Bluetooth Smart (BLE) ART Connection Guide

Core iOS Demo

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Contents

1. Introduction

Bluetooth Low Energy is implemented on the iOS mobile platform as the Core Bluetooth Framework. Amp'ed RF has developed a demo application to evaluate our platforms.

BLE mode has 3 options which are set via "at+ab config BLEModemMode = [0-2]" as follows:

0: Demo, battery service used to exchange data with `LeBypass`

1: Modem, Custom Service is used to exchange data with `LeBypass`

2: Profile, no `LeBypass` mode allowed (some FW versions do not support this)

1.1. Demo (default mode)

The default mode is battery service based data exchange with `LeBypass`. A BLE connection is used to transfer data between ART CoreBlue Bluetooth demo and the module. Also, writing to the battery state of the module will result in a notification from the module by the LightBlue demo.

1.2. Modem mode

Using `LeBypass`, the first characteristic of customer service can be written to the module and notifications can be received from the module through the LightBlue demo.

1.3. Profile mode

If the module is not in BLE bypass mode, it will not go into `LeBypass` mode after the connection is made. Each characteristic of customer service can be read and written in the module and the module can send notifications using AT commands such as legetchar/leupdatechar to get and set characteristics locally.

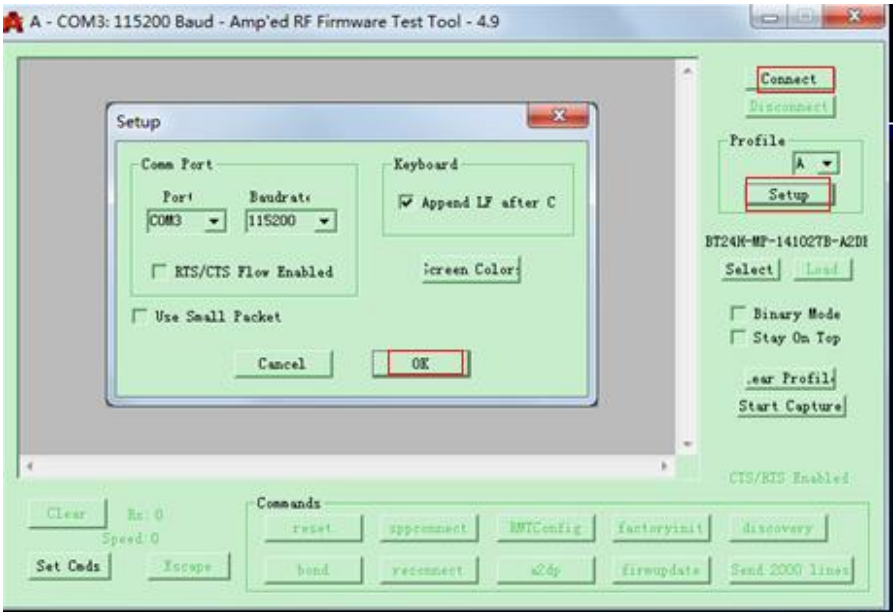
2. iOS Evaluation Application

2.1. Startup

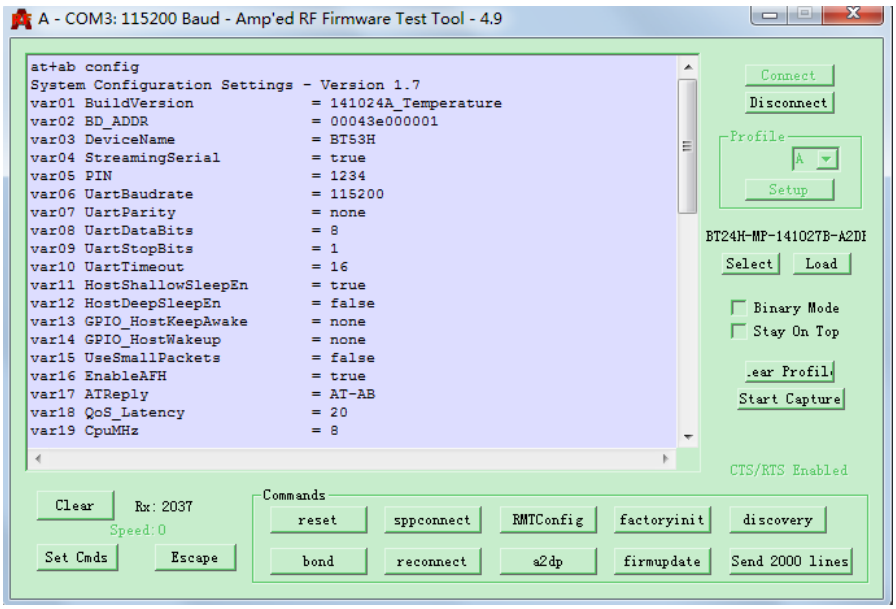
- Launch the evaluation terminal tool from UART

Open the tools “Term”. 

