EWD104-BT58 Series Product Specifications

Chinese-made BLE 5.3 Bluetooth Beacon with AT Commands



成都亿佰特电子科技有限公司
Chengdu Ebyte Electronic Technology Co.,Ltd.

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1. Product Overview

1.1 Product Introduction

The EWD104-BT58 series products are domestically developed Bluetooth beacons by Chengdu Ebyte Electronics Technology Co., Ltd. They comply with the BLE 5.3 protocol standard, operate in the 2402–2480MHz frequency band, support iBeacon and Eddystone, and are flexibly applicable to various systems such as iOS and Android. This series also features OTA firmware upgrades, mini-program/AT command parameter configuration, and power-off data retention. With a maximum coverage range of up to 160m, it can be used in personnel positioning, asset management, indoor positioning and navigation, and other fields .

The image below shows a sample product appearance. For detailed corresponding models and parameters, please refer to Section 2.1 of this document.



Standard Version



Waterproof Version

1. 2 Features and Functions

- Supports Apple's iBeacon, Google's Eddystone-UID, URL, TLM, and EID modes;
- Supports custom beacon company IDs;
- IP67 waterproof protection;
- Supports OTA firmware upgrades;
- Supports configuring beacon parameters using AT commands;
- Supports configuring beacon parameters in WeChat Mini Programs;
- Supports user-defined communication authentication to enhance data security and confidentiality;
- Optional versions with temperature & humidity sensor and gyroscope sensor are available.
- The product operates in low-power mode by default, enabling ultra-low power consumption and extended battery life.
- Parameters are saved after power-off, and the module resumes operation according to the configured parameters after power-on;
- Built-in watchdog automatically resets and restores operation in case of unexpected conditions;

1.3 Application Scenarios

- Indoor positioning and navigation
- Personnel positioning
- Smart store marketing

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- Smart Guide for Exhibition Halls/Museums
- Advertising/Ground Promotion
- Seamless access control, seamless attendance, and meeting check-in
- Asset Management and Theft Prevention
- Smart Home and Automation

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2. Specifications

2.1 Comparison of Product Selection Parameters

Product Model	EWD104-BT58	EWD104-BT58TH	EWD104-BT58THA	EWD104-BT58P	EWD104-BT58PA
Product Overview					
Product Category	Regular version ①	Regular version ①	Regular version ①	Waterproof version ②	Waterproof version ②
Bluetooth Standard	BLE5.3	BLE5.3	BLE5.3	BLE5.3	BLE5.3
Operating frequency band	2402～2480MHz	2402～2480MHz	2402～2480MHz	2402～2480MHz	2402～2480MHz
Temperature and humidity sensor	//	Available	Available	//	//
Accelerometer	//	//	Available	//	have
Waterproofing	//	//	//	IP67	IP67
Working life ③	3-4 years	3-4 years	3-4 years	3-4 years	3-4 years
Battery capacity	600mAh	600mAh	600mAh	600mAh	600mAh
Battery Model	CR2450	CR2450	CR2450	CR2 450	CR2450
Transmission power ④	0～8dBm	0～8dBm	0～8dBm	0～8dBm	0～8dBm
Transmission distance ⑤	160m	160m	160m	160m	160m
Broadcast cycle ⑥	1S	1S	1S	1S	1S
Power supply voltage ⑦	3.0V	3.0V	3.0V	3.0V	3.0V
Operating power consumption ⑧	≈16uA	≈16uA	≈19uA	≈16uA	≈16uA
Case Dimensions⑨	40mm(Φ)*12mm	40mm(Φ)*12mm	40mm(Φ)*12mm	42mm(Φ)*16mm	42mm(Φ)*16mm
Operating temperature ⑩	-40～+85℃	-40～+85℃	-40～+85℃	-40～+85℃	-40～+85℃
Product weight	≈17g	≈17g	≈17g	≈17g	≈17g

Note:

(1)Regular version ①: Not waterproof.

(2)Waterproof version ②: IP67 waterproof rating.

(3)Working life ③: Powered by a CR2450 button cell battery. When the battery is depleted, the user can replace it himself. For replacement instructions, please see Chapter 3 of this article .

