BT900 MODULE

SPP CONNECTION WITH ANDROID DEVICES

Quick Start Guide *v1.2*

INTRODUCTION

Laird BT900 is a dual mode Bluetooth v4.0 module. The BT900 series utilise Laird's robust, field proven *smart*BASIC programming language to control and configure the module. This Quick Start Guide illustrates how to utilise Classic BT on the BT900 to make Serial Port Profile (SPP) connections with standard Android devices.

The BT900 ship from Laird facilities with a factory default with communications setting of 115200,N,8,1.

Note: Detailed description of *smart*BASIC programming language can be found in the *smart*BASIC Core and Extensions User Manuals.

REQUIREMENTS

- DVK-BT900-Sx loaded with v9.1.2.0 or later firmware
  - (Firmware on Software Tab of BT900 Product Page)
- Android Device with Classic Bluetooth
- Laird Toolkit android app
- FTDI USB-UART driver
- Windows 7 or later
- *smart*BASIC sample applications from GitHub
- Laird UWTerminal serial program:
  - Laird UW Terminal v7.0 (on Software Tab of BT900 Product Page)

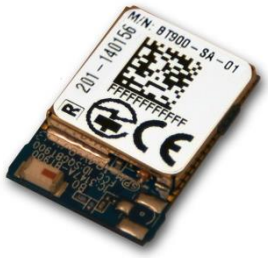


Figure 1: BT900-SA Module

The development board features a FTDI USB-UART chip to provide UART connectivity to the module. The USB interface powers the board as well. Laird provides a terminal emulator program (UWTerminal) for downloading the *smart*BASIC applications to the BT900 module. UWTerminal can also be used to test SPP connectivity.

SETUP PREPARATION

To prepare your setup, follow these steps:

1. Plug in the BT900 development board to a PC. The development board has a FTDI USB-UART chip on board. Windows 7 or later should install the driver automatically. The driver is also available from the FTDI website.
2. Locate the COM port in Windows Device Manager. The COM port number varies for different computers (Figure 2).

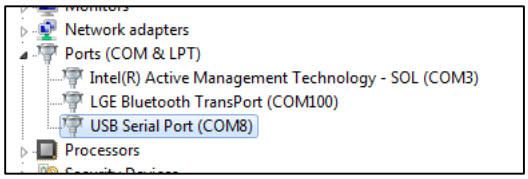
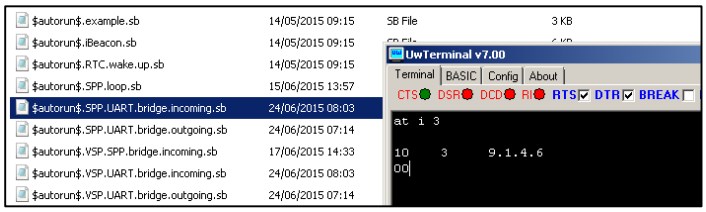


Figure 2: Device manager

3. Download the *smart*Basic sample applications zip file from GitHub link and unzip it to a folder on your computer (such as C:\Laird\BT900).

4. Download the X-Compiler and UWTerminal from the Laird website.
5. Place the X-compiler and UWTerminal in the same *smart*BASIC sample application folder.



6. Open UWTerminal with the COM port number found in Step 2 at the BT900 default settings of **115200 bps 8-N-1.**

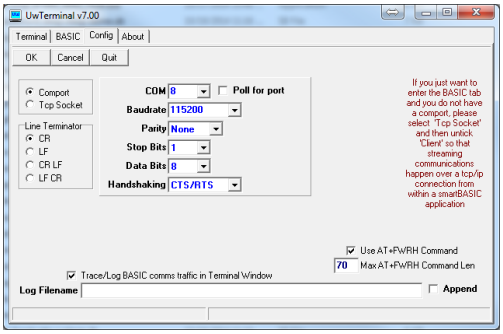


Figure 3: UWTerminal configuration page

7. Type **AT I 3** and press **Enter** to confirm the module is accessible.

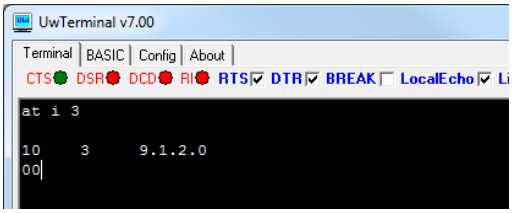


Figure 4: BT900 firmware version

MODIFYING THE *SMART*BASIC APPLICATION

Set Connectable and Pairable Mode

In the *smart*BASIC sample application for SPP, the module is, by default, in a connectable, discoverable and pairable mode. This can be altered by modifying the *smart*BASIC application.

