



WLT8266BMG BLE Module

User manual

V1.1



Introduction

This BLE module is designed to connect electronic products and smart mobile devices via Bluetooth Low Energy technology. It can be widely used in various application senario, such as industrial control, instrumentation, logistics tracking, health care, smart home, motion measurement, automotive electronics, leisure toys, etc. With WLT8266BMG module's integrated BLE stack, fine-tuned RF performance and power consumption, and module level BQB/FCC/CE certifications, developpers can use this module to make their product development cycle much shorter.

The following is a table of different modules of our WLT8266BM product family:

Table 1 WLT8266BM Series Modules

Module type	Function	Size(mm)
WLT8266BMG	Wi-linktech Standard software BLE module,does not support software customization.Standard software functions including BLE passthrough data, AT Command control, Smartphone App configuration, OTA firmware upgrade. Provide Android/IOS APP reference source code	15 × 17
WLT8266BM	BLE modules with customized software per each customer specific needs. In addition to supporting all functions of WLT8266BMG, it also supports slave, host,Mesh networking, master-slave role switching, BLE/Mesh switching and other working modes.	
WLT8266BME	Same software functions as WLT8266BM, but with a smaller module mechanical size to adapt to more application scenarios.	11.2 × 15

Note: 1,Antena locates at the shorter edge of the module. For detailed size parameters, please refer to the details of 'WLT866BMG Data sheet'.

2,WLT8266BM supports mesh function, which can realize users' networking and multi-connection requirements. In addition, in order to solve the problem that the power consumption of Mesh is too high and BLE can not meet the needs of multi-connection , our company specially developed a BLE/Mesh switching technology to reduce the overall system power consumption while meeting the needs of users. For more information, please login at <http://www.wi-linktech.com/> to contact our customer service.

3,WLT8266BMG, WLT8266BM, WLT8266BME each have a shielded version as well. If you need it, you can contact us.

4,For module samples and development boards, please login to Alibaba International Station <https://www.alibaba.com/> search WLT8266BMG for purchase. Or login at <http://www.wi-linktech.com/> to contact our customer service



About This Manual

《WLT8266BMG User manual》 provides a functional introduction of the WLT8266BMG module, including default parameters, AT instruction set and its parsing, Passthrough Transmission function testing, mode switching, module sleep and wake-up mode, and upgrade functions. Readers can refer to this document for some understanding and application of the overall function of the module. If you have any questions, please login at <http://www.wi-linktech.com/> to contact our company or customer service.

Version History

Version Information Management

Vision	Date	Update Record	Editor
V1.0	2018.12.13	Instructions for use, default parameters, operating methods, function description (detailed)	Shanshan.Xu Enqing.Li
V1.1	2019.02.19	Add introduction	Eric



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1. About WLT8266BMG BLE Module

1.1 Use and obtain of Development Board

1) Instructions:

Method 1: (final connection as shown in Figure 2)

As shown in Figure 1: The red circle is the power and serial interface. Use the mini USB cable or micro USB cable to connect one of them. At the same time, the yellow circled TXD RXD is connected with a jump.

Method 2: (final connection as shown in Figure 3)

Use the USB to serial port tool to connect V (3v3), G (GND), TXD, and RXD (the TXD RXD is close to the module end) in the yellow circle shown in Figure 1. The connection mode of the TXD and RXD interfaces is shown in Figure 4. This method does not require wiring in the red circle.

Note: SWS is the download port and is not used when it is used.

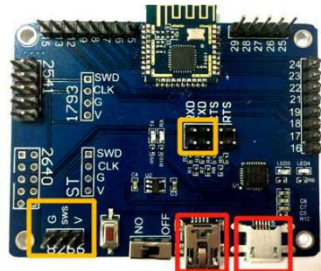


Figure 1.

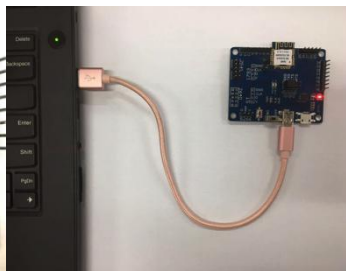


Figure 2.

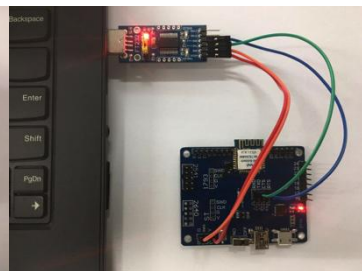


Figure 3.

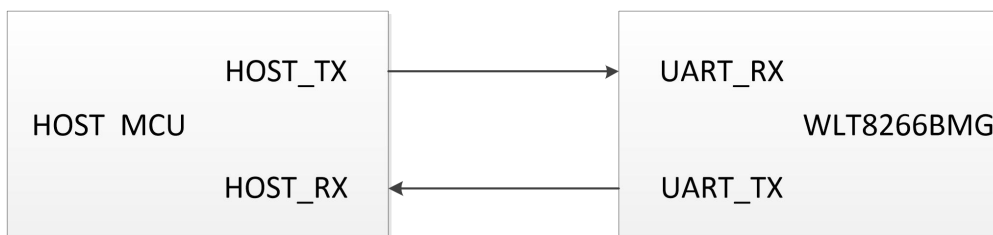


Figure 4. UART connection between WLT8266BMG and Host MCU

2) Method of Obtaining:

Development Board can be obtained from our company at <http://www.wi-linktech.com/> or customer service.



