PW-01 Serial Bluetooth Transparent Transmission Module Data Sheet

Version: V1.2

Catalog

1. Description

PW-01 Bluetooth module is a Bluetooth transparent transmission module with master-slave integration, serial data transparent transmission and low energy.

Using Texas Instruments TI CC2541 chip as core processor, this module is based on the Bluetooth 4.0 protocol standard.

The software advantages of this module are to use the master-slave design, AT command to modify the module name, master-slave mode, transmit power, PIN, scan connection specified slave, etc.. The host can also remotely control the slave pin output high and low level , ADC sampling, ranging, etc. What's more, manufacturer provides APP source code for batch users, which is very convenient for customers to develop their own products according to their needs.

With low power consumption, small size, long transmission distance, and strong anti-interference ability hardware advantages, this module is equipped with board-level high-performance serpentine antenna, which can also be connected to the external antenna according to customer needs, the external connected way is opened to customers by half-hole form.

This module supports Android, IOS mobile phones, tablet, computer connection, can be widely used in 2.4G Bluetooth low energy systems, data acquisition, transmission and control. It can also improve the reliability of the operation, improve the signal transmission distance and anti-interference. Besides, it still can solve the problem of inter-operation between different electronic products, and its battery life can be significantly extended.

2. Function and Application

● Master-slave integration

● Serial data transparent transmission

● Low energy, can be used for battery-powered devices, extending battery life

● With Bluetooth remote control switch function, can remotely control switch, relay, LED, output high and low level, etc.. It also applies to many control applications such as electronic lock, lamp or relay switch and so on.

● With Bluetooth remote measurement voltage analog function, remote sensor data reading, etc., can be used for temperature, humidity and many other sensor data acquisition applications

● Remotely measure the slave battery power and supply voltage

● Remotely measure the internal temperature of the slave chip

● Bluetooth ranging, etc.

Can be widely used in consumer electronics, industrial control, mobile phone peripherals, automotive electronics, household appliances, remote control switches, smart locks, remote controls, anti-lost devices, smart bracelets, medical equipment, smart home, shared bicycles, toys, smart meters, blood pressure monitors, heart rate meters, pedometers, electronic scales, attendance machines, alarms, door magnetic switches, smart scooters, remote temperature monitors, metal detectors, sensor data collection and so on.

3. Parameter

●**Power Consumption**

Working mode	Connected current	Unconnected current	Standby current
Slave transparent transmission	8.29mA	65uA	1uA
Slave broadcast	8.29mA	65uA	1uA
Host transparent transmission	8.29mA	8.29mA	1uA

Note: The above test results are taken by powering the module at 3.3V.

● Transmission distance: ≥50m in open area, strong anti-interference ability.
● Working frequency band: 2400-2483.5MHz
● Transmit power: maximum 0dBm (power can be changed by AT command)
● Receiving sensitivity: -96dbm
● Frequency error: ±20khz
● Operating temperature: -40°C - +85°C
● Storage temperature: -55°C - +125°C
● Reliability: MTBF ≥ 50000h
● Low supply voltage 2.0-3.6V
● Transparent transmission rate

When the baud rate is 115200, the maximum transmission per packet is 200 bytes, the module will send packets internally. When the module is the slave, using notify method, the maximum transmission is 60 bytes for each sending interval, each sending interval is 8ms. When the module is the host, the maximum transmission per packet is 20 bytes, each sending interval is 8ms.

The highest transparent transmission speed from slave module to master module is 5K Bytes/s.

The maximum transmission speed from master module to slave module is 1K Bytes/s.

