Jinou Bluetooth Embedded module manual

Notice

1. Embedded modules evaluation kit RS232 Conversion board Supply power 6V-9V positeve internal, negative outside.
2. The voltage of embedded modules(VCC) is 3V（ 0< signal cable voltage <VCC ）
3. The PIN which marked NC don't need to connect (refer to documents)
4. Making sure Jinou Bluetooth modules quality, please make use of our evaluation kits to test and debug first.
5. **EXCEPT TO BC02 chipset and 5V voltage, this sort of module BTM0202C2P is similar to Standard module BTM0704C2P on function, setting, and parameters etc.**

BTM0202C2P

Class 2

on-board antenna and PIN

BC02 CSR Chipset/ 5V

Size: 30.02(L)*12.4(W)*2.7(H)

1. Brief introduction

Bluetooth Modules can be applied to all kinds of home appliances, equipment (such as medical treatment equipment) and other electronic information products. As a cable replacement program, it can connect the single-chip processor or processor directly via using PnP mode to achieve the wireless data transmission among equipments transparently. Bluetooth module has the discrimination of principal and subordinate, which can be matched as one set. The principal and subordinate equipment can establish connection, identify and memorize the opposite equipments automatically when hardware circuit of Bluetooth module connects correctly with electricity supply. The equipments of user can use Bluetooth mdoules as the same as serial wires.

Bluetooth module can be used independently as well, excluding using by match. When user's equipment equipped with a Bluetooth module of one subordinate equipment, other Bluetooth devices, such as Bluetooth PDA can search out adapter of this Bluetooth module, and find out the services provided, then establish links and communication with this adapter through these services as well. This module can still be used as the same as the serial wires for the communications of users' equipments.

Bluetooth module provides a safety identification function. When users use safety

identification, the equipments' connects must be authenticated, and only the authenticated equipment can realize communication. However this process could be automatically finished among a matched Bluetooth module. (Default password: 1234).

Figure 1   Connecting two device just through a cable

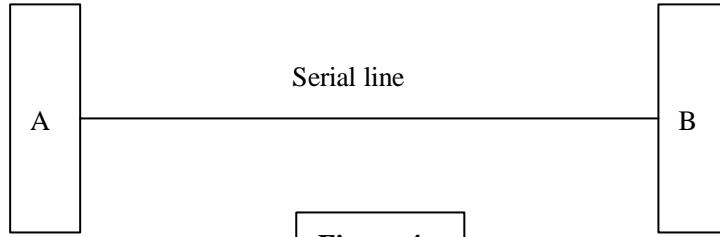**Figure 2   The two device connect embedded module respectively, the function is equal to one serial cable.**

Serial line

A   B

Figure 4

A — UART — MODULE A ≈ MODULE B — UART — B
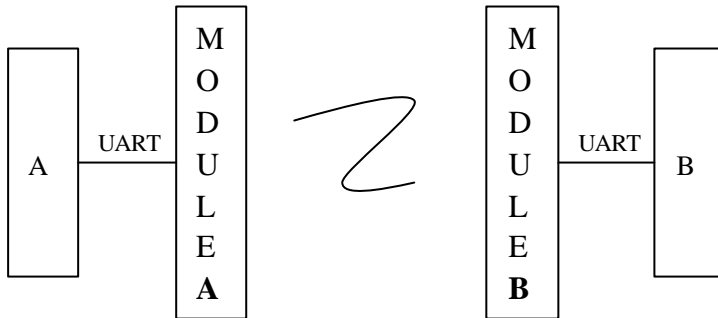
Figure 5

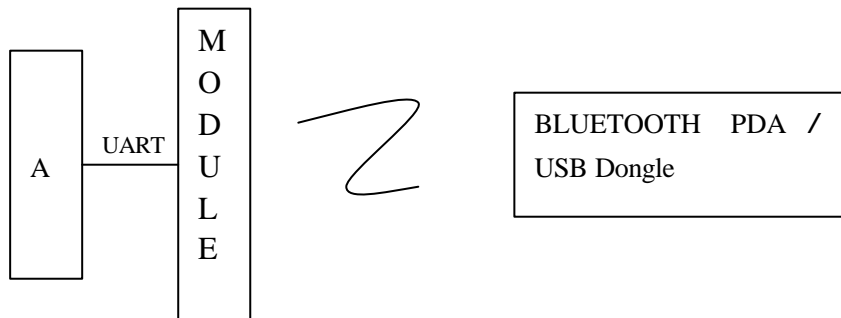A — UART — MODULE ≈ BLUETOOTH PDA USB Dongle

