RT58x Zigbee Gateway/Light/Switch Operation Guide V1.0

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1. Introduction

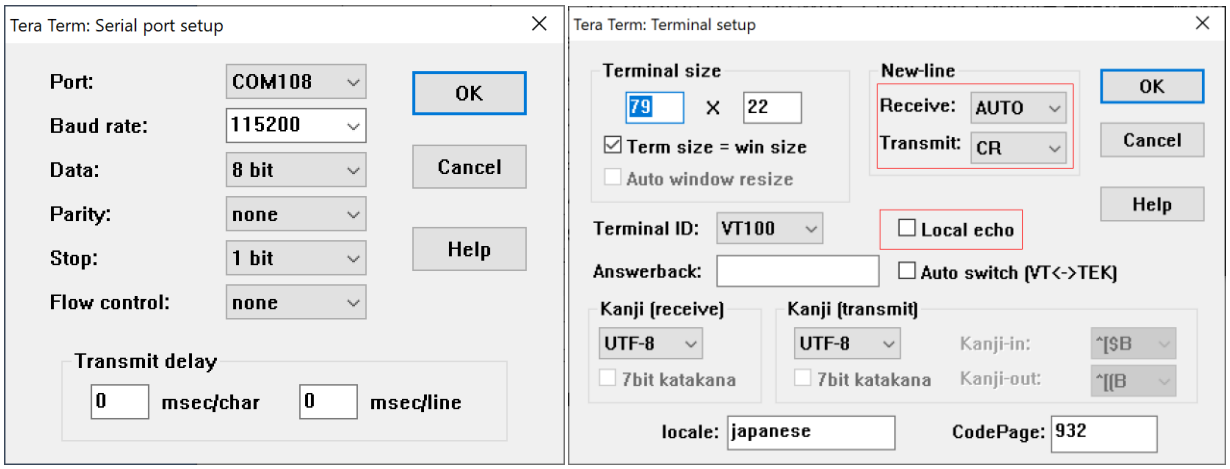
This document demonstrates the SDK examples between Gateway, Light and Switch devices.
The user can use the related Gateway CLI command to

1. Start/Manage the zigbee network
2. Setting the binding and grouping table on Switch and Light devices
3. Sending the related zigbee clusters packets (OnOff/Dimming/Color) to control the Light device.

It also can use the preconfigured physical button on the Switch device to control the Light devices as well.

2. Demo Environment Setup

1. Prepare at least 3 EVK boards for Gateway, Light and Switch devices.
2. Before running the demo, all the related firmware images should be built and download into the EVK board. Please refer to the document
   [SW_01]RT58x_SOC_Platform_Getting_Started_V1.1.pdf
   [SW_04]RT58x_Zigbee_Application_Guide_V1.0.pdf
3. The recommend UART terminal tool is “Tera Term”, it can be found from https://ttssh2.osdn.jp
   The related terminal UART setting:



3. Demo Procedure

3.1 Gateway start a zigbee network

Proceeding the following reset procedure to be sure the gateway in the default initial state

1. Press and hold the "button1" button
2. Press the "reset" button

3. release "button1"

After reset procedure, on the gateway UART terminal:
E.g. Using the following UART command to form the zigbee network on channel 18 with Pan ID 0x1234
UART command→ start 1 18 0x1234 1
It should show the following message on the gateway terminal:

```
Successfull steering, start f&b target
Device start success
PAN: 1234, ShortAddr: 0000, on channel: 18, MAC: 10:83:45:32:33:32:38:50
```

Indicated the gateway has successes to form the zigbee network and at this moment, we can start the Light and Switch devices to join the network.

3.2 Light device join the zigbee network

On the light EVK board, perform reset to default procedure
1. Press and hold the "button1" button
2. Press the "reset" button
3. Release "button1"
The light device should in the reset to default state and then will start the scan and join the zigbee network procedure automatically, after it success join the network from by the gateway, it should show the following message

```
Successfull steering, start f&b target
Device join success
PAN: 1234, ShortAddr: AEB6, on channel: 18, MAC: 11:52:45:32:33:32:38:50
```

Indicated the light successes join the gateway panID:0x1234 and got the network address AEB6

3.3 Switch device join the zigbee network

On the switch EVK board, perform reset to default procedure
1. Press and hold the "button1" button
2. Press the "reset" button
3. Release "button1"
The switch device should in the reset to default state and then will start the scan and join the zigbee network procedure automatically after it success join the network from by the gateway, it should show the following message

```
Device join success
PAN: 1234, ShortAddr: 1C97, on channel: 18, MAC: 12:46:45:32:33:32:38:50
```

Indicated the light successes join the gateway panID:0x1234 and got the network address 1C97

3.4 Devices status on gateway

After light and switch device join the network, the device information can be show on the gateway's UART terminal, the user can use the following command to show the device information:

UART command → s2e

After 's2e' command, the message should be like

```
Short addr | Joined | Cap |    Device ID | EP List | ClusterID(in)
========================================================================
[001]:0xAEB6 |     O      | ZR    |      0102       |2 |0 3 5 4 6 8 300
[002]:0x1C97 |     O      |   ZD    |      0105       |1 2 3|
```

Indicated that a ZR(light, address:0xAEB6) and ZD(switch zigbee end device, address:0x1C97) joined in the zigbee network.

