 has been designed to be simple to use. It will automatically, if there is a suitable gateway within range, join the LoRaWAN Things Network when the temperature probe is plugged in and after this regularly send data to the users rpr-IoT dashboard.

Message interval

The rpr-IoT-T01 will adhere to the Things Network's public community network fair use policy and adjust the minimum uplink message interval depending on the Data rate / Spreading Factor as shown in the following table:

| Data rate | Spreading factor | Minimum up message interval |
|-----------|------------------|-----------------------------|
| DR5 | SF7 | 3 minutes |
| DR4 | SF8 | 6 minutes |
| DR3 | SF9 | 10 minutes |
| DR2 | SF10 | 20 minutes |
| DR1 | SF11 | 45 minutes |
| DR0 | SF12 | 90 minutes |

The spreading factor is determined by the Adaptive Data Rate (ADR) mechanism implemented in The Things Stack which is based on the signal to noise ratio (snr) of the received signal. When first switched on the node will join with a spreading factor of 12. To optimise battery usage the uplink message interval can be set to a longer value.

rpr-IoT-T01

Data Security

Advanced Encryption Standard (AES) 128-bit algorithms are used to provide two layers of cryptography, to the network server and end-to-end to the application server.

Dashboard

The rpr-IoT dashboard is user configurable to display data from multiple sensor nodes. Tiles can be added which display data in different formats, for example: line plots, bar graphs, dials or graphically on a map or plan. Individual tiles can be defined and positioned by the user to suit their needs. Sensors can be given names applicable to their application.

The dashboard allows status information including battery state, signal strength, signal to noise ratio,

and gateways to be monitored. Commands to set the uplink message interval can be sent from the dashboard.

RPR Products

Richard Paul Russell Ltd offers a range of IoT systems, weather instrumentation and data loggers. Please contact us for more information.

Contact Us

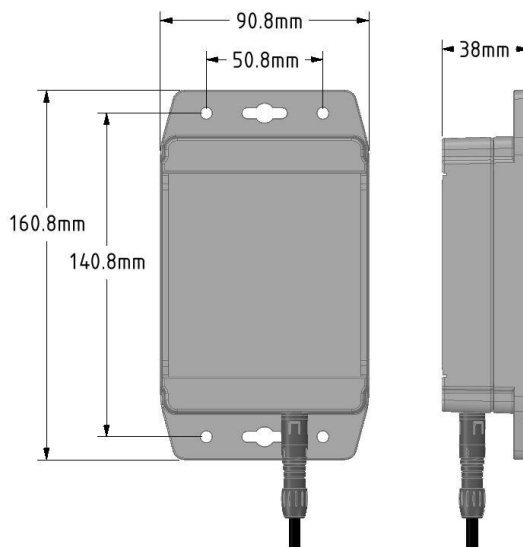
e-mail: sales@r-p-r.co.uk

Tel: +44 (0)1590 641223

Website: www.r-p-r.co.uk

Richard Paul Russell Ltd
 The Lodge, Unit 1 Barnes Farm Business Park
 Barnes Lane, Milford on Sea, SO41 0AP UK

Specification



| | |
|---|--|
| Physical | |
| Enclosure dimensions including flanges but excluding sensor | 160.8mm x 90.8mm x 38 mm |
| Mounting holes | 4 off 5 mm dia. 140.8 mm x 50.8 mm |
| Mounting key holes | 2 off 8.5 mm dia. 4.6 mm slot, 140.8 spacing |
| Flange thickness | 6.5 mm |
| Enclosure material | Polycarbonate, Light Gray (RAL 7035) |
| Enclosure flammability rating | UL94 5VA @ 3mm |
| Weight | 245g |
| | |
| Temperature Probe | See probe datasheet |
| | |

| | |
|--------------------------------------|--|
| Wireless/network Connectivity | |
| Frequency band | 863-870 MHz |
| LoRa Channel | EU868 |
| Networking Protocol | LoRaWAN, Class A |
| Aerial | Internal Meandering Monopole circuit board mounted |
| Uplink Message Interval | Selectable between 1 minute and 1 day |
| Range | Up to 10km Line of sight dependent on environment |
| | |
| Power | |
| Battery type | A size Lithium Thionyl Chloride (LiSOC12) |
| Nominal Battery Capacity | 4000mAh |
| Nominal Battery Voltage | 3.6V |
| | |
| | |
| Environmental | |
| Temperature range | Operating: -10°C to +60°C, Storage: -40°C to +70°C |
| Relative Humidity | 0% to 100% |
| Enclosure protection | IP67 |
| Compliance | UKCA, CE |

The manufacturer reserves the right to amend the specification and therefore the information in this document may be subject to change.