Figure 6

Figure 4 User device A to B, connect each other by one cable. Figure 5 user device A to B, connect each other just through the two Bluetooth embedded modules, the function is equal to one cable. Figure 6 Bluetooth embedded module connect with other Bluetooth device (such as PDA), the function is similar to Figure 4 and Figure 5.

2. PIN Explanation

NO.	Name	Describe	Capability
1	CLR	State switch (input), as using normal mode: low voltage for parameter setting state, high voltage for normal working state: as using low power mode: high voltage for parameter setting state, low voltage for normal working	0-VCC

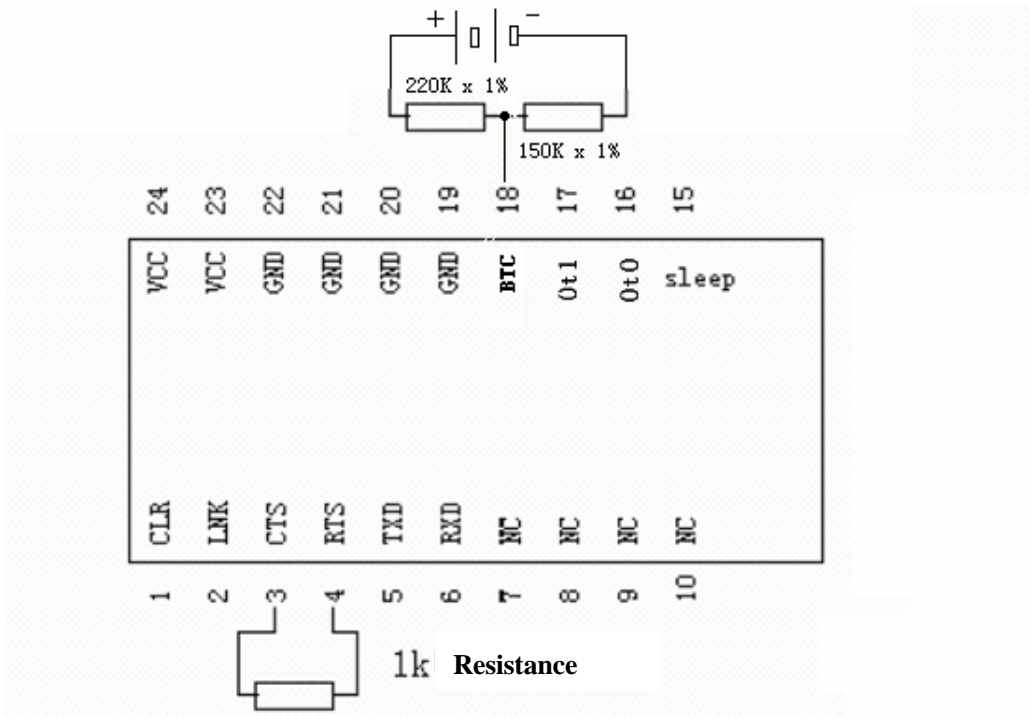|			
		state.	
2	LNK	Connect indicator (output), In the connecting state output high voltage; In the disconnecting state output low voltage.	0-VCC
3	CTS	CTS Input	0-VCC
4	RTS	RTS Output	0-VCC
5	TXD	Serial data output	0-VCC
6	RXD	Serial data input	0-VCC
7,8,9,10	NC	No connection	
11,12,13,14		The PIN which don't exist	
15	Sleep	Sleep/awaken/clear up address input , the normal mode: connect high voltage when not in use; the low power mode: connect low voltage when not in use.	0-VCC
16	Out0	Output spare port 0	
17	Out1	Output spare port 1	
18	BTC	Can be used for battery voltage control, when battery max-voltage higher than VCC, need to partial pressure (check the explaining picture below). Disconnect when not in use.	0-VCC
19,20,21,22	GND	Power supply	
23,24	VCC	Voltage (input)	2.7-3.3V Type: 3V