Where the ZR(light) support the following clusters on endpoint 2

0x0000 (Basic cluster)

0x0003 (Identify cluster)

0x0005 (Scenes cluster)

0x0004 (Groups cluster)

0x0006 (OnOff cluster)

0x0008 (Level control cluster)

0x0300 (Color control cluster)

3.5 Control the light via gateway CLI command

After got the light device information, we can send the onoff command from gateway to switch on/switch off the light device using the following command:

UART command → onoff 0xAEB6 2 0

To send the off(0) command to the light address, the BLUE LED(LED1) on the light EVK should be off.

UART command → onoff 0xAEB6 2 1
To send the on(1) command to the light address, the BLUE LED(LED1) on the light EVK should be on.

UART command → onoff 0xAEB6 2 2
To send the toggle(2) command to the light address, the BLUE LED(LED1) on the light EVK should be toggle behavior

3.6 Setup a light device in a group address

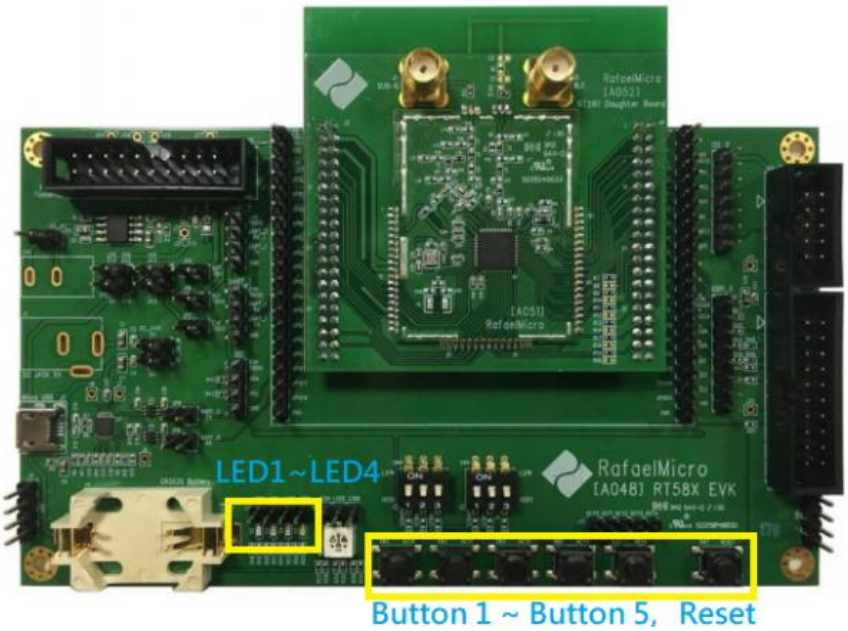
We can use the gateway CLI command to add the light device into a group address:

UART command → group a 0xAEB6 2 0x0001
To add the light device (address 0xAEB6, endpoint 2) to group address 0x0001, after the light add in the group address, we can use the switch device's buttons to send the group addressing packet to control the light in the corresponding group address.

The user can also remove the group address via following CLI command
UART command → group r 0xAEB6 2 0x0001

3.7 Setup the binding table in a switch device

Before using the switch button to control the light device, we need to use the gateway CLI command to bind the specific switch's button to a specific group address. In the Rafael SDK switch example, the buttons definition as below:



Button 1

- Set as endpoint 1
- Defined to send the onoff toggle command to the binding group address

Button 2 & 3

- Set as endpoint 2
- Defined to send the level control command to the binding group address
- Button 2 send the level step up command, button 3 send the level step down command

Button 4

- Set as endpoint 3
- Defined to send the color control command to the binding group address

The user can use the following CLI command to bind the buttons to a specific group address:

UART command → bind 0x1C97 1 0x0006 0x0001
To bind the switch device's(0x1C97) button1(endpoint1) cluster ID: 0x0006(onoff cluster) to the group address 0x0001.

UART command → bind 0x1C97 2 0x0008 0x0001
To bind the switch device's(0x1C97) button2/button3(endpoint2) cluster ID: 0x0006(level control cluster) to the group address 0x0001.

UART command → bind 0x1C97 3 0x0300 0x0001
To bind the switch device's(0x1C97) button4(endpoint3) cluster ID: 0x0300(color control cluster) to the group address 0x0001.

After the binding command set to the corresponding button, the user can then press the button to send the onoff/level control/color control command to the group address.

The user can also use the following CLI command to unbind the button, disable the corresponding button's control function.

UART command → unbind 0x1C97 1 0x0006 0x0001
To unbind the switch device's(0x1C97) button1(endpoint1) cluster ID: 0x0006(onoff cluster) to the group address 0x0001.

UART command → unbind 0x1C97 2 0x0008 0x0001
To unbind the switch device's(0x1C97) button2/button3(endpoint2) cluster ID: 0x0006(level control cluster) to the group address 0x0001.

UART command → unbind 0x1C97 3 0x0300 0x0001
To unbind the switch device's(0x1C97) button4(endpoint3) cluster ID: 0x0300(color control cluster) to the group address 0x0001.

3.8 Using switch to control the light

After assigning the group address to the light device (section 3.6) and bind the corresponding information to the switch's button (section 3.7), the user can then press the button to control the light device via press

Switch Button1: to send the toggle command to the light device, the light's LED1 should be in on/off state accordingly.

Switch Button2 & Button3: to send the step level control command to the light device, when pressing these buttons, it will show "Move up step:" or "Move down step:" information in the light's UART terminal.

Switch Button4: to send the color control command to the light device, when pressing this button, it will show "Move color x: y:" information in the light's UART terminal.

Revision History

Revision	Description	Owner	Date
1.0	Initial version	Justin	2022/03/23