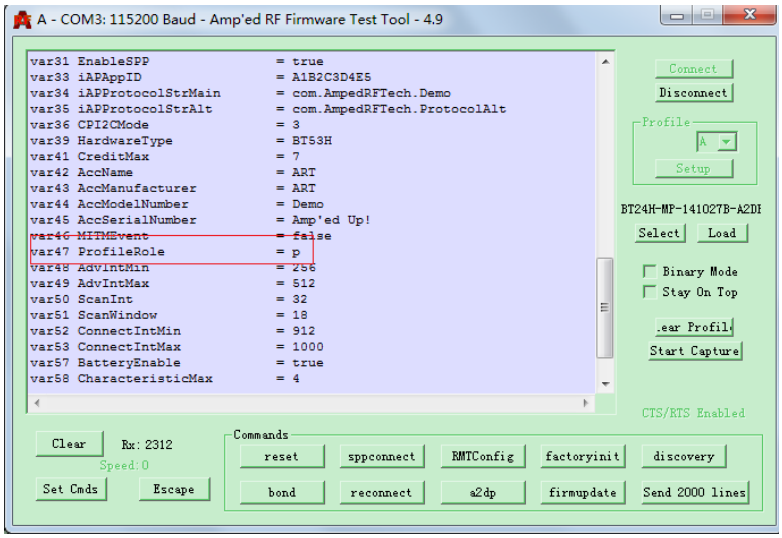
Click “Setup”, then select the desired port and use the default baud rate of 115200. Click “OK”, then “Connect”.



Send “at+ab config”, and confirm the module’s configurations.



Confirm ProfileRole=P.

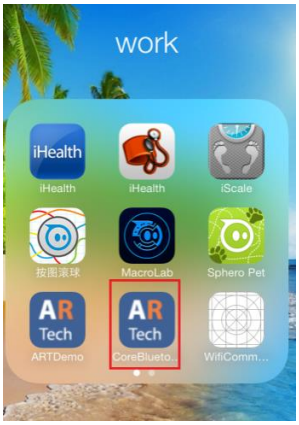


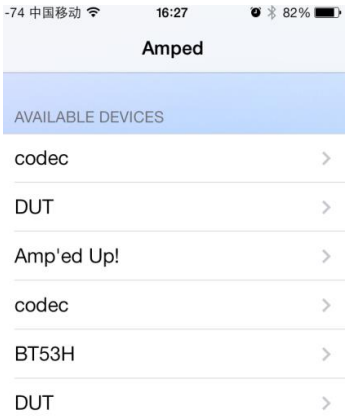
2.2. Connection

- Establish BLE connection between the iOS device and the BT module

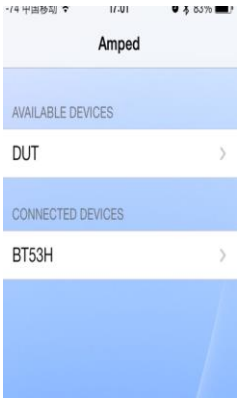
Scan for nearby BT devices by turning on Bluetooth on the iOS device (Settings/Bluetooth/On).

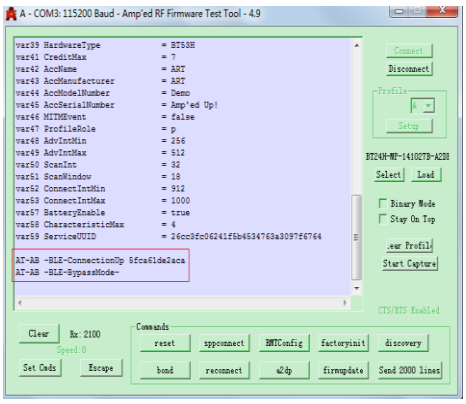
Open CoreBluetooth and select the BT module to create the BLE connection.





The iOS device will display “Connected device” and the module will go into bypass mode.

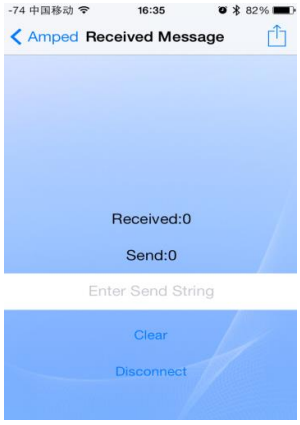


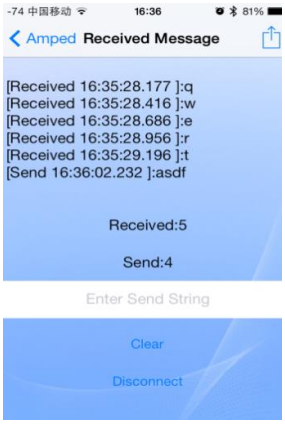


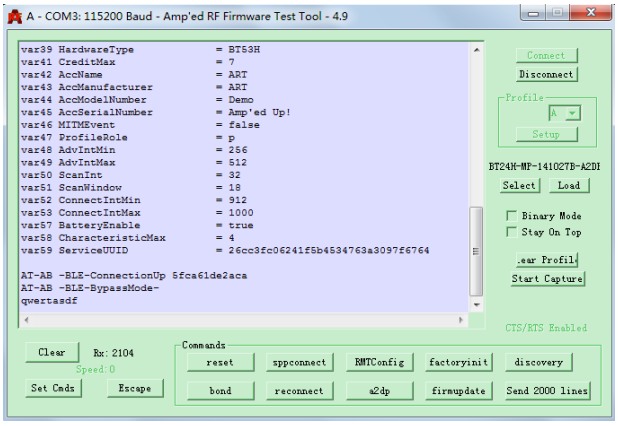
Select the BT device for the data exchange window.

