E104-BT06 User Manual

BLE4.2　SMD Bluetooth-serial port module



Chengdu Ebyte Electronic Technology Co.,Ltd.

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Chapter 1 Overview

1.1 Introduction

E104-BT06 is a serial port to BLE low-cost Bluetooth slave module based on Bluetooth protocol version 4.2, working in the 2.4GHz frequency band.



The E104-BT06 module uses universal AT commands to set parameters, which is simple and quick to operate. The module only supports Bluetooth slave mode, and the module functionally supports low-power broadcast, data transparent transmission, and air configuration. Modules can be widely used in home automation, home security, personal health care, smart home appliances, accessories and remote controls, automobiles, lighting, industrial Internet, smart data collection, smart control and other fields.

1.2 Features

- Bluetooth BLE 4.2 protocol;
- Support two working modes of configuration and transparent transmission;
- Automatic broadcast and automatic connection after startup;
- IBeacon and ordinary broadcast switching;
- MAC binding connection,
- Multiple serial port modes and baud rates;
- Comes with PCB antenna, no need for external antenna;
- Support Bluetooth parameter air configuration function;
- The maximum communication distance is 80M (@3dBm, 1Mbps);
- Low-power sleep, synchronous broadcast;
- Transmit power modification. The maximum emission is 3dBm;

1.3 Application scenarios

- Wireless meter reading and wireless sensing;

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- Smart home
- Industrial remote control and telemetry;
- Intelligent buildings, intelligent buildings;
- Automated data collection;
- Health sensor
- Smart robot;
- Wireless sensing
- Electronic label;
- Intelligent control;

Chapter 2 Specifications

2.1 Limit parameters

Main parameters	Performance		Remark
	Min	Max	
Power supply voltage (V)	2	3.6	Over 3.6V will permanently burn the module

2.2 Operating parameter

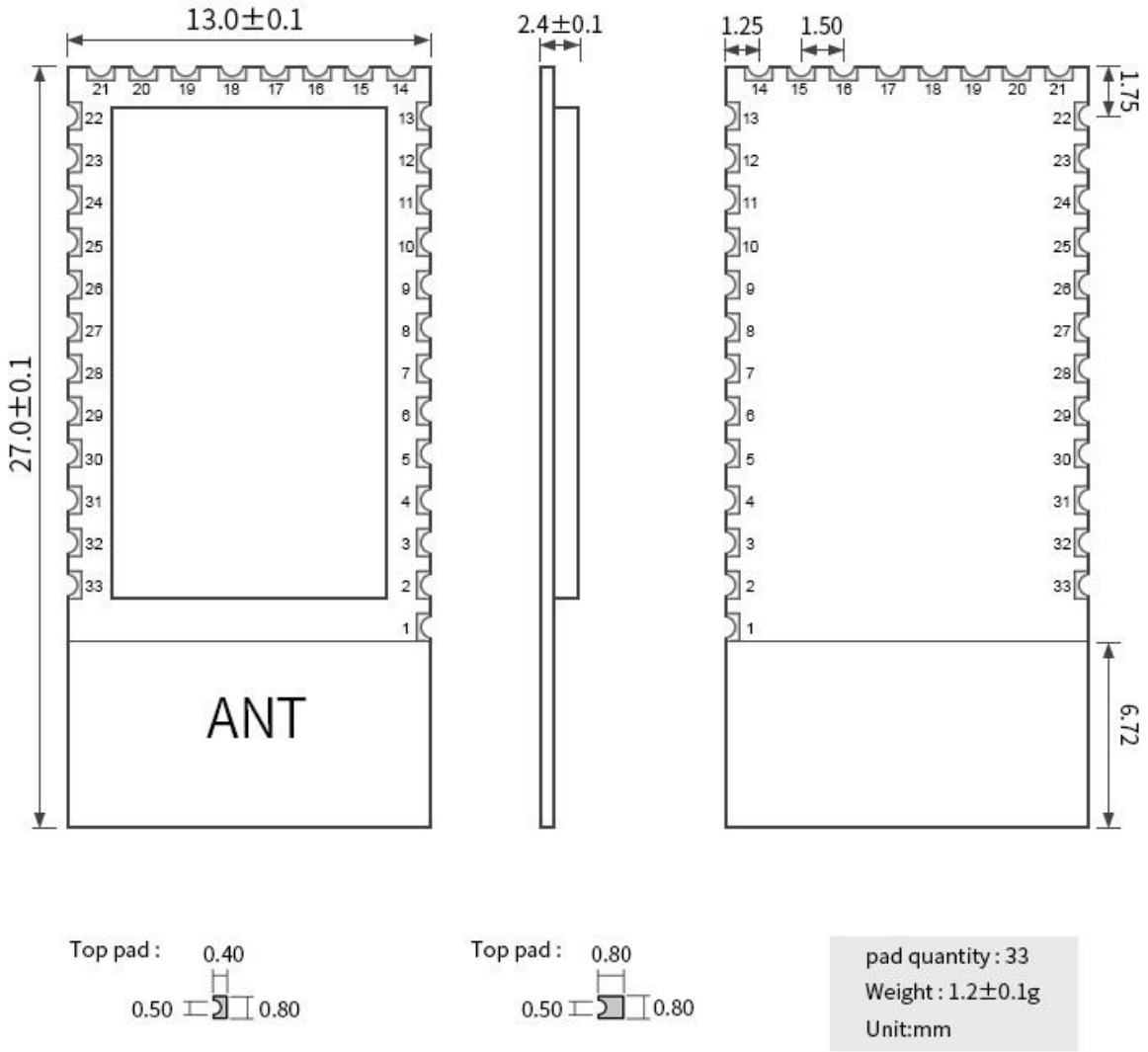
Main parameter		Performance			Remark
		Min	Type	Max	
Operating voltage（V）		2.0	3.3	3.6	≥3.3V can guarantee output power
Communication level (V)		-	3.3	-	Using 5V level is risky to burn
Operating frequency（Mhz）		2402	-	2480	Applicable ISM frequency band
Power consumption	Emission current (mA)	-	30.4	-	Peak emission
	Receiving current (mA)	-	-	-	-
	Sleep current (μA)	-	9	-	Default parameters
Transmit power (dBm)		-15	0	3	-
Receiving sensitivity (dBm)		-	-85	-	Chip manual parameters
Sleep broadcast current (default)		-	194.62	-	Unit : uA. Default broadcast interval 1S
Wake-up broadcast current (default)		-	6.9	-	Unit: mA. Default broadcast interval is 1s

