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Function Description

This document is used to tell users about the use of RFID and there is a simple example in this document. Through this document, user can learn how to use RFID.

This document needs to be used with the RFID demo(rfid_reference demo). The function of the RFID demo is every 1 second wakeup to collect ADC voltage and send data through rf module, finally into deep mode.

Platform

To use RFID, we need to configure the RFID environment。

Hardware Platform

- Telink TLSR8258 EVK(C1T139A30_V1.2)
- Telink Burning EVK(V1.0.0.0)

Figure 1 Telink burning EVK

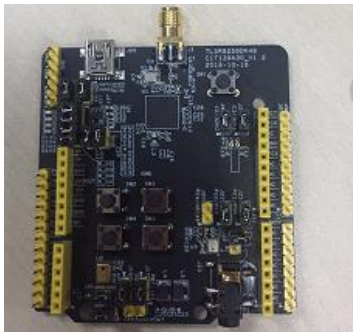

Figure 2 Telink TLSR8258 EVK

Software Platform

- Telink Burning and Debugging Tool
- RFID software(RFID_REFERENCE.bin)

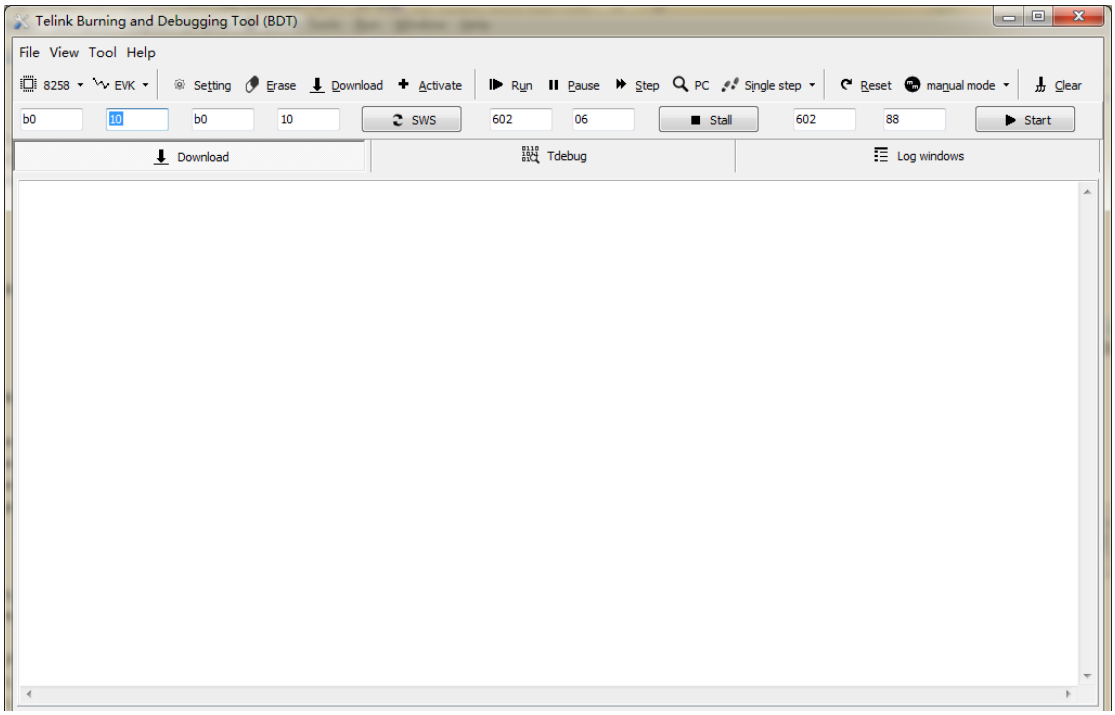

Figure 3 Telink Burning and Debugging Tool

Burning Step

Step1

Connect Telink Burning EVK and Telink TLSR8258 EVK with an usb cable, then connect with PC. Note： we also need connect Telink Burning EVK SWM pin and Telink TLSR8258 EVK SWS pin with a wire.

