



HOBBYWING SDM16HA BLE Transparent Transmission Module Instructions

[Home](#) » [HOBBYWING](#) » HOBBYWING SDM16HA BLE Transparent Transmission Module Instructions 



SDM16HA(LE5.1)HY-1.0
BLE transparent transmission module
Specifications and instructions



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Contents

- [1 Features](#)
- [2 Functional Overview](#)
- [3 Product hardware layout and interface description](#)
- [4 Hardware Design](#)
- [5 Module Dimensions](#)
- [6 Module Transparent Transmission Protocol](#)
- [7 Instructions for instructions](#)
- [8 General instructions](#)
- [9 Connection instruction](#)
- [10 FCC Warning](#)
- [11 Documents / Resources](#)
- [12 Related Posts](#)

Features

This module is a BLE transparent transmission module designed based on the Bluetooth Low Energy standard published by Bluetooth SIG. This module is controlled through the serial port and also supports wireless control through the host side. Users do not need to pay attention to complex Bluetooth protocol application software and can develop standard low-power Bluetooth products in a short period of time. After the connection is established through serial control, two-way data transmission can be realized between the BLE host and the slave.

Functional Overview

1. Support fully transparent transmission
2. Support serial port command to modify and get module settings
3. power consumption and performance can be independently weighed and selected
4. The fastest one-way communication rate can exceed 3kBytes/s
5. Support serial large data packets of up to 200 bytes, and the module can buffer and sub-package independently
6. Serial port configuration (or read) parameters such as baud rate, device name, broadcast interval, etc.
7. Abundant I/O control and status indication functions, simpler and real-time control module and obtain module status
8. Simpler software and hardware design requirements

Product hardware layout and interface description

2.1 Module pin layout

Module pin layout as shown in Figure 2-1

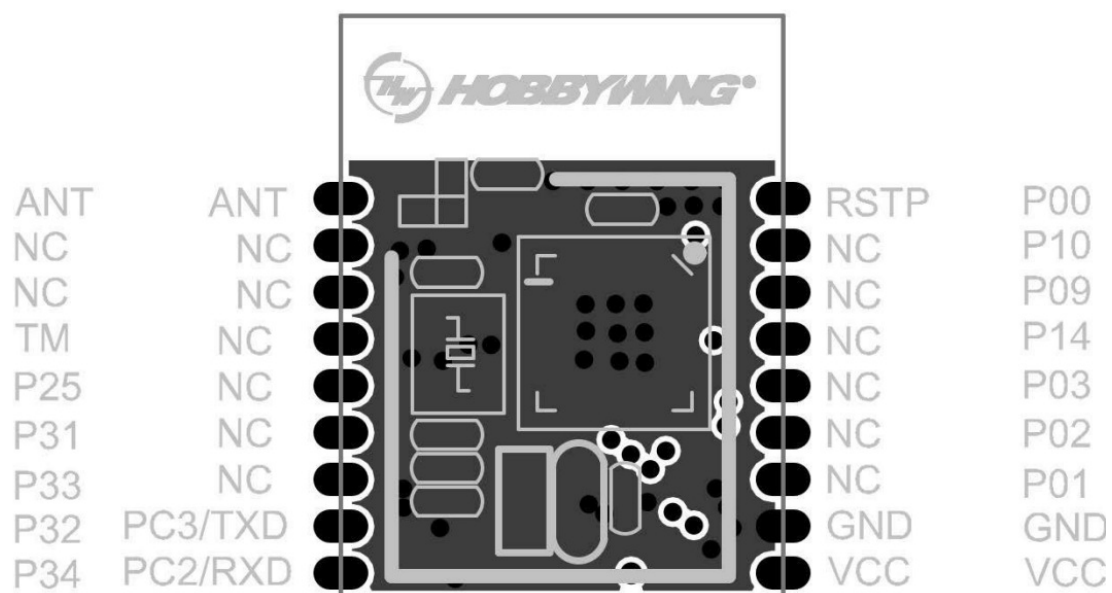


Figure 2-1

2.2 BLE module pin description

BLE module pin description in Table 2-1

Number	Pin	Features	Direction	Instruction
1	ANT	external antenna		Connect external antenna
2	NC	NC		NULL
3	NC	NC		NULL
4	TM	NC		NULL
5	P25	NC		NULL
6	P31	NC		NULL
7	P33	NC		NULL
8	P32	BTX	I/O	UART Tx
9	P34	BRX	I/O	UART Rx
10	P00	RSTP		Connect GND to Reset
11	P10	NC		NULL
12	P09	NC		NULL
13	P14	NC		NULL
14	P03	NC		NULL
15	P02	NC		NULL
16	P01	NC		NULL
17	GND	GND		Connect GND
18	VCC	VCC		Vbat 3.0-4.2v

