Specification For Telink 8258 Mesh RCU TLSR8258MRC48

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Brief：

This document is a product specification for Telink BLE (Bluetooth Low Energy) Audio Remote Control demo based on TLSR8258.

TELINK SEMICONDUCTOR

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Bldg 3, 1500 Zuchongzhi Rd,
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For further information on the technology, product and business term, please contact Telink Semiconductor Company (www.telink-semi.com).

For sales or technical support, please send email to the address of:

telinkcnsales@telink-semi.com

telinkcnsupport@telink-semi.com

Revision History

Version	Major Changes	Date	Author
1.0.0	Initial version	2019/5	HZF, JF

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1   Introduction

In this document, the BLE remote control (RC) specification is described in details based on one sample use case. This model of remote control has button function and it's built on Telink's TLSR8258MRC48 platform.

1.1   Supported features

The RC demo supports the following features:

- works with dual batteries

- 14 valid buttons and 1 indicating LED

- OTA firmware upgrade

- PC tool for button display and demonstration

- Low power consumption

1.2 Button layout

The RC demo supports 14 valid buttons as shown in Figure 1, including:

- ✧ Up
- ✧ Down
- ✧ Left
- ✧ Right
- ✧ All_On
- ✧ All_Off
- ✧ 1_On
- ✧ 1_Off
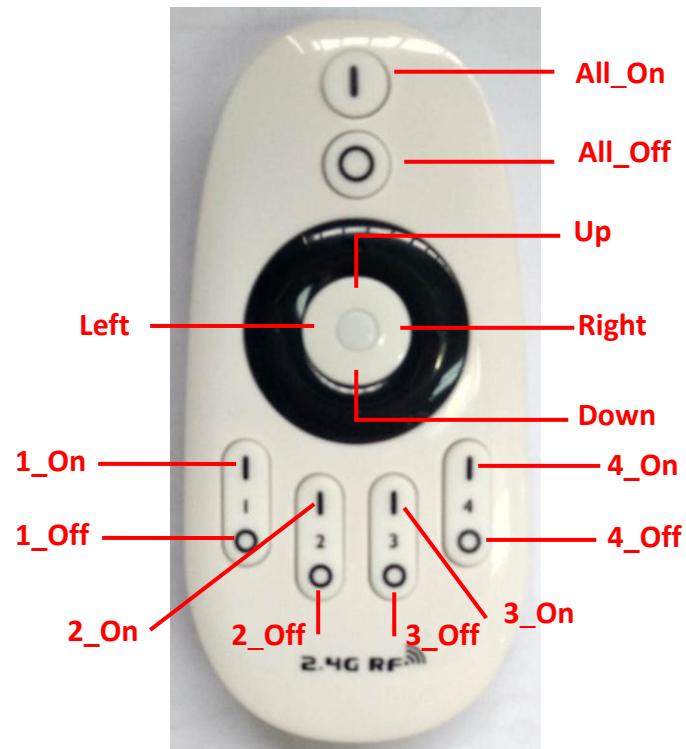- ✧ 2_ On
- ✧ 2_Off
- ✧ 3_On
- ✧ 3_Off
- ✧ 4_On
- ✧ 4_Off

Figure 1 Telink BLE RC demo
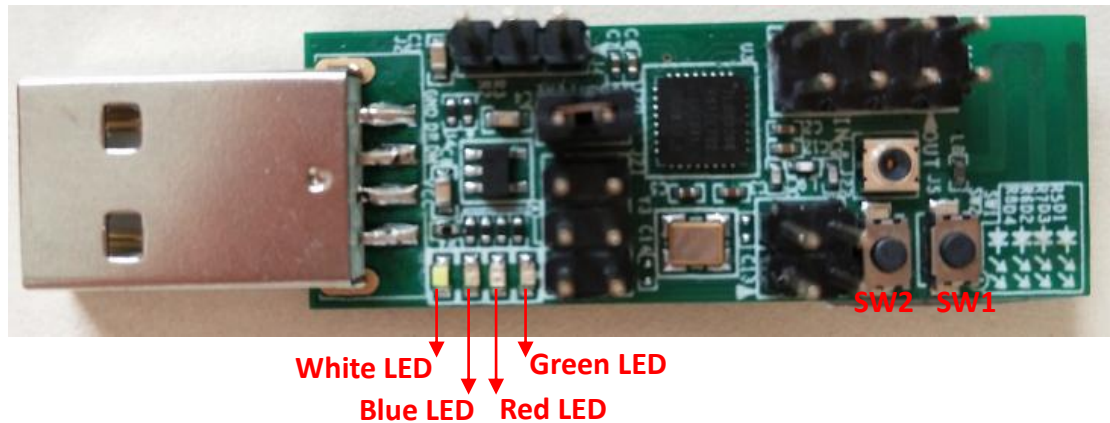
Telink sample BLE dongle is shown in Figure 2.

