Remote temperature 2 sensors

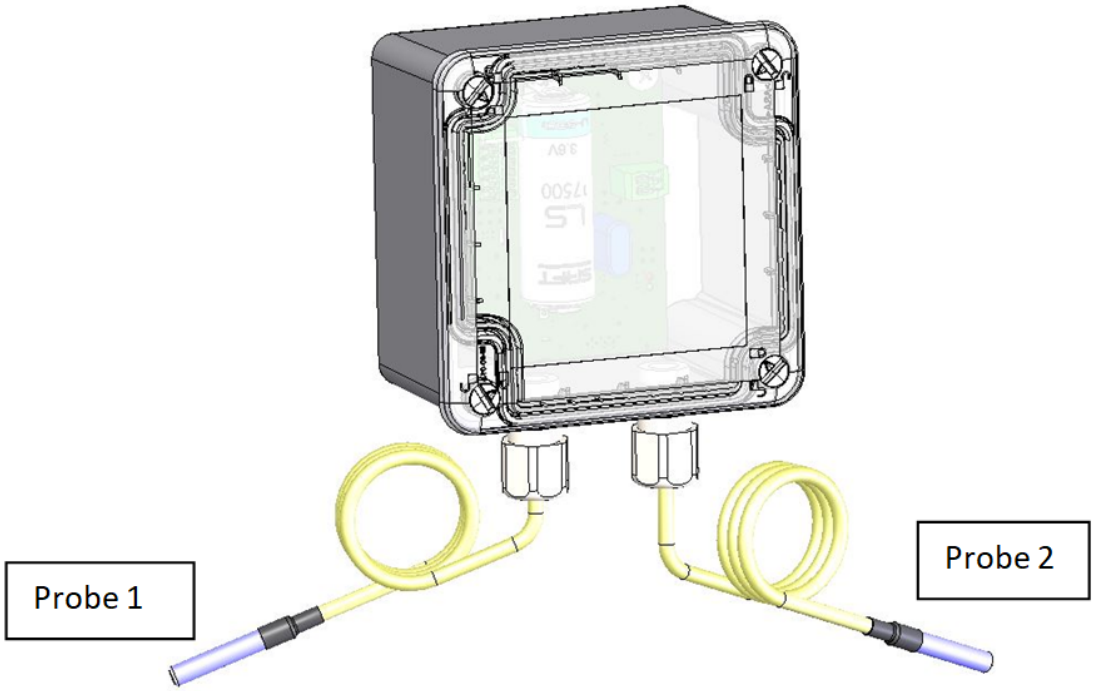
support.watteco.com/remote-temperature-2/

Presentation

The Remote temperature 2 sensors is a LoRaWAN class A sensor that integrates an internal on the battery. It also incorporates an internal antenna.

The sensor includes two 2-meter temperature probe:

- Probe 1 is BLUE
- Probe 2 is RED



The Remote temperature 2 sensors allows the measurement of temperature over a wide range of values. It can measure from -40°C to +110°C.

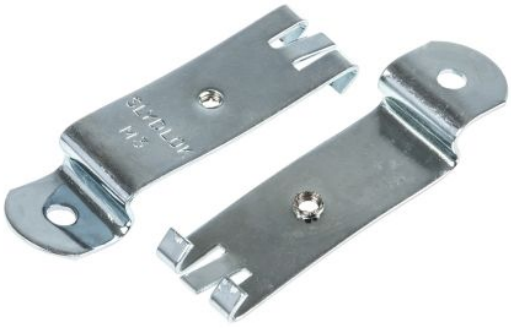
The table below shows the precision for each range of temperatures:

Temperature range	Precision
[-40°C ; -31°C]	+/-1.5°C

Temperature range	Precision
[-30°C ; -16°C]	+/-1.0°C
[-15°C ; +5°C]	+/-0.5°C
[+6°C ; +97°C]	+/-0.2°C
[+98°C ; +110°C]	+/-0.5°C

The measurement period is defined in the minimum field of a frame.

