

# JDY - 10M BLE Bluetooth Multifunctional Mesh Networks Module



# **JDY - 10M BLE Bluetooth Multifunctional Mesh Mesh networks Module**

## **Product introduction**

The JDY-10 transparent transmission module is based on the Bluetooth 4 protocol standard, the working frequency range is 2.4GHZ, the modulation mode is GFSK, the maximum transmit power is 8dB, and the maximum transmitting distance is 50 meters. It has the characteristics of low power consumption, small size, strong signal and stable data transmission, etc.

## **Product features**

- 1: Support Android and IOS mobile data transmission.
- 2: Support one-to-multiple, multiple to one, and multiple to multiple data transmission and control.
- 3: Support mesh networks LED lights (26 profiles and panel modes), brightness, white light, adjustable speed.
- 4: Support mesh networks GPIO control (one-to-multiple, multiple to one, and multiple to multiple).
- 5: It can be certified by FCC/CE.
- 6: Support mesh networks remote control (ultra low power consumption), two batteries can use at least one year.
- 7: Support mesh networks 4 PWM control.
- 8: Maximum mesh networks number 255.
- 9: Support broadcast and unicast MESH to send data.
- 10: Support BLE master-slave working at the same time without a master and slave switching.

## **Product Application Range**

- 1: Bluetooth mesh networks LED lights (one-to-multiple, multiple to one, cell phone or remote control, and multiple to multiple control)
- 2: Application of motor control in Bluetooth mesh networks (one-to-multiple, multiple to one, cell phone or remote control, and multiple to multiple control).
- 3: Mesh networks panel switch, 86 switch (ultra-low power consumption)
- 4: Mesh networks intelligent home application control (switches, relays, and curtains).
- 5: Application of mesh networks sensor.
- 6: Application of WIFI mesh networks gateway.
- 7: Application of Zigbee mesh networks.
- 8: Application of mobile phone mesh networks control.

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### Technical specifications:

Type		Specification parameter
working voltage		1.9 - 3.6V
working temperature		-40 - 85° C
max transmit power		+8dbm
antenna		PCB board antenna
receiving sensitivity		-92dbm
SMT welding temperature		<260°C
communication interface		UART
average	Mesh mode	28MA
current	Deep Sleep mode	5 uA

### Factory default configuration:

Sequence	Function	Parameters	AT instruction
1	Baud rate	115200	AT+BAUD0
2	Module short address	1 byte after the MAC address	
3	Mesh networks ID no.	123456789ABC	AT+NETIDC0C1C2C3C4C5
4	K1 target short address	FF	AT+KVALUE01FF
5	K2 target short address	FF	AT+KVALUE01FF
6	K3 target short address	FF	AT+KVALUE01FF
7	K4 target short address	FF	AT+KVALUE01FF
8	K5 target short address	FF (broadcast)	
9	APP connection password switch	close	AT+ISCENO
10	APP connection password	12345	AT+PSS12345
11	Broadcast name	JDY-10M	AT+NAMEJDY-10M

