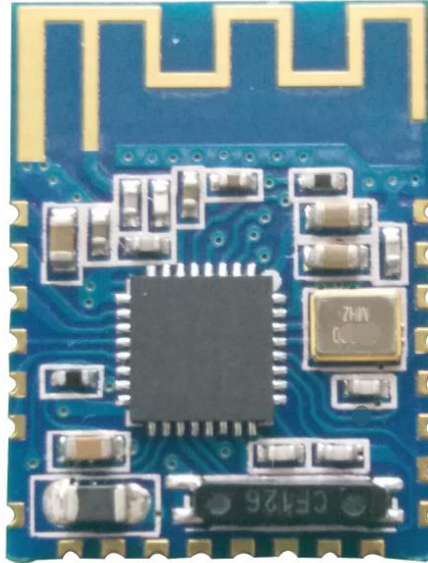


# Bluetooth 4.2 BLE module

JDY-16 Bluetooth module usage manual



## JDY-16 High Speed Transparent Transmission Bluetooth Module

### **Version**

Version	Date	Instruction
V1.2	2017-8-19	Release version
V1.4	2017-10-26	WeChat sports has been added Modify the boot wake stat Added 128 bit UUID support Added the feature UUID:FFE3
V1.5	2017-11-01	Updating IIC power consumption and 128 bit UUID problems

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## JDY-16 High Speed Transparent Transmission Bluetooth Module

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	iBeacon IBSING register .....

## JDY-16 High Speed Transparent Transmission Bluetooth Module

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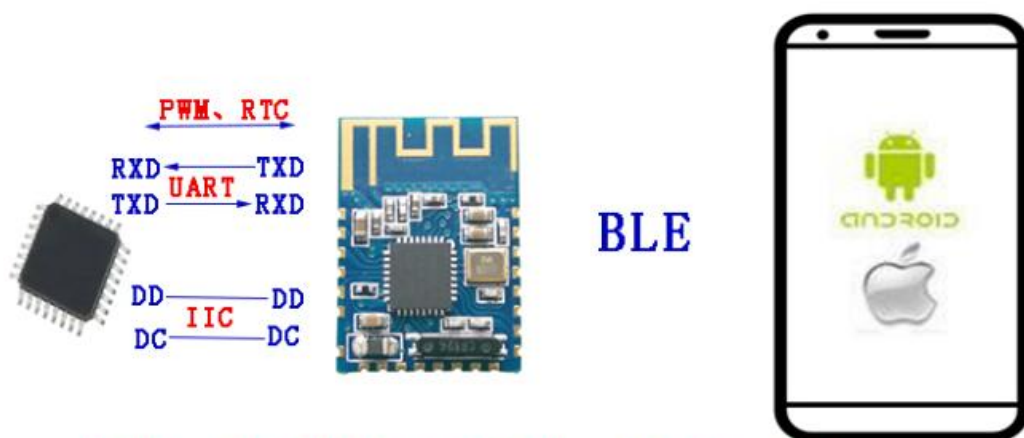
# JDY-16 High Speed Transparent Transmission Bluetooth Module

## 1.Product brief introduction

The JDY-16 transmission module is based on Bluetooth 4.2 standard, the working frequency is 2.4GHZ, the modulation mode is GFSK, the maximum transmission power is 0db, and the maximum transmission distance is 60 meters, using imported original chip design, which supports users to modify the name of the device, service UUID, transmit power, pairing passwords and other instructions through the AT command, convenient and flexible to use.

JDY-16 Bluetooth module can realize data transmission between module and mobile phone or module and module, and can select UART or IIC communication mode through IO, and through simple configuration, you can quickly use BLE Bluetooth for product applications.

**Make BLE be faster and more convenient in product application.**



**模块与手机或微信（小程序、公众号）通信**



**模块主从通信**

### 2. Debugging tools

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

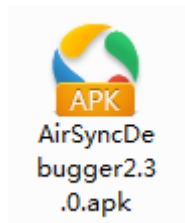


Use WeChat scan and select in the upper right to open in the browser.

2.2 Serial port tool (data package attached)



2.3: WeChat Airsync debugging tool (data package attached)



This APK is the official WeChat Airsync testing tool.

## JDY-16 High Speed Transparent Transmission Bluetooth Module

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### 3. Module parameter details

#### Module parameter

JDY-16 product parameters	
Model	JDY-16
Working frequency band	2.4G
Transmit power	0db (Max)
Communication interface	UART or IIC
Working voltage	1.8V – 3.6V
Working temperature	-40℃ - 80℃
Antenna	Built in PCB antenna
Receiving sensitivity	-97dbm
Transmission distance	60 meters
Module size	19.6mm * 14.94 *2.6
Bluetooth version	BLE 4.2 (compatible with BLE4.0, BLE4.1)
Transparent transmission rate	115200 bps/s
Wake-up status current	4mA (Broadcast)
Light sleep status current	<300uA (Broadcast)
Deep sleep status current	1.8uA (No broadcast)
Instruction parameter saving	Parameter configuration power down data is saved
STM welding temperature	<300℃



## JDY-16 High Speed Transparent Transmission Bluetooth Module

### Working current

Working mode	Broadcast state	current	Remarks
Wake up	Broadcast	4mA	Generally communicate with APP connection, which is suggested that broadcast should not set too long, for which will affect the connection time. The broadcast interval is generally recommended to be set between 100 to 500mS. If you need to connect fast and with no power requirement, the broadcast intervals can be set to the shortest.
Deep no broadcast sleep	No broadcast	1.38uA	
Light sleep broadcast	100mS broadcast interval	280uA	
Average power consumption	200mS broadcast interval	140uA	
	300mS broadcast interval	80uA	
	400mS broadcast interval	The following currents are much lower	
	500mS broadcast interval		
	600mS broadcast interval		
	700mS broadcast interval		
	800mS broadcast interval		
	900mS broadcast interval		
1000mS broadcast interval			
Wake up state	Connected	4mA	In connection state, the PWRC pin can be pulled down to send the AT command or directly set the operation mode, you can check the AT+STARTEN instruction.
Sleep state	Connected	50uA	

### Description of JDY-16 sleep mode

Sleep mode	Instructions	Function description
Sleep mode 0	AT+STARTEN0	Mode 0: Wake up, users need sleep can be controlled by AT+SLEEP command, wake up can be controlled by PWRC pin wake-up.
Sleep mode 1	AT+STARTEN1	Mode 1: Boot sleep, wake up after the connection, disconnect automatically into sleep, <b>note: AT+SLEEP invalid mode 1, sleep controls sleep by Bluetooth module itself.</b>
Sleep mode 2	A T+STARTEN2	Mode 2: Boot sleep, connect and disconnect all sleep, APP to send data to the serial port module or module to send data automatic wake-up, after data transmission is completed, it will be automatic sleep, note: AT+SLEEP of mode 1 is invalid, <b>note: AT+SLEEP invalid mode 1, sleep controls sleep by Bluetooth module itself.</b>

## JDY-16 High Speed Transparent Transmission Bluetooth Module

### FAQ

Questions	Question answer
1 : How does MCU disconnect Bluetooth connection under connection state?	In the connection state, the PWRC pin is pulled down, and the serial port sends AT+DISC to disconnect the connection IIC can disconnect the memory address: 0X15 writes 0X01 values to indicate disconnection
2: Can it write data to the module if the connection password is incorrect?	No, it can't. Only the correct password can write data to the module
3: How much data can the serial port write at one time?	No byte limit, 100K can be sent once (master slave communication)
4 : How fast can the fastest communication rate be reached?	With mobile phone measured 8K Bytes per second, module master slave communication can achieve 115200 baud rate continuous transceiver, and the rate of 115200bps.
5: After configuring parameters by serial port or IIC, does it need to be restarted to take effect?	It is recommended to restart when the module parameters are set.
6: Parameters of serial port or IIC configuration, is the power up stored next time?	After saving, configuring, the next power up is the last configuration parameter.
7: How to test the deep sleep current of test module?	It is recommended to connect the VCC and GND pins to test current.