1.2 Module Factory Default Configuration

- ▶ Baud Rate: 115200
- ▶ Equipment Name: WLT8266BMG
- ▶ Broadcast Interval: 48 (30ms)
48 is the set program parameter,the broadcast time interval is 30ms.
- ▶ Transmitting Power: 10 (8dBm)
10 is the set program parameter,the transmit power is 8dBm.

Note: For detailed parameter configuration,see the AT command analysis section.

1.3 Test Tools and Sources

- ▶ Mobile Phone Transmission Test Tool:
iOS: light blue
App Store can search for light blue;
Android: WLT connect
Search for “Wei Lintong Test Software” through Baidu Mobile Assistant to download;
- ▶ Computer Serial Assistant Tool:
Friendly Serial Assistant
Baidu search for “Friendly Serial Debugging Assistant” download or other serial port assistants;
- ▶ OTA Firmware Upgrade Tool:
OTA
OTA upgrade tool is required for customized software,you can contact our company or customer service to obtain;



Figure 5.

2. Module Function

2.1 Mode Selection

1) Bluetooth Connection Status Indication



GPIO_PE5 indicates the Bluetooth connection status:

Bluetooth connection – high level

Connection disconnected – low level

2) Pass through Transmission and Command Mode Switching Mode

The Bluetooth module has two modes: command mode and Passthrough Transmission mode:

- ▶ When the Bluetooth module is not connected, it is command mode;
- ▶ When the Bluetooth module is connected, the mode of the Bluetooth module is controlled by the level of GPIO_PE4:

GPIO_PE4 high: Pass through Transmission Mode

GPIO_PE4 low: Command Mode

3) Module Prompt Information

- ▶ +IND=BLECONNECTED<CR><LF>
Prompt module is connected
- ▶ +IND=BLEDISCONNECTED<CR><LF>
Prompt module disconnected
- ▶ +IND=Enter AT Cmd Mode<CR><LF>
Prompt module to enter AT command mode
- ▶ +IND=Enter Throughput Mode<CR><LF>
Prompt module to enter pass through Transmission mode

2.2 AT Command Mode

According to 1.1 1) use the module to complete the wiring, open the serial assistant tool, you can test the instruction; pay attention to the instruction transmission format when the instruction is tested, there should be a line break after each instruction; the instruction and test chart are as follows.

1) Instruction Set:

- ▶ AT+MINFO
- ▶ AT+RESET
- ▶ AT+GETNAME
- ▶ AT+SETNAME
- ▶ AT+SETBAUD
- ▶ AT+GETBAUD
- ▶ AT+SETPOWER
- ▶ AT+GETPOWER
- ▶ AT+SETADVINTERVAL
- ▶ AT+GETADVINTERVAL



- ▶ AT+STARTADVERTISING
- ▶ AT+STOPADVERTISING
- ▶ AT+GETADDRESS
- ▶ AT+SETDEFAULT
- ▶ AT+SLEEP

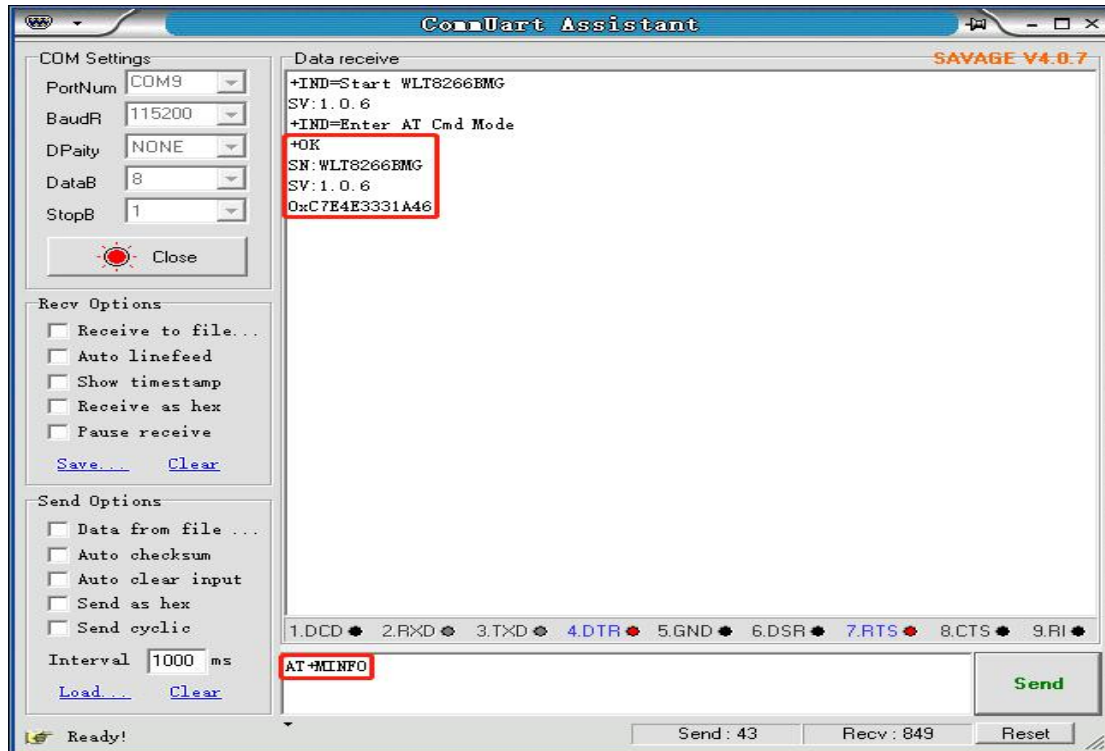


Figure 6.