(4)Transmit power ④: Factory default 0dBm, error range ±1dBm, power is adjustable in multiple levels. For details on power levels, please refer to 5.4.1 BLE transmit power value in this document .

(5)Transmission distance ⑤: Under good, open, and sunny conditions (for reference only; actual measurement is recommended).

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(6)Broadcast cycle ⑥ : The factory default is 1 second. Users can adjust it according to their own needs through a mini program or AT command.

(7)Power supply voltage ⑦ : Powered by a CR2450 button cell battery, with a voltage range of 1.8V to 3.6V. Exceeding 3.6V may cause permanent damage to the chip. Users can replace the battery themselves when it is depleted. For replacement instructions, please refer to Chapter 3 of this document .

(8)Operating power consumption ⑧ : Average operating power consumption, transmit power @ 0dBm, supply voltage 3.0V.

(9)Outer shell dimensions ⑨ : The error is ±0.2mm. For detailed dimensions, please see Chapter 3 of this document .

(10)Operating temperature ⑩ : Industrial grade standard.

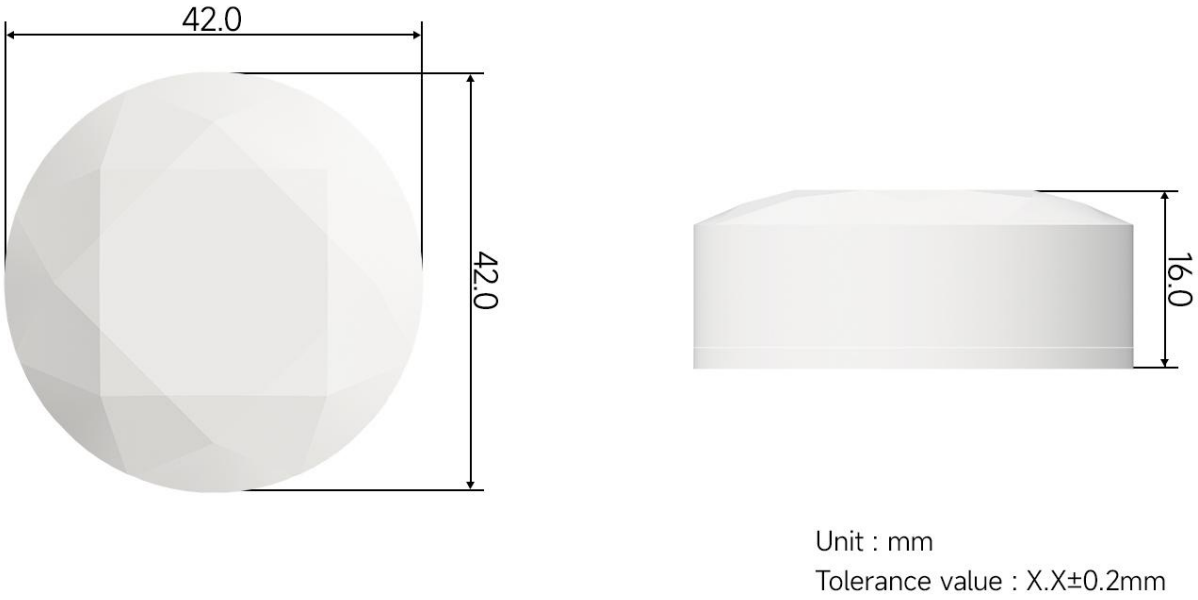
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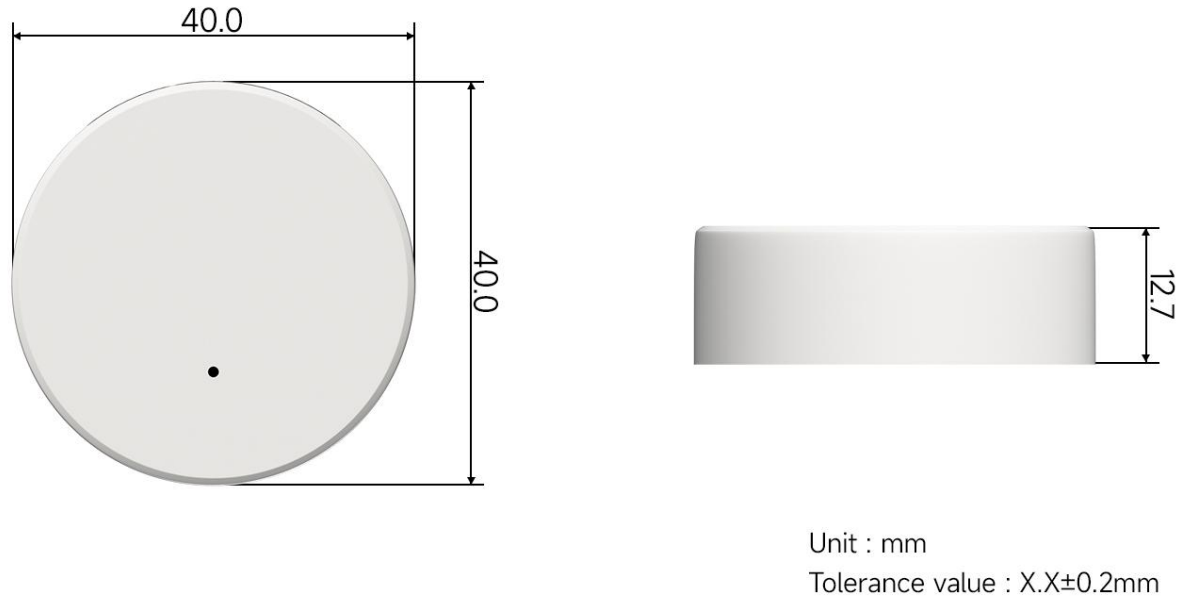
3. Mechanical dimensions