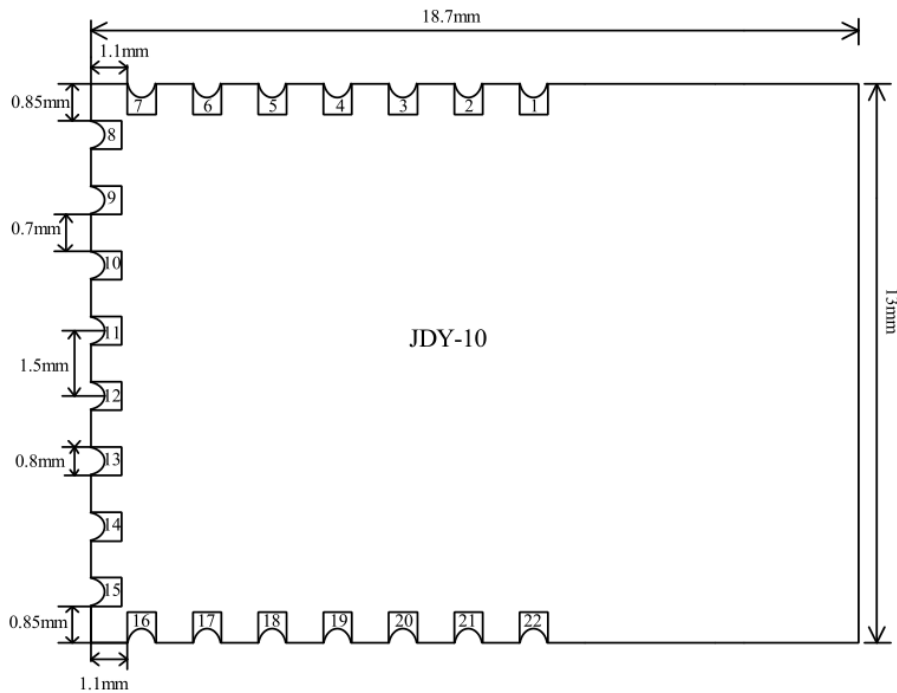
## Pin function description

Pin	Definition	Function	Description
1	RESET	Reset	Low level effective
2	E5	OUTPUT1	The output pin can control the level through the mesh networks, and the pin level has the memory function. Next time when you reconnect, it can keep the level set before.
3	E6	OUTPUT2	The output pin can control the level through the mesh networks, and the pin level has the memory function. Next time when you reconnect, it can keep the level set before.
4	E7	OUTPUT3	The output pin can control the level through the mesh networks, and the pin level has the memory function. Next time when you reconnect, it can keep the level set before.
5	F0	OUTPUT4	The output pin can control the level through the mesh networks, and the pin level has the memory function. Next time when you reconnect, it can keep the level set before.
6	F1	I01	K5 input pin (target short address of key can be set by AT instruction) <b>Special note: K5 pin function is IO full on / off function pin, click it to let all the mesh networks module OUT pins output low level, and click once again to let all the modules in the mesh networks output high level, which can be used for one key full open or close in the application.</b>
7	SWS		Download program pin
8	VCC	power supply	
9	GND	Power Ground	
10	PWM3	PWM	AT+CLSSA0: the pin is a common PWM function AT+CLSSB1: the pin is <b>LED light white light</b> pin control
11	STAT	Connection state pin	Low level before connected, high level after connected.
12	ALED	Broadcast indicate	MESH work instruction pin flash once a second, output 100MS high level.
13	PWRC	Connect AT instruction	Connected state: PWRC pin low to send AT instruction PWRC pin high or suspended to transparent transmission

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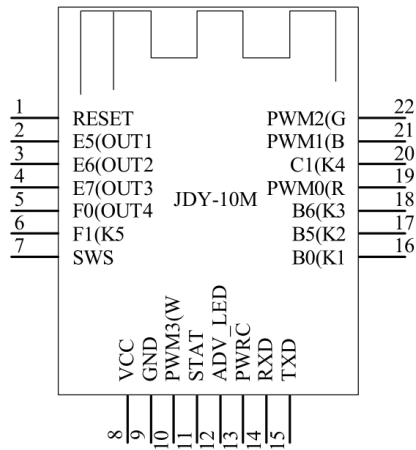
			Unconnected state: any state of the PWRC pin can send AT instruction
14	RXD		Serial port input, the level is TTL level
15	TXD		Serial port output, the level is TTL level
16	B0	K1	K1 input pin (target short address of key can be set by AT instruction)
17	B5	K2	K2 input pin (target short address of key can be set by AT instruction)
18	B6	K3	K3 input pin (target short address of key can be set by AT instruction)
19	PWM0	PWM	AT+CLSSA0: the pin is a common PWM function AT+CLSSB1: the pin is <b>LED light red light</b> pin control
20	C1	K4	K4 input pin (target short address of key can be set by AT instruction)
21	PWM1	PWM	AT+CLSSA0: the pin is a common PWM function AT+CLSSB1: the pin is <b>LED light blue light</b> pin control
22	PWM2	PWM	AT+CLSSA0: the pin is a common PWM function AT+CLSSB1: the pin is <b>LED light green light</b> pin control

### Dimensional drawing



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## Pin figure



## Debugging tools



APP tools (IOS and Android share a two-dimensional code)

Use WeChat scan and select in the upper right to open in the browser.