4. Module Size

5. Pin Definition

```
        RST        ANT
        P01        P22
        P02/RX     P21
        P03/TX     P20
        P04        P17
        P05        P16
        P06        P15
        P07        P14
        P10        P12
        GND        VCC
```
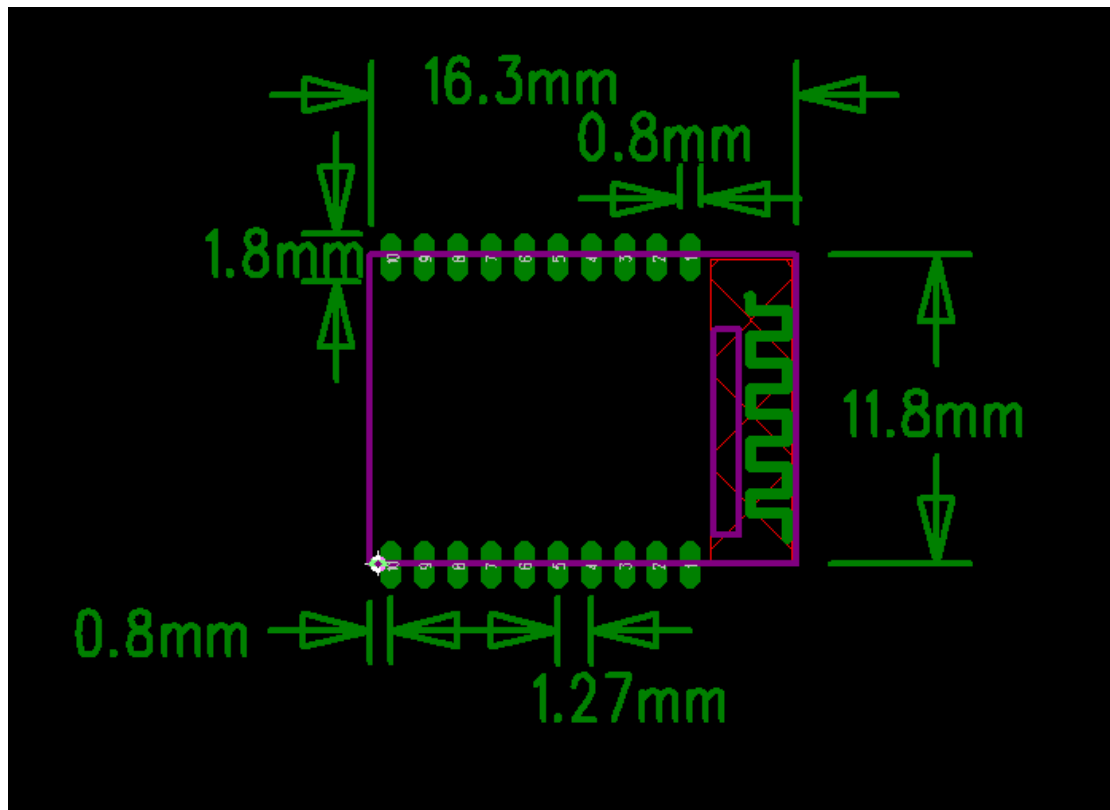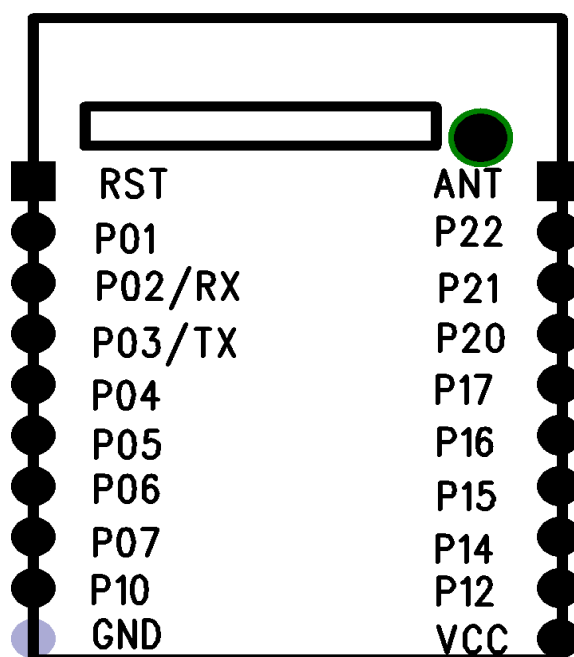
Pins	Module Definition	Function	Description
1	ANT	Antenna	External antenna pin
2	P22	Low-power status indicative pin	Output pin, low-power status indicator 0: The module is working properly 1: The module is in a low-power status, the serial RX ray and module can not receive data.
3	P21	Connection status	Output pin, connection status indicator 0: Connected 1: Unconnected
4	P20	Module enable and sleep	Input pin, control module enters low-power sleeping status or working status, level trigger mode. Regardless of any power status, such as during broadcast or after being connected, this pin level can be switched to a low power status without affecting the Bluetooth connection or communication. 0: Module enable, high power consumption,

			serial RX ray can receive data 1: Module sleep, enters the low-power consumption status, serial RX ray and module can't receive the data, but still broadcast every 400ms at this moment, can be found and connected
5	P17	Input pin	This pin is unconnected
6	P16	Input pin	This pin is unconnected
7	P15	Remote control switch pin	Output pin, remote control switch pin Remote host inputs command and then sends over after connected AT:P15=1 This pin VOH AT:P15=0 This pin VOL
8	P14	Remote control switch pin	Output pin, remote control switch pin Remote host inputs command and then sends over after connected AT:P14=1 This pin VOH AT:P14=0 This pin VOL
9	P12	Factory reset	Input pin, factory reset After this pin is continuously pulled low for 20s at any time, all parameters of the system are factory reset. When this pin is pulled low, the AT command will not respond; the module has no broadcast and can not be found; if it is in the connected status, the connection will be immediately disconnected, and need to restart before broadcast can be found again.
10	VCC	Power positive pole	Module positive pole: voltage range 2.0V-3.6V
11	GND	Module ground	Module ground GND
12	P10	System status indicator pins	Output, after the external LED, as the system status indicator, if not used please disconnect. Normally, the host flashes slightly faster when used as a host. Flash slowly when used as the slave. It will fast flash every 100ms intervals when enters a low-power status.