3.1 Mechanical Dimensions

3.1.1 EWD104 -BT58P & EWD104-BT58P A Dimensions



3.1.2. EWD104-BT58 & EWD104-BT58TH & EWD104-BT58THA Dimensions



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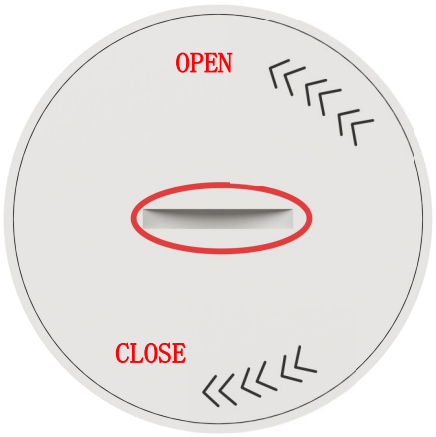
3.2. Enclosure Disassembly Details

3.2.1 EWD104-BT58P&EWD104-BT58PA



The bottom of the EWD104-BT58P and EWD104-BT58PA is marked with “OPEN” and “CLOSE” labels, along with the indicated rotation direction. When replacing the battery or disassembling the enclosure, simply rotate it according to the instructions.

3.2.2 EWD104-BT58T&EWD104-BT58TH&EWD104-BT58THA



The bottom of the EWD104-BT58, EWD104-BT58TH, and EWD104-BT58THA features a flat-head slot. Insert a coin (such as a one-yuan coin) or another suitable tool into the slot and rotate it according to the direction indicated in the figure above to open the enclosure.

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4. Functional Details

4.1 Button Functions

- Press the reset button to reset the device. For the standard version, the reset button is located in the small hole on the side of the enclosure; for the waterproof version, the enclosure must be opened to access the internal button.
- Press and hold the button for at least 1 second, then release it to restore the factory default settings.

4.2 LED Function

- Note: This feature is not available on the non-LED version; currently, only the waterproof version does not support this feature.
- A single flash during reset/power-on indicates that the device is functioning correctly.
- After a successful OTA upgrade, the system will automatically reset and flash twice upon entering the system.

4.3 BLE Function

- The factory default operation is in iBeacon mode with a 1-second broadcast cycle.
- You can scan beacons using the mobile BLE debugging assistant and receive a scan response data packet. For details on the data packet format and content, please refer to: 5.3 BLE Scan Response Data Packet .
- The beacon equipment can be configured via a WeChat mini-program.
- The QR code within the red circle in the image below is the MAC address of the Bluetooth beacon, which can be scanned using WeChat.