## AT instruction set

The user can communicate via the serial port and the Bluetooth chip. The serial port uses Tx and Rx signal lines. The baud rate supports 4800, 9600, 19200, 38400, 57600, 115200. The default baud rate of the serial port is 115200bps.

### Instruction set details

(Note: You must enter carriage-return button when sending the AT instruction. The AT instruction can only be taken into effect when the module is unconnected. Once the Bluetooth module is connected to the device, the Bluetooth module is entered into the data transmission mode. Only for feature UUID:FFE1, MESH can send data and instruction communication through feature UUID:FFE2

#### Instruction details

(AT instructions are case sensitive and all end with carriage return or new-line character: \r\n)

##### 1、 Query - version number:

Instruction	Response	Parameter
AT+VER	+<Param>	Param: version Default: +JDY-10M-V2.1-MESH

##### 2、 Query - Bluetooth MAC address

Instruction	Response	Parameter
AT+MAC	+MAC:<Param>	Param: MAC address

##### 3、 Set - soft reset

Instruction	Response	Parameter
AT+RESET	+OK	

##### 4、 Set/query - Bluetooth name

Instruction	Response	Parameter
AT+NAME<Param>	+OK	Param: Bluetooth name Default name: JDY-10M Max 18 bytes

##### 5、 Set/query - serial port baud rate

Instruction	Response	Parameter
AT+BAUD<Param>	OK	Param: (0-7)
AT+BAUD	+BAUD:<Param>	0: 115200 bps 1: 57600 bps 2: 38400 bps 3: 19200 bps 4: 9600 bps 5: 4800 bps

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		Default value: 0
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### 6、Set/query - device type

Instruction	Response	Parameter
AT+CLSS<Param>	+OK	Param: (00 - FF) A0: Transparent transmission mode (support PWM, key switch input, OUT output)
AT+CLSS	+CLSS=<Param>	B1: LED light mode (support LED light, key input, OUT output) C0: Low power consumption telecontroller (only support key input) Default: A0 transparent transmission mode

A0 mode support: PWM, 4 way GPIO output, 5 way key input (not support low power consumption)

B1 mode support: LED light, 4 way GPIO output, 5 way key input (not support low power consumption)

C0 mode support: 5 way key input (support low power consumption)

### 7、Set/query - disconnect

Instruction	Response	Parameter
AT+DISC	+OK	

Note: when the disconnect instruction is sent under the connection state, the PWRC pin of the module needs to be pulled down to send it.

### 8、Set/query - mesh networks ID

Instruction	Response	Parameter
AT+NETID<Param>	+OK	Param: (12 bytes)
AT+NETID	+NETID=<Param>	Default: 123456789ABC

### 9、Set/query - mesh networks short address

Instruction	Response	Parameter
AT+MADDR<Param>	OK	Param: (2 bytes)
AT+MADDR	+MADDR=<Param>	Default: The last byte of the MAC address (HEX)

Special Description: the default mesh networks short address is the last byte of the device's MAC address, and the users can modify it by themselves.

### 10、Set/query - APP connection password

Instruction	Response	Parameter
AT+PSS<Param>	+OK	Param: (12 bytes)
AT+PSS	+PSS=<Param>	Default: 12345



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### 11、Set/query - APP password connection switch

Instruction	Response	Parameter
AT+ISCEN<Param>	OK	Param: (1 bytes)
AT+ISCEN	+ISCEN=<Param>	1: open APP password switch 0: APP connections do not require a password Default: 0

Special Description: When the password switch is opened, the APP is required to send the password to the module.

If the password is wrong, APP can not modify and communicate the parameters in the module.