13	P07	Sensor analog ADC sampling pins	Input pin, remote sample this pin ADC value Remote host inputs command and then sends over after connected AT: ADC7 return to ADC test value and voltage of host P0.7 pin. Sample:ADC7=xxxx, X.XXv xxxx is ADC value, and X.XXv is the calculated voltage.
14	P06	Sensor analog ADC sampling pins	Input pin, remote sample this pin ADC value Remote host inputs command and then sends over after connected AT: ADC6 return to ADC test value and voltage of host P0.6 pin. Sample:ADC6=xxxx, X.XXv xxxx is ADC value, X.XXv is the calculated voltage.
15	P05	Sensor analog ADC sampling pins	Input pin, remote sample this pin ADC value Remote host inputs command and then sends over after connected AT: ADC5 return to ADC test value and voltage of host P0.5 pin. Sample:ADC5=xxxx, X.XXv xxxx is ADC value, X.XXv is the calculated voltage.
16	P04	Sensor analog ADC sampling pins	Input pin, remote sample this pin ADC value Remote host inputs command and then sends over after connected AT: ADC4 return to ADC test value and voltage of host P0.4 pin. Sample:ADC4=xxxx, X.XXv xxxx is ADC value, X.XXv is the calculated voltage.
17	P03/TX	TX	Output pin, module serial port sender
18	P02/RX	RX	Output pin, module serial port sender
19	P01	Master and slave starting pins	Input pin, this pin is input with 0 or 1 when starting up. 0: Regardless of the previous memory status, it will be started as a host 1: The first start is the default slave, and then each start is the last memorized master or slave role.
20	RST	Reset pin	Module reset pin, active low

6. AT Command Summary

AT Command	Function	Host or Slave	Initial Values
AT	Test	Host/slave	-
AT:NAME	Module name	Host/slave	PW-01
AT:BAUD	UART Baud rate	Host/slave	115200
AT:RESET	Module reset and restart	Host/slave	-
AT:ROLE	Bluetooth module master and slave	Host/slave	Slave
AT:MODE	Module operating mode	Host/slave	0
AT:PASS	Bluetooth pairing password	Host/slave	000000
AT:TYPE	Module authentication operating type	Host/slave	0
AT:MAC	Query and set the module MAC address	Host/slave	-
AT:RSSI	RSSI signal strength value	Host/slave	-
AT:RESTORE	Factory reset	Host/slave	-
AT:TXPW	Module transmit signal strength	Host/slave	0
AT:IMME	Module operating type	Host/slave	0
AT:VERS	Software version No.	Host/slave	Software version No.
AT:ADC	Read an ADC voltage value	Host/slave	No
AT:DISC	The host scan the slave	Host	-
AT:CONN	Connect slave device	Host	No
AT:CON	Connect specified MAC slave device	Host	No
AT:RADD	Query successfully connected slave address	Host	No
AT:CLEAR	Clear master device pairing information	Host	No
AT Command	**Function**	**Host or Slave**	**Initial Values**
AT:UID	Set and query communication UUID	Host/slave	0xAB00
AT:M	Bind specified MAC slaves	Host	000000000000
AT:DISCON	Unconnected	Host/slave	-
AT:ADVT	Set system broadcast period	Slave	100ms
AT:ENADV	Turn on and off system broadcasts	Slave	1

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7. Detailed Description for AT Command

The default configuration of the serial port is: baud rate 115200, non parity, data bit 8, stop bit 1, no flow control.

After the module is powered on, the current master and slave status of the module will be issued from the serial port. "Peripheral" indicates current slave, and "Central" indicates current host.

Strings that begin with "AT" are parsed and executed as AT commands, and the execution results are output from the serial port, "AT:OK\r\n" or "AT:ERROR\r\n". Serial data packets that do not begin with "AT" and do not end with "\r\n" will be treated as transparent transmission data.

Sending the data from serial port to module in the unconnected status, when the data is not ended with "\r\n", it will not be recognized as an AT command and the module will reply "NOT CONNECTED\r\n".

●**Test Instructions**

Command	Back	Parameter
AT	AT: OK	No

●**Module Broadcast Name**

Command	Back	Parameter
AT:NAME< Parameter1>		< Parameter1>=
Query AT:NAME?	Current Name is: < Parameter2>	?: Query the name of current module
Set AT:NAME< Parameter3>	Changed Name to: < Parameter3>	< Parameter2>= Original module name The initial value is PW-01 < Parameter3>= Name of new module Length is 1~20 bytes Modify the module name The initial value is PW-01 E.g： AT:NAME? AT:NAME01234567890123456789

●Baud Rate

Command	Back	Parameter
AT:BAUD< Parameter>		< Parameter>= ?:Query the baud rate of the current module < Parameter>= 0~4 0 : 9600 1 : 19200 2 : 38400 3 : 57600 4 : 115200 The initial value is 4 E.g： AT:BAUD? AT:BAUD0
Query AT:BAUD?	BAUD: < Parameter>	
Set AT:BAUD< Parameter>	OK+Set: < Parameter>	

