User Guide

Sentrius™ RS26x

Version 1.3

Contents

1 About this Guide

This document provides a guide on how to configure the **Sentrius™** RS26x **[A]** sensors to suit the intended application. It covers all **Sentrius™** RS26x functionality, including Bluetooth and LoRa configuration in detail, as well as setting up the sensor on a LoRa Network Server (LNS).

In order to comply with the LoRaWAN spec **[B] [C]**, Ezurio offers different versions of the Sentrius Sensor. Regions supported include Europe (EU) and North America (US). Regional configuration is fixed during manufacture and cannot be modified by the end user.

2 Nomenclature

Device Parameters are displayed in ***italicized bold*** font.

Device Parameter values are displayed in ***'italicized bold'*** within single quotation marks.

3 Introduction

3.1 Product Overview

The **Sentrius™ RS26x** LoRa-Enabled sensor from Ezurio is the ultimate in secure, scalable, robust LoRa solutions for end-to-end control of your private LoRaWAN network. Based on the **Semtech SX1261 / SX1262 chipset**, it offers **long range up to ten miles**, perfect for highly scalable, flexible IoT networks.

The **Sentrius™ RS26x** incorporates a LoRaWAN v1.0.4 compliant LoRaWAN implementation for uplink of sensor data and a BLE v5.4 compliant implementation for local configuration and firmware update.

The **Sentrius™** RS26x sensor works with the **Sentrius™** RG1xx gateways **[D]** for simple out-of-the-box integration and is compatible with third-party and LoRa network servers.

Features accessible from the front of the device are shown in **Figure 1**.

1. Mounting Holes: These are used to fix the sensor in position in the user installation. Refer to XX for mounting instructions and guidance.

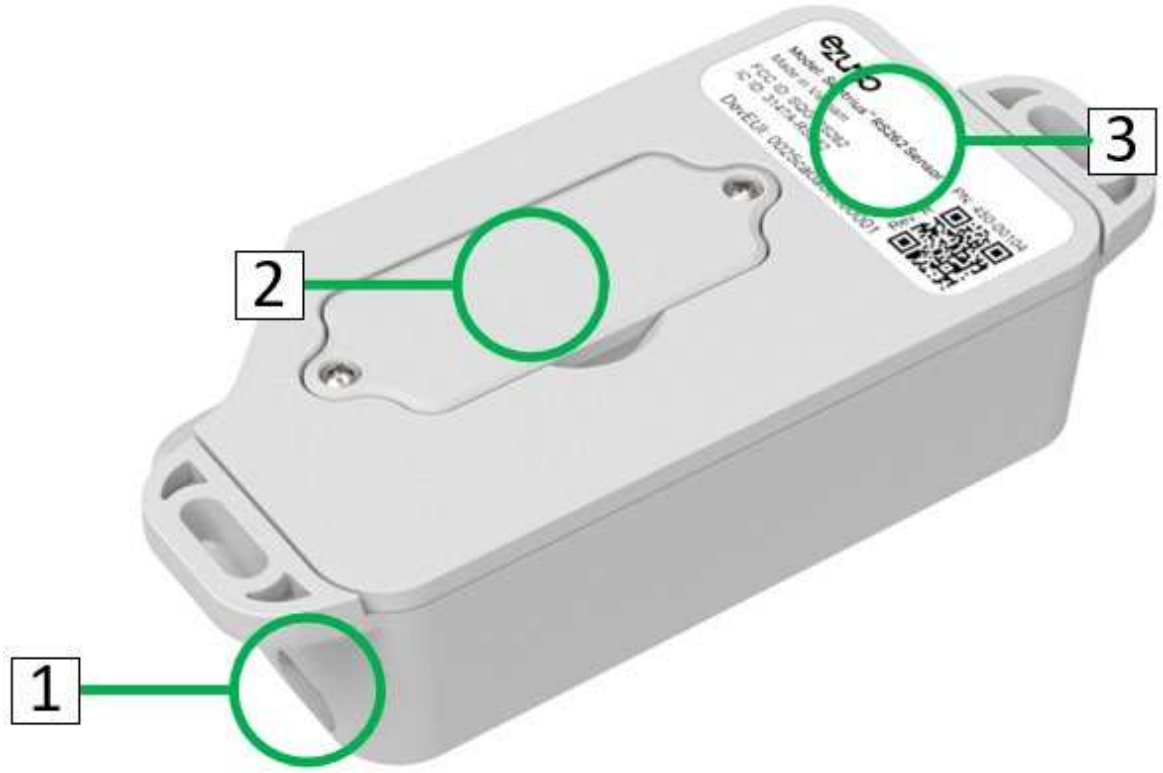
2. Pushbutton: This is a multi-function push-button. Refer to section 5.1 for details of its usage.

3. Bluetooth LED: This LED is used to indicate the BLE status of the device. Refer to section 5.2 for further details.

4. Heartbeat LED: This LED is used to indicate the device status. Refer to section 5.3 for further details.

5. Internal Temperature Sensor: Only available for the Internal Temperature sensor variant.

Figure 1: RS26x front view



1. USB-C Connector: Available for external sensor devices only for connection of the external sensor.

2. Battery Compartment Lid: Allows replacement of the device battery following removal. Refer to section 4.3 for further details.

3. Product Label: Includes details of the device part number and LoRaWAN DevEUI. The QR code includes the same information.

Figure 2: RS26x rear view

Note: The USB-C Connector features a modified layout from the USB-C standard. It is designed to prevent damage to either the device or a standard USB-C device connected to it. It is not however intended for connection to standard USB-C devices.

Note: When an external sensor is not connected to the USB-C Connector, the provided dust cap must be kept in place to maintain the device ingress protection.

Note: The USB-C Connector allows connection of external sensors in either orientation.

3.2 Specifications

Product specifications are detailed in the device Product Brief **[E]**.

3.3 Architecture Overview

The major pieces of a LoRa network are shown in Figure 3. The RS26x sensor is an End Node in the diagram below. The RS26x requires the other components in the diagram below to operate.

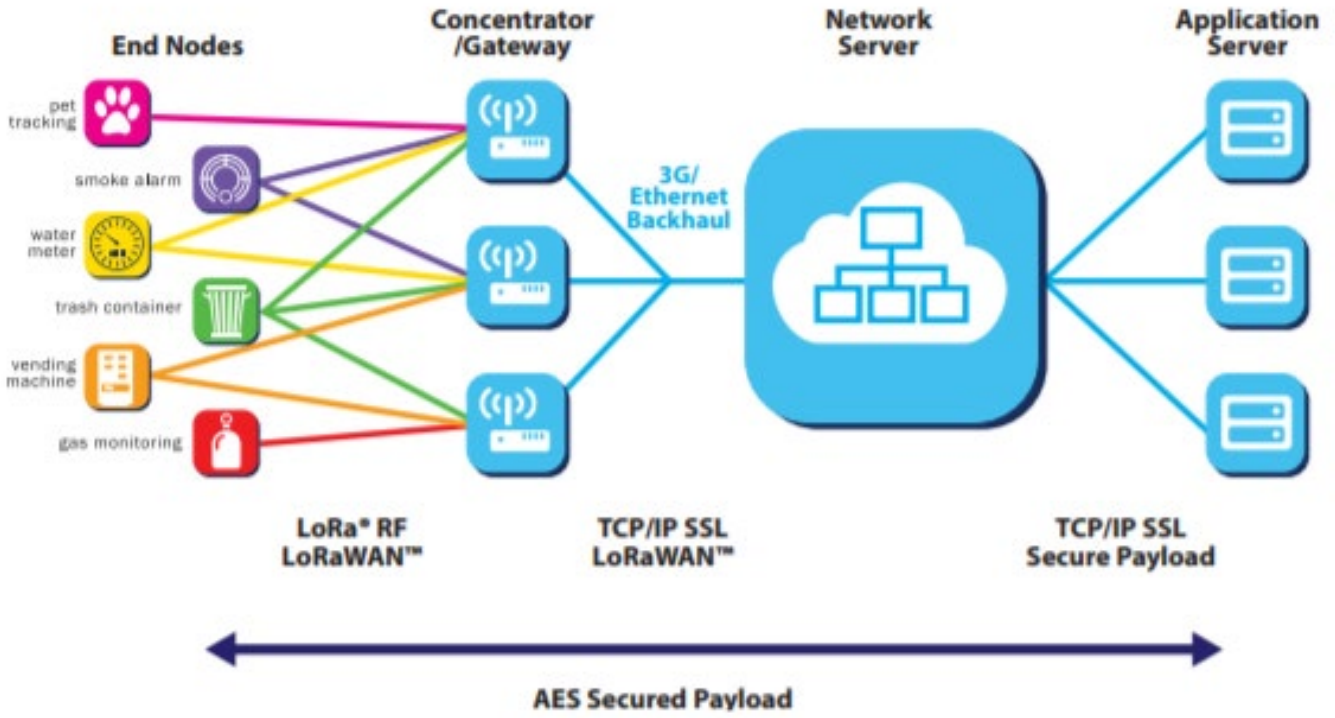


Figure 3: LoRa Architecture

4 Powering Up the Sensor

Note: The **Sentrius™** sensor has no power switch. Inserting the battery powers up the device.

4.1 Unboxing

The RS26x ships from the factory in a low-power state. It is set into normal operation by depressing the push button for at least 1 second then releasing.

4.2 Battery Type

The **Sentrius™** sensor is designed for use with primary **CR123A** lithium cells.

4.3 Battery Replacement

The Sentrius RS26x battery is replaced by removing the Battery Compartment Lid, as shown in **Figure 4**.

Figure 4: RS26x battery replacement

Note: Battery orientation should be confirmed to match that shown in **Figure 4**. Guard rails in the Battery Compartment protect from mis-orientation of the battery.

Note: The Battery Compartment Lid must be replaced and screwed in place following battery replacement to ensure the device ingress protection is maintained.

5 Sensor Front Panel

The device includes a pair of LEDs for status indications and a Pushbutton for triggering device actions. These are described as follows.

5.1 Pushbutton

The front panel Pushbutton allows one of three device actions to be performed, depending upon the length of time the button is depressed for then released. These are described in Table 1.

Action	Pushbutton time to activate (s)	Details
Dynamic Uplink	< 1	This is only available when a connection to an LNS is available. Upon triggering, a single sensor measurement is performed and the result sent as a LoRa uplink message.
Start BLE Advertising	> 1 < 10	The device will begin BLE advertisements, allowing connection to a BLE device. The advertising period expires after 30s if no BLE connection is made.
Reboot Device	> 10	The device performs a software reset. If previously in a connection with an LNS, the device will restart its join mechanism. If in a BLE connection, advertising must first be restarted using the Pushbutton before another BLE connection can be established.