### Default parameter configuration for factory

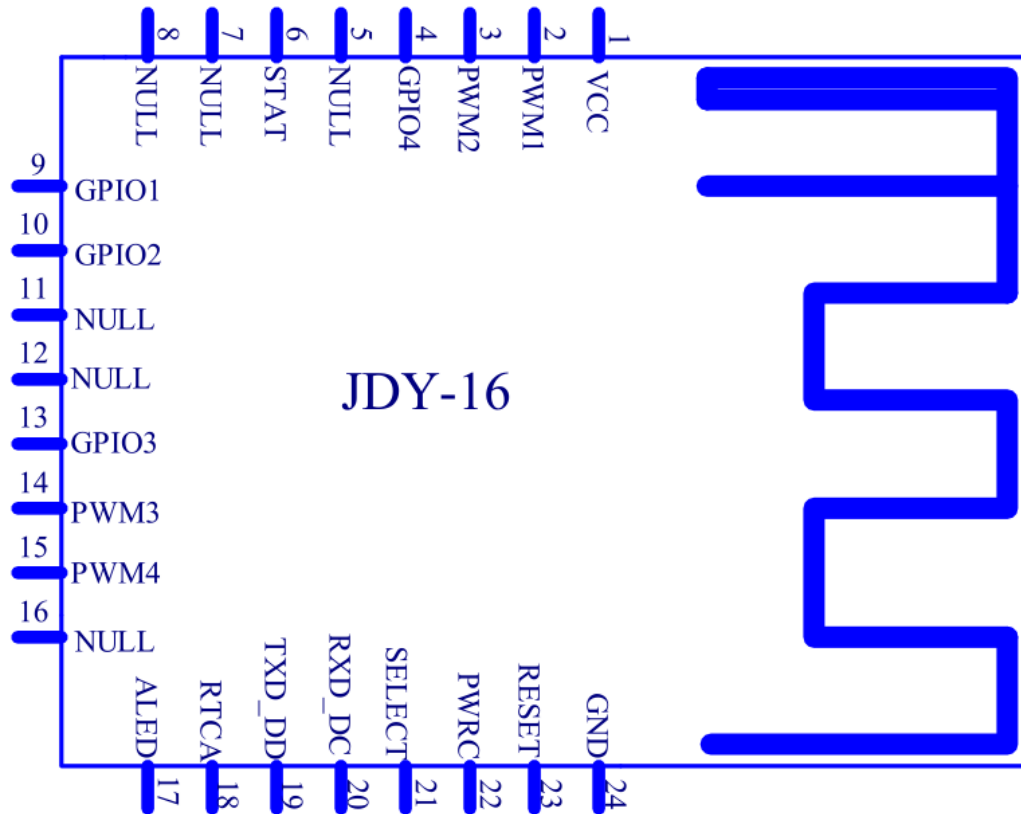
Sequence	Function	Default parameters of factory	Instructions
1	Communication mode	UART	SELECT pin hanging
2	Serial port baud rate	9600	AT+BAUD4
3	Sleep mode	Boot wake up	AT+STARTEN0
4	Broadcast name	JDY-16	AT+NAMEJDY-16
5	Broadcast interval	100MS	AT+ADVINT0
6	Master slave mode	slave transparent transmission	AT+HOSTEN0
7	Output status	Output status	AT+ENLOG1
8	Broadcast LED pin switch	On	AT+ALED1
9	Transparent transmission service UUID	0XFFE0	AT+SVRUUIDFFE0
10	Transparent transmission features UUID	0XFFE1	AT+CHRUUIDFFE1

## JDY-16 High Speed Transparent Transmission Bluetooth Module

11	Function configuration UUID	0XFFE2	<b>Unmodifiable</b>
12	APP write feature UUID	0XFFE3	<b>AT+CRXUUIDFFE3</b>

Special note: Transparent transmission service UUID, transparent transmission features UUID, APP write feature UUID all support 16 bit or 128 bit UUID.

### Pin definition



### Pin function description

Pin	Function	Description
1	VCC	Power supply (1.8-3.6V)
2	PWM1	Support UART, IIC, APP control
3	PWM2	Support UART, IIC, APP control
4	IO4	High and low electrical level can be controlled by APP
5	NULL	
6	STAT	UART communication mode: not connected low electrical level, high electrical level after connection IIC communication mode: not connected high electrical level, connection, disconnect or receive data will work in interrupt mode, interrupt the falling edge holding time 200ms
7	NULL	
8	NULL	
9	IO1	High and low electrical level can be controlled by APP

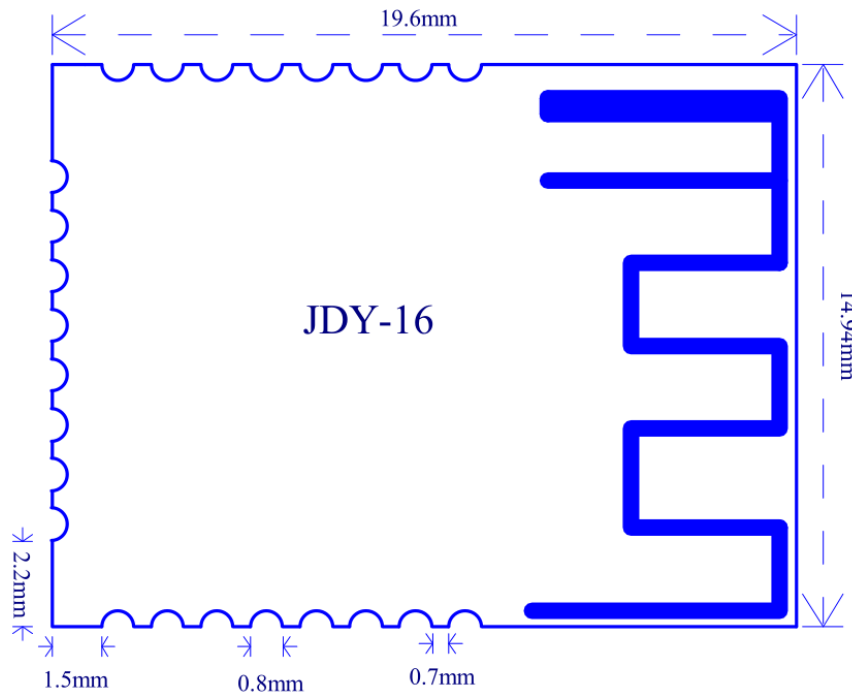
## JDY-16 High Speed Transparent Transmission Bluetooth Module

