User Manual

PRODUCT SPECIFICATION

BLE Bluetooth Module

WB101N

Version 1.3

FCC 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.

Notice:
Any changes or modifications not expressly approved by the party responsible for compliance could void your 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. 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.

Modular information form OEM Information to Be Supplied to the End User by the OEM or Integrator.
The following regulatory and safety notices must be published in documentation supplied to the end user of the product or system incorporating an adapter in compliance with local regulations.
Host system must be labeled with " Contains transmitter module FCC ID: PPQ-WB101N , FCC ID displayed on label.

The antenna(s) used for this transmitter must not be co-located of operating in conjunction with any other antenna or transmitter.
This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. Ln order to avoid the possibility of exceeding the Fcc radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8inches) during normal operation.

Product Features

LiteON BLE Module WB101N adopts nRF52810 Central Processing Unit as a high performance and low energy（Bluetooth Low Energy）transmitting/receiving module system.

Being assembled with extremely compact size, total dimension is 14.3*14.3mm*2.1mm so as to perfectly support low energy Bluetooth 4.0 protocol, Bluetooth 4.2 Secure Connection and also part of Bluetooth 5.0 protocol to apply to all kinds of IoT and other wireless application.

User MCU could link to module system through serial port（UART）to achieve the data mutual interaction between module and mobile smart device.

Upon receiving data from serial port of user’ s MCU, the module system will transmit to mobile smart device automatically; also the device could send data to module through application, and the data will be passed to user MCU from module.

***Module supports specific serial AT commands to configure communication parameters, such as serial port transmission rate as well as Bluetooth connection interval,**
and also support data preservation when facing power outage

***Transparent transmission (through bridging) enables user to operate conveniently. Even for user without Bluetooth development experience could easily operate.**

***User interface adopts standardized UART（TTL）interface which allows mutual information transmission with simple operation.**

***Support serial port AT command. User could modify the transmission rate (default rate as 115200bps) and name of module serial port.**

MAC Address and other basic information

Low energy application could be controlled by hardware serial port

Able to decide packet length of any serial port freely and without limit

Bluetooth forecast data is compatible with ibeacon mode.

Transmission distance：10～30 Meter, class II

Transmission rate：Up to 6Kbyte/s

Supply voltage：1.8～3.6V（3.3V typical）

Module dimension：14.3*14.3mm

Operation temperature：-40˚C ～85˚C

Note: *The lowest operation temperature for low voltage mode could be -25˚C .*

Product Specifications

MAIN CHIPSET

• Nordic nRF52810

FUNCTIONAL SPECIFICATIONS

2.4 GHz transceiver

- -96 dBm sensitivity in Bluetooth® low energy mode
- Supported data rates: 1 Mbps, 2 Mbps Bluetooth® low energy mode
- -20 to +3 dBm TX power, configurable in 3 dB steps
- On-chip balun (single-ended RF)
- 4.6 mA peak current in TX (0 dBm)
- 4.6 mA peak current in RX
- RSSI (1 dB resolution)

ARM® Cortex®-M4 32-bit processor, 64 MHz

- 144 EEMBC CoreMark® score running from flash memory
- 34.4 µA/MHz running from flash memory
- 32.8 µA/MHz running from RAM
- Serial wire debug (SWD)

Flexible power management

- 1.7 V-3.6 V supply voltage range
- Fully automatic LDO and DC/DC regulator system
- Fast wake-up using 64 MHz internal oscillator

- 0.3 µA at 3 V in System OFF mode, no RAM retention
- 0.5 µA at 3 V in System OFF mode with full 24 kB RAM retention
- 1.5 µA at 3 V in System ON mode, with full 24 kB RAM retention, wake on RTC

192 kB flash and 24 kB RAM

Nordic SoftDevice ready

Support for concurrent multi-protocol

12-bit, 200 ksps ADC - 8 configurable channels with programmable gain

64 level comparator

Temperature sensor

Up to 32 general purpose I/O pins

4-channel pulse width modulator (PWM) unit with EasyDMA

Digital microphone interface (PDM)