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Main parameter	Description	Remark
Reference distance	80m	Clear and open environment, height 2.0 meters; @3dBm; this distance from the mobile phone host module is the distance for the connection
Bluetooth protocol	BLE4.2	
Communication Interface	UART serial port	-
Package	SMD	-
Dimensions	27*13mm	-
RF interface	PCB antenna	Equivalent impedance is about 50 Ω

Chapter 3 Size and pin definition



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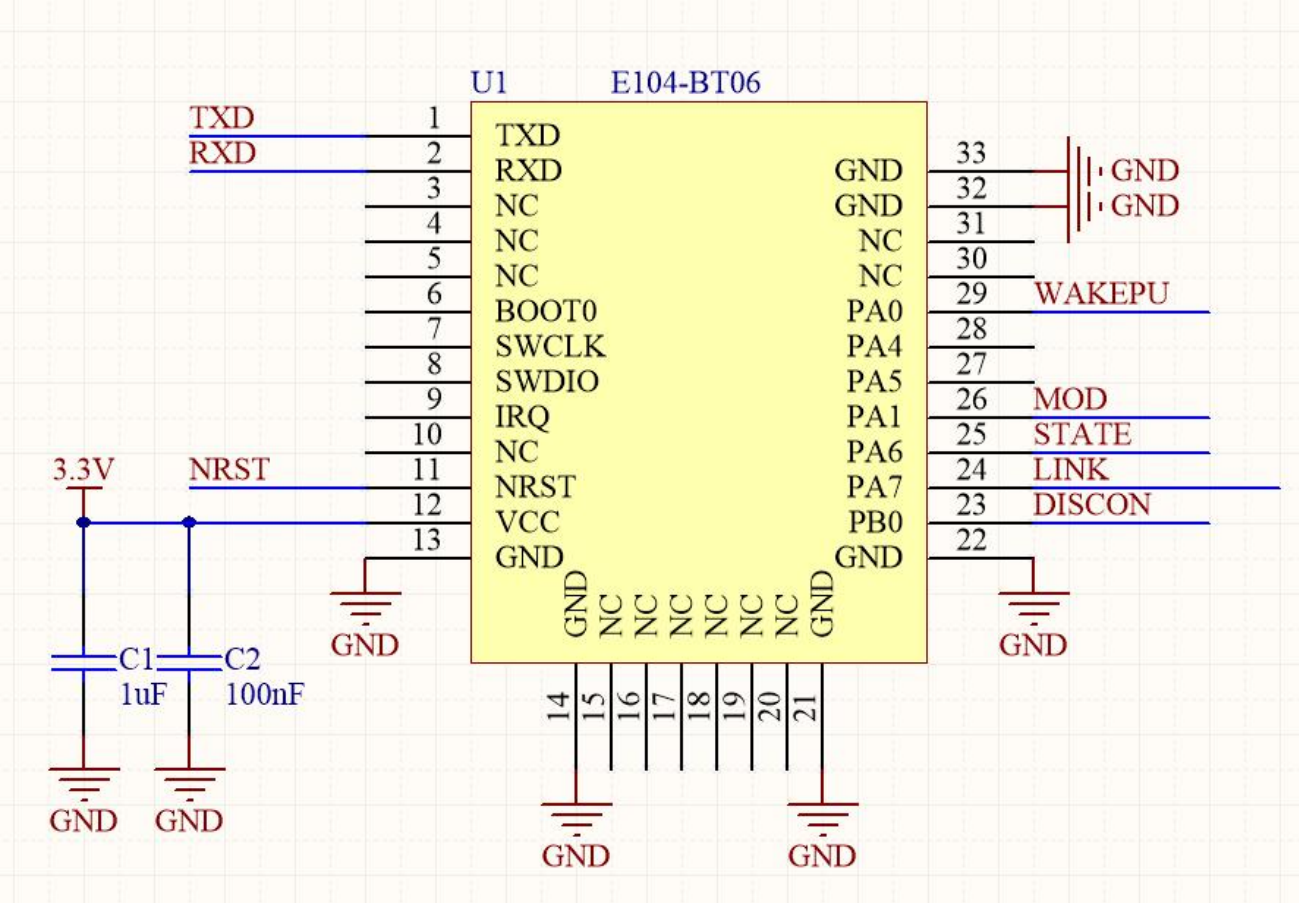
NO.	Pin item	Direction	Function	Application
1	TXD	O	Serial port	--
2	RXD	I	Serial port	--
3	NC	--	--	--
4	NC	--	--	--
5	NC	--	--	--
6	NC	--	--	--
7	NC	I	--	--
8	NC	I	--	--
9	NC	--	--	--
10	NC	--	--	--
11	RST	I	Reset pin	Low reset
12	VCC	I	Positive power	Connect to power +3.3V
13	GND	--	Power ground	--
14	GND	--	Power ground	--
15	NC	--	--	--
16	NC	--	--	--
17	NC	--	--	--
18	NC	--	--	--
19	NC	--	--	--
20	NC	--	--	--
21	GND	--	Power ground	--
22	GND	--	Power ground	--
23	PB0	I	DISCON	Disconnect pin
24	PA7	O	LINK	Status indication output pin
25	PA6	O	STATE	Data connection indicator pin
26	PA1	I	MOD	In the connected state, when the serial port has data entering the chip, and the data is not sent through Bluetooth, it is high, and the sending is completed pull down the pin. The user can use this pin to determine whether to continue to input data through the serial port
27	PA5	--	--	--
28	PA4	--	--	--
29	PA0		WAKEUP	If the module enters sleep, the falling edge wakes up
30	NC	--	--	--
31	NC	--	--	--
32	GND	--	Power ground	--
33	GND	--	Power ground	--