2.3. Data Exchange

- Send and receive data to/from the BT module as desired.



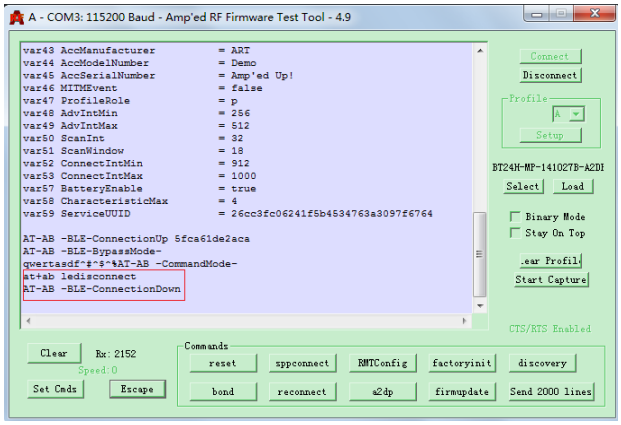




2.4. Disconnect

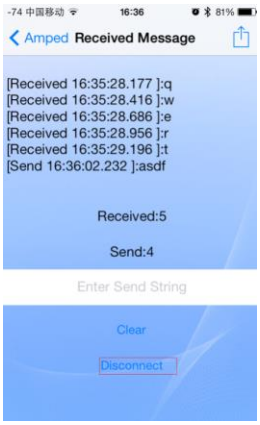
- Disconnect by BT module

Use the “Escape” string to switch from bypass mode to command mode. Send “at+ab LeDisconnect” to close the connection.



- Disconnect by iOS device

Click “Disconnect” to close the BLE connection.



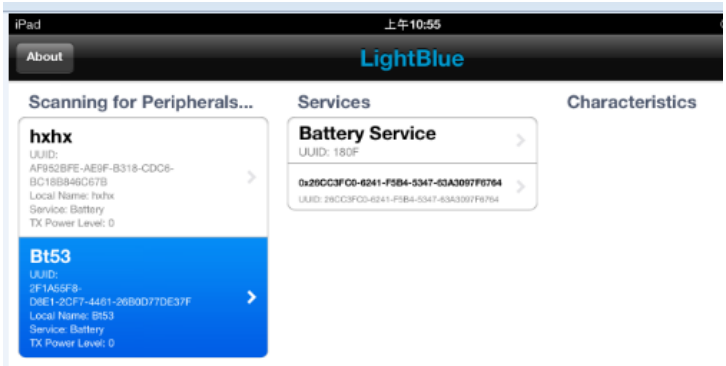
Note: After disconnecting, close the BLE demo. It must be closed before using it again.

3. LightBlue Application Evaluation using Modem Mode 0

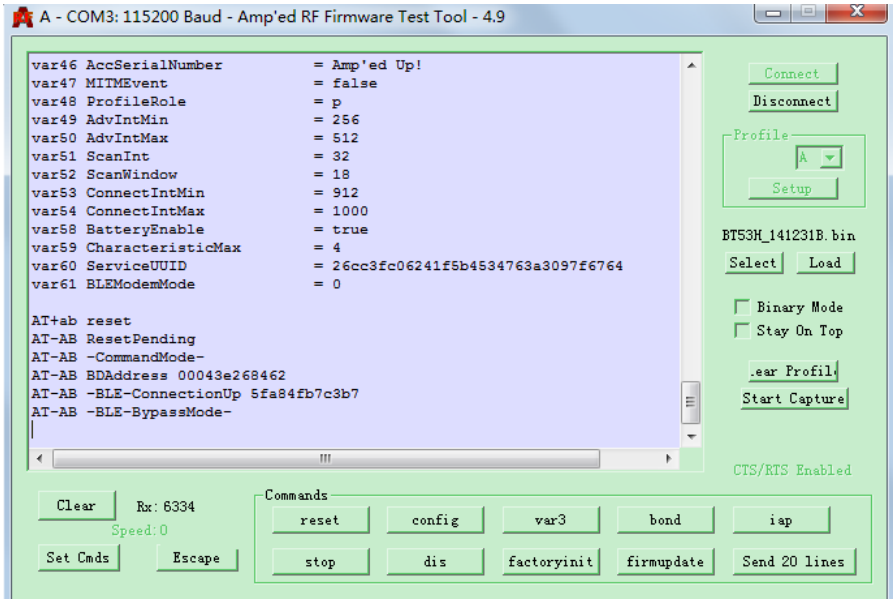
3.1. Connection

- Set the configuration: AT+AB config BLEModemMode=0.
- Connect the module to the PC using the method shown in the previous section.
- Establish BLE connection between the iOS device and the BT module

Open the LightBlue demo, select the module and make the BLE connection.