Table 2-1

Hardware Design

3.1 Module simple application connection circuit diagram

Module simple application connection circuit diagram as shown in Figure 3-1

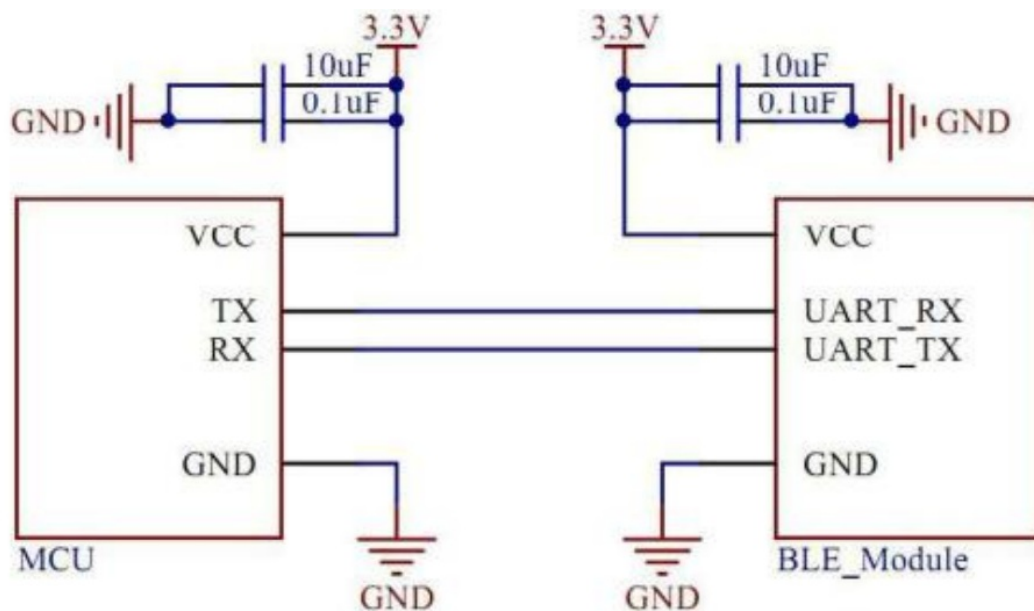


Figure 3-1

Module Dimensions

4.1 The module size

The module size is shown in Figure 4-1

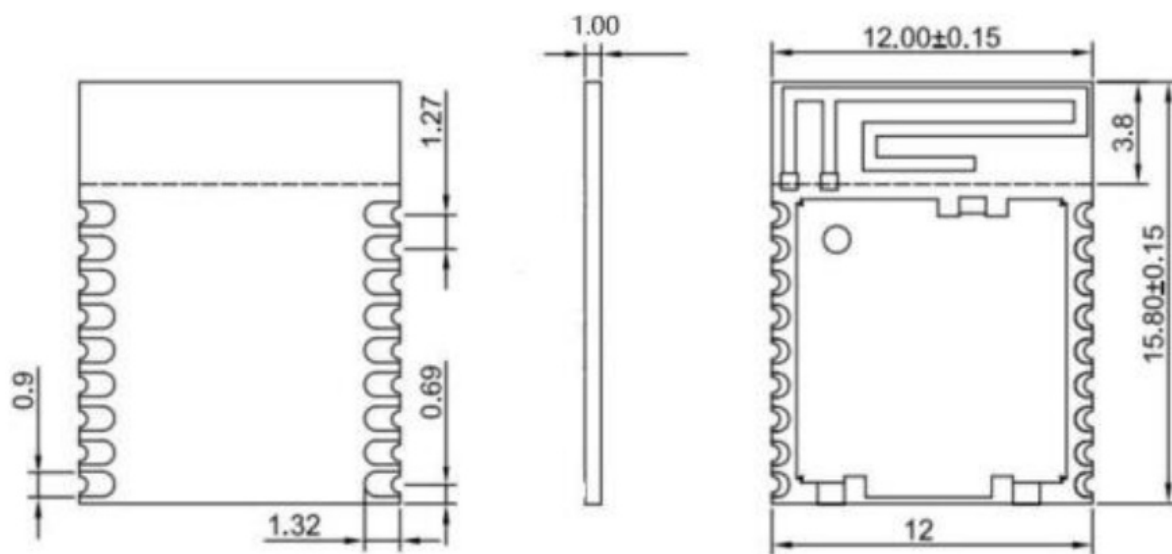


Figure 4-1

Module Transparent Transmission Protocol

5.1 AT command configuration

<AT+> command refers to the command set passed by the user through UART and module input command in command mode. The usage format of the AT+ command will be explained in detail later. After power-on and startup, you can set the default UART of the module through UART. The port parameters are z baud rate 115200, no parity, 8 data bits, and 1 stop bit.

5.2 AT command overview

<AT+ >commands can be input directly through serial debugging programs such as CRT, AT+ commands use command lines based on ASCII codes, and the format of the commands is as follows.

1. Format description

< >: Indicates the part that must be included

[]: Optional part

2. Command Message

AT+<CMD [p][para-1,para-2,para-3,para-4 CR><LF>

AT+: Command message prefix:

[op]: Command operator, specify parameter setting or query:

"=": Indicates parameter setting

"?": means query

[para-n]: Input for parameter setting, such as query does not need:

<CR>: end character, carriage return, ASCII code 0x0D;

<LF>: end character, line feed, ASCII code 0x0A;

3. Response message

<CR><LF>+<RSP>[op] [para-1,para-2,para-3,para-4]<CR><LF>

+: Response message prefix:

RSP: Response string, including 2

"OK": means success

"ERR": Indicates failure

[para-n]: Return parameters when querying or error code when an error occurs

<CR>: ASCII code 0x0D;

<LF>: ASCII code 0x0A;

Instructions for instructions

General instructions

[NAME] resistance Query/set the name of the module

[MODE] query/set the mode of the module MAC query the MAC address of the module

[CIVER] query the software version number

[UART] setting/query module serial port parameters

[Z] control module restart

[+++] Enter transparent transmission mode