4.4 Quick Start

Example 1: Parameter configuration using the BLE debugging assistant.

- Connect using any BLE debugging assistant. After connecting, as shown in the image, you will see the following services.

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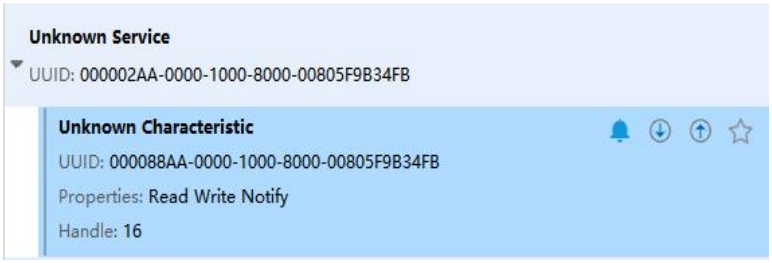
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- Please note the UUID used for AT configuration. Before configuration, notifications on the slave device must be enabled first in order to obtain the configuration information.
- For user authentication, only the key needs to be entered in ASCII format.



- OTA upgrade service.



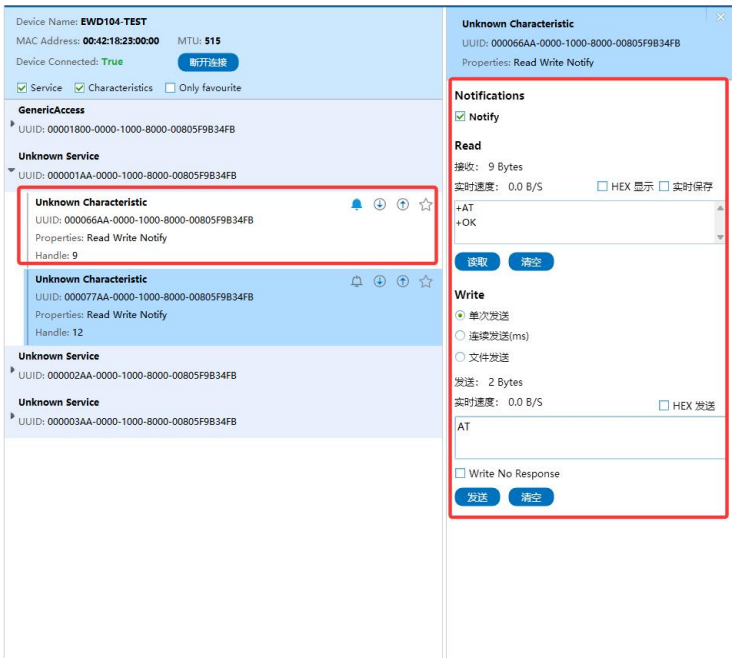
- Mini Program Configuration Service.



- AT configuration example.

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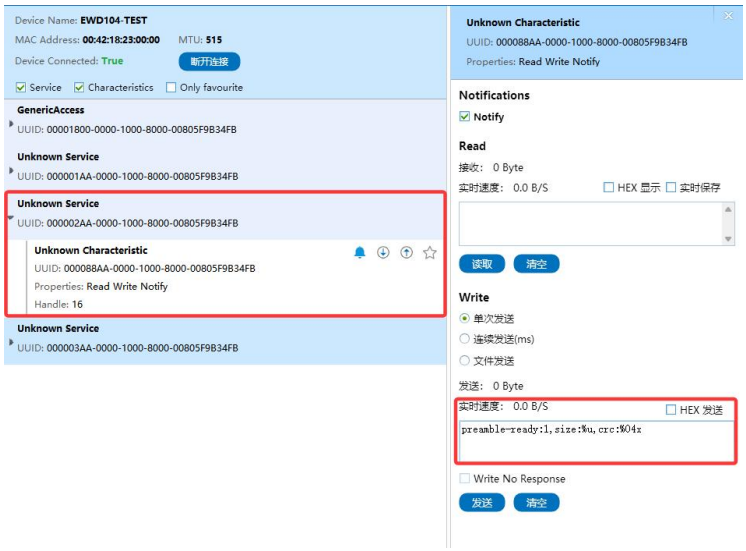
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Note: Configuration must be performed strictly according to the format specified in the command table. Please note that after sending the reset command or restore factory settings command, there will be no feedback response, as the device will reset immediately.