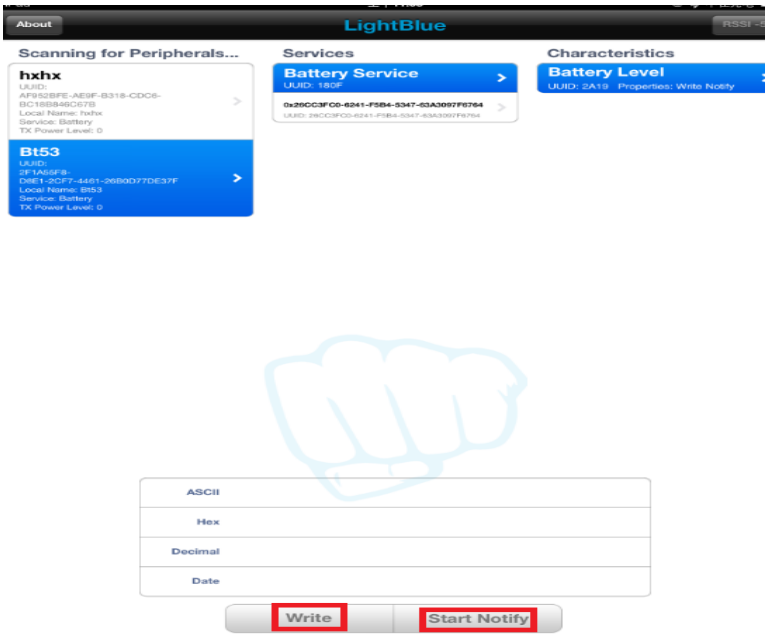


The module will enter BLE bypass mode.

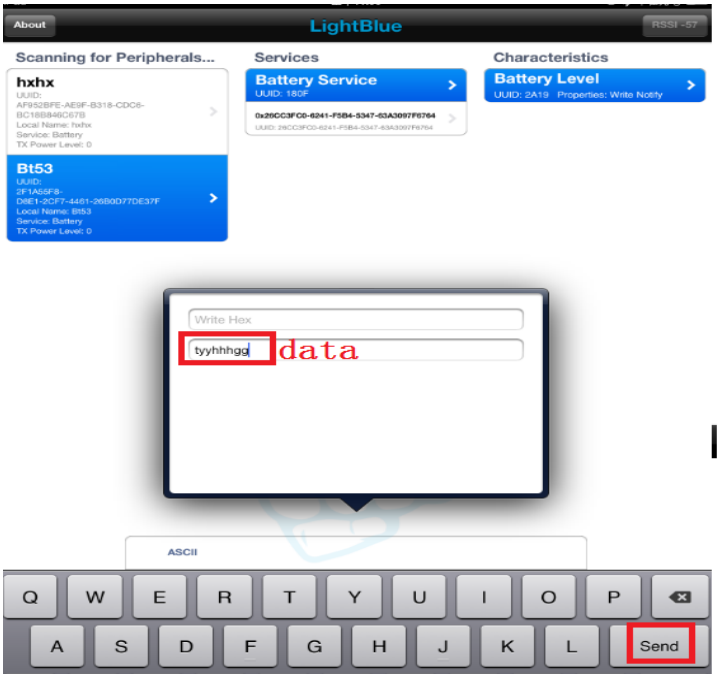


3.2. Data Exchange

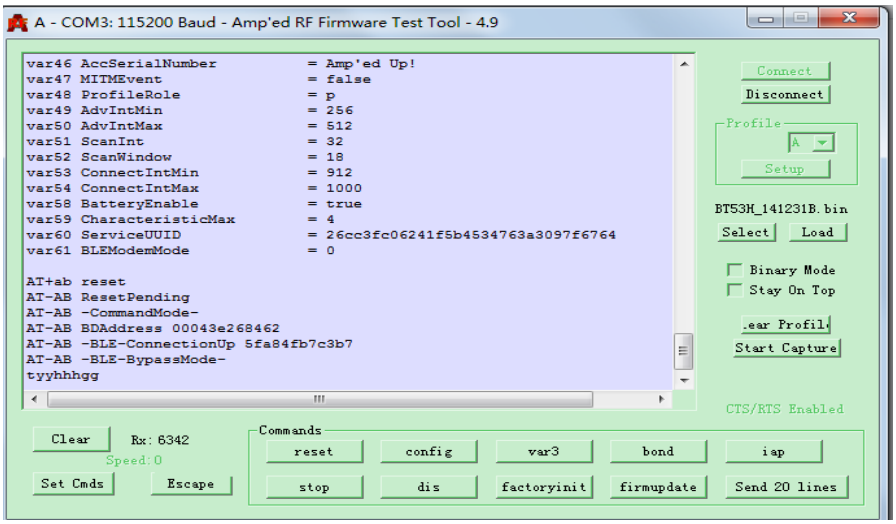
Select "Battery Service", then "Battery Level". Then, the “Write” and “Start Notify” buttons will appear.



Click “Write”, fill in the desired data in the “Write ASCII” window (≤ 20 bytes), and then click “Send”.