The housing is compatible with the following DIN rail adapter:



Family code / Release Note

The family code of Remote temperature 2 sensors devices is: 50-70-163-xxx

Older release was 50-70-139-xxx

Release note:

50-70-163-000: new casing, battery holder, better precision temperature, Leds IHM

LoRaWAN release

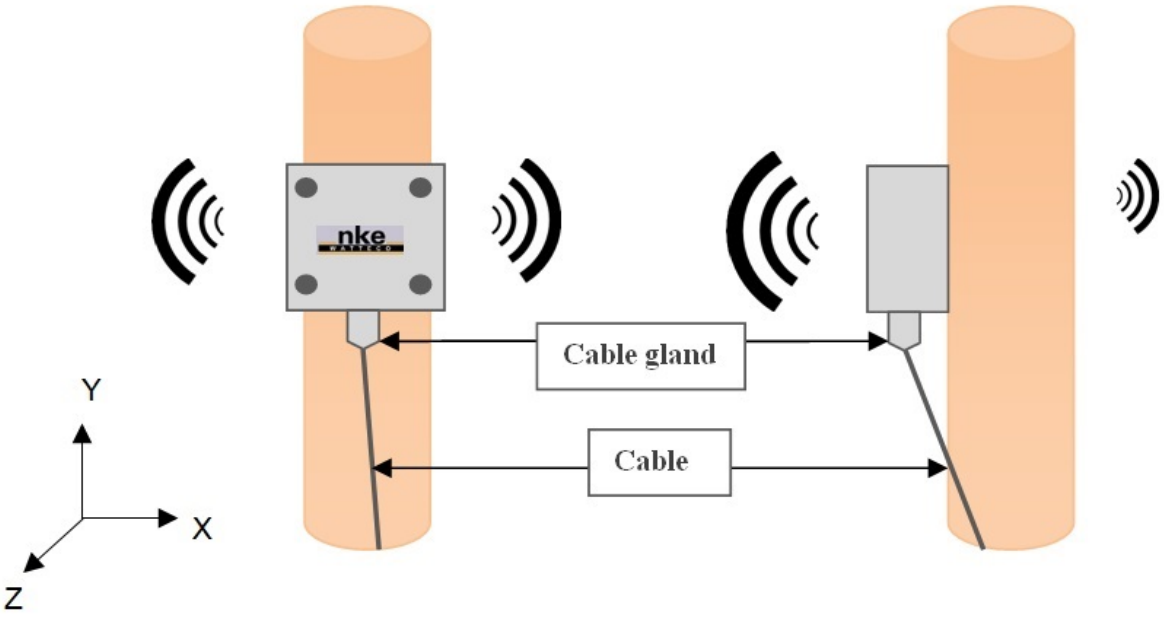
v1.0.2 Region Parameter rev B

User Guide

Notice installateur FR

Radio propagation

In order for the sensor to operate correctly, the number of obstacles should be limited in order to avoid excessive radio wave attenuation. It is also important to place the sensor as high as possible. The cable gland should be positioned downward.



Autonomy

The information in the table below represents how long the battery can last. It is based on the default configuration at ambient temperature (+25°C) within the optimal operating range of the sensor via a LoRaWAN network (one uplink frame), when the spreading factor used is SF12.

The disposable battery has a 3.6Ah capacity, of which 85% is used.

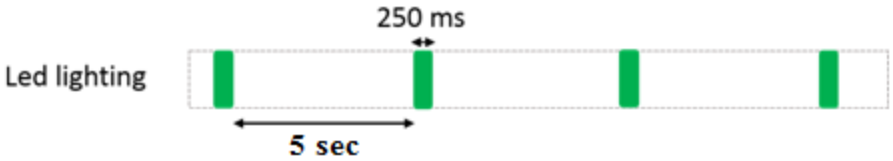
Transmission periodicity	Battery life
1 frame/ 2 hours	12 years

Human Machine Interface

Video Tutorials - WATTECO

There are two LEDs on the device:

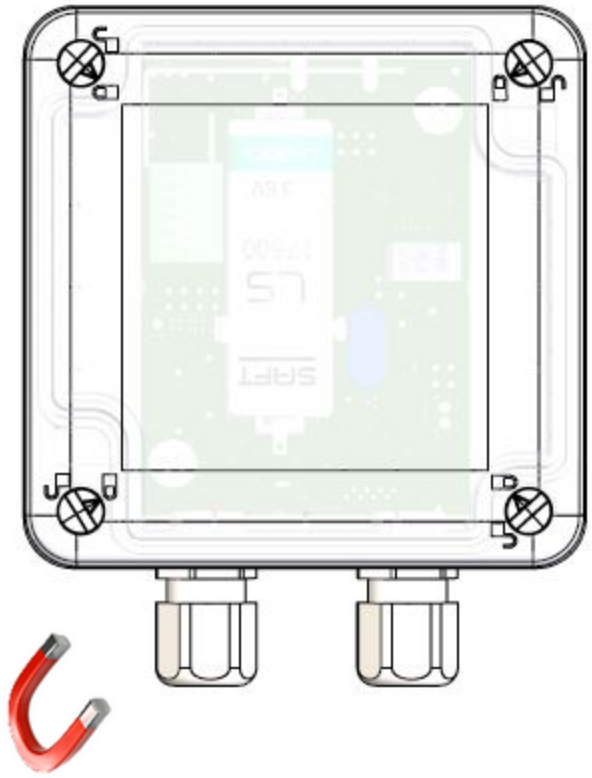
ASSN: blinking until the association with a network is done.



