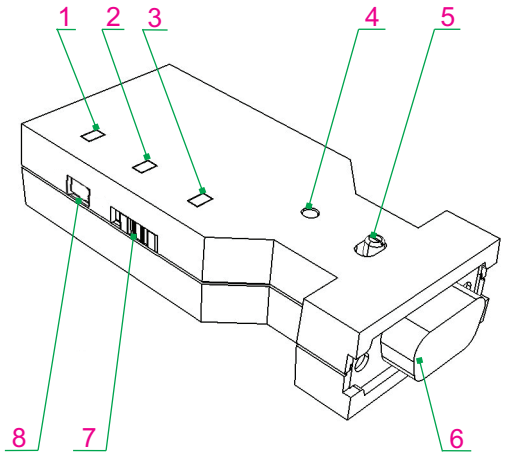
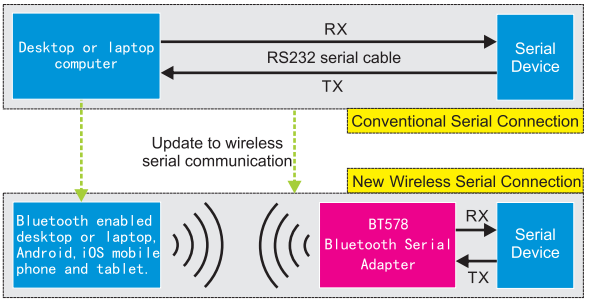


1. Serial Data Activity LED (Green)
2. Bluetooth Status LED (Blue)
3. Power/Charging LED (Red)
4. AT Command Button
5. DB9 Male/Female Slide Switch
6. Serial Port (DB9-Male)
7. Internal Battery Power Switch
8. External MiniUSB Power Port

1. Introduction

Thank you for purchasing IRXON BT578 Serial Bluetooth adapter. This adapter can eliminates your conventional RS232 serial cables, providing an easy-to-use, invisible connection with freedom of movement. The adapter support both SPP and BLE, it allows any device with a standard 9-pin serial port to communicate with desktop or laptop PC, Android or iOS mobile phone and tablet wirelessly.



Serial Bluetooth communication diagram and application

1.1 Features

- Supports Classic Bluetooth Serial Port Profile(SPP) and new generation BLE.
- Connects with PC via Bluetooth SPP, connects with mobile phone via Bluetooth BLE.
- Connects to RS232 serial port device via DB9 connector or converter.
- A green LED was used to indicate RS232 serial communication TX/RX activity.
- Supports Pin 9 power supply, just connect pin9 to 3~6V and pin5 to GND.
- Built-in battery and charging circuit, come with a MiniUSB power/charging cable.
- Supports AT command setting on computer to personalize name, baud rate, etc.
- Built in Amplifier, typical wireless communication distance is 30 meters.

1.2 Package Contents

- BT578 Serial Bluetooth adapter x1
- DB9 male to female converter x1
- AC to USB power adapter x1
- USB to MiniUSB cable for power supply x1
- This user's manual x1

2. Specifications

2.1 Technical Specifications

- Standard: Bluetooth v2.1(SPP) + Bluetooth v4.0(BLE)
- Selectable RS232 Baud Rate: 1200,2400,4800,9600,19200,38400,57600,115200 bps
- BLE Communication Characteristic: 0000ffe1-0000-1000-8000-00805f9b34fb
- Coverage: 30 meters (line of sight)
- TX Power: 3dBm
- RX Sensitivity: -90dBm
- Typical Operating Current: 22 mA
- Dimension and Weight: 78x34x16mm 39g

2.2 RS232 Interface

PIN	DB9-M	DB9-F	NOTE
2	RXD	TXD	VCC: Power supply
3	TXD	RXD	TXD: Transmit data
5	GND	GND	RXD: Receive data
9	VCC	VCC	GND: Signal ground

Pin 1,4,6,7,8, no connection. VCC range:3.5V~6V

2.3 Factory settings

The default factory settings of BT578 V2:

- Serial Port Baud Rate: 9600bps
- Serial Port Parity: none
- Serial Port Data bit: 8
- Serial Port Stop bit: 1
- Serial Port Flow Control: None
- Bluetooth Name: BT578_SPP(For Classic desktop or laptop PC connecting)
  BT578_BLE(For Android or iOS mobile phone connecting)
- Bluetooth SPP Pairing Password: 1234

Please refer to section 4.4, AT Commands.

3. Hardware Structure

Please refer to hardware structure figure on the first page.

3.1 AT Command Button

When Bluetooth connection is established, press and hold the AT command button , the adapter enter in AT command mode, release to come back to Bluetooth connected mode.