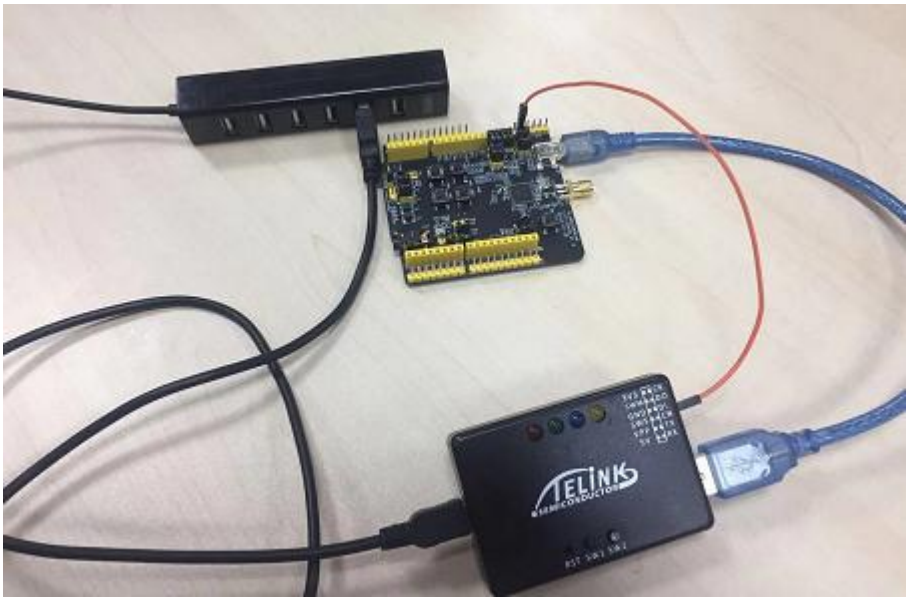

Figure 4 Connect way

Step2

Open Telink Burning and Debugging Tool (BDT) and select 8258 chip, then click on SWS. If BDT shows ‘’no evk device!’’, you should check whether the hardware connection is correct. If BDT shows “Swire ok!”, that means hardware is ok.

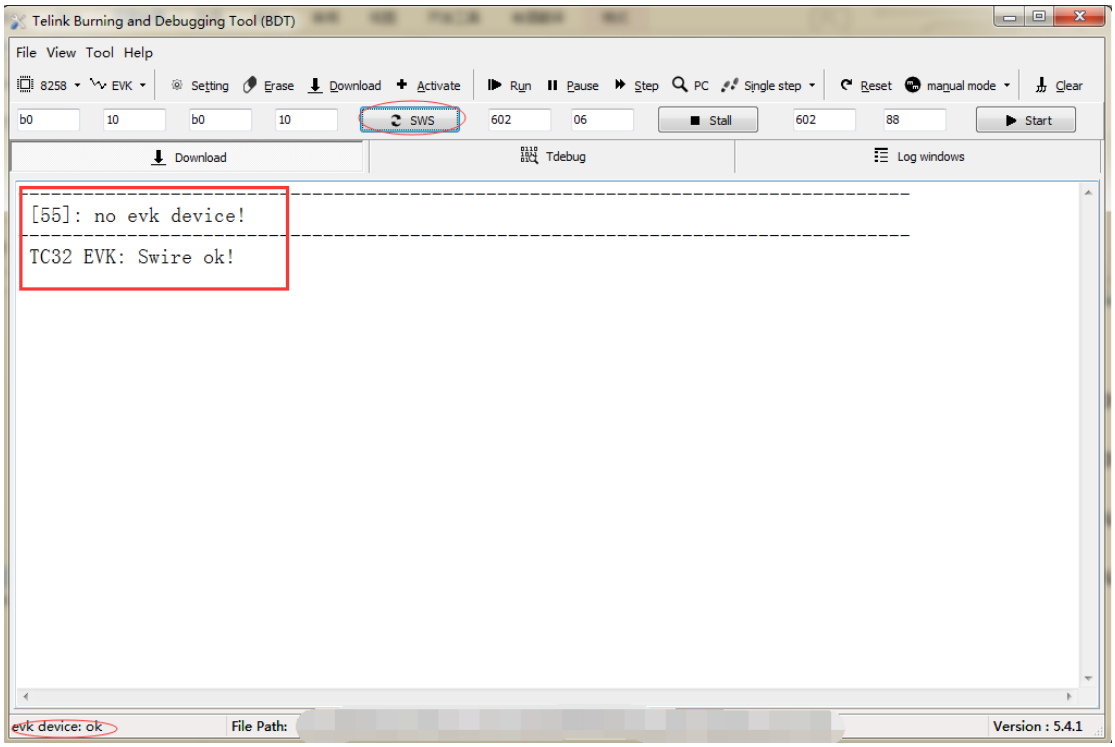

Figure 5 BDT information

step3

Burning the program to the 8258 TLSR8258 EVK. You should click on "file" button to select your target bin file, then click on “Download” button, it will show download information correctly. Whereas, if the BDT shows “Swire err! ”, check your hardware or click on "Active" button ,it may solves your problem!

