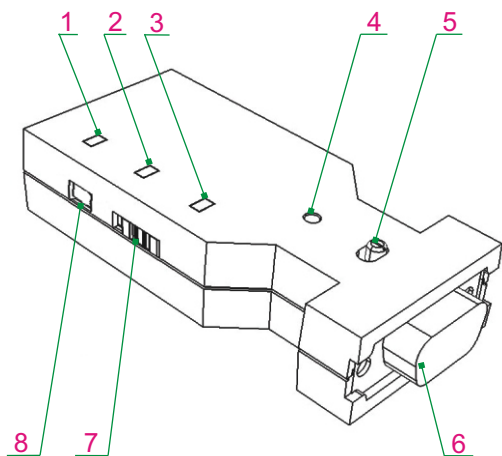
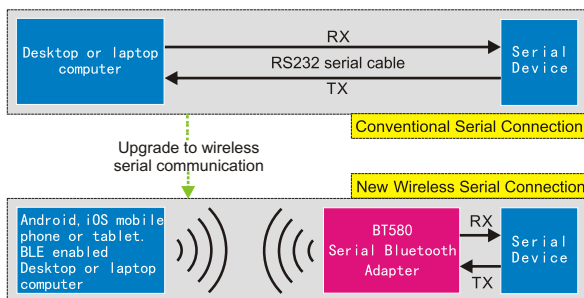


1. Introduction

Thank you for purchasing IRXON BT580 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 PC via Bluetooth Low Energy(BLE), 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.



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



Serial Bluetooth communication diagram and application

1.1 Features

- Can be used either as a Bluetooth slave or as a Bluetooth master.
- Can be connected to female or male serial port device by DB9 connector or converter.
- Can be set by AT commands via Bluetooth link or traditional RS232 connection.
- A green LED was used to indicate TX/RX activity of RS232 serial communication.
- Built-in battery and charging circuit, can also be powered by Pin9 of DB9 port.
- Auto sleep function allows the internal battery to be used for several days.
- Can be woken up by data activity of Bluetooth link or serial port.
- Built in Amplifier, the typical wireless communication distance is up to 30 meters.

1.2 Package Contents

- BT580 Serial Bluetooth adapter x1
- DB9 male to female converter x1
- AC to USB power adapter x1
- USB to MiniUSB power/charging cable x1
- This User Guides x1

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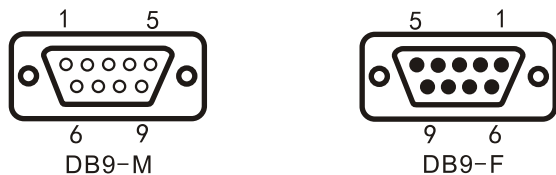
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2. Specifications

2.1 Technical Specifications

- Standard: Bluetooth v4.0 Low Energy (BLE)
- Selectable Serial Baud Rate: 1200,2400,4800,9600,19200,38400,57600,115200 bps
- Serial Communication BLE Characteristic: 0000fff6-0000-1000-8000-00805f9b34fb
- Typical Bluetooth Coverage: 30 meters (line of sight)
- TX Power: 3dBm
- RX Sensitivity: -90dBm
- Typical Sleep/Full-speed Current: 0.1mA/10 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:3V~6V

2.3 Factory settings

The default factory settings of BT580:

- Serial Port Baud Rate: 9600 bps
 - Serial Port Parity bit: None
 - Serial Port Data bit: 8
 - Serial Port Stop bit: 1
 - Bluetooth Role: Slave
 - Bluetooth Name: BT580
 - Bluetooth Pairing Mode: No need Pairing
 - Bluetooth Pairing Password: 123456 (If pairing mode is password needed)
- Please refer to section 5.3, AT Commands.

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3. Hardware Structure

Please refer to hardware structure figure on the first page.

3.1 Restore Default Button

Press and hold the button, and then switch on the adapter, all settings will be restored to factory default, release the button to start the adapter.

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 BT580 adapter is connected 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 BT580 adapter will be shut down.
- Pin9 of DB9 connector power supply: Connect pin9 to 3~6V and pin5 to GND.

3.3 LED Status

- 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 about 2-3 hours.
- Bluetooth Status LED (Blue):
 - The LED will flash several times after a successful booting.
 - When Bluetooth is not connected, the slave flashes slowly (2 sec), and the master flashes quickly (1 sec). When Bluetooth is connected, both the master and slave will stay on.
 - The LED will be off when the adapter enters the sleep mode or has been shut down.
 - When the voltage of built-in battery is too low, the LED will flash rapidly (0.2 sec).
- Serial Data Activity LED (Green): When a byte passing through BT580 serial port, whether it is sending or receiving, the LED will flash to indicate.