.

- OTA upgrade example (third-party BLE debugging upgrade is possible, self-upgrade is not recommended), it is recommended to use Ebyte WeChat mini program for OTA upgrade.



1. First, send the AT+OTA command in the AT configuration interface. After receiving the OK response, proceed with the upgrade settings in the OTA service.
2. In the characteristics of the OTA service, send the configuration information in the following format: preamble-ready:1,size:%u,crc:%04x. This information includes the firmware size and the 2-byte CRC16 checksum.

   For example:

   If the firmware size is 115200 and the CRC16 value is 0152, then the following data should be sent:

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`preamble-ready:1,size:115200,crc:0152` . Please ensure the format is correct. After the command is sent successfully, the device will respond with E108 ready, indicating that the complete BIN firmware file can now be transmitted.

Please note:
The firmware file must not be encrypted;
The maximum packet size for firmware transmission is 512 bytes;
If the last packet is smaller than 512 bytes, send it according to the actual remaining size;
After the upgrade is completed, wait for a moment until the connection disconnects automatically;
After the device resets and restarts, the LED will flash twice, indicating that the OTA upgrade was successful.

Example 2: Parameter configuration using WeChat Mini Program.

- Quick use of WeChat mini programs

1. Enable location and Bluetooth functions in WeChat, and make sure the required permissions are granted in advance. Search for the “ebyte-wireless” Mini Program and select the E104-BT58 model.



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2. After entering the main page, follow the instructions shown in the figure below for the corresponding operations. Please note that the target product of the current Mini Program is the device with the broadcast name EWD104-BT58. Please make sure not to select other Bluetooth devices. Select the device you want to connect to, tap it, and confirm the connection. Please wait patiently during the connection process.



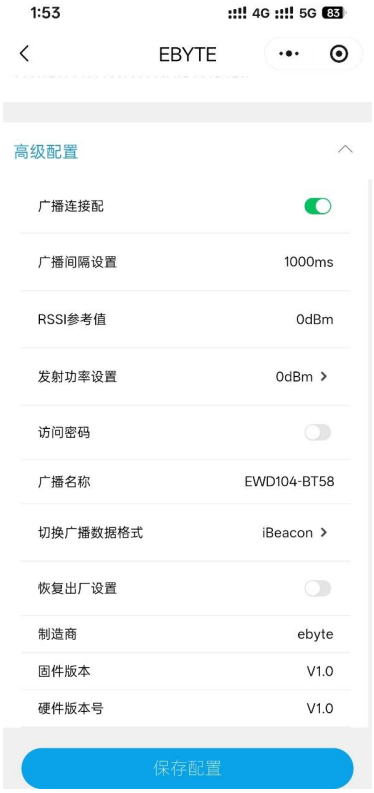
3. After a successful connection, you will see the following parameters. These parameters need to be configured according to the user manual.

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4. After setting it up, simply click "Save Configuration".



5. To perform an OTA upgrade, tap the three dots in the upper right corner of the homepage. After entering the interface shown below, tap "Select Device," then "Select File." Here, you'll need to select the firmware to

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upgrade from your WeChat contacts. Finally, tap "Start Upgrade." Keep the device powered on during the upgrade process; do not perform any other operations.





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5. AT Commands

- AT commands can be divided into two types:

Type	Instruction format	Describe
Query command	AT+[x]?	This command is used to query the current value of the returned parameter.
Setting instructions	AT+[x]=<...>	This command is used to set parameters.

Notice:

1. AT commands can only be used for parameter configuration through a BLE debugging tool or a BLE host device.

2. Not every command supports the above two command types.

3. AT commands must be entered in uppercase letters. No carriage return or line feed is required when sending commands, and command parameters are saved after power-off.

