Chengdu Ebyte Electronic Technology Co.,Ltd

Wireless Modem

User Manual

E104-BT5032U User Manual

nRF52832 USB Bluetooth wireless packet capture tool

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Chapter 1 overview

1.1 Brief introduction



E104-BT5032U is a small USB interface Bluetooth wireless packet capture tool produced by Ebit, with a high-performance PCB on-board antenna and Bluetooth low energy (BLE) SOC scheme.

E104-BT5032U adopts Nordic's original imported nRF52832 RF chip, which supports Bluetooth 4.2 and Bluetooth 5.0; the chip comes with a high-performance ARM CORTEX-M4 core, using 32M+32.768kHz industrial grade crystal oscillator, and has AART, I2C, SPI, ADC, DMA, PWM and other rich peripheral resources.

E104-BT5032U is a package grabbing tool developed by Chengdu Ebyte Basic Nordic Official Development Board PCA10056. The capture tool firmware is provided for Nordic, and Billion has not made any modifications.

1.2 Features and functions

- Under ideal conditions, the communication distance is up to 80m;
- Maximum transmit power 2.5mW, software multi-stage adjustable;
- Support for the global license-free ISM 2.4GHz band;
- On-board 32.768kHz clock crystal oscillator;
- Built-in high-performance low-power ARM@Cortex-M4 processor;
- Rich resources: 512kB Flash/64kB RAM;
- USB power supply, USB is ESD protection treatment;
- Industrial standard design, support -40 °C ~ 85 °C long time use;
- PCB on-board antenna, no external antenna required.

1.3 Scenarios

- Smart home and industrial sensors, etc.;
- Security system, positioning system;
- Wireless remote control, drone;
- Wireless game remote control;
- Healthcare products;
- Wireless voice;
- Automotive applications.

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Chapter II Specifications

2.1 Limit parameters

Table 2-1 Limit parameter table

Main parameters	performance		remark
	minimum	maximum	
USB supply voltage (V).	0	5.5	Over 5.5V permanently burns the module
Blocking power (dBm)	-	10	The probability of burning up at close range is small
Operating temperature (°C).	-40	+85	Industrial grade

2.2 Working parameters

Table 2-2 Table of working parameters

Main parameters		performance			remark
		minimum	Typical values	maximum	
Operating Voltage(V)		4.35	5	5.5	USB/VBUS power supply
Operating temperature (°C).		-40	-	+85	Industrial-grade design
Operating frequency band (MHz).		-	2400	2480	Support for the ISM band
power consumption	Transmit current (mA)	24	28	32	-
	Accept current (mA)	20	21	22	-
	Sleep current (mA)	-	10	-	-
Maximum transmit power (dBm)		2.8	3	4	-
Acceptance sensitivity (dBm)		-96dBm@BLE 1Mbps			
Reference distance	80m	Clear and open, air rate 1Mbps			
Crystal oscillator frequency	32MHz/32.768kHz	-			
Power supply mode	USB	-			
Interface mode	USB	-			
Full name of IC	nRF52832-QFAA/QFN48	-			
FLASH	512kB	-			
RAM	64kB	-			
kernel	ARM@ Cortex ® -M4	-			
Dimensions	59 * 18	Add shell with cap			
Antenna form	PCB on-board antenna	-			

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Chapter III Basic operation

3.1 Fact sheet

A version of the relevant information is available: V3.0 - nrf_sniffer_V3_0.rar. Suitable for python 3.6 and above environment, users can also choose to download the corresponding sniffer version from the official website to install according to their own computer python environment. The structure of the data package is as follows:

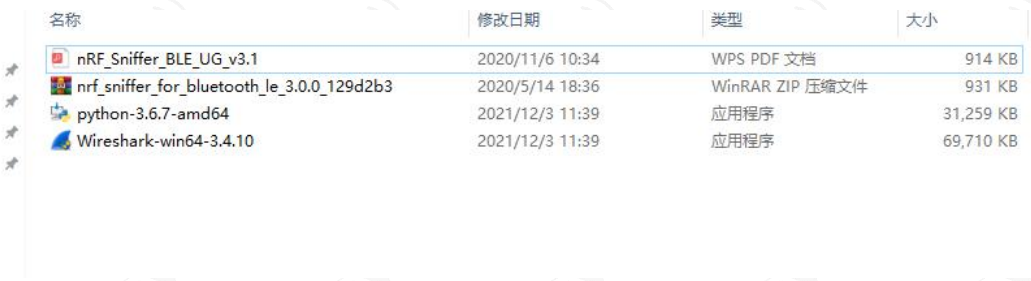


Figure 3-1 Data package explanation

3.2 Firmware introduction

The default firmware from the factory is V3.0 version, and users can burn the firmware according to their own situation. nRF_Sniffer Firmware is shown in the figure with the firmware name sniffer_pca10040_xxxxxx.hex.

