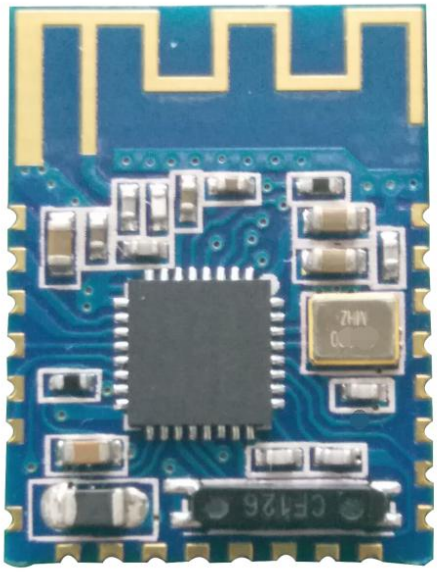
JDY-16 High Speed Transparent Transmission Bluetooth Module

（WeChat Transparent Transmission、APP Transparent Transmission、Master-slave integration、iBeacon）

Module version number：JDY-16-V1.2



JDY-16 Version supports (WeChat、APP、Android) Transparent Transmission、IO、RTC、PWM　and other functions

JDY-16M version supports MESH networking, IO, RTC, PWM and other functions

Note: the same hardware of JDY-16 is divided into two sets of version software,and the version that ends with M supports MESH networking.

This manual is the JDY-16 version manual.

Version

Brief function introduction of JDY-16-V1.2 version

1：BLE high speed transparent transmission supports 8K Bytes rate communication

2：Send and receive data without byte limit, support 115200 baud rate continuously send and receive data

3：Support 3 modes of work (see the description of AT+STARTEN instruction function)

4：Support (serial port, IO, APP) sleep wake up

5：Support WeChat Airsync, WeChat applet and APP communication

6：Support 4 channel IO port control

7：Support high precision RTC clock

8：Support PWM function (can be controlled by UART, IIC, APP, etc.)

9：Support UART and IIC communication mode, default to UART communication

JDY official debugging tool

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

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

Ⅱ. Serial port tool (data package attached)

Ⅲ. WeChat Airsync debugging tool (data package attached)

This APK is the official WeChat Airsync testing tool.

JDY-16 High Speed Transparent Transmission Bluetooth Module

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 80 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.

Brief introduction of the function

1：WeChat transparent transmission (support for AirSync protocol, applied to WeChat H5 or manufacturer server communication)

2：Support WeChat applet

3：APP transparent transmission (support for Android and IOS data transparent transmission)

4：IBeacon mode (support for WeChat shake protocol and apple iBeacon protocol)

5：Master transparent transmission mode (inter-module data transparent transmission, Master communicate with slave)

6：IO mode (applied to mobile phone control relay or LED lighting)

7：RTC function

8：PWM support (APP, IIC, APP, WeChat applet) control

Electrical characteristics

Working mode	Broadcast state	Current	Remarks
Wake up	Broadcast	4.9mA	Generally communicate with APP connection, it suggests broadcast should not be set too long, which will affect the connection time. It is generally recommended between 100 to 500mS, and if you need to connect fast and no power requirements, broadcast intervals can be set to the shortest.
Deep no broadcast sleep	No broadcast	1.38uA	
Light sleep broadcast sleep	100mS broadcast interval	180uA	
Average power consumption	200mS broadcast interval	80uA	
	300mS broadcast interval	40uA	
	400mS broadcast interval	The following current is much lower	
	500mS broadcast interval		
	600mS broadcast interval		
	700mS broadcast interval		
	800mS broadcast interval		
	900mS broadcast interval		
	1000mS broadcast interval		
Wake up state	Connected	4.93mA	Under connection state, the AT command can be pulled down by PWRC pin or the working mode is set directly, please see the AT+STARTEN instructions.
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, note: AT+SLEEP invalid mode 1, sleep controls sleep by Bluetooth module itself.
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, note: AT+SLEEP invalid mode 1, sleep controls sleep by Bluetooth module itself.

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
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.