● Module Restart and Reset

Command	Back	Parameter
AT:RESET		

● Module Master-slave Mode

Command	Back	Parameter
AT:ROLE< Parameter>		< Parameter>= ?: Query the master and slave status of the current module < Parameter>= 0：Slave 1：Host The initial value is 0 E.g： AT:ROLE? AT:ROLE0
Query AT:ROLE?	Host: Current Role is Peripheral. Slave: Current Role is Central.	
Set AT:ROLE< Parameter>	Set Role Successfully: < Parameter>	

● **Module Work Type**

Command	Back	Parameter
AT:MODE< Parameter>		< Parameter>= ?:Query the current module operating mode
Query AT:MODE?	Working Mode: < Parameter>	
Set AT:MODE< Parameter>	Set Working Mode: < Parameter>	< Parameter>= 0: Turn on the serial port transparent transmission mode 1:Turn off the serial port transparent transmission mode The initial value is 0 E.g： AT:MODE? AT:MODE0

● **Connect Pairing Password**

Command	Back	Parameter
AT:PASS< Parameter>		< Parameter>= ?:Query the current pairing password
Query AT:PASS?	PASS: < Parameter>	
Set AT:PASS< Parameter>	Set Pass: < Parameter>	< Parameter>= 000000~999999 Modify module pairing password The initial password is 000000 E.g： AT:PASS? AT:PASS000000

● Authentication Method for Connection Pairing

Command	Back	Parameter
AT:TYPE< Parameter>		< Parameter>=
Query AT:TYPE?	Current Type: < Parameter>	?: Query the current authentication method
Set AT:TYPE< Parameter>	Set Type: < Parameter>	< Parameter>= 0:Do not require password when connecting 1: Require password when connecting The initial value is 0 E.g： AT:TYPE? AT:TYPE0

● Module MAC Address

Command	Back	Parameter
AT:MAC< Parameter>		< Parameter>=
Query AT:MAC?	MAC: < Parameter>	0x_XXXXXXXXXXXX XXXXXXXXXXXX is the current 12-bit MAC address of the module
Set AT:MAC< Parameter1>	Set Type: < Parameter1>	< Parameter1>= YYYYYYYYYYYY YYYYYYYYYYYY will be the new MAC address that sets for the module Kindly be noted: when setting a new address, the module will automatically put first 2bits of the address| 0xC0 E.g：0xC8 = 0x88 | 0xC0

		The initial value is the default MAC address of the chip factory E.g： AT:MAC? AT:MAC0123456789AB

● RSSI Signal Strength Value

Command	Back	Parameter
Query AT:RSSI?	RSSI: < Parameter>	< Parameter> The signal strength value, uses db as unit, is a negative value. The smaller the absolute value, the greater the signal strength. E.g： AT:RSSI?

● Factory Reset

Command	Back	Parameter
AT:RESTORE	Restore Successfully	E.g： AT:RESTORE

● Module Transmit Signal Strength

Command	Back	Parameter
AT:TXPW< Parameter>		< Parameter> ?:Query signal strength of the current module < Parameter>= 0~3 0:0dbm 1:0dbm 2:-6dbm 3:-23dbm The initial value is 0
Query AT:TXPW?	Current TXPW: < Parameter>	
Set AT:TXPW< Parameter>	Set TXPW: < Parameter>	

		E.g： AT:TXPW? AT:TXPW0

● Module Work Type

Command	Back	Parameter
AT:IMME< Parameter>		< Parameter>=
Query AT:IMME?	Current: < Parameter>	?: Query the operating mode of the current module
Set AT:IMME< Parameter>	Set: < Parameter>	< Parameter>= 0: Work immediately 1: Wait for AT:CON or AT:CONNL commands The initial value is 0 E.g： AT:IMME? AT:IMME0

● Query software version number

Command	Back	Parameter
Query AT:VERS?	Software version information	E.g： AT:VERS?

● Read ADC voltage value

Command	Back	Parameter
AT:ADC< Parameter>		< Parameter>=
Query AT:ADCx (3<x<8)	OK+Get:ADCx=abcd,l.mnv E.g： OK+Get:ADC5=560,0.23v	4~9 4: Measure the voltage adc of port P0.4 5: Measure the voltage adc of port P0.5
Query AT:ADC8	OK+Get:ADC8=abc,mn% E.g： OK+Get:ADC8=469,100%	6: Measure the voltage adc of port P0.6 7: Measure the voltage adc of port P0.7 8: Measure the supply

| Query AT:ADC9 | OK+Get:ADC9=abcd,ef.gh
E.g：
OK+Get:ADC9=1429,20.55
20.55 degrees is the current internal temperature of the chip | voltage value
9: Measure the temperature inside the chip

E.g：
AT:ADC8 |

● **Query and Set Module Service (Service UUID), Charateristic (Charateristic UUID)**