10	IO2	High and low electrical level can be controlled by APP
11	NULL	
12	NULL	
13	IO3	High and low electrical level can be controlled by APP
14	PWM3	Support UART, IIC, APP control
15	PWM4	Support UART, IIC, APP control
16	NULL	
17	ALED	Broadcast flashes, always bright after connection (master-slave effective)
18	RTCA	RTC timing time to produce a drop edge interrupt signal, usually high electrical level
19	TXD_OR_D D	SELECT boot to High electrical level, the pin function of this serial port is TXD SELECT boot to low electrical level, this pin function is IIC DD
20	RXD_OR_D C	SELECT boot to High electrical level, the pin function of this serial port is RXD SELECT boot to low electrical level, this pin function is IIC DC
21	SELECT	UART or IIC select pin Boot low electrical level: IIC communication mode Boot high electrical level: UART communication mode The default SELECT is suspended as high electrical level: UART communication mode, when the user needs IIC, the SELECT pin is required to be grounded
22	PWRC	When the AT instruction is required to be sent in the connection state, the AT instruction mode can be displayed by maintaining the low electrical level of the pin. In the unconnected state, this pin is AT command mode regardless of the high and low electrical levels
23	RESET	Hardware reset pin
24	GND	Power ground

## JDY-16 High Speed Transparent Transmission Bluetooth Module

### Dimensional drawing

JDY-16 specifications are in the data PCB package folder, and the format is CAD version of the document.



### Serial port AT instruction set

JDY-16 module serial port send AT instruction must add \r\n, AT does not distinguish case

Seq uenc e	Instruction	Function	Mast er / slav e	Work mode	Default
1	AT+PERM	APP permission configuration	S		IO、PWM open
2	AT+RST	Reset	M/S	—	
3	AT+MASTERE N	Master-slave setting	M/S	—	slave
4	AT+MAC	Device MAC	M/S	—	
5	AT+BAUD	Baud rate	M/S	—	9600
6	AT+NAME	Broadcast name	S		JDY-16
7	AT+NL	Long broadcast name	S		JDY-16
8	AT+NF	Setting broadcast name does not store FLASH Power on again, no memory	S		JDY-16
9	AT+CONN	Master connect slave	M		
10	AT+SCAN	Master scan slave	M		
11	AT+BAND	Master binding slave MAC	M		000000000000
12	AT+USTP	Serial port stop bit	M/S		0
13	AT+SLEEP	Sleep	M/S		

## JDY-16 High Speed Transparent Transmission Bluetooth Module

14	AT+PARITY	Serial port parity check bit	M/S		0
15	AT+PASS	Slave connection password	S		123456
16	AT+STARTEN	Start working mode	M/S		0
17	AT+DEFAULT	Restore factory configuration	M/S		
18	AT+FLOWC	Serial port flow control	M/S		0
19	AT+VER	Version number	M/S		
20	AT+ISCEN	Slave connection password switch	M/S		0
21	AT+ WXSVR	WeChat Airsync H5 or server	S	transparent transmission	0
22	AT+WXINEN	Manual and automatic test of WeChat Airsync	S	transparent transmission	0
23	AT+ CLSS	Device style	S		A0
24	AT+VID	Manufacturer ID identification code	S		
25	AT+MAJOR	iBeacon MAJOR value	S	iBeacon	0A
26	AT+MINOR	iBeacon MINOR value	S	iBeacon	07
27	AT+IBUUID	iBeacon UUID value	S	iBeacon	FDA50693A4E 24FB1AFCFC 6EB07647825
28	AT+IBSING	iBeacon SING value	S	iBeacon	40
29	AT+SVRUUID	Bluetooth service UUID	M/S	transparent transmission	FFE0
30	AT+CHRUUID	Bluetooth feature UUID	M/S	transparent transmission	FFE1
31	AT+ADVINT	Broadcast interval	S		1
32	AT+ADVEN	Broadcast switch	S		1
33	AT+RTCOPEN	RTC switch	M/S		0
34	AT+RTCD	RTC time read & write	M/S		2016-01-01,00:

## JDY-16 High Speed Transparent Transmission Bluetooth Module

					00:00
35	AT+POWR	Transmitting power	S		1
36	AT+DISC	Disconnect	S		
37	AT+STAT	Connection state	M/S		00
38	AT+ENLOG	State output enable	M/S		0
39	AT+PWMFRE	PWM frequency	M/S		1000
40	AT+PWMOPE N	PWM switch	M/S		0
41	AT+PWM1PU S	PWM1 pulse width	M/S		10
42	AT+PWM2PU S	PWM2 pulse width	M/S		10
43	AT+PWM3PU S	PWM3 pulse width	M/S		10
44	AT+PWM4PU S	PWM4 pulse width	M/S		10
45	AT+ALED	Broadcast indicating LED switch	M/S		Open
46	AT+FUNC	Master controls slave IO or PWM	M		
47	AT+NETIN	Module communication enable with low rate BLE	M		0
48	AT+CHRUUID	APP writes UUID to modules	M/S	transparent transmission	FFE3
49	AT+WXP	WeChat steps, distance, calories	S	WeChat sport	000000000000 000000
50	AT+WXT	WeChat spotr target (step number)	S		00000000
51	AT+UIDLEN	16 bit or 128 bit UUID selection	S		0

Explanation: green characters represent new functions, red bold parts need special attention

## JDY-16 High Speed Transparent Transmission Bluetooth Module

### 4.AT instruction description

Special note: JDY-16 module serial port instruction AT need to add terminator \r\n

#### APP permission Settings / queries

Instruction	Response	Parameter
AT+PERM<Param>	+OK	Param (5 bit byte)
AT+PERM	+PERM=<Param>	

Each byte function in 5 bytes is explained in detail

Param(5 bit byte)	Function	Permission (Y/N)	Y indicates that APP has permission control N indicates APP without permission control
Byte1	Can broadcast be modified by APP?	Default: N	
Byte2	Can the connection password be modified by APP?	Default: N	
Byte3	Can the APP control the IO electrical level?	Default: Y	
Byte4	Can APP control PWM?	Default: Y	
Byte5	Can APP configure iBeacon Parameter?	Default: N	

The above configuration Parameter sends AT+PERM, returns Parameter is:  
+PERM=00110

The example opens the APP settings (broadcast name, IO, PWM) permissions

Send: AT+PERM10110

#### Soft reset

Instruction	Response	Parameter
AT+RST	OK	None

#### Settings / queries –device style

Instruction	Response	Parameter
AT+CLSS<Param>	+OK	Param (00-FF) Default: 0xa0
AT+ CLSS	+ CLSS=<Param>	

#### Restore factory configuration (revert to factory default configuration Parameter)

Instruction	Response	Parameter
AT+DEFAULT	+OK	None



## JDY-16 High Speed Transparent Transmission Bluetooth Module

### Settings / queries-- Boot sleep and wake up reading and writing

Instruction	Response	Parameter
AT+STARTEN<Param>	OK	Param: (0-2)
AT+STARTEN	+STARTEN=<Param>	0: Wake up, sleep can be controlled by AT+SLEEP 1 : Boot sleep, connect wake up, disconnect sleep 2 : Boot sleep, connect sleep, disconnect sleep Auto wakeup when sending data by APP or serial port Default: 0

### Settings / queries—Sleep Instruction

Instruction	Response	Parameter
AT+SLEEP<Param>	+SLEEP:OK	Param: (1-2)
AT+SLEEP		1: light sleep (Broadcast) 2 : deep sleep ( No Broadcast)