Figure 2 Telink BLE Dongle demo

2   Factory Test Mode

Factory test mode is customizable depending on user's requirement, and it's not supported by all RC demos.

Following shows an implementation example:

Press the specific combination buttons (to be determined), power on the RC with the buttons held, the indicating LED of the RC will blink to indicate the RC enters factory test mode.

In factory test mode, the RC won't send pairing/adv packet unless specific button is clicked. This mode is used to test key values in a controlled way (e.g. user can determine when to send pairing/adv packet).

The RC will exit factory test mode and enter normal state by clicking specific button.

3   Factory Reset Mode

Factory reset mode is customizable depending on user's requirement, and it's not supported by all RC demos.

After the RC is powered on, if it's not connected to the demo dongle, the factory reset mode (if supported) can be triggered by pressing the specific combination buttons (to be determined) for several seconds (to be determined). The indicating LED of the RC will blink several times (to be determined) to indicate the RC is reset to its factory default state.

4   Pairing and Un-pairing

NOTE: The RC needs to be paired with the demo dongle before it can be used. Telink samples provided to customers are already paired, so the pairing steps in this section can be skipped.

Before pairing operation, both the RC and Dongle should be burned with the right firmware, respectively. Telink-supplied RC and Dongle samples are preloaded with FW already. If user needs to update the FW, please follow the operations as described in the document "***AN_FBD-EVK-UG_Firmware burning and debugging User Guide***" or implement OTA upgrade (see section 9).

The RC demo supports pairing and un-pairing initiated by the demo dongle side.

4.1   Pairing between RC and dongle

The pairing operation is as shown below:

1)   Power on the BLE RC. Insert the BLE Dongle into PC.

2)   Click the "SW1" button of the BLE Dongle to start pairing process.

3)   The red LED light on the BLE Dongle will be turned on and keep the state always to indicate successful pairing.

4) After power cycle the paired RC/Dongle, it's not needed to click the "SW1" button again and the RC will be paired with the Dongle automatically.

5) After the BLE RC is successfully paired with the Dongle, if the RC is powered down or the communication is disconnected, the white indicating LED light on the Dongle will also be turned on. Power on the RC again or reestablish the communication, the white light will be turned off.

4.2   Un-pairing

Once paired with the Dongle, the RC can be manually unpaired using the following sequence:

1) Click the "SW2" button of the BLE Dongle to start un-pairing process.

2) The red LED light on the BLE Dongle will be turned off to indicate successful un-pairing.

5   Button Function

After the BLE RC is successfully paired with the Dongle, the RC can send certain key value by pressing corresponding button. The function of each button is shown as in **Section 1.2**.

To test the simple button input, no special PC tool is needed. User can open up Notepad on the PC with dongle plugged in, key presses such as 1, 2, 3, …, will be directly taken as input to the text file.

User can also use PC tool (KeySimulator) to simulate button press, release and repeat on the RC.

6　Low Battery Detect

Telink RC sample supports low battery detect function.

The implementation method of low battery detect function is customizable depending on user's requirement. One typical implementation is shown as below:

When battery voltage drops below 2.0V, the indicating LED of the RC will fast blink three times, and then the RC will be shut down automatically. In this case, user should replace the battery.

*Note: Frequency and number of times of the indicating LED blinking are customizable.

7　Repeatable Buttons

Each button on the RC is customizable as repeatable button depending on user's requirement.

For example, generally the following group of buttons can be customized as repeatable buttons:

- Left

- Right

- Up

- Down

Under BLE mode, when the repeatable buttons are pressed and held, the key values will be sent at 250ms (configurable) intervals.