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Chapter 4 Basic Operation

4.1 Recommended circuit



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Chapter 5 Function Description

5.1 Role description

Module support role: slave.

The module slave can connect with other models of our company's Bluetooth products to support transparent transmission. (E104-BT5032, E104-BT5010, E104-BT52)

- AT+ADV=1 configure normal broadcast mode
- The broadcast switch is configured to be on, and it will automatically enter the broadcast state after power-on, otherwise the stop broadcast device will not be found.
- After receiving the host connection request, the Bluetooth connection is established to stop the Bluetooth broadcast and enter the data transmission mode.
- For broadcast data configuration, please refer to 5.5 Broadcast.

5.2 Power mode

The module supports two power modes: low power consumption mode and wake-up mode.

5.2.1 Low Power Mode

The so-called low power consumption mode means that the BLE function continues to run after the module enters this mode, and peripherals other than the wake-up pin of the module are turned off. If you need lower power consumption, you can turn off the broadcast through the AT command, disconnect all connections, and set a longer broadcast gap connection gap.

Enter low power consumption:

AT command "AT+SLEEP" immediately enters low power consumption mode;

AT command "AT+ONSLEEP=1" power on immediately enters low power consumption;

Wkp pin falling edge wakes up the system

After the module enters the low power consumption mode, it outputs "STA: sleep" through the serial port (LOGMSG does not turn off the output).

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Note: In the low-power mode, the serial port output is valid and cannot be input

5.2.2 Wake-up mode

The so-called wake-up mode means that the peripherals required by the module are in a normal working state in this mode. After the module wakes up, it outputs the status "STA: wakeup".

Wake-up method:

Wake up immediately through the falling edge of WKP pin;

5.3 Data transmission mode

5.3.1 Data transparent transmission

The so-called data transparent transmission means that the data received by the serial port is sent to the other device through BLE without any processing, and the data received by BLE is sent out through the serial port without any processing.

5.4 MAC address binding

The module supports MAC address binding. If the MAC address binding function is enabled. The device only connects to devices with added MAC addresses.

5.5 Broadcast

5.5.1 General broadcast information

The broadcast information includes advertising and scan respone. Advertising is a broadcast report sent actively, and scan respone is a broadcast report returned after receiving a host scan request.

Advertising

Fixed field	Len	Vendor field	Manufa data
020106	N	0xFF	Configurable, maximum 26 bytes
e.g：020106< Len >FF< Manufa data >			

Users can only configure Manufa data field data.Scan response

Len	Fixed	UUID	Len	Fixed	Device name

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0x03	0x03	FFF0	N	0x09	Configurable, maximum 22 bytes
e.g：0303FFF0<len>09< Device name >					

Note: This data does not require user configuration.

iBeacon broadcast information

- ✧ Instructions to configure UUID, Major, and Minor respectively
- ✧ Command AT+ADV=2 to configure to work in iBeacon broadcast mode, broadcast immediately
- ✧ Bluetooth connection is not supported in iBeacon broadcast mode

Advertising

iBeacon Prefix	UUID	Major	Minor	Tx-Power
9B	16B	2B	2B	1B
E.g：0201061AFF4C000215FDAFDA50693A4E24FB1AFCFC6EB076478252775848F00				

5.4 Configuration

The module supports two configuration methods: serial port configuration, air configuration (FFF3 characteristic value). The two configuration methods are basically the same. Before the air configuration, the authentication password of AT+AUTH=123456 must be passed. After the authentication is passed, the module is allowed to use the air configuration. The air configuration authentication cycle is this connection, and re-authentication is required if the device is disconnected and reconnected.

5.5 Data indication

When the module outputs data through the serial port, the module sets the DATA pin to a high level, indicating that data is being sent. AT command response does not change the DATA pin state.

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5.6 UUID description

Service UUID	FFF0（Configurable）		
Eigenvalues	UUID	Attributes	Description
SLAVE CHANNEL	FFF1（Not configurable）	read / notify	The slave sends the data, and the master receives the data channel.
MAST CHANNEL	FFF2（Not configurable）	read / write	The host sends data and the slave receives data channels
CONFIG CHANNEL	FFF3（Not configurable）	read / write / notify	Air configuration channel

5.7Status or event printing

Command AT+LOGMSG to enable the serial port printing function of status information. Status information includes: connected, disconnected, awake, and sleep. The format is as follows:

Status	Print information
connection succeeded	\r\n STA:connect\r\n
Disconnect	\r\n STA:disconnect\r\n
System wake up	\r\n STA:wakeup\r\n
Sleep mode	\r\n STA:sleep\r\n

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Chapter 6 AT Command

Note: Before sending operation instructions, first ensure that the module is in wake-up mode, otherwise it will not be able to receive configuration instructions.