### Settings / queries-- baud rate

Instruction	Response	Parameter
AT+BAUD<Param>	OK	Param: (1-9)
AT+BAUD	+BAUD=<Param>	1——1200 2——2400 3——4800 4——9600 5——19200 6——38400 7——57600 8——115200 9——230400 Default value: 0

### Setting - disconnect

Instruction	Response	Parameter
AT+DISC	OK	None

## JDY-16 High Speed Transparent Transmission Bluetooth Module

### Settings / queries-- Broadcast switch

Instruction	Response	Parameter
AT+ADVEN<Param>	OK	Param: (0-1) 0—Stop Broadcast 1—Open Broadcast Default value: 1
AT+ADVEN	+ADVEN=<Param>	

### Settings / queries -- Mode work pattern

Instruction	Response	Parameter
AT+HOSTEN<Param>	OK	Param: (0-3) 0—Slave (APP, WeChat, small program) transparent transmission 1—Host transparent transmission mode 3—Slave (iBeacon) mode Default value: 0
AT+HOSTEN	+ AT+HOSTEN =<Param>	

### Settings / queries-- Broadcast interval

Instruction	Response	Parameter
AT+ADVINT<Param>	OK	Param: (0-9) 0—100ms 1—200ms 2—300ms 3—400ms 4—500ms 5—600ms 6—700ms 7—800ms 8—900ms 9—1000ms Default value: 0
AT+ADVINT	+ADVINT=<Param>	

### Settings / queries-- Broadcast name

Instruction	Response	Parameter
AT+NAME<Param>	OK	Param: Mode Bluetooth name The longest: 18 bytes Default name: JDY-16
AT+NAME	+NAME=<Param>	

## JDY-16 High Speed Transparent Transmission Bluetooth Module

### Settings / queries—Long Broadcast name

Instruction	Response	Parameter
AT+NL<Param>	OK	Param: Mode Bluetooth name The longest: 18 bytes Default name:JDY-16
AT+NL	+NL=<Param>	

### Settings / queries— Broadcast name F

Instruction	Response	Parameter
AT+NF<Param>	OK	Param: Mode Bluetooth name The longest: 18 bytes Default name:JDY-16
AT+NF	+NF=<Param>	

### Settings / queries-- MAC address

Instruction	Response	Parameter
AT+MAC<Param>	OK	Param: MAC address 112233445566
AT+MAC	+MAC=<Param>	

Example of modifying MAC address: AT+MAC112233445566

### Settings / queries-- Transmit power

Instruction	Response	Parameter
AT+POWR<Param>	OK	Param: (0-1) 0——Negative 16db 1——0db <b>Default value: 1</b>
AT+POWR	+POWR=<Param>	

### Settings / queries--iBeacon UUID

Instruction	Response	Parameter
AT+IBUUID<Param>	OK	Param: Hexadecimal UUID Default value: FDA50693A4E24FB1AFCFC6EB07647825
AT+IBUUID	+IBUUID=<Param>	

#### hexadecimal data

Example: 41 54 2B 49 42 55 55 49 44 FD A5 06 93 A4 E2 4F B1 AF CF C6 EB 07 64 78 25 0D 0A

AT+IBUUID

FDA50693A4E24FB1AFCFC6EB07647825

结束符

### Settings / queries--iBeacon Major

Instruction	Response	Parameter
AT+ MAJOR<Param>	OK	Param: (0000-FFFF) Default: 000A
AT+ MAJOR	+ MAJOR=<Param>	

## JDY-16 High Speed Transparent Transmission Bluetooth Module

### Settings / queries--iBeacon Minor

Instruction	Response	Parameter
AT+MINOR<Param>	OK	Param: (0000-FFFF) Default: 0007
AT+MINOR	+MINOR=<Param>	

### Settings / queries--iBeacon IBSING

Instruction	Response	Parameter
AT+IBSING<Param>	OK	Param: (00-FF) Default: 40
AT+IBSING	+IBSING =<Param>	

This Parameter is applied to signal check value of iBeacon within 1 meter

### Query - version number

Instruction	Response	Parameter
AT+VER	+JDY-16-V1.3	None

### Settings / queries-- Manufacturer identification code

Instruction	Response	Parameter
AT+VID<Param>	OK	Param: (00-FF) Default: 88
AT+VID	+VID=<Param>	

### Settings / queries--Password connection switch

Instruction	Response	Parameter
AT+ISCEN<Param>	OK	Param: (0-1) 0: Not open password connection function 1: Open password connection is not bound Default: 0
AT+ISCEN	+ISCEN=<Param>	

### Settings / queries—Connection password

Instruction	Response	Parameter
AT+PASS<Param>	OK	Param:6 bit number password Default value: 123456
AT+PASS	+PASS=<Param>	

### Settings / queries—Service UUID

Instruction	Response	Parameter
AT+SVRUUID<Param>	OK	Param: (0000-FFFF) Default value: FFE0
AT+SVRUUID	+SVRUUID=<Param>	

## JDY-16 High Speed Transparent Transmission Bluetooth Module

### Settings / queries—Feature UUID

Instruction	Response	Parameter
AT+CHRUUID<Param>	OK	Param: (0000-FFFF) Default value: FFE1
AT+CHRUUID	+CHRUUID=<Param>	

### Setting -- Master scan

Instruction	Response	Parameter
AT+SCAN	OK	None

Example: +DEV:1=1893D711AB87,-82,JDY-08 The Master scans MAC, RSSI, and device names from the machine

### The list address that the Master connects to scan

Search list connection

Instruction	Response	Parameter
AT+CONN <Param>	OK	Param: (0-7)
AT+CONN	+CONN=<Param>	

Direct MAC address connection

Instruction	Response	Parameter
AT+CONN<Param>	OK	Param: (MAC)
AT+CONN	+CONN=<Param>	

Example: AT+CONN112233445566

### Settings / queries-- Master binding MAC address

Instruction	Response	Parameter
AT+BAND<Param>	OK	Param: (MAC)
AT+BAND	+BAND=<Param>	

Example: AT+BAND112233445566

### Setting - Master cancels binding

Instruction	Response	Parameter
AT+CLRBAND	OK	None

### Settings / queries-- Connection state

Instruction	Response	Parameter
AT+STAT	+GETSTAT=<Param>	Param: (0-1) 0: Not connected 1: Connected

## JDY-16 High Speed Transparent Transmission Bluetooth Module

### Settings / queries –RTC year/month/time/minute/second

Instruction	Response	Parameter
AT+RTCD<Param>	+OK	Param (xxxx-xx-xx,xx:xx:xx) Default: 2014-12-05,12:07:08
AT+RTCD	+ RTCD=<Param>	

Example:

Set RTC time:

AT+RTCDATE2014-12-05,12:07:08

Return: +OK

Read RTC time

AT+RTCD

Return: +RTCDATE:14-12-05,12:07:08

### Settings / queries –RTC open & close

Instruction	Response	Parameter
AT+RTCOPEN<Param>	OK	Param (0-2) 0: Indicates closing the RTC function 1: Indicates opening RTC 2: Indicates turn on the switch and switch on next time Default: 0
AT+RTCOPEN	+ RTCOPEN=<Param>	

### Settings / queries-- WeChat H5 or server selection

Instruction	Response	Parameter
AT+WXSVR<Param>	OK	Param: (0-1) 0: H5 communication 1: Server communication Default: 0
AT+WXSVR	+WXSVR=<Param>	