### 12、Set/query - target short address of the key switch

Instruction	Response	Parameter
AT+KVALUE<Param>	+OK	Param: (4 bytes)  01FF: means that K1 is configured as a broadcast mode. When K1 is pressed, all devices will receive the key value of K1. 0108: means that K1 is configured as unicast. When K1 is pressed, only the device's short address is 08 can receive the key value of K1.  02FF: means that K2 is configured as a broadcast mode. When K2 is pressed, all devices will receive the key value of K2. 0208: means that K2 is configured as unicast. When K2 is pressed, only the device's short address is 08 can receive the key value of K2.  03FF: means that K3 is configured as a broadcast mode. When K3 is pressed, all devices will receive the key value of K3. 0308: means that K3 is configured as unicast. When K3 is pressed, only the device's short address is 08 can receive the key value of K3.  04FF: means that K4 is configured as a broadcast mode. When K4 is pressed, all devices will receive the key value of K4. 0408: means that K4 is configured as unicast. When K4 is pressed, only the device's short address is 08 can receive the key value of K4.  05FF: means that K5 is configured as a broadcast mode. When K5 is pressed, all

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		<p>devices will receive the key value of K5.                      0508: means that K5 is configured as unicast.                      When K5 is pressed, only the device's short address is 08 can receive the key value of K5.</p>
AT+KVALUE<Param2>	+KVALUE=<Param>	<p>Param2: (2 bytes)</p> <p>01: means read the K1 address                      02: means read the K2 address                      03: means read the K3 address                      04: means read the K4 address                      05: means read the K5 address</p>

Example: Setting K1 short address is 11, AT instruction sends: AT+KVALUE0111

Read K1 short address, AT instruction send: AT+KVALUE01

## Serial port MESH wireless control instruction

1) Serial port MESH data transmit(one-to-multiple, multiple to one, and multiple to multiple)

Instruction	Target short address	Data
AAFB	2byte	10Byte

Description: When sending broadcast, the target short address is FFFF. When sending unicast, the high byte of short address must be 00, for example, 0002, which means sending data to the 02 device.

Example 1: Send broadcast data to all modules: 112233445566

Send instruction format: **AAFBFFFF112233445566**

Example 2: Send data 112233 to short address 02 module

Send instruction format: **AAFB0002112233**

2) Serial port MESH data acceptance

Instruction	Target short address	Data length	Data
AA	1 byte	1 byte	10 bytes
BB	1 byte	1 byte	10 bytes

The above table is the MESH data transparent transmission and function control receive data format.

Instruction AA means that this data packet is a transparent transmission data

Instruction BB means that this data packet is function data (PWM, key value, LED)

Example 1: When serial port receives **AA02050102030405** means receiving 5 bytes data from 02 short address module, and the data content is **0102030405**.

Example 2: the serial port receives **BB2903E7F101** that it receives not the serial data, but the control command. The data is sent by device of short address 29, the data length is 3 bytes, and the **E7F101** command is to set OUT1 pin to output high level.

3) Serial port MESH functional data(one-to-multiple, multiple to one, and multiple to multiple)

Instruction	Target short address	Data
AAFC	2 bytes	Param

### 3.1 IO MESH level control

IO port No.	Param	Function	Data format
OUT1	<b>E7F101</b>	OUT1 pin high level	HEX
	<b>E7F100</b>	OUT1 pin low level	HEX
OUT2	<b>E7F201</b>	OUT2 pin high level	HEX
	<b>E7F200</b>	OUT2 pin low level	HEX
OUT3	<b>E7F301</b>	OUT3 pin high level	HEX
	<b>E7F300</b>	OUT3 pin low level	HEX
OUT4	<b>E7F401</b>	OUT4 pin high level	HEX
	<b>E7F400</b>	OUT4 pin low level	HEX
ALL	<b>E7FFFF</b>	OUT all high level	HEX
	<b>E7F000</b>	OUT all low level	HEX

Example 1: Set the short address 02 module OUT1 to high level, instruction: **AAFC0002E7F101**

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Example 2: Set all MESH networks modules OUT pins to high level, instruction: [AAFCFFFE7FFFF](#)

