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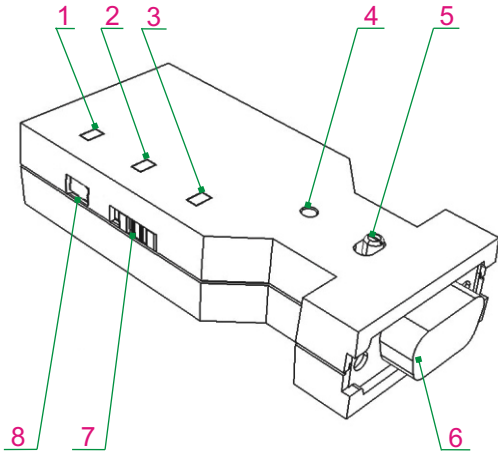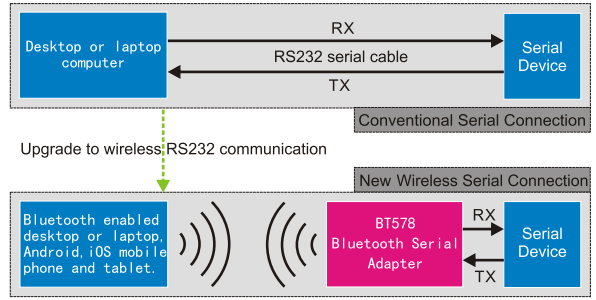8. Type-C Power Port

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1. Introduction

Thank you for purchasing IRXON BT578 Serial Bluetooth adapter! The adapter is usually connected to a serial device by DB9 serial port, and then communicates with a mobile phone or a computer via Bluetooth SPP or BLE, so achieve the wireless connection between serial device and computer or mobile phone. It can eliminate your conventional RS232 serial cable, provides a wireless connection with more freedom and convenience.

Serial Bluetooth communication diagram and application

1.1 Features
• Supports Classic Serial Port Profile(SPP) and new generation Bluetooth LE(BLE).
• Power supply and charging using the current popular Type-C interface.
• Can be connected to female or male serial port device by DB9 connector or converter .
• A green LED is used to indicate TX/RX activity of RS232 serial communication.
• Supports Pin 9 power supply, just connect pin9 to 4~6V and pin5 to GND.
• Built-in battery and charging circuit, more than 24 hours battery usage time.
• Supports AT command setting on computer to personalize name, baud rate, etc.
• Lower power consumption than BT578_V2, but longer communication distance.

1.2 Package Contents
• BT578 RS232 Bluetooth adapter x1
• DB9 male to female converter（Gender Changer）x1
• USB to Type-C power/charging cable x1
• This User Guides（Electronic edition）

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2. Specifications

2.1 Technical Specifications
• Standard: Bluetooth V3. 0(SPP) + Bluetooth V4.2(BLE)
• Selectable Serial Baud Rate: 1200,2400,4800,9600,19200,38400,57600,115200 bps
• Serial Communication BLE Characteristic: 0000ffe1-0000-1000-8000-00805f9b34fb
• Typical Wireless Connection Distance: 30 meters (line of sight)
• TX Power: 5dBm
• RX Sensitivity: -95dBm
• Typical Working Current: 8 mA
• Dimension and Weight: 78x34x16mm 30g

2.2 RS232 Interface
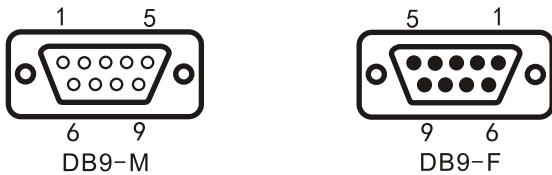
PIN	DB9-M	DB9-F	NOTE
2	RXD	TXD	VCC:Power supply
3	TXD	RXD	TXD:Transmit data
5	GND	GND	RXD:Receive data
9	VCC	VCC	GND:Signal ground