Command	Back	Parameter
AT:UID< Parameter>		< Parameter>=
Query AT:UID?	UUID:Service:0xAAAA_R_char:0xBBBB_W_char:0xCCCC Service UUID is 0xAAAA when the external is transparent transmission with module, Charateristic UUID is 0xBBBB when reading data from the module, Charateristic UUID is 0xCCCC when writing data to the module E.g： UUID:Service:0xab00_R_char:0xab02_W_char:0xab01	?: Query the communication of the current module UUID < Parameter1>= 0x0010~0xFFE0 Set the service of module transparent communication UUID(Service UUID) Kindly be noted that the last digit of this value must be 0, not 0x0000, 0xFFF0 < Parameter2>= 0x0011~0xFFFF Set the characteristics that read data from the module UUID(Charateristic UUID) Kindly be noted that this value must be with the same bit as Service UUID front value that is
Set AT:UID < Parameter1> < Parameter2> < Parameter3>	UUID:Service:0xAAAA_R_char:0xBBBB_W_char:0xCCCC Service UUID is 0xAAAA when the external is transparent transmission with module, Charateristic UUID is 0xBBBB when reading data from the module, Charateristic UUID is	not 0, and the last bit cannot be set as 0 < Parameter3>= 0x0011~0xFFFF Set the characteristics that write data to the module UUID(Charateristic UUID) Kindly be noted that this value

	0xCCCC when writing data to the module E.g： UUID:Service:0x2000_R_char:0x2001_W_char:0x2002	must be with the same bit as Service UUID front value that is not 0, and the last bit cannot be set as 0 Kindly be noted that <Parameter2> can not be the same as < Parameter3> Initial value： Serv:0xAB00 R_char:0xAB02 W_char:0xAB01 E.g： AT:UID? AT:UIDFFF0FFF8FFF9

●**Disconnect the Current Connection**

Command	Back	Parameter
AT:DISCON	Disconnected	Disconnect the current connection if the current disconnection is the host , simultaneously clearing automatic re-connection and binding fixed MAC slave signs. E.g： AT:DISCON

●**Set the System Broadcast Period**

Command	Back	Parameter
AT:ADVT< Parameter>	adv_time:abcd abcd is the successful broadcast cycle time, unit is ms E.g： adv_time:100	< Parameter>= 000A~7FFF The broadcast time unit is ms, represented by a 4-digit hexadecimal number, 0 is also need to be written, such as

	Means that has set the current broadcast period as 100ms	100ms=0x0064, 400ms=0x0190 Initial value： 0x0064 100ms E.g： AT:ADVT03E8 Set the broadcast period as 1s

● **Turn System Broadcast on and off**

Command	Back	Parameter
AT:ENADV< Parameter>	enadv?:0 System broadcast is turned off and Bluetooth module can not be found enadv?:1 System broadcast is turned off and Bluetooth module can be found	< Parameter>= 0: Turn off system broadcast 1: Turn on system broadcast E.g： AT:ENADV0 AT:ENADV1

● **Scan the Slave in Host Mode (Executable in Host Mode Only)**

Command	Back	Parameter
AT:DISC?	OK+DISCS OK+DISC: 123456789012 OK+DISCE	This command is a master mode, manual operation mode command. AT: ROLE1, AT:IMME1 conditions must be met before use. After sending the AT+DISC? command, if the module is in the standby status, it will return back to OK+DISCS and then start searching. If BLE being searched, the device will return back to OK+DISC:12345678901

		2, among which the numeric string represents the other partner's Bluetooth address and returns a maximum of six, with the subscript starting from zero. It will return back to OK+DISCE after finishing the searching. For example, if only one device is being searched: Send: AT+DISC? Receive: OK+DISCS Receive: OK+DISC:123456789012 Receive: OK+DISCE If you want to connect to the searched device, start the subscript from 0. Send: AT+CONN0 to connect the first searched device. Send: AT+CONN1 to connect the second searched device, and so on. E.g：AT:DISC?

● **Connect the Discovered Slave（Executable in Host Mode Only）**

Command	Back	Parameter
AT:CONN< Parameter>	Connecting Param Update Connected	< Parameter>= 0: AT:CONN0 connect to the first searched device 1: AT:CONN1 connect the second searched device, and so on.

		Return back after successful connecting： Connecting Param Update Connected The slave will output Connected immediately. After updating the parameters, the host will return back to Connected after about 2~3 seconds after updating the parameters. And at this point it will turn to transparent mode. E.g： AT: CONN0

● **Connect the Last Successful Slave Device**
（**Executable in Host Mode Only**）

Command	Back	Parameter
AT:CONNL	AT:CONN< Parameter> Connecting Param Update Connected	< Parameter>= L: Connecting N: empty address E: Connection error F: Connection failed

● **Connect the Master or Slave Device of Specified Bluetooth MAC Address**（**Executable in Host Mode Only**）

Command	Back	Parameter
AT:CON< Parameter1>	AT:CONN< Parameter2> Connecting Param Update Connected	< Parameter1>= The MAC address of the Bluetooth device that being searched, for example 123456789012 < Parameter2>=

		A: Connecting
		E: Connection error
		F: Connection failed

● **Query the Ever Successful Connected Slave Address**
（**Executable in Host Mode Only**）