### 3.2 PWM MESH control (Must ensure that the CLSS type is AT+CLSSA0)

Function	Param	Description
PWM frequency (250HZ)	<a href="#">E8A200F0</a>	Set frequency to 250HZ
PWM open	<a href="#">E8A101</a>	Open PWM
PWM close	<a href="#">E8A100</a>	Close PWM
PWM1 pulse width	<a href="#">E7F410</a>	PWM1 pulse width is 16/255
PWM2 pulse width	<a href="#">E7F420</a>	PWM2 pulse width is 32/255
PWM3 pulse width	<a href="#">E7F430</a>	PWM3 pulse width is 48/255
PWM4 pulse width	<a href="#">E7F40A</a>	PWM4 pulse width is 10/255

Example 1: Set all the PWM frequency of modules in the MESH networks to 252, instruction:

[AAFCFFFE8A200F2](#)

Example 2: Open the PWM of the short address 05 module, instruction: [AAFC0005E8A101](#)

Example 3: Set the PWM2 pulse width of the short address 05 module to 50/255, instruction:

[AAFC0005E8A432](#)

### 3.3 LED light MESH control (Must ensure that the CLSS type is AT+CLSSB1)

Function	Param	Description
Open LED light	<a href="#">E9B1A901</a>	
Close LED light	<a href="#">E9B1A900</a>	
Panel mode RGB value	<a href="#">E9B2FF000000</a>	Coloring panel red
Set brightness	<a href="#">E9B10250</a>	Set the brightness to 80/255
Set speed	<a href="#">E9B10305</a>	Set the speed to 50%
Set white light brightness	<a href="#">E9B1AF64</a>	Set the white light brightness to 100/255
Profile (static red	<a href="#">E9B10101</a>	
Profile (static green	<a href="#">E9B10102</a>	
Profile (static blue	<a href="#">E9B10103</a>	
Profile (static green and red	<a href="#">E9B10104</a>	
Profile (static cyan	<a href="#">E9B10105</a>	
Profile (static yellow	<a href="#">E9B10106</a>	
Profile (static purple	<a href="#">E9B10107</a>	
Profile (static white	<a href="#">E9B10108</a>	
Profile (three-color -color jump change	<a href="#">E9B10109</a>	
Profile (seven-color jump change	<a href="#">E9B1010A</a>	
Profile (red gradual change	<a href="#">E9B1010B</a>	
Profile (green gradual change	<a href="#">E9B1010C</a>	
Profile (blue gradual change	<a href="#">E9B1010D</a>	
Profile (yellow gradual change	<a href="#">E9B1010E</a>	
Profile (cyan gradual change	<a href="#">E9B1010F</a>	
Profile (purple gradual change	<a href="#">E9B10110</a>	
Profile (white gradual change	<a href="#">E9B10111</a>	

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Profile ( seven-color gradual change	E9B10112	
Profile (red stroboscopic	E9B10113	
Profile (green stroboscopic	E9B10114	
Profile (blue stroboscopic	E9B10115	
Profile (yellow stroboscopic	E9B10116	
Profile (purple stroboscopic	E9B10117	
Profile (white stroboscopic	E9B10118	
Profile (cyan stroboscopic	E9B10119	
Profile (seven-color stroboscopic	E9B1011A	

Example 1: Set the short address 01 module LED light to the profiles of three-color gradual change mode, instruction: **AAFC0001E9B10112**

Example 2: Set the short address 05 module LED light panel mode color to yellow, instruction: **AAFC0005E9B2FFFF0000**

Example 3: Turn off all LED lights, instruction: **AAFCFFFE9B1A900**

## Mobile phone APP terminal instruction

1) APP UUID list

Service UUID: FFE0 (Service UUID)

Feature UUID: FFE1 (APP serial port transparent transmission, non MESH function)

Feature UUID: FFE2 (APP function settings, MESH (LED light, IO, PWM) control)

2) APP serial port non MESH transparent transmission (Features UUID:FFE1)

Support common modules and APP serial port transparent transmissions, non MESH mode.