2) The instruction test is as follows:

▶ AT+MINFO

Function: Get module information

Format:

Send: AT+MINFO (line feed)

Reply: +OK (line feed)

SN: WLT8266BMG (line feed)

SV : <SV> (line feed)

< address > (line feed)

Parameters: <SV>: Software version number

< address > : Bluetooth current mac address

▶ AT+RESET

Function: Restart the module (ie: reset)

Format:

Send: AT+RESET (line feed)



Note: The module immediately resets when it receives the command and does not return a message.

► AT+SETNAME

Function: Set the module name

Format:

Send: AT+SETNAME=name (line feed)

Reply: +OK

Parameters: name: the name of the device to be set

Note: The set name will be written to FLASH and will be valid after reset.

► AT+GETNAME

Function: Get the module name

Format:

Send: AT+GETNAME (line feed)

Reply: +OK= name

► AT+SETBAUD

Function: Set the module baud rate

Format:

Send: AT+SETBAUD= baudrate (line feed)

Reply: +OK

Parameters: baud rate: the baud rate to be set can be:
9600, 19200, 38400, 57600, 115200

Note: The set baud rate will be written to the FLASH and will be valid after reset.

► AT+GETBAUD

Function: Get module baud rate

Format:

Send: AT+GETBAUD (line feed)

Reply: +OK= baudrate

► AT+SETPOWER

Function: set module transmit power

Format:

Send: AT+SETPOWER= power (line feed)

Reply: +OK

Parameters: Transmit power

0: -37DBM

1: -30DBM

2: -28DBM



- 3: -24DBM
- 4: -20DBM
- 5: -14DBM
- 6: -10DBM
- 7: -4DBM
- 8: 0DBM
- 9: 4DBM
- 10: 8DBM

Note: The set transmit power will be written to the FLASH and will be valid after reset.

► AT+GETPOWER

Function: Get module transmit power

Format:

Send: AT+GETPOWER (line feed)

Reply: +OK= power

► AT+SETADVINTERVAL

Function: Set the module broadcast interval

Format:

Send: AT+SETADVINTERVAL = time (line feed)

Reply: +OK

Parameters: time: broadcast interval (unit 625us)

Such as: 100ms = time*625us time = 160

ADV_INTERVAL_10MS	16
ADV_INTERVAL_15MS	24
ADV_INTERVAL_20MS	32
ADV_INTERVAL_25MS	40
ADV_INTERVAL_30MS	48
ADV_INTERVAL_35MS	56
ADV_INTERVAL_40MS	64
ADV_INTERVAL_45MS	72
ADV_INTERVAL_50MS	80
ADV_INTERVAL_55MS	88
ADV_INTERVAL_100MS	160
ADV_INTERVAL_105MS	168
ADV_INTERVAL_200MS	320
ADV_INTERVAL_205MS	328
ADV_INTERVAL_300MS	480
ADV_INTERVAL_305MS	488
ADV_INTERVAL_400MS	640
ADV_INTERVAL_405MS	648
ADV_INTERVAL_500MS	800



ADV_INTERVAL_505MS	808
ADV_INTERVAL_1S	1600

Note: The set broadcast interval will be written to the FLASH and will be valid after reset.

► AT+GETADVINTERVAL

Function: Set the module broadcast interval

Format:

Send: AT+GETADVINTERVAL (line feed)

Reply: +OK= time

► AT+STARTADVERTISING

Function: Start broadcasting

Format:

Send: AT+STARTADVERTISING (line feed)

Reply: +OK

► AT+STOPADVERTISING

Function: stop broadcasting

Format:

Send: AT+STOPADVERTISING (line feed)

Reply: +OK

► AT+GETADDRESS

Function: Get the module's Bluetooth MAC address

Format:

Send: AT+GETADDRESS (line feed)

Reply: +OK= address

Parameters: address: current Bluetooth MAC address

► AT+SETDEFAULT

Function: Restore factory settings

Format:

Send: AT+SETDEFAULT (line feed)

Note: This command restores all the settings listed in 2.2 2) Command Test Case to the factory default settings. The original settings in all FLASH will be erased. After the erase is completed, the module will automatically reset and no message will be returned.

► AT+SLEEP

Function: Low power setting

Format:

Send: AT+SLEEP= Value (line feed)



Reply: +OK

+IND=Response

Parameters: Value:

0: Exit low power, provided the wake-up pin is high.

1: Enter low power consumption

Response :

WAKE UP : When Value=0.

SLEEP MODE : When Value=1.

Note:

1. The power consumption of the module is related to the broadcast time interval. For details, see 2.5 Sleep Low Power Consumption.

2. Exit the sleep mode immediately after the module is successfully connected.

3. The program defaults to non-low power consumption. The AT command can be used to enter low power consumption. Wake-up GPIO_PD5 can be used to send AT command wake-up to the high-level pin. After the wake-up, the data is sent and received normally. (Wake-up is based on the fact that the GPIO_PD5 pin is held high and the AT instruction is inactive at low power).