Command	Back	Parameter
AT:RADD?	RADD: < Parameter>	< Parameter>= The MAC address of the Bluetooth device that being searched, for example 123456789012 NULL: No successfully connected slave address

●**Clear master device pairing information**（**Executable in Host Mode Only**）

Command	Back	Parameter
AT:CLEAR	Cleared	Clear all the pairing information of the master device

●**Bind Specified MAC Address Slave, Automatically Connect When Booting up,**（**Executable in Host Mode Only**）

Command	Back	Parameter
AT:M< Parameter>		< Parameter>=
Query AT:M?	LOCK_MAC:get: 0123456789ab 0123456789ab is the 12-bit MAC address bound by the current module	?: Query the 12-bit slave MAC address bound by the module, and it will be automatically connected to the address after booting
Unbind AT:M0	LOCK_MAC:disable! Unbind	< Parameter>= 0: Cancel the current binding

| Set up the binding AT:M1 < Parameter> | LOCK_MAC:set: 0123456789ab

Sets the module as a slave 12-bit MAC address that is automatically bound after the host is turned on | < Parameter>= 1XXXXXXXXXXX XXXXXXXXXXX is the 12-bit MAC slave address that connects immediately after booting.

Initial value：000000000000

E.g：
AT:M?
AT:M0
AT:M1xxxxxxxxxxxx |

8. Mobile Phone APP Transparent Transmission

If transparent transmission with mobile phone APP, please follow as below：

1. Unchangeable communication UUID
Service UUID : 0xFFF0
Characteristic UUID:0xFFF6
Both Android and IOS use this UUID to communicate with the module

2. Can self-define communication UUID by AT command to adapt to
   customer's original APP
The default values are as below:
Service UUID : 0xAB00
The Charateristic UUID data that writes to the module is 0xAB01
The Charateristic UUID data that reads from the module is 0xAB02
The user can modify the communication UUID of the module by AT command
without modifying his/her existing APP to adapt to the currently developed APP.
For the specific modification method, please check the AT command AT:UID,
for more details.

9. Mobile Phone or Host Module Remote Control Instructions

After the mobile phone terminal APP or the host module is connected with the slave module (Charateristic UUID: 0xFFF6), the mobile phone terminal APP or the host module will send the following command to perform various operations on the remote control module. Do not end the remote control command with "\r\n", otherwise it will be processed by this module by AT command and cannot reach the slave.

● **Remotely Control the Slave P1.4 or P1.5 Port to Output High and Low Level**

Remote Command	Back	Parameter
AT:P14=< Parameter> AT:P15=< Parameter>		< Parameter>= 0: Output low level 1: Output high level The initial value is low level The slave will output this command and execute it on the serial port.

● **Remotely Measure Pin Voltage**

Remote Command	Back	Parameter
AT:ADC< Parameter>	Sample:ADC< Parameter>=abcd,l.mnv	< Parameter>= 4~7 4: Remotely sample the slave voltage adc of port P0.4 5: Remotely sample the slave voltage adc of port P0.5 6: Remotely sample the slave voltage adc of port P0.6 7: Remotely sample the slave voltage adc of port P0.7 The slave will output this command and execute it on the serial port.

		Please kindly be noted that do not end with "\r\n" when the host sends this command, otherwise it will be executed by this module with AT command. The returned test value is the test value of the corresponding port of this module.

● Remotely Measure the Slave Battery Power

Remote Command	Back	Parameter
AT:ADC8	Sample:ADC8=abc,mn%	It will return back to the supply voltage value ADC of the host, as well as the remaining charge percentage of the slave battery. The slave will output this command and execute it on the serial port. Please kindly be noted that do not end with "\r\n" when the host sends this command, otherwise it will be executed by this module with AT command. The returned test value is the power supply voltage and the percentage of remaining battery power of this module.

●**Remotely Measure the Internal Temperature of the Slave Chip**

| Remote Command	Back	Parameter
AT:ADC9	Sample:ADC9=abcd,ef.gh	It will return back to the internal temperature of the slave chip. The slave will output this command and execute it on the serial port. Please kindly be noted that do not end with "\r\n" when the host sends this command, otherwise it will be executed by this module with AT command. The returned test value is the internal temperature of the module chip.

●**Ranging**

Command	Back	Parameter
AT:RSSI=< Parameter>	Rssi=ab, cdeCM Rssi=ab, cdeCM Rssi=ab, cdeCM Rssi=ab, cdeCM Rssi=ab, cdeCM Rssi=ab, cdeCM	< Parameter>= ?: When the the ranging starts, it will continuously return back to the RSSI signal strength between the master and slave together with its calculated distance. The serial ports of the master and slave will simultaneously output the results.. 0: Stop ranging This measured distance has limited accuracy and cannot be used for precision data measurements.