3) APP sends MESH serial port data (Feature UUID:FFE2)

Instruction	Target short address	Data
FA	1 byte	Maximum data byte

Example 1: APP sends data 0x1234 to a module with a short address of 06, instruction: FA061234.

Example 2: APP broadcasts data 0x1234 to all modules, instruction: FAFF1234

4) APP sends MESH functional data (Feature UUID:FFE2)

Instruction	Target short address	Data
FB	1 byte	Param

**Param Value parameter:** 2.1 IO MESH level control

2.2 PWM MESH control

2.3 LED light MESH control

Example 1:APP closes all IO pins to low level, instruction:FBFFE7F000

Example 2:APP opens the short address for the 09 module's OUT1 pin to output high level, instruction: FB09E7F101

Example 3:APP closes the LED lights of all modules, instruction: FBFFE9B1A900

5) APP sends APP connection password (Feature UUID: FFE2)

Instruction	Password
FE	5 bytes

Example 1:APP sends the password 123456 to the module, instruction: FE313233343536

Note: When the serial port AT+ISCEN is set to 0, whether APP sends the APP password or not, modules can communicate with APP.

When the serial port AT+ISCEN is set to 1, the module will verify the password sent by APP, and only after the password is correct can the module communicate with APP.

6) APP modifies the APP connection password of the current module

Instruction	Target short address	Data
F3	1 byte	Param

Example 1: APP sends the new password 112233 to the module, instruction: FE313132343333

Note: When modifying the internal password of the module, only when APP sends the connection password correctly, can the module support APP to modify the password.

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7) APP modifies module short address

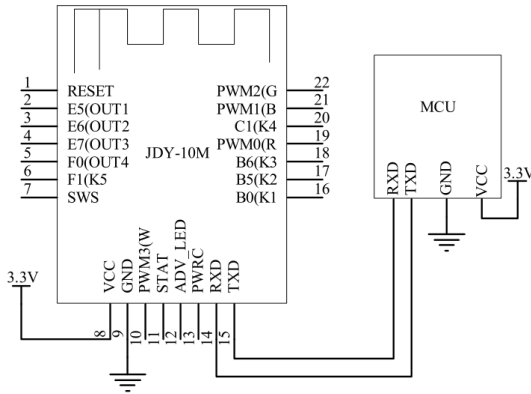
Instruction	Target short address
F4	1 byte

Example 1: APP modify the short address of the current device to 11, instruction: F411

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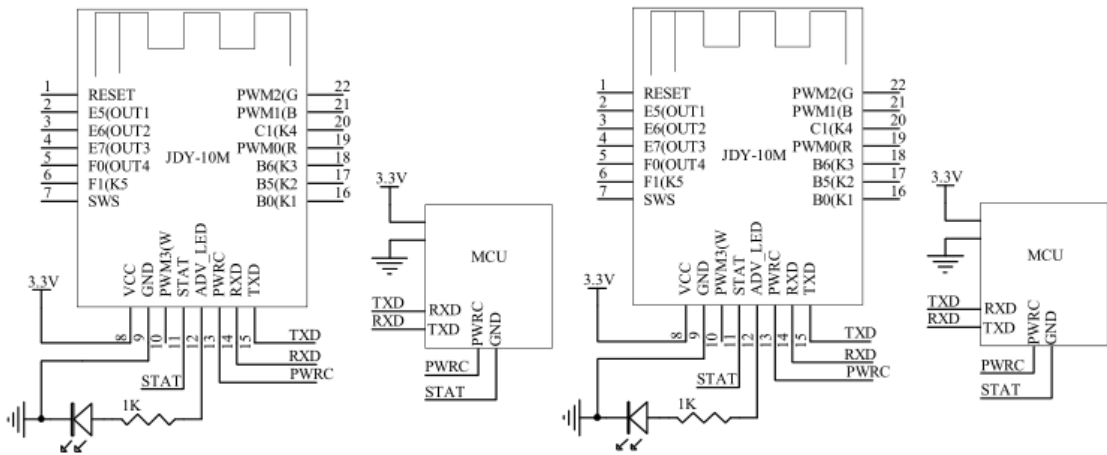
## JDY-10M basic application wiring diagrams

1) Wiring diagram of APP and MCU serial port transparent transmission



The device type of non MESH serial port and APP transparent transmission application or MESH serial port and APP transparent transmission application is AT+CLSSA0.