6.1 Instructions

- All AT commands do not need to add carriage return (\r), line feed (\n)
- All AT commands are case sensitive
- The return result of the AT command ends with \r\n (except for the return of HEX)
- Command error response format +ERR=[NUM]. (NUM is ACSII)

6.2 Error Code

NUM	Description	wrong reason	Solution
1	Instruction does not exist	AT command characters are wrong	Check AT specified string
2	Parameter length error	1. The total length of AT command is wrong;	Check parameters
3	Invalid parameter	2. The data length exceeds the range	Check the parameter value against the command

6.3 Status printing

Status	Print information
Connection succeeded	\r\nSTA:connect\r\n
Disconnect	\r\nSTA:disconnect\r\n
System wake up	\r\nSTA:wakeup\r\n
Sleep mode	\r\nSTA:sleep\r\n

6.4 Instruction list

6.4.1 AT Test instruction

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Instruction	React
AT	**+OK**
Description: None	

6.4.2 AT+RESET reset command

Instruction	React
AT+RESET	**+OK**
Description: effective immediately	

6.4.3 AT+RESTORE restore factory command

Instruction	React
AT+RESTORE	**OK**
Description: 1、 After resetting, it will restart automatically; 2、 In the process of restoring factory settings, any form of reset is prohibited, and the power off before the operation is completed is prohibited;	

6.4.4 AT+BAUD serial port baud rate

Instruction		**React**
Inquire	**AT+BAUD?**	**+OK=[para]**
Setting	**AT+BAUD=[para]**	**+OK：Done** **+ERR=[NUM]：Error**
Parameter		

para（ASCII）	Baud rate(bps)
0	230400
1	120800
2	115200（Default）
3	760800
4	57600
5	19200
6	9600
7	4800
8	2400

Description	Restart to take effect.

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E.g.	AT+BAUD=2. Set the baud rate to 115200 HEX: 41,54,2B,42,41,55,44,3D,31,30

6.4.5 AT+PARI serial port check bit

Instruction		**React**
Inquire	**AT+PARI?**	**+OK=[para]**
Setting	**AT+PARI=[para]**	**+OK：Done** **+ERR=[NUM]：Error**
Parameter		

para(ASCII)	**Description**
0	No inspection (default)
1	Odd parity
2	Even parity

Description	Restart to take effect, save when power off
E.g.	AT+PARI=0

6.4.6 AT+DATABIT Serial data bit

Instruction		**React**
Inquire	**AT+DATABIT?**	**+OK=[para]**
Setting	**AT+PARI=[para]**	**+OK：Done** **+ERR=[NUM]：Error**
Parameter		

para(ASCII)	Description
0	5 data bits
1	6 data bits
2	7 data bits
3	7 data bits

Description	Restart to take effect, save when power off
E.g.	AT+PARI=0

Remark	Restart to take effect, save when power off Maximum string length 32bytes

6.4.7 AT+ADV broadcast enable

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<table>
<tr><th colspan="2">Instruction</th><th>React</th></tr>
<tr><td>Inquire</td><td>AT+ADV?</td><td>+OK=[para]</td></tr>
<tr><td>Setting</td><td>AT+ADV=[para]</td><td>+OK：Done
+ERR=[NUM]：Error</td></tr>
<tr><td>Parameter</td><td colspan="2"><table><tr><td>para（ASCII）</td><td>Description</td></tr><tr><td>0</td><td>Turn off broadcast</td></tr><tr><td>1</td><td>Normal broadcast (default)</td></tr><tr><td>2</td><td>iBeacon Broadcast</td></tr></table></td></tr>
<tr><td>Description</td><td colspan="2">1. Take effect immediately (if the broadcast is not turned on, or it is connected, it will take effect next time), save when power off;
2. Slave or master-slave integration supports broadcasting.</td></tr>
</table>

6.4.8 AT+ADVDAT broadcast data

<table>
<tr><th colspan="2">Instruction</th><th>React</th></tr>
<tr><td>Inquire</td><td>AT+ADVDAT?</td><td>+OK=[para]</td></tr>
<tr><td>Setting</td><td>AT+ADVDAT=[para]</td><td rowspan="2">+OK：Done
+ERR=[NUM]：Error</td></tr>
<tr><td>Setting((do not save))</td><td>AT+ADVDAT1=[para]</td></tr>
<tr><td>Parameter</td><td colspan="2">para(HEX):
1.Support ASCII, HEX
2.The length is not more than 26 bytes</td></tr>
<tr><td>Description</td><td colspan="2">● Take effect immediately (if broadcast is not turned on, or it is connected, it will take effect next time) Save when power off;
● The slave or master-slave integrated supports broadcasting, and other roles can still be configured;</td></tr>
<tr><td>E.g.</td><td colspan="2">1. Command: 41 54 2b 41 44 56 44 41 54 3d 31 32 33 34 35 36 37 38 39 30;
2. The broadcast data is: 31 32 33 34 35 36 37 38 39 30</td></tr>
</table>