Pin 1,4,6,7,8, No connection. VCC Range:4V-6V

2.3 Factory settings
The default factory settings of BT578 V3:
• RS232 Serial Port Baud Rate: 9600bps
• RS232 Serial Port Parity: None
• RS232 Serial Port Data bit: 8
• RS232 Serial Port Stop bit: 1
• RS232 Serial Port Flow Control: None
• Bluetooth Name: BT578_SPP_xxxx(xxxx are last 4 digits of BD address)
                                  BT578_BLE_xxxx(xxxx are last 4 digits of BD address)
• Bluetooth SPP Pairing Password: 1234
Please refer to section 4.4, AT Commands.

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3. Component Description
Please refer to component diagram on the first page.

3.1 Wake-up Button
This button must be used in concert with the "AT+SLEEP" command. Sending the sleep command puts the adapter into a sleep state, and chick the button wakes the adapter to work.

3.2 Power Supply
• Internal lithium battery power supply: Do not insert Type-C cable, slide the internal battery power switch to serial port direction, the adapter get all power from internal battery, slide to the other side, the adapter will be shut down.
• External USB power supply: Slide the internal battery power switch in opposite direction to the serial port, insert Type-C cable, connect the cable to USB power, red LED will be turned on, the adapter get all power from external power supply.
The internal battery can be charged when the adapter is connected to external power via Type-C cable, the red LED will be turned off after the battery is full charged.
• Pin 9 of DB9 connector power supply: Connect pin9 to 4~6V and pin5 to GND.

3.3 LED Indicators
• Power/Charging LED (Red): The LED will be on when external power is connected. The LED also act as a charging indicator, when internal battery is fully charged, the LED will be turned off, the charging time from empty to full is nearly 1 hours.
• Bluetooth Status LED (Blue):
The blue LED flashes to indicate that Bluetooth is broadcasting, the adapter is waiting for Bluetooth finding and connecting, it is also the mode to send AT command.
When the LED turns constant 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 bytes pass through BT578 serial port, whether it is sending or receiving, the green LED will flash to indicate.

3.4 DB9 Male/Female Slide Switch
• The serial interface of BT578 is DB9 male, it can be directly connected to the widely used female DB9 serial port devices, the switch should be slid to mark "M" side.
• If you want to connect BT578 to a male DB9 serial port device, please use DB9 gender changer in the package. In this case, the switch should be slid to mark "F" side.

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4. Configuration

Before connecting the BT578 RS232 Bluetooth adapter to serial device, it is usually necessary to change some settings of the adapter, such as the baud rate. The baud rate of BT578 serial port should be kept the same as serial port baud rate of the device.

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 RS232 port, please buy a USB-RS232 serial port cable to add a COM port to your computer.

4.2 Software Preparation

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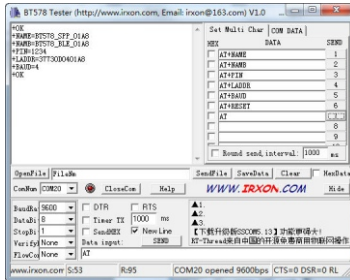
4.3 Test Command

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

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4.4 AT Commands

AT commands should use uppercase English letters, "+" is English character.
At the end of AT command, a Return(Hex:0D) and a Line Feed(Hex:0A) must be added, in BT578 Tester program, just check "New Line".

• Inquire/Change BT578 serial port baud rate
Inquiring command: AT+BAUD   Return message such as: +BAUD=4
Changing command: AT+BAUDn, "n" is the codename of different baud rate, please refer to the table on the right.
For example, send: AT+BAUD8, this will change the baud rate to 115200 bps
The new baud rate will take effect immediately, please update the computer serial port baud rate in time.

n	baud rate
2	2400
3	4800
4	9600
5	19200
6	38400
7	57600
8	115200

• Inquire/Change SPP broadcast name
Inquiring command: AT+NAME   Return message such as: +NAME=BT578_SPP_01A8
Changing command: AT+NAME<SPP name>, Return message: +OK
The SPP name can be composed of letters, numbers, dashes or slashes, and should not exceed 18 characters.

