

Smart Building Reference Kit User Guide

IOT8EUSBREF-1 (EU 868)
IOT9USSBREF-1 (NA 915)

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Welcome!

The Smart Building Reference kit is designed to provide validation of the network coverage within a building, accelerate solution development and facilitate a portable demonstration to a wide range of stakeholders.

By moving the location of the sensors to different spots around the building, users can determine a gateway's range of coverage.

By relying on readily-available hardware, solution developers can focus on providing customer value through data collection and analysis while using off-the-shelf hardware available from external suppliers.

The self-contained nature of the Reference Kit makes it easy to set up, take down and move the network in a matter of minutes.

All data collected in the kit is displayed on a dashboard accessible by the user via a browser. The dashboard shows the type of display which can be created with the data collected. The URL for the dashboard and how to locate the log in credentials for your kit, are explained under the **Getting Started** section of this guide.

Note: The reference kit does not allow access to the underlying data directly or the ability to change the LoRaWAN Network Server (LNS) to which the gateways are connected. If those are desired requirements, please contact Semtech at SBKSales@semtech.com.

Additionally the user may separately access a dashboard that shows a permanent installation of a Smart Building Reference Solution Kit inside an office facility. This provides the user with a rich set of historical data to use in demonstrations. To access this dashboard, log in to the following site, using the credentials below.

URL: lora-developers.semtech.com/smart-building-kit

Login: SemtechDemo1

Password: LoraWan592

The data in each dashboard is stored for a maximum of 30 days.

In this document we explain how to set up and use the kit.

What is in the kit

The kit contains the following:

- 5 Desk Sensors
- 2 Grid-Eye Sensors
- 2 Temperature/Humidity Sensors
- 2 IR Blasters
- 5 Door/Window Sensors
- 5 Room Occupancy Sensors
- 1 Leak sensor
- 2 Mini-hub LoRaWAN gateways
- 1 Wi-Fi to Mobile Portable Hotspot

Getting started

To begin, log in by scanning the QR code or, **using Chrome** as your web browser, navigate to lora-developers.semtech.com/smart-building-kit.

Note: Your individual login credentials can either be found on the inside cover of the kit box, or on the DEVEUI data sheet provided with the kit.

Figure 1: Scan to log in

Get to know your Hotspot and Mini-hubs

The mini-hubs and hotspot are preconfigured to work together. The hotspot includes 1GB of free data service. If you need more data, you will need to sign up for a cellular service plan. For plan options, see GlocalMe.

If additional options are needed, you can add up to two nano SIM cards in the hotspot. Use a needle to pull out the available the SIM slots and insert the SIM cards.

Note: The hotspot included in this kit does not support SIM cards that require PIN codes.

Setting-up the kit

1. Fully charge the hotspot.
2. Once charged, press and hold the hotspot's power button (#11) for five seconds and wait for the device to boot.



Figure 2:
Hotspot Buttons and Ports

3. The hotspot will automatically log-in and connect to the GlocalMe service.



Figure 3:
Automatic Logon

4. Once the hotspot displays the Wi-Fi name and Password, as illustrated in you can start setting-up the mini-hubs.



Figure 4: GLocal Logon Complete

5. Remove the cover plate on the first mini-hub. If necessary, attach the power adapter before plugging-in the mini-hub to a wall socket as shown in Figure 5.



Figure 5: Plug-in the mini-hub

6. You will know the mini-hub is connected to the hotspot when the light on top turns green as shown in Figure 6



Figure 6: Connected to Hotspot

Setting-up the sensors

In this kit, we are monitoring room or desk use, temperature, humidity and leaks. To this end, set up the sensors as follows.

1. Grid Eye sensors are most effective if mounted on the ceiling or inside of a lighting fixture. Use the adhesive tape provided with the sensor to mount it in an appropriate location in your conference room. The Grid Eye sensor can be used to determine the number of people occupying a room. The sensor begins the count when motion is detected and provides an update approximately every 5 minutes thereafter.
2. Window/Door sensors can be mounted on either side of the window frame or door frame, as illustrated in Figure 7.

