Firmware Reprogramming Guide

20 Sept. 2011

1 UART Connection Hardware Setup

Modules and adaptors may be reprogrammed using the procedure detailed in this document. Normally, our platforms will be delivered with the final firmware already pre-loaded, so this should not need to be part of a product's normal production. But, it is strongly suggested to incorporate a re-flashing mechanism into your final product, due to rapidly changing standards and target device Bluetooth stacks.

Typically, the following tools and equipment are necessary:

1. New flash image from Amp'ed RF Technology.
2. Serial cable to PC.
3. TTL to RS232 level shifter; when programming modules.

1.1 UART Connections

The new firmware must be loaded using the UART interface. Access to this interface depends on the product type.

The minimum UART pins that are needed are the Rx and Tx pins. The RTS and CTS flow control pins are not used when programming devices, and should always remain floating during this procedure.

1.2 Modules

Amp'ed RF Bluetooth modules support TTL level UART communications, but a PC requires RS232 voltage levels. Therefore, a TTL to RS232 level shifter is required.

2 Terminal Configuration

To use the Flash Loader, the user must have a PC running HyperTerminal (or similar) with the following configuration in Figure 1.

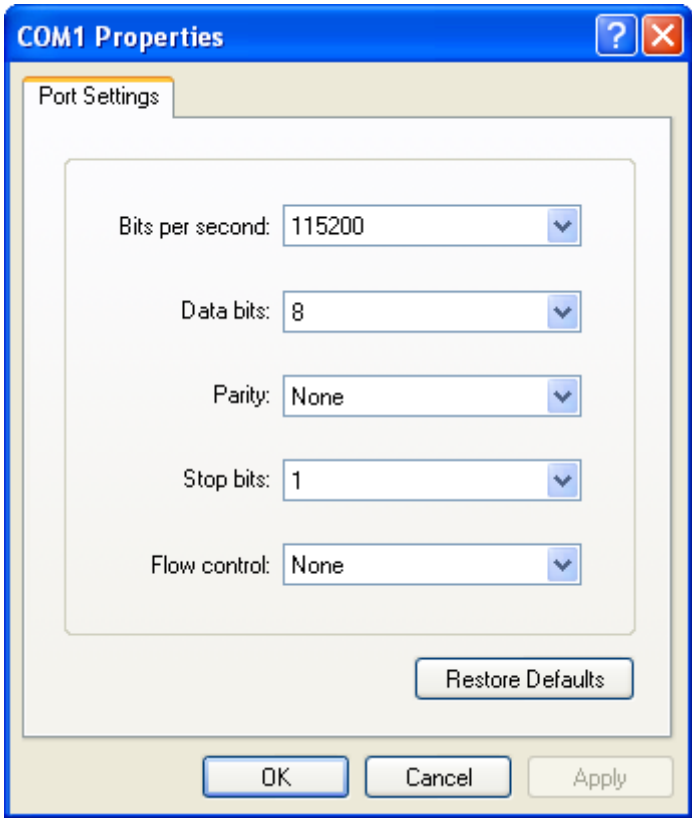


Figure 1. COM port properties

The default serial port setup for the flash loader is 115K bps, 1 stop bit, no party, 8 data bits, and HW flow control must be disabled.

2.1 Executing the Flash Loader

2.1.1 GPIO[2]

GPIO [2] of the module is used to select the flash loader option in NVM, in order to re-flash the application firmware. When the device is reset, the GPIO [2] state is read to determine the program execution section:

```
High (default): executes the application firmware.
Low: executes from the flash loader.
```

NOTE: The flash loader will only remain active for 2 seconds following a reset. After this time, the normal application will execute, and re-flashing will not be able to proceed.

The flash loader requires a y-modem protocol, and uses the main UART running at 115200 baud.

2.1.2 AT Command

There is also an AT command which will erase the current application, and launch the flash loader. This command is:

```
AT+AB InvalidateApplication
```

Once entered, the previous application FW is erased. With this option, there is no longer a 2 second timeout of the flash loader, since no application exists.

2.2 Flash Loader Menu

Running the Flash Loader displays the following menu in the HyperTerminal window.

