

# Integrating Cayenne on TTN v3

## RS1xx Series

Application Note

v2.0

## 1 Introduction

Cayenne is an IoT data processing system that can display transmitted data in visualized form with drag-and-drop configuration. You can configure a LoRaWAN network server (e.g. The Things Network v3) to receive data from end-devices and forward that data to an external application server in a format that the application server can understand. RS1xx supports Cayenne LPP packet format for this purpose and the received data on Cayenne will be decoded to display in icons and widgets.

## 2 Requirement

The following hardware is required for this integration:

- RS1xx LoRa-enabled sensor
- Sentrius Mobile App – available in iOS and Android
- LoRaWAN gateway (e.g. [Ezurio Sentrius RG1xx](#))

## 3 Overview

This application note demonstrates that the RS1xx captures data and transmits it over a LoRa network to a Cayenne application server. As such, the gateway is set up as the packet forwarder pointing to TTN as the destination. Also, the TTN network server is configured to redirect data from end-devices to Cayenne MyDevice so that it can be displayed in widgets on a browser.

## 4 Test Setup

This document assumes that you already have registered gateways and end-devices to the TTN v3. If you have not done it yet, refer to the [app note for setting up Basic Station on the Things Stack v3](#).

### 4.1 TTN setup

1. On The Things Stack web UI, navigate to *Application > Integrations > Webhooks* and click **Add webhook**.

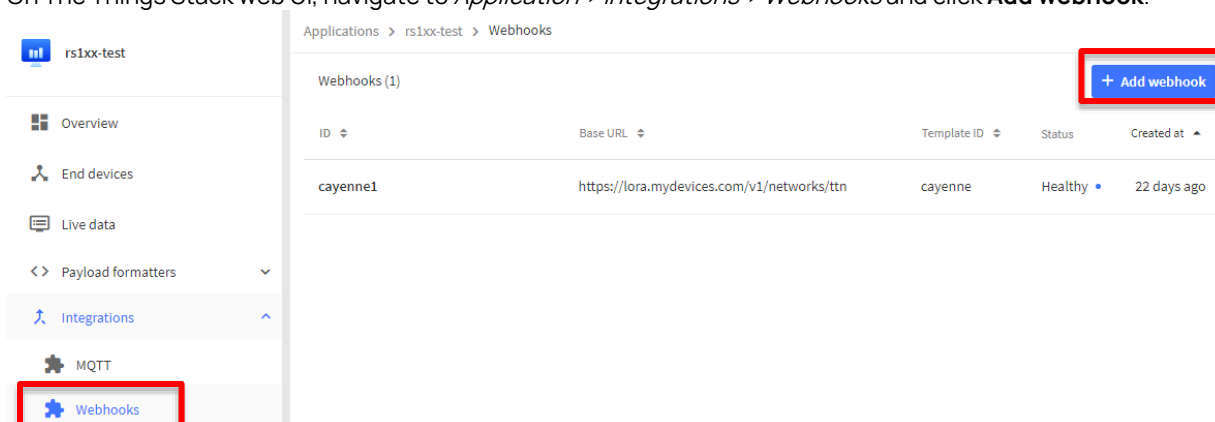


Figure 1: Add webhooks

2. Choose Cayenne.

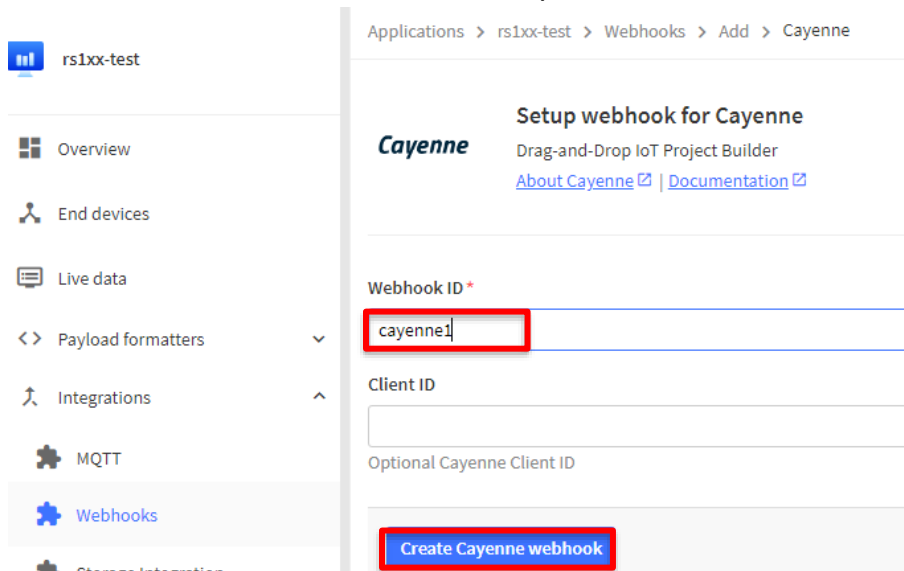
## Cayenne

### Cayenne

Drag-and-Drop IoT Project Builder

Figure 2: Cayenne icon in webhooks

3. Give a name for Webhook ID and click **Create Cayenne webhook**.



Applications > rs1xx-test > Webhooks > Add > Cayenne

**Cayenne**  
Drag-and-Drop IoT Project Builder  
[About Cayenne](#) | [Documentation](#)

Webhook ID \*  
cayenne1

Client ID

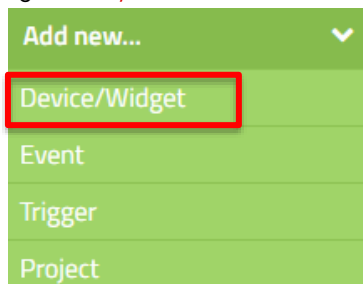
Optional Cayenne Client ID

**Create Cayenne webhook**

Figure 3: Webhooks ID for Cayenne

## 4.2 Cayenne Setup

1. Log into [Cayenne website](#) and click *Add new...* > *Device/Widget*.



Add new... ▼

Device/Widget

Event

Trigger

Project

Figure 4: Add new device

- Search for “Cayenne” and choose Cayenne LPP in the search result on the right column.

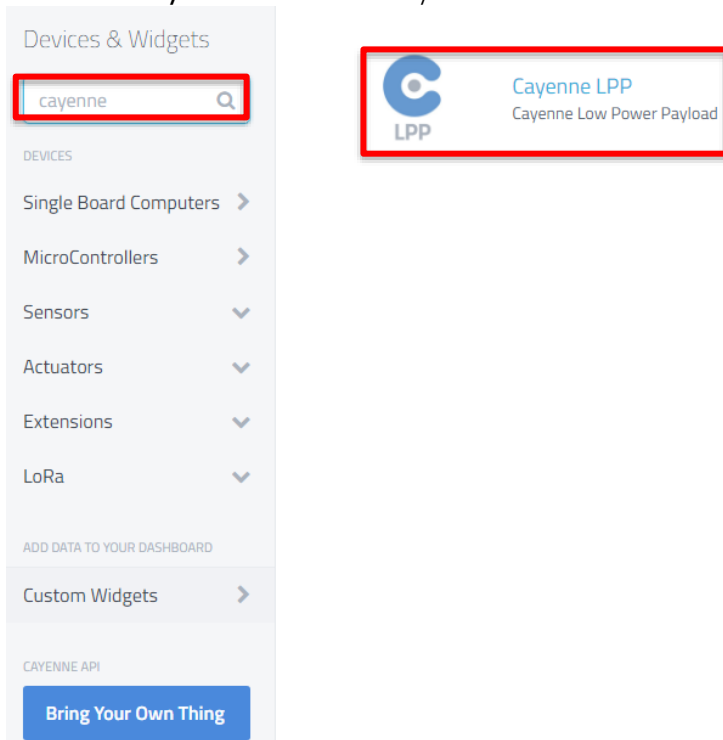


Figure 5: Set device type to Cayenne LPP

- Enter *DevEU1* and leave the rest empty. Then, click **Add device**.