Table 1: Pushbutton operation

5.2 Bluetooth LED

The Bluetooth LED is a single color blue LED. It is used to indicate BLE activity. Possible behaviors are described in Table 2.

Flash Period (s)	Flash Duration (ms)	Details
-		BLE is inactive.
1		BLE advertisements are in progress and the device can accept BLE connections.
10		A BLE connection has been established with the device.

Table 2: Bluetooth LED flash codes

5.3 Heartbeat LED

The Heartbeat LED is a bi-color green and orange LED. It is used to indicate device status conditions with possible behaviors described in Table 3.

Flash Period (s)	Flash Duration (ms)	Color	Details
Configurable by ***Heartbeat LED Flash Period*** parameter	20	Red	The device is trying to establish a LoRaWAN connection.
Configurable by ***Heartbeat LED Flash Period*** parameter	20	Green	The device has established a LoRaWAN connection.
1	100	Red	Connectivity with the device sensor has failed.
1	20	Red	The device battery is at a critical low level and should be replaced.

Table 3: Heartbeat LED flash codes

6 Setting up RS26x

This section describes configuration of the device using the BLE interface. More limited configuration of the device is possible using the LoRaWAN interface, this is fully described in **[H]**.

The RS26x is based on Ezurio's Canvas Software Suite **[F]**. An RS26x specific applet in conjunction with Canvas' XBit application is used for device configuration. Mobile and desktop versions of the XBit app are available at **[G]**. For mobile devices, the XBit application can also be downloaded via the platform app store.

Once XBit has been installed on the chosen platform, the RS26x specific applet is available from the XBit homepage.

A complete list of the configurable device parameters and their purpose is available at **[H]**.

Note: While Xbit is available for desktop use, it requires additional hardware—a BL654 dongle with special firmware. This guide focuses on the **Canvas Xbit Mobile** app, which does not need extra hardware. For more information on the desktop version, refer to **[I]**.

6.1 Starting the RS26x Sensor Applet

The XBit Home Page is shown in ***Figure 5***. The RS26x Sensor Applet is started by clicking on the Launch button associated with the RS26x Sensor Applet.

Note: Xbit can be updated to the latest available version by clicking the Update button to the top right at any stage.

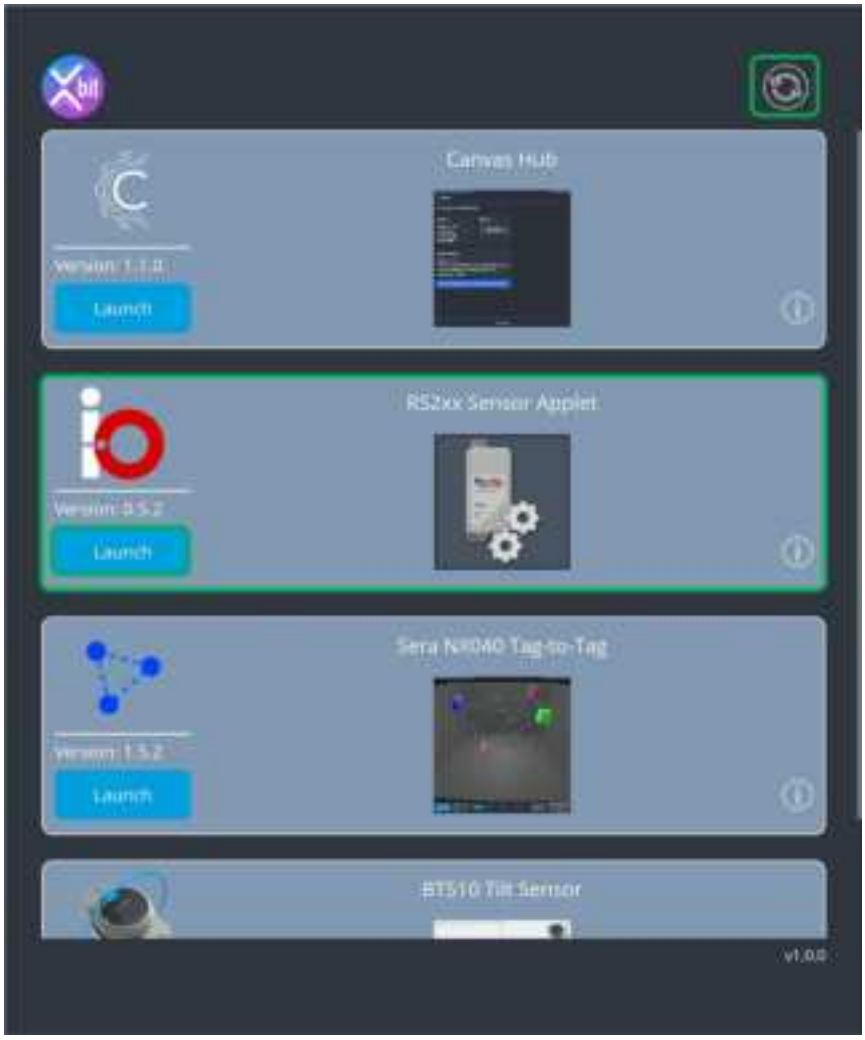


Figure 5: XBit Home Page

The RS26x Sensor Applet opening page and features are shown in **Figure 6**.

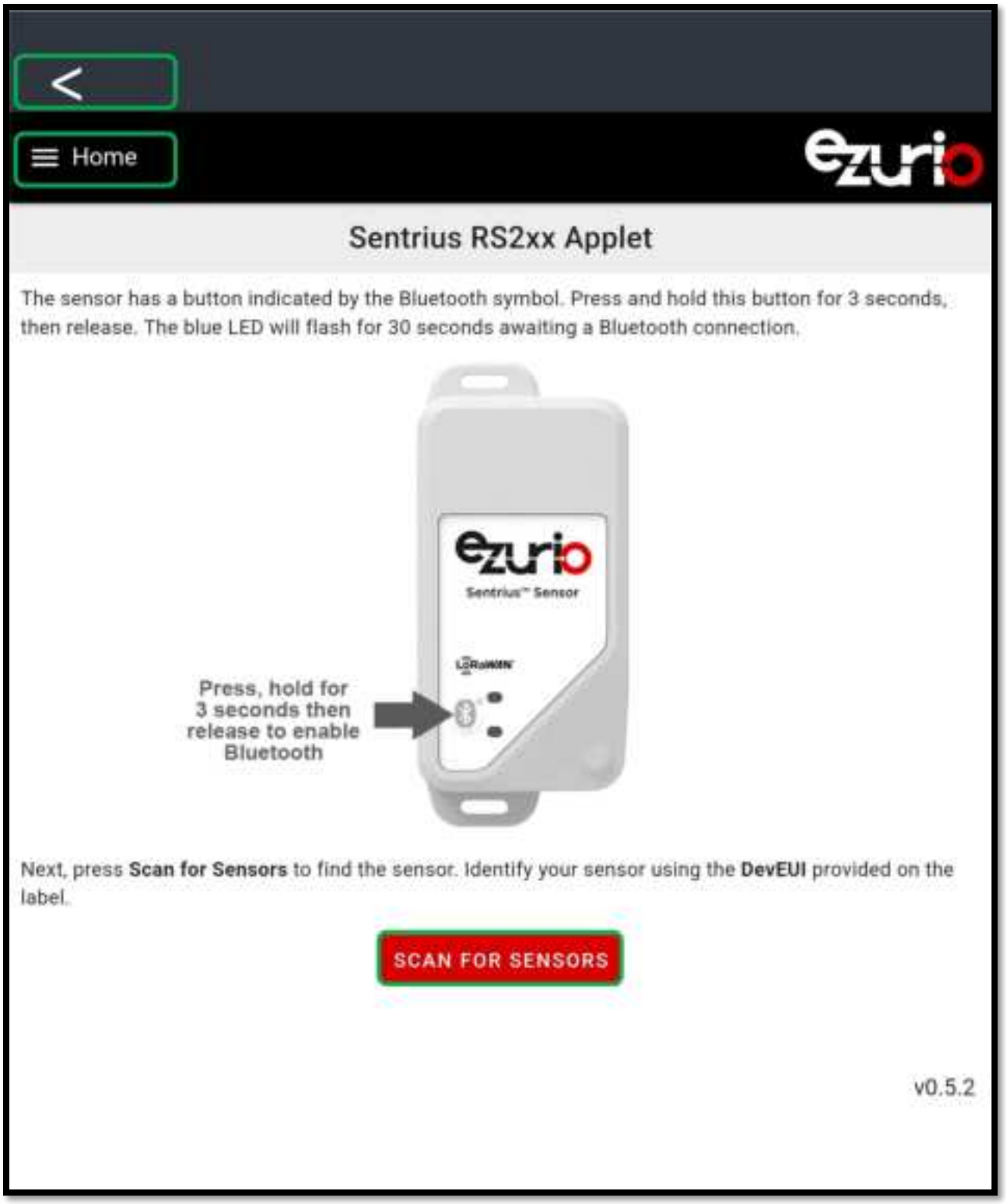


Figure 6: RS26x Sensor Applet Home Page

- The Back button to the top left can be used to return to the XBit Home Page at any time.
- The Home button is used to display License and version information.
- The Scan For Sensors button is used to establish a connection to an RS26x device.

6.2 Connecting to a device

Clicking the Scan For Devices button will start the RS26x Sensor Applet scanning for RS26x devices within the vicinity for 10s. Scanning in progress is indicated as shown in **Figure 7**.

Note: Prior to starting the scan, the device intended for configuration should be advertising for connection. Section 5.1 should be referred to for the steps required.

Figure 7: RS26x Sensor Applet BLE scanning in progress

If no devices are found, this is indicated as shown in Figure 8. The scan can be restarted by clicking the button to the bottom right of the page.