Technical parameter

1：Serial transmission without byte limitation during transparent and transmission
2：The effective communication distance is less than 80 meters
3：Working temperature -40 ~ +80℃
4：The communication rate is 8K Bytes per second
5：Support the communication between UART and IIC
6：Working voltage 1.8 - 3.3V

Default parameter configuration for factory

1：Communication mode: UART （**SELECT pin hanging**）

2：Serial port baud rate: 9600 （**AT+BAUD4**）

3：Sleep mode: boot sleep, connection wake up （**AT+STARTEN1**）

4：Broadcast name: JDY-16 （**AT+NAMEJDY-16**）

5：Broadcast interval: 200MS （**AT+ADVIN2**）

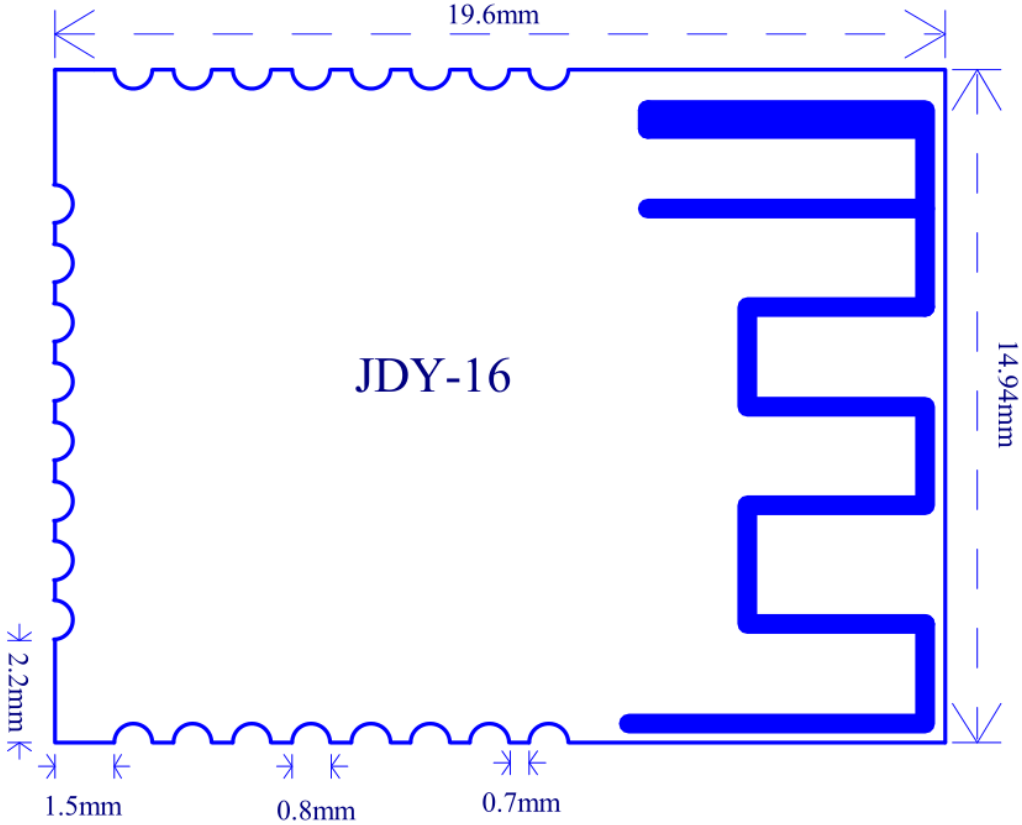
6：Master slave mode: slave transparent transmission （**AT+MASTEREN0**）

7：Output status: connection or disconnection status output from serial port （**AT+ENLOG1**）