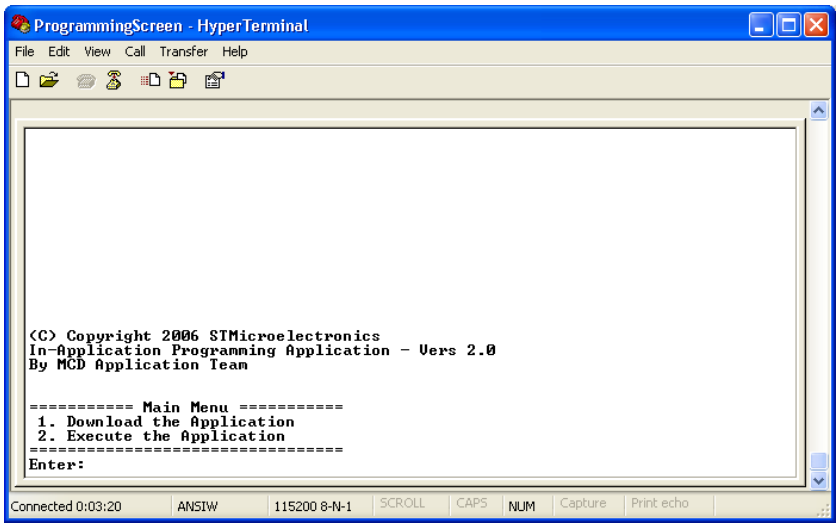


Figure 2. Flash Loader Menu

2.3 Download Image to the Internal Flash Memory

To download a binary file via HyperTerminal to the internal Flash memory:

1. Press **1** on the keyboard to select the **Download the Application** menu
2. Select **Transfer** and then **Send File**
3. In the **Filename** field, type the name and path of the binary file you want to download
4. From the protocol list, select the **Ymodem** protocol
5. Click on the **Send** button

2.4 Execute the New Program

Once the new program has been loaded, press **2** on the keyboard to select the **Execute the Application** menu and execute the code. Resetting the device should also automatically load the new program.

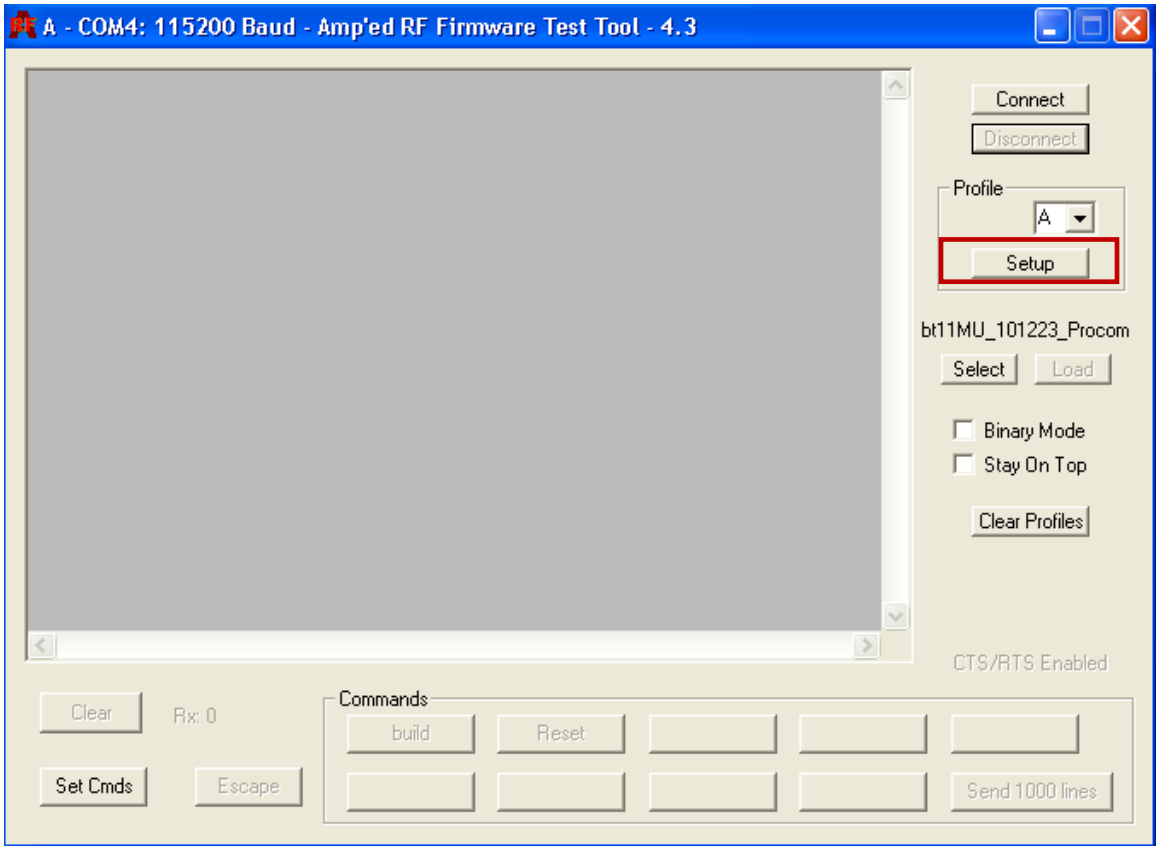
NOTE: After the new application is running, an additional power cycle or reset is needed to initialize the configuration variables within the FW.