2) MCU and MCU serial port MESH one-to-multiple, multiple to one, and multiple to multiple transparent transmission, and support APP connection control.

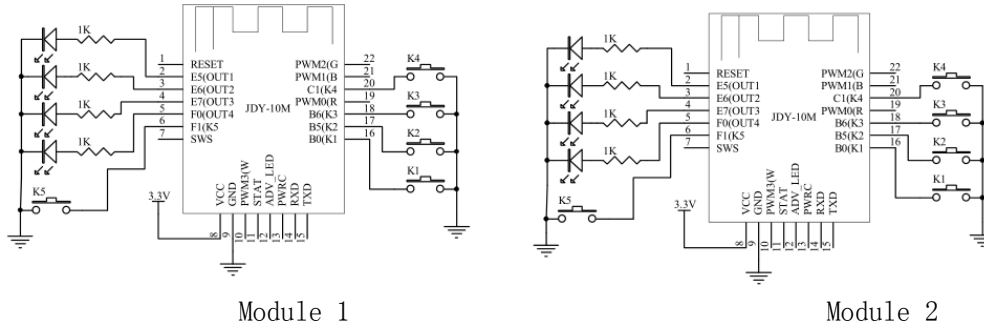


Note: the type of MESH transparent transmission device is AT+CLSSA0



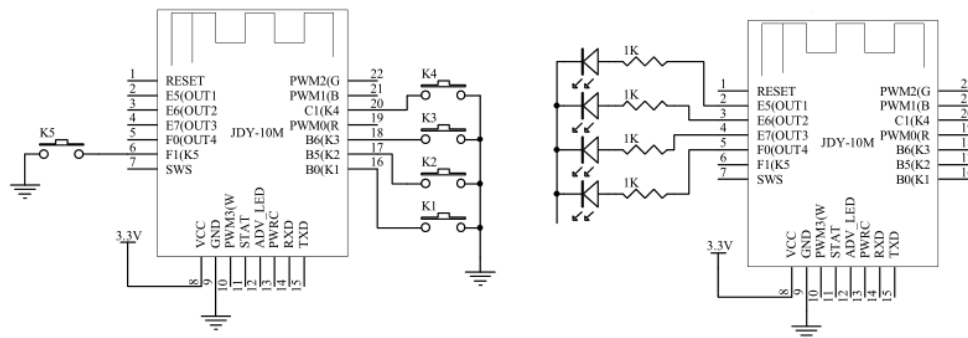
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3) IO switch volume is controlled by one-to-multiple, multiple to one, and multiple to multiple MESH networks, and connected with APP.



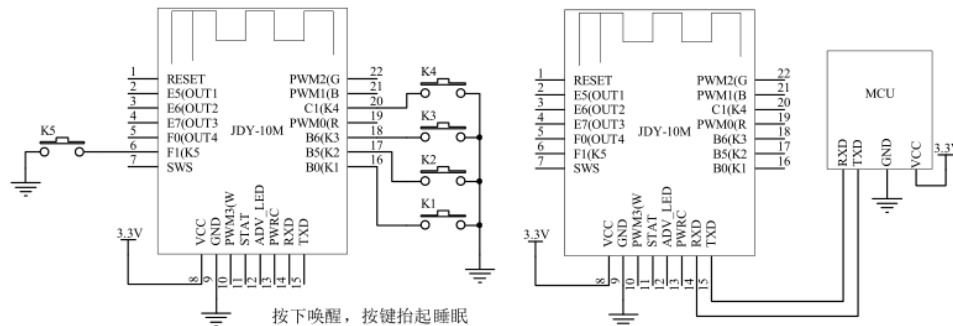
Description: the key of module 1 can control the LED light of module 2, and the key of module 2 can also control the LED light application of module 1. Note that the type of the two is AT+CLSSA0, of course, the short address of the key needs the user's own configuration. The above module 1 and module 2 are only an example, not only support two modules to control each other, but can also support dozens of module control.