### Settings / queries—PWM frequency

Instruction	Response	Parameter
AT+PWMFRE<Param>	OK	Param: (50-25KHZ) Default: 1000hz
AT+PWMFRE	+PWMFRE<Param>	

### Settings / queries—Open & close PWM

Instruction	Response	Parameter
AT+PWMOPEN<Param>	OK	Param: (0-1) 0: Close PWM 1: Open PWM Default: 0
AT+PWMOPEN	+PWMOPEN<Param>	

## JDY-16 High Speed Transparent Transmission Bluetooth Module

### **Settings / queries--PWM1 pulse width**

Instruction	Response	Parameter
AT+PWM1PUS<Param>	OK	Param: (0-255) PERCENTAGE OF PWM PULSE WIDTH Default: 10
AT+PWM1PUS	+PWM1PUS: <Param>	

### **Settings / queries--PWM2 pulse width**

Instruction	Response	Parameter
AT+PWM2PUS<Param>	OK	Param: (0-255) PERCENTAGE OF PWM PULSE WIDTH Default: 10
AT+PWM2PUS	+PWM2PUS: <Param>	

### **Settings / queries--PWM3 pulse width**

Instruction	Response	Parameter
AT+PWM3PUS<Param>	OK	Param: (0-255) PERCENTAGE OF PWM PULSE WIDTH Default: 10
AT+PWM3PUS	+PWM3PUS: <Param>	

### **Settings / queries--PWM4 pulse width**

Instruction	Response	Parameter
AT+PWM4PUS<Param>	OK	Param: (0-255) Percentage of PWM pulse width Default: 10

### **Settings / queries--Serial port parity check bit**

Instruction	Response	Parameter
AT+PARITY<Param>	OK	Param (0-2) 0: No parity bit 1: Odd parity bit 2: Even parity bit Default: 0 No parity bit
AT+PARITY	+ PARITY=<Param>	

### **Settings / queries--WeChat (automatic, manual) test mode**

Instruction	Response	Parameter
AT+WXINEN<Param>	OK	Param (0-1) 0: WeChat manual test mode 1: WeChat automatic test mode Default: 0
AT+WXINEN	+WXINEN=<Param>	

## JDY-16 High Speed Transparent Transmission Bluetooth Module

### Settings / queries–Broadcast indicating LED lamp

Instruction	Response	Parameter
AT+ALED<Param>	OK	Param (0-1) 0: Close the broadcast LED instructions 1: Open the broadcast LED instructions Default: 0
AT+ALED	+ALED=<Param>	

### Settings – from module IO

This instruction is only applied to master and slave communication modes (master instructions)

AT+FUNC Sixteen hexadecimal instruction	Response	Function
41 54 2B 46 55 4E 43 E7 F1 01 0D 0A	OK	Master set slave IO1 high electrical level
41 54 2B 46 55 4E 43 E7 F1 00 0D 0A	OK	Master set slave IO1 low electrical level
41 54 2B 46 55 4E 43 E7 F2 01 0D 0A	OK	Master set slave IO2 high electrical level
41 54 2B 46 55 4E 43 E7 F2 00 0D 0A	OK	Master set slave IO2 low electrical level
41 54 2B 46 55 4E 43 E7 F3 01 0D 0A	OK	Master set slave IO3 high electrical level
41 54 2B 46 55 4E 43 E7 F3 00 0D 0A	OK	Master set slave IO3 low electrical level
41 54 2B 46 55 4E 43 E7 F4 01 0D 0A	OK	Master set slave IO4 high electrical level
41 54 2B 46 55 4E 43 E7 F4 00 0D 0A	OK	Master set slave IO4 low electrical level

### Settings / queries - Module communication enable with low rate BLE

Instructions	Response	Parameters
AT+NETIN<Param>	OK	Param (0-1) 0: High speed 1: Low speed Default: 0 (high speed)
AT+NETIN	+NETIN=<Param>	

### Settings / queries - APP writes UUID

Instructions	Response	Parameters
AT+CRXUUID<Param>	OK	Param (0000-FFFF) Default: 0Xffe3
AT+CRXUUID	+CRXUUID=<Param>	



## JDY-16 High Speed Transparent Transmission Bluetooth Module

### **Settings - WeChat sport (step data, distance, calories)AT+WXP +**

Step data + distance + calories

The instructions are sent in hexadecimal format

Example: set the number of Wechat walk steps as: 100 thousand steps, distance of 250 kilometers, 5000 calories

41 54 2B 57 58 50 A0 86 01 FA 00 00 88 13 00 0D 0A  
AT+WXP steps distance calories terminator

### **Settings - WeChat sport (target)**

AT+WXT + target value

The instructions are sent in hexadecimal format

Example: setting WeChat sport is now the 5000 steps

41 54 2B 57 58 54 88 13 00 0D 0A  
AT+WXT target terminator

### **Settings / queries - UUID is 128 for 16 bits**

Instructions	Response	Parameters
AT+UUIDLEN<Param>	OK	Param (0-1) 0: indicates 16 bit UUID 1: indicates 128 bit UUID Default: 0

## JDY-16 High Speed Transparent Transmission Bluetooth Module

### 5.IIC communication format

#### IIC data communication read write format

IIC write communication format JDY-16 module IIC device address: 0xa0

START	1byte address		A	Internal Function Address	A	Data N	NACK	Stop
	7 bit address	0	C K		C K			

IIC read communication format

START	1byte address		A	Internal Function Address	A	8 bytes		A	NACK	Stop
	7 bit address s	0	C K		C K	7 bit address ss	1	C K		

#### IIC register address table

Main body	Address	Function	Data length	Read & write
Authority	01H	APP control authority	5 bytes	Read & write
Basic	10H	Reset	1 byte	Write
	11H	Search version number	11 bytes	Read
	12H	Restore factory configuration	1 byte	Write
	13H	Sleep	1 byte	Write
	14H	Device MAC address	6 bytes	Read & write
	15H	Disconnect	1 byte	Write
	16H	Operative mode	1 byte	Read
Mode	C0H	Master-slave mode	1 byte	Read & write
	C1H	Startup sleep	1 byte	Read & write
Master	20H	Master scan slave	1 byte	Write
	21H	Master binding slave	6 bytes	Read & write
	22H	Master gets the number of slave machines to scan	1 byte	Read
	23H	Master connect slave	1 byte	Write
	24H	Master connect slave MAC address	6 bytes	Write
Broadcast	30H	Broadcast name	(1-20) bytes	Read & write
	31H	Broadcast name length	1 byte	Read
	32H	Broadcast interval	1 byte	Read & write
	34H	Broadcast switch	1 byte	Read & write
	35H	Transmit power	1 byte	Read & write
	36H	Broadcast indicating LED light switch	1 byte	Read & write
Password	40H	Connect password switch	1 byte	Read & write
	41H	Connect password	6 bytes	Read & write
	60H	Device type	1 byte	Read & write