2.3 Pass through Transmission mode

2.3.1 iOS: light blue

Use light blue to search and connect the module, as shown in Figure 7, to view the following features:

1) Broadcast Package Content:

The content of the broadcast package includes the Bluetooth name and the Bluetooth MAC address. The app can filter the device according to the content of the broadcast package. After the Bluetooth connection is successful, click “Show” in Figure 8. The content of the broadcast package is as shown in Figure 9 below:

2) Device Information Content:

The device information includes the software version number. You can view the version information directly through the app. You do not need to view the serial port message, as shown in Figure 10 below.

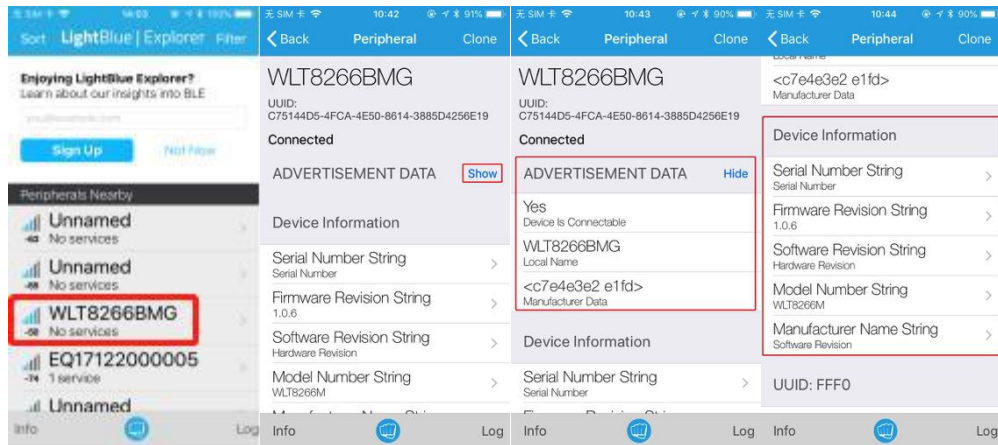


Figure 7.

Figure 8.

Figure 9 .

Figure 10.

3) Data transmission channel - UUID: 0xFFFF0

Data transparent transmission channel, data interaction between mobile phone and module, There is Notify (0xFFFF1): Receive mode & Write (0xFFFF2): Send mode, as shown in Figure 11;



Figure 11.

①Notify (0xFFFF1): Receive mode

Click listen for notifications to enter the receiving state, the serial port sends hexadecimal (ASCII) data, and the mobile phone receives, as shown in Figure 12;

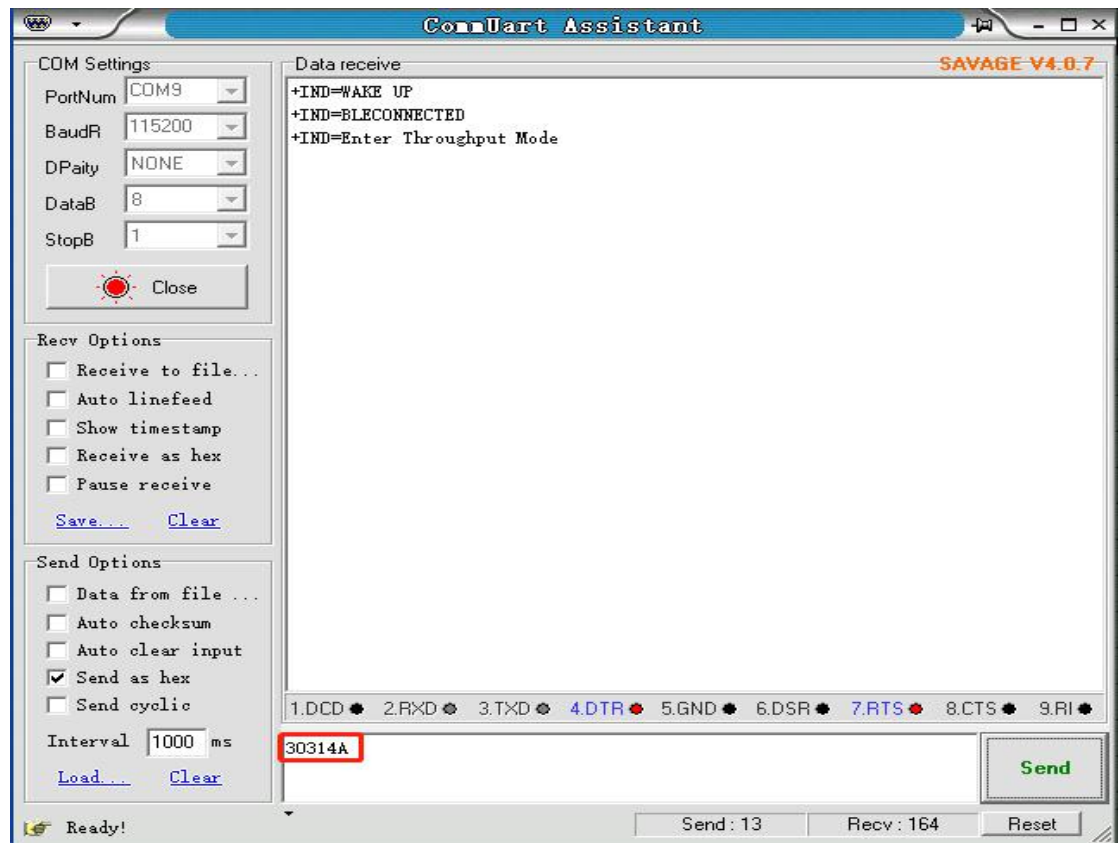
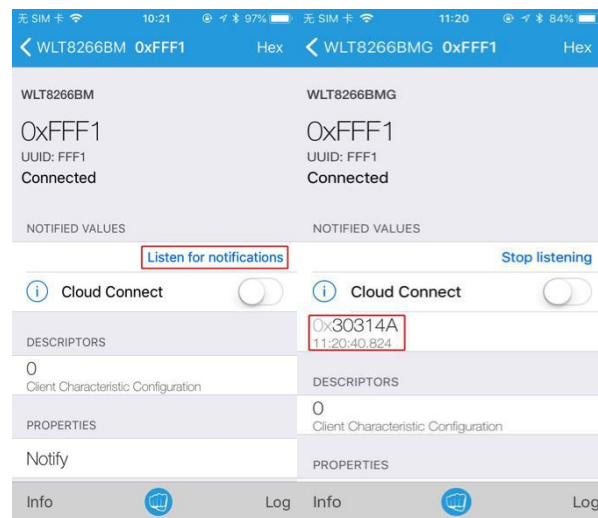