10. Wiring Diagram (Serial Assistant, MCU)

●**Transmission Mode**

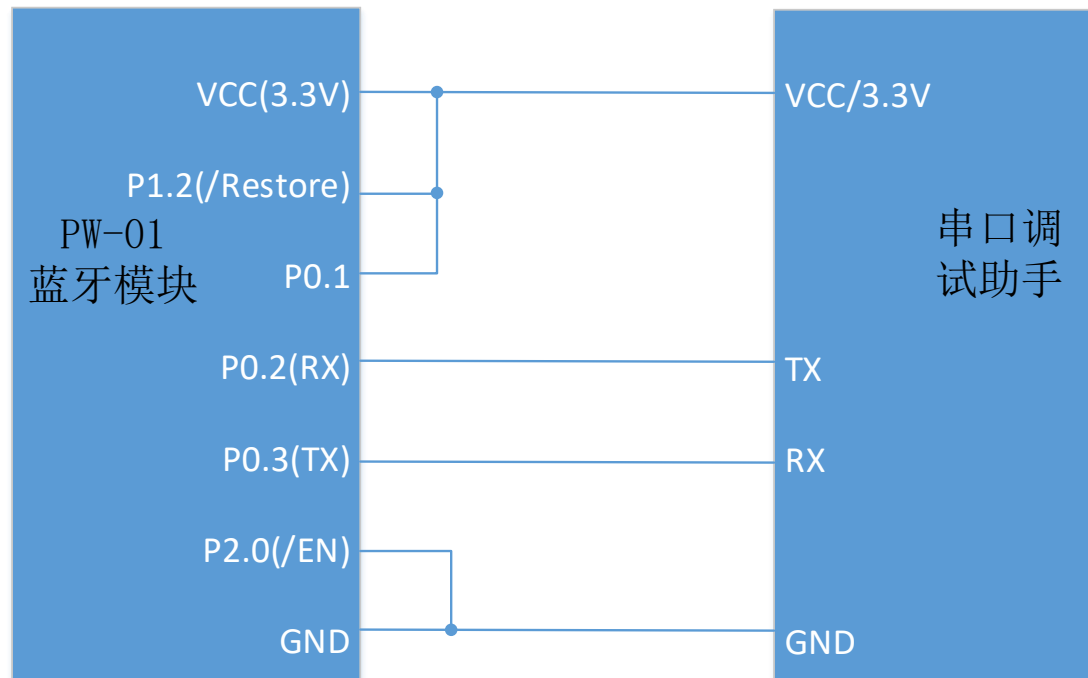**●Power-up Working Drawing of Single Bluetooth Module**
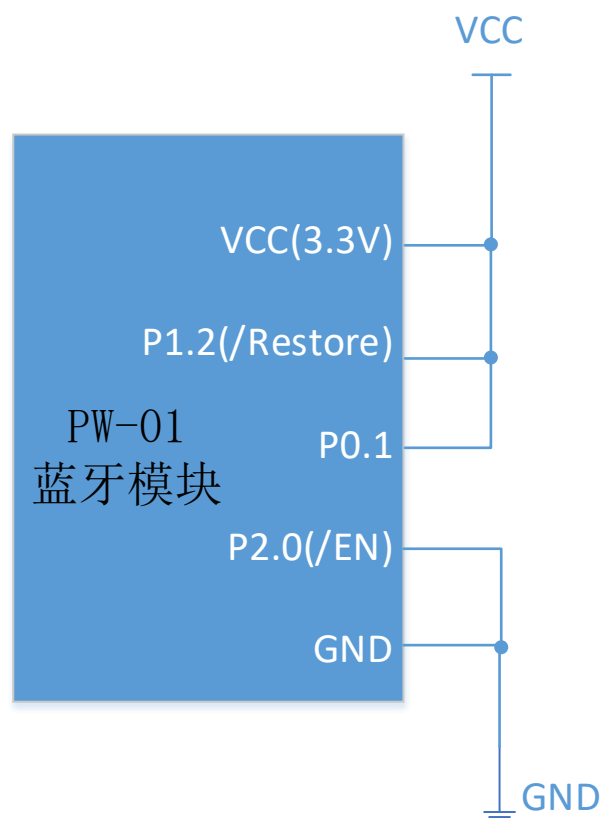
All other pins are unconnected, including the RST pin. Remote control function pins can be connected to external circuits according to design requirements.

After wiring according to the above figure, power on the system. At this time, the module will start as a slave. The module PW-01 can be searched by mobile phone APP, and you can perform remote control after connecting.

If the module cannot be found after power-on, it means that the module is in host status. Firstly, Grounding with P1.2 for 20 seconds to restore the factory setting of the module. After that, the system will be powered off, and the system will be powered on. Then, the system will be powered on and start as a slave. The module PW-01 can be searched by the mobile phone APP, and you can perform remote control after connecting.

● **The Connection Wiring Diagram of Bluetooth Module and Serial Debugging Assistant**

| PW-01 蓝牙模块		串口调试助手
VCC(3.3V)	——	VCC/3.3V
P1.2(/Restore)		
P0.1		
P0.2(RX)	——	TX
P0.3(TX)	——	RX
P2.0(/EN)		
GND	——	GND

Setting the baud rate of the serial debugging assistant as 115200,8,N,1.