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ID type	61H	Manufacturer identification code	1 byte	Read & write
iBeacon	70H	IBeacon UUID	16 bytes	Read & write
	71H	IBeacon MAJOR	2 bytes	Read & write
	72H	IBeacon MINOR	2 bytes	Read & write
	73H	IBeacon SING	1 byte	Read & write
<b>Main body</b>	<b>Address</b>	<b>Function</b>	<b>Data length</b>	<b>Read &amp; write</b>
Bluetooth UUID	80H	Bluetooth service UUID	2 or 16 bytes	Read & write
	81H	Bluetooth feature UUID (notify write)	2 or 16 bytes	Read & write
	82H	Bluetooth feature UUID (write)	2 or 16 bytes	Read & write
	83H	Length selection of UUID	1 bytes	Read & write
RTC	90H	RTC switch	1 byte	Read & write
	91H	RTC time	6 bytes	Read & write
PWM	95H	PWM frequency	2 bytes	Read & write
	96H	PWM switch	1 byte	Read & write
	97H	PWM1 pulse width	1 byte	Read & write
	98H	PWM2 pulse width	1 byte	Read & write
	99H	PWM3 pulse width	1 byte	Read & write
	9AH	PWM4 pulse width	1 byte	Read & write
Commu nication	F0H	IIC writes data to APP	1-250 bytes	Write
	F1H	Read the data length sent by APP	2 bytes	Read
	F2H	Read the data sent by APP	1-250 bytes	Read
Master search Equipment MAC	E0H	Read the Master scan list 0 device MAC	6 bytes	Read
	E1H	Read the Master scan list 1 device MAC	6 bytes	Read
	E2H	Read the Master scan list 2 device MAC	6 bytes	Read
	E3H	Read the Master scan list 3 device MAC	6 bytes	Read
	E4H	Read the Master scan list 4 device MAC	6 bytes	Read
	E5H	Read the Master scan list 5 device MAC	6 bytes	Read
	E6H	Read the Master scan list 6 device MAC	6 bytes	Read
	E7H	Read the Master scan list 7 device MAC	6 bytes	Read

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	E8H	Read the Master scan list 8 device MAC	6 bytes	Read
	E9H	Read the Master scan list 9 device MAC	6 bytes	Read

### APP control authority register

Address: 0x01	W							
DATA	DATA[5]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Each byte function in 5 bytes is explained in detail

Param (5 bit byte)	Function	Authority (Y/N)	Y indicates that APP has permission control N indicates APP without permission control
Byte1	Can broadcast be modified by APP?	Default: N	
Byte2	Can the connection password be modified by APP?	Default: N	
Byte3	Can the APP control the IO electrical level?	Default: Y	
Byte4	Can APP control PWM?	Default: Y	
Byte5	Can APP configure iBeacon parameters?	Default: N	

### Reset register

Address: 0x10	W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (1)

1—Reset (module reboot)

### Search version number register

Address: 0x11	R							
DATA	DATA[11]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Module version number read length is 11 bits

### Restore the factory configuration register

Address: 0x12	W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (1)

1—Restore the factory configuration

## JDY-16 High Speed Transparent Transmission Bluetooth Module

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### Sleep register

Address: 0x13	W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (1)

1——Sleep

### MAC address register

Address: 0x14	R/W							
DATA	DATA[6]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (6)

The MAC address of the module can be read or modified, and the length of the 6 bytes is fixed.

### Disconnect register

Address: 0x15	W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (1)

Used to disconnect the Master or slave

### Working status register

Address: 0x16	R							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (0-1)

0——Not connected

1——Connected

### Operating mode register

Address: 0Xc0	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (0-3)

0——APP and WeChat transparent transmission mode

1——Master transparent transmission mode

3——iBeacon mode

Default: 0

## JDY-16 High Speed Transparent Transmission Bluetooth Module

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### Sleep mode register

Address: 0xc1	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (0-2)

0——Wake up mode, sleep can be controlled by SLEPP command

1——Start sleep, connect wake up, sleep after disconnecting

2——Start sleep, sleep after connection, sleep after disconnecting

Default: 0

### Master scanner slave register

Address: 0x20	W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (1)

1——Scan the slave

### Master binding slave register

Address: 0x21	R/W							
DATA	DATA[6]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (1)

Bind to 6 bit MAC address, readable and writable

### Get the number register of the Master scan slave

Address: 0x22	R							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (1-10)

The Master search list maximum cache is 10.

### Master connect slave register

Address: 0x23	W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

### Master connect slave MAC register

Address: 0x24	W							
DATA	DATA[6]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

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### Broadcast name register

Address: 0x30	R/W							
DATA	DATA[1-20]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

### Broadcast name length register

Address: 0x31	R/W							
DATA	DATA[1-20]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

### Broadcast interval register

Address: 0x32	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (0-9)

0—100MS

1—200MS

2—300MS

3—400MS

4—500MS

5—600MS

6—700MS

7—800MS

8—900MS

9—1000MS

### Broadcast switch register

Address: 0x34	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (0-9)

0—Close broadcast

1—Open broadcast

Default: 1

### Broadcast switch register

Address: 0x35	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (0-1)

0—Negative 16db

1—0db

Default: 1

## JDY-16 High Speed Transparent Transmission Bluetooth Module

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### Broadcast indication LED lamp register

Address: 0x36	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (0-1)

0—Close the broadcast LED lights indication

1—Open the broadcast LED lights indication

Default: 1

### Connection password switch register

Address: 0x40	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (0-1)

0—Close password connection function

1—Open password connection function

Default: 0

### Connection password register

Address: 0x41	R/W							
DATA	DATA[6]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (0-6)

Default: Password is 123456

### Device type register

Address: 0x60	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default: 0xa0

### Manufacturer identification register

Address: 0x60	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default: 0x88

### iBeacon UUID register

Address: 0x70	R/W							
DATA	DATA[16]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default: 0xFDA50693A4E24FB1AFCFC6EB07647825



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### iBeacon MAJOR register

Address: 0x71	R/W							
DATA	DATA[2]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default: 0x000a

### iBeacon MINOR register

Address: 0x72	R/W							
DATA	DATA[2]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default: 0x0007

### iBeacon IBSING register

Address: 0x72	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default: 0x40 This parameter is applied to the iBeacon value of 1 meters signal check value

### Bluetooth service UUID register

Address: 0x80	R/W							
DATA	DATA[2 or 16]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default: 0xffe0

### Bluetooth feature UUID register

Address: 0x81	R/W							
DATA	DATA[2 or 16]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default: 0xffe1

### Bluetooth feature UUID (write) register

Address: 0x82	R/W							
DATA	DATA[2 or 16]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default: 0xffe3

### Bluetooth UUID length register

Address: 0x83	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default: 0x00

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### RTC switch register

Address: 0x90	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

0——close RTC

1——open RTC

Default: 0

### RTC time read-write register

Address: 0x90	R/W							
DATA	DATA[6]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default: 0x110506010200

Means: May 6, 2017 01:02: 00

### PWM frequency register

Address: 0x95	R/W							
DATA	DATA[2]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default value: 0x03E8 means 1KHZ

### PWM switch register

Address: 0x96	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

DATA: (0-1)

0——close PWM

1——open PWM

### PWM1 pulse width register

Address: 0x97	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default value: 0x0A means 10/255

### PWM2 pulse width register

Address: 0x98	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default value: 0x0A means 10/255

## JDY-16 High Speed Transparent Transmission Bluetooth Module

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### PWM3 pulse width register

Address: 0x99	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default value: 0x0A means 10/255

### PWM4 pulse width register

Address: 0x9A	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default value: 0x0A means 10/255

### APP transparent transmission register

Address: 0xf0	R/W							
DATA	DATA[1-200]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

In the connection state, data written to the APP transparent transmission register will be uploaded to the APP

### APP send data length register

Address: 0xf1	R/W							
DATA	DATA[2]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Used to read the data length sent by APP

### APP send data register

Address: 0xf2	R/W							
DATA	DATA[1]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Used to read data sent by APP

### APP send data register

Address: 0xe0 to 0xe9	R/W							
DATA	DATA[6]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

A list of devices used to read the Master scanner when scanning the slave data. The data is a 6 bit MAC address.