3x 32-bit timer with counter mode

SPI master/slave with EasyDMA

I2C compatible 2-wire master/slave

UART (CTS/RTS) with EasyDMA

Programmable peripheral interconnect (PPI)

Quadrature decoder (QDEC)

AES HW encryption with EasyDMA

2x real-time counter (RTC)

Single crystal operation

Antenna information:

Manufacture: OPTO

Model No.: OPTO-BTM-02

Antenna Type: Printed Antenna

Antenna Gain: 3.0 dBi

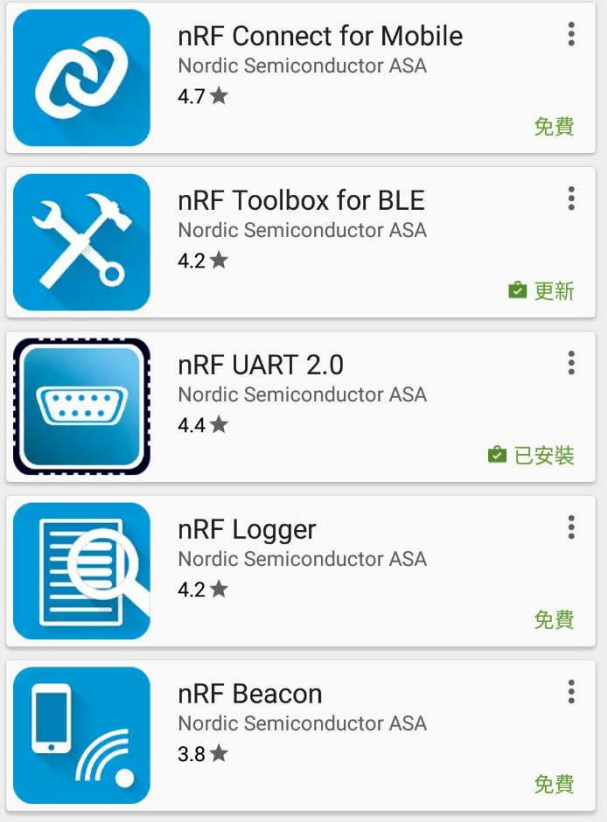
PIN ASSIGNMENT

PIN	Name/Function	Remark
1	VDD/Power supply	
2	General purpose I/O pin	P0.30
3	General purpose I/O pin (UART RXD)	P0.00
4	General purpose I/O pin (UART TXD)	P0.01
5	General purpose I/O pin	P0.02
6	General purpose I/O pin	P0.03
7	General purpose I/O pin	P0.04
8	General purpose I/O pin	P0.05
9	General purpose I/O pin	P0.06
10	General purpose I/O pin	P0.07
11	General purpose I/O pin	P0.08
12	General purpose I/O pin	P0.09
13	General purpose I/O pin	P0.10
14	General purpose I/O pin	P0.11
15	General purpose I/O pin	P0.12
16	General purpose I/O pin	P0.13
17	General purpose I/O pin	P0.14

18	General purpose I/O pin	P0.15
19	General purpose I/O pin	P0.16
20	SWDIO nRESET/System reset (active low). Also hardware debug and flash programming I/O.	
21	SWDCLK/Hardware debug and flash programming I/O.	
22	General purpose I/O pin	P0.17
23	General purpose I/O pin	P0.18
24	General purpose I/O pin	P0.19
25	General purpose I/O pin	P0.20
26	NC	
27	NC	
28	ANT/Differential antenna connection (TX and RX)	
29	GND/Ground (0 V)	
30	GND/Ground (0 V)	
31	General purpose I/O pin	P0.21
32	General purpose I/O pin	P0.22
33	General purpose I/O pin	P0.23
34	General purpose I/O pin	P0.24
35	General purpose I/O pin	P0.25
36	General purpose I/O pin	P0.26
37	General purpose I/O pin	P0.27
38	General purpose I/O pin	P0.28
39	General purpose I/O pin	P0.29
40	VDD/Power supply	

