CONTROLLEDCARE

Wireless Single Push Button

User Guide

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1. QUICK START

sensor.

The sensor configuration, message monitoring, and setting up alerts is usually self-explanatory through the user interface. For further explanations of any sensor features, you may refer to this user guide.

2. OVERVIEW

2.1. Sensor Overview

The wireless sensors designed and manufactured by Radio Bridge provide full sensor to cloud solutions for Internet of Things (IoT) applications. The wireless single push button sensor can be used as a panic button, PERS, remote control, or other remote push button applications. When the button is pressed, a message is sent over the wireless network. Versions of the sensor support the major LPWAN standards such as Sigfox, LoRa/LoRaWAN, and NBIoT.

Features include:

- Built-in radio that talks directly with the wireless network. Standards include:
  - Sigfox
  - LoRa/LoRaWAN
  - NBIoT
- 20,000-200,000+ transmissions on a single battery and a 5-10 year battery life depending on usage (see Battery section)
- Fully integrated internal antenna
- Over the air sensor configuration in the field
- Automatic low battery reporting and supervisory messages

3. TECHNICAL SPECIFICATIONS

3.1. Absolute Maximum Ratings

Table 4 Absolute Maximum Ratings

Parameter	Rating	Units
Operating ambient temperature	-30 to +70	°C
Storage ambient temperature	-40 to +100	°C

4. BATTERY LIFE

The sensor uses a lithium non-rechargeable battery and is capable of 20,000 to 200,000+ total messages depending on the wireless standard and usage. For an accurate estimate of battery life, please refer to the "Sensor Battery Estimator.xlsx" spreadsheet on the Radio Bridge website. This spreadsheet combines usage information such as average number of messages per day and estimates the battery life for a particular sensor.

Refer to the spreadsheet "Sensor Battery Estimator.xlsx" on the Radio Bridge website for specific battery life estimates.

The power required for a message transmission is much greater than the "sleep current" (the power consumed when the sensor is inactive) for high power radio technologies such as Sigfox and LoRaWAN. This means that the battery life for most sensors is primarily dependent on the number of transmissions per day.

Different battery types will deplete over time with different voltage profiles. For instance, a lithium battery will maintain a relatively high voltage for the life of the battery and then experience a rapid drop near the end, whereas an alkaline battery will experience a more gradual reduction in voltage over time. Radio Bridge sensors are shipped with lithium batteries, and these are recommended when the battery needs to be eventually replaced.

Temperature also plays a role in battery life. The battery life estimates in the online spreadsheet assume room temperature, but temperatures close to the maximum and minimum ratings will have a negative impact on battery life. For example, battery voltage tends to be lower in cold temperatures and the internal circuitry needs a certain minimum voltage to operate properly before it will shut down. Thus, battery life will tend to be shorter when running the sensor in cold environments.

Battery voltage will be lower in cold temperatures and thus battery life will be reduced in cold environments.

The battery voltage is reported by the supervisory messages as well as a low battery indicator. See the section on Message Protocol for more detail.

5. RESET

To reset the push button sensor, hold the button down for 10 seconds or more and then release. The reset will initiate a downlink message (see the section Downlink Messages) which means that the push button can be reconfigured with a press and hold and doesn't require disassembly for battery replacement.

6. MESSAGE PROTOCOL

This section defines the protocol and message definitions for the sensor.

Radio Bridge provides a web-based console at console.radiobridge.com to configure and monitor sensors. Usage of this console is highly recommended for most customers rather than implementing the protocols defined in this section.

If the standard Radio Bridge console (console.radiobridge.com) is not used, refer to this section to decode the sensor data and configure the sensor through downlink messages.

6.1. Common Messages

There are common messages across all Sigfox sensors that are defined in the document "Common Messages for Sigfox Sensors" which is available on the Radio Bridge website.

Refer to the document "Common Messages for Sigfox Sensors" for definitions of all common messages. Common messages are not defined in this document.

Common messages include basic error messages, tamper, supervisory, and downlink ack. It is important to refer to that document prior to decoding the messages defined in this section.

6.2. Uplink Messages

The uplink message (sensor to web application) specific to the RBS104-1 is defined in following table. The common uplink messages are not included in this section (see common messages document).

Table 5 Uplink Message 0x06: Push Button Event

Button ID	Event Payload	Description
0x03	0x00	Button pressed
0x03	0x01	Button released
0x03	0x02	Button held

The first byte is the button identifier and always 0x03 for the single push button.

6.3. Downlink Messages

The downlink message (web application to sensor) specific to the RBS104-1 configuration is defined in following table. The common downlink messages are not included in this section (see common messages document).

