



Model: HM-10

Tinysine Bluetooth 4.0 BLE module

User Manual



Tinysine Electronics © 2014
Version 1.0

INTRODUCTION

The most complete, most convenient, the most stable of Bluetooth data transmission, remote control, PIO acquisition module

- Master and slave role in one
- Remote control without other MCU
- The PIO data acquisition without other MCU

SPECIFICATIONS

- BT Version: Bluetooth Specification V4.0 BLE
- Send and receive no bytes limit
- Working frequency: 2.4GHz ISM band
- Modulation method: GFSK(Gaussian Frequency Shift Keying)
- RF Power: 0.01mw-5mw, can modify through AT Command AT+POWE
- Speed: Asynchronous: 6K Bytes, Synchronous: 6K Bytes
- Security: Authentication and encryption
- Service: Central & Peripheral UUID FFE0,FFE1
- Power: +3.3VDC 50mA
- Open space have 100 Meters with iphone4s
- Power: In sleep mode 400uA~1.5mA, Active mode 8.5mA.
- Working temperature:-5 ~ +65 Centigrade
- Dimension: 26.9mm x 13mm x 2.2mm

Overview

System function

How to wake up module from sleep mode?

in sleep mode, you can send a long string (Length > 80 or more), that string can made module wake up, and you will receive “OK+WAKE” string through UART. That string can't include any AT commands.

How to let module into sleep mode?

In discoverable mode, send “AT+SLEEP” string through UART, if all is okay, module will return “OK+SLEEP” string and into sleep mode.

AT commands

Factory default setting:

Name: HMSoft; Baud: 9600, N, 8, 1; Pin code: 000000; Peripheral Role; transmit mode.

AT Command format:

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

On Transmit version: Only accept AT Command from UART interface when Bluetooth device is not connected with remote device.

On Remote version: Can accept AT Command from UART interface when Bluetooth Device is not connected with remote device, Also can accept AT Command from remote Bluetooth device when connected that.

On PIO collection version: Only accept AT Command from UART interface when Bluetooth device is not connected with remote device.

1. Test Command

Send	Receive	Parameter
AT	OK	None
	OK+LOST	

If Module is not connected to remote device will receive: “OK”

If Module has connected, module will disconnected from remote device, if “AT

+ NOTI” is setup to 1, will receive: “OK+LOST

2. Query module address

Send	Receive	Parameter
AT+ADDR?	OK+ADDR:MAC Address	None

3. Query/Set Advertising interval

Send	Receive	Parameter
AT+ADVI?	OK+ Get:[Para]	None
AT+ADVI[Para]	OK+ Set:[Para]	HMSoft: Para: 0 ~ 1 HMSensor: Para: 0~9 0: 100ms 1: 1285ms 2: 2000ms 3: 3000ms 9: 9000ms Default: 0

The maximum 1285ms recommendations from the IOS system. That is to say, 1285ms is apple allowed, but in response to scan and connected all the time will be long. This command is added since V517 version.

4. Query/Set battery monitor switch

Send	Receive	Parameter
AT+BATC?	OK+ Get:[Para]	None
AT+BATC[Para]	OK+ Set:[Para]	Para: 0 ~ 1 0: Off 1: On Default: 0

5. Query battery information

Send	Receive	Parameter
AT+BATT?	OK+BATT:[Para]	Para: 000~100

There has three ways to get battery information:

- Before establishing a connection, Send “AT+BATT?” through UART.
- After established a connection, In Mode 1 or 2, remote side send “AT+BATT?”
- Battery information has included in scan response data package, one hour update once. You can use Android or IOS discovery module, when module has been discovered, you can get it from scan result array. Data format is three bytes: 0x02, 0x18, [battery byte].

6. Set iBeacon into service mode

Send	Receive	Parameter
AT+BUSHU	OK+BUSHU	None

This command is added in V520

This command set iBeacon into service mode until next power on.

BUSHU is Chinese spelling, meaning the deployment.

Note: Should to open iBeacon switch first (AT+IBEA).

7. Query/Set Bit format

Send	Receive	Parameter
AT+BIT7?	OK+Get:[para1]	Para1: bit7 switch. 0-----Not compatible 1-----Compatible Default: 0
AT+BIT7[para1]	OK+Set:[para1]	

This command is used only for compatible uses 7 data bits, 2 stop bit device.

8. Query/Set baud rate

Send	Receive	Parameter
AT+BAUD?	OK+Get:[para1]	Para1: Baud rate No.
AT+BAUD[para1]	OK+Set:[para1]	

		0-----9600
		1-----19200
		2-----38400
		3-----57600
		4-----115200
		5-----4800
		6-----2400
		7-----1200
		8-----230400
		Default: 0(9600)

e.g.

Query baud:

Send: AT+BAUD?