6.4.9 AT+ADVINTV Broadcast gap

<table>
<tr><th colspan="2">Instruction</th><th>React</th></tr>
<tr><td>Inquire</td><td>AT+ADVINTV?</td><td>+OK=[para]</td></tr>
<tr><td>Setting</td><td>AT+ADVINTV=[para]</td><td>+OK：Done
+ERR=[NUM]：Error</td></tr>
<tr><td>Parameter</td><td colspan="2">para(ASCII):14~16384
Default：1000（1S）</td></tr>
<tr><td>Description</td><td colspan="2">1. Take effect immediately (if the broadcast is not turned on, or it will take effect next time if connected), save when power off
2. The slave or master-slave integrated supports broadcasting, other roles can still be configured;</td></tr>
</table>

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E.g.	**AT+ADVINTV=1000**

6.4.10 AT+IBCNUUID iBeacon UUID Instruction

Instruction		React
Inquire	**AT+IBCNUUID?**	**+OK=[para1]**
Setting	**AT+IBCNUUID=[para]**	**+OK：Done** **+ERR=[NUM]：Error**
Parameter	para(HEX)：16-bit UUID	
Description	1. Take effect immediately (if the broadcast is not turned on, or it will take effect next time if connected), save when power off 2. The slave or master-slave integrated supports broadcasting, other roles can still be configured;	
E.g.	Set iBeacon UUID to“FDA50693A4E24FB1AFCFC6EB07647825” 41 54 2B 49 42 43 4E 55 55 49 44 3DFDA50693A4E24FB1AFCFC6EB07647825	

6.4.11 AT+MAJOR iBeacon Major Instruction

Instruction		React
Inquire	**AT+MAJOR?**	**+OK=[para]**
Setting	**AT+MAJOR=[para]**	**+OK：Done** **+ERR=[NUM]：Error**
Parameter	para(HEX)： 0X0001-0XFFFF Default：	
Description	1. Take effect immediately (if the broadcast is not turned on, or it will take effect next time if connected), save when power off 2. The slave or master-slave integrated supports broadcasting, other roles can still be configured;	
E.g.		

6.4.12 AT+MINOR iBeacon Minor Instruction

Instruction		React
Inquire	**AT+Minor?**	**+OK=[para]**
Setting	**AT+Minor=[para]**	**+OK：Done** **+ERR=[NUM]：Error**
Parameter	para(ACSII)： 0X0001-0XFFFF Default：	
Description	1. Take effect immediately (if the broadcast is not turned on, or it will take effect next time if connected), save when power off 2. The slave or master-slave integrated supports broadcasting, other roles can still be configured;	
E.g.		

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6.4.13 AT+IPWR Modify ibeacn tx_power

Instruction		React
Inquiry	**AT+IPWR?**	**+OK=[para]**
Setting	**AT+ IPWR =[para]**	**+OK：Done** **+ERR=[NUM]：Error**
Parameter	para(HEX)： 0-0XFF Default：0	
Description	1. Take effect immediately (if the broadcast is not turned on, or it will take effect next time if connected), save when power off 2. The slave or master-slave integrated supports broadcasting, other roles can still be configured;	

6.4.14 AT+NAME Broadcast Device Name

Instruction		React
Inquiry	**AT+NAME?**	**+OK=[para]**
Setting	**AT+NAME=[para]**	**+OK：Done** **+ERR=[NUM]：Error**
Setting((do not save))	**AT+NAME1=[para]**	
Parameter	para(HEX): broadcast device name, Broadcast name is not more than 22 bytes Default: E104-BT52-V1.0	
Description	1.Take effect immediately, save when power off; 2.Only supported by the slave, other roles can still be configured;	

6.4.15 AT+DISCON Disconnect Instruction

Instruction		React
Setting	**AT+DISCON**	**+OK：Done** **+ERR=[NUM]：Error**
Disconnect all	**AT+DISCON**	**+OK：Done** **+ERR=[NUM]：Error**
Parameter		
Description	Take effect immediately.	

6.4.16 AT+MAC Local MAC Address

Instruction		React
Inquiry	**AT+MAC?**	**+OK=[para]**
Parameter	para（HEX）:MAC Address E.g：F0E1D2C3B4A5	

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Description	Take effect immediately, save when power off
E.g.	Command: AT+MAC? Return: 2B 4F 4B 3D FE 30 EE 50 35 DA Explanation: The local MAC address is FE 30 EE 50 35 DA

6.4.17 AT+BONDMAC Add Binding MAC Address

Instruction		**React**
Inquiry	**AT+BONDMAC?**	**+OK=[EN][[mac]**
Setting	**AT+BONDMAC=[EN][mac]**	**+OK Done** **+ERR=[NUM]：Error**
Parameter	**EN(HEX):** Whether to open the binding function; **mac(HEX):** 6bytes mac address;	
Description	Take effect immediately, save when power off	
E.g.	Query: AT+BONDMAC?	
	Return: B 4F 4B 3D 03 CC 34 27 1A 0C D4 3D AC 82 16 0F 58 D2 D4 C3 07 0E C4	

6.4.18 AT+AUTH Air Configuration Authentication Password

Instruction		**React**
Setting	**AT+AUTH =[para]**	**+OK：成功** **+ERR=[NUM]：错误**
Parameter	para(HEX): 6-byte password	
Description	This directive is only used for air certification. Default password: 123456	
E.g.	AT+AUTH=123456	

6.4.19 AT+UPAUTH Modify Air Authentication Password

Instruction		**React**
Inquiry	**AT+UPAUTH？**	**+OK=[para]**
Setting	**AT+UPAUTH =[para]**	**+OK：Done** **+ERR=[NUM]：Error**
Parameter	para(HEX): 6-byte password	
Description	Effective immediately. Power-down save	

6.4.20 AT+ONSLEEP Power-On Sleep

Instruction		**React**
Inquiry	**AT+ONSLEEP?**	**+OK=[para]**
Setting	**AT+ONSLEEP =[para]**	**+OK：Done**

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		+ERR=[NUM]：Error
Parameter	para（ASCII）	Description
	0	Off (default)
	1	Turn on
Description	Take effect immediately, save when power off.	