Enter Settings



Cayenne Cayenne  
LPP  
Cayenne Low Power  
Payload

This device uses Cayenne LPP

Name  
Cayenne LPP

DevEU1  
0025CA0A0001383D

Activation Mode  
Already Registered

ThingPark Server

ThingPark Email

ThingPark Password

Tracking

Location  
This device moves

Add device

- Newly created device should show up on the left column as *Cayenne LPP* by default

## 4.3 RS1xx setup

To configure the RS1xx to transmit data to the Cayenne Application server, complete the following steps:

1. Ensure Bluetooth is enabled on your mobile device and open the Sentries Mobile app.
2. Press the Bluetooth button on the RS1xx so that it starts advertising (the blue LED will start flashing). The RS1xx will become discoverable and appear in the devices list.
3. Select the correct RS1xx from the list of Bluetooth devices. If there are multiple devices detected, match the correct device with the Device EUI printed on the sticker on the reverse of the sensor) and the device will connect to the sensor.
4. Once connected, click *LoRa Radio Settings and Info*.

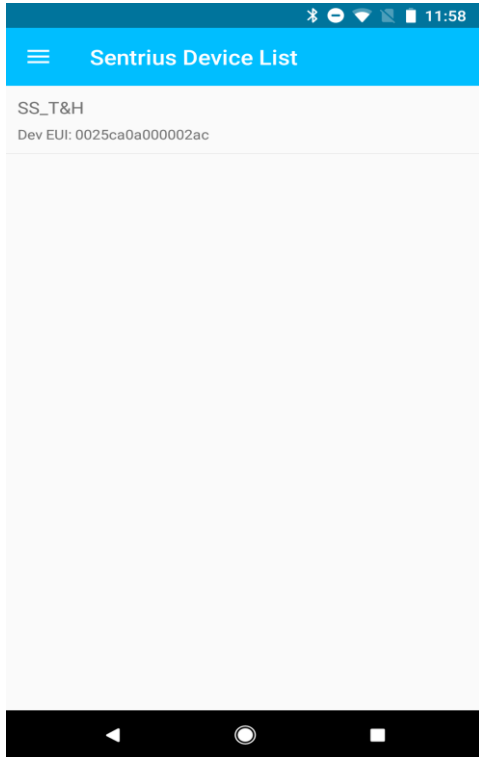


Figure 6: Showing available sensors

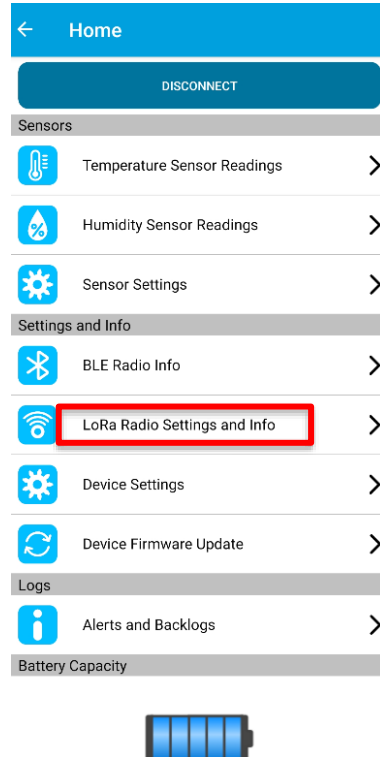


Figure 7: Connected to the sensor

5. Configure *Operating Mode* to **Cayenne** and check for **Confirmed packets**.

| LoRa Settings and Info |                  |
|------------------------|------------------|
| Settings               |                  |
| Channel Mask           | Sub-Band 2       |
| Operating Mode         | Cayenne          |
| Dev EUI                | 0025ca0a0001383d |
| App EUI                | f9c60ecea3adc6bd |
| App Key                | ???              |
| Information            |                  |
| RSSI (dBm)             | -32              |
| SNR                    | 21               |
| Data Rate              | 13               |
| RF Power (dBm)         | 14               |
| Uplink Packet Count    | 21021            |
| Downlink Packet Count  | 21371            |
| RX1 Count              | 62989            |
| RX2 Count              | 11               |
| LoRa Stack Version     | 4.4.1            |

Figure 8: LoRa Settings and Info

LoRa Settings and Info

Settings

Channel MaskSub-Band 2

Operating ModeCayenne

Dev EUI0025ca0a0001383d

App EUIf9c60ecea3adc6bd

App Key???