3 Term Test Tool

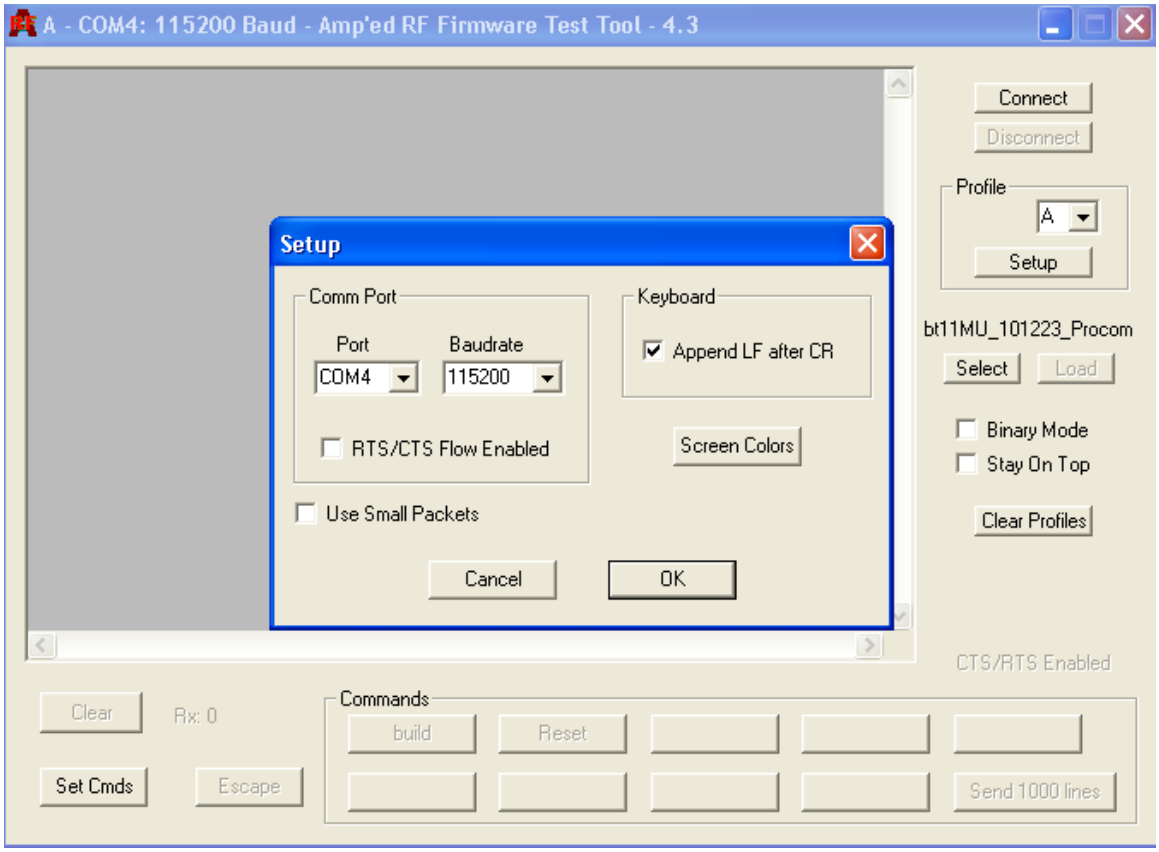
Instead of HyperTerminal we have our own Term Test tool. A user can download this software tool from our website under the development tools tab.