3.4 DB9 Male/Female Slide Switch

- The serial interface of BT580 is DB9 male, it can be directly connected to the widely used female DB9 port serial devices, the switch should be slid to mark "M" side.
- If you want to connect BT580 to a male DB9 port serial device, please use DB9 male to female converter provided with the adapter. In this case, the switch should be slid to mark "F" side.

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4. Sleep and wake-up

The BT580 serial Bluetooth adapter has two power modes: Sleep mode and Full-Speed mode. The power consumption of sleep mode is about 0.1mA, and the power consumption of full-speed mode is about 10mA, which is quite different.

In sleep mode, the Bluetooth works the same as it is in full-speed mode, while the serial communication can only work in full-speed mode.

- Auto sleep: The adapter will work in full-speed mode after power on. If there isn't Bluetooth and serial port data activity for more than 30 seconds, the adapter will enter sleep mode and the Blue LED will turn off.
- Auto wake-up: When the adapter is in sleep mode, if it detect Bluetooth or serial port data activity, it will immediately switch to full-speed mode, and the Blue LED will also resume indication.
- Disable auto sleep: By sending AT command: AT+AUTOSLEEP=0, user can disable the auto sleep function. The factory default is auto sleep enabled. When the adapter is in master role, it does not support auto sleep and auto wake-up.

5. Configuration

Before connecting the BT580 serial Bluetooth adapter to a serial device, it is usually necessary to modify some default settings of the adapter, such as the baud rate, the baud rate of BT580's serial port should be kept the same as serial port baud rate of the device. You can inquire/change BT580's settings by sending AT command to the adapter, there are two ways to send the command, the first way is sending AT command to BT580 slave via Bluetooth connection, the second way is sending AT command to BT580 slave or master via RS232 serial connection.

5.1 Remote Bluetooth AT command setting

- For Android mobile phone, please download a APP named "ATBlue" from this URL: <http://www.irxon.com/download/ATBlue-EN.rar>
- After extracting the compressed file and installation, tap ATBlue icon to run the APP. The APP is specified for BT580 adapter, tap "SCAN" button to start searching nearby BLE device, then tap "BT580" in the found Bluetooth devices list, a Bluetooth link between mobile phone and BT580 adapter will be established (the blue LED turns steadily on), it's ready to communicate with BT580 adapter, furthermore, communicate with serial device which BT580 adapter is attached.
- Type testing command "AT+BT" at bottom, then tap "SEND", if the adapter returns a message "OK" in upper screen, it means the testing AT command was run successfully, you can proceed with more AT commands.

⑤

Inquiring command: AT+PARITY=? Return message such as: OK get parity:0
Changing command: AT+PARITY=Code Return message such as: OK set:1,EVEN
The default parity bit is none, the code is 0. Even parity code is 1. Odd parity code is 2.

► Inquire/Change serial stop bit
Inquiring command: AT+STOPBIT=? Return message such as: OK get stopbit:0
Changing command: AT+STOPBIT=Code Return message such as: OK set:1, 2 bits
The default is one stop bit, the code is 0. Two stop bits, the code is 1.

► Inquire/Change Bluetooth name
Inquiring command: AT+NAME=? Return message such as: OK get:BT580
Changing command: AT+NAME=Name Return message such as: OK set:IRXON
The Bluetooth name can be composed of letters, numbers, dashes or slashes, and should not exceed 8 characters.

► Inquire/Change Bluetooth pairing password
Inquiring command: AT+WORD=? Return message such as: OK get:123456
Changing command: AT+WORD=Password (6 digits)
The pairing password is only useful after the AT+PASS=1 command was sent.

► Inquire the Bluetooth address of BT580 adapter
Command: AT+ADDR=? Return message such as: OK get: 2C35FA2DCFA8

► Clear binding record
Command: AT+CLEAR Return message such as: OK clear all bonds

► Inquire/Change Bluetooth role
Inquiring command: AT+ROLE=? Return message such as: OK get:0
Changing command: AT+ROLE=Code Return message such as: OK set:1, master
The factory default Bluetooth role is slave, the code is 0. The master role code is 1. If the adapter is set as a Bluetooth master, it can't be found by mobile phones and can't be set by remote AT command any more. The BT580 master can only be used to search and connect BT580 slave, and make a wireless serial connection between the two adapters.

► Restart the adapter
Command: AT+RESTART
The settings changed by remote AT commands will take effect after restarting. Restarting will cause the Bluetooth connection to be interrupted.