Explanation

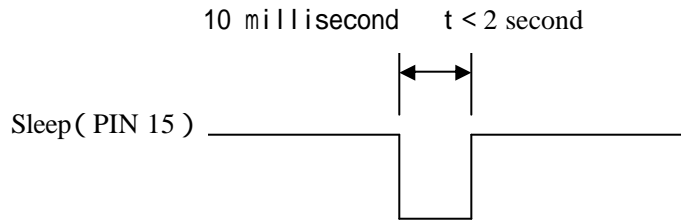As for CTS and RTS , If you don't need flow control, Connect them by 1k resistance. Drawing is followed:

11,12,13,14 is DIP24   Direct insert   The PIN canceled, this type exterior is compatible to DIP24.

Please make sure power supply voltage and polarity is correct, Bluetooth modules strictly prohibit using negative.（ Please comply with COMS circuit operation rules, If there is any improper operation results in damage, we will not be responsible for your loss.）
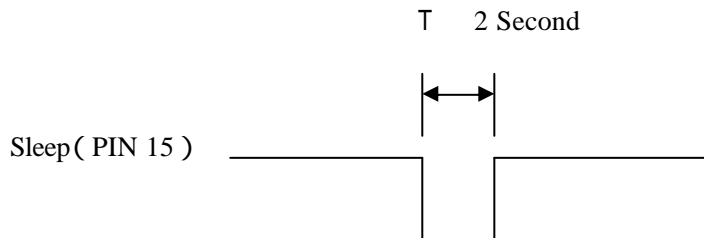
2. Timing Diagram

```
        +  ┃ ┃  ─
        220K x 1%
                        150K x 1%
```

24	23	22	21	20	19	18	17	16	15
VCC	VCC	GND	GND	GND	GND	BTC	Ot1	Ot0	sleep

CLR	LNK	CTS	RTS	TXD	RXD	NC	NC	NC	NC
1	2	3	4	5	6	7	8	9	10

1k **Resistance**

The normal mode:

10 millisecond   t   2 second

Sleep   PIN 15

Explain   When the voltage of sleep PIN accord with requirement above, Bluetooth modules sleeping/awaken.
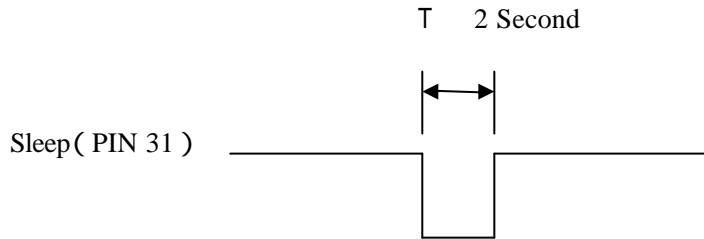
T   2 Second

Sleep   PIN 15

Explain   When the voltage of sleep PIN accord with requirement above, Bluetooth modules clear up memorized address

The saving power mode：
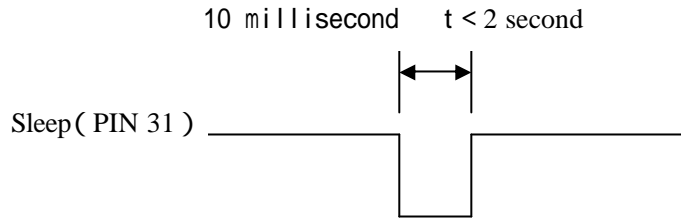
10 millisecond   t   2 second

Sleep   PIN 31

Explain   When the voltage of sleep PIN accord with requirement above, Bluetooth modules sleeping/awaken.