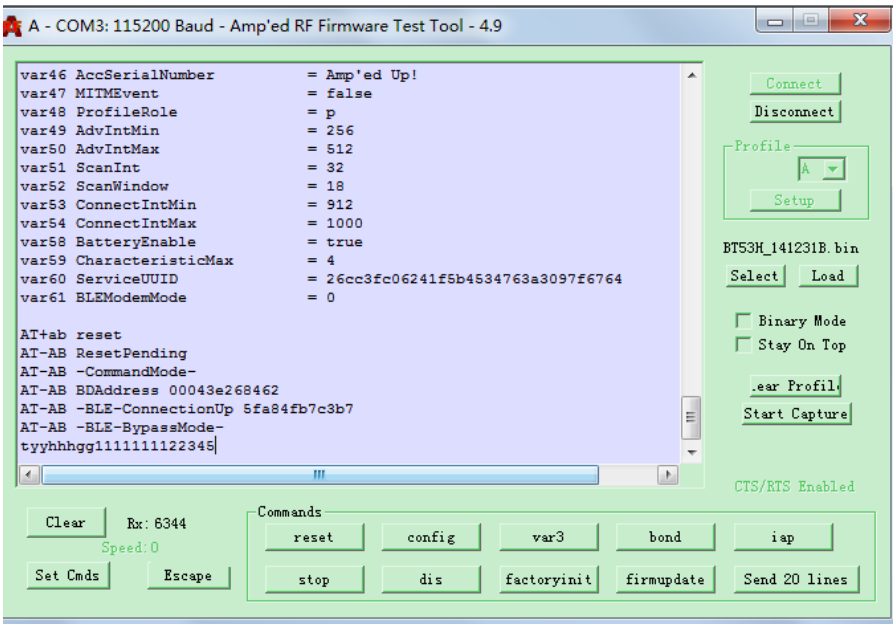


The module will receive the data.



If the data needs to be sent to an iPad, first click “Start Notify” on the demo, which will change to “Stop Notify”.

DUT sends data to the demo, which will then be displayed on the demo.



The demo will receive data one byte by one byte.

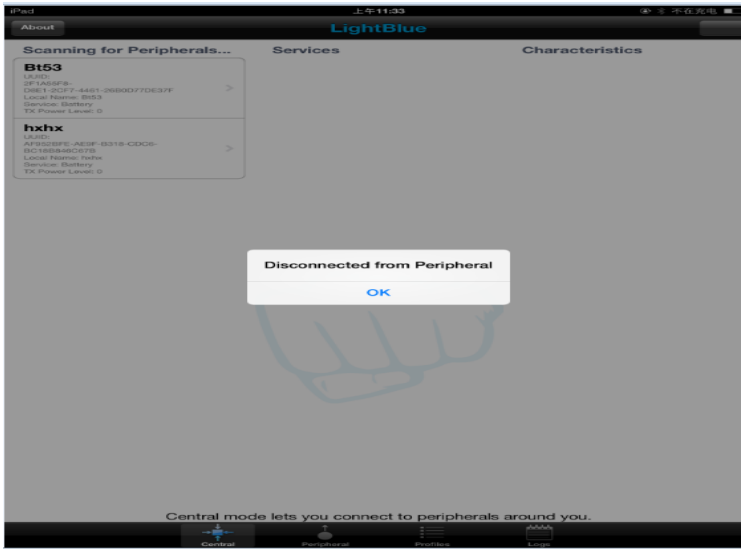
3.3. Disconnect

- Disconnect by BT module

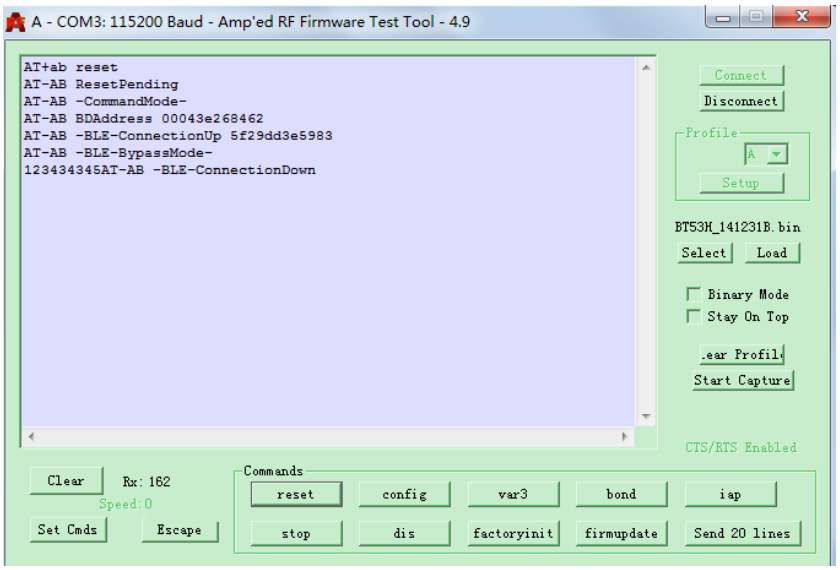
Same as per previous demo.

- Disconnect by iOS device

On the left, press and hold the BT module to disconnect.



The BT module will prompt “AT-AB -BLE-ConnectionDown”.