Except for the buttons customized as repeatable buttons, all the other buttons are treated as non-repeatable keys.

8　Couch Time

Couch time is customizable depending on user's requirement, and it's not supported by all RC demos.

This feature is used to save power for RC when some button is pressed by mistake and held for a long time.

- The RC will only transmit one packet if a non-repeatable button is pressed and held.

- However, if a repeatable button is pressed and held, it will keep transmitting packets for up to 60 seconds (normally) after which the RC will stop transmitting until the pressed button is released.

9   OTA firmware upgrade

This feature is used to upgrade the RC firmware using the Telink PC tool (Key Simulator), a burning EVK and the dongle demo.

The operation is described as below:

1. Download new Firmware (FW) into the dongle.

   1) Connect hardware: Connect the burning EVK with PC via an USB cable, and connect the dongle with the EVK via USB interface.

FCC COMPLIANCE STATEMENT:

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.

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

Figure 3 Connect EVK, Dongle and PC

2) Start the "KeySimTool" on PC side. Click the "Download" button on the interface, and select the new FW (to be determined) in the "Open" window.
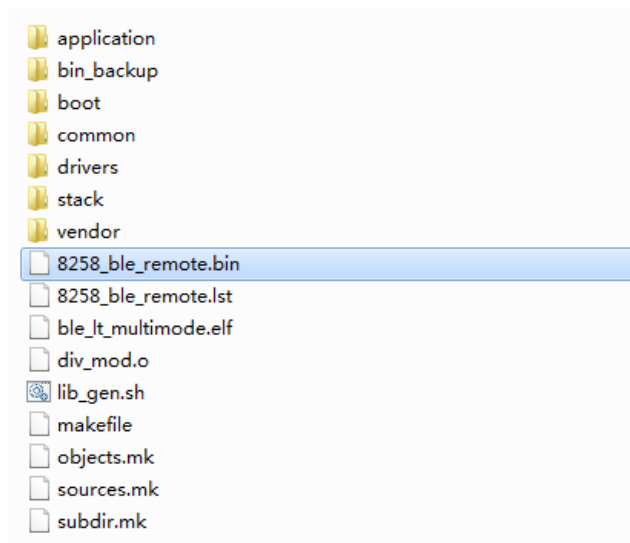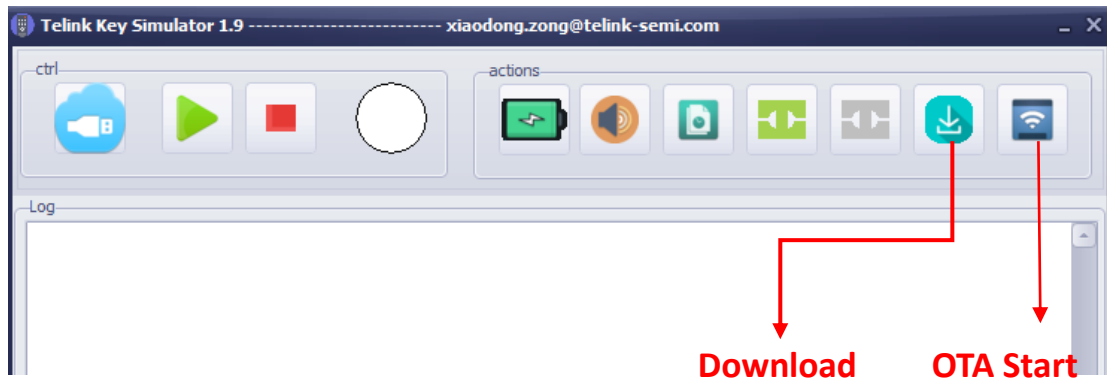