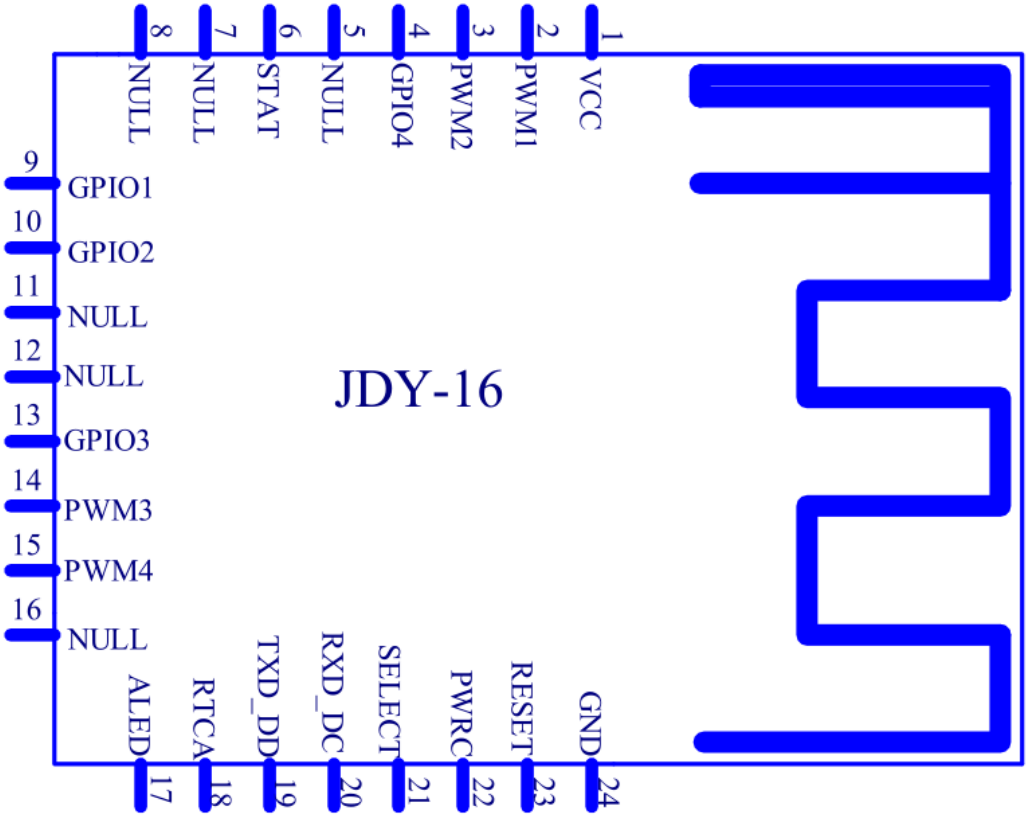
8：Broadcast LED indicator pin open （**AT+ALED1**）

If the default configuration parameters above cannot meet the requirements, you can contact the service or FAE

Dimensional drawing



Pin definition



Pin function description

Pin	Function	Description
1	VCC	Power supply (1.8-3.3V)
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
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_DD	SELECT boot to low 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_DC	SELECT boot to low electrical level, the pin function of this serial port is TXD SELECT boot to low electrical level, this pin function is IIC DD
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

Serial port AT instruction set

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

Sequence	Instruction	Function	Master / slave	Work mode	Default
1	AT+PERM	APP permission configuration	S		IO、PWM open
2	AT+RST	Reset	M/S	—	
3	AT+MASTEREN	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+CONN	Master connect slave	M		
8	AT+SCAN	Master scan slave	M		
9	AT+BAND	Master binding slave MAC	M		000000000000

10	AT+USTP	Serial port stop bit	M/S		0
11	AT+SLEEP	Sleep	M/S		
12	AT+PARITY	Serial port parity check bit	M/S		0
13	AT+PASS	Slave connection password	S		123456
14	AT+STARTEN	Start working mode	M/S		0
15	AT+DEFAULT	Restore factory configuration	M/S		
16	AT+FLOWC	Serial port flow control	M/S		0
17	AT+VER	Version number	M/S		
18	AT+ISCEN	Slave connection password switch	M/S		0
19	AT+ WXSVR	WeChat Airsync H5 or server	S	transparent transmission	0
20	AT+WXINEN	Manual and automatic test of WeChat Airsync	S	transparent transmission	0
21	AT+ CLSS	Device style	S		A0
22	AT+VID	Manufacturer ID identification code	S		
23	AT+MAJOR	iBeacon MAJOR value	S	iBeacon	0A
24	AT+MINOR	iBeacon MINOR value	S	iBeacon	07
25	AT+IBUUID	iBeacon UUID value	S	iBeacon	FDA50693A4E24FB1AFCFC6EB07647825
26	AT+IBSING	iBeacon SING value	S	iBeacon	40
27	AT+SVRUUID	Bluetooth service UUID	M/S	transparent transmission	FFE0
28	AT+CHRUUID	Bluetooth feature UUID	M/S	transparent transmission	FFE1
29	AT+ADVIN	Broadcast interval	S		1
30	AT+ADVEN	Broadcast switch	S		1