LIVE DEMO

Step1. Download Nordic APP (nRF UART or nRF Toolbox)

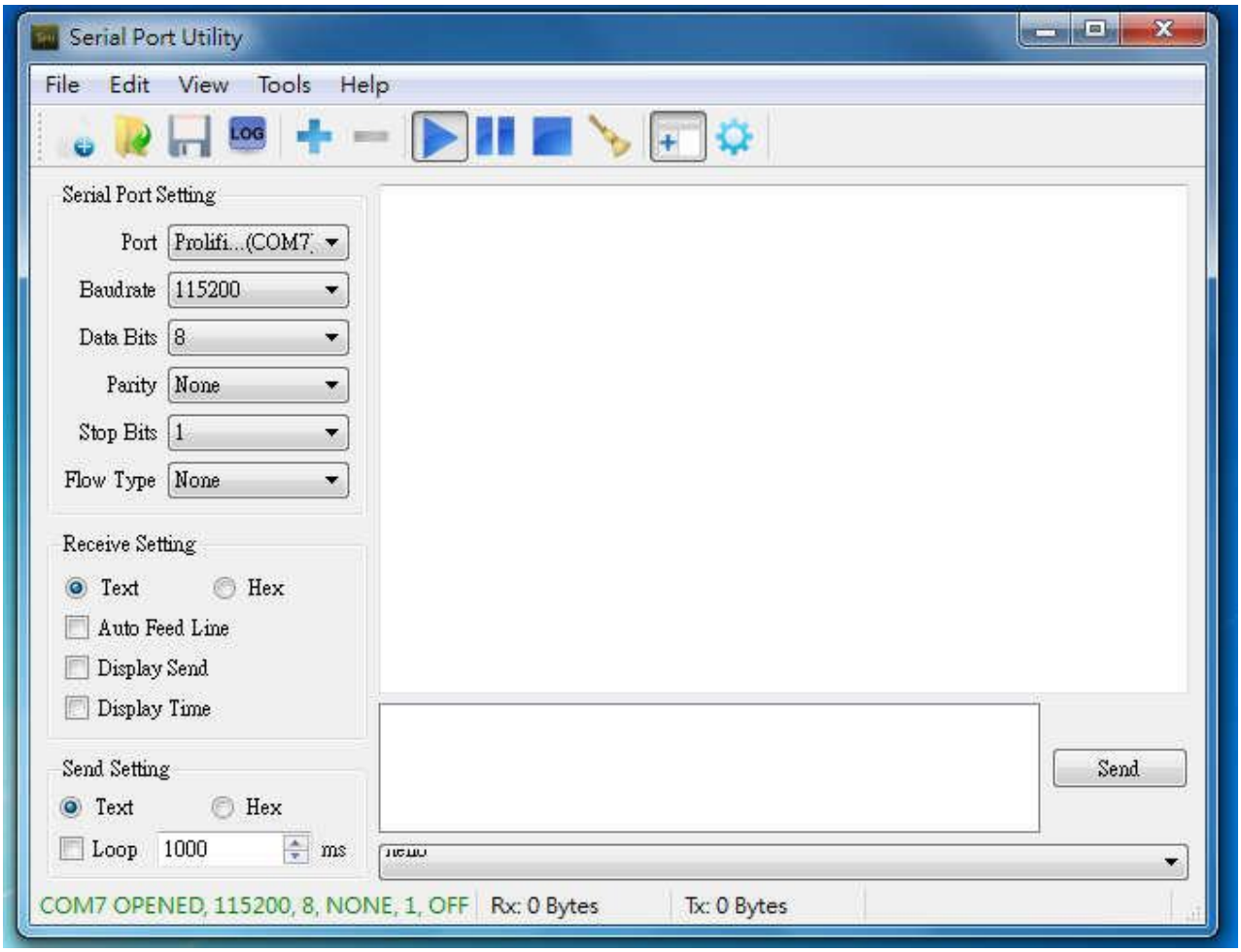


Step2. Install

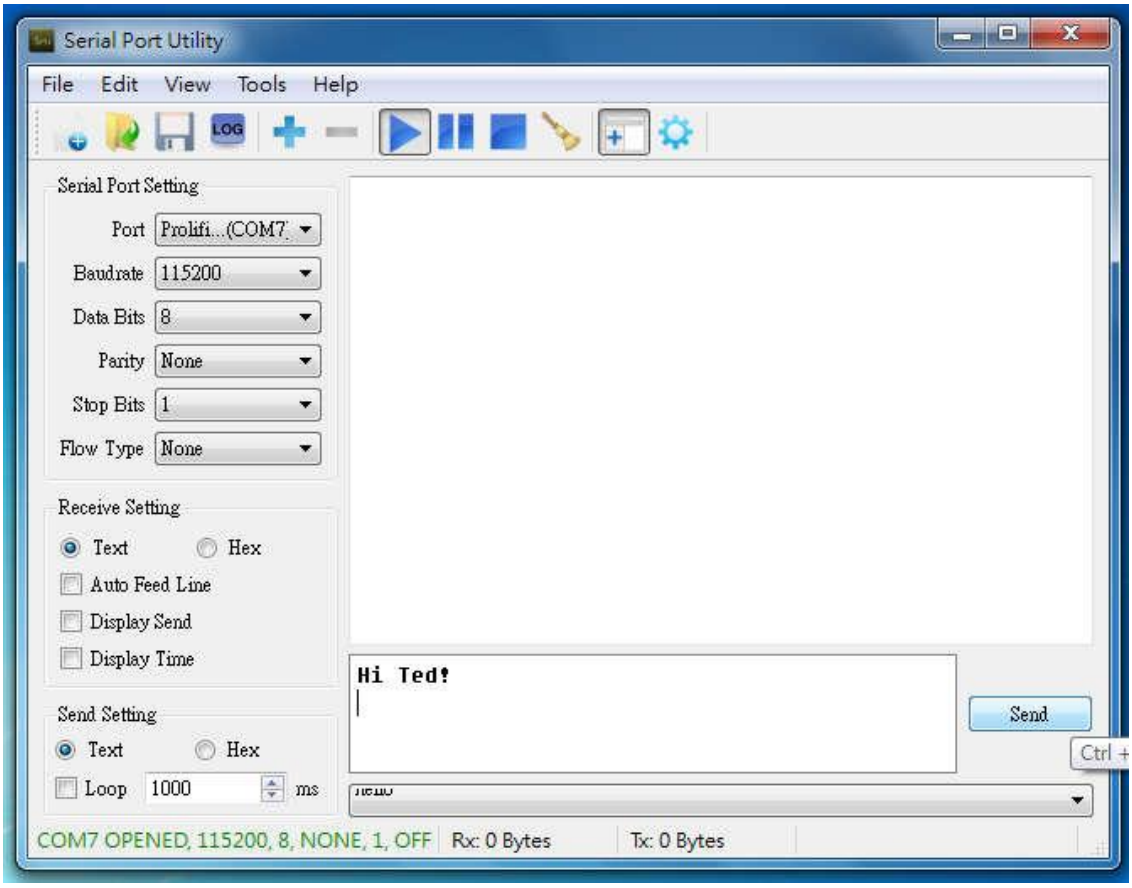
Step 3. Run APP(Connect to demo board ”Nordic UART”)

(Demo boardconnected)

Step 4. RUN PC terminal tool(UART tool)



Step 5. Send string from PC to smartphone (ex: Hi Ted!)



Step 6. Received string on your smartphone (ex: Hi Ted!)

Step 7. Send string fromsmartphone to PC (ex: Hello Nordic!)

Step 8. Received string on your PC(ex: Hello Nordic!)