### Master searches the list of slave MAC addresses

Address: 0xe0 to 0xe9	R/W							
DATA	DATA[6]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

A list of devices used to read the host scanner when scanning the slave data. The data is a 6 bit MAC address.

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### 6.Mobile terminal instructions

#### APP UUID list

- Service UUID: FFE0 (Service UUID default ffe0 user can change)  
Feature UUID: FFE1 (For transparent transmission default ffe1 users can change)  
Feature UUID: FFE2 (For module function configuration)  
Feature UUID: FFE3 (For APP writing)

#### APP command usage instructions (IO)

##### 1) APP transparent transmission (using feature UUID:FFE2)

0XFFE1 is the APP transparent transmission characteristic of UUID (It is applied to IOS, Android or WeChat applet communication)

##### 2) APP control IO port (using feature UUID:FFE2)

IO port number	APP send command	Function	Factory default electrical level
IO1	E7F100	IO1 Output low electrical level	Low electrical level
	E7F101	IO1 Output high electrical level	
IO2	E7F200	IO2 Output low electrical level	Low electrical level
	E7F201	IO2 Output high electrical level	
IO3	E7F300	IO3 Output low electrical level	Low electrical level
	E7F301	IO3 Output high electrical level	
IO4	E7F400	IO4 Output low electrical level	Low electrical level
	E7F401	IO4 Output high electrical level	
All	E7F0	Set all IO to low	
	E7F5	Set all IO to high	
	E7F6	Read all IO States	

Instruction: E7F101 means setting IO1 to high electrical level

##### 3) APP setting and reading iBeacon UUID (using feature UUID:FFE2)

Instruction	Response	Parameter
E111<Param>	None	Param (16 bit byte)
E112	22<Param>	Default: FDA50693A4E24FB1AFCFC6EB07647825

Example instruction: E111FDA50693A4E24FB1AFCFC6EB07647825

Instruction:E112 reads iBeacon UUID

Return: 12FDA50693A4E24FB1AFCFC6EB07647825

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Return instruction: 12 for command head, FDA50693A4E24FB1AFCFC6EB07647825 is UUID

### 4) APP setting iBeacon MAJOR (using feature UUID:FFE2)

Instruction	Response	Parameter
E321<Param>	None	Param (0000H – FFFFH) Default: 000AH
E322	22<Param>	

Example instruction: E221000A means that Major is sixteen hexadecimal 000A

Instruction:E222 read MAJOR value

Return:22000A means 22 for command head, 000A is sixteen hexadecimal Major

### 5) APP setting iBeacon MINOR (using feature UUID:FFE2)

Instruction	Response	Parameter
E331<Param>	None	Param (0000H – FFFFH) Default: 0007H
E332	32<Param>	

Example instruction: E3310007 means setting Minor to sixteen hexadecimal 0007

Instruction: E332 means reading Minor sixteen hexadecimal value

Return: 320007 instructions 32 for command head, 0007 for sixteen hexadecimal Minor

### 6) APP setting iBeacon SING (using feature UUID:FFE2)

Instruction	Response	Parameter
Eff1<Param>	None	Param (00H – FFH) Default: d0H
E332	32<Param>	

Example instruction: EFF140 means setting SING to sixteen hexadecimal 40, 40 means signal strength within 1 meters is decimal system: 28

Instruction: EFF2 means reading SING sixteen hexadecimal value

Return: F240 instructions F2 for command head, 40 for sixteen hexadecimal SING

### 7) APP sets Bluetooth broadcast name (using feature UUID:FFE2)

Instruction	Response	Parameter
E661<Param>	None	Param: Module Bluetooth name The longest: 18 bytes Default name: JDY-16
E662	62<Param>	

Example instruction: E661313233 indicates setting broadcast name:123

Instruction: E662 indicates reading broadcast name

Return:62313233 instructions 62 for command head, 313233 indicates the broadcast name is:  
123

### 8) APP setting and read Connection password (use feature UUID:FFE2)

Setting up the connection password instruction format: E5 +51 + 6 bit current password + 6 bit new password

Instruction:E551313233343536313132323333 indicates the password after setting: 11223344

Read connection password E552+6 bit current device password

Example instruction:E552313233343536

Return:52313233343536

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Only when the current password is the same as the module password, can the new password be set up, and the previous password will be invalid after the password is updated.

### 9) APP reset Bluetooth module (use feature UUID:FFE2)

Instruction	Response	Parameter
E90101	None	None

Instruction: after the module receives this instruction, it restarts immediately.

### 10) APP request hardware active disconnect from APP (use feature UUID:FFE2)

Instruction	Response	Parameter
E90102	None	None

Instruction: APP and module connection, this instruction allows the module to disconnect from the APP automatically.

Usually the General APP and module disconnect will not be used.

### 11) APP read module version (using feature UUID:FFE2)

Instruction	Response	Parameter
E90103	0103<Param>	Param: (MAC address)

Example: 01034A44592D31362D56312E32 indicates the return version number is JDY-16-V1.2

Instruction

Version number

### 12) APP read module MAC address (using feature UUID:FFE2)

Instruction	Response	Parameter
E90104	0104<Param>	Param: (MAC address)

Example: 0104112233445566 indicates the return MAC address is 112233445566

### 13) APP control PWM switch (using feature UUID:FFE2)

Function	APP send command	Return
PWM off	E8A100	None
PWM on	E8A101	None
PWM open the turn on/off startup	E8A102	None
<b>PWM frequency setting (Frequency range 50—4KHZ)</b>		
PWM frequency is set to 1000HZ	E8A203E8	None
<b>PWM temporary empty ratio setting (Range 00—FF)</b>		
PWM1 temporary empty ratio is set to 10%	E8A319	None
PWM2 temporary empty ratio is set to 50%	E8A47D	None

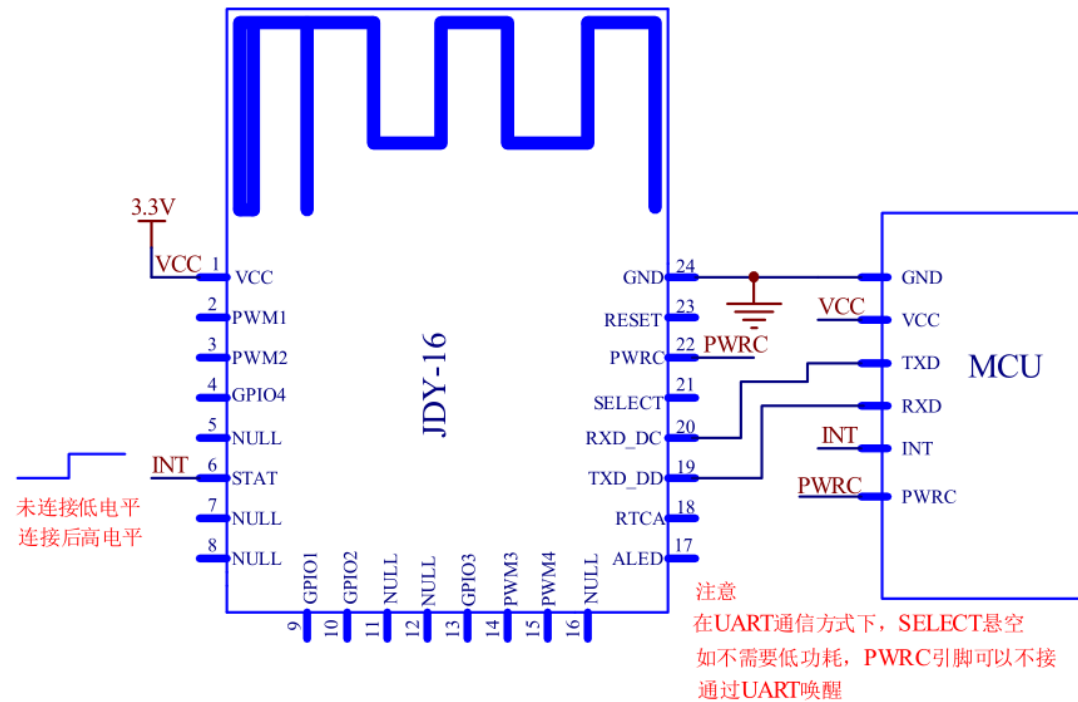
## JDY-16 High Speed Transparent Transmission Bluetooth Module