Figure 12.



②Write (0xFFFF2): Send Mode:

Click write new value to enter the sending state, the mobile phone sends hexadecimal (ASCII) data, serial port reception, as shown in Figure 13;

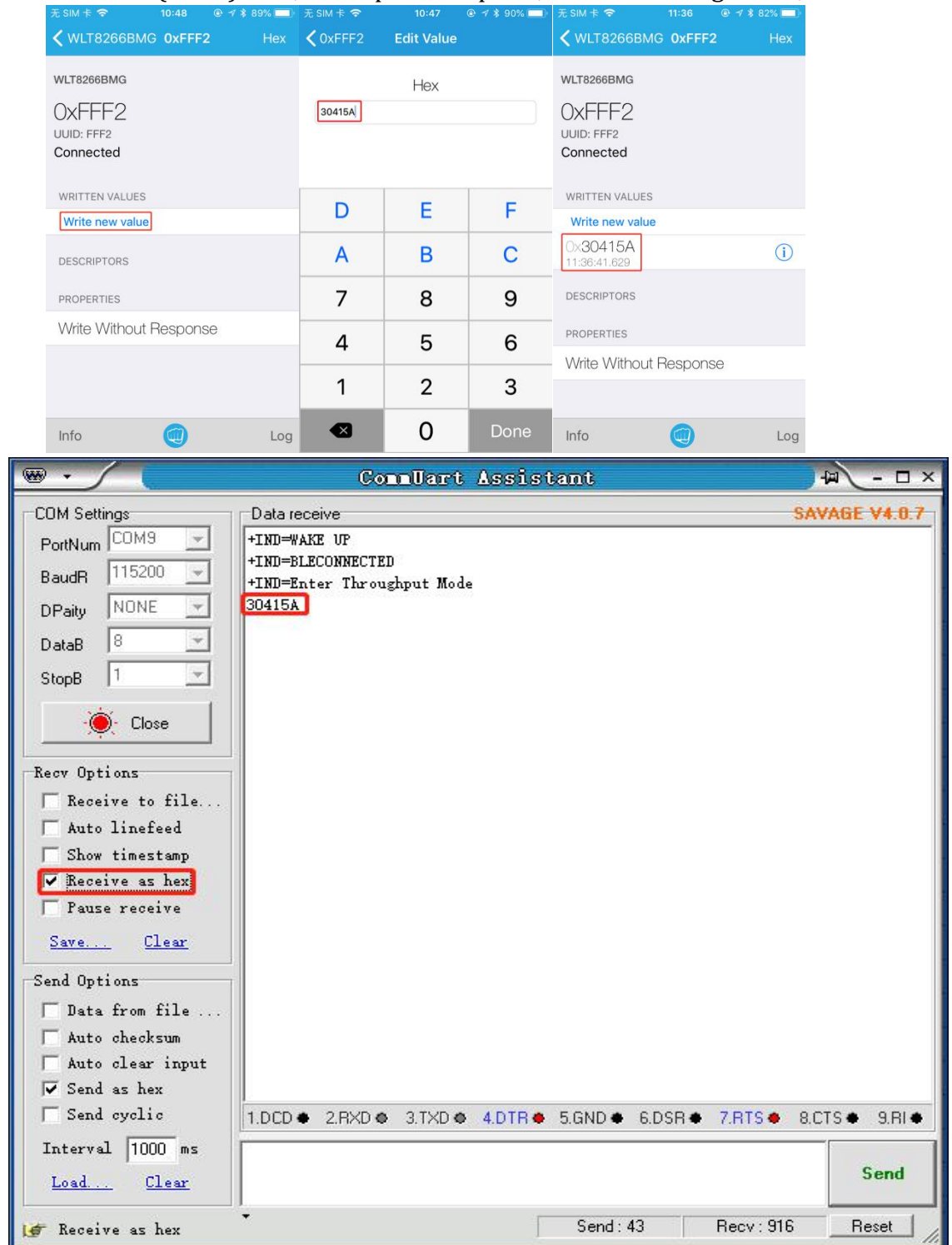


Figure 13.