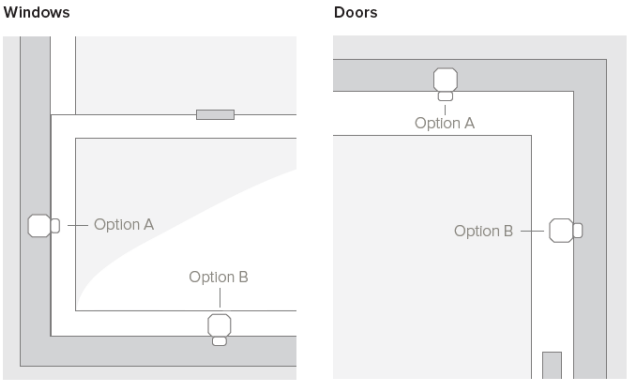


Figure 7: Window and Door Sensor Placement

Note: The maximum allowable gap between a sensor and the corresponding magnet is 1 cm. Be sure to align the sensor side with the blue LED to the magnet face with the notch, as illustrated in Figure 8.

The Door/Window sensor will provide an indication of whether the door or window is open or closed.

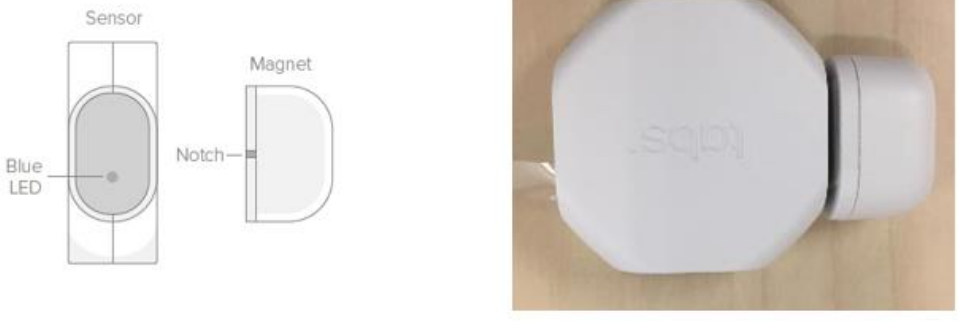


Figure 8: Sensor / Magnet Alignment

3. The Desk Occupancy sensor may be mounted on the underside of a desk using the double-sided tape provided. For best results, mount the sensor horizontally approximately 25 cm from the front edge of the desk, as shown in Figure 9.

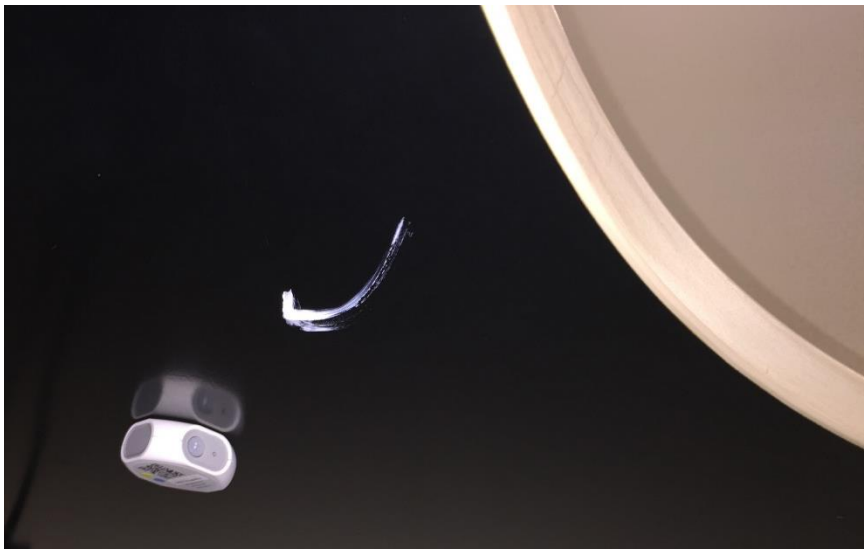


Figure 9: Desk Occupancy Sensor

Note: The sensor will send a message when motion is detected. No additional messages will be sent as long as motion is detected anytime within succeeding 5 minute windows. Only after detecting no motion during a 5 minute period will it send a message indicating that the desk is unoccupied. Therefore, changes in condition may not be reflected in the dashboard immediately.

The daily Desk Occupancy statistics shown on the dashboard are calculated for the preceding day at midnight.

4. To detect movement in a room, place the Room Occupancy sensor on a flat surface, such as a table or bookshelf. The Room Occupancy sensor behaves much like the Desk Occupancy sensor. The two have different parameters configured to account for the size of the space being monitored.

   As with Desk Occupancy statistics, Room Occupancy statistics are only calculated for the preceding 24 hour period at midnight each day.