[AUTO+++] The query/setting module automatically enters the transparent transmission mode after being connected

[FLASH] stores the default configuration parameters to the flash, the specific parameters are explained later.

[SLEEP] sets the chip to start/stop sleep.

Connection instruction

[LINK] Query the connection status of the module

[SCAN] Search the surrounding slaves

[DISCONN] Set to disconnect the current connection

[CONN] Actively connect to the peer device scanned by [SCAN]

[CONNADD] Set the default to peer MAC address for active connection Features z

[UUID] Set/Query UUID of the module

[POWER] Query/set the transmit power of the radio frequency

[ADVINT] query/set broadcast interval

5.2.1 AT+NAME

Function: Query/set the name of the module

Query the current parameter value

AT+ NAME? {CR}{LF}

Response

{CR}{LF}+NAME: name{CR}{LF}OK{CR}{LF}

Setting

AT+NAME=name {CR}{LF}

Response

{CR}{LF}+NAME: name{CR}{LF}OK{CR}{LF}

Parameter name: Name of the module {limit length 1" 15 bytes} setting example

For example, if you want to set the module name to USR-BLEIOO, you need to set it as follows AT+NAME=USR-BLEIOO {CR}{LF},the {CR}{LF} and carriage return in the above formula.

5.2.2 AT+MODE

Function: Query/set the working mode of the module

Query the current parameter value z

AT+ MODE? {CR}{LF}

Response

{CR}{LF}+MODE: mode{CR}{LF}OK{CR}{LF}

Setting

AT+MODE=mode{CR}{LF}

Response

{CR}{LF}+MODE: mode{CR}{LF}OK{CR}{LF}

Parameter mode: the working model of the module

I: wall idle mode, query display I, set the parameter to I (uppercase)

S: Slave mode, query display s, no need to set

M: In each mode of the main setting, the query displays M, and the parameter is set to M (uppercase)

B: Broadcast mode, query display B, set the parameter to B (uppercase) C: link mode in progress, query display c, no need to set X: abnormal mode, query display x, cannot be set

5.2.3 AT+SLEEP

Function: Start/stop the sleep function of the module, using AT+FLASH will record the current Sleep, Enable the setting, the last sleep setting will be automatically enabled when the power is turned on next time.