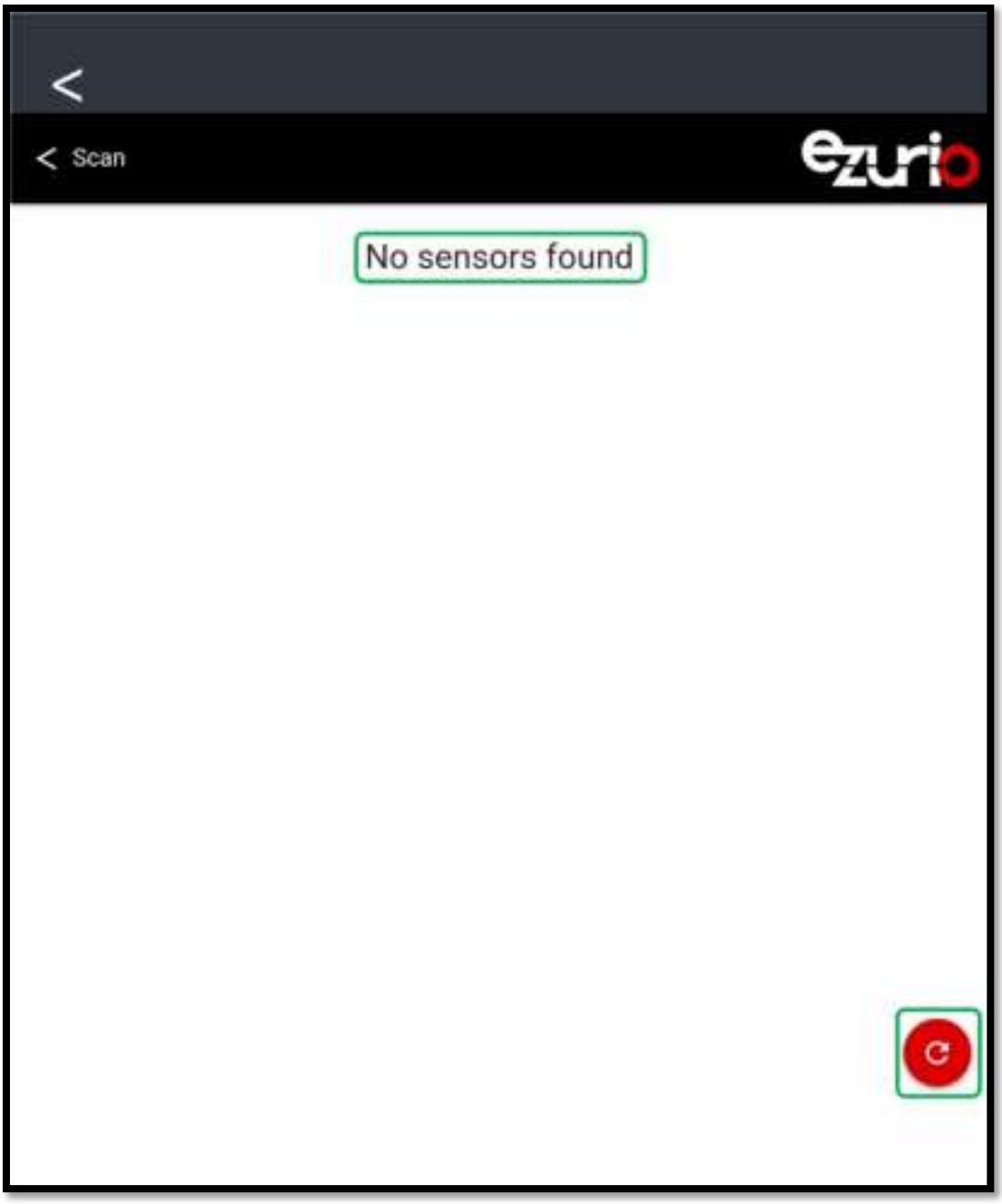


Figure 8: RS26x Sensor Applet indicating no devices found

Upon detection of devices available for connection, the Scan page is updated as shown in **Figure 9**. The device ***DevEUI*** and ***Friendly Name*** are used to indicate each device detected. Clicking the Connect button will establish a connection to the device and open the device Home Page.

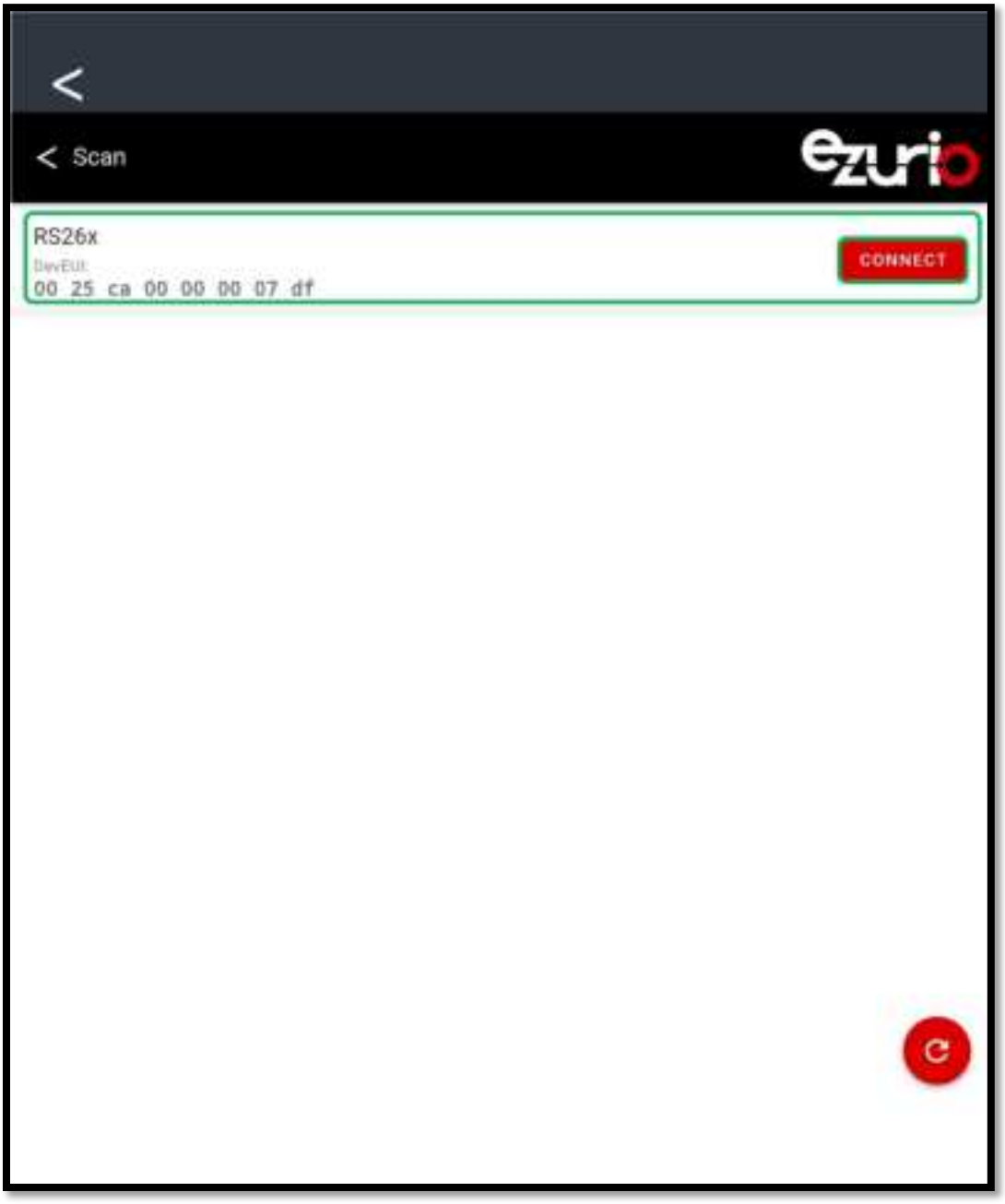


Figure 9: RS26x Sensor Applet displaying devices available for connection

6.3 Device Home Page

The device Home Page and features are shown in **Figure 10**.

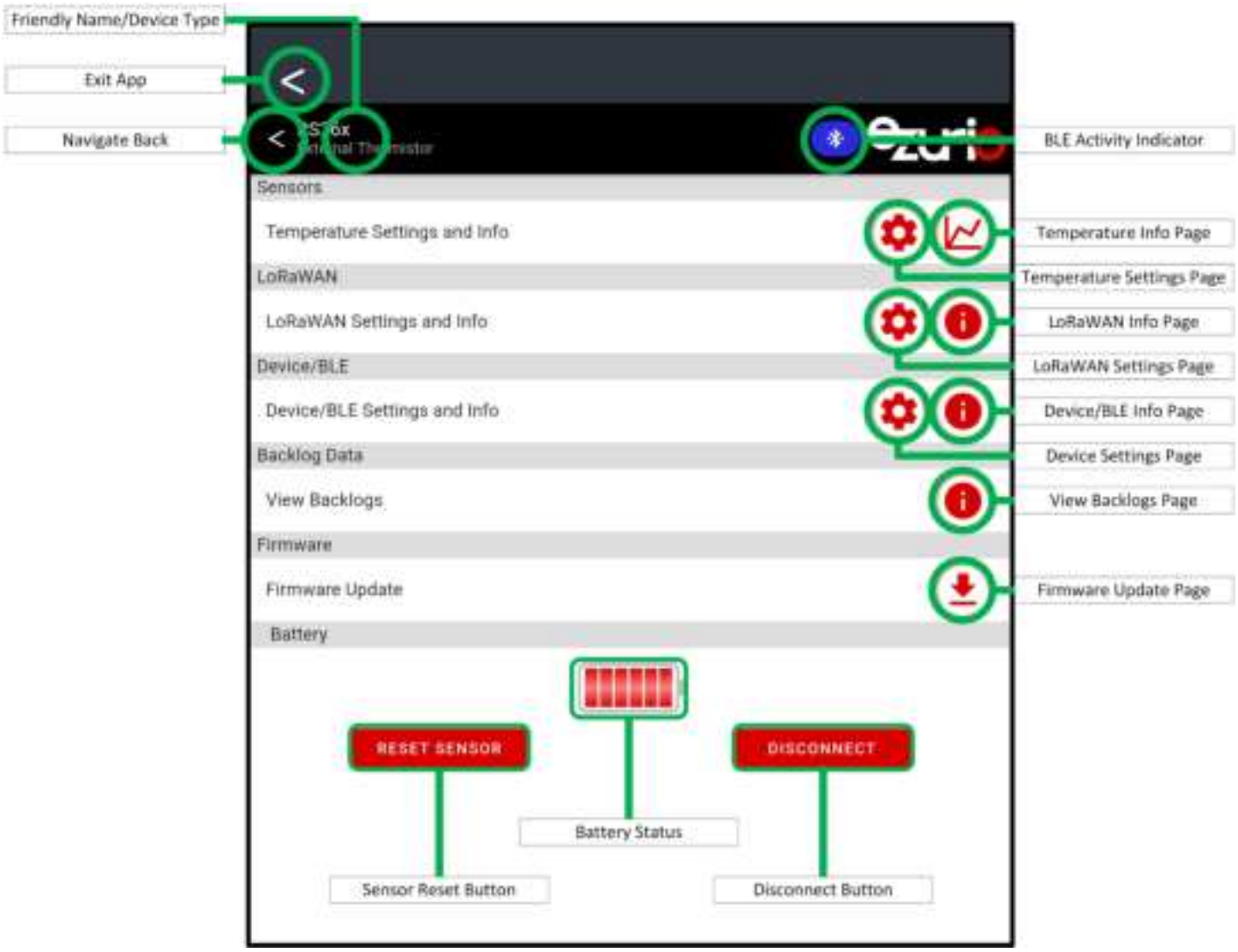


Figure 10: RS26x Sensor Applet Device Home page

The features are described as follows.

