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

1. Introduction

Thank you for purchasing BT578_V3 Serial Bluetooth adapter! The adapter is usually connected to a RS232 serial communication device by the DB9 serial port, and then connected to a computer or mobile phone via Bluetooth SPP or BLE, thus build a wireless bridge between the serial device and the computer or mobile phone. It can eliminate your conventional RS232 serial cable, connects communication both sides over the air, provides a wireless serial connection with more freedom and convenience.
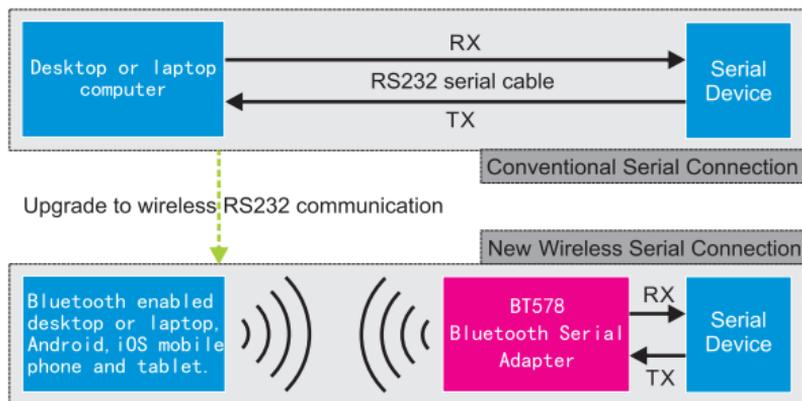
Serial Bluetooth communication diagram and application

1.1 Features

• Supports Classic Serial Port Profile(SPP) and new generation Bluetooth LE(BLE).
• Use the popular USB Type-C connector for power supply or charging.
• AT commands can be sent via Bluetooth link to personalize name, baud rate, etc.
• A green LED is used to indicate TX/RX activity of RS232 serial communication.
• Supports Pin 9 power supply, just connect pin9 to 5V and pin5 to GND.
• Built-in battery and charging circuit, more than 40 hours battery usage time.
• Can be connected to female or male serial device by DB9 connector or converter.

1.2 Package Contents

• BT578_V3 Serial Bluetooth adapter x1
• DB9 male to female converter（Gender Changer） x1
• USB to Type−C power/charging cable x1
• This User Guides （Electronic edition)

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
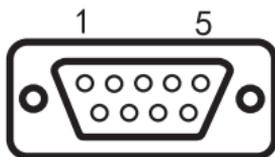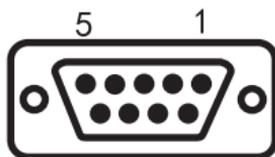
DB9-M   DB9-F

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

3. Description

Please refer to hardware structure 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 lit up when external power is connected. The LED also act as a charging indicator, when internal battery is fully charged, the LED will blink or turn off, the charging time from empty to full is nearly 1 hours.

• Bluetooth Status LED (Blue):

The blue LED blinks to indicate that Bluetooth is broadcasting, the adapter is waiting for Bluetooth searching and connecting, it is also the mode to send serial AT command. When the LED light constantly, it means Bluetooth is connected to computer or mobile phone, it is ready for Bluetooth AT command and 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 devices, the switch should be slid to mark "M" side.

• If you want to connect BT578 to a male DB9 serial device, please use DB9 gender changer in the package. In this case, the switch should be slid to mark "F" side.

4. Configuration

AT commands is adopted to query or change settings such as the serial baud rate of BT578 adapter. You can send AT commands via Bluetooth connection or serial connection.

4.1 Sending AT commands via Bluetooth connection

It is recommended that users use an Android phone to connect to BLE name of BT578_V3 through an APP to send AT commands. There are many good APPs to use, we recommend an App named "Serial Bluetooth Terminal" , you can install it in Google Play.