6.4.21 AT+SLEEP Sleep Instruction

Instruction		**React**
Setting	**AT+SLEEP**	**+OK**
Parameter	None	
Description	Take effect immediately	

6.4.22 AT+LOGMSG Running Status Output

Instruction		**React**
Inquiry	**AT+LOGMSG?**	**+OK=[para]**
Setting	**AT+LOGMSG =[para]**	**+OK：Done** **+ERR=[NUM]：Error**
Parameter	para（ASCII）	Description
	0	Off (default)
	1	Turn on
Description	Take effect immediately, save when power off.	

6.4.23 AT+PWR Set Output Power

Instruction		**React**
Inquiry	**AT+ PWR?**	**+OK=[para]**
Setting	**AT+ PWR =[para]**	**+OK：Done** **+ERR=[NUM]：Error**
Parameter	**para(**ASCII**)**	**val**
	0	3dBm
	1	0 dBm（Default）
	2	-3dBm
	3	-6 dBm
	4	-8 dBm

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	5	-15 dBm
Description	Take effect immediately, save when power off.	

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Chapter 7 Quick Use

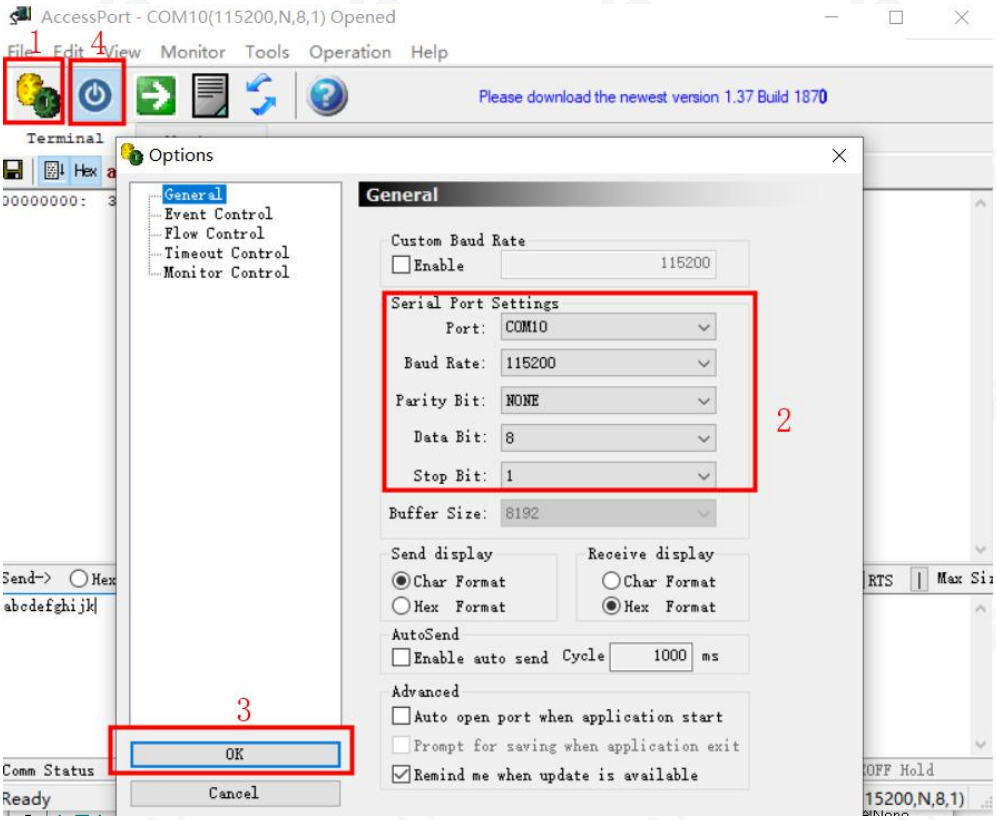
Recommended software for debugging/testing:

- C-side serial port tool-XCOM.exe;
- Mobile ble debugging APP-nRF connect.

7.1 Quick Guide to Configuration Mode

7.1.1 Serial port configuration

- Confirm whether the module is currently in configuration mode (pulling the MOD pin low to enter configuration)
- Set XCOM string related configuration (default configuration: 115200, 8, 1, none, no flow empty), as shown in the following chart:



- Configure the module according to the instructions shown in the at instruction list;

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7.1.2 Air configuration

- Open the app "BLE Test Tool", start scanning the device, and find the "E104-BT06" connection module;
- Open the fff0 service of uuid and enable the configuration channel notiy;
- Then enter the FFF3 service and send the authentication command (AT+AUTH=123456)
- As shown in the figure below, after I send the authentication command, I send the NAME query command and the module responds with OK and then my name (the response command for the air configuration channel is the same as the serial port, refer to the command table)