- ***Friendly Name/Device Type***: The device Friendly Name parameter and its fixed sensor type details are shown here for identification purposes.
- Exit App: The RS26x Sensor Applet can be exited at any time by clicking this button.
- Navigate Back: This button is available for all RS26x Sensor Applet pages. It is used to navigate back to the previous page.
- BLE Activity Indicator: This is used to indicate when BLE communications with the device are taking place.
- Temperature Info Page: This page is used to view live temperature values read from the device.
- Temperature Settings Page: This page is used to configure device parameters related to the device temperature measurements.
- LoRaWAN Info Page: This page is used to view read-only parameter data related to the device LoRaWAN connection.
- LoRaWAN Settings Page: This page is used configure device LoRaWAN parameters.
- Device/BLE Info Page: This page is used to view read-only parameter data related to the device and the BLE connection.
- Device Settings Page: This page is used to configure parameters related to the device.
- View Backlogs Page: This page is used to view backlog data stored in the device.
- Firmware Update Page: This page is used to update the device core and application firmware.
- Sensor Reset Button: A device reset can be performed using this button. This will break the BLE connection.
- Battery Status: The device battery status is indicated here.
- Disconnect Button: The BLE connection can be ended by clicking this button.

6.4 Temperature Info Page

The Temperature Info page is shown in **Figure 11**.

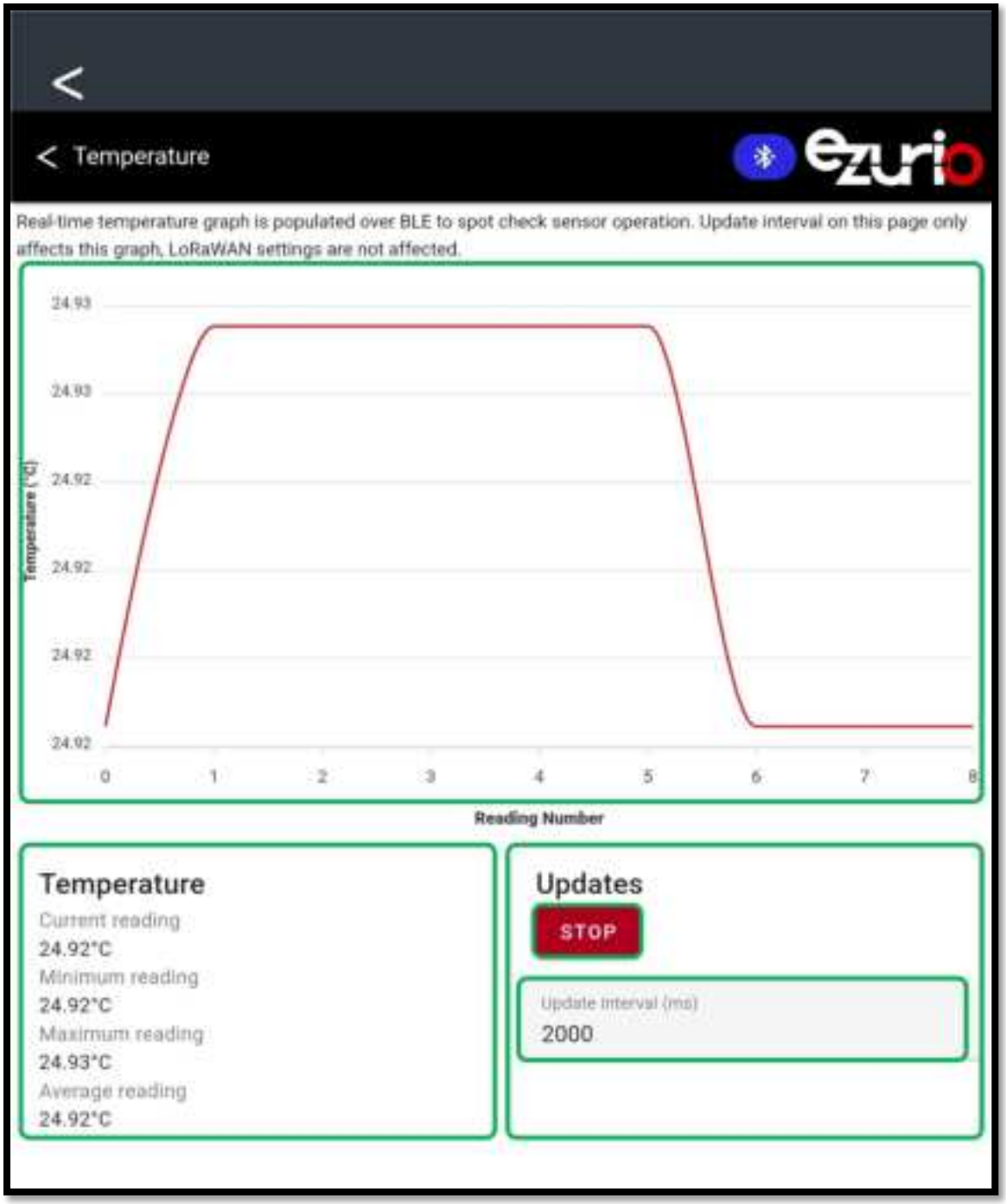


Figure 11: Temperature Info page

- Live readings are displayed in the graph area.
- A summary of readings is displayed in the Temperature area.
- Updates can be stopped and started using the button in the Updates pane.
- The frequency of updates can be adjusted in milliseconds using the Update Interval entry field in the Updates pane.

6.5 Temperature Settings Page

The Temperature Settings page is shown in **Figure 12**.

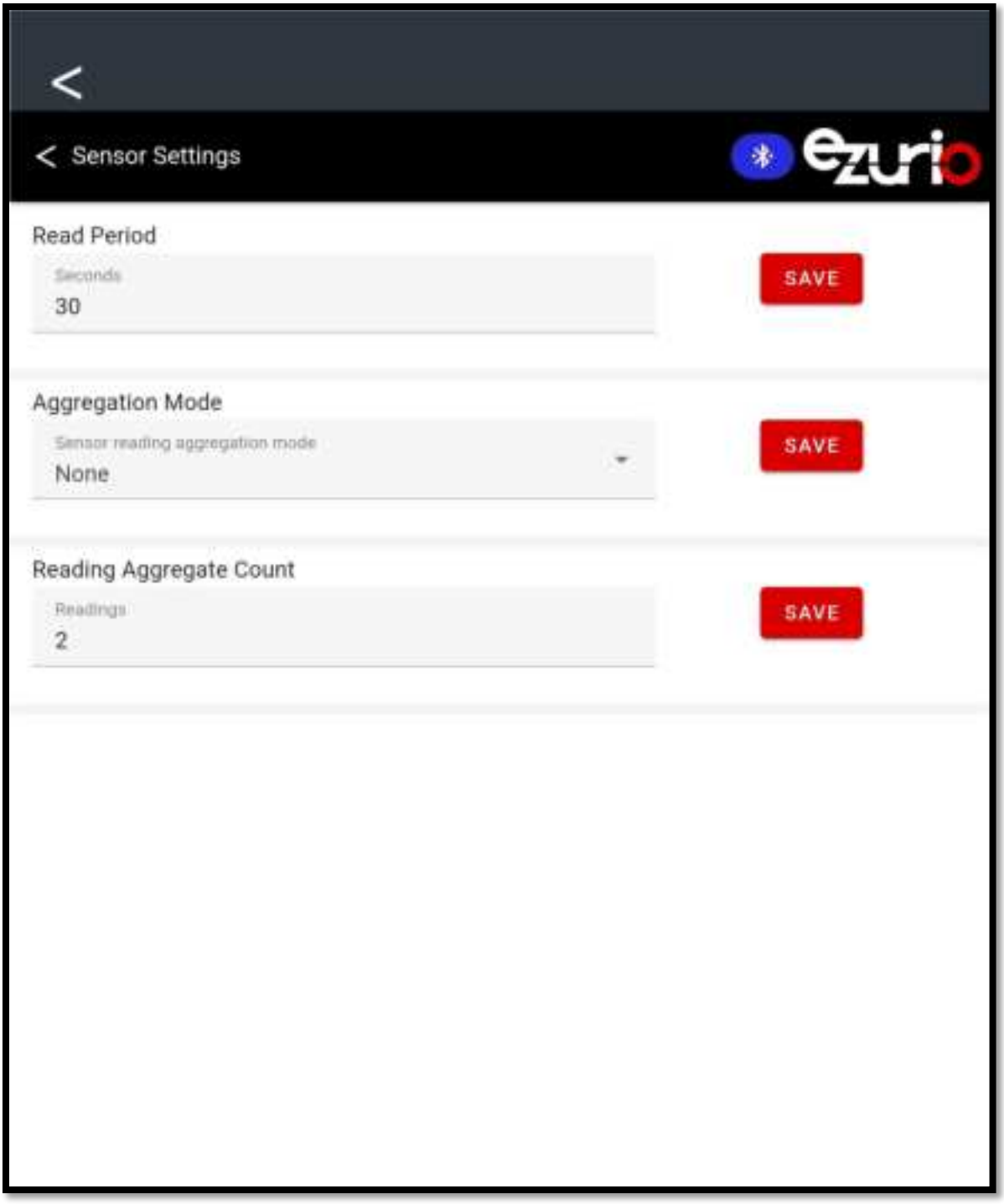


Figure 12: Temperature Settings page

- The ***Read Period*** determines the frequency of sensor reads and subsequent uplinks using the LoRaWAN connection.
- ***Aggregation Mode*** can be set to ***'Aggregation'***, where a number of readings are performed and sent in one LoRaWAN uplink, or ***'Averaging'***, where sensor readings are averaged and sent in one LoRaWAN uplink, or ***'None'***, where single sensor readings are sent in each device uplink.
- ***Reading Aggregate Count*** is used to determine how many readings an Aggregated or Averaged LoRaWAN uplink is comprised of.