After installation, open the APP, select "Devices", click "SCAN" in the "Bluetooth LE" column, and click "BT578_BLE_xxxx" in the scan results to connect to BT578, on the next "Terminal" interface, you can send AT commands. The APP operation interface is shown in the figure below:
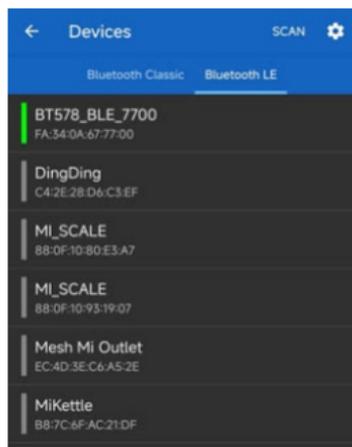
4.2 Sending AT commands via Serial connection

Connect the adapter to RS232 port of a Windows computer by DB9 gender changer, slide DB9 Male/Female Switch to mark "F" side. If your computer does not have a RS232 port, please buy a USB-RS232 serial cable to add a COM port to your computer.

Please download "BT578 Tester" program from URL: http://www.irxon.com/download/BT578-Tester.rar, you'll get a exe file when you extract the rar file, double click the exe file to run, on the program interface, select the COM port number which BT578 actually connected, and then set the baud rate and other settings the same with the serial settings of the BT578 adapter (factory default is 9600,8,1,N), check "new line" to add a return and a line feed to the end of AT command, click "OpenCom" to open the serial port, type two

letters "AT" in the data sending area, click "Send" button, if a message "+OK" is returned from the adapter in data receiving area, it means the testing "AT" command was run successfully, you can proceed with more AT commands. The interface of the program is shown in the figure below.

Data Receiving Area

User Preset Commands or Data

Computer COM Port Setting Area

Data Sending Area
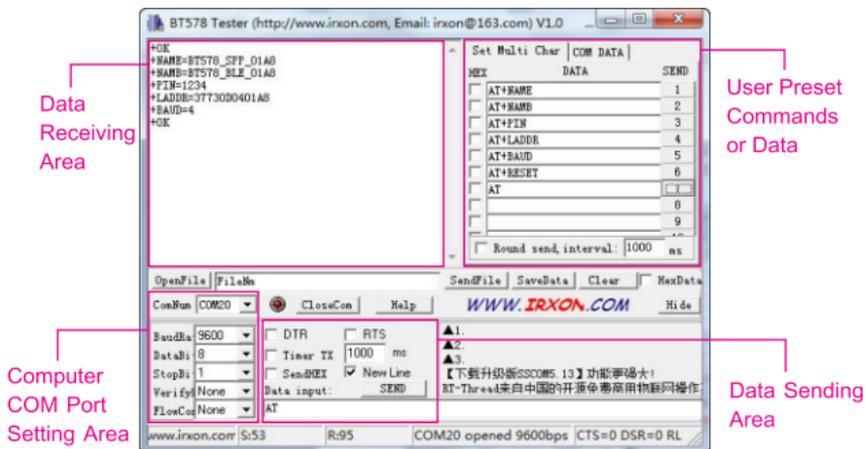
4.3 AT Commands

AT commands should be uppercase English letters, "+" is English character.
At the end of AT command, a Return(CR, Hex:0D) and a Line Feed(LF, Hex:0A) must be added.

• Query/Change adapter's serial baud rate
Querying command: AT+BAUD   Return message such as: +BAUD=4
Changing command: AT+BAUDn, "n" is the code name of different baud rate, please refer to the right table.
For example, send: AT+BAUD8, this will change the baud rate to 115200 bps.
The new baud rate will take effect immediately, please update computer baud rate if you are sending serial AT commands.

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

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

• Query/Change BLE broadcast name

Querying command: AT+NAMB   Return message such as:+NAMB=BT578_BLE_01A8

Changing command: AT+NAMB*BLEname*, Return message: +OK

The BLE name can be composed of letters, numbers, dashes or slashes, and should not exceed 18 characters.

• Query/Change Bluetooth SPP pairing password

Querying 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)

• Query Bluetooth address of adapter

Command: AT+LADDR, Return message such as: +LADDR=36630D0401A8

• Query/change adapter's serial parity

Querying command: AT+UARTMODE   Return message such as: +UARTMODE=0,0

Changing command: AT+UARTMODEm,n, code m is fixed to 0, code n represents the parity mode.

n=0: None (no parity, factory default); n=1: Odd (odd parity); n=2: Even (even parity)

For example, send: AT+UARTMODE0,2, the parity mode will be changed to even.