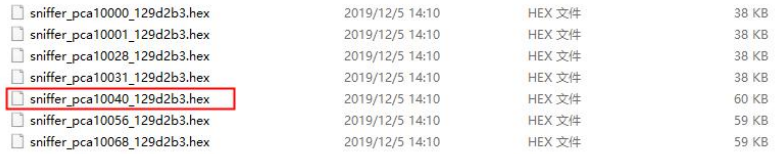


Figure 3-2 Firmware kit

The user needs to open the shell to burn the firmware by himself, and the programming method is detailed in section nRF_Sniffer_UG_v2.2 -2.2 The Install firmware with SEGGER J-Link

The programmed firmware interface is shown in the following figure:

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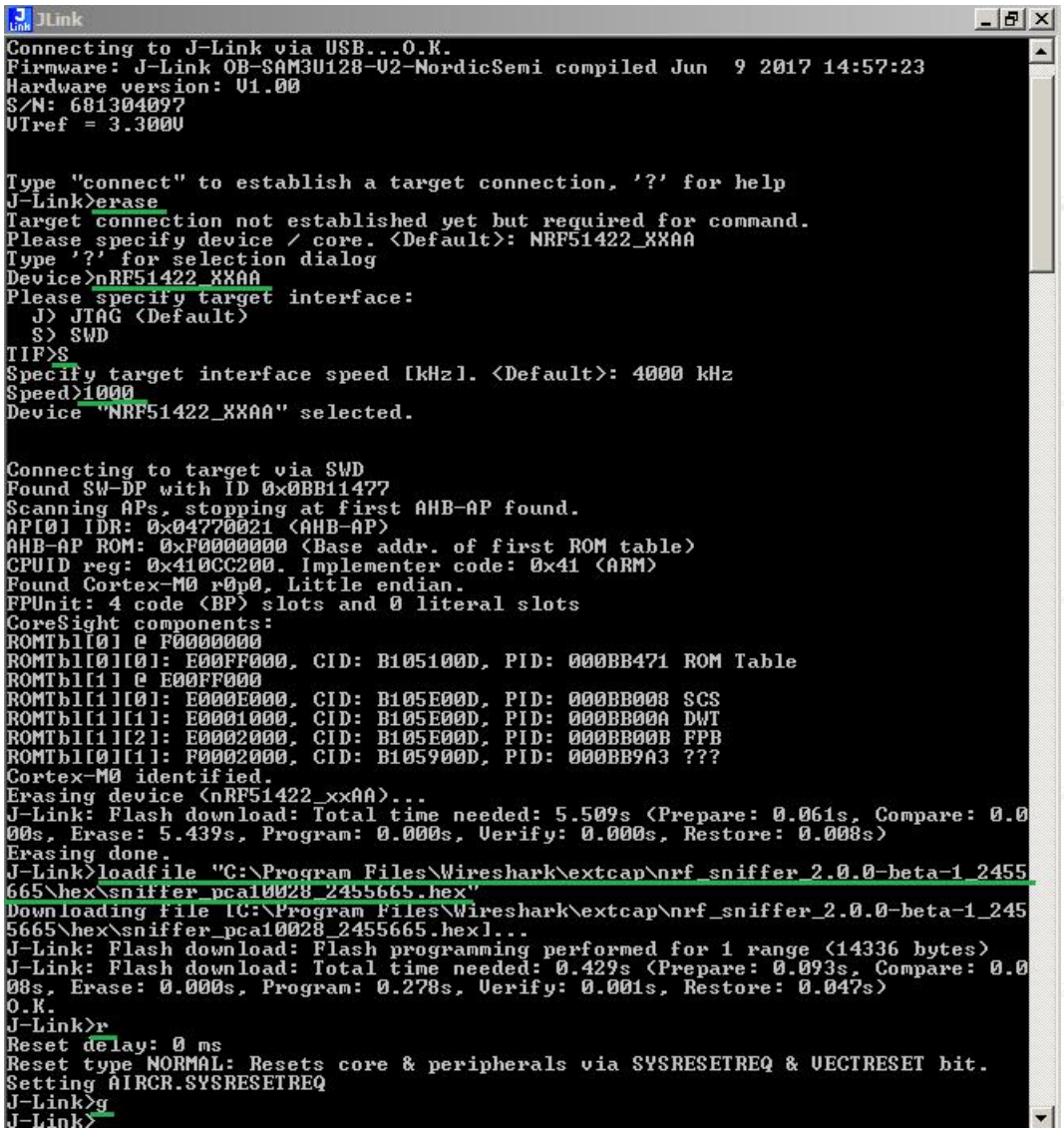