Receive: OK+Get:0

Setup baud:

Send: AT+BAUD1

Receive: OK+Set:1

Note: If setup to Value 7, After next power on, module will not support any

AT Commands, until PIO0 is pressed, Module will change Baud to 9600.

9. Query/Set Characteristic

Send	Receive	Parameter
AT+CHAR?	OK+Get:[para1]	Para1: 0x0001~0x FFFE Default: 0x FFE1
AT+CHAR[para1]	OK+Set:[para1]	

e.g. change characteristic value to 0xAAA0

Send: AT+CHAR0xAAA0

Recv: OK+Set:0xAAA0

10. Clear Last Connected device address

Send	Receive	Parameter
AT+CLEAR	OK+CLEAR	None

Notice: Only Central role is used.

11. Try connect to last succeeded device

Send	Receive	Parameter
AT+CONN	OK+CONN[Para1]	Para1: L, E, F, N L: Connecting E: Connect error F: Connect Fail N: No Address

Notice: Only Central role is used.

If remote device has already connected to other device or shut down,

“OK+CONN” will received after about 10 seconds.

12. Try connect an address

Send	Receive	Parameter
AT+CON[Para1]	OK+CONN[Para2]	Para1: Address Like: 0017EA090909 Para2: A, E, F A: Connecting E: Connect error F: Connect Fail

Notice: Only central role is used.

If remote device has already connected to other device or shut down,

“OK+CONN” will received after about 10 Seconds.

e.g.

Try to connect an device which MAC address is 00:17:EA:09:09:09

Send: AT+CON0017EA090909

May receive a reply:

OK+CONNA	=====	Accept request, connecting
OK+CONNE	=====	Connect error
OK+CONN	=====	Connected, if AT+NOT11 is setup

13. Query PIO04~PIO11 input(output) state

Send	Receive	Parameter
AT+COL??	OK+ Col:[Para1]	Para1: 0x00~0xFF

Para1 is a byte, has 8 bits, bit 7 ~ bit 0 is map to the PIO4 ~ PIO11.

This command is added since V515 version.

14. Query/Set PIO collection rate

Send	Receive	Parameter
AT+CYC??	OK+ Get:[para1]	Para1: 00~99 Unit: seconds Default: 10
AT+CYC[para1]	OK+ Set:[para1]	

In mode 1, when PIO state is change, module will send OK+Col:[xx] to UART or remote side. This command is set send interval.

This command is added since V515 version.

15. Query/Set filter of HM modules

Send	Receive	Parameter
AT+FILT?	OK+ Get:[para1]	Para1: 0, 1 1: Only find HM Modules 0: Will find all BLE modules Default: 0
AT+FILT[para1]	OK+ Set:[para1]	

16. Query/Set flow control switch

Send	Receive	Parameter
AT+FLOW?	OK+ Get:[para1]	Para1: 0, 1 0: Off 1: On Default: 0
AT+FLOW[para1]	OK+ Set:[para1]	

17. System Help Information

Send	Receive	Parameter
AT+HELP?	Help Information	None

18. Query/Set Module work type

Send	Receive	Parameter
AT+IMME?	OK+ Get:[para1]	Para1: 0, 1 1: When module is powered on, only respond the AT Command, don' t do anything. until AT + START is received,or can use AT+CON,AT+CONNL 0: When power on, work immediately Default: 0
AT+IMME[para1]	OK+ Set:[para1]	

This command is only used for Central role.

19. Query/Set Module iBeacon switch

Send	Receive	Parameter
AT+IBEA?	OK+Get:[para1]	Para1: 0, 1 0: Turn off iBeacon 1: Turn on iBeacon Default: 0
AT+IBEA[para1]	OK+Set:[para1]	

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

This command is added since V517 version.

20. Query/Set iBeacon UU ID

Send	Receive	Parameter
AT+IBE0?	OK+Get:[para1]	Para1: 0x00000001~ 0xFFFFFFFFE Default: 74278BDA
AT+IBE0[para1]	OK+Set:[para1]	

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

This command can change red color string in iBeacon UU ID.

This command is added since V520 version.

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

21. Query/Set iBeacon UU ID

Send	Receive	Parameter
AT+IBE1?	OK+Get:[para1]	Para1: 0x00000001~ 0xFFFFFFFFE Default: B6444520
AT+IBE1[para1]	OK+Set:[para1]	

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

This command can change red color string in iBeacon UU ID.

This command is added since V520 version.

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

22. Query/Set iBeacon UU ID

Send	Receive	Parameter
AT+IBE2?	OK+Get:[para1]	Para1: 0x00000001~ 0xFFFFFFFFE Default: 8F0C720E
AT+IBE2[para1]	OK+Set:[para1]	

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

This command can change red color string in iBeacon UU ID.

This command is added since V520 version.