Table 6 Downlink Configuration Message 0x06

Byte	Description
0	Disable events (see table Disable Event Bit Definitions)
1	Hold delay

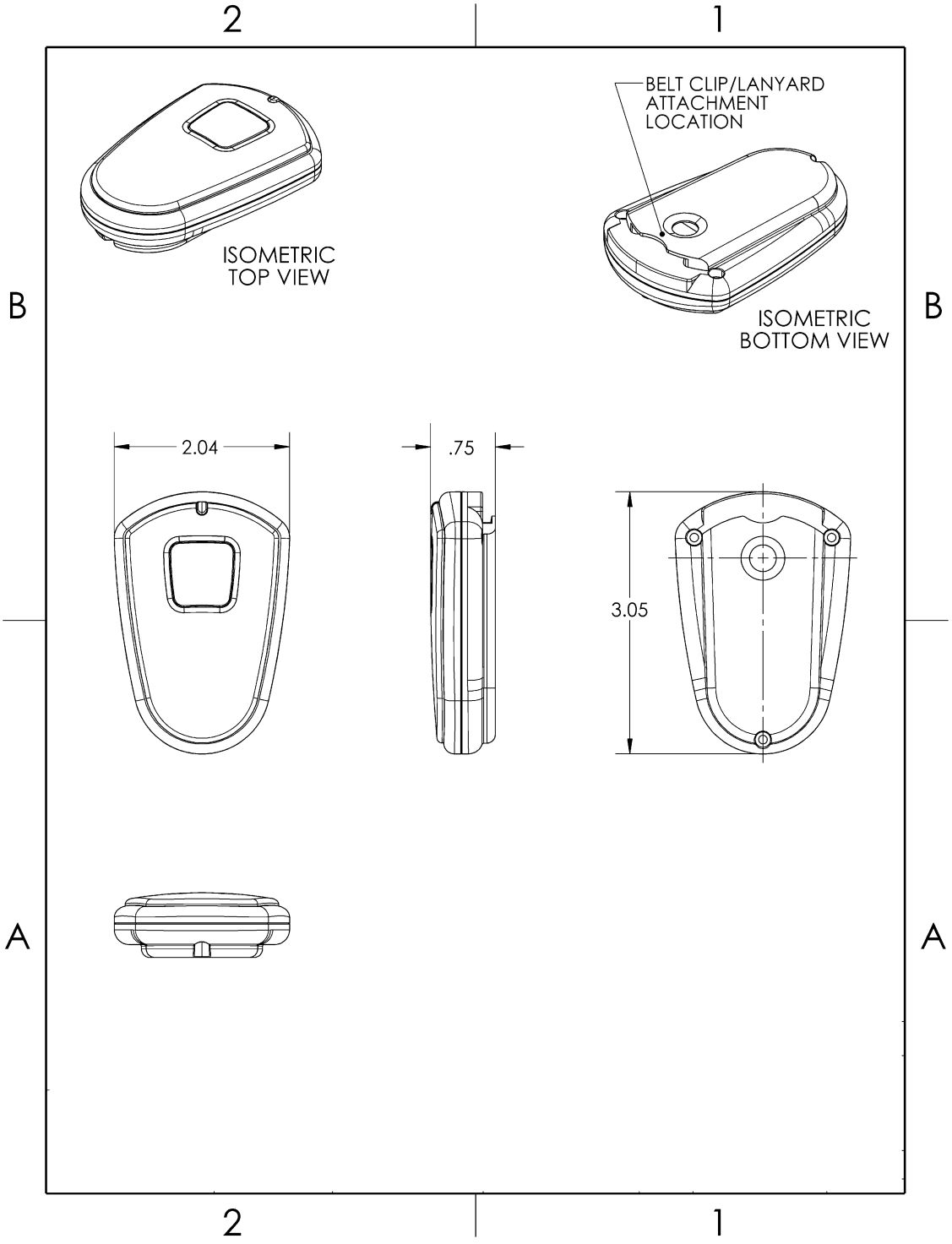
The hold delay defines the amount of time the button must be held before a button held event is sent. The field can range from 0-20 in 250ms increments (0-5 seconds). If set to 0 then the hold delay will not send an event message.

The disable event bit definitions are shown in the following table.

Table 7 Disable Event Bit Definitions

Bits	Description
7:3	Unused
2	Disable button hold event. Set to disable, clear to enable.
1	Disable button released event. Set to disable, clear to enable.
0	Disable button pressed event. Set to disable, clear to enable.

7. MECHANICAL DRAWINGS



8. REGULATORY AND COMPLIANCE

8.1. Federal Communications Commission (FCC)

Per FCC 15.19(a)(3) and (a)(4) 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.

Per FCC 15.21, Changes or modifications not expressly approved by Radio Bridge could void authority to operate the devices.

Sigfox RBS104 sensors FCC ID: 2APNUSFM10R2

LoRaWAN RBS304 sensors FCC ID: 2APNUCMABZ

8.2. Harmonized Commodity Description (HS Code)

The Harmonized Commodity Description and Coding System generally referred to as “Harmonized System” or simply “HS” is a multipurpose international product nomenclature developed by the World Customs Organization (WCO).

HS Code: 8531.90

8.3. Export Control Classification Number (ECCN)

ECCNs are five character alpha-numeric designations used on the Commerce Control List (CCL) to identify dual-use items for export control purposes. An ECCN categorizes items based on the nature of the product, i.e. type of commodity, software, or technology and its respective technical parameters.

ECCN: 5a992.c