2.3.2 Android: WLT connect

Use the WLT connect test software to search and connect the module, as shown in Figure 14;

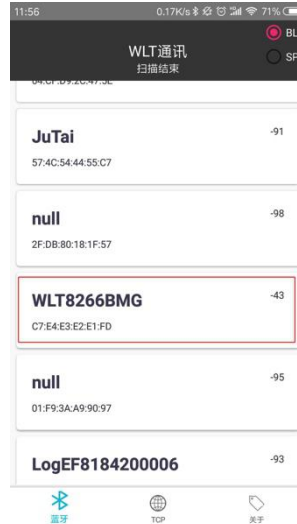


Figure 14.

1) Receive Mode, as shown in Figure 15.

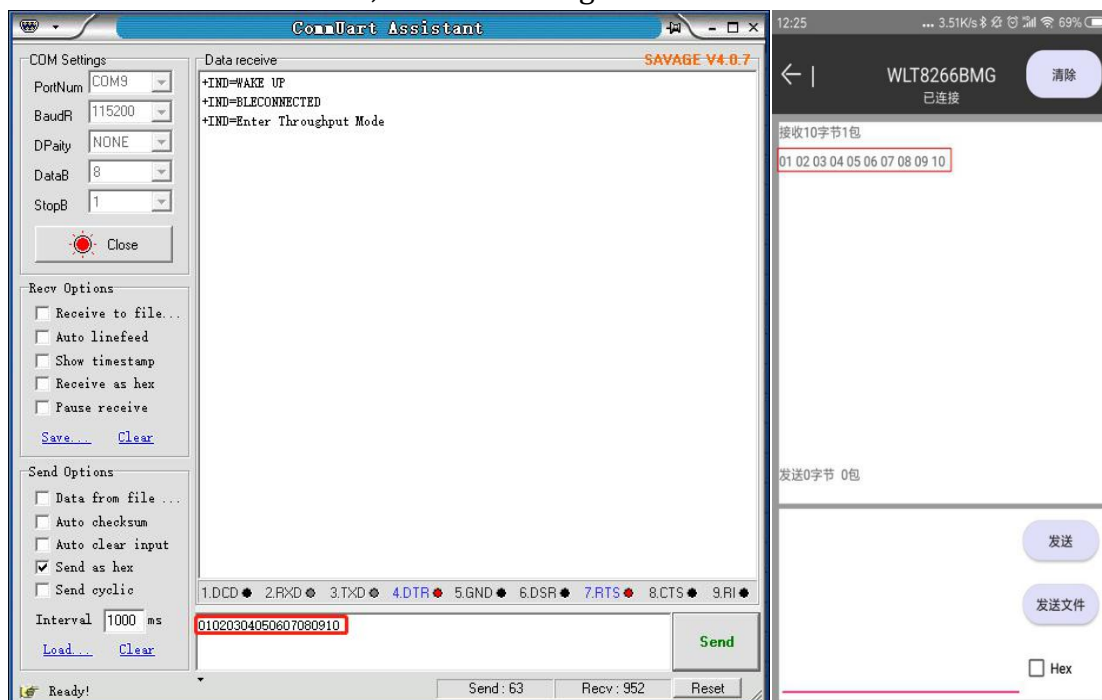


Figure 15.



2) **Send Mode**, as shown in Figure 16;