Download   OTA Start

Figure 4 Open new firmware

3) After the FW is successfully downloaded into the Dongle, the log window of
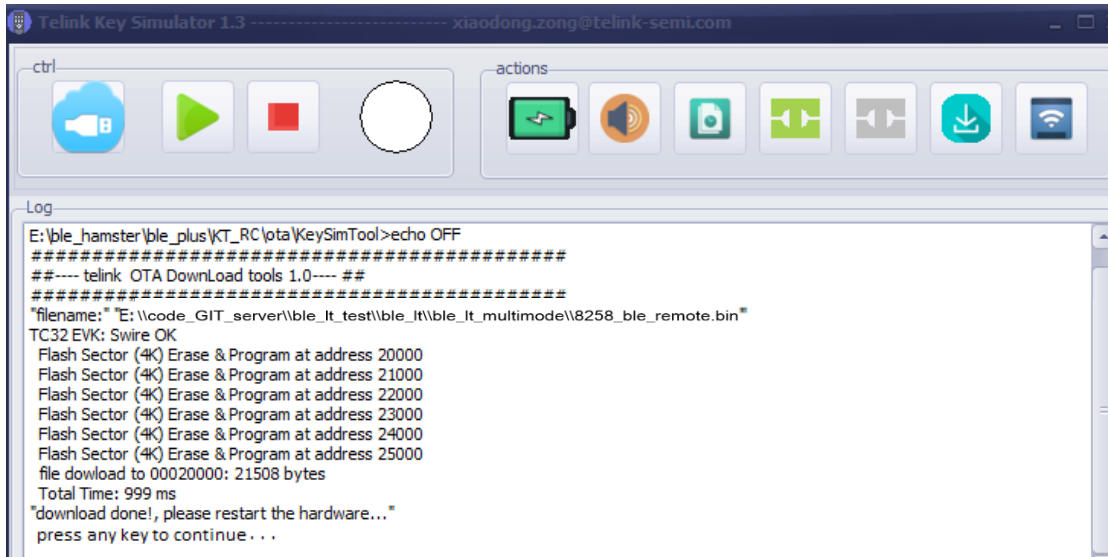
the interface is shown as below:

Figure 5 Successful downloading indication

2. Insert the dongle into PC USB. Make sure that the RC is connected with the

dongle in BLE state (i.e. the red light of the dongle is on, and the white light is off),
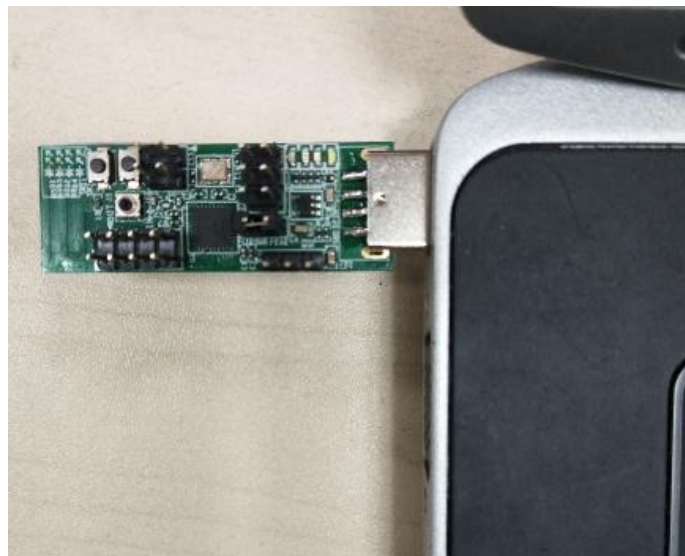
at the same time the button function should be OK.

Figure 6 Insert Dongle into PC

3. Click the "OTA Start" button on the "KeySimTool" interface (as shown in Figure 4), the blue light of the dongle (as shown in Figure 2) will be turned on to indicate the dongle is in OTA mode.

4. When the blue light of the dongle is turned off, the OTA process ends. The OTA result can be checked in the log window of the "KeySimTool" interface.

Figure 7 indicates successful OTA FW upgrade.