Update value

Set the new operating mode

Packet type: Cayenne

Confirmed packets:

CANCEL
SAVE

Downlink Packet Count21389

RX1 Count63007

RX2 Count11

LoRa Stack Version4.4.1

Figure 9: Operating mode

- Return to the Cayenne dashboard. You can view the data in a tabular format on the Data tab, or as a series of icon boxes in the Overview tab.

| Cayenne LPP Network: |              |          |                  |                         |               |      |              |
|----------------------|--------------|----------|------------------|-------------------------|---------------|------|--------------|
| Overview             |              | Data     |                  |                         |               |      |              |
| Live                 |              | m        | h                | d                       | w             | 1mo  | Custom Query |
|                      |              | Download |                  |                         |               |      |              |
| Timestamp            | Devic...     | Chan...  | Sensor Name      | Sensor ID               | Data ...      | Unit | Values       |
| 2018-05-30 1:06:40   | Cayenne L... | 3        | Analog Input (3) | 159a91d0-52c0-11e8-...  | digital_ac... | d    | 5            |
| 2018-05-30 1:06:40   | Cayenne L... | 101      | SNR              | 9a91cd90-4e10-11e8-a... | snr           | db   | 8.75         |
| 2018-05-30 1:06:40   | Cayenne L... | 1        | Temperature (1)  | 9abf6d40-4e10-11e8-a... | temp          | c    | 23.3         |
| 2018-05-30 1:06:40   | Cayenne L... | 2        | Humidity (2)     | 9ab29c00-4e10-11e8-8... | rel_hum       | p    | 55.5         |
| 2018-05-30 1:06:40   | Cayenne L... | 100      | RSSI             | 9a826440-4e10-11e8-...  | rssi          | dbm  | -43          |
| End of list          |              |          |                  |                         |               |      |              |

Figure 10: Data tab

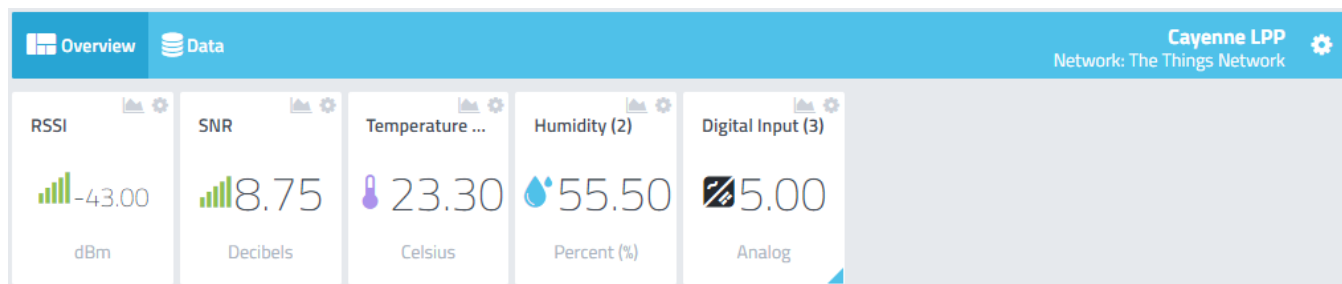


Figure 11: Overview tab

## 5 Resources

- Cayenne Payload Structure – <https://developers.mydevices.com/cayenne/docs/lora/>
- RS1xx Setup Guides – <https://www.ezurio.com/products/rs1xx-lora-sensors#documentation>

## 6 Revision History

| Version | Date        | Notes             | Contributor(s)                 | Approver       |
|---------|-------------|-------------------|--------------------------------|----------------|
| 1.0     | 29 Aug 2023 | Initial Release   | Seokwoo Yoon<br>Dave Drogowski | Seokwoo Yoon   |
| 2.0     | 2 May 2025  | Ezurio rebranding | Sue White                      | Dave Drogowski |

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