Use the following example to understand how to modify the application code:

1. Edit the **$autorun$.SPP.UART.bridge.incoming.sb** with any text editor.

Note: This sample application is contained in the GitHub link (see Step 3 of **Setup Preparation** for additional information).

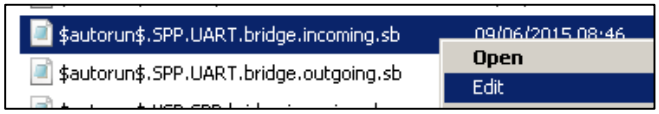


Figure 5: Edit the smartBASIC file

2. Search for OPEN_SPP_ON_STARTUP and ensure that the value is set to 1.

```
        //if set to 1, on startup an SPP port will be opened
#define OPEN_SPP_ON_STARTUP                 1
```

Figure 6: Search for OPEN_SPP_ON_STARTUP

3. Search for PAIRABLE_ON_STARTUP and ensure the value is set to 1, it can be changed to 0 if pairing is not desired.
4. Save the change and exit the editor.

COMPILING, DOWNLOADING, AND LAUNCHING THE SMARTBASIC APPLICATION

Preparation – Putting the Files in the Right Place

There is a corresponding Xcompiler for every firmware version. For firmware 9.1.2.0, the Xcompiler version is A042_7E28. The Xcompiler, UwTerminal, and *smart*BASIC application must be placed in the same folder. Also, the *smart*BASIC application may import some *smart*BASIC libraries – the best practice is to maintain the same file hierarchy as is present in the original zip file from the GitHub download (Figure 7).

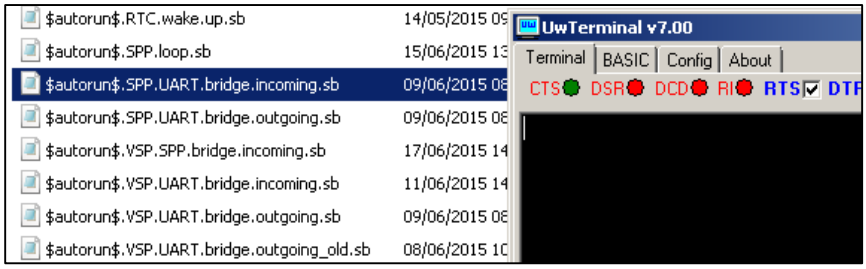


Figure 7: Files location

Compiling and Downloading

Use the following steps to compile and download the application inside UwTerminal.

1. Right click within the UWTerminal window and select **Xcompile + Load**.

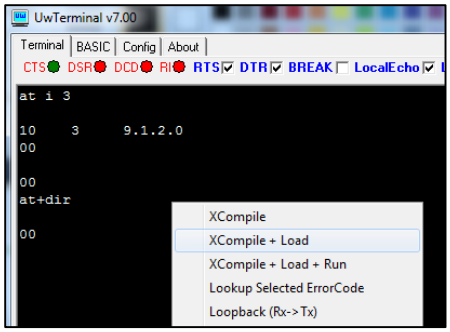
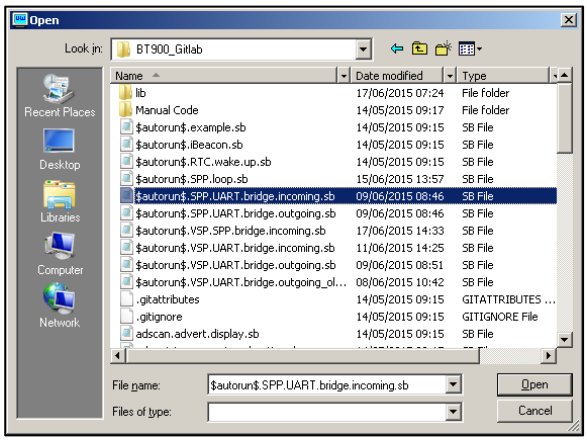


Figure 8: Compile and download inside UWTerminal

2. Select **$autorun$.SPP.UART.bridge.incoming.sb**.



3. Click **Open**. The *smart*BASIC application is now compiled and downloaded to the module (Figure 9).

Note: The application name is *$autorun$*.

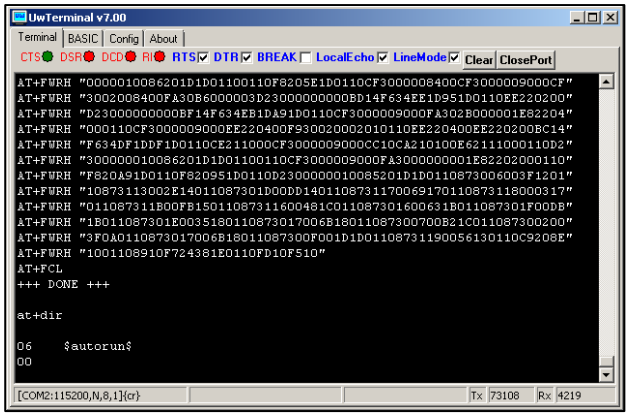


Figure 9: Compiled and downloaded application

Launching the Application

Enter **at+run "$autorun$"** to launch the application.