5. To detect the temperature and humidity in the room, place the Temp/Humidity sensor anywhere in the room. To mitigate momentary changes in temperature due to opening a door or window, best practice is to place this sensor away from doors and windows.

6. The IR blaster can control wall-mounted HVAC systems, heaters, televisions and any other electronic devices that use an infrared signal with a known Pronto code. A list of codes can be found at either of these two websites:

   http://irdb.tk/

   http://www.remotecentral.com/cgi-bin/codes/

   To use, place the IR blaster so that it is three to five feet from the item to be controlled, facing the item's infrared receiver.



Figure 10: Face of the IR Blaster

Next, navigate on your browser to your kit's dashboard. Click on the **Environment** tab on the left hand side. You will be presented with a screen which includes a place where the Pronto code can be entered as shown in Figure 11.

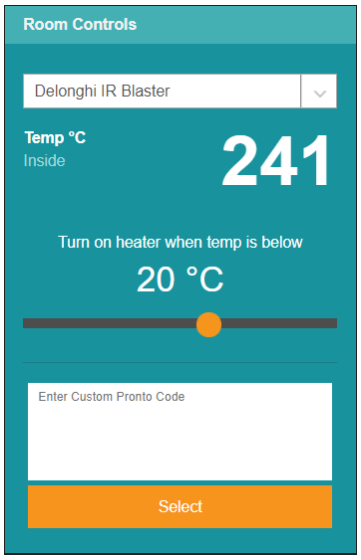


Figure 11: Entering Pronto codes for the IR Blaster

7. For information about how to remove or replace the battery in any of the devices, scan the QR code below, or use the Chrome web browser to navigate to https://qrgo.page.link/iWxb.

Note: Regulations require that the battery must be removed from the device when shipping or flying by air. Alternatively, you can re-insert the plastic tabs to disrupt the battery current.

Changing the Mini-Hub Wi-Fi connection

If you do not want to use the hotspot provided Wi-Fi network, you can configure the mini-hub to use another network. To do so, follow these steps:

1. Leaving the mini-hub plugged-in, turn off the hotspot.
2. Using a computer, perform a network scan and select the open Wi-Fi network that starts with MiniHub-xxxxx where xxxxx are the last 6 digits of the mini hub MAC address, as illustrated in Figure 12.

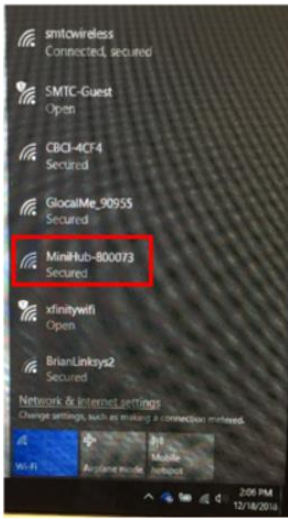


Figure 12: Mini-hub network

3. Once the computer is connected to the mini-hub, open a web browser and type **192.168.4** in the address bar.
4. Edit the WiFi SSID and WiFi Password to reflect the new WiFi network you want to connect to. Click **Apply** to save your changes.

Mini-Hub LED status indicators and button functionality

LED indicators

Table 1 shows what the various LED colors and blink patterns displayed by the mini-hub indicate.

Color(s)	Blink Pattern	Mode	Status
GREEN	blinking 1 sec	GW	WiFi STA not connected
GREEN	blinking 1/4 sec	GW	WiFi STA connected, establishing connection to LNS, configuring radio
GREEN	Solid	GW	WiFi STA connected, Sta on connected to LNS, radio listening
GREEN/ ORANGE	blinking 1/4 sec	GW	WiFi STA connected, CUPS transaction in progress Note: Do not unplug device in this state
ORANGE	blinking 1/4 sec	CONFIG	Scanning WiFi networks, setting up configuration AP
ORANGE	blinking 1 sec	CONFIG	Configuration AP active

Table 1: LED Status Indicators

Button Functionality

- To switch from GW (gateway) mode to CONFIG mode, press the **Setup** button for 10 seconds.
- To reboot the mini-hub, while in CONFIG mode, press the **Setup** button for 5 seconds.
- To return the mini-hub to factory settings, (and delete the Wi-Fi and LoRaWAN Network Server credentials), press the **Reset** button for 5 seconds.

Support

For any additional questions about operation or help with troubleshooting please contact SBKSupport@semtech.com

For more information about LoRa®, LoRaWAN® or the hardware contained within the kit please contact SBKSales@Semtech.com