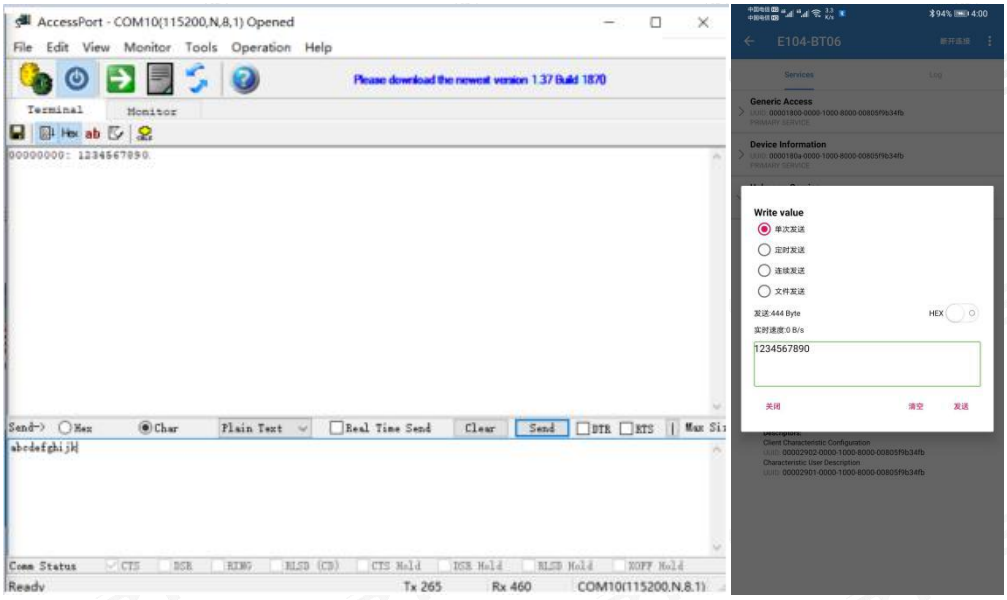


7.1.3 Data transparent transmission

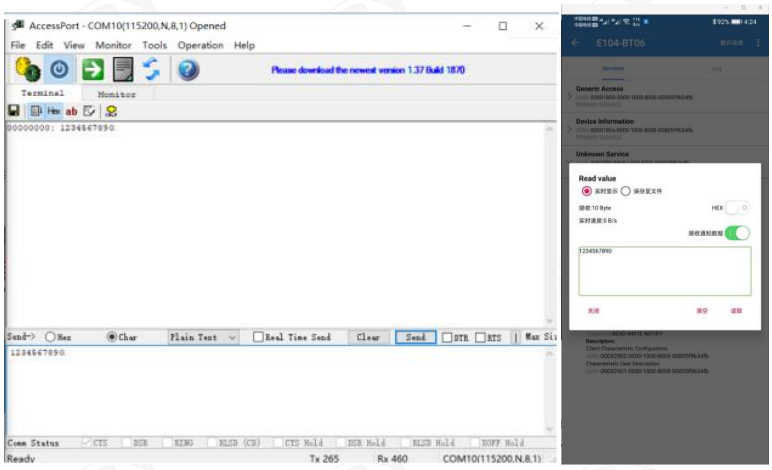
1. The module is powered on. Enable logmsg printing from the machine (AT+LOGMSG=1);
2. MODE pin is pulled high
3. The slave prints sta: connecte". The LINK pin is high.
4. The mobile phone sends the data "1234567890" to the module, and the slave receives the data as "1234567890";

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5. The effective data sent by the module to the mobile phone is "1234567890" (ASCII). . At this time, the mobile phone receives the data as "123456789" such as:



Chapter 8 Frequently Asked Questions

8.1 Insufficient transmission distance

- When there is a straight line communication obstacle, the communication distance will be attenuated accordingly;
- Temperature, humidity, and co-frequency interference will increase the communication packet loss rate;
- The ground absorbs and reflects radio waves, and the test results near the ground are poor;

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- Sea water has a strong ability to absorb radio waves, so the seaside test results are poor；
- If there is a metal object near the antenna or placed in a metal shell, the signal attenuation will be very serious;
- The power register setting is wrong, the air speed setting is too high (the higher the air speed, the closer the distance);
- The low voltage of the power supply at room temperature is lower than the recommended value, the lower the voltage, the lower the power output;
- The poor matching degree of the antenna and the module or the quality of the antenna itself.

8.2 Module is easily damaged

- Please check the power supply to ensure that it is within the recommended power supply voltage. If it exceeds the maximum value, it will cause permanent damage to the module;
- Please check the stability of the power supply, and the voltage should not fluctuate greatly and frequently;
- Please ensure anti-static operation during installation and use, and high-frequency components are electrostatically sensitive;
- 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 requirement, it is not recommended to use at too high or too low temperature.

8.3 Bit error rate is too high

- Unsatisfactory power supply may also cause garbled codes. Ensure the reliability of the power supply；