Setting

AT+SLEEP=set{ CR}{LF}

Response

{CR}{LF}+SLEEP: set{CR}{LF}OK{CR}{LF}

Parameter

set: module sleep start or stop

S: Set the module to enter sleep E: Set the module to stop sleep

5.2.4 AT+MAC

Function: Query the MAC address of the module. Format z

* Query the current parameter value 2

AT+MAC?{CR}{LF}

Response

{CR}{LF}+MAC:mac{CR}{LF}OK{CR} {LF}

Setting

AT+ MAC "mac{CR}{LF}

Response

{CR}{LF}+MAC:mac{CR}{LF}OK{CR} {LF}

Parameter mac: MAC address of the device, such as FFFFFFFFFFFFFFFF

5.2.5 AT+CIVER

Function: Query software version number

Query the current version value 2

AT+CIVER? {CR}{LF}

Response

{CR}{LF}+VER: Version number {CR}{LF} OK{CR}{LF}

5.2.6 AT+ UART

Function: Set/query module serial port parameters

Query the current parameter value

AT+UART?{CR}{LF}

Response

{CR}{LF}+UART: baud rate ,data bit,p cylinder i, stop{CR}{LF}OK{CR}{LF}

Setting

AT+ UART = baud rate ,data bit,p cylinder i,stop {CR}{LF}

Response

{CR}{LF}+UART: baud rate ,data bit,p cylinder i, stop{CR}{LF}OK{CR}{LF}

Parameter

baud rate: The serial port baud rate is any value from 2400 to 115200, the factory default is 115200 data bit: the data bit is 5, 7,8, and the factory default is 8.

Paris: check digit, factory default no check

0: No parity

1: Odd parity

2: Even parity

stop: stop bit, factory default 1 stop bit

1: 1bit stop bit

5.2.7 AT+Z

Function: Control module restart

Setting

AT+Z{CR}{LF}

Response

{CR}{LF}+Z{CR}{LF}OK{CR}{LF} 5.2.8 AT +++

Function: Control module enters transparent transmission mode

Setting

AT++++{CR} {LF}

Response

{CR}{LF} ← {CR}{LF}OK{CR}{LF} 5.2.9 AT+AUTO+++

Function: Query/set whether the module automatically enters the transparent transmission mode after being connected.

* Query the current parameter value 2

AT+AUTO+++?{CR} {LF}

Response

{CR}{LF}+AUTO ten set{CR}{LF}OK{CR}{LF}

Setting

AT+A stare at O set{CR}{LF}

Response

{CR}{LF}+AUTO material→: set {CR}{LF}OK{CR}{LF}

Parameter

set: Whether to automatically enter the transparent transmission after the module is linked

Y: Automatically enter transparent transmission

N: Do not enter transparent transmission automatically

Function: The control module stores UART, MAC (own address and the peer address of the default link), NAME, broadcast interval, whether to automatically enter the transparent transmission, whether to automatically enable the sleep function and transmit power information to FLASH.

Setting

AT+FLASH{CR} {LF}

Response

{CR}{LF}+FLASH{CR}{LF}OK{CR} {LF}

5.3.1 AT+ LINK

Function:Query module connection status

Query the current parameter value z AT+LINK? {CR}{LF}

Response

{CR}{LF}PeerAddr:MAC{CR} {LF}Rssi:RssidBm{CR}{LF}+LINK:syang"s {CR}{LF}OK{CR}{LF}

Parameter

MAC: The address of the connected device, if there is no connection, it will not respond to this item

Rossi: The signal strength of the connected device, if there is no connection, it will not respond to this item

status: module connection status OnLi Wei E: connection is successful OffLine: module is not connected