T   2 Second

Sleep   PIN 31

Explain   When the voltage of sleep PIN accord with requirement above, Bluetooth modules clear up memorized address

4. Feature
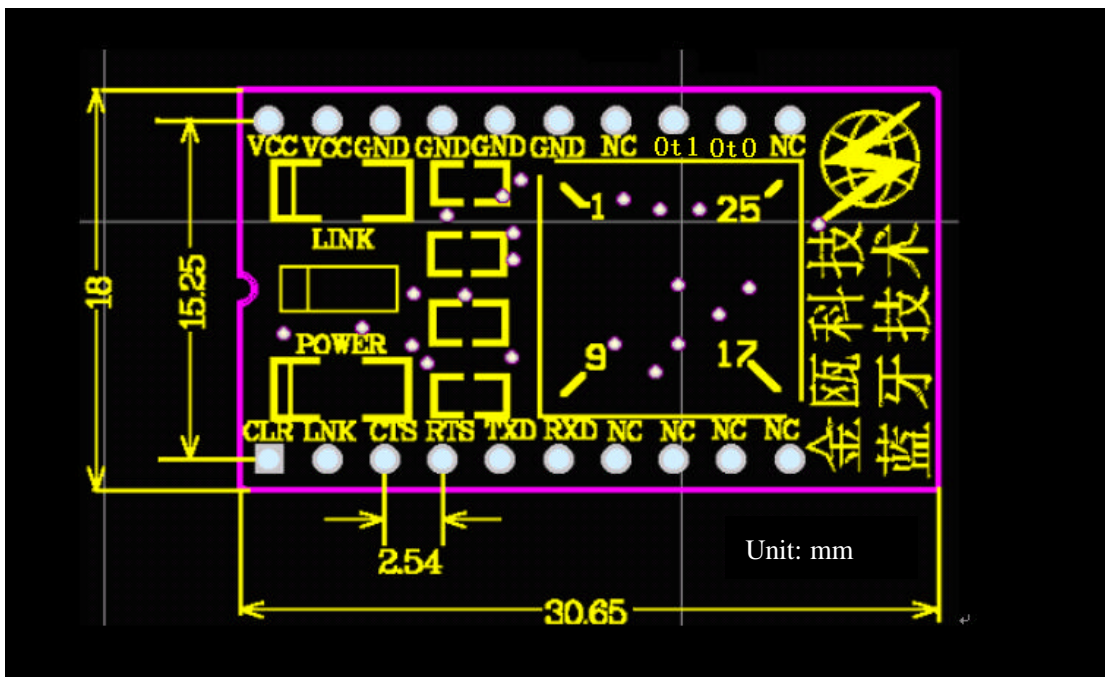
Compatible Bluetooth 1.2 2.0 Specification
Class 2 Standard
Effective distance 10M
Working temperature: -25   85
UART interface
Multiple Baud Rates are supported (9.6k and 19.2k, 38.4k and 57.6k, 115.2k)
Maximum is available to 1.384 Mbps
Automatic energy-saving mode
Low -power -wasted mode support & high-speed working mode support
Safe authentication,   data encryption.

Using normal mode

Mode	Test condition(Slave)	Max mA	Type mA	Minimal mA	Remark
Working	Sniff Open No data transmission	2.5	2	1.8	
	Sniff Turn off or data transmission	21.8	-	20.2	The Bluetooth devices are 10m apart sustainingly transmit document at 9600 baud rate
Dormancy		1.3	1.3	1.3	
Connectionless	Connection inquiry spacing=800; Connection inquiry sustain =0012	5	2.5	1.29	

Using low power mode

Mode	Test condition(Slave)	Max mA	Type mA	Minimal mA	Remark
Working	Sniff Open No data transmission	2.5	2	1.8	
	Sniff Turn off or data transmission	21.8	-	20.2	The Bluetooth devices are 10m apart sustainingly transmit document at 9600 baud rate

Dormancy		1.3	1.3	1.3	
Connectionless	Connection inquiry spacing=800; Connection inquiry sustain =0012	4	1	0.03	

6. Realize protocol

LM   LC   L2cap   SDP   RFCOMM

Bluetooth Serial Port Profile

7. Indicator light and keystroke specification

There are two indicator lights on the embedded module: LINK(green light) and POWER(red light). LINK light shows the module state, POWER light shows module if or not in the normal working state. You could amend indicator light pin by AT instruction, detailed check " Embedded module AT introduction"

POWER Light If POWER light flashes once every several seconds, the embedded module works well. We can judge the device if it is master or slave by the interval time of power light flash. If the module flashes once every 2 seconds, it is slave. If flashes once every 5 seconds, it is master.