5.1 AT Command Table

Command	Function
AT	Test command to verify communication status
AT+RESET	Reset
AT+RESTORE	Factory reset parameters
AT+RSSI	Query RSSI
AT+VERSION	Query current firmware version
AT+NAME	Query/Set Device Name
AT+MAC	Query/Set Device MAC
AT+ADS	Query/Set BLE Broadcast Parameters
AT+ENCRYPT	Query/Set BLE Parameter Encryption
AT+MODE	Query/Set beacon type
AT+POWER	Query/Set Device Transmit Power
AT+AUTH	Query/Set User Authentication Parameters
AT+BEACON	Query/Set Beacon Parameters
AT+OTA	OTA upgrade
AT+EDDYSTONE	Query/Set Eddystone Parameters
AT+SENSORCYCLE	Query/Set SENSORCYCLE Parameter

Note: The instructions contain jump links; hold down Ctrl to jump to the link.

5.2 Detailed AT Commands

5.2.1 AT Communication Test

Command format	AT
Execution Example	● Send: AT ● answer: AT OK
Feature Description	

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5.2.2 AT+RESET Reset

Instruction format	AT+RESET
Execution Example	● Send: AT+RESET ● answer: +OK (may not display)
Feature Description	The broadcast count will be reset.

5.2.3 AT+RESTORE Factory Reset

Instruction format	AT+RESTORE
Execution Example	● Send: AT+RESTORE ● answer: +OK (may not display)
Feature Description	All parameters are at their default values.

5.2.4 AT+RSSI query for RSSI value

Instruction format	AT+RESTORE
Execution Example	● Send: AT+RSSI? ● answer: RSSI=-62 OK
Feature Description	Real-time 2.4G RSSI

5.2.5 Use AT+VERSION to query the firmware version number

Instruction format	AT+VERSION
Execution Example	● Send: AT+VERSION? ● answer: VERSION=V1.0 OK
Feature Description	

5.2.5 AT+NAME: Set/Query Device Name

Instruction	AT+NAME

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format	
Setup Example	Send: AT+NAME=EWD104-BT58 ● answer: +NAME OK
Query Example	● Send: AT+NAME? ● answer: +NAME=EWD104-BT58 OK
Parameter Description	Parameter: Any visible ASCII character
Feature Description	Maximum name 11 bytes

5.2.6 AT+MAC: Setting/Querying Device MAC Address

Instruction format	AT+MAC
Setup Example	● Send: AT+MAC=11:22:33:44:55:66 ● answer: +MCA OK
Query Example	● Send: AT+MAC? ● answer: +MAC=11:22:33:44:55:66 OK
Parameter Description	Parameter: 6-byte hexadecimal MAC
Feature Description	6 bytes

5.2.7 AT+ADS Setting/Querying Device Broadcast Parameters

Instruction format	AT+ADS
Setup Example	● Send: AT+ADS=1,1000 ● answer: +ADS OK
Query Example	● Send: AT+ADS? ● answer: +ADS=1,1000 OK
Parameter Description	Parameter 1: 0 - Cannot be connected; 1 - Can be connected Parameter 2: Broadcast interval, range: 20~10240 ms
Feature	Note: If ADS parameter 1 is set to "unconnectable", the device can only be

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Description	reset to connect.

5.2.8 AT+ENCRYPT setting/querying broadcast parameter encryption

Instruction format	**AT+ENCRYPT**
Setup Example	● Send: AT+ENCRYPT=1,0123456789ABCDEF ● answer: +ENCRYPT OK
Query Example	● Send: AT+ENCRYPT? ● answer: +ENCRYPT=1,0123456789ABCDEF OK
Parameter Description	Parameter 1: 0 - Disable encryption; 1 - Enable encryption Parameter 2: Key, 16-byte ASCII code
Feature Description	iBeacon's Major and Minor parameters are encrypted using XOR, with the XOR value being the last two bytes of the MAC address.

5.2.9 AT+MODE setting/querying beacon mode

Instruction format	**AT+MODE**
Setup Example	● Send: AT+MODE=0 ● answer: +MODE OK
Query Example	● Send: AT+MODE? ● answer: +MODE=0 OK
Parameter Description	Parameters: 0-iBeacon 1-UID 2-URL 3-TLM 4-EID
Feature Description	

5.2.10 AT+POWER Setting/Querying Transmit Power

Instruction format	**AT+POWER**
Setup Example	● Send: AT+POWER=0 ● answer: +POWER OK
Query Example	● Send: AT+POWER? ● answer:

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	+POWER=0 OK
Parameter Description	Parameter: Power Index Value
Feature Description	Power index value - see 3.1 BLE transmit power value for details.