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

23. Query/Set iBeacon UU ID

Send	Receive	Parameter
AT+IBE3?	OK+Get:[para1]	Para1: 0x00000001~ 0xFFFFFFFFE Default: AF059935
AT+IBE3[para1]	OK+Set:[para1]	

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

This command can change red color string in iBeacon UU ID.

This command is added since V520 version.

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

24. Query/Set Module iBeacon Marjor version

Send	Receive	Parameter
AT+MARJ?	OK+Get:[para1]	Para1: 0x0001, 0xFFFE Default: 0x FFE0
AT+MARJ[para1]	OK+Set:[para1]	

E.g. Change marjor version to 0x0102

Send: AT+MARJ0x0102, if all is okay, module will send back OK+Set:

0x0102

This command is added since V517 version.

25. Query/Set Module iBeacon minor

Send	Receive	Parameter
AT+MINO?	OK+Get:[para1]	Para1: 0x0001, 0xFFFE Default: 0x FFE1
AT+MINO[para1]	OK+Set:[para1]	

This command is added since V517 version.

26. Query/Set Module iBeacon Measured power

Send	Receive	Parameter
AT+MEAS?	OK+Get:[para1]	Para1: 0x0001, 0xFFFE Default: 0x FFE1
AT+MEAS[para1]	OK+Set:[para1]	

This command is added since V519 version.

27. Query/Set Module Work Mode

Send	Receive	Parameter
AT+MODE?	OK+Get:[para1]	Para1: 0, 1, 2 0: Transmission Mode 1: PIO collection Mode +Mode 0 2: Remote Control Mode+ Mode 0 Default: 0
AT+MODE[para1]	OK+Set:[para1]	

Mode 0:

Before establishing a connection, you can use the AT command configuration module through UART.

After established a connection, you can send data to remote side from each other.

Mode 1:

Before establishing a connection, you can use the AT command configuration module through UART.

After established a connection, you can send data to remote side. Remote side can do follows:

Send AT command configuration module.

Collect PIO04 to the PIO11 pins input state of HM-10.
 Collect PIO03 pins input state of HM-11.
 Remote control PIO2, PIO3 pins output state of HM-10.
 Remote control PIO2 pin output state of HM-11.
 Send data to module UART port (not include any AT command and per package must less than 20 bytes).

Mode 2:

Before establishing a connection, you can use the AT command configuration module through UART.

After established a connection, you can send data to remote side. Remote side can do fellows:

Send AT command configuration module.
 Remote control PIO2 to PIO11 pins output state of HM-10.
 Remote control PIO2, PIO3 pins output state of HM-11.
 Send data to module UART port (not include any AT command and per package must less than 20 bytes).

28. Query/Set Notify information

Send	Receive	Parameter
AT+NOTI?	OK+Get:[para1]	Para1: 0, 1
AT+NOTI[para1]	OK+Set:[para1]	0: Don't Notify 1: Notify Default: 0

If this value is set to 1, when link ESTABLISHED or LOSTED module will send OK+CONN or OK+LOST string through UART.

29. Query/Set Module name

Send	Receive	Parameter
AT+NAME?	OK+NAME[para1]	Para1: module name, Max length is 12. Default: HMSoft
AT+NAME[para1]	OK+Set[para1]	

e.g.

change module name to bill_gates

Send: AT+NAMEbill_gates

Receive: OK+SetName:bill_gates

30. Query/Set Parity bit

Send	Receive	Parameter
Query: AT+PARI?	OK+Get:[para1]	None
Set: AT+PARI[para1]	OK+Set:[para1]	Para1: 0,1,2 0:None 1:EVEN 2:ODD Default: 0 (None)

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

Send	Receive	Parameter
AT+PIO1?	OK+Get:[para1]	Para1: 0, 1 0: Unconnected Output 500ms High 500ms Low,Connected output High. 1: Unconnected output Low, Connected output High. Default: 0
AT+ PIO1 [para1]	OK+Set:[para1]	

32. Query/Set PIO pins output high or low (Only this time, when module next power on, this value is not be used)

Send	Receive	Parameter
AT+PIO[para1]?	OK+PIO:[para1][para2]	Para1: 2~B Para2: 0, 1 HM-11 only has 4 pins. Para1 is which PIO pin you want to Query/Set
AT+PIO[para1][para2]	OK+PIO:[para1][para2]	

		Value: 2,3,4,5,6,7,8,9,A,B. Para2 is Query or setup value. 0 is low and 1 is high
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e.g.

Query PIO2

Send: AT+PIO2?

Setup PIO2 output high

Send: AT+PIO21

Receive: OK+PIO21

33. Query/Set Pin Code

Send	Receive	Parameter
AT+PASS?	OK+Get:[para1]	Para1 :000000~999999 . Default: 000000
AT+ PASS[para1]	OK+Set:[para1]	

e.g.

Query Pin Code

Send: AT+ PASS?

