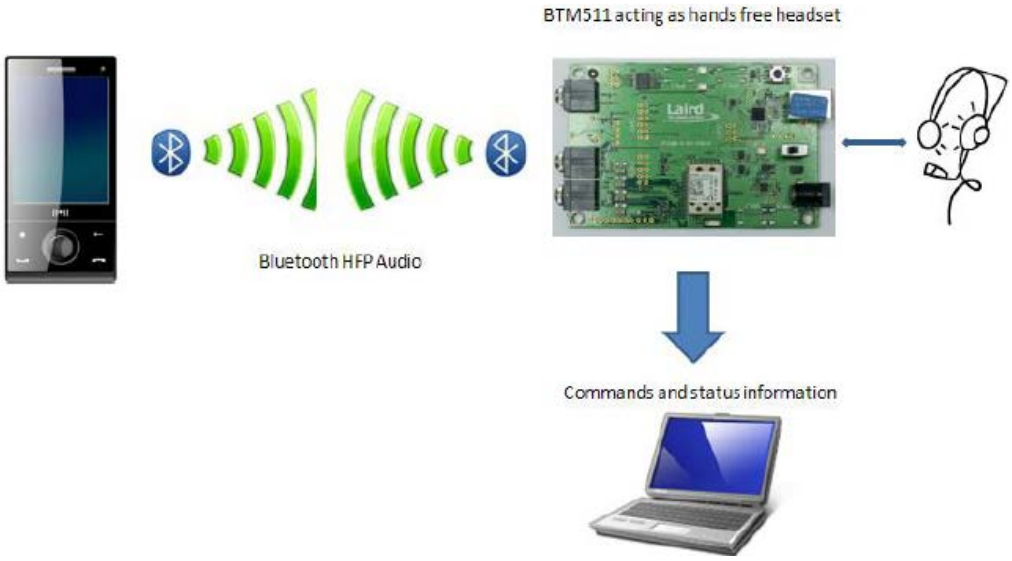
BTM510/511 Development Kit - HFP

Application Note

HANDS FREE PROFILE (HFP ROLE) EXAMPLE

Introduction

This example illustrates using the BTM511 as a hands free device. The BTM511 takes the hands free role and a mobile phone takes the audio gateway role.



Requirements

- BTM511 Development Board
- USB Cable (A-B)
- Windows Computer
- Terminal Software such as Ezurio terminal
- Mobile phone with Bluetooth hands free support (HFP)
- Wired headphones
- FTDI Driver

The development board USB socket provides both power and serial communications with the module. We provide a terminal program called Ezurio terminal but you can use your preferred terminal program in its place.

A wired headset should be plugged into the stereo out/mic in of the BTM511 development board. Early versions of the board did not have mic in enabled, so you must use the stereo in (line level) input in its place.

Module Setup

- Install the FTDI VCP drivers.
- Install your preferred terminal program if not already installed.
- Connect the USB cable to the computer and development board, ensuring the switch on the development board is set to USB. Windows should find and install the board as new hardware.

- Identify the virtual com port used by the board using device manager on a Windows computer.
- Connect your speakers to the development board stereo out socket.
- Open your terminal program and select the virtual com port (9600 8N1)identified in step 4.
- Check you can communicate by sending AT and then return, you should see OK.
- Send the commands as in the screenshot below to configure the BTM511. Please refer to the user manual for detailed explanations of the commands listed below. Note that if you power cycle the BTM511 then at+BTP must be sent again. All other settings are stored in non-volatile memory.

Commands are shown in lower case, responses from the BTM511 in upper case.