When any of the parameters are changed, the corresponding Save button must be clicked to apply the changes in the device.

6.6 LoRaWAN Info Page

The LoRaWAN Info page is shown in **Figure 13**.

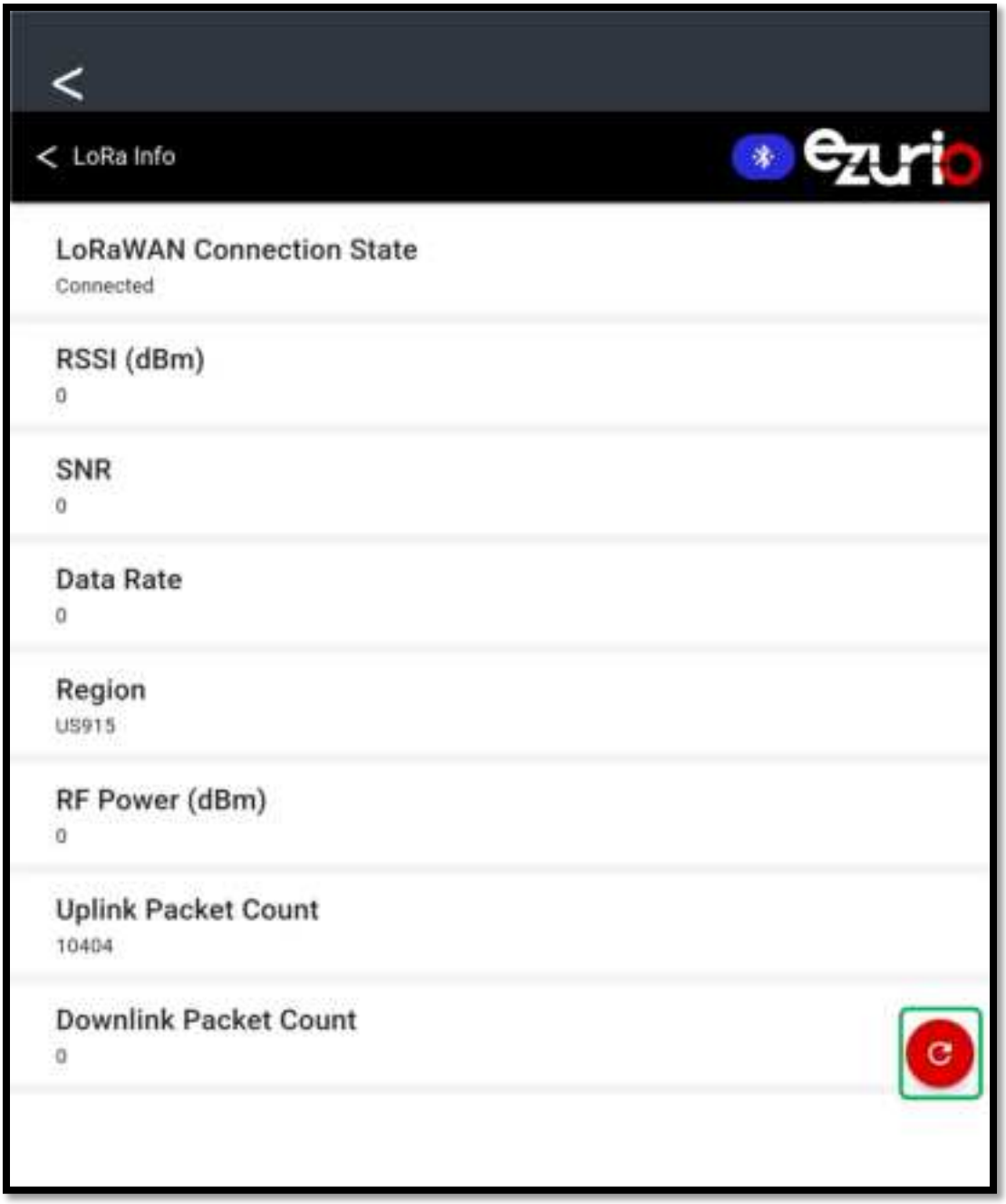


Figure 13: LoRaWAN Info page

- ***LoRaWAN Connection State*** is used to indicate if the device is connected to an LNS.
- ***RSSI (dBm)*** indicates the RSSI for the last received LoRaWAN packet.
- ***SNR*** indicates the SNR for the last received LoRaWAN packet.
- ***Data Rate*** indicates the current LoRaWAN data rate being used for LoRaWAN uplinks.
- ***Region*** indicates the configured device Region.
- ***RF Power (dBm)*** indicates the current transmit power being used for LoRaWAN uplinks.
- ***Uplink Packet Count*** indicates the number of LoRaWAN uplinks performed during the current Join session.
- ***Downlink Packet Count*** indicates the number of LoRaWAN downlinks received during the current Join session.

The LoRaWAN Info page can be refreshed at any stage by clicking the Refresh button to the bottom right of the page.

6.7 LoRaWAN Settings Page

The LoRaWAN Settings page is shown in **Figure 14**.

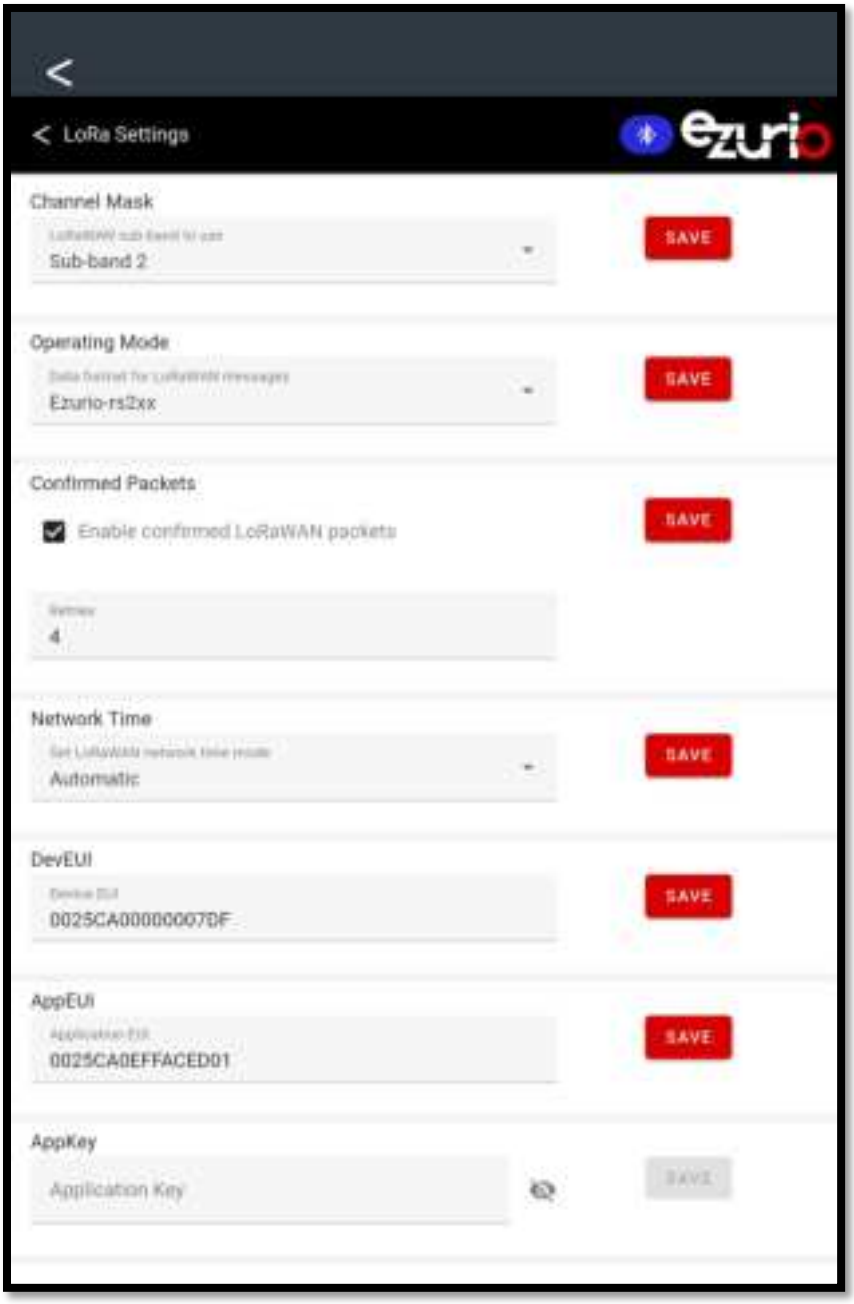


Figure 14: LoRaWAN Settings page

- The ***Channel Mask*** applies to AU915 and US915 devices only. It determines the group of 8 channels the device will use for its LoRaWAN connection.
- The ***Operating Mode*** determines the protocol used by the device for LoRaWAN messages.
- Confirmed Packets can be enabled and disabled using the ***Enable confirmed LoRaWAN Packets*** checkbox.
- The number of retries that will be performed following no acknowledgement from the LNS is configured using the ***Confirmed Packets Retries*** entry field. Note this setting only applies to devices where Confirmed Packets are enabled.
- The ***Network Time*** can be configured to ***'Automatic'***, where it is requested from the LNS, or ***'Manual'***, where it is configured manually for the device. If set to Manual, a ***UTC Seconds*** entry field is displayed where the Network Time can be entered in UNIX epoch format.
- The ***DevEUI*** is the currently configured device DevEUI.
- The ***AppEUI*** is the currently configured device AppEUI.
- The ***AppKey*** is the currently configured device AppKey. Note this cannot be read except whilst being configured.

6.8 Device/BLE Info page

The Device/BLE Info page is shown in Figure 15.