Figure 7 OTA success

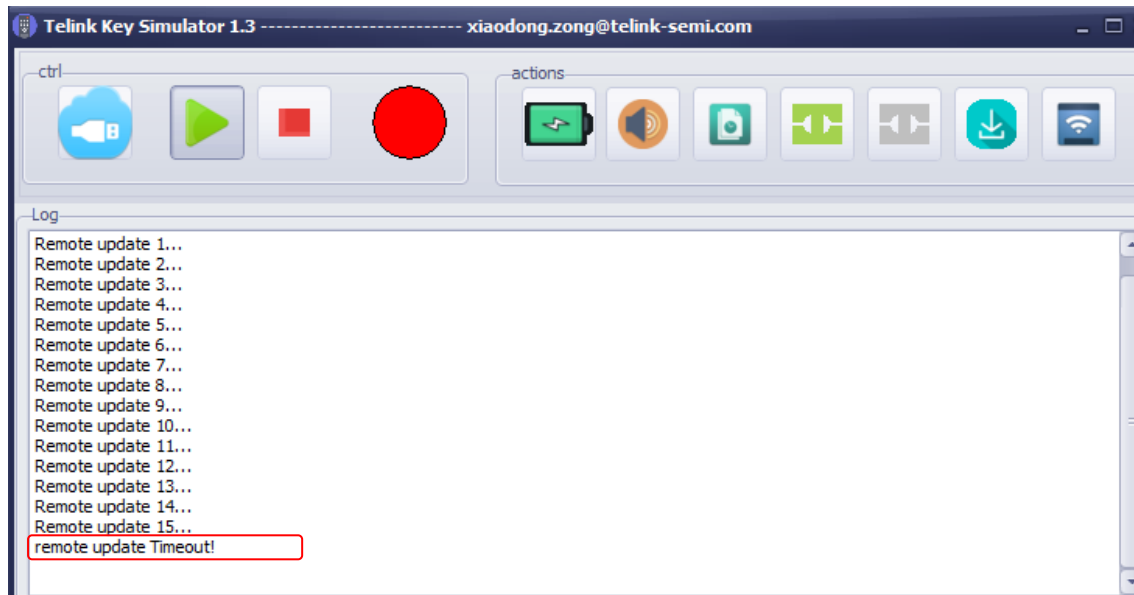Figure 8 indicates the timeout duration for OTA expires.

Figure 8 OTA timeout
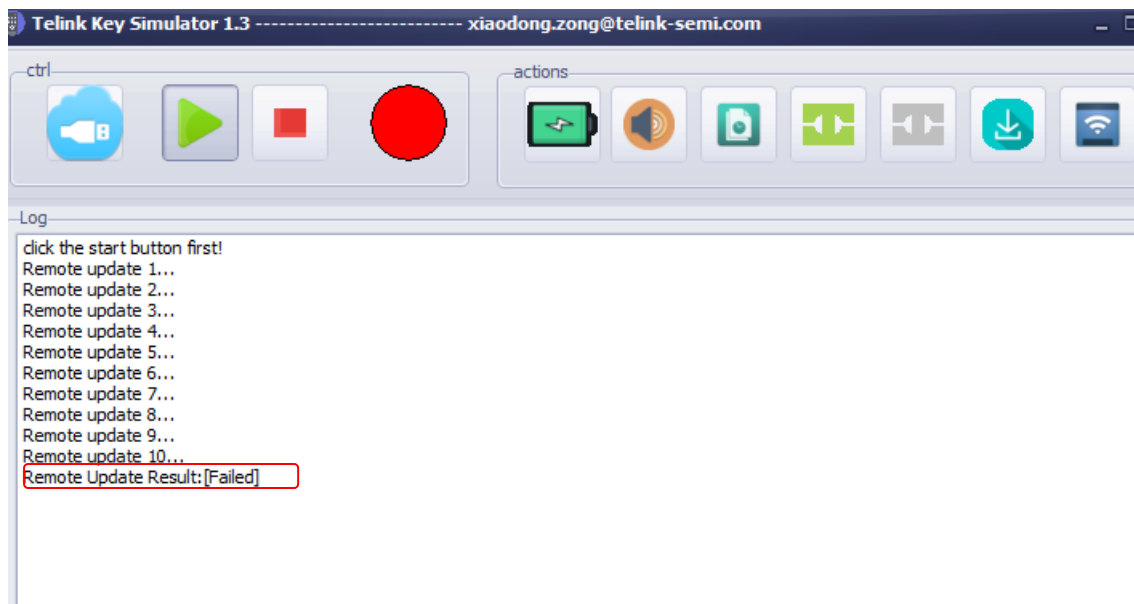
Figure 9 indicates the OTA process fails.

Figure 9 OTA failure

In the case of OTA failure or timeout, user should power cycle the RC and the dongle, then repeat steps 2~3 above to restart OTA process.