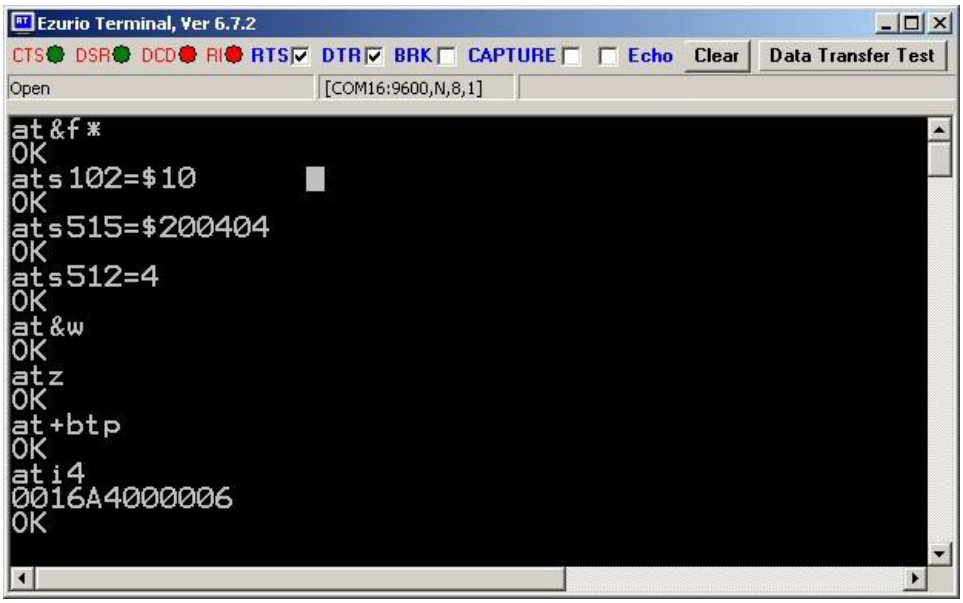


Figure 1: BTM511 Configuration

Discovery and pairing

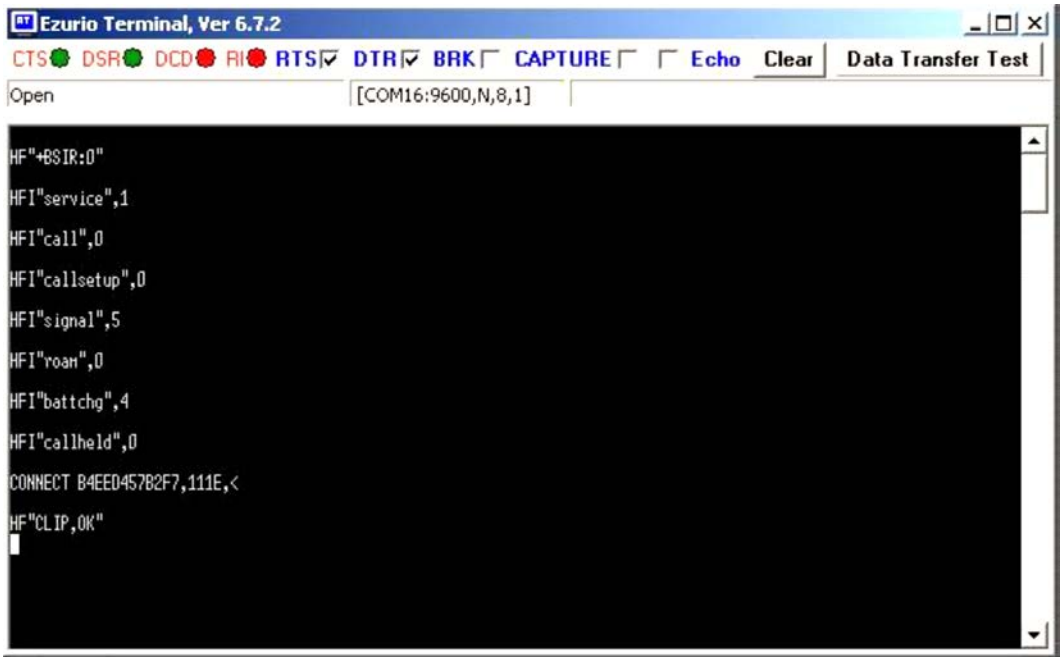
Initiate a search for the BTM511 from your mobile phone's Bluetooth settings screen. If your source device supports Bluetooth 2.1 (most modern phones do) it may try to use simple secure pairing, in which case you will receive a prompt on both the source device and from the BTM511 (Figure 2). In the screenshot below "PAIR?" indicates an incoming pairing request, "B4EED457B2F7" is the Bluetooth address of the source device, "MB525" is its friendly name and "315245" the random six digit number displayed on both devices. Accept the pairing on the source device and then accept the pairing on the BTM511 by sending "at+btby".

Figure 2: Simple Secure Pairing prompt

A successful pairing is indicated by a "PAIR 0 <remote device address>" message. If your phone uses legacy pairing you must enter a PIN on the phone and the BTM511. Enter at+btk="1234" where 1234 is the pin.

Connecting

Often a mobile phone will initiate a connection immediately, if not initiate the connection from the phone. You will see service level connection (SLC) giving status information from the mobile phone. Please refer to the user BTM511 user manual for more information on these status messages.



Note the "Connect" message that lists the Bluetooth address of the connected device, the profile (UUID) in use and the direction of the connection.

Making a Call

From the mobile phone, make a call. The call audio is routed via the BTM511 rather than the phone's internal speaker and microphone.

Note the changes in the status information to indicate call setup and the switching on of the audio indicated by the "HF"AU1" message. "ath*" can be used to drop the Bluetooth connection.

If no outgoing audio from the BTM511 is heard at the remote end of the call then try supplying a line level input to the stereo in of the development board instead of mic. Early version of the development board did not have mic input enabled.

Resources

FTDI Driver http://www.ftdichip.com/Drivers/VCP.htm

Ezurio terminal http://www.lairdtech.com/zips/Bluetooth%20Terminal%20Download.zip

Support http://www.lairdtech.com/Products/Wireless-M2M-and-Telematics-Solutions/Bluetooth-Module/

BTM511 User Manual http://www.lairdtech.com/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=5114