3.1 How to use

Step 1: First Click on SetUp button.

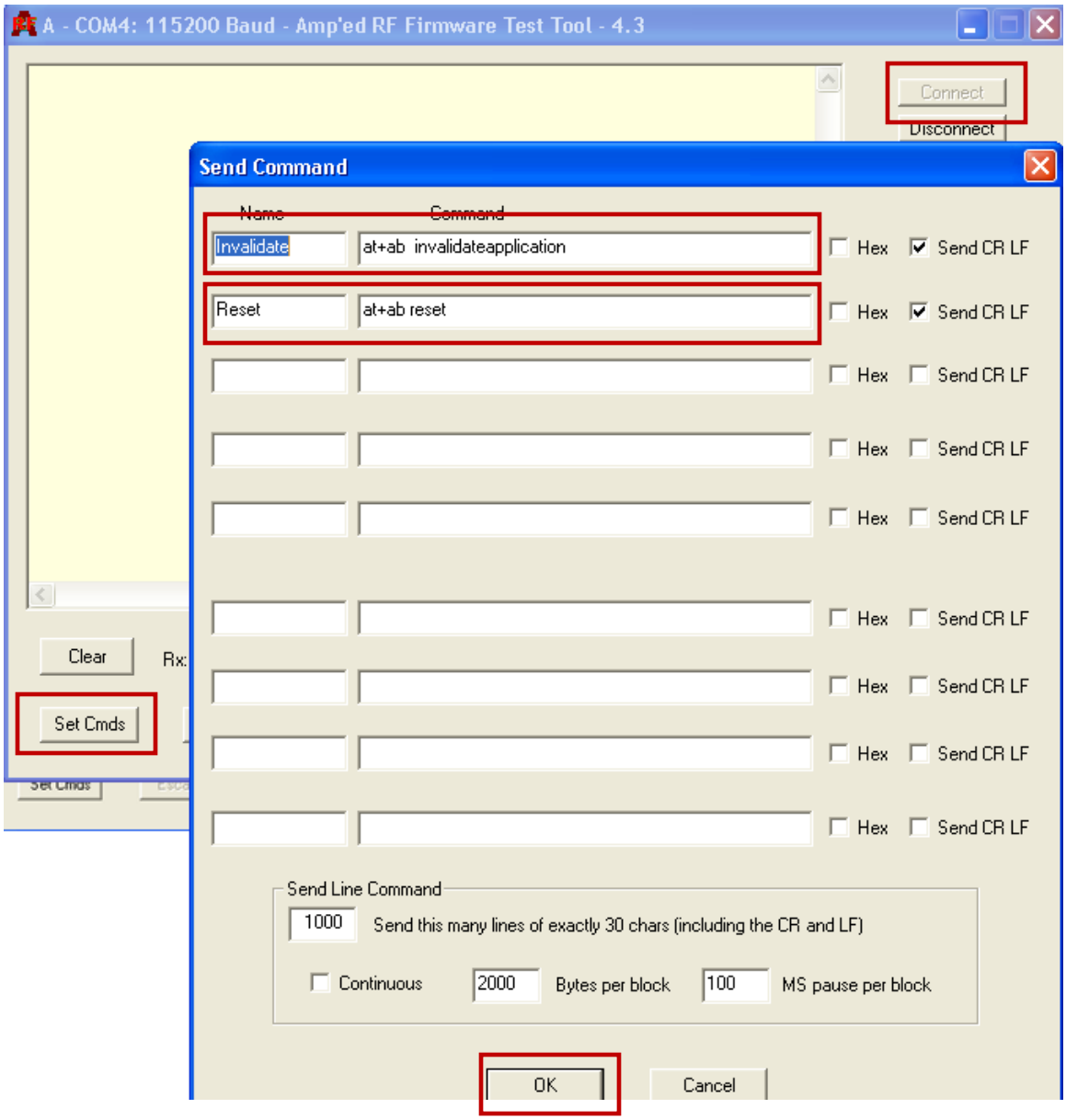


Step 2: Change the setup configuration as per your requirements.