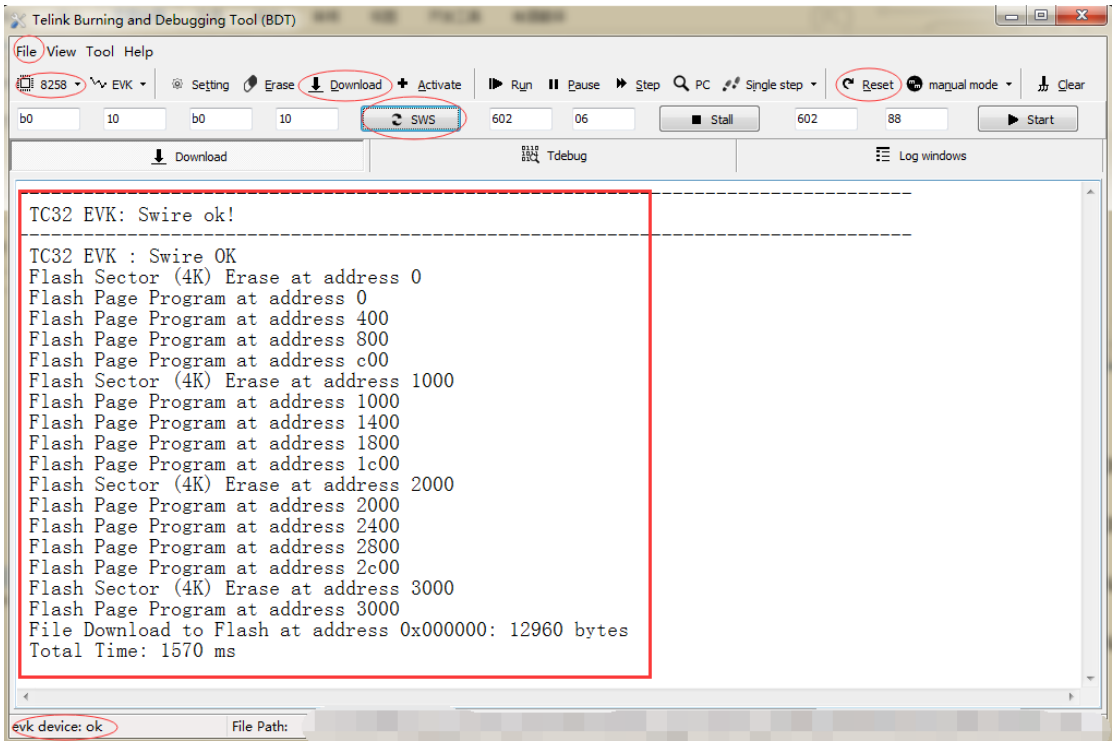

Figure 6 BDT information

Code Structure

System initialization

Include cup initialization, clock initialization, GPIO initialization RF initialization and ADC initialization.

```
//system and clock init
cpu_wakeup_init();
clock_init(SYS_CLK_24M_Crystal);

//blink the led
gpio_set_func(GREEN_LED_PIN, AS_GPIO);
gpio_set_output_en(GREEN_LED_PIN, 1);
gpio_write(GREEN_LED_PIN, 1);

//do battery volt sample
adc_init(ADC_INPUT_PIN);
battery_volt = adc_sample_result_get();

rfid_radio_config();
```

ADC Sampling

In rfid_reference demo, user gets ADC voltage with adc_sample_result_get() API.

```
battery_volt = adc_sample_result_get();
```

RFID packet setting

API rfid_packet_send() is used for send RFID packet.

```
rfid_packet_send(rfid_payload, sizeof(rfid_payload));
```

Power management

API cpu_sleep_wakeup()is used to into deep mode and the parameter DEEP_DURATION is used for setting time.