5.2.11 AT+AUTH settings/queries for user authentication

Instruction format	**AT+AUTH**
Setup Example	● Send: AT+AUTH=1,30,1234 ● answer: +AUTH OK
Query Example	● Send: AT+AUTH? ● answer: +AUTH=1,30,1234 OK
Parameter Description	Parameter 1: 0 - Disable user authentication; 1 - Enable user authentication Parameter 2: Authentication timeout period, range: 10~65535 (unit: seconds) Parameter 3: Password (1~6 bytes of ASCII code)
Feature Description	The connection will be disconnected if authentication times out.

5.2.12 AT+BEACON settings/query BEACON

Instruction format	**AT+BEACON**
Setup Example	● Send: AT+BEACON=004C,1234,5678,C2,01122334455667788 99AABBCCDDEEFF0 ● answer: +BEACON OK
Query Example	● Send: AT+BEACON? ● answer: +BEACON=004C,1234,5678,C2,01122334455667788 99AABBCCDDEEFF0 OK
Parameter Description	Parameter 1: Company ID (2 bytes, 0x004C is Apple's ID) Parameter 2: Major 2-byte hex Parameter 3: Minor 2-byte hex Parameter 4: RSSI 1 byte, two's complement hex Parameter 5: UUID 16-byte hexadecimal format

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Feature Description	

5.2.13 AT+OTA Firmware Upgrade

Instruction format	**AT+VERSION**
Execution Example	● Send: AT+OTA ● answer: +OTA OK
Feature Description	For detailed usage instructions, please refer to the OTA examples in the Quick Start section.

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5.2.14 Setting/querying Google Eddystone parameters using AT+EDDYSTONE

Instruction format	AT+EDDYSTONE
Setup Example	● Send: AT+EDDYSTONE=URL,01,07,baidu ● answer: +EDDYSTONE OK
Query Example	● Send: AT+EDDYSTONE? ● answer: +EDDYSTONE =UID: ENAMESPACE,123456 =URL:01,07,baidu =TLM:01,0000,0000 =EID:ABCDEFGH OK
Parameter Description	UID: Parameter 1: Namespace - 10-byte ASCII code Parameter 2: Instance - 6-byte hex value URL: Parameter 1: URL prefix Parameter 2: URL suffix Parameter 3: 16-byte ASCII code of the URL TLM: Parameter 1: Version number, 1 byte hex Parameter 2: Battery voltage, 2 bytes hex (unit: mV) Parameter 3: Chip temperature, 2 bytes hex (unit: degrees Celsius) EID: Parameter 1: Temporary encryption identifier, 8-byte ASCII code
Feature Description	● Setting TLM parameters is not currently supported. ● For details on URL prefixes and suffixes, see section 3.2, EDDYSTONE Prefix and Suffix Index Values. ● TLM: Actual number of broadcasts = Number of broadcasts ÷ Sensor sampling period.

5.2.15 AT+SENSORCYCLE sets/queries the sensor sampling period

Instruction format	AT+BEACON
Setup Example	● Send: AT+SENSORCYCLE=10 ● answer: +SENSORCYCLE OK
Query Example	● Send: AT+SENSORCYCLE? ● answer: +SENSORCYCLE=10

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	OK
Parameter Description	Parameter 1: 1~65535
Feature Description	The parameter represents how many broadcast cycles the sensor uses to sample. For example, if the parameter is 10, the sensor will sample every 10 broadcast cycles. (Note: In sensorless versions, this parameter is only used for periodically sampling battery voltage and chip temperature; the longer the cycle, the lower the power consumption .)

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5.3 BLE Scan Response Data Packet

- By default, the device's advertising packet content follows the iBeacon / Eddystone protocol format.

5.3.1 Response packet data format (without sensors)

- For devices without sensors, the default data format of the corresponding advertising response packet is shown below, where the Service Data (Type: 0xFF) field contains the MAC address.

Len	Type	Data	Len	Type	Data						
0x0C	0x09	Name data	0x11	0xFF	0x1803	MAC	0x1234	0x4567	06	0x03E8	0x51
Broadcast name length 1 byte	Broadcast type 1 Byte	Name 11 Byte	Service data length 1 byte	Broadcast type 1 Byte	UUID 2 Byte	Device MAC address 6 bytes	Major 2 Byte	Minor 2 Byte	Emission probability index value 1 Byte	Broadcast interval 2 bytes	Battery voltage percentage 1 Byte

5.3.2 Response packet data format (with sensor)

- The service data (Type: 0xFF) field is 4542 13 00 FAC0 E480 39C0 1624 1034 51, which can be parsed according to the data format in the table below:
  - ▶Manufacturer ID: 0x4542;
  - ▶Device connectivity indicators: 0x13 - Connectable / 0x12 - Not Connectable;
  - ▶Whether the broadcast is encrypted: 0 - No / 1 - Yes;
  - ▶Raw gyroscope data: 0xFAC0E48039C0;
  - ▶Temperature and humidity sensor data: 0x16241034. When the ambient temperature is below zero, the highest bit of the temperature data is 1, indicating a negative temperature. The remaining bits are represented using two's complement.
  - ▶Battery level: 0x51, which is 81%.

(Note : For temperature and humidity, the first byte is the integer part and the second byte is the decimal part; for gyroscope data, the high byte comes first and the low byte comes last. If there is no sensor, the corresponding position data is 0.)

Len	Type	Data	Len	Type	Data								
0x0C	0x09	Name data	0x10	0xFF	0x4542	logo	logo	X-axis	Y-axis	Z-axis	temperature	humidity	Battery power
Broadcast name length 1 byte	Broadcast type 1 Byte	Name 11 Byte	Custom vendor data length 1 byte	Broadcast type 1 Byte	Manufacturer ID 2 Byte	Connectable identifier	Broadcast encryption identifier	Number of accelerometer sensors According to (6 bytes), X, Y, and Z each occupy 2 bytes			Temperature and humidity sensor Device data (4 characters) (section), temperature and Humidity		Battery voltage percentage 1 Byte

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									accounts for 2 bytes	

5.4 Parameter Supplement

5.4.1 BLE Transmit Power Value

Power level (dBm)
8
7
6
5
4
3
2
1
0

5.4.2 EDDYSTONE prefix and suffix index values

Prefix	
0x00	http://www.
0x01	https://www.
0x02	http://
0x03	https://
Suffix	
0x00	.com/
0x01	.org/
0x02	.edu/
0x03	.net/
0x04	.info/
0x05	.biz/
0x06	.gov/
0x07	.com
0x08	.org
0x09	.edu
0x0A	.net
0x0B	.info
0x0C	.biz
0x0D	.gov

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0x0E~0x20	reserve
0x7F~0xFF	reserve

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5.5 Precautions

- The device will not enter a low-power state while connected; in this state, power consumption is at its highest. Therefore, it is necessary to disconnect the device as soon as possible after configuration to save power.
- Pressing the button resets the device; the LED flashes once. Pressing and holding the button for 1 second and then releasing it restores the device to factory settings; the LED lights up for 1 second and then turns off (waterproof version has no LED).
- Indicator light description: If the LED flashes multiple times after power-on/reset/factory reset (3 times for each sensor, excluding one flash during normal power-on and one flash after OTA), it indicates a sensor malfunction.
- The device operates at a default transmit power of 0dBm, with a default broadcast period of 1 second and a default sensor sampling period of 10 broadcast periods (e.g., if the broadcast period is 1 second, then the sensor sampling period is 10 seconds).
- If a command has parameters that involve ASCII codes, English commas and spaces cannot be used as parameters.
- During OTA upgrades, a stable power supply must be maintained and the device should not be operated to avoid abnormalities that could brick the device.

5.6 Error Code

Code	Illustrate	Example	Remark
1	Instruction error	+MAC +ERR=3	An attribute error indicates that the current instruction is neither writable nor readable.
2	Attribute error		
3	Parameter error		

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Revision History

Version	Revision Date	Revision Notes	maintainer
V1.0	2026-5-18	first edition	Hao

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Address: B5 Mould Industrial Park, 199# Xiqu Ave, High tech Zone, Chengdu, Sichuan, China

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