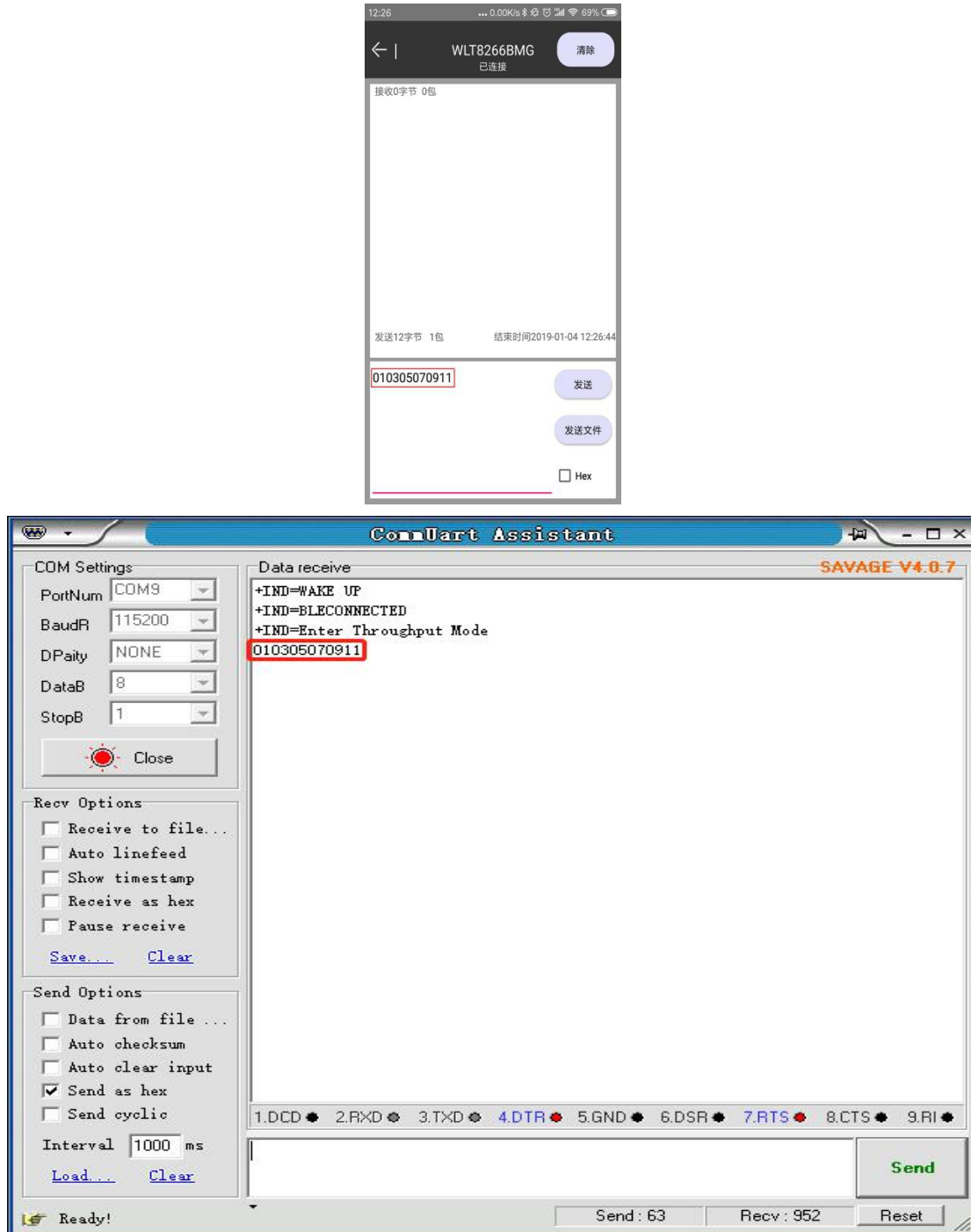


Figure 16.



2.4 Configuration Mode

1) APP configuration channel - UUID: 0xFFE0

UUID: 0xFFE0 channel is used to directly change some parameters of Bluetooth by using APP, as shown in Figure 17;



Figure 17.

Click write new value, enter the hexadecimal format (ASCII code) of the AT command and send it, as shown in Figure 18, 19 (the legend is the hexadecimal code of AT+MINFO);

- Note: 1. Each line instruction needs to add a line break at the end: 0D (<CR>), 0A (<LF>);
2. Abnormal instruction data is not processed and not transmitted;
3. The AT command set of the APP configuration is the same as the AT command set of the AT mode.

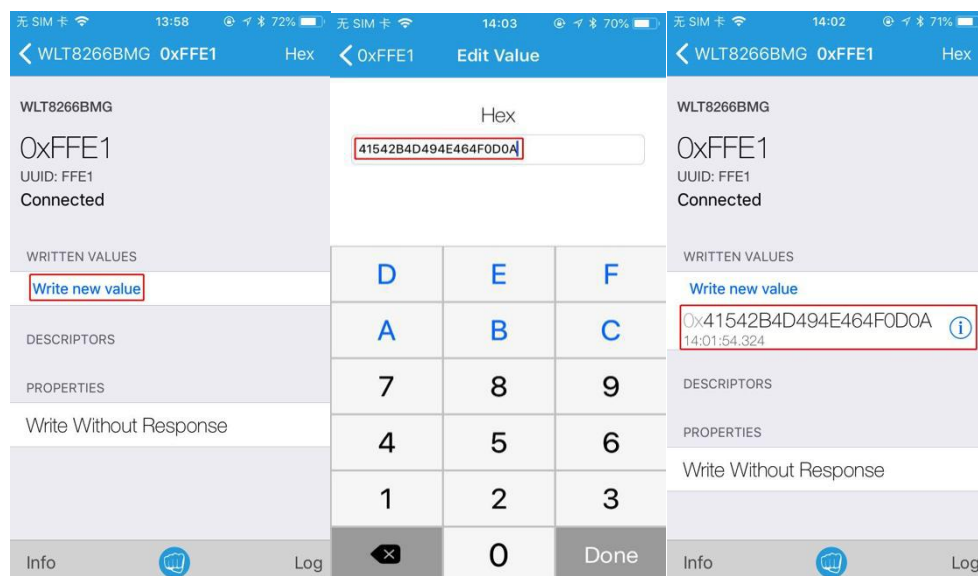


Figure 18.