图 3-3 J-Link erase

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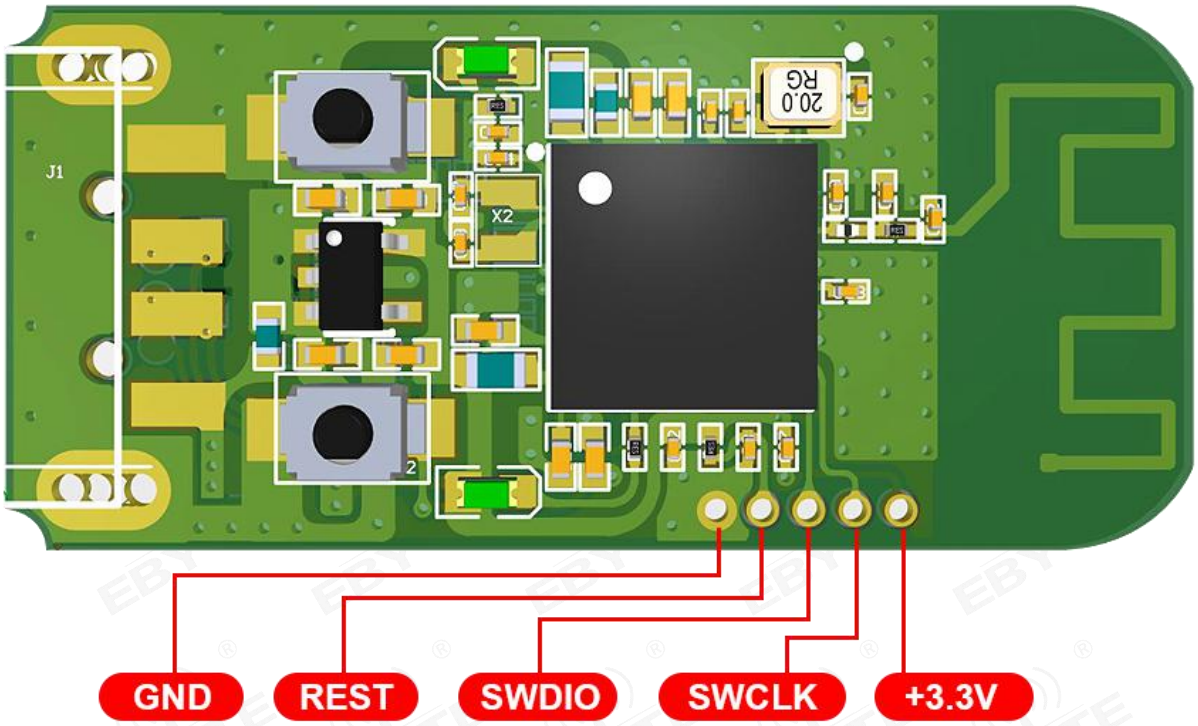


Figure 3-4 Programming interface

Chapter IV frequently asked questions

4.1 The transmission distance is not ideal

- When there is a straight-line communication barrier, the communication distance will be attenuated accordingly;
- Temperature, humidity, and co-frequency interference will lead to an increase in the packet loss rate of communications
- The ground absorbs and reflects radio waves, and the effect of testing close to the ground is poor;
- Seawater has a strong ability to absorb radio waves, so the seaside test effect is poor;
- If there is a metal object near the antenna, or placed in a metal shell, the signal attenuation will be very serious;
- Incorrect power register setting, over-air rate setting (higher air rate, closer distance) ;
- At room temperature, the low voltage of the power supply is lower than the recommended value, and the lower the voltage, the smaller the power generation;
- The use of antennas is poorly matched to the module or the quality of the antenna itself is a problem;
- Poor or too long extension cords, feeders, or too long can also cause a high bit error rate.

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4.2 Modules are fragile

- Please check the power supply to ensure that between the recommended supply voltages, if the maximum value is exceeded, it will cause permanent damage to the module;
- Please check the stability of the power supply, the voltage can not fluctuate significantly and frequently;
- Please ensure that the installation process is anti-static operation, and the static sensitivity of high-frequency devices;
- Please ensure that the humidity during installation and use should not be too high, and some components are humidity sensitive devices;
- If there is no special need, it is not recommended to use it at too high and too low temperatures.

4.3 The bit error rate is too high

- There is the same frequency signal interference nearby, stay away from the source of interference or modify the frequency and channel to avoid interference;
- The clock waveform on the SPI is not standard, check whether there is interference on the SPI line, and the SPI bus trace should not be too long;
- Unsatisfactory power supply may also cause garbled code, and it is important to ensure the reliability of the power supply.

Revision History

version	Date of revision	Revision Notes	Maintainer
1.0	2021-12-24	Initial release	

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