



ED1608RTS Manual

Product description for firmware 2.00



ED1608RTS-full Weatherstation:

The ED1608RTS is a Long Range LoRa/SIGFOX Node rail temperature sensor that can be used to measure the temperature of the rail in switches or at normal track. Potential applications are prevention of Railway Buckling and early detection of freezing of railway Switches. The sensor is rugged so it can withstand the tough conditions in railways. With 4 strong magnets with a total capacity of 44 kg that will keep the sensor in place it can be mounted onto the track.

It has a large battery pack and 5 configurable intervals for 4 temperature limits, defining 5 temperature bands. Each band has its own configurable update interval.

On the bottom, a one-wire external temperature sensor is mounted to measure the temperature. It has on-board GPS/GLONASS receiver to determine its location for easy asset management and theft prevention. On request the sensor can be expanded with all the features of the ED1608. As a failsafe, the ED1608RTS also has an internal temperature sensor and an internal humidity sensor. In case of mechanical damage the humidity sensor can detect a water leak.



The ED1608RTS is based on the standard ED1608 and allows the user to send data and reach extremely long ranges at low data-rates. It provides ultra-long range spread spectrum communication and high interference immunity whilst minimising current consumption. It targets professional wireless sensor network applications such as irrigation systems, smart cities, building automation and so on. The ED1608RTS is fully LoRaWan and SIGFOX certified so the ED1608RTS LoRa can be used on The Things Network, KPN LoRa network, any other LoRa provider or private LoRa gateway/server. The SIGFOX version can be used in combination with a SIGFOX network provider.

Example applications:

- Wireless temperature Alarm
- Railways temperature sensor for anti-freeze protection

Default configuration:

The 4 temperature limits (low to high) have default factory values of -10, +7, +30, +80. If you need other values you can use a downlink to set these values.

Each temperature marks a border for a range. Each range can have a transmit interval of up to max. 255 minutes and the temperature range can be -127 up to 127 degrees celsius. The max. values are sensor measurement limits. **Beware that the ED1608RTS itself cannot be used outside the -40 up to +85°C degree celsius range.** The housing, battery and electronics are not made for extreme temperatures.

Range: -127 to -10 degrees Celsius with interval 15 min.

Range: -10 to 7 degrees Celsius with interval 15 min.

Range: 7 to 30 degrees Celsius with interval 60 min.

Range: 30 to 80 degrees Celsius with interval 60 min.

Range: 80 to 127 degrees Celsius with interval 30 min.

While a temperature remains inside a range the corresponding update interval will be used to send the measured value. If there is a temperature change out of range, the message will be sent immediately as an “alarm” message.

The message format is identical for LoRaWan and SIGFOX use.



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Configuration downlinks:

The ED1608RTS has a few special downlinks that we will describe below. See the standard ED1608 documentation for all other commands.

Set temperature interval:

- 1 byte: Command ID 0x80
- 1 byte: band1 (minutes)
- 1 byte: band2 (minutes)
- 1 byte: band3 (minutes)
- 1 byte: band4 (minutes)
- 1 byte: band5 (minutes)

Example1:

Set temperature interval to 15, 20, 30, 40, 50 (minutes)

The downlink in Hexadecimal notation is: **800F141E2832**

In response to the downlink, a response uplink will be sent with the new values.

Set temperatures:

- 1 byte: Command ID 0x81
- 1 byte: Temperature 1 (degrees celsius)
- 1 byte: Temperature 2 (degrees celsius)
- 1 byte: Temperature 3 (degrees celsius)
- 1 byte: Temperature 4 (degrees celsius)
- 1 byte: 0x00 (for future use)

Example:

Set temperatures to -10, 10, 20, 30, 40 (degrees celcius)

The downlink in Hexadecimal notation is: **81F6141E2800**

In response to the downlink, a response uplink will be sent with the new values.

Get position:

- 1 byte: Command ID 0x82
- 2 bytes: max. GPS on-time in seconds

Example:

Get position, max on-time is 300 seconds

The downlink in Hexadecimal notation is: **82012C**

In response to the downlink, a standard response "Alive" message will be sent.