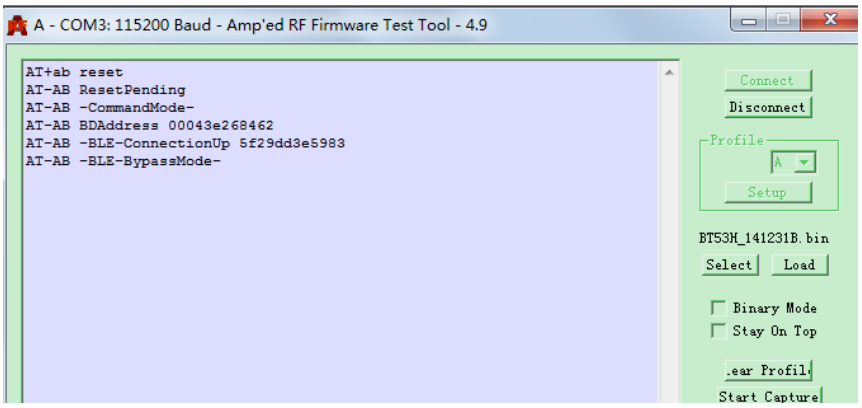


4. LightBlue Application Evaluation using Modem Mode 1

4.1. Connection

- Set the configuration: AT+AB config BLEModemMode=1.
- Connect the module to the PC using the method shown in the previous section.
- Establish BLE connection between the iOS device and the BT module

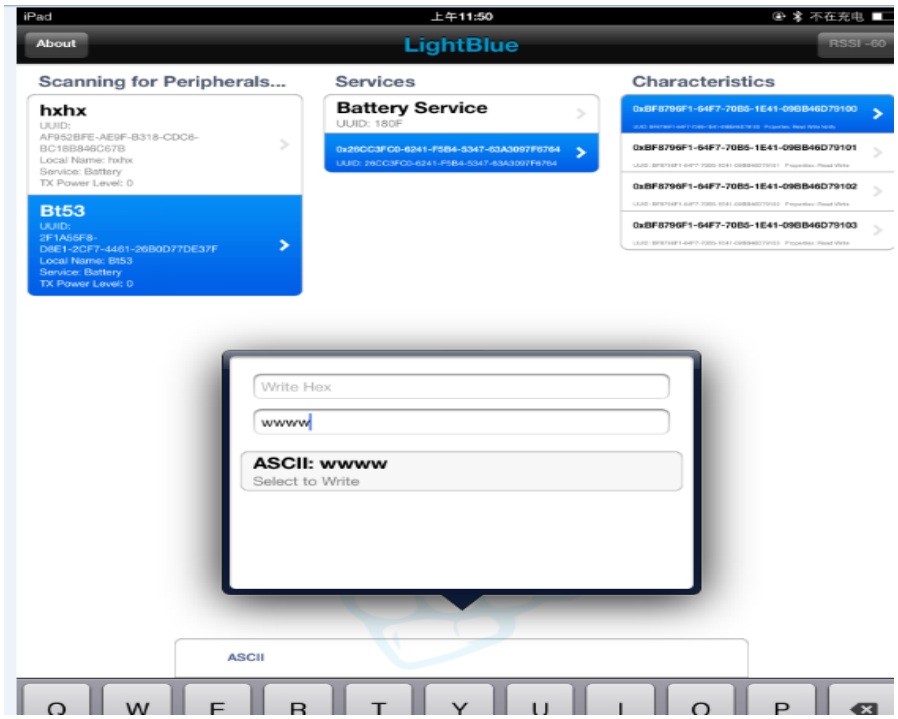
Open the LightBlue demo, select the module and make the BLE connection.



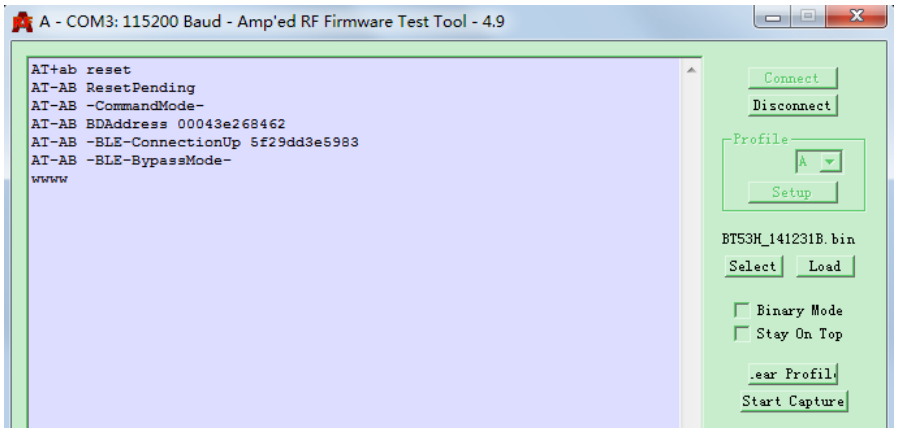
4.2. Data Exchange

Select the 1st characteristic of customer service.

Click “Write”, fill in the desired data in the “Write ASCII” window (≤ 20 bytes), and then click “Send”.