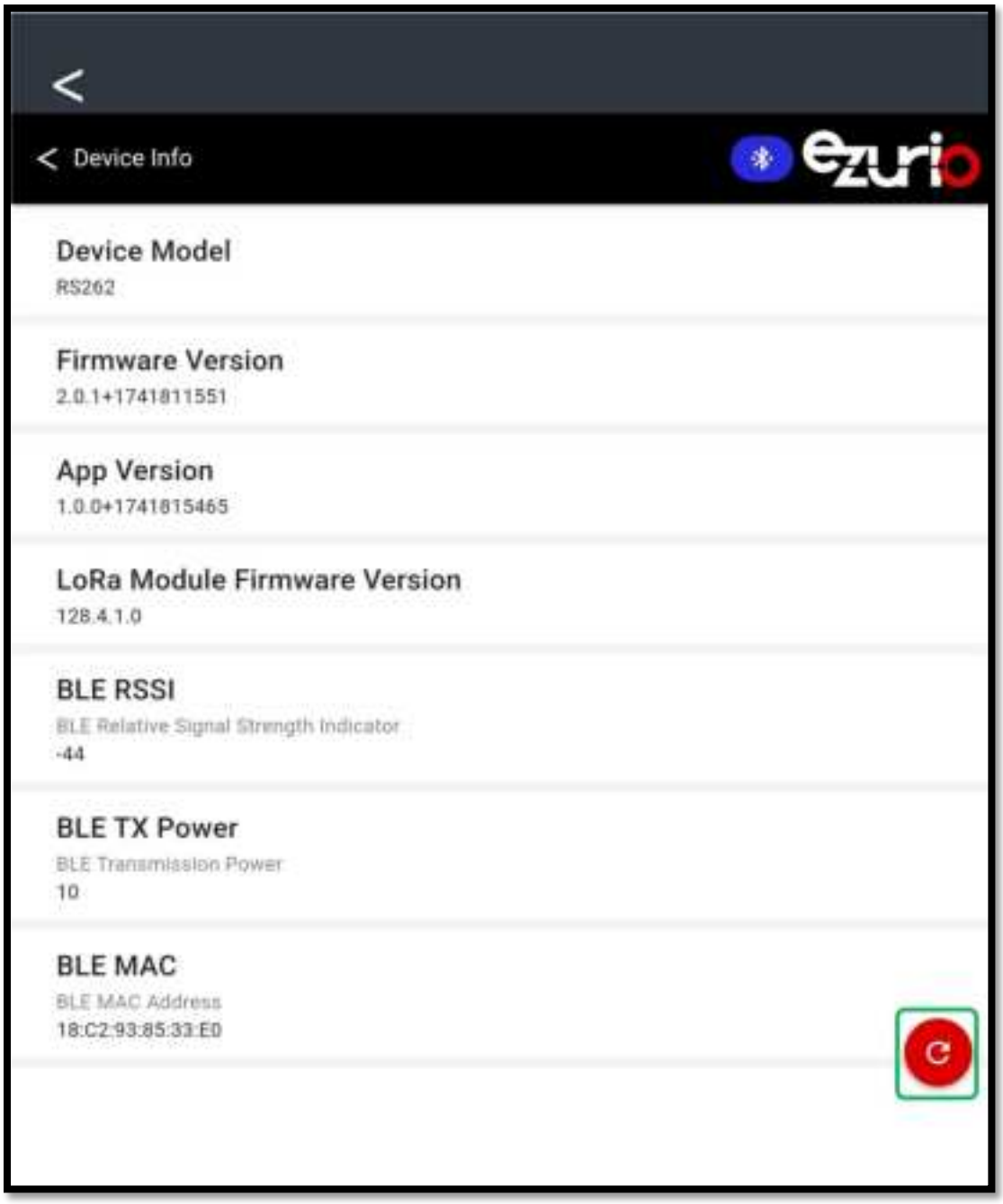


Figure 15: Device/BLE info page

- The ***Device Model*** field indicates the device type currently connected to.
- The ***Firmware Version*** field indicates the version of the Core firmware image.
- The ***App Version*** field indicates the version of the App firmware image.
- The ***LoRa Module Firmware Version*** field indicates the version of the RM126x LoRa module firmware.
- ***BLE RSSI*** indicates the current RSSI of the BLE connection.
- ***BLE TX Power*** indicates the BLE transmit power currently being used.
- The ***BLE MAC Address*** field shows the BLE Address of the device connected to.

Dynamic values can be updated at any time by clicking the Refresh button to the bottom right of the page.

6.9 Device Settings page

The Device Settings page is shown in **Figure 16**.

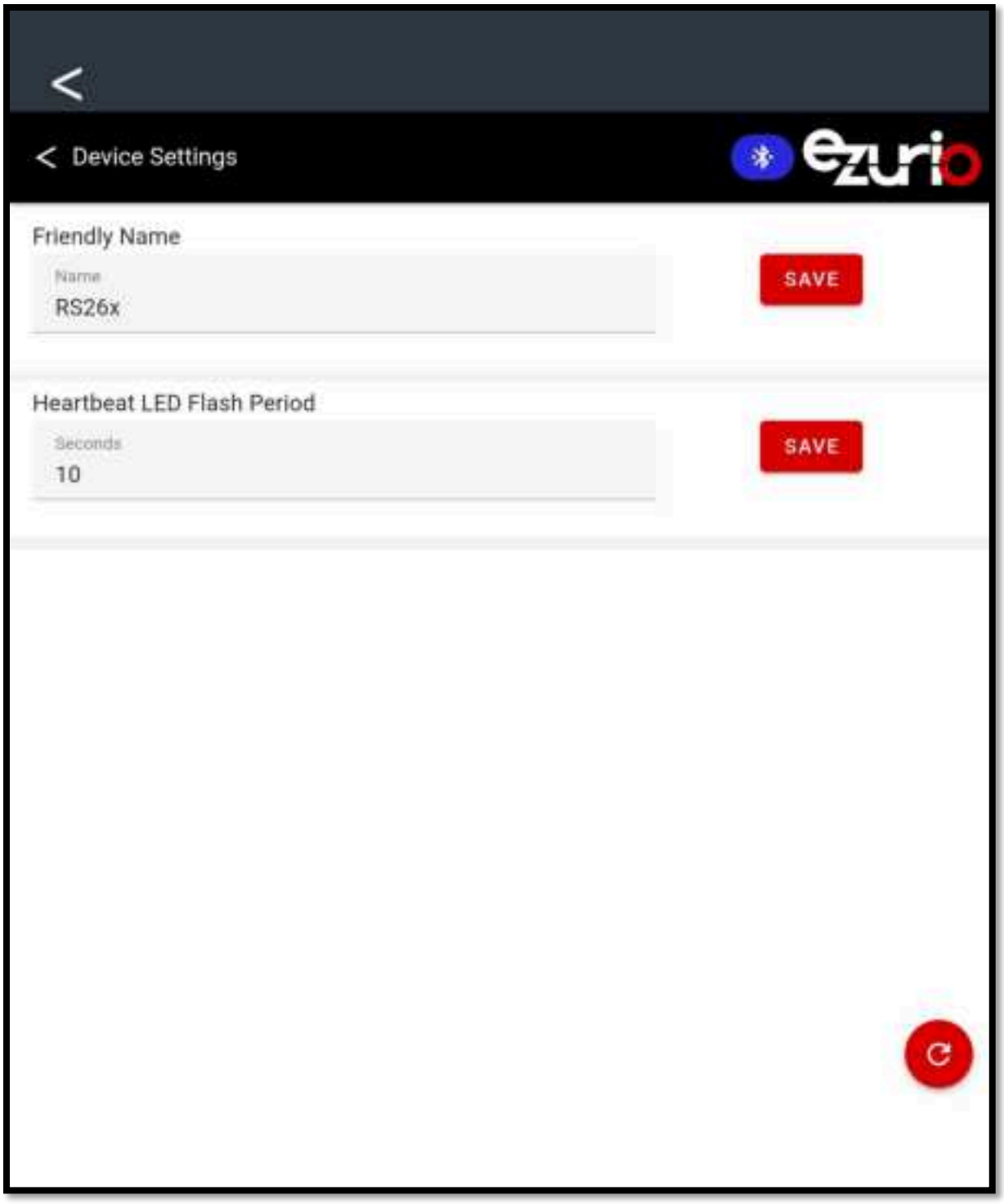


Figure 16: Device Settings page

- ***Friendly Name*** is a textual name assigned to the device for identification purposes.
- ***Heartbeat LED Flash Period*** is used to determine the Period of Heartbeat LED flashes for LoRaWAN status indication. Setting this value to 0 disables the Heartbeat LED LoRaWAN status indications.

6.10 View Backlogs page

The View Backlogs page is shown in **Figure 17**.