3.2 Power Supply

- External power supply: Slide the internal battery power switch to external power supply icon side, insert MiniUSB cable, connect cable to USB power adapter, red LED will turn on, the adapter get all power from external power adapter.
  The internal battery can be charged when BT578 adapter connect to external power.
- Built-in lithium battery power supply: Do not insert MiniUSB cable, slide the internal battery power switch to battery icon side, the adapter get all power from internal battery, slide to the other side, the BT578 adapter will be shut down.
- Pin9 of DB9 connector power supply: Connect pin9 to 3.5V~6V and pin5 to GND.

3.3 LED Status

- Power/Charging LED (Red): When External Power is Connected, the red LED is turned on. The LED also act as a charging indicator, when internal battery is fully charged, the LED will be turned off.
- Bluetooth Status LED (Blue):

Blinking indicates the adapter is discoverable and waiting for a Bluetooth pairing or connecting, it is not ready for Bluetooth communication yet.
When the LED turns steadily on, it indicates Bluetooth connection is established between the adapter and PC or mobile phone, it is ready for Bluetooth communication.

- Serial Data Activity LED (Green): When a byte passing through BT578 serial port, whether it is sending or receiving, the LED will flash to indicate. If there is a continuous data stream, the LED will stay on.

3.4 DB9 Male/Female Slide Switch

- The DB9 interface of BT578 is male, it can be directly connected to the widely used female serial devices, the switch should be slid to mark "M" side.
- If you want to connect BT578 to a male serial port device, please use DB9 male to female converter provided with this adapter. In this case, the switch should be slid to mark "F" side.

4. Configuration

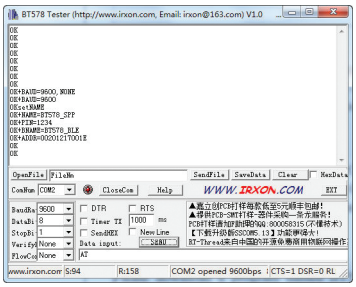
Before connecting the BT578 serial Bluetooth adapter to serial device, it is usually necessary to modify some default settings of the adapter, such as the baud rate. The baud rate of the BT578 serial port and the device serial port should be kept same.

4.1 Hardware Preparation

Connect the adapter to a serial port of Windows PC via DB9 converter, slide DB9 Male/ Female Switch to "F". If your PC does not have a serial port, please buy a USB-RS232 serial port adapter to add a COM port to your computer.

4.2 Software Preparation

Almost all serial port monitor software can be used to communicate with BT578 adapter, here we take IRXON "BT578 Tester" program as an example for demonstration.
Please download the software from URL below.
http://www.irxon.com/download/BT578-Tester.rar
After extracting the compressed file, you'll get "BT578_Tester.exe" program.
Double click the program to run, the interface of the program is shown as below.



4.3 AT Test Command

In the program window, select the COM port which the adapter connected to, configure the COM port using the same settings as BT578 serial port(default 9600,N,8,1), ensure the blue LED is blinking (Bluetooth not connected), click "Open Com" button, input test command "AT" in data input box, then press "SEND", if BT578 returns a message "OK" in upper receiving area, it means AT test command was run successful, you can proceed with more AT command.

4.4 AT Commands

AT commands should use uppercase English letters, +, =, ? are English symbols.

• Inquire/modify BT578 serial port baud rate and parity.
Inquiring format: AT+BAUD=? Return message such as: OK+BAUD=9600,NONE
Modifying format: AT+BAUD=<baud rate>,<parity>
<baud rate>, there are 8 possible values, they are:1200, 2400, 4800, 9600(default), 19200, 38400, 57600, 115200.
<parity>, there are 3 possible values, they are: N, O, E.
The value N means NONE (no parity, default);
The value O means ODD (odd parity);
The value E means EVEN (even parity).
The <parity> can be omitted, that is to keep the parity value unchanged.
For example, send to the adapter: AT+BAUD=115200,E, if OK messages is returned, the serial port settings of BT578 adapter have been modified to 115200,E,8,1(the factory default is 9600,N,8,1). If AT+BAUD=115200 is sent, the baud rate will be changed to 115200, and the parity will not be changed.

• Inquire/Modify Bluetooth SPP broadcasting name.
Inquiring format: AT+NAME=? Return message such as: OK+NAME=BT578_SPP
Modifying format: AT+NAME=<Bluetooth SPP name>, Return message: OKsetNAME
The Bluetooth SPP name can be composed of letters, numbers, dashes or slashes, and should not exceed 12 characters.