All other pins are unconnected, including the RST pin.

After wiring according to the above figure, insert the serial port assistant into the computer's USB port. At this moment, the module will start as a slave. The module PW-01 can be searched by mobile phone APP, and you click the connection to transparently transmit the data.

If the module cannot be found after power-on, it means the module is in the host status. You can switch the module back to the slave mode by sending the AT command "AT:ROLE0\r\n" from the serial debugging assistant. The module PW-01 can be searched by mobile phone APP, and you click the connection to transparently transmit the data.

● **The Connection Wiring Diagram of Bluetooth Module and MCU**
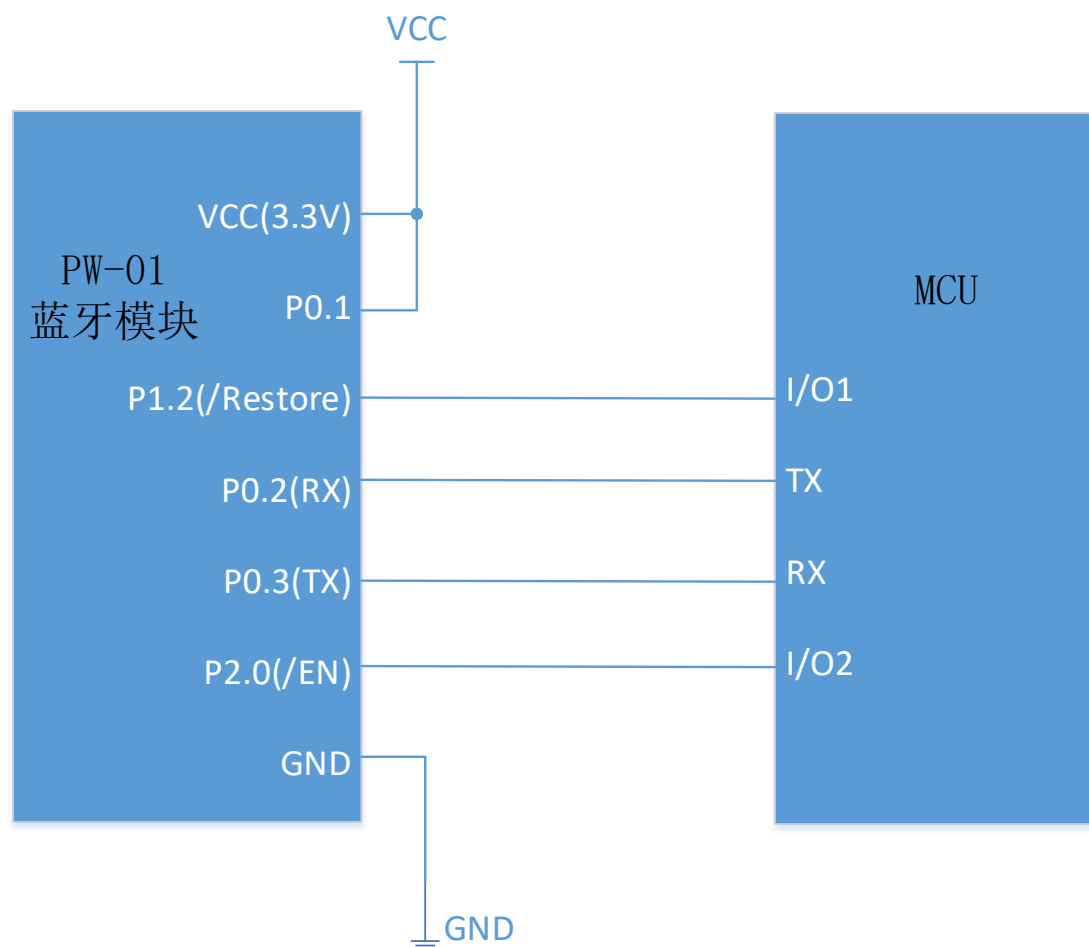
The baud rate of Bluetooth module and MCU communication is 115200,8,N,1.

All other pins are unconnected, including the RST pin.

The pin of the Bluetooth module P1.2/Restore is connected to the IO1 of the MCU. At this time, the IO1 pin of the MCU will be set as the output high level after power-on. Otherwise, the Bluetooth module will not work, and the factory settings will be restored and restarted after 20 seconds. When restoring the factory settings is needed, the MCU will pull down IO1 for 20 seconds, and the system will automatically restart. And after restarting, the IO1 of the MCU will be set as the output high level. If you do not need to restore the factory settings, you can also connect the pin of the Bluetooth module P1.2/Restore to 3.3V directly .

The pin of the Bluetooth module P2.0/EN is connected to the IO2 of the MCU. When the MCU needs the system to work normally, make the output of the IO2 pin low; when the MCU needs the Bluetooth module to enter the low power consumption status, make the IO2 pin of the MCU output high.

11. Contact Us

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