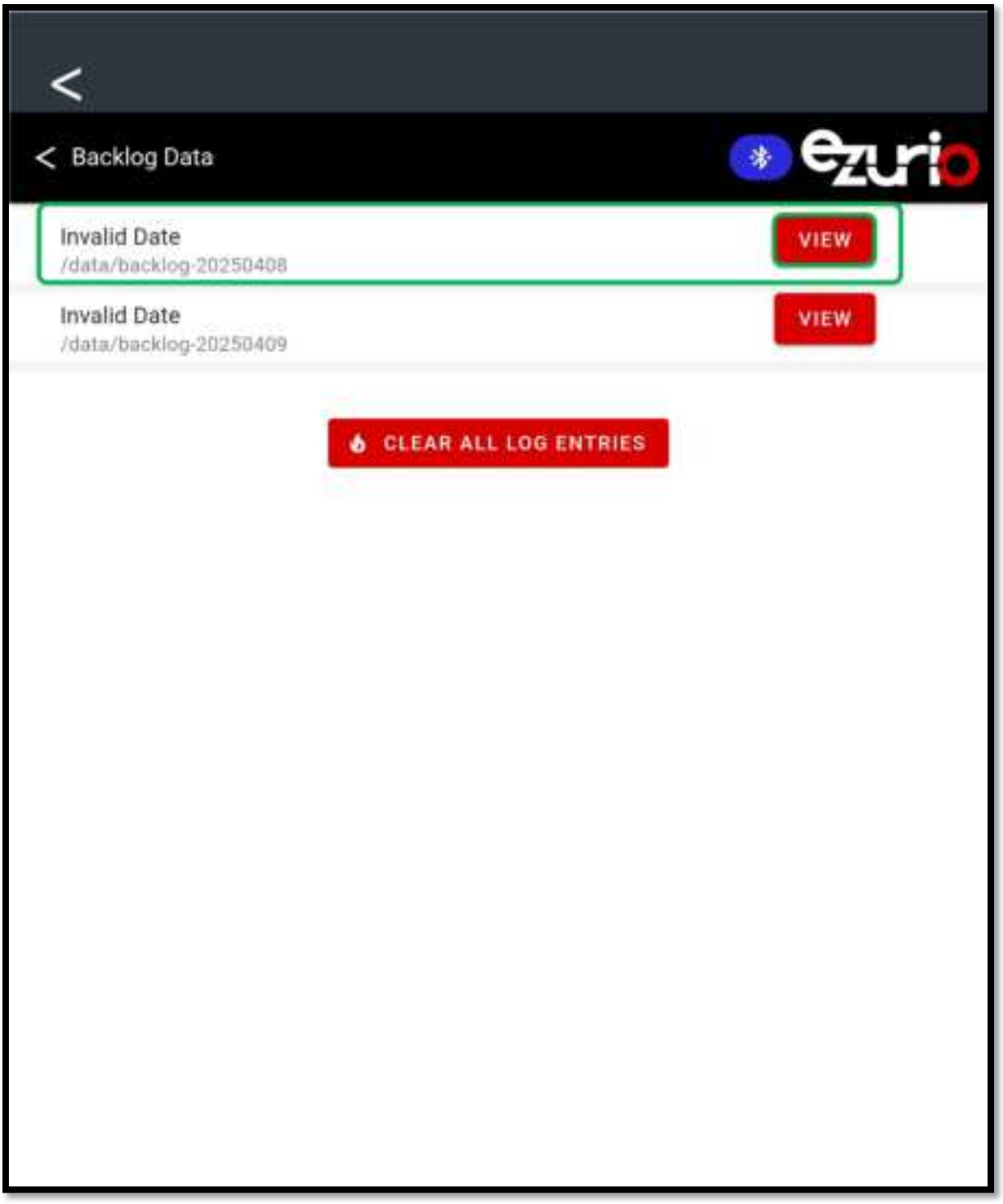


Figure 17: View Backlogs page

Backlog information is grouped into files, each can be viewed by clicking the associated View button.

All backlog data can be deleted by clicking the Clear All Log Entries button.

Clicking on the View button associated with a Backlog file downloads the file from the device and displays its content in graphical format as shown in **Figure 18**.

Figure 18: Backlog content graph

Under the graphical view of the Backlog file content, the status of each entry is displayed, as shown in **Figure 19**. A status of Published indicates the backlog has been sent successfully to the LNS.

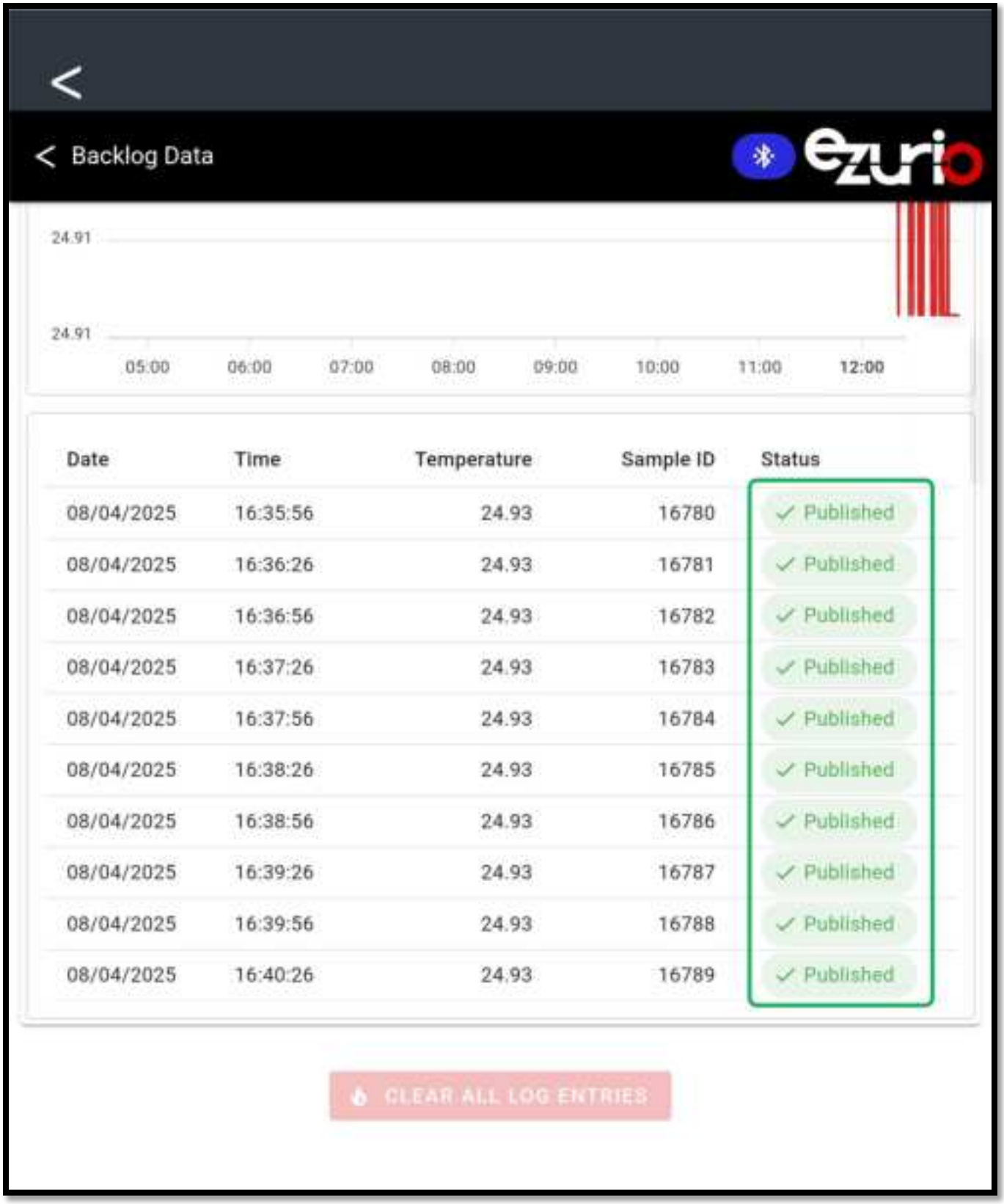


Figure 19: Backlog file entry status

6.11 Firmware Update page

The Firmware Update page is shown in **Figure 20**.

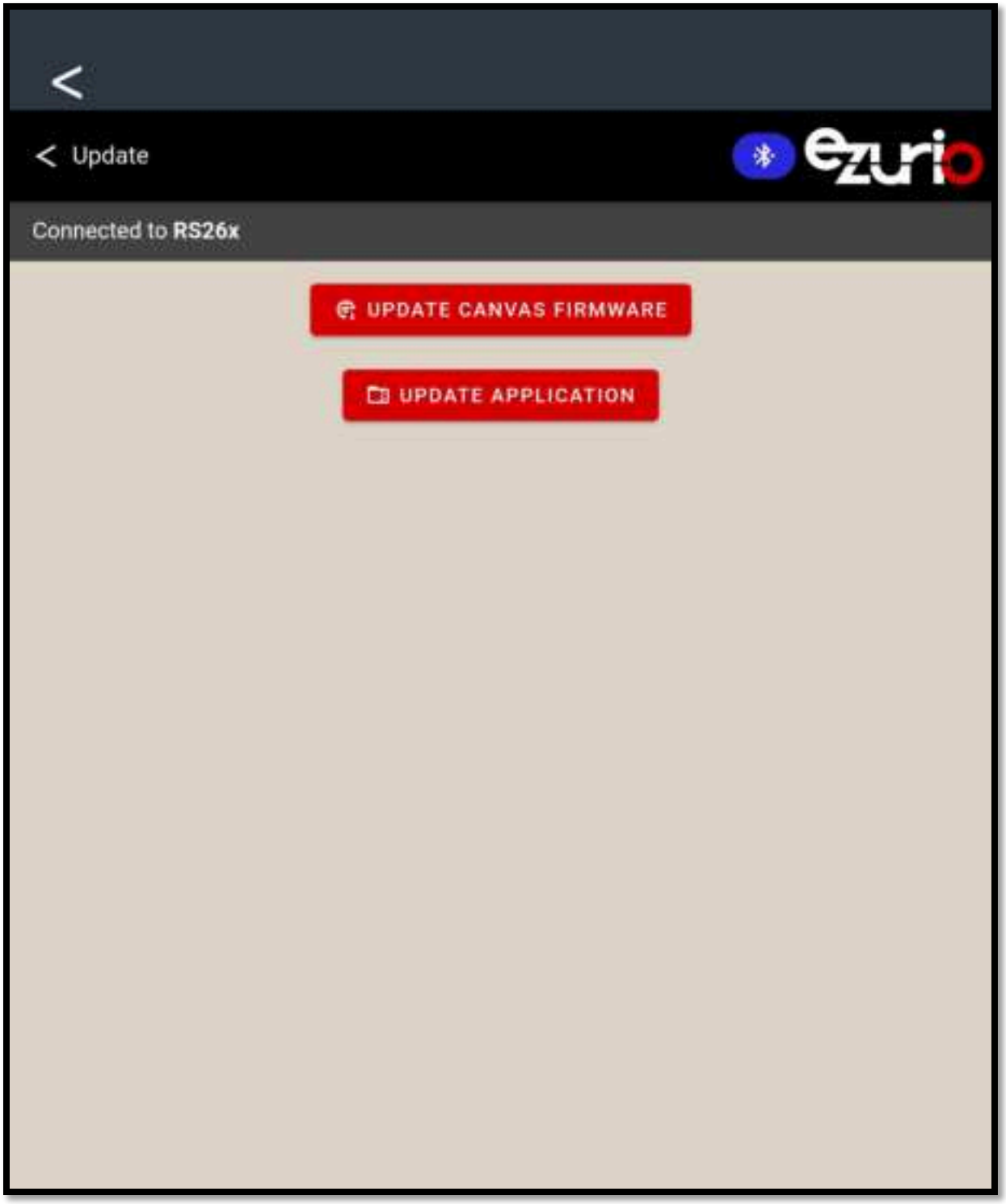


Figure 20: Firmware Update page

- The Update Canvas Firmware button is used to update the Canvas Core firmware image.
- The Update Application button is used to update the Canvas Application firmware image.

7 LoRa Considerations

The following should be revised to optimize device LoRaWAN performance and device battery life.

7.1 Definitions

Knowledge of the following terms is important for this section:

- **Uplink/Upstream** – Transmissions originating from the sensor and received by the LoRa Network Server via the LoRa Gateway.
- **Downlink/Downstream** – Transmissions originating from the LoRa Network Server and received by the sensor via the LoRa Gateway.

7.2 Data Rate, Sensor Performance, and Tradeoffs

7.2.1 Range

As the data rate decreases, the RF range increases.