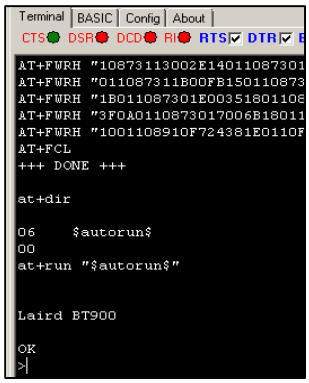
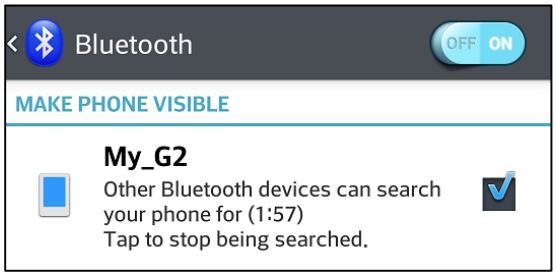


Figure 10: Launched SPP application

SPP CONNECTION

Before any SPP connection, it is required to pair with the Android device. To do this, follow these steps:

1. Make the Android device to be Bluetooth discoverable.



2. On the module, issue **AT+BTI** to trigger a Bluetooth inquiry scan for the Android device.

```
>at+bti

INQ: 58A2B55FB6C6 -48   My_G2
OK
>
```

The module retrieves the Android Bluetooth MAC address. The Bluetooth MAC address is unique for every Bluetooth device.

3. Append the MAC address to the pairing command AT+BTW.

Note: There is a space in between.

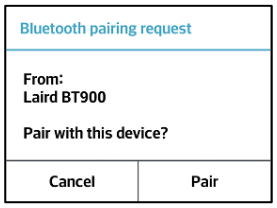
```
>at+btw 58A2B55FB6C6

OK
>
Pair Req: 58A2B55FB6C6
>
Type 'y' to pair and 'n' to decline - and press Enter
```

4. By default, Simple Secure pairing (SSP) "just works" is enabled.
5. Enter **y** to confirm the pairing.

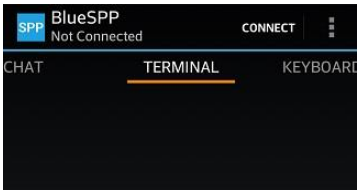
```
>
Type 'y' to pair and 'n' to decline - and press Enter
y
```

6. Click **Pair** to accept the pairing request on the Android device.



7. Once pairing is successful, click **Blueterm** on the Android device.

8. Select the BlueSPP TERMINAL tab.



9. Select **Connect**.
10. Click **Laird BT900** (Figure 11) to establish the SPP connection.

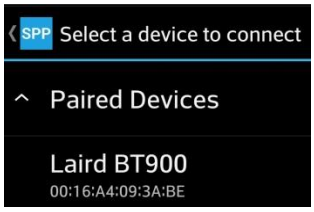


Figure 11: Click Laird BT900

BlueSPP (Figure 12) and the BT900 (Figure 13) show a successful connection.

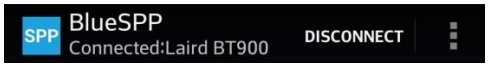


Figure 12: BlueSPP displays the connection

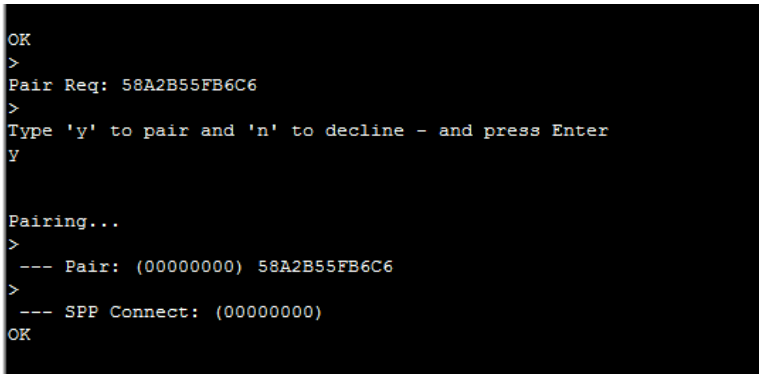


Figure 13: BT900 displays the connection

Sending and Receiving Serial Data

To send and receive serial data, follow these steps:

1. On the UWTerminal, unselect the LocalEcho and LineMode checkboxes (Figure 14).

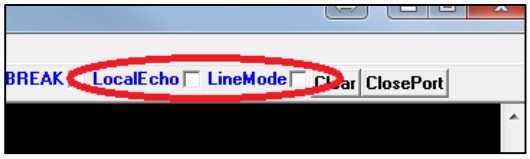


Figure 14: LocalEcho and LineMode checkboxes

Anything typed on the UWTerminal is sent to Blueterm as serial data.

