RIGEL

BLE Sensor and Gateway User Manual

Version 1.0

REVISION HISTORY

Version	Date	Author	Remarks
1.0	13-Mar-2023	YT	Release

1 INTRODUCTION

This user manual is designed to guide users through the process of using the BLE sensor and BLE Gateway to measure object distance from on-board ToF sensor, relative humidity and temperature data. The BLE sensor is a coin battery-powered device that repeatedly measures and reports sensor data to the gateway every 15 minutes via Bluetooth.

1.1 HARDWARE

The following photos show the BLE sensors and BLE gateway PCBAs.

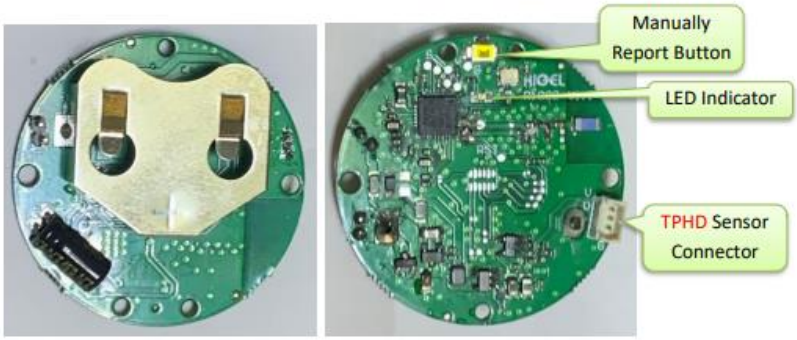

Figure 1 Relative Temperature and Humidity (TPHD) Sensor

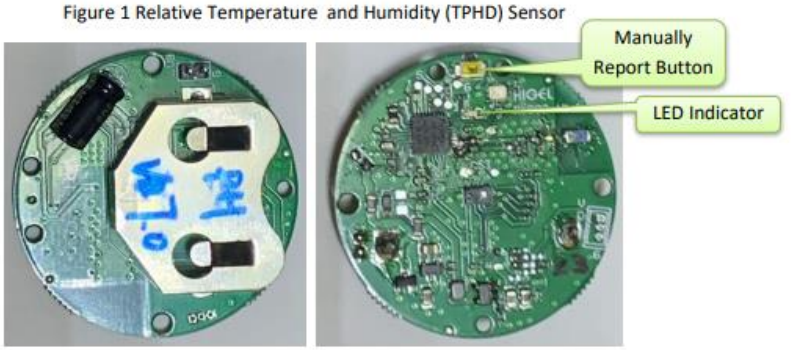

Figure 2 BLE ToF Sensor for PH/WB/SB Application

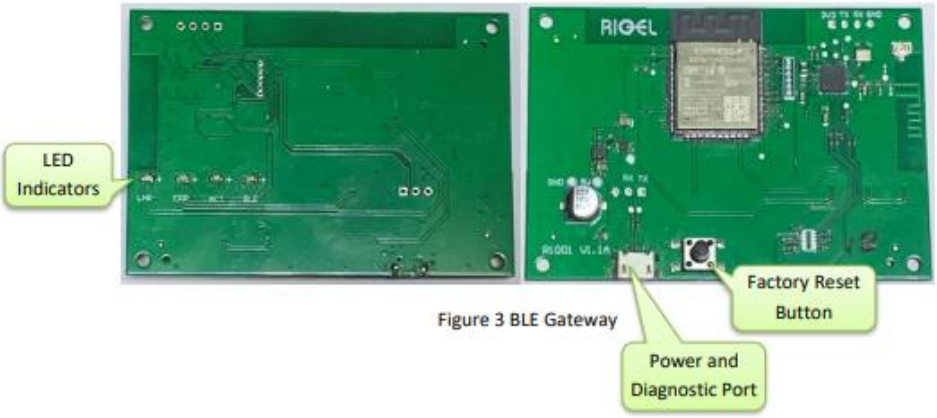

Figure 3 BLE Gateway

Figure 1 shows the TPHD sensor PCBA interfaces:

- Manually report button: to trigger measurement and report after pressing the button 60 seconds
- LED indicator: to indicate the manual measure and report
- TPHD sensor connector: to connect with a relative temperature and humidity sensor

Figure 2 shows the ToF sensor PCBA interfaces:

- Manually report button: to trigger measurement and report after pressing the button 60 seconds
- LED indicator: to indicate the manual measure and report

Figure 3 shows the BLE Gateway PCBA interfaces:

- LED indicators:
  - LNK: Link (Blue LED)
    - Blinking fast (10Hz): the gateway does not have the router's setting (SSID and password). The gateway is in smart configuration mode and waiting for the mobile App to configure the gateway to connect to a router
    - Blink slow (1Hz): the gateway has been configured previously, and it is trying to connect to the router
    - On / no-blinking: the gateway is already connected to the router. Note: the router might not be connected to the internet. This LNK indicator only shows the link status between the gateway and the router.

- ERR: Error (Red LED)
  - Blinking (1Hz): the gateway has not established a connection to the MQTT server
  - OFF: the gateway established a connection to the MQTT server
  - On / no-blinking: hardware failure, the ESP32 failed to communicate with the TLSR8258 chip
- ACT: Activity (Green LED)
  - Blink once: the ESP32 communicates with TLSR8258 chip
- BLE: Bluetooth (Green LED)
  - The TLSR8258 receives a valid report packet from a sensor

- Power and diagnostic port: this port is used to power the gateway. With a USB-to-UART cable, users can download firmware and diagnose the gateway
- Factory reset: press and hold for 6 seconds, and the gateway goes to factory reset mode.

1.2 MOBILE APP

The following photo shows a mobile App to configure the gateway

2 GATEWAY SETUP

The following shows the steps to set up the BLE gateway:

- Power up the BLE gateway
- Make sure the gateway blinks fast (10Hz)
    - If not blink fast, press and hold the 'factory reset button' for 6 seconds. Then the gateway blinks fast

- Connect the mobile phone to the 2.4GHz Wi-Fi router
- Run the mobile app "app_wifi_light (demo application)"

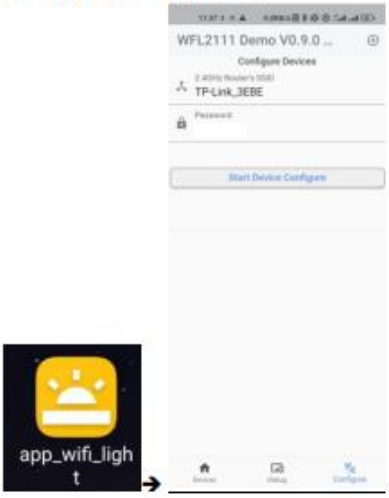

Figure 4 Mobile App Icon and Configure Page

- Fill up 2.4GHz Router's SSID and password
- Click 'Start Device Configure'
- Observer the gateway's LNK indicator, when the device received the mobile App's settings, the LNK indicator blinks slow (1Hz)
- After the LNK indicator is always on (no-blinking), this means the gateway connects to the router successfully
- Then observe ERR indicator, when the ERR indicator is off (no blinking), this means the gateway established a connection to the MQTT server

FCC warning:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: 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. 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.

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 a particular 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 or more 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.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.