31	AT+RTCOPEN	RTC switch	M/S		0
32	AT+RTCD	RTC time read & write	M/S		2016-01-01,00:00:00
33	AT+POWR	Transmitting power	S		1
34	AT+DISC	Disconnect	S		
35	AT+STAT	Connection state	M/S		00
36	AT+ENLOG	State output enable	M/S		0
37	AT+PWMFRE	PWM frequency	M/S		1000
38	AT+PWMOPEN	PWM switch	M/S		0
39	AT+PWM1PUS	PWM1 pulse width	M/S		10
40	AT+PWM2PUS	PWM2 pulse width	M/S		10
41	AT+PWM3PUS	PWM3 pulse width	M/S		10
42	AT+PWM4PUS	PWM4 pulse width	M/S		10
43	AT+ALED	Broadcast indicating LED switch	M/S		Open

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

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）	
Byte1	Can broadcast be modified by APP?	Default: N	Y indicates that APP has permission control N indicates APP without permission control
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

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

Instruction	Response	Parameter
AT+STARTEN<Param>	+OK	Param：(0-2) 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
AT+STARTEN	+STARTEN=<Param>	

Settings / queries—Sleep Instruction（can broadcast under sleep state）

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

Settings / queries-- baud rate Note: the default baud rate of the module is: 115200

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

Setting - disconnect

Instruction	Response	Parameter
AT+DISC	+OK	None

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+MASTEREN<Param>	+OK	Param：（0-3） 0——Slave (APP, WeChat, small program) transparent transmission 1——Master transparent transmission mode 3——Slave（iBeacon）mode Default value: 0
AT+MASTEREN	+MASTEREN=<Param>	

Settings / queries-- Broadcast interval

Instruction	Response	Parameter
AT+ADVIN<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+ADVIN	+ADVIN=<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>	

Settings / queries-- MAC address（The MAC address of the module can be changed）

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 **Default value:** 1
AT+POWR	+POWR=<Param>	

Settings / queries--iBeacon UUID（iBeacon mode Instruction）

Instruction	Response	Parameter
AT+STRUUID<Param>	+OK	Param：Character string UUID Default value: FDA50693A4E24FB1AFCFC6EB07647825
AT+STRUUID	+UUID=<Param>	

Example: AT+STRUUIDFDA50693A4E24FB1AFCFC6EB07647825

Settings / queries----iBeacon Major（iBeacon mode Instruction）

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

Settings / queries--iBeacon Minor（iBeacon mode Instruction）

Instruction：AT+MINOR0007　Indicates setting Minor to 7

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

Settings / queries--iBeacon IBSING（iBeacon mode Instruction）

Instruction：AT+MINOR0007　Indicates setting Minor to 7

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

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

Query - version number（iBeacon mode Instruction）

Instruction	Response	Parameter
AT+VER	+JDY-08-V3.0	None

Settings / queries-- Manufacturer identification code（iBeacon mode Instruction）

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

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
AT+PASS	+PASS=<Param>	Default value: 123456

Settings / queries—Service UUID （Service UUID in APP data communication）

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

Settings / queries—Feature UUID（Service UUID in APP data communication）

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+CONNET112233445566

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

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+RTCDATE

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>	

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>	

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>	

IIC communication format

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

START	8 bytes		ACK	Internal Function Address	ACK	Data N	NACK	Stop
	7 bit address	0						

IIC read communication format

START	8 bytes		ACK	Internal Function Address	ACK	8 bytes		ACK	Data N	NACK	Stop
	7 bit address	0				7 bit address	**1**				

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

ID type	60H	Device type	1 byte	Read & write
	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
Main body	**Address**	**Function**	**Data length**	**Read & write**
Bluetooth UUID	80H	Bluetooth service UUID	2 bytes	Read & write
	81H	Bluetooth feature UUID	2 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
	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）	
Byte1	Can broadcast be modified by APP?	Default: N	Y indicates that APP has permission control N indicates APP without permission control
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

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

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

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

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

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]							
	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0

Default: 0xffe0

Bluetooth feature UUID register

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

Default: 0xffe1

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

PWM2 pulse width register

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

Default value: 0x0A means 10/255

PWM2 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.