CNF: blinking in configuration mode.

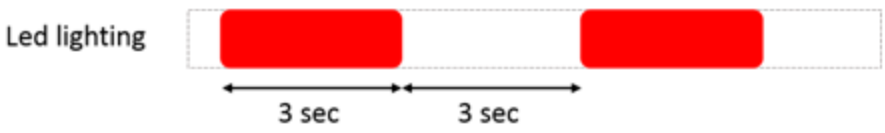
To start up the device, a magnet must be placed next to the sensor for one second (to the left of the cable gland). The red LED blinks quickly during this step. After one second, the red LED stops blinking and the green LED blinks slowly until the association is done.

To switch off the device, repeat the same operation by placing the magnet next to the sensor for 5 seconds. After those 5 seconds, the red LED blinks 5 times slowly.



A reed switch is available under the sticker. A magnet can be used to activate it and perform specific actions on the sensor (switch off, switch on, reassociation…). When the reed switch is activated, the red LED blinks quickly.

Configuration



Configuration mode	
Way to trigger it	One passage of the magnet near the reed switch or specific ZCL command

Configuration mode	
Way to stop it	Another passage of the magnet or specific ZCL command
Effects on the sensor	The CONF led (red) blinks (3 sec. OFF, 3 sec. ON) and the sensor sends an uplink frame every minute.
Duration	The configuration mode lasts 10 minutes

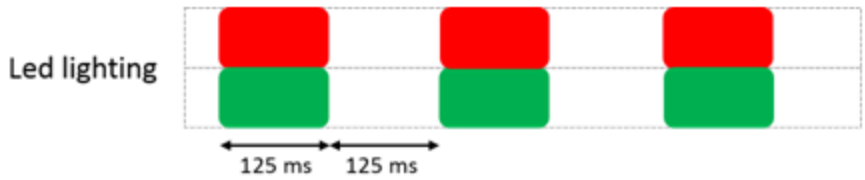
A reassociation procedure can be requested if no downlink frame is received by the sensor during a given periodicity (4 days by default) or if a given number (100 by default) is reached or in case of failure (no acknowledgement received) by sending an applicative frame to the sensor or via the sensor's IHM.

The sensor keeps the AppEUi and DevAddr configured, Confirmed/Unconfirmed configuration and all applicative configurations. However, LoRaWAN configurations (channel, data rate …) are lost.

ReAssociation Mode	
Way to trigger it	Three passages of the magnet near the reed switch or ZCL command from LoRaWAN cluster.
Effects on the sensor	The ASSN led (green) blinks as the "no commissioned sensor" LED is lit.

A factory reset is available on Watteco's sensors. It deletes all the applicative settings saved in the flash memory (i.e. configured batches and reports will be deleted).

The sensor keeps the AppEUi and DevAddr configured. However, LoRaWAN configurations (channel, data rate…) and applicative configurations are lost.



Factory reset	
Way to trigger it	Two quick passages and a long passage of the magnet near the reed switch
Effects on the sensor	The CONF LED (red) and ASSN LED (green) blink at the same time briefly. All the applicative settings (for batches and reports) are deleted. The blinking is illustrated below this table.

Applicative layer

> **Codecs are available to decode frames: Downloads**

The Remote temperature 2 sensors integrates the following clusters:

Cluster	Cluster name	Managed attributes
0x0000	Basic	All
0x0050	Configuration	All
0x8004	LoRaWAN	All
0x0402	Temperature Measurement	All

Probe 1 is on the EndPoint 0 / Probe 2 is on the EndPoint 1

Default configuration

A default configuration is set:

> The device reports a "batch" of temperature from probe 1 and probe 2 every 1 hour with a measure all 10 minutes.

The configuration of batch is :

Features	Label (size= 3)	Measure periodicity	Transmission periodicity	resolution
Temperature 1 (probe 1)	0	10 minutes	1 hour	0.1°C
Temperature 2 (probe 2)	1	10 minutes	1 hour	0.1°C
Battery Voltage	5	24 hours	24 hours	100mV

Every change made to the default configuration must comply with the legal duty cycle (for example, the most restrictive in the EU is 0.1%, which corresponds to approximately 1 frame per hour with SF12)

To decode the default "batch" is necessary to use this argument: **3 0,10,7 1,10,7 5,100,6 .**

Measurement periodicity

The measurement periodicity depends on the minimum and maximum recording intervals, and the delta.

If the value of the minimum and the delta is 0, then the maximum value is the periodicity. However, if the value of delta is different than 0, then the periodicity is 1 second.