• Inquire/Change BLE broadcast name
Inquiring command: AT+NAMB   Return message such as:+NAMB=BT578_BLE_01A8
Changing command: AT+NAMB<BLE name>, Return message: +OK
The BLE name can be composed of letters, numbers, dashes or slashes, and should not exceed 18 characters.

• Inquire/Change Bluetooth SPP pairing password
Inquiring command: AT+PIN   Return message such as: +PIN=1234
Changing command: AT+PIN<password>, Return message: +OK
The password is fixed to 4 digits, can be composed of letters or numbers, the factory default is 1234. (Password is unnecessary in BLE connecting)

• Inquire Bluetooth address
Command: AT+LADDR, Return message such as: +LADDR=36630D0401A8

• Restart adapter
Command: AT+RESET, it is recommended to restart the adapter after the AT command setting.

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5. Application

The adapter is usually connected to a serial device by DB9 port, and then communicates with a mobile phone or a computer via Bluetooth SPP or BLE, thus a wireless serial connection is established between the serial device and the computer or mobile phone.

5.1 Preparation

RS232 serial communication requires communication both sides have the same serial port settings. For the serial device which the BT578 adapter will attached 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 serial port settings of the device, please refer to section 4.4 to change BT578 serial port, make the adapter and the device have same serial port settings.
Connect BT578 adapter to serial device by DB9 connector. If the DB9 port of the device is male, please use Gender changer to connect, and slide the Male/Female switch to mark "F" side.
Turn on power of the adapter, prepare for Bluetooth finding and connecting.
The BT578_V3 can be connected to a computer or Android phone via the Bluetooth SPP protocol, or an Android or iOS phone via the BLE protocol, but SPP and BLE cannot be used at the same time.

5.2 Connect to computer via 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, check "Device Manager" on the computer, the system had assigned a Bluetooth virtual COM port to the 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 constant on), it's ready to communicate with BT578 adapter, and further communicate with serial device which BT578 attached.

5.3 Connect to Android phone via SPP or BLE

Bluetooth SPP is well supported on the Android system (iOS has many limitations), and there are many related APPs. It is recommended to use "Serial Bluetooth Terminal" (please download it from Google Play). The APP supports both SPP and BLE, so it is very good for connecting BT578_V3 SPP and BLE dual-mode RS232 Bluetooth adapter.

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To connect BT578 adapter to an Android phone via SPP, you need to pair with BT578 in the system "Settings" - "Bluetooth" firstly, and select BT578_SPP_xxxx in the found Bluetooth devices.
After pairing, enter "Serial Bluetooth Terminal", click "Devices", and click BT578_SPP in the "Bluetooth CLASSIC" column to establish a SPP connection with BT578.
Click the "Bluetooth LE" column, and click "SCAN", click BT578_BLE in the scan results, a BLE connection with BT578 will be established.
The blue LED of BT578 adapter will turns constant on when the BLE or SPP connection is established. It's ready to communicate with BT578 adapter, and further communicate with serial device which BT578 attached.

5.4 Connect to iPhone via BLE

BLE communication are processes of reading and writing BLE characteristics, 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 its characteristic FFE1 and listening for its notifications.

6. FAQ

Q: I input "AT" commands in BT578 Tester program, but I can't get OK message from BT578, 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, flow control. The computer serial port settings should be kept same as the adapter serial port.
2. The AT commands to change BT578 serial port baud rate will take effect immediately. After the serial port baud rate of the adapter is changed, the computer serial port should be changed to same baud rate, otherwise the AT command setting cannot proceed.
3. The position of the Male/Female slide switch should be placed on the "F" mark side.
4. When the Bluetooth is connected (the blue LED stay on), the AT command will be sent as normal data to computer or mobile phone.

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

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