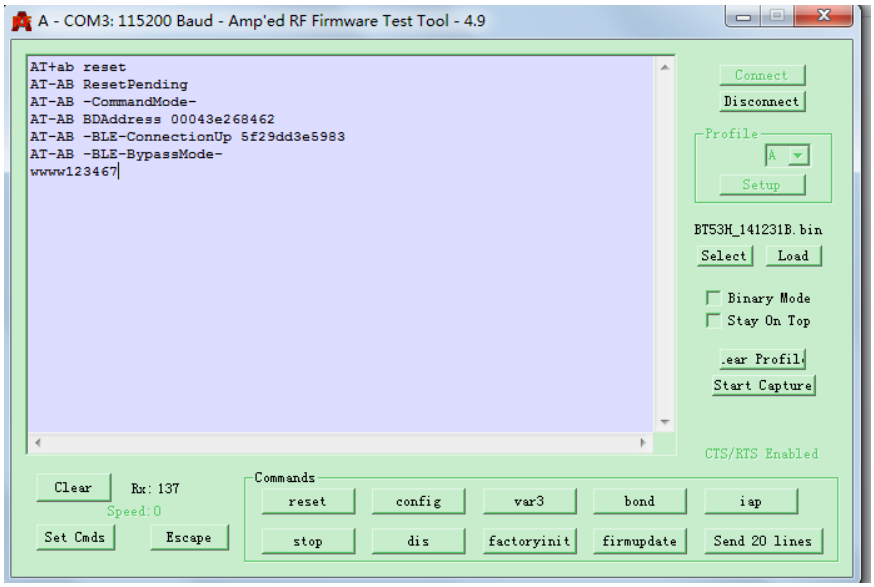


The BT module will receive the data.



If the data needs to be sent to an iPad, first click “Start Notify” on the demo, which will change to “Stop Notify”.

DUT sends data to the demo, which will then be displayed on the demo.



The demo will receive data one byte by one byte.

4.3. Disconnect

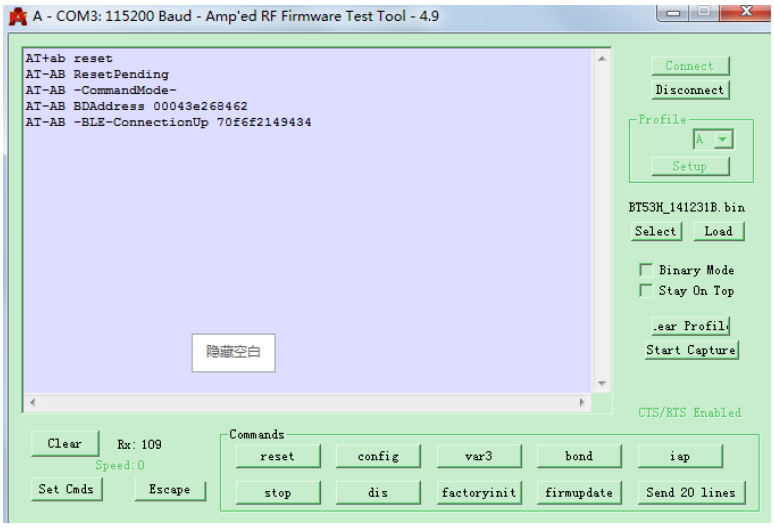
Same as previous demo.

5. LightBlue Application Evaluation using Modem Mode 2

5.1. Connection

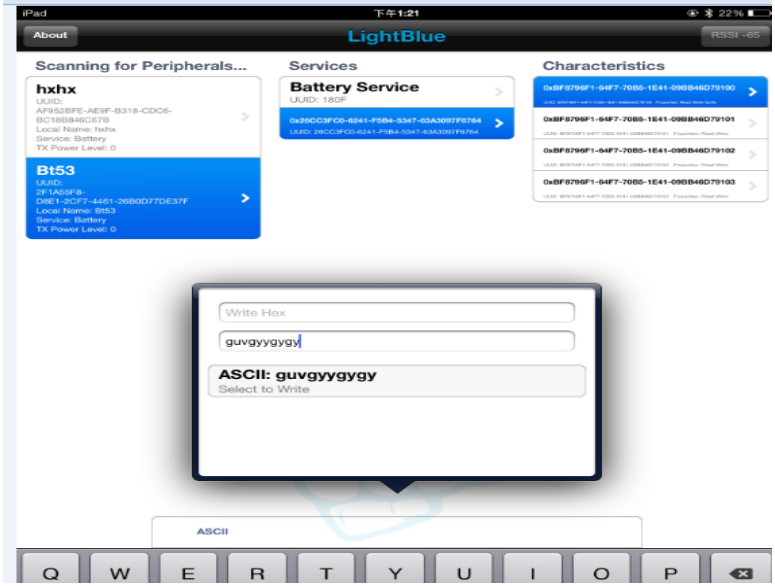
- Set the configuration: AT+AB config BLEModemMode=2.
- Connect the module to the PC using the method shown in the previous section.
- Establish BLE connection between the iOS device and the BT module

Open the LightBlue demo, select the module and make the BLE connection. Note that the module does NOT switch to BLE Bypass Mode.