If the value of the minimum is different than 0, then this value is the same as the periodicity.

Frame examples

> **All frames have to be sent on port 125**

Standard report

Report

Report of the temperature of the remote sensor

→ Applicative payload is: ***11 0a 04 02 00 00 29 00 64***

00 64: Measured value 1°C (Temperature (°C) = Measured value/100)

Configuration

Configure a standard report on the temperature

Report immediately the temperature for every 11°C of variation. This measurement has to be reported at least every hour.

→The temperature is on the EndPoint 0, Cluster “Temperature Measurement” is 0x0402, Attribute “MeasuredValue” is 0x0000.

The maximum field has to be 0x0e10 to have a report every one hour and the minimum field has to be 0x0000 to have a report immediately after the right variation.

The delta has to be configured to 1100=0x044c for a report every 11°C of variation.

Applicative payload is: ***11 06 04 02 00 00 00 29 00 1e 0e 10 04 4c***

00 1e:minimum reporting interval (30 seconds)

0e 10: maximum reporting interval (1 hour)

04 4c: reportable change (11°C)

→Response: 11 07 04 02 00 00 00 00

To disable the previous configuration, change the value of the minimum and maximum sending intervals and the delta to 0: ***11 06 04 02 00 00 00 29 00 00 00 00 00 00***

Batch report

→ Applicative payload is:
22050010355c04b3c89e800e0c20005901c80a405600b2029085244992ea743800

with the "batch" codec and the argument **3 0,10,7 1,10,7 5,100,6** the result of this is :


```
{
   "batch_counter": 5,
   "batch_relative_timestamp": 2127542,
   "batch_absolute_timestamp": "2020-03-05T17:46:37.699",
   "dataset": [
      {
         "data_relative_timestamp": 2124472,
         "data": {
            "value": 2150,
            "label": 0,
            "label_name": "Temperature1"
         },
         "data_absolute_timestamp": "2020-03-05T16:55:27.699Z"
      },
      {
         "data_relative_timestamp": 2125072,
         "data": {
            "value": 2150,
            "label": 0,
            "label_name": "Temperature1"
         },
         "data_absolute_timestamp": "2020-03-05T17:05:27.699Z"
      },
      {
         "data_relative_timestamp": 2125672,
         "data": {
            "value": 2150,
```

```
        "label": 0,
        "label_name": "Temperature1"
    },
    "data_absolute_timestamp": "2020-03-05T17:15:27.699Z"
},
{
    "data_relative_timestamp": 2126272,
    "data": {
        "value": 2150,
        "label": 0,
        "label_name": "Temperature1"
    },
    "data_absolute_timestamp": "2020-03-05T17:25:27.699Z"
},
{
    "data_relative_timestamp": 2126872,
    "data": {
        "value": 2150,
        "label": 0,
        "label_name": "Temperature1"
    },
    "data_absolute_timestamp": "2020-03-05T17:35:27.699Z"
},
{
    "data_relative_timestamp": 2127472,
    "data": {
        "value": 2150,
        "label": 0,
        "label_name": "Temperature1"
    },
    "data_absolute_timestamp": "2020-03-05T17:45:27.699Z"
},
{
    "data_relative_timestamp": 2124472,
    "data": {
        "value": 1140,
        "label": 1,
        "label_name": "Temperature2"
    },
    "data_absolute_timestamp": "2020-03-05T16:55:27.699Z"
},
{
```

```
    "data_relative_timestamp": 2125072,
    "data": {
        "value": 1130.0,
        "label": 1,
        "label_name": "Temperature2"
    },
    "data_absolute_timestamp": "2020-03-05T17:05:27.699Z"
},
{
    "data_relative_timestamp": 2125672,
    "data": {
        "value": 1140.0,
        "label": 1,
        "label_name": "Temperature2"
    },
    "data_absolute_timestamp": "2020-03-05T17:15:27.699Z"
},
{
    "data_relative_timestamp": 2126272,
    "data": {
        "value": 1140.0,
        "label": 1,
        "label_name": "Temperature2"
    },
    "data_absolute_timestamp": "2020-03-05T17:25:27.699Z"
},
{
    "data_relative_timestamp": 2126872,
    "data": {
        "value": 1150.0,
        "label": 1,
        "label_name": "Temperature2"
    },
    "data_absolute_timestamp": "2020-03-05T17:35:27.699Z"
},
{
    "data_relative_timestamp": 2127472,
    "data": {
        "value": 1150.0,
        "label": 1,
        "label_name": "Temperature2"
    },
```

```
            "data_absolute_timestamp": "2020-03-05T17:45:27.699Z"
        }
    ]
}
```