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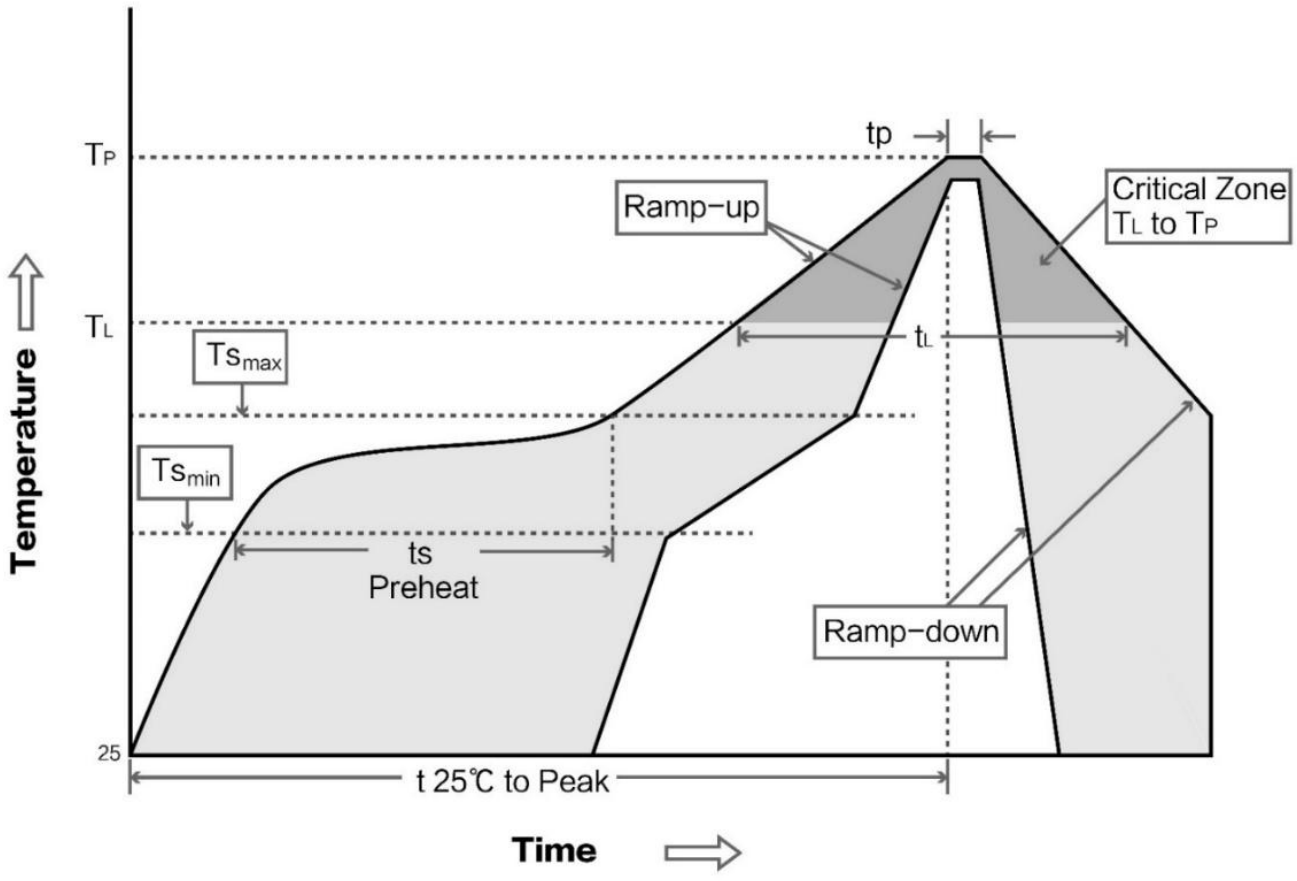
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Chapter 9 Welding Operation Guidance

9.1 Reflow Temperature

Profile Feature	Sn-Pb Assembly	Pb-Free Assembly
Solder Paste	Sn63/Pb37	Sn96.5/Ag3/Cu0.5
Preheat Temperature min （Tsmin）	100℃	150℃
Preheat temperature max (Tsmax)	150℃	200℃
Preheat Time (Tsmin to Tsmax)(ts)	60-120 sec	60-120 sec
Average ramp-up rate(Tsmax to Tp)	3℃/second max	3℃/second max
Liquidous Temperature (TL)	183℃	217℃
Time（tL）Maintained Above（TL）	60-90 sec	30-90 sec
Peak temperature（Tp）	220-235℃	230-250℃
Aveage ramp-down rate（Tp to Tsmax）	6℃/second max	6℃/second max
Time 25℃ to peak temperature	6 minutes max	8 minutes max

9.2 Reflow soldering curve



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Chapter 10 Related Models

Models	IC	Frequency Hz	Power dBm	Interface	Protocol BLE	Size mm	Antenna	Feature
E72-2G4M05S1B	CC2640	2.4G	5	I/O	4.2	17.5*28.7	PCB/IPX	Hardware resources Secondary development.
E73-2G4M04S1A	nRF52810	2.4G	4	I/O	4.2/5.0	17.5*28.7	PCB/IPX	Hardware resources Secondary development.
E73-2G4M04S1B	nRF52832	2.4G	4	I/O	4.2/5.0	17.5*28.7	PCB/IPX	Hardware resources Secondary development.
E73-2G4M08S1C	nRF52840	2.4G	8	I/O	4.2/5.0	13*18	PCB/IPX	Hardware resources Secondary development.
E73-2G4M04S1D	nRF51822	2.4G	4	I/O	4.2	17.5*28.7	PCB/IPX	Hardware resources Secondary development.
E104-BT01	CC2541	2.4G	0	I/O	4.0	14*22	PCB	Hardware resources Secondary development.
E104-BT02	DA14580	2.4G	0	TTL	4.2	14*22	PCB	Lowest power consumption High-speed continuous transmission Sniffing
E72-2G4M04S2B	CC2640	2.4G	2	TTL	4.2	14*23	PCB/IPX	Built-in ARM dual core Multi-role mode
E104-2G4U04A	CC2540	2.4G	0	USB	4.0	18*59	PCB	Dongle Protocol analyzer
E104-BT5010A	nRF52810	2.4G	0	UART	5.0	11.5 * 16	Ceramic antenna	Low power consumption, transparent transmission

Revision history

Version	Date	Description	Issued by
1.0	Initial version		Ren

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