5.3.2 AT commands for BT580 Slave only

► Inquire/Change the Bluetooth password authentication
Inquiring command: AT+PASS=? Return message as: OK get pass:0
Changing command: AT+PASS=Code Return message such as: OK set:1,password needed
The default is that Bluetooth connection does not need pairing password, the code is 0. Set the code to 1, BT580 slave will send security request to the master device after Bluetooth connection is established, if the master can't give the correct password, the Bluetooth

⑦

- For iPhone, please install a universal BLE communication APP named "LightBlue" in the App Store. LightBlue is a professional APP, user can send AT command to BT580 by writing its characteristic FFF6 and listening for its notifications, please refer to above Android introduction.

5.2 Local RS232 AT command setting

Connect the adapter to serial port of a 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 cable to add a COM port to your computer.

Almost all serial port monitor program can be used to communicate with BT580 adapter, if you don't have a preference, please download a serial program from URL below: <http://www.irxon.com/download/BT578-Tester.rar>

Double click to run the program, in the program window, select the COM port which the adapter is connected to, configure the COM port using the same settings as BT580 serial port(default 9600,N,8,1), ensure the blue LED is blinking (Bluetooth not connected), click "Open Com" button, input testing command "AT" in data input box, then press "SEND", if BT580 returns a message "OK" in upper receiving area, it means the testing AT command was run successfully, you can proceed with more AT commands.

5.3 AT Commands

AT commands should use uppercase English letters, +, =, ? are English symbols. After the remote AT command is sent to change some settings, you must send command AT+RESTART to restart the adapter for the setting to take effect. Restarting the adapter will cause the Bluetooth connection to be interrupted.

Local AT command setting is not restricted by the Bluetooth connection and will restart the adapter to make settings effective immediately.

5.3.1 AT commands for both BT580 Master and BT580 Slave

► Inquire/Change the serial baud rate
Inquiring command: AT+BAUDRATE=? Return message such as: OK get baudrate: 3
Changing command: AT+BAUDRATE=Code
The codes are numbers 0 to 7, representing the eight serial baud rates of BT580.

Code	0	1	2	3	4	5	6	7
Baud rate	1200	2400	4800	9600	19200	38400	57600	115200

For example, the factory default baud rate is 9600 bps, the code is 3, send to the adapter: AT+BAUDRATE=7, if "OK set: 7,115200" message is returned, it means that the serial baud rate has been changed from 9600 bps to 115200 bps.

► Inquire/Change serial parity bit

⑥

connection will be terminated.

► Inquire/Change auto sleep function
Inquiring command: AT+AUTOSLEEP=? Return message such as: OK get sleep:1
Changing command: AT+AUTOSLEEP=Code Return message such as: OK set:0,no sleep
The default is auto sleep, the code is 1. If the code is 0, the function will be disabled.

5.3.3 AT commands for BT580 Master only

• **Automatic searching and connecting commands:** Can be sent by local or remote AT commands. After it is sent by remote AT command, you need to send the AT+ROLE=1 command to change the adapter to master role, and then send the AT+RESTART command to restart, the adapter will become Bluetooth master and automatically connect to BT580 slave in the mode specified by AT+AUTOCONN command.

► Inquire/Change searching and connecting mode of BT580 master
Inquiring command: AT+AUTOCONN=? Return message such as: OK get mode:1
Changing command: AT+AUTOCONN=Code Return message such as: OK set: 2
Code 0, Manual mode, search and connect BT580 slave by manual local AT commands.
Code 1, Auto mode 1, auto connecting to the first BT580 slave found by the Master.
Code 2, Auto mode 2, auto connecting to BT580 slave which was connected last time.
Code 3, Auto mode 3, auto connecting to BD address specified by the AT+BD command.
The default is Auto mode 1, the code is 1. Setting the code to 0 will disable Auto mode and enable manual searching and connecting.

► Inquire/Change the BD address of BT580 slave for Auto mode 3
Inquiring command: AT+BD=? Return message such as: OK get: if the address is empty.
Changing command: AT+BD=Address, return message such as: OK set:F78EABB95850
The Bluetooth address is a 12-digit hexadecimal number, ABCDEF must be uppercase.

• **Manual searching and connecting commands:** Must be sent by local AT command, first send AT+ROLE=1 command to set the adapter to master role, then send command AT+AUTOCONN=0 to set searching and connecting mode to manual.

► Manual searching
Command: AT+FIND Return message such as:
scanning... found: [0]F78EABB95850 [1]5AF8D1DF79D7 end
It shows that there are two BT580 slaves nearby, with number and Bluetooth address.

► Manual connecting
Command: AT+CONNECT=Number Return message such as: connecting...connected
This command must be used after the AT+FIND command. The Number is the BT580 slave number assigned by the AT+FIND command.

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