Before into deep sleep mode, we need set all unused GPIOs during deep sleep as high_Z state to avoid current leakage.

```
//goto deep sleep
gpio_high_z_config(); //set all unused GPIOs during deep sleep as high_Z state, avoiding current leakage
cpu_sleep_wakeup(DEEPSLEEP_MODE_RET_SRAM_LOW32K, PM_WAKEUP_TIMER, ClockTime()+DEEP_DURATION*1000*16);
```

Result analysis

PD3 is at high level status when system in active mode and PD3 is at low level status when system in deep mode, so we can capture the waveform of the PD3 to get the time which system in deep.

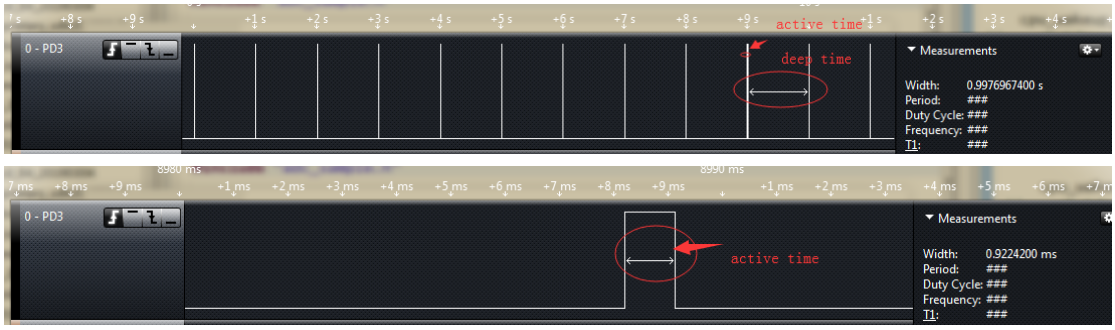

Figure 7 The waveform of the PD3

From the figure, obviously, we can know system's active time and sleep time. Sleep time is the same as what we set.

When system in deep mode, its power consumption is very small and its average current is only 2.5ua.

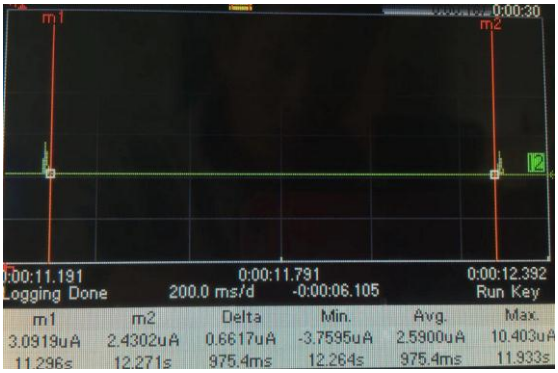

Figure 8 Average current in deep mode

When system in active mode, its average current is about 4.48ma.

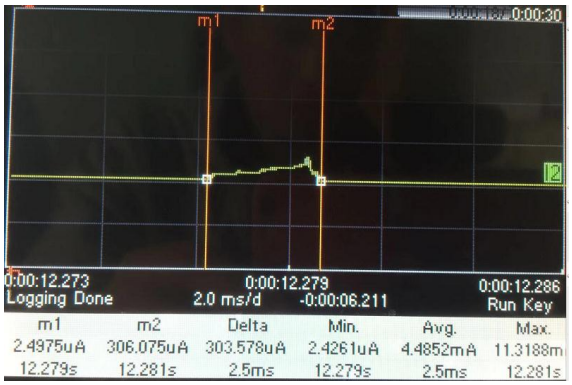

Figure 9 Average current in active mode

The average current of the system is about 15ua per cycle.

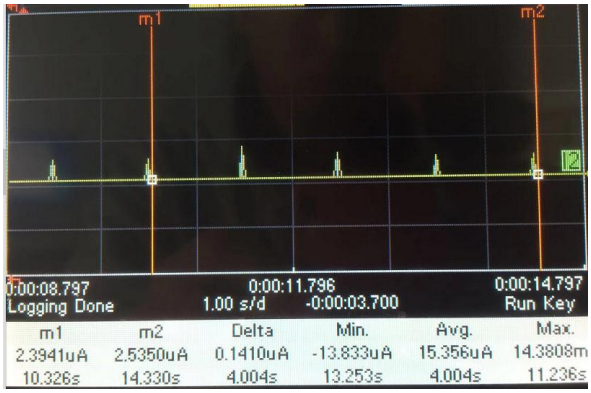

Figure 10 Average current per cycle