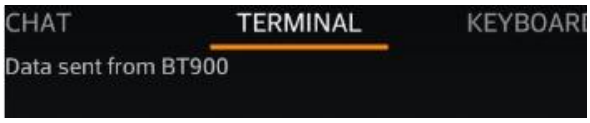


Figure 15: BT900 is sending serial data

Anything typed on Blueterm is sent to the UWTerminal as serial data.

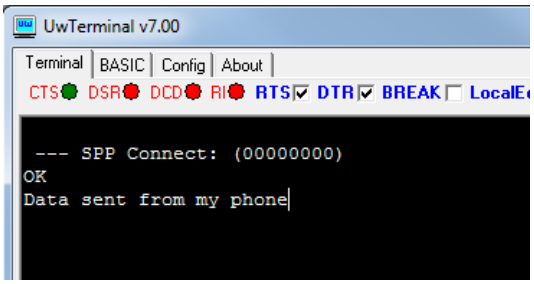


Figure 16: BT900 is receiving serial data

Dropping the SPP Connection

In order to drop the SPP connection, you can either click **Disconnect** in the Android application or disconnect from the module side. The following example shows how to disconnect from the module side.

To disconnect the SPP connection from the module side, follow these steps:

1. Issue the **^^^** command in UwTerminal to switch to Connected mode.
   The BT900 responds with OK to indicate the switch is successful.
2. Type **ATH** and press **Enter** to drop the SPP connection.
   To show the command syntax, LocalEcho is enabled temporarily.

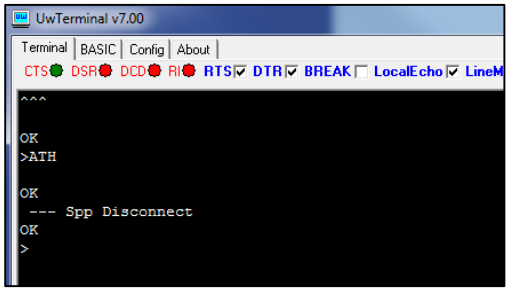


Figure 17: Disconnecting the SPP connection from the module side

Creating an SPP Connection from the BT900

Making an SPP connection is bidirectional. To connect from the BT900, follow these steps:

1. In the BlueSPP app, click **Menu** on the upper right corner.
2. Select **Preferences**.
3. Select the Server mode checkbox.

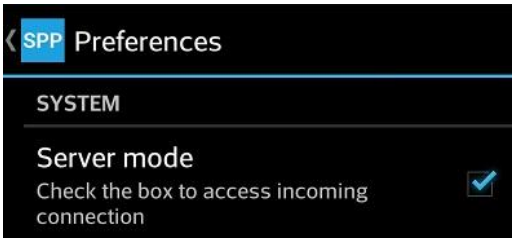


Figure 18: Server mode checkbox

4. In UWTerminal, select the LocalEcho checkbox to show the command syntax and to temporarily enable LocalEcho (Figure 19).

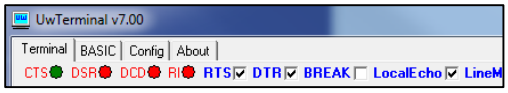


Figure 19: Select LocalEcho

5. Append the MAC address to the SPP open command at+btd. Note that there is a space in between. A return code (00000000) indicates the SPP connection is successful.

```
atd 58A2B55FB6C6

 --- Pair: (00000000) 58A2B55FB6C6
>
 --- SPP Connect: (00000000)
OK
```

Figure 20: Return code (00000000)

Additional Documentation and Resources

Laird offers a variety of documentation and ancillary information to support our customers through the initial evaluation process and ultimately into mass production. The following documentation is available from the Laird support site or Laird website BT900 product pages:

- BT900 – Firmware User Guide
- BT900 – Hardware Integration Guide (HIG)
- DVK-BT900 – User Guide
- DVK-BT900 – Schematics

For any additional questions or queries, or to receive local technical support for this Development Kit or for the BT900 module series, use the Laird Embedded Wireless Solutions Support Center: http://ews-support.lairdtech.com

Revision History

Revision	Date	Description	Approved By
1.0	26 Nov 2014	Initial Release	Jonathan Kaye
1.1	06 Jan 2015	Updated website links. Added Revision History	Sue White
1.2	24 Jun 2015	Updated filenames and default text	Jamie McCrae