Receive: OK+Get:000000

Setup Pin Code 008888

Send: AT+PASS008888

Receive: OK+Set:008888

34. Query/Set Module Power

Send	Receive	Parameter
AT+POWE?	OK+Get:[para1]	None
AT+ POWE [para1]	OK+Set:[para1]	Para: 0 ~ 3 0: -23dbm 1: -6dbm 2: 0dbm

		3: 6dbm Default: 2
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35. Query/Set Module sleep type

Send	Receive	Parameter
AT+PWRM?	OK+Get:[para1]	None
AT+PWRM[para1]	OK+Set:[para1]	Para1: 0~1 0:Auto sleep 1:don' t auto sleep Default: 1

Only support peripheral role.

36. Restore all setup value to factory setup

Send	Receive	Parameter
AT+RENEW	OK+RENEW	None .

37. Restart module

Send	Receive	Parameter
AT+RESET	OK+RESET	None

38. Query/Set Master and Slaver Role

Send	Receive	Parameter
AT+ROLE?	OK+Get:[para1]	Para1: 0, 1 0: Peripheral 1: Central Default: 0
AT+ROLE[para1]	OK+Set:[para1]	

39. Query RSSI Value

Send	Receive	Parameter
AT+RSSI?	OK+RSSI:[para1]	None

Require: AT+MODE value > 0

This command only used by Remote device query when connected.

40. Query Last Connected Device Address

Send	Receive	Parameter
AT+RADD?	OK+RADD:MAC Address	None

41. Query/Set Module Sensor work interval

Send	Receive	Parameter
AT+RAT??	OK+Get:[para1]	Para1: 00~99 0:Save when connected 1:Don' t Save Default: 0 Unit: minute
AT+RAT[para1]	OK+Set:[para1]	

Note: This command is only use for HMSensor

42. Query/Set Stop bit

Send	Receive	Parameter
AT+STOP?	OK+Get:[para1]	None
AT+STOP[para1]	OK+Set:[para1]	Para1:0, 1 0: One stop bit 1: Two stop bit Default: 0 (One stop bit)

43. Work immediately

Send	Receive	Parameter
AT+START	OK+START	None

This command is only used when AT+IMME1 is setup.

44. Query Module into sleep mode

Send	Receive	Parameter
AT+SLEEP	OK+SLEEP	None

Only support Peripheral role.

45. Query/Set Module save connected address parameter

Send	Receive	Parameter
AT+SAVE?	OK+Get:[para1]	None
AT+SAVE[para1]	OK+Set:[para1]	Para1: 0~1 0:Save when connected 1:Don't Save Default: 0

46. Query/Set sensor type on module PIO11(HM- 11 is PIO3)

Send	Receive	Parameter
AT+SENS?	OK+Get:[para1]	Para1: 0, 1, 2 0: None 1: DHT11 2: DS18B20 Default: 0
AT+SENS[para1]	OK+Set:[para1]	

Note: This command is use for HMSensor.

47. Query/Set Module Sensor Temperature and humidity(if has a sensor)

Send	Receive	Parameter
AT+TEHU?	OK+Get:[para1][para2]	Para1: 000~120 Para2: 000~100
AT+BIT7[para1]	OK+Set:[para1]	

Note: This command is use for HMSensor.

This value is added into scan response data package.

Data format is 0x02,0x17, [Temperature],[humidity], you can add this into your program.

48. Query/Set module connect remote device timeout value

Send	Receive	Parameter
AT+TCON?	OK+TCON:[para1]	None
AT+TCON[para1]	OK+Set:[para1]	Para1 is timeout

This value is only used for Central Role, when module has Last Connected address.

49. Query/Set Module Bond Mode

Send	Receive	Parameter
AT+TYPE?	OK+Get:[para1]	None
AT+TYPE[para1]	OK+Set:[para1]	Para1: 0~2 0:Not need PIN Code 1:Bond not need PIN 2:Bond with PIN Default: 0

Important: If your module version is less than V515, please don't use this command.
Under android 4.3 AT+TYPE1 is same to AT+TYPE2.

50. Query/Set service UU ID

Send	Receive	Parameter
AT+UUID?	OK+Get:[para1]	Para1: 0x0001~0x FFFE Default: 0x FFE0
AT+UUID[para1]	OK+Set:[para1]	

e.g. Change UU ID value to 0xAAA0

Send: AT+UUID0xAAA0

Recv: OK+Set:0xAAA0

51. Query/Set UART sleep type

Send	Receive	Parameter
AT+UART?	OK+Get:[para1]	Para1: 0~1 0: When module into sleep mode, you can wake up module through UART. 1: When module into sleep
AT+UART[para1]	OK+Set:[para1]	

		mode, shutdown UART too. Default: 0x FFE0
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Note: This command is only use for HMSensor.

52. Query Software Version

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