4) Wiring diagrams of low power consumption telecontroller and panel switch application



Note: switch volume transmit can use default AT+CLSSA0 type without requiring low power consumption.

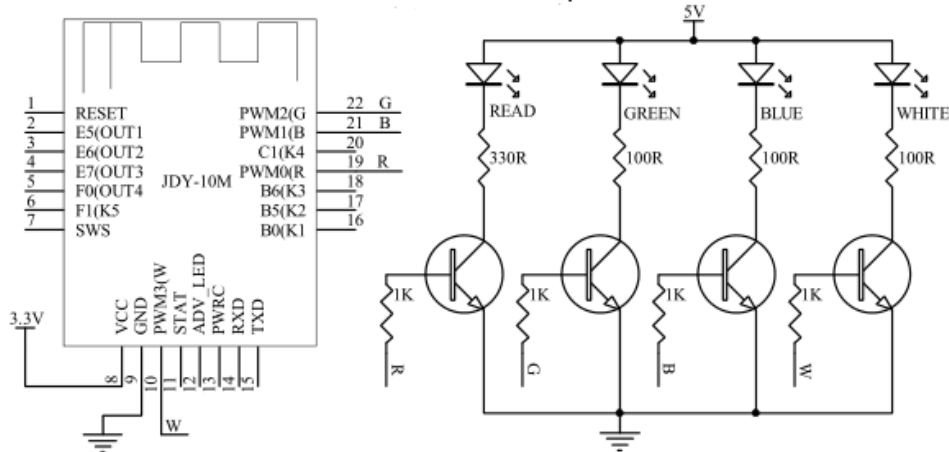
5) Wiring diagrams of low power consumption telecontroller transmit and MCU receive key value application



Note: the low power consumption telecontroller must pre configure the module to AT+CLSSC0 type, so that when the button is not pressed, the current will be several uA. When the button is pressed, the transmit key value is waken up.

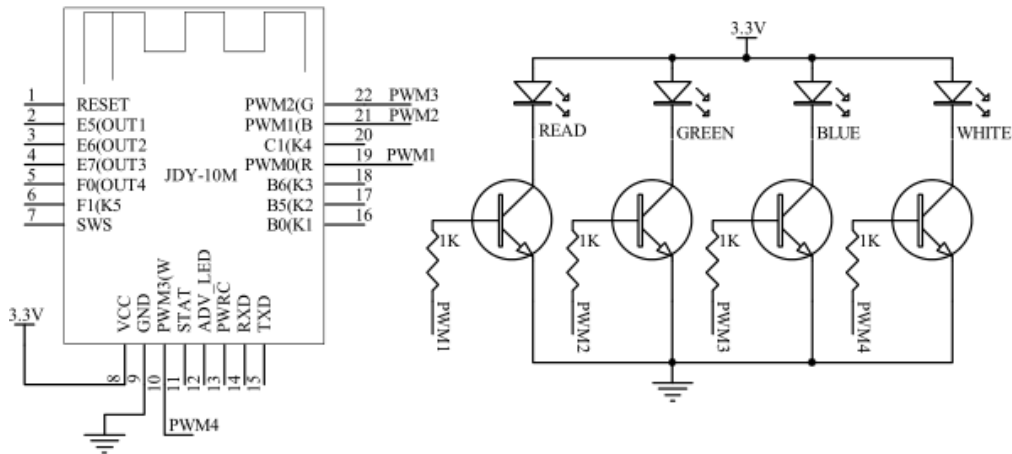
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## 6) Wiring diagram for application of mesh networks LED light



Note: LED light application, we must pre configure the module to AT+CLSSB1 type, supporting hundreds of LED lights mesh networks control.

## 7) Wiring diagram of mesh networks PWM application



Note: the PWM application type is AT+CLSSA0