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）

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

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）
E322	22<Param>	Default: 000AH

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）
E332	32<Param>	Default: 0007H

Example instruction: E3310007 means setting Mmior 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）
E332	32<Param>	Default: d0H

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
E662	62<Param>	The longest: 18 bytes
		Default name: JDY-16

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:E55131323334353631313232333333 indicates the password after setting: 11223344

Read connection password E552+6 bit current device password

Example instruction:E552313233343536

Return:52313233343536

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

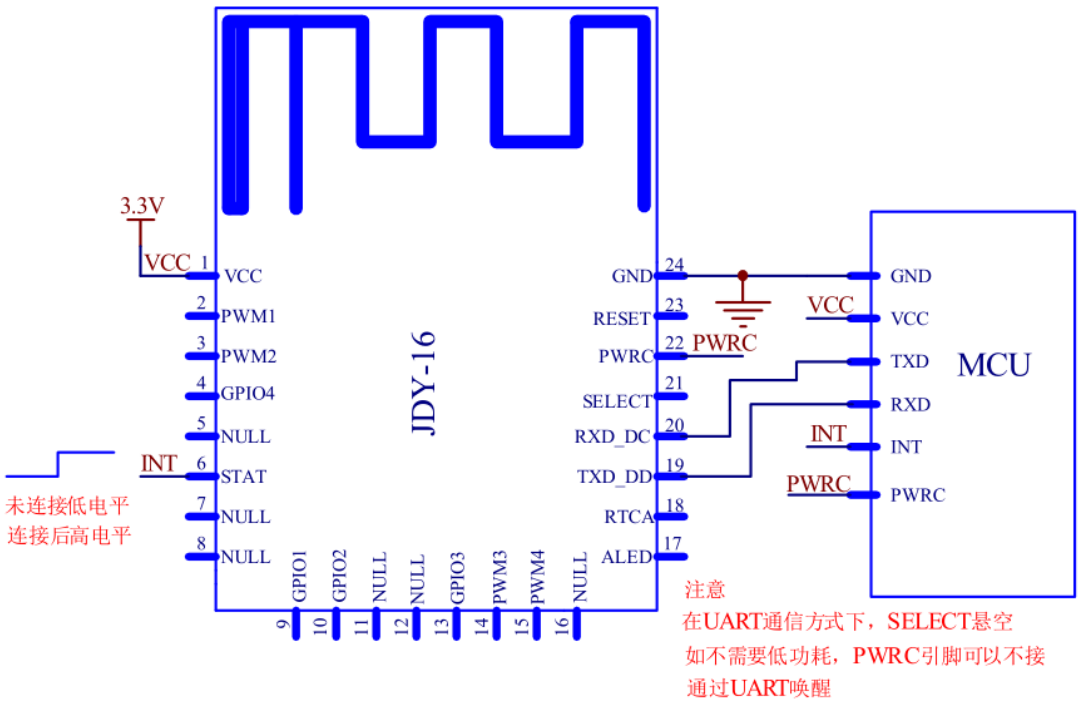
13）APP control PWM switch (using feature UUID:FFE2)

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

PWM3 temporary empty ratio is set to 90%	E8A5E1	None
PWM4 temporary empty ratio is set to 30%	E8A64B	None
Read PWM state		
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%