After changing the parity mode, the adapter will automatically restart.

• Restart adapter

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

5. Application

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

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5.1 Preparation

RS232 serial communication requires communication both sides have the same serial settings. For serial device which the BT578 adapter will attached to, please check the manual of the device to know its serial settings. The default settings of the BT578 serial

port are 9600,N,8,1, if the settings are different from the serial device, please refer to section 4.3 to change settings to make both sides the same serial settings.

Connect the adapter to serial device via DB9 connector. If the DB9 port of the device is male, please use Gender changer to connect, and slide the M/F switch to mark "F" side.

Turn on power of the adapter to wait for Bluetooth searching and connecting.

The BT578_V3 can be connected to a computer or Android device via Bluetooth SPP, or an Android or iOS device via Bluetooth LE.(SPP and BLE of the BT578 adapter cannot be connected at the same time)

5.2 Communicate with 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 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 adapter will be built (the blue LED turns constant on), it's ready to communicate with the adapter, and further communicate with serial device which the adapter attached to.

5.3 Communicate with Android device via SPP or BLE

Bluetooth SPP is well supported in Android system (iOS has limitation), and there are many APPs to use. We recommend an App named "Serial Bluetooth Terminal" , you can install it in the Google Play store. The App supports both SPP and BLE, so it is good for connecting the BT578_V3 adapter which supports SPP and BLE dual-mode.

To connect the adapter to an Android device via SPP, you need to search and pair with BT578_SPP_xxxx in the system "Settings" - "Bluetooth" firstly, after pairing, open "Serial Bluetooth Terminal", click "Devices", and click BT578_SPP in the "Bluetooth CLASSIC" column to build a SPP connection with the adapter.

Exit SPP connection, in the "Bluetooth LE" column, click "SCAN", select BT578_BLE_ xxxx in the scan list, a BLE connection with the adapter will be built.

The blue LED of adapter will turns constant on when the BLE or SPP connection is bulit. It's ready to communicate with BT578 adapter, and further communicate with serial device which BT578 attached to.

5.4 Communicate with iOS device via BLE

The BLE communication is done by writing and listening to the Bluetooth characteristic

"FFE1" of the adapter. Please install an APP named "LightBlue" in the App Store, run the app, select BT578_BLE_xxxx in Bluetooth scan list , click "0xFFE1" on next interface, check "Listen for notification" to enable data receiving, and click "Write new value" to send data to the adapter.

6. FAQ

• Q: What is Bluetooth SPP and what is Bluetooth BLE, and what is the difference?

• A: Bluetooth SPP is the abbreviation of Serial Port Profile. SPP is a protocol of traditional Bluetooth, which can virtualize Bluetooth link into a serial connection. Bluetooth BLE is the abbreviation of Bluetooth Low Energy. BLE is a relatively new Bluetooth technology that came with the release of Bluetooth 4.0.

There are several differences between the two protocol:

1. Different user interfaces: The user interface provided by SPP is a Bluetooth virtual serial COM port; the user interface provided by BLE is a Bluetooth characteristic.

2. Different communication target: SPP is usually used to connect to computers; BLE is usually used to connect to Android or iOS devices.

3. Different applications: The application of serial device can still be used over Bluetooth SPP connection; while the Bluetooth characteristic provided by BLE usually require new application development.

• Q: After pairing the Windows computer with the BT578_SPP_xxxx, the computer will generate two virtual Bluetooth COM ports. Which COM port should be selected in the serial communication application?

• A: The "outgoing" COM port should be selected. Please click "More Bluetooth Options" in the Bluetooth settings interface of the computer, and click "COM Port" in the new window. You can see that there are outgoing and incoming signs in "Direction". There is usually a "Dev B" after the outgoing port.

• Q: What are the changes in the V2.0 user guides compared to the original version?

• A: Since November 2024, the newly produced BT578_V3 serial Bluetooth adapter has added the function of sending AT commands via Bluetooth connection, and the V2.0 user guides added the introduction of this function.

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