LINK Light   If LINK Light is extinguished, that shows the module has connected with other Bluetooth devices; if flashes, it shows disconnecting. When it is not connecting, we can judge the device if it memorized address or not by LINK Light flash rapidity (the way of judging if it paired with other Bluetooth devices or not.). If flashes rapidly (2 times per second), that shows it memorized address; if flashes slowly (once per second), that shows it hasn't been memorized.

For master, flashes once every 2 seconds as inquiring. Rapidly flashes 4 times every second as pairing; flashes once every second as connecting, the light extinguishes after connect.

The two indicator lights are both extinguished when embedded module enters into sleep state or working in the state of parameter setting.

Sleepkey Sleep key has two functions, Sleep key and clear address key. Distinguish by keystroke time: short time pressing (10 millisecond   t   2 second) sleeping/awaken, Long time pressing (T   2 Second) clear up address. Please refer to **timing diagram** above. Slave can be searched over again (bind address situation), master restart to search after clean up address.

LINK and POWER are both extinguished after enter into sleep mode, under this mode embedded module power is low, it can't inquire, check or transmit data etc. between the Bluetooth devices, but it can accept AT command. After entering into sleep mode, if user hopes to waken up modules, press Sleep keystroke again. Then embedded modules start to awaken and work.

Cmd Data switch   Turn Cmd Data switch to the Cmd side,   PIN 1 input low voltage embedded module indicator lights are all extinguished, this time embedded module is working in

the state of parameter setting. In the state of parameter setting, embedded module stop working, this time we can't do anything but set embedded module parameter, and the sleep keystroke is invalidation.

Turn Cmd Data switch to Data side　PIN 1 input high voltage　embedded module exit to the state of parameter setting, and start to work(search, pair, connect, transmit data etc.). This time sleep keystroke is availability, but we can't set embedded module parameter. If user needs to set parameter, please turn Cmd Data switch to the Cmd side　or else turn Cmd Data switch to Data side.　using normal mode explain

7. Use specification

If amendment of the parameters are needed, please move Cmd Data Switch to Cmd side until the completion of parameter setting, and install related parameters via the "AT command" or "parameter setting tool", such as parameters for principle/ subordinate equipment, baud rate, authentication and address binding. If the communication is between two Bluetooth modules, you should set one as the principle one, and another one subordinate. Please move the Cmd Data to the Date side after finished.

After starting the equipment up, if no memorized addresses are saved, search nearby Bluetooth equipment first. If searching out, the principle equipment would enter into matching state. If authenticating right, the principle equipment would memorize (save) the address, and establish links with the equipment. If linking success, LINK light twinkles one time every five seconds; if having memorized addresses yet, the principle equipment connects directly with the memorized equipment without inquiries and matching. The memorized address could be deleted by using the AT command and Sleep keystroke.