PWM3 temporary empty ratio is set to 90%	E8A5E1	None
PWM4 temporary empty ratio is set to 30%	E8A64B	None
<b>Read PWM state</b>		
Read PWM switch state	E8A8	A831 indicates PWM on A830 indicates PWM off
Read the PWM frequency	E8A9	A903E8 indicates frequency of 1000HZ
Read the PWM1 temporary empty ratio	E8AA	AA19 indicates the temporary empty ratio is 10%
Read the PWM2 temporary empty ratio	E8AB	AB7D indicates the temporary empty ratio is 50%
Read the PWM3 temporary empty ratio	E8AC	ACE1 indicates the temporary empty ratio is 90%
Read the PWM1 temporary empty ratio	E8AD	AD4B indicates the temporary empty ratio is 30%

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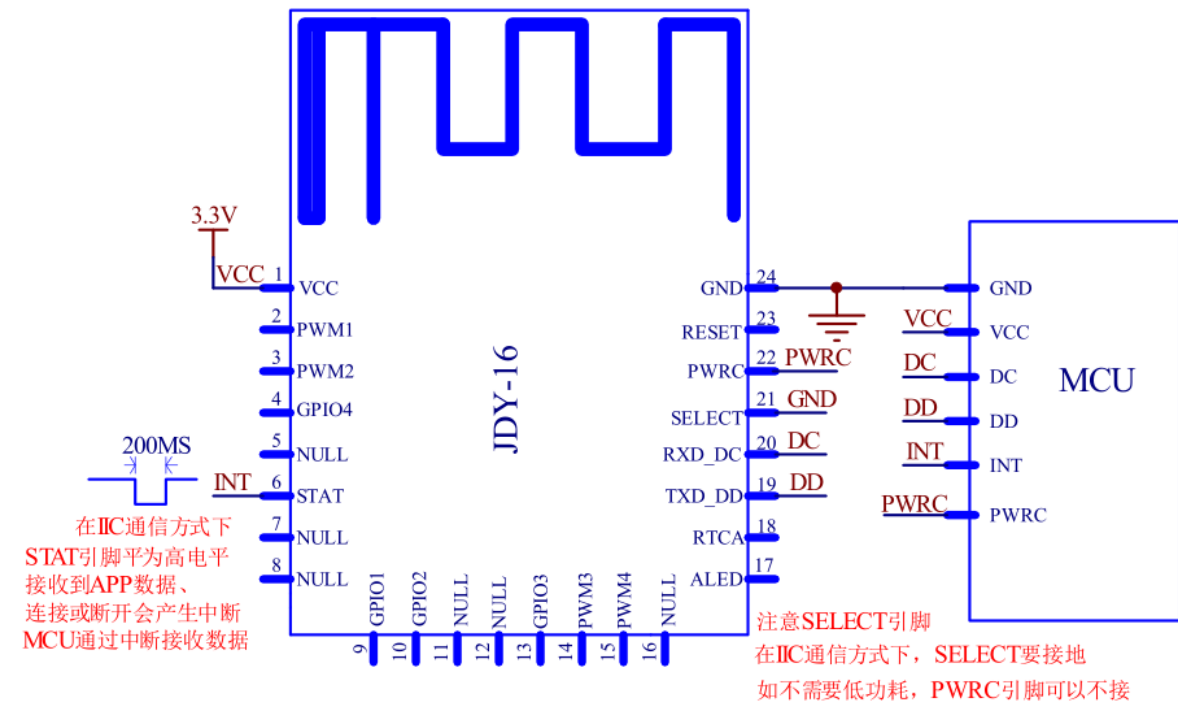
## 7.JDY-16 basic application wiring diagram

### Wiring diagram of serial port communication mode



### Wiring diagram of IIC communication mode

Low cost MCU without UART can be connected by IIC mode.

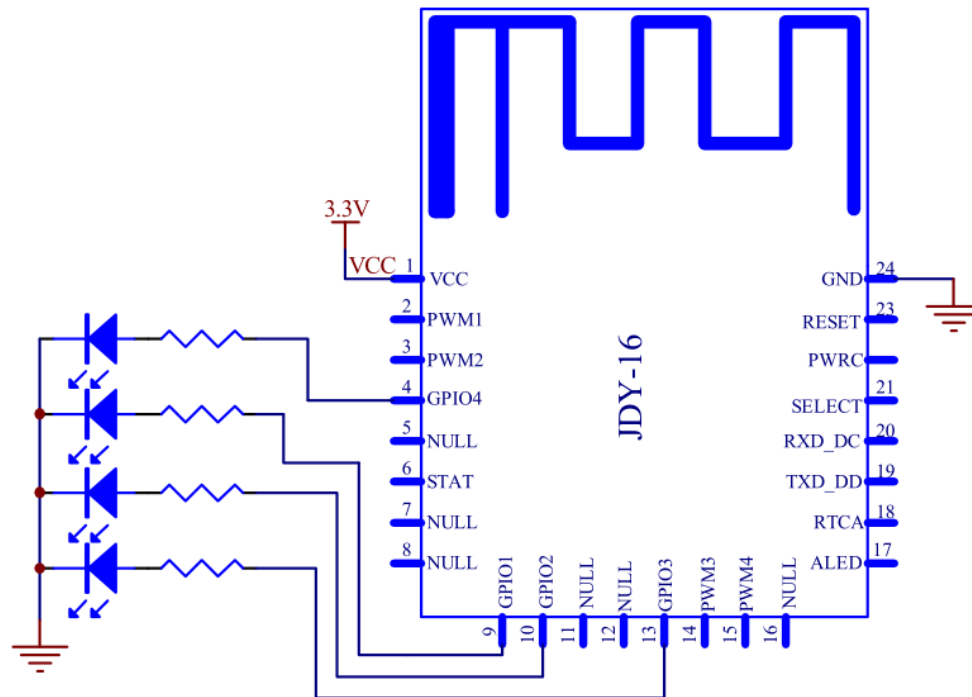




# JDY-16 High Speed Transparent Transmission Bluetooth Module

## IO control wiring diagram

It is applied to switch control and other applications.



## PWM control wiring diagram

It is applied to motor high speed and LED lamp PWM control.