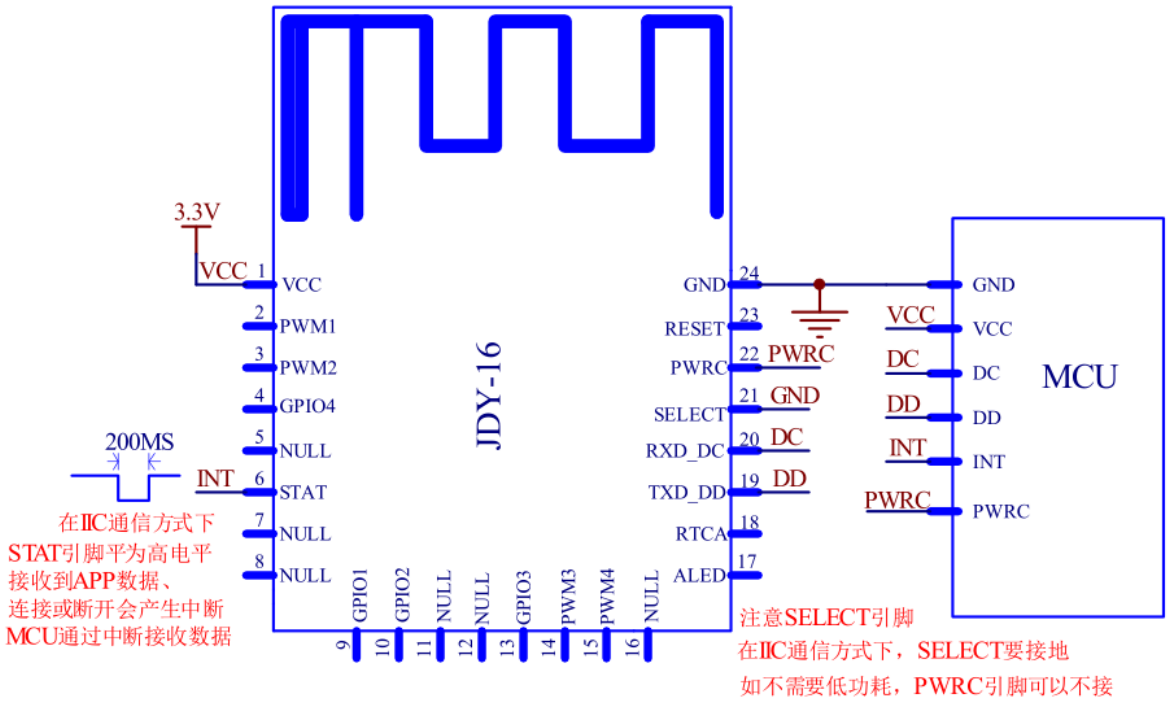
JDY-16 basic application wiring diagram

1）Wiring diagram of serial port communication mode



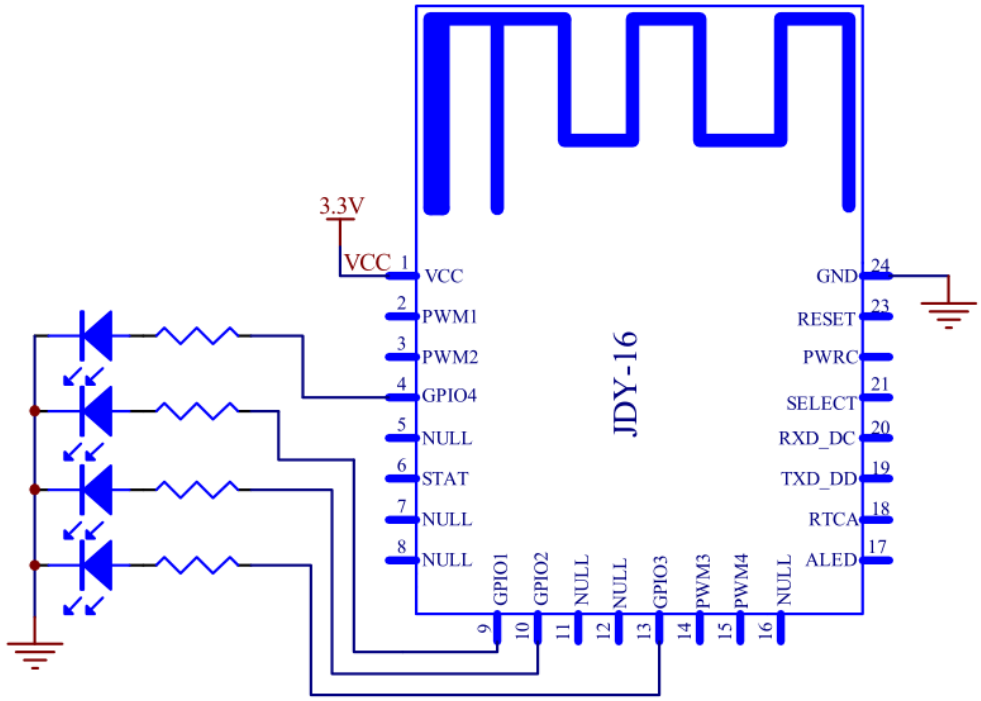
2）Wiring diagram of IIC communication mode

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



3）IO control wiring diagram

It is applied to switch control and other applications.



4）PWM control wiring diagram

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