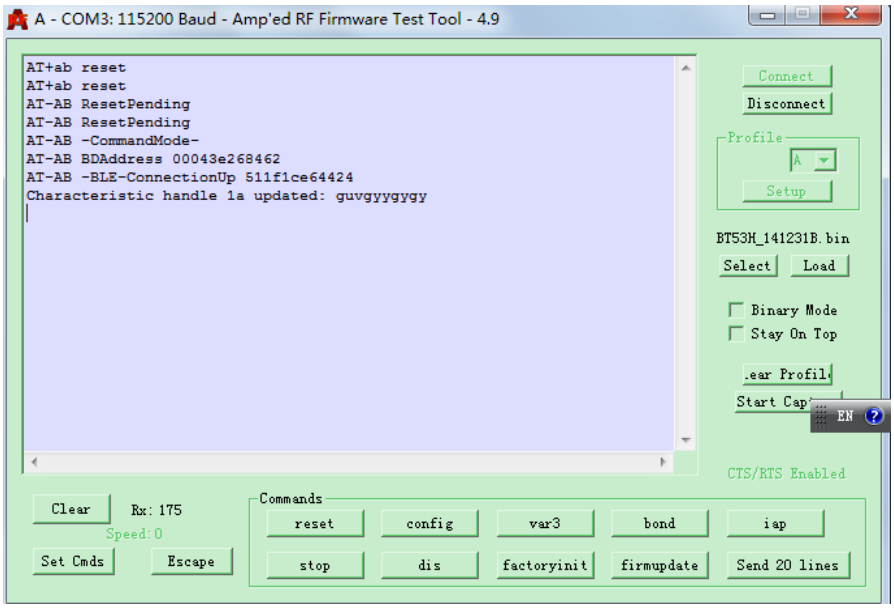


5.2. Data Exchange

Click “Write”, fill in the desired data in the “Write ASCII” window (≤ 20 bytes), and then click “Send”.

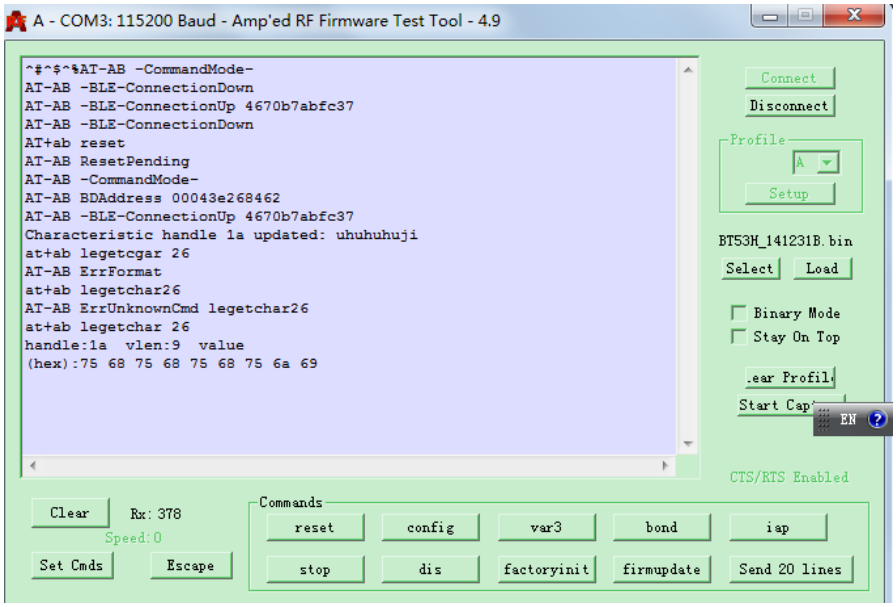


The BT module will receive the data.



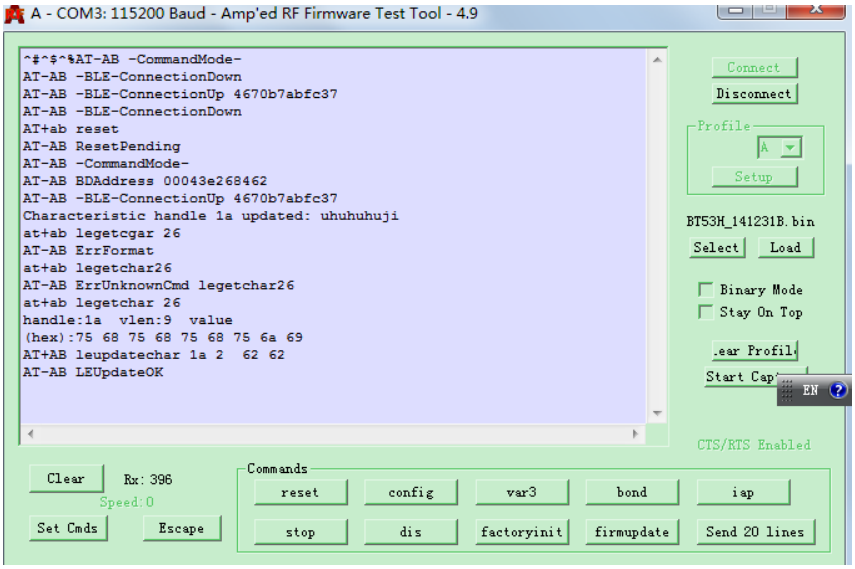
In the BT module receiving data, "**1a**" ("26" is hexadecimal) is the offset. The legetchar/leupdatechar command can be used to read /update the char of offset.

Use AT command "AT+AB legetchar **26**" to get the message ("26" is decimal).



Click the “Read” button to see the message.

Update the message using the “AT+AB leupdatechar 1a 2 62 62” command.



5.3. Disconnect

Same as previous demo.