As for subordinate equipment, which wait for being connected and searched by other equipment, its LINK light is dead, if connecting successfully
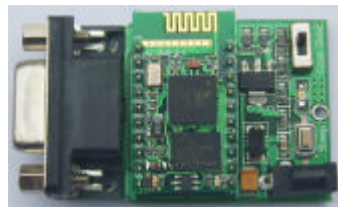
OEM Bluetooth embedded modules for you !
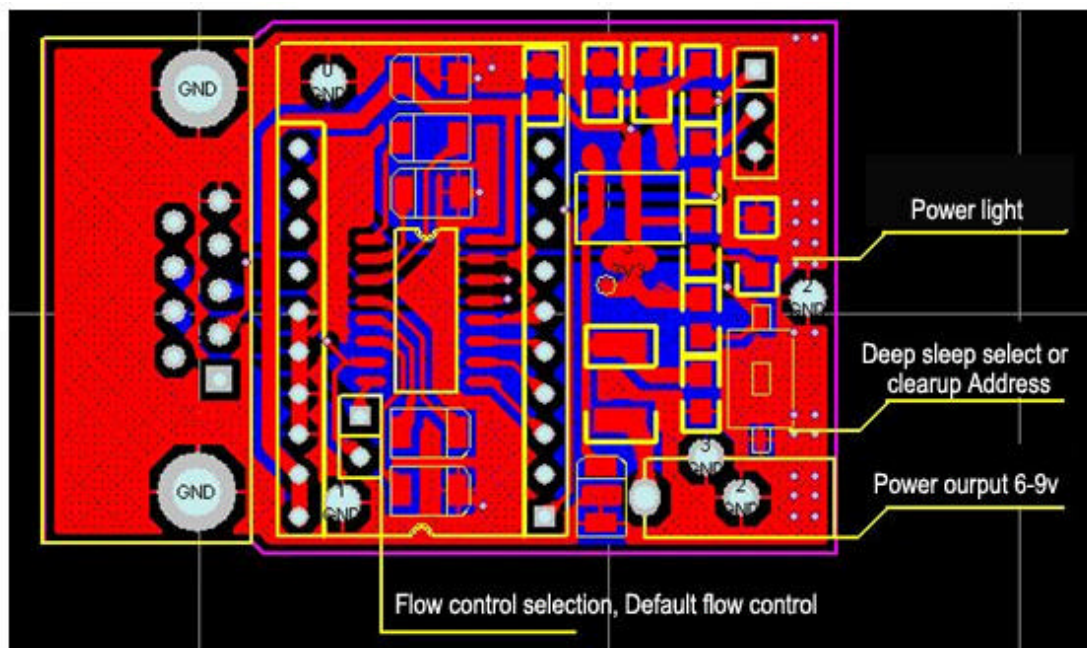
Evaluation kit：

JINOU Bluetooth RS232 Conversion board
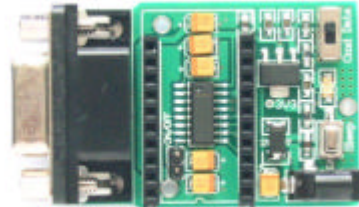
Especial for testing Jinou Bluetooth embedded module

**Jinou Bluetooth embedded module inserts into this evaluation board**

Jinou Bluetooth evaluation kit, RS232 Conversion board is a typical application of JINOU Bluetooth Embedded Module. It mainly converts UART Pin into standard RS232 connector jack and realizes voltage conversion. It is facilitated to set parameters of Jinou Bluetooth embedded modules making use of this conversion board to set Bluetooth embedded modules' AT Command. (Connect conversion board with computer serial port by the straight serial wire both with PIN and HOLE. Default baud rate is 9600, Hardware flow control.) (Know more about setting parameters, please check *Bluetooth modules AT command manual.)*

Chinese web   http://www.jinoux.com   English web : http://www.OEMblue.com

There are two kinds of RS232 conversion boards for embedded modules testing: 9 PIN and 9 HOLE.

When conversion board with 9 Hole is communicating with computer serial port, you must make use of the straight serial wire both with PIN and HOLE (2 feet connect 2 feet, 3 feet connect 3 feet, 7 feet connect 7 feet, 8 feet connect 8 feet).

When conversion board with 9 PIN is communicating with computer serial port, you must make use of the cross serial wire both with HOLE (2 feet connect 3 feet, 3 feet connect 2 feet, 7 feet connect 8 feet, 8 feet connect 7 feet)

The power supply condition of evaluation board is followed.

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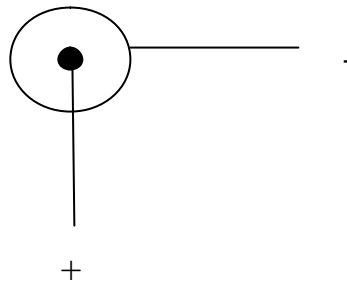
Positive internal
Negative outside
Voltage   6V-9V

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