5.3.2 AT+ SCAN

Function: Search surrounding slaves Query the current parameter value z

AT+SCAN {CR}{LF}

Response

{CR}{LF}+SCAN: ON{CR}{LF}OK{CR}{LF}{LF} {LF}No: num

Address: mac

Rossi: sizedBm{LF}{LF}{CR}{LF}Scan response: {CR}{LF} data{CR}{LF}

Thing parameter z

num: searched the index number of the slave device (up to 20 devices around it are displayed)

mac: The MAC address of the slave device is found

size: The signal strength of the searched slave device

data: The scan response data packet of each slave device is searched, if not, it will display NONE

5.3.3 AT+ CONN

Function: Quickly establish a connection by searching to the index number'

Set the current parameter value

AT+CONN ium{CR}{LF}

Response

{CR}{LF}+CONN: num{CR}{LF}OK{CR}{LF}Take parameter z

num: index number after searching

5.3.4 AT+ CONNADD

Function: Set/query the MAC address of the default connection module when the device is powered on. Format z

'Query the current parameter value z

AT+CONNADD? {CR}{LF}

Response

{CR}{LF}+CONNADD: mac{CR}{LF}OK{CR}{LF}

Setting

AT+CONNADD nac{CR}{LF}

Response

{CR}{LF}+CO ADD: mac{CR} {LF}OK{CR}{LF}

Parameters

mac: The default connection MAC address after power-on

5.3.5 AT+ DISCONN

Function: Set to disconnect the current connection

Setting

AT+DISCONN {CR}{LF}

Response

{CR}{LF}+DISCONN:OK{CR}{LF}OK{CR} {LF}

5.3.6 AT+ UUID

Function: Set/inquire each serial port service UUIDQuery the current parameter value

AT+ UUID? {CR}{LF}

Response

{CR}{LF}+bleUart_Server _l]uid:

{CR}{LF}DATA:UUID{CR} {LF}{CR}{LF}+bleU cylinder t_Server_Tx_Uuid:

{CR}{LF}DATA:UUID{CR} {LF}{CR}{LF}+bleUart_Server_Rx_Uuid:

{CR}{LF}DATA:UUID{CR} {LF}OK{CR}{LF}

Setting

AT+ UUID =NUM+UUID{CR}{LF}

Response

{CR}{LF}+bleUart_Server_Uuid:{CR} {LF}DATA:UUID{CR} {LF}{CR}{LF}

LF}successful{CR}{LF}or

{CR}{LF}+bleUart_Server_Tx_Uuid:{CR} {LF}DATA:UUID{CR} {LF}{C R}{LF}successful{CR}{LF}or
{CR}{LF}+bleUart_Server_Rx_Uuid:{CR} {LF}DATA:UUID{CR} {LF}{C R}{LF}success
such as {CR}{LF}

Parameter

NUM: used to differentiate services

* AA: bleUart Server Uuid: main service UUID

* BB: bleUart_Server_Tx_Uuid: serial port read service, a Notify service

* CC: bleUart Server Rx Uuid: serial port write service, one WriteWithoutResponse service

5.3.7 AT+POWER

Function: Query/set the RF power of the module

* Query the current parameter value 2

AT+ POWER? {CR}{LF}

Response

{CR}{LF}+POWER:set{CR} {LF}OK{CR}{LF}

Setting

AT+POWER=set{CR} {LF}

Response

{CR}{LF}+POWER:set{CR} {LF}OK{CR}{LF}

Parameter

set: RF power of the module

0: Sdb

1: 2.Sdb

2, odb

3: -Sdb

4: -lOdb

5: -17db

5.3.8 AT+ADVINT

Function: query/set broadcast interval

* Query the current parameter value

AT+ ADVINT?{CR}{LF}

Response

{CR}{LF}+ADV T:set{CR}{LF}OK{CR} {LF}

FCC Warning

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE 1: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in an articular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



Model: HW6187

CMIIT ID: 2021DP16214

Version: V1. 2

Date: 2021-05-20

Documents / Resources

	HOBBYWING SDM16HA BLE Transparent Transmission Module [pdf] Instructions HW6187, 2AIWP-HW6187, 2AIWPHW6187, SDM16HA BLE Transparent Transmission Module , Transparent Transmission Module, Transmission Module
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[Manuals+](#)