7.2.2 Battery Life

As the data rate decreases, each packet takes longer to transmit which decreases battery life.

7.2.3 Bandwidth

As the data rate decreases, it takes longer to transmit a packet, decreasing available bandwidth on the network and increasing the probability of RF collisions or interference.

7.2.4 EU Considerations

In the EU, many bands are highly restricted regarding how much airtime a device can use. For example, some bands allow only a 0.1% duty cycle, although in most use cases the channels set in the sensor are in a 1% band. The duty cycle is the transmit time of the device relative to the non-transmit time. If a device transmits a packet that was one second long, it could not transmit for another 1000 seconds (1/1000 = 0.1%) (1000 seconds is over 15 minutes) in a 0.1% band.

Remember to take LoRa gateway duty cycle restrictions into consideration, regarding the number of sensors at certain data rates that a gateway can support, if confirmed packets are configured.

Plan carefully to ensure that a device does not exceed this duty cycle limitation, including possible retries. The LoRa stack running inside the sensor monitors the duty cycle of the device and does not allow a device to transmit if it exceeds the allowable duty cycle.

7.3 MAC Commands and the LoRa Standard

Configuration of the LoRa parameters are handled by the LoRa stack contained within the RS26x firmware. Any changes to this configuration are handled automatically by the stack or via a downlink MAC command from the network server.

7.3.1 902-928 MHz US and Canada

On power up, the **Sentrius™** sensor starts transmitting Join requests alternately on a random 125-kHz channel at data rate 0 in the selected sub-band and then a random 500-kHz channel at data rate 6. It continues this sequence until the sensor joins the network.

7.3.2 863-870 MHz EU

On power up, the **Sentrius™** sensor starts transmitting Join Requests at data rate 5, reducing the data rate by one each attempt until it reaches data rate 0. If data rate 0 fails, the sequence repeats until the sensor joins the network.

7.3.3 915-928 MHz AS

On power up, the **Sentrius™** sensor starts transmitting Join Requests at data rate 5, reducing the data rate by one each attempt until it reaches data rate 2. If data rate 2 fails, the sequence repeats until the sensor joins the network.

7.3.4 915-928 MHz AU

On power up, the **Sentrius™** sensor starts transmitting Join requests alternately on a random 125-kHz channel at data rate 2 in the selected sub-band and then a random 500-kHz channel at data rate 6. It continues this sequence until the sensor joins the network.

7.3.5 Data rate control

The LoRa specification defines the commands necessary to manage the sensor data rate in response to changing RF conditions.

Information transferred between the LoRa stack contained within the RS26x and the LoRa Network automatically adjust the system data rate to optimize communication reliability and power consumption.

8 Connecting to a LoRa Network Server

The exact steps needed to connect to a LoRa network server vary by network provider however in all cases, the following three described LoRa keys below must be known by the external LoRa network server.

8.1 AppEUI (Join EUI)

The AppEUI is an 8-byte ID used to uniquely identify your application and/or installation. For example, imagine you are installing the **Sentrius™** sensor in a store chain. You could use a specific AppEUI to identify a specific store or perhaps the entire chain of stores.

Note: Previously called the appEUI, LoRaWAN providers also call the appEUI, the **JoinEUI**. Both terms mean the same just a naming convention.

8.1.1 Default AppEUI

The default AppEUI is 0xec,0xc0,0x7a,0x00,0x00,0x00,0x00,0x09, **ecc07a0000000009**, and it is set in the device by Ezurio at the time of manufacturing.

8.1.2 Reading or Changing the AppEUI

The AppEUI can be read or changed via the **Sentrius™** XBIT mobile application. The number is generated by the end-user, so any number can be used. **Please note that the appEUI you select should follow the IEEE numbering structure as suggested by LoRa Alliance**.

8.2 DevEUI

The DevEUI is an 8-byte ID used to uniquely identify your device. It is assigned and set in the device by Ezurio at the time of manufacturing.

8.2.1 Reading the DevEUI Back Label

The DevEUI is printed on the back label of the sensor as highlighted in red in Figure 21.

8.2.1.1 Barcode

The DevEUI is also accessible via the barcode on the back label where the last comma separated value is the DevEUI.

Example Readout:

450-00133,1 ,0213117,0025ca0a00000001

Note: The sensor labels may change at any time.

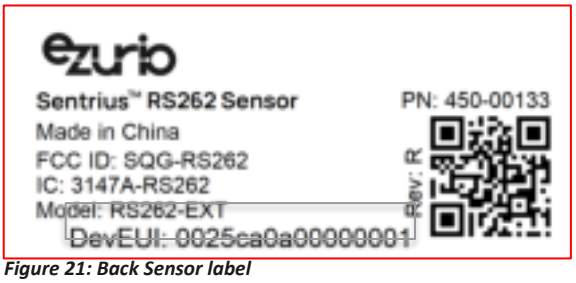


Figure 21: Back Sensor label

8.2.1.2 Reading or Changing the DevEUI via Mobile App

Normally, there is no need to change the DevEUI. However, if necessary, it can be read or changed via the **Sentrius™** XBIT mobile application. Because the IEEE governs the generation of the number, you must be familiar with these standards in order to change the DevEUI.

8.3 AppKey

The AppKey is a 16-byte security key assigned to the device. Ezurio assigns and sets it in the device at the time of manufacturing.

8.3.1 Reading the AppKey

8.3.1.1 Removeable Label

The AppKey is coded on a **removeable** label that is attached to the device when it is shipped (*Figure 22*).

IMPORTANT! It is the user's responsibility to keep track of the assigned AppKey and to keep it secure.

IMPORTANT! The removeable label must be removed prior to device installation.

8.3.1.2 Barcode

The AppKey is accessible via the barcode printed on this removeable label.

Figure 22: JoinEUI / AppKey removeable label

8.3.1.3 Reading or Changing the AppKey

Normally, there is no need to change the AppKey. However, it can be changed via the **Sentrius™** XBIT mobile application if necessary.

Note: This key is write-only as there is a security risk in making it readable via the mobile application.

9 Regulatory

Note: For complete regulatory information, refer to the RS26x Regulatory Information document which is also available from the Sentrius RS26x product page.

The RS26x holds current certifications shown in Table 4.

Country/Region	Regulatory Id
Canada (ISED) – RS262 only	3147A-RS262
EU – RS261 only	N/A
USA (FCC) – RS262 only	SQG-RS262

Table 4: RS26x certification ids

9.1 FCC Regulatory

Model	US/FCC (15.247)
RS262-INT Internal Temperature Sensor	SQG-RS262
RS262-EXT External Temperature Sensor	

Table 5: RS262 FCC Id

9.1.1 FCC Documentation Requirements

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in an installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference; and
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment can be installed and operated at a distance of 8 cm between the radiator and your body.

9.2 ISED (Canada) Regulatory

Model	Canada/ISED (RSS-247)
RS262-INT Internal Temperature Sensor	3147A-RS262
RS262-EXT External Temperature Sensor	

Table 6: RS262 ISED Id

9.2.1 ISED (Canada) Statement

The end user manual shall include all required regulatory information/warning as shown in this manual.

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. *l'appareil ne doit pas produire de brouillage;*
2. *l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

Radiation Exposure Statement

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 8 cm between the radiator & your body.

Déclaration d'exposition aux radiations:

Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 8 cm entre le radiateur et votre corps.

10 Variants & Ordering Information

10.1 External Temperature Sensor

The **Sentrius™** Sensor is available with an external sensor port – USB-C style (Figure 23). It allows users to connect an external thermistor probe to make remote temperature measurements.

Figure 23: External Temperature Sensor port and temp probe

Part	Description
450-00104-K1	Sentrius™ RS262 – LoRaWAN / BLE Internal Temperature Sensor. North America (Single)
450-00040-K1	Sentrius™ RS261 – LoRaWAN / BLE Internal Temperature Sensor. Europe / UK (Single)
450-00129-K1	Sentrius™ RS262 – LoRaWAN / BLE Internal Temperature Sensor. Australia (Single)
450-00105-K1	Sentrius™ RS262 – LoRaWAN / BLE Internal Temperature Sensor. New Zealand (Single)
450-00133-K1	Sentrius™ RS262 – LoRaWAN / BLE Sensor inc External Thermistor Probe. North America (Single)
450-00041-K1	Sentrius™ RS261 – LoRaWAN / BLE Sensor inc External Thermistor Probe. Europe / UK (Single)
450-00161-K1	Sentrius™ RS262 – LoRaWAN / BLE Sensor inc External Thermistor Probe. Australia (Single)
450-00153-K1	Sentrius™ RS262 – LoRaWAN / BLE Sensor inc External Thermistor Probe. New Zealand (Single)

Table 7: Top level kit and associated sensor part numbers

11 Definitions, Abbreviations and Acronyms

Term	Definition
BLE	Bluetooth Low Energy
LNS	LoRa Network Server

12 References

Ref	Details
[A]	Ezurio RS26x Home Page https://www.ezurio.com/iot-devices/lorawan-iot-devices/rs26x-sensor
[B]	LoRa Regional Parameters RP2-1.0.3 https://lora-alliance.org/wp-content/uploads/2021/05/RP002-1.0.3-FINAL-1.pdf
[C]	LoRaWAN L2 1.0.4 Specification https://lora-alliance.org/wp-content/uploads/2021/11/LoRaWAN-Link-Layer-Specification-v1.0.4.pdf
[D]	Ezurio RG1xx Home Page https://www.ezurio.com/iot-devices/lorawan-iot-devices/sentrius-rg1xx-lorawan-gateway-wi-fi-ethernet-optional-lte-us-only
[E]	RS26x Product Brief https://www.ezurio.com/documentation/product-brief-rs26x-sensor
[F]	Canvas Software Suite https://www.ezurio.com/canvas/software-suite
[G]	Canvas XBit Software Resources https://github.com/Ezurio/Canvas_Xbit_Desktop
[H]	RS26x LoRa Protocol https://www.ezurio.com/documentation/application-note-lora-protocol-rs26x-series
[I]	Canvas XBit Desktop Setup Guide https://github.com/Ezurio/Canvas_Xbit_Desktop/doc/XBit_for_Desktop_Setup_Guide.docx

13 Revision History

Version	Date	Notes	Contributors	Approver
1.0	4 March 2025	Initial Release	John Lofgren	Jonathan Kaye
1.1	6 March 2025	Reviewed version	John Lofgren	Jonathan Kaye
1.2	9 April 2025	Added Front Panel section Reorganized sections	John Lofgren Rich Walters Greg Leach	Jonathan Kaye