• Inquire/Modify BLE broadcasting name.
Inquiring format: AT+BNAME=? Return message such as: OK+BNAME=BT578_BLE
Modifying format: AT+BNAME=<BLE name>, Return message: OKsetNAME
The BLE name can be composed of letters, numbers, dashes or slashes, and should not exceed 12 characters.

• Inquire/Modify Bluetooth SPP pairing password.
Inquiring format: AT+PIN=? Return message such as: OK+PIN=1234
Modifying format: AT+PIN=<password>, Return message: OKsetPIN
The password can be composed of letters and numbers, no more than 12 characters, the factory default is 1234. The password is unnecessary in BLE connecting.

• Inquire BT578 Bluetooth address.
Inquiring format: AT+ADDR=? Return message such as: OK+ADDR=2C35FA2DCFA8

5. Application

The BT578 serial Bluetooth adapter is usually connected to a serial device by DB9 port, and then connected with a computer or a mobile phone via Bluetooth, it is just like a bridge, links up communication both sides in the air.

5.1 Preparation

RS232 serial communication requires two different serial devices have the same serial port settings. For the device the BT578 adapter will be connected to, please first check the documentation of the device to know its serial port settings. The default settings of the BT578 serial port are 9600,N,8,1, if this settings is different from device serial port settings, please refer to section 4.4 to modify the BT578 serial port, make BT578 adapter and the device have same serial port settings.
Connect BT578 adapter to the serial device by DB9 connector. If the DB9 port of the device is male, please use male-to-female converter to connect, and slide the Male/Female switch to mark "F" side.
Turn on the power of the BT578 and prepare for Bluetooth connection with the computer or mobile phone. BT578 can connect with a computer via the traditional Bluetooth SPP protocol, or connect with a mobile phone via the Bluetooth BLE protocol, but it can not connect with a computer and a mobile phone at the same time.

5.2 Connect with computer via Bluetooth SPP

On a laptop or desktop computer, start to search Bluetooth device, select BT578_SPP in the found Bluetooth devices list (do not select BT578_BLE), send a pairing request from the computer, and enter the BT578 pairing password (default password is 1234).
After the pairing is completed, check the device manager of the computer, the system will assign a Bluetooth virtual COM port number to BT578 adapter.
In the user's serial device application program, just select the virtual COM port number and open the COM port, a Bluetooth link between the computer and the BT578 adapter will be established (the blue LED turns steadily on), it's ready to communicate with BT578 adapter, furthermore, communicate with serial device which BT578 adapter is attached.

5.3 Connect with mobile phone via Bluetooth BLE

BLE communication is a process of reading and writing BLE characteristic, it is necessary to run BLE communicating APP in Android or iOS mobile phone.
• For iPhone, please install a universal BLE communication APP named "LightBlue" in

the App Store. LightBlue is a professional APP, user can communicate with BT578 by writing FFE1 characteristic of BT578 adapter and listening for its notifications.
• For Android phones, please download a APP named "ATBlue" from the URL below.
http://www.irxon.com/download/ATBlue-EN.rar
After extracting the compressed file and installation on Android mobile phone, tap ATBlue icon to run the APP.
The APP is specified for BT578 adapter, tap "SCAN" button to start searching BLE device, then tap "BT578_BLE" in the found Bluetooth devices list, a Bluetooth link between mobile phone and BT578 adapter will be established (the blue LED turns steadily on), it's ready to communicate with BT578 adapter, furthermore, communicate with serial device which BT578 adapter is attached.

6. FAQ

Q: I input AT commands in BT578 Tester program, but the BT578 adapter do not return OK message, what's the problem?
A: There are many possibilities to cause the problem.
1. It is possible that the computer serial port settings in the serial port monitor program are incorrectly selected, such as serial port number, baud rate, data bit, stop bit, parity. The computer serial port settings should be consistent with the adapter serial port , otherwise serial communication will be failed.
2. The AT commands to modify BT578 serial port setting will take effect immediately. After the serial port settings of the adapter are changed, the computer serial port should be modified to same settings in time, otherwise the AT command setting cannot proceed.
3. The position of the Male/Female slide switch is wrong, it should be placed on the side of "F" mark.
4. After the Bluetooth link is established (the blue LED stay on), the AT command will be sent as normal data to computer or mobile phone. To force BT578 dispose AT command in connected state, press and hold the AT command button, then the AT command can be recognized.
5. Make sure the DB9 port of BT578 is tightly attached to the serial port of computer, check the COM port in device manager of computer to see if the serial port driver is properly installed.

For more information, please visit IRXON website: http://www.irxon.com