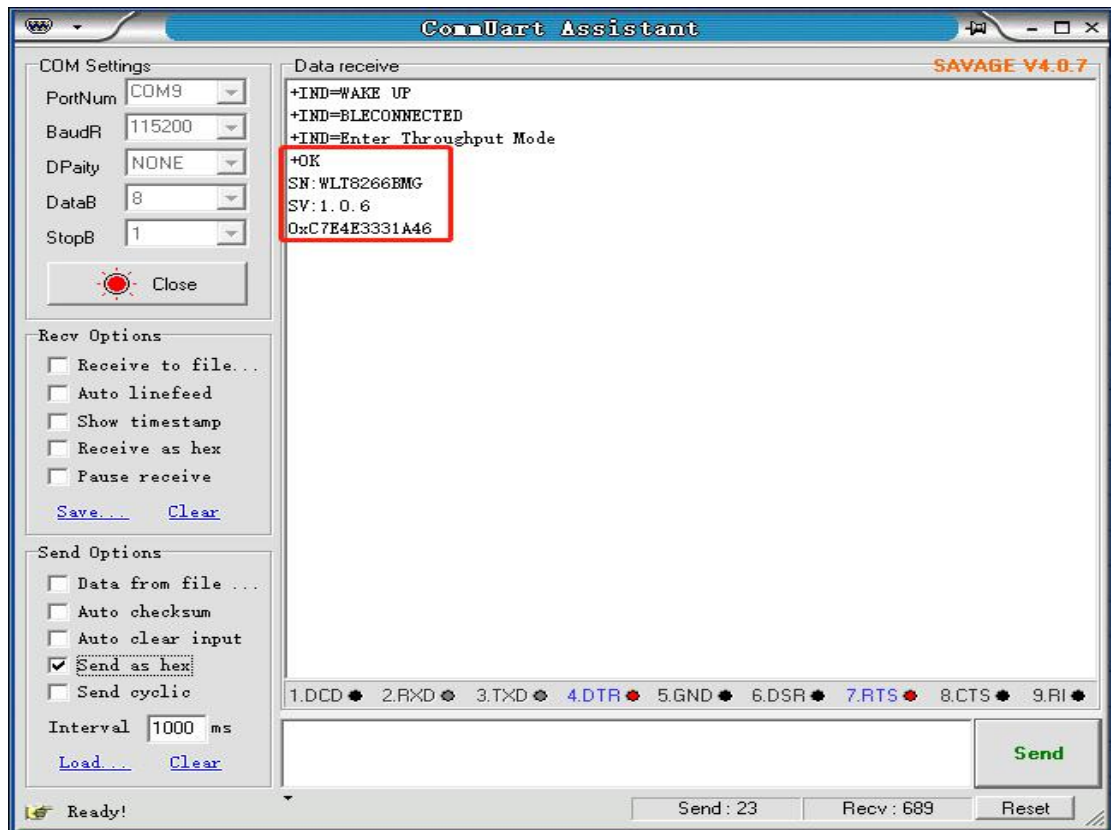


Figure 19.

2.5 Sleep Low Power

The module contains the sleep mode, and uses the command to send AT+SLEEP=1 to enter the sleep mode. There are two wake-up modes, one is AT+SLEEP=0 and the pin GPIO_PD5 is high-level wake-up; the other is Bluetooth connection wake-up.

The average power consumption of the sleep broadcast period has a certain relationship with the broadcast time interval. See Table 1 for the following:

Note: Detailed power consumption can be contacted by our company or customer service.

Table 2. Module power consumption table

Number	Channel(default 3)	Broadcast Interval	Power Consumption
1	3	30MS	About 1.2mA
2	3	100MS	About 450uA
3	2	500MS	About 110uA
4	1	500MS	About 75uA
5	1	5S	About 12uA



2.6 OTA Upgrade

The module includes an OTA upgrade feature that updates the module firmware using the phone app.

1) OTA Condition

Hardware Condition: Android Phone

Software Condition: WLT8266BM_OTA.apk

2) OTA Method

1. The target is powered on and confirms that the target Bluetooth is turned on and can be connected.
2. Open the OTA upgrade software.
3. Import the firmware 8266_module.bin that WLT8266BMG will upgrade to the phone.
4. Click on the firmware in the OTA upgrade software and select 8266_module.bin.
5. Click to refresh the list
6. Click to select the target Bluetooth and connect
7. After the connection is successful, click on “Start OTA”
8. Observe the progress below. The upgrade completes with “Prompt: OTA completed, whether to return to the scan page”.

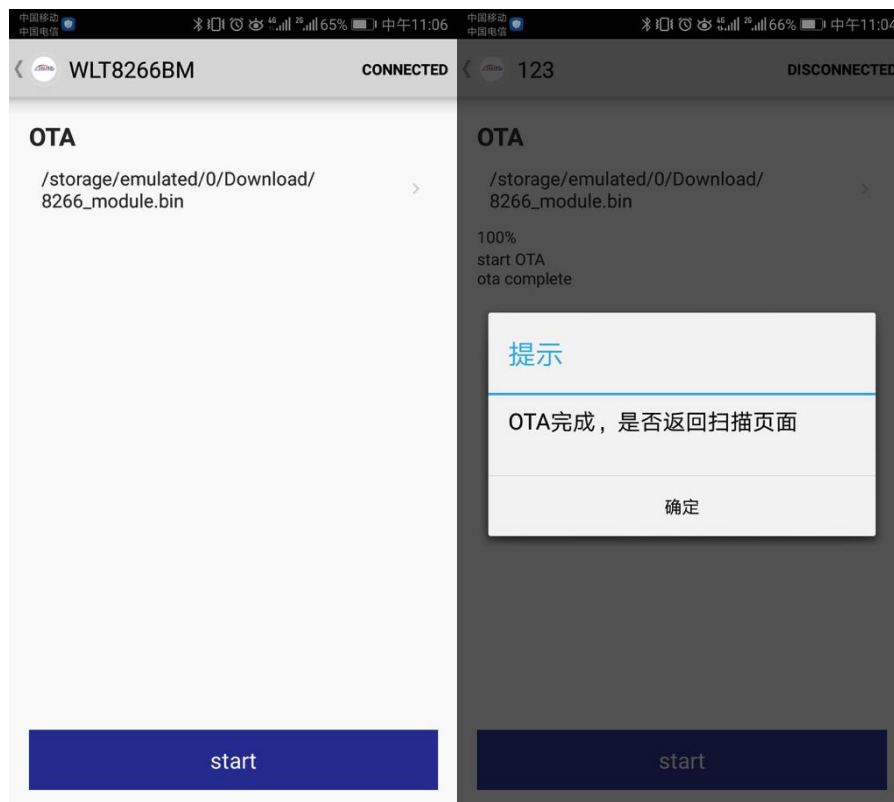


Figure 20.