

HC-08 and CC41-A is the copycat
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JNHuaMao Technology Company

Dual mode Bluetooth module

Datasheet

- 2 Professional bluetooth products suppliers.
- 2 Remote control module provider
- 2 data transmission module provider
- 2 PIO state acquisition module provider
- 2 Customizable bluetooth module and bluetooth solutions
- 2 Jinan high and new technology enterprise
- 2 SIG members

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**The most complete, most convenient, the most stable of
Bluetooth data transmission, remote control, PIO state
collects modules**

---- Master and slave role in one

---- Remote control without other MCU

---- The PIO state collects without other MCU

13. Product parameters

- Ø BT Version: Bluetooth Specification V4.0 & BLE
- Ø UART send and receive max bytes is 512.
- Ø Other device to module in SPP mode: 90 Bytes per packet
- Ø Other device to module in BLE mode: 20 Bytes per packet.
- Ø Two data transmission mode, balance mode and high speed mode.
- Ø Working frequency: 2.4GHz ISM band
- Ø Modulation method: GFSK(Gaussian Frequency Shift Keying)
- Ø RF Power: -23dbm, -6dbm, 0dbm, 6dbm.
- Ø Speed: Asynchronous: 3K Bytes
Synchronous: 3K Bytes
- Ø Security: Authentication and encryption
- Ø Service: Slave SPP, Peripheral BLE, UUID FFE0,FFE1
- Ø Power: +3.3VDC 50mA
- Ø Long range: SPP 30 meters, BLE 60 meters.
- Ø Power: SPP 13.5mA, BLE 9.5mA.
- Ø Working temperature:-5 ~ +65 Centigrade
- Ø Size: HM-12 26.9mm x 13mm x 2.2 mm;
- Ø Size: HM-13 18 x 13.5 x 2.2mm

2. Product overview

Thanks for you choose our products. If you want to know more, www.jnhuamao.cn or www.huamaosoft.com can help you (Videos, New version datasheet, Module work flow, project Codes, etc.)

HM dual mode bluetooth module use CSR dual mode chip and nuvoton MCU.

Support SPP and BLE dual mode at same time.

HM-01, HM-02, HM-09, HM-10, HM-12 have same size and same pins.

HM-05, HM-06, HM-07, HM-11, HM-13 have same size and same pins.

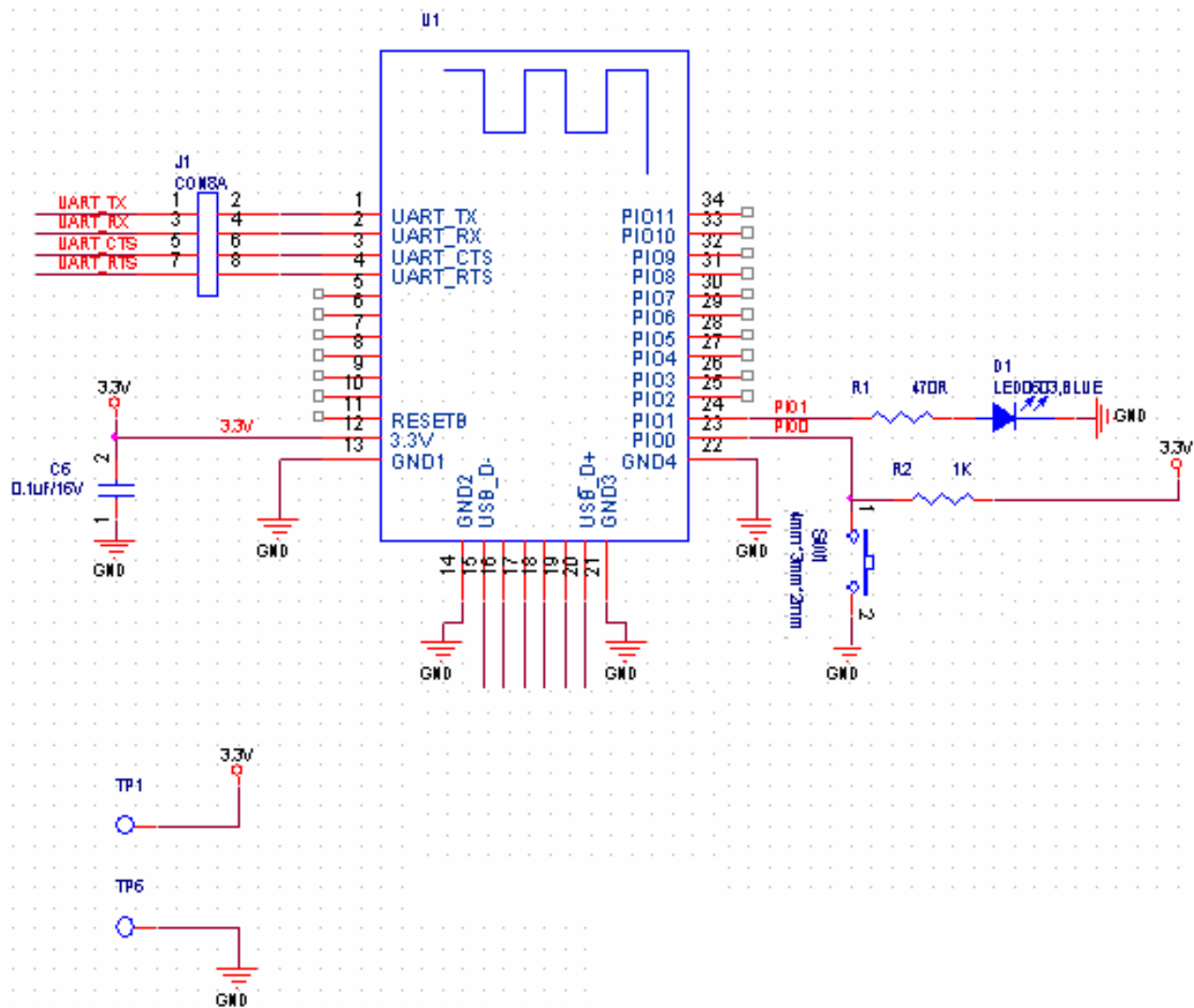
3. Product model

Models	VDD	Size(mm)	Flash	Chip	BT Version
HM-12	2.5-3.7V	13*28*2.2	64KB		V4.0 & BLE
HM-13	2.5~3.7V	13.5*18*2.2	64KB		V4.0 & BLE

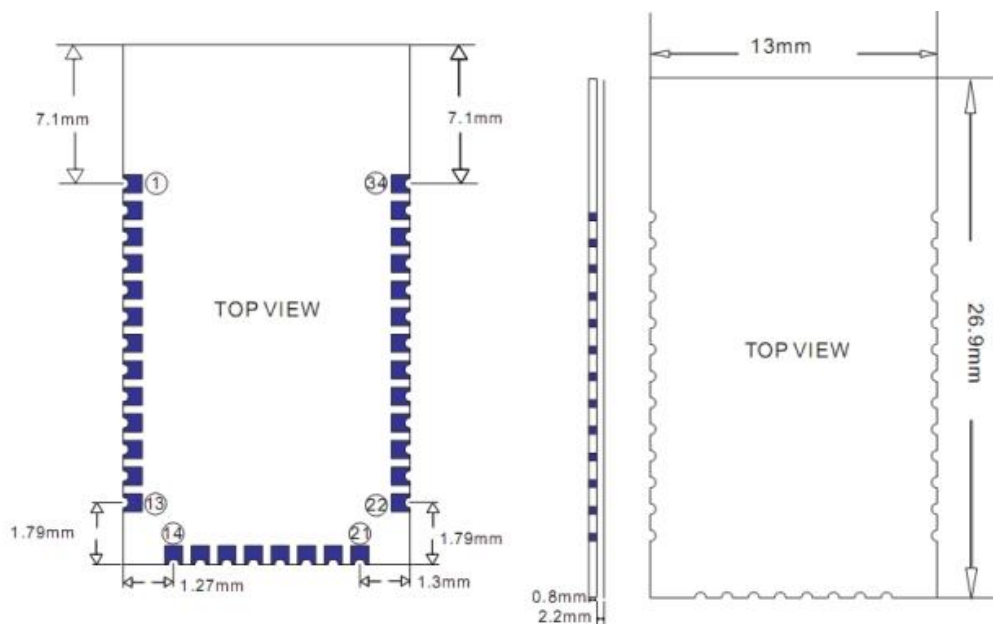
4. Product technical specifications

This document only include dual mode bluetooth module document, You can visit www.jnhuamao.cn or www.huamaosoft.com get Bluetooth V2.1 version or Bluetooth BLE datasheet.

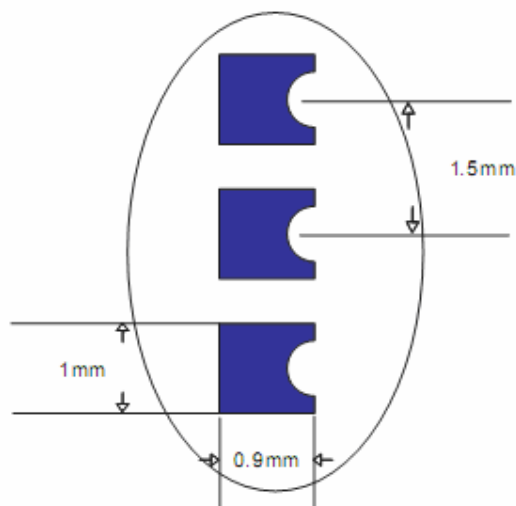
6.1 HM-12 Schematic



6.2 HM-12 Size



6.3 HM-12 package information



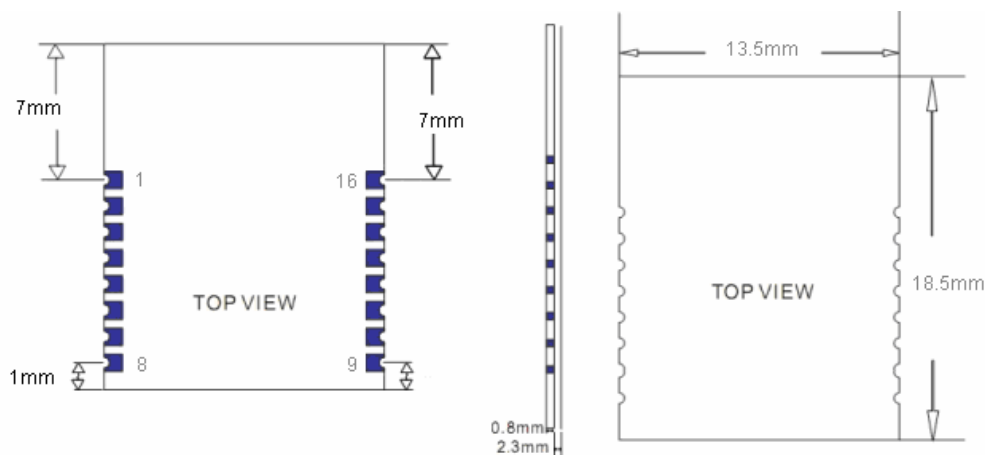
6.4 HM-10 Device Terminal Functions

No	Name	Description	Note
1	UART_TX	UART interface	
2	UART_RX	UART interface	
3	UART_CTS	UART interface	

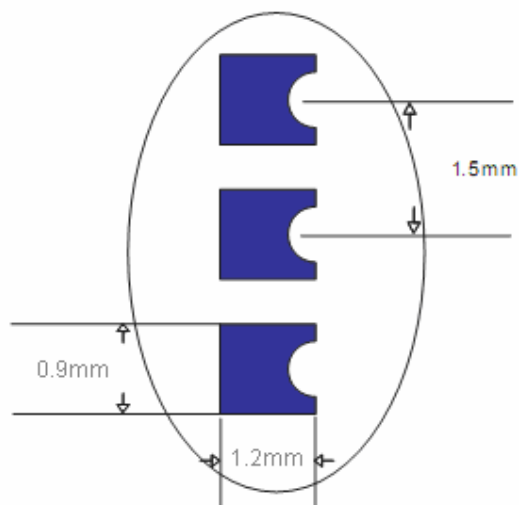
4	UART_RTS	UART interface	
5	NC	NC	
6	NC	NC	
7	NC	NC	
8	NC	NC	
9	NC	NC	
10	NC	NC	
11	RESETB	Reset if low >1000ms.	
12	VCC	3.3V	
13	GND	Ground	
14	GND	Ground	
15	NC	NC	
16	NC	NC	
17	NC	NC	
18	NC	NC	
19	NC	NC	
20	NC	NC	
21	GND	Ground	
22	GND	Ground	
23	PIO0	System Key	
24	PIO1	System LED	
25	PIO2	input/output pin	
26	PIO3	input/output pin	
27	PIO4	input/output pin	
28	PIO5	input/output pin	
29	PIO6	input/output pin	
30	PIO7	input/output pin	
31	PIO8	input/output pin	
32	PIO9	input/output pin	

33	PIO10	input/output pin	
34	PIO11	input/output pin	

6.5 HM-13 Size



6.6 HM-13 Package information



6.7 HM-13 Device Terminal Functions

No	Name	Description	Note
1	UART_RTS	UART interface	
2	UART_TX	UART interface	

3	UART_CTS	UART interface	
4	UART_RX	UART interface	
5	NC	NC	
6	NC	NC	
7	NC	NC	
8	NC	NC	
9	VCC	V3.3	
10	NC	NC or VCC	
11	RESETB	Reset if low <1000ms	
12	GND	Ground	
13	PIO3	input/output pin	
14	PIO2	input/output pin	
15	PIO1	System LED	
16	PIO0	System KEY	

7. System function

System KEY function (PIO0) (Add in V208)

Press if Low > 1000ms:

7.3.1 If Module has already connected to remote device

Module will disconnect from remote device.

7.3.2 If Module is standby mode

Module will reset to default configuration. Then restart.

System MAC address

Each dual mode module contains two IEEE addresses, like follow:

00: 0E: 0E: XX: XX: XX (00: 0E: 0E is SPP address)

00: 0E: 0B: XX: XX: XX (00: 0E: 0B is BLE address)

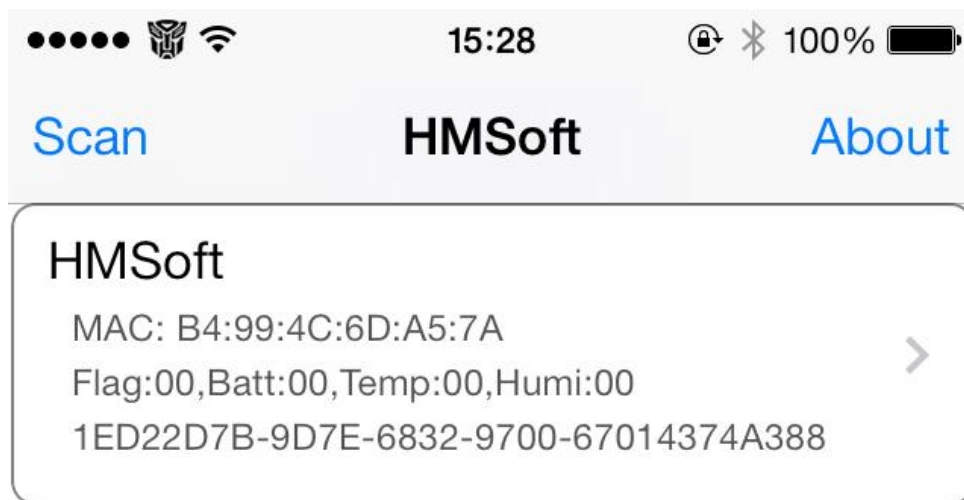
In BLE mode, we also put address information into the advert package.

Under iOS, you can use `CBAvertisementDataManufactureDataKey` property to get it, string format like follow:

0x48, 0x4D, 0x00, 0x0E, 0x0B, 0xXX, 0xXX, 0xXX

0x48 and 0x4D is "HM" string.

0x00: 0x0E: 0x0B: 0xXX: 0xXX: 0xXX is BLE MAC Address.



System LED function (PIO1)

If "AT+PIO10" is setup

Unconnected status: Output High 500 ms, Low 500 ms

Connected status: Output High

If AT+PIO11 is setup

Unconnected status: Output Low.

Connected status: Output High.

8. AT Commands

Factory default setting:

EDR Name HMSoft, Slave role, PinCode 1234

BLE Name HMSoft, Slave role, PinCode 000000

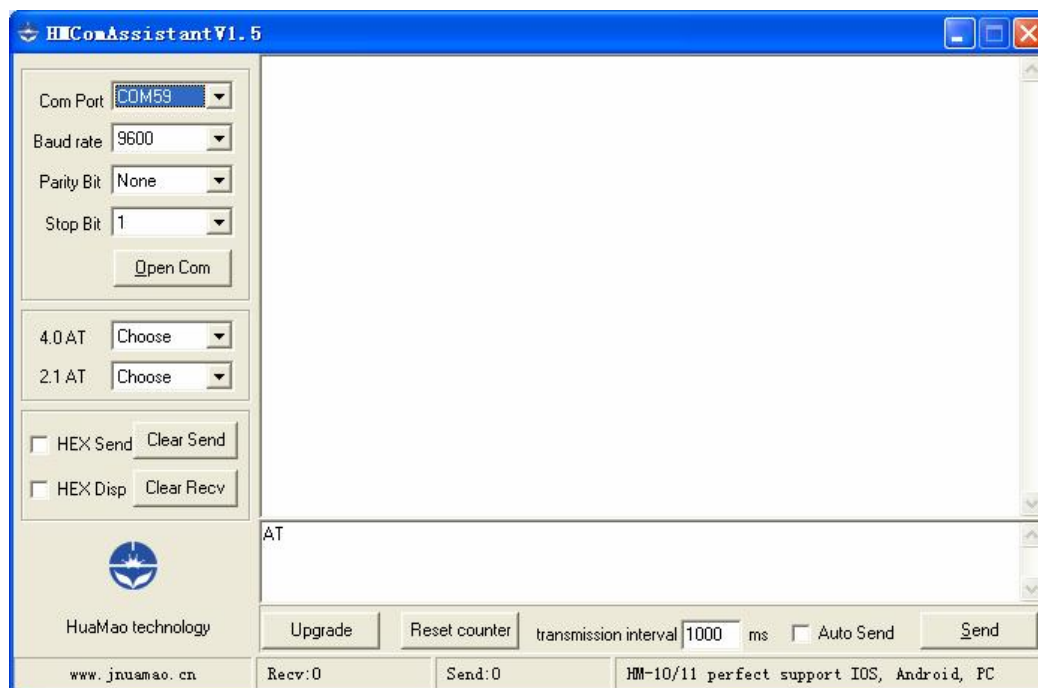
Baud: 115200, N, 8, 1;

Before V216: Key function is open as default settings. You must pull up.

Since V216: Key function is off as default settings. PIO0 could be NC.

AT Command format:

Uppercase AT command format. string format, without any other symbol. (e.g. \r or \n).



1. Test Command

Send	Receive	Parameter
AT	OK/ER/Disconnect link	None

If module is not connected to remote device will receive: "OK"

If module has an error, will receive: "ER"

If Module has connected, module will disconnected from remote device, if "AT + NOTI" is setup to 1, will receive information string

2. Query module EDR address

Send	Receive	Parameter
AT+ADDE?	OK+ Get: MAC	None

3. Query module BLE address

Send	Receive	Parameter
AT+ADDB?	OK+ Get: MAC	None

3. Query/Set Authentication mode

Send	Receive	Parameter
Q: AT+AUTH?	OK+ Get:[P1]	P1: 0, 1, (Default: 0) 0 – Not authentication 1 – Must authentication
S: AT+AUTH[P1]	OK+ Set:[P1]	

AT+AUTH0: allow made an insecure connection.

AT+AUTH1: every connection must with authentication.

4. Query/Set A to B mode

Send	Receive	Parameter
Q: AT+ATO B?	OK+ Get:[P1]	P1: 0, 1, (Default: 0) 0 – Not Open ATOB 1 – Open ATOB mode
S: AT+ATO B[P1]	OK+ Set:[P1]	

This command must work with AT+MODE0(In V209 AT+MODE command change to AT+DUAL command) command.

When A device (SPP mode) connect to the module and B device (BLE mode) is also connect to the module, The data string from A device send to the

module will send to B device. The data string from B device send to the module is also send to the A device.

5. Query/Set baud rate

Send	Receive	Parameter
Q: AT+BAUD?	OK+ Get:[P1]	P1: 1~7, (Default: 6). 1 - 4800 2 - 9600 3 - 19200 4 - 38400 5 - 57600 6 - 115200 7 - 230400
S: AT+BAUD[P1]	OK+ Set:[P1]	

e.g.

Query baud:

Send: AT+BAUD?

Receive: OK+Get:0

Setup baud:

Send: AT+BAUD1

Receive: OK+Set:1

6. Clear bond information

Send	Receive	Parameter
AT+BONDE	OK+BONDE	Clear EDR bond info
AT+BONDB	OK+BONDB	Clear BLE bond info

BLE mode not supports it yet.

7. Clear Last Connected EDR Device Address

Send	Receive	Parameter
AT+CLEAE	OK+CLEAE	None

* Added in V211

8. Clear Last Connected BLE Device Address

Send	Receive	Parameter
AT+CLEAB	OK+CLEAB	None

* Added in V211

9. Query/Set Module DUAL Work Mode

Send	Receive	Parameter
Q: AT+DUAL?	OK+ Get:[P1]	P1: 0, 1, (Default: 0) 0 – Allow dual connect. 1 – Allow one connect.
S: AT+DUAL[P1]	OK+ Set:[P1]	

AT+DUAL0: allow two connections at same time (SPP and BLE).

AT+DUAL1: Only allow one connection at same time (SPP or BLE)

AT+ATOB command must work with AT+DUAL0 in V209 version.

This command added in V208.

10. Query/Set hardware flow control switch

Send	Receive	Parameter
AT+FIOW?	OK+ Get:[P1]	P1: 0, 1,(Default: 0) 0: Hardware flow control off 1: Hardware flow control on
AT+FIOW[P1]	OK+ Set:[P1]	

Add since V211.

11. Query/Set module data transmission speed mode

Send	Receive	Parameter
AT+HIGH?	OK+ Get:[P1]	P1: 0, 1,(Default: 0) 0: Balance mode 1: High speed mode
AT+HIGH[P1]	OK+ Set:[P1]	

In balance mode, we balanced SPP and BLE with a steady speed.

In high speed mode, we don't control speed, so SPP mode will got high speed.

In high speed mode, module lost RESETB pin function, but you still could use "AT+RESET" command to reset module.

Add since V212.

12. System Help Information

Send	Receive	Parameter
AT+HELP?	Help Information	None

13. Query/Set module EDR work type

Send	Receive	Parameter
AT+IMME?	OK+ Get:[P1]	P1: 0, 1,?, (Default: 0)
AT+IMME[P1]	OK+ Set:[P1]	0: Automatic work 1: Use AT+STARE start work

This command will take effect after next power on.

If AT+IMME1 setup, the module will start work until receive AT+STARE.

Added in V301 .

14. Query/Set module BLE work type

Send	Receive	Parameter
AT+IMMB?	OK+ Get:[P1]	P1: 0, 1,?, (Default: 0)
AT+IMMB[P1]	OK+ Set:[P1]	0: Automatic work 1: Use AT+STARB start work

This command will take effect after next power on.

If AT+IMMB1 setup, the module will start work until receive AT+STARB.

Added in V301 .

15. Query/Set module loaded notify

Send	Receive	Parameter
AT+INIT?	OK+ Get:[P1]	P1: 0, 1,?, (Default: 0)
AT+INIT[P1]	OK+ Set:[P1]	0: Loaded notify Off 1: Loaded notify on

When “AT+INIT1” is setup, after module loaded, module will output “OK+INIT” string through UART.

Added in V211 .

16. Query/Set Module iBeacon switch

Send	Receive	Parameter
AT+IBEA?	OK+Get:[P1]	P1: 0, 1

AT+IBEA[P1]	OK+Set:[P1]	0: Turn off iBeacon 1: Turn on iBeacon Default: 0
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Default iBeacon UUID is: 74278BDA-B644-4520-8F0C-720EAF059935.

This command is added since V309 version.

17. Query/Set iBeacon UUID

Send	Receive	Parameter
AT+IBE0?	OK+Get:[P1]	P1: 00000001~ FFFFFFFFE Default: 74278BDA
AT+IBE0[P1]	OK+Set:[P1]	

iBeacon UUID is: **74278BDA**-B644-4520-8F0C-720EAF059935.

This command can change red color string in iBeacon UUID.

This command is added since V309 version.

e.g.: Send: AT+IBE012345678 to change iBeacon UUID red color string to “12345678”

18. Query/Set iBeacon UUID

Send	Receive	Parameter
AT+IBE1?	OK+Get:[P1]	P1: 00000001~ FFFFFFFFE Default: B6444520
AT+IBE1[P1]	OK+Set:[P1]	

iBeacon UUID is: 74278BDA-**B644-4520**-8F0C-720EAF059935.

This command can change red color string in iBeacon UUID.

This command is added since V309 version.

e.g.: Send: AT+IBE112345678 change iBeacon UUID red color string to “12345678”

19. Query/Set iBeacon UUID

Send	Receive	Parameter
AT+IBE2?	OK+Get:[P1]	P1: 00000001~ FFFFFFFFE
AT+IBE2[P1]	OK+Set:[P1]	

		Default: 8F0C720E
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iBeacon UUID is: 74278BDA-B644-4520-8F0C-720EAF059935.

This command can change red color string in iBeacon UUID.

This command is added since V309 version.

e.g.: Send: AT+IBE112345678 change iBeacon UUID red color string to "12345678"

20. Query/Set iBeacon UUID

Send	Receive	Parameter
AT+IBE3?	OK+Get:[P1]	P1: 00000001~
AT+IBE3[P1]	OK+Set:[P1]	FFFFFFFE Default: AF059935

iBeacon UUID is: 74278BDA-B644-4520-8F0C-720EAF059935.

This command can change red color string in iBeacon UUID.

This command is added since V309 version.

e.g.: Send: AT+IBE112345678 change iBeacon UUID red color string to "12345678"

21. Query/Set Module iBeacon Marjor version

Send	Receive	Parameter
AT+MARJ?	OK+Get:[P1]	P1: 0001~FFFE
AT+MARJ[para1]	OK+Set:[para1]	Default: FFE0

E.g. Change marjor version to 0102

Send: AT+MARJ0102, if all is okay, module will send back OK+Set: 0102

This command is added since V309 version.

22. Query/Set Module iBeacon minor

Send	Receive	Parameter
AT+MINO?	OK+Get:[P1]	P1: 0001~FFFE
AT+MINO[P1]	OK+Set:[P1]	Default: FFE1

This command is added since V309 version.

23. Query/Set Module iBeacon Measured power

Send	Receive	Parameter
AT+MEAS?	OK+Get:[P1]	P1: 00~FF
AT+MEAS[P1]	OK+Set:[P1]	Default: C5

This command is added since V309 version.

24. Query/Set Module Work Mode

Send	Receive	Parameter
Q: AT+MODE?	OK+ Get:[P1]	P1: 0, 1, (Default: 0)
S: AT+MODE[P1]	OK+ Set:[para1]	0 – Data transmission. 1 – Remote control.

AT+MODE0: Only transfer data when connection establishment.

AT+MODE1: Transfer data and response AT commands.

This command is changed in V209. Before V209 this command is used to change DUAL work mode(please see AT+DUAL command).

25. Query/Set Notify information

Send	Receive	Parameter
Q: AT+NOTI?	OK+ Get:[P1]	P1: 0, 1, (Default: 0)
S: AT+NOTI[P1]	OK+ Set:[P1]	0: Don't Notify 1: Notify

After AT+NOTI1, module will send connect or disconnect string through UART when module state is change:

OK+CONE ===== EDR connect

OK+LSTE ===== EDR disconnect

OK+CONB===== BLE connect

OK+LSTB ===== BLE disconnect

OK+LSTA ===== except disconnect, module will reset after 500 ms.

26. Query/Set notify mode

Send	Receive	Parameter
Q: AT+NOTP?	OK+ Get[P1]	P1: 0, 1; default: 0
Q: AT+NOTP[P1]	OK+ Set[P1]	0: without address

		1: with address
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This command must work with “AT+NOTI1”, if this switch is open, when the module connect to disconnect, the prompt string will include the remote address.

OK+CONB:001122334455, OK+LSTB:001122334455

OK+CONE:001122334455, OK+LSTE:001122334455

Added since V213

27. Query/Set Module EDR name

Send	Receive	Parameter
Q: AT+NAME ?	OK+ Get:[P1]	P1: module EDR name, Max length is 12. Default: HMSoft
Q: AT+NAME[P1]	OK+ Set:[P1]	

e.g.

change module name to bill_gates

S: AT+NAMEbill_gates

R: OK+Set:bill_gates

28. Query/Set Module BLE name

Send	Receive	Parameter
Q: AT+NAMB?	OK+ Get:[P1]	P1: module BLE name, Max length is 12. Default: HMSoft
S: AT+NAMB[P1]	OK+ Set:[P1]	

29. Query/Set PIO0 function (System Key)

Send	Receive	Parameter
Q: AT+PIO0?	OK+ Get:[P1]	P1: 0, 1,(default: 0) 0: Key function is off. 1: Key function is open.
S: AT+ PIO0[P1]	OK+ Set:[P1]	

Added since V216

30. Query/Set PIO1 output status (System LED)

Send	Receive	Parameter

Q: AT+PIO1?	OK+Get:[P1]	P1: 0, 1 0: Unconnected Output 500ms High 500ms Low, Connected output High. 1: Unconnected output Low, Connected output High. Default: 0
S: AT+ PIO1 [P1]	OK+Set:[P1]	

31. Query/Set PIO output status

Send	Receive	Parameter
Q: AT+PIO[P1]?	OK+ Get:[P1][P2]	P1: 2~B (HM-12)
S: AT+ PIO[P1][P2]	OK+ Set:[P1][P2]	P2: 2~3 (HM-13) 0: Output Low 1: Output High ?: Query

Note: Add in V209

32. Query/Set EDR Pin Code

Send	Receive	Parameter
Q: AT+PINE?	OK+ Get:[P1]	P1: module EDR Code
S: AT+PINE[P1]	OK+ Set:[P1]	Max length: 6 Default: 1234

33. Query/Set BLE Pin Code

Send	Receive	Parameter
Q: AT+PINB?	OK+ Get:[P1]	P1: module BLE Code
S: AT+PINB[P1]	OK+ Set:[P1]	000000~999999 Default: 000000

34. Query/Set UART parity bit

Send	Receive	Parameter
Q: AT+PARI?	OK+ Get:[P1]	P1: 0, 1, 2, (Default: 0)

S: AT+PARI[P1]	OK+ Set:[P1]	0: Parity None 1: Parity even 2: Parity odd
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Added in V211.

35. Restore all setup value to factory setup

Send	Receive	Parameter
AT+RENEW	OK+RENEW	None

36. Restart module

Send	Receive	Parameter
AT+RESET	OK+RESET	None

37. Query BLE RSSI value

Send	Receive	Parameter
AT+RSSB?	OK+RSSB: [P1]	P1: RSSI value 9999: No connection 9998: Try later 9997: Read error Xxxx: RSSI value

This command must use after "AT+MODE1" is setup.

This command is only used by remote Bluetooth device.

Added in V215

38. Query EDR RSSI value

Send	Receive	Parameter
AT+RSSE?	OK+RSSE: [P1]	P1: RSSI value 9999: No connection 9998: Try later 9997: Read error Xxxx: RSSI value

This command must use after "AT+MODE1" is setup.

This command is only used by remote Bluetooth device.

Added in V215

39. Query Last Connected EDR Device Address

Send	Receive	Parameter
AT+RADE?	OK+Get:MAC Address	None

Added in V211

40. Query Last Connected BLE Device Address

Send	Receive	Parameter
AT+RADB?	OK+ Get:MAC Address	None

Added in V211

41. Query/Set Master and Slaver Role

Send	Receive	Parameter
AT+ROLB?	OK+ Get:[P1]	P1: 0, 1 (default: 0) 0: Peripheral 1: Central
AT+ROLB[P1]	OK+ Set:[P1]	

This command will take effect after module next power on or reset.

Added in V214

42. EDR start work command

Send	Receive	Parameter
Q: AT+STARE	OK+ STARE	NONE

This command is sub command of AT+IMME1.

This command will let module start work.

Added in V301

43. BLE start work command

Send	Receive	Parameter
Q: AT+STARB	OK+ STARB	NONE

This command is sub command of AT+IMMB1.

This command will let module start work.

Added in V301

44. EDR stop work command

Send	Receive	Parameter
Q: AT+STOPE	OK+ STOPE	NONE

This command is sub command of AT+IMME1.

This command will let module pause work.

Added in V304

45. BLE start work command

Send	Receive	Parameter
Q: AT+STOPB	OK+ STOPB	NONE

This command is sub command of AT+IMMB1.

This command will let module pause work.

Added in V304

46. Query/Set EDR Advert type

Send	Receive	Parameter
Q: AT+SCAN?	OK+ Get:[P1]	P1: 0, 1, (Default: 0) 0: Discovery and connectable 1: Only connectable
S: AT+SCAN[P1]	OK+ Set:[P1]	

47. Query/Set UART stop bit

Send	Receive	Parameter
Q: AT+STOP?	OK+ Get:[P1]	P1: 0, 1, (Default: 0) 0: 1 stop bit 1: 2 stop bits
S: AT+STOP[P1]	OK+ Set:[P1]	

Added in V211

48. Query Software Version

Send	Receive	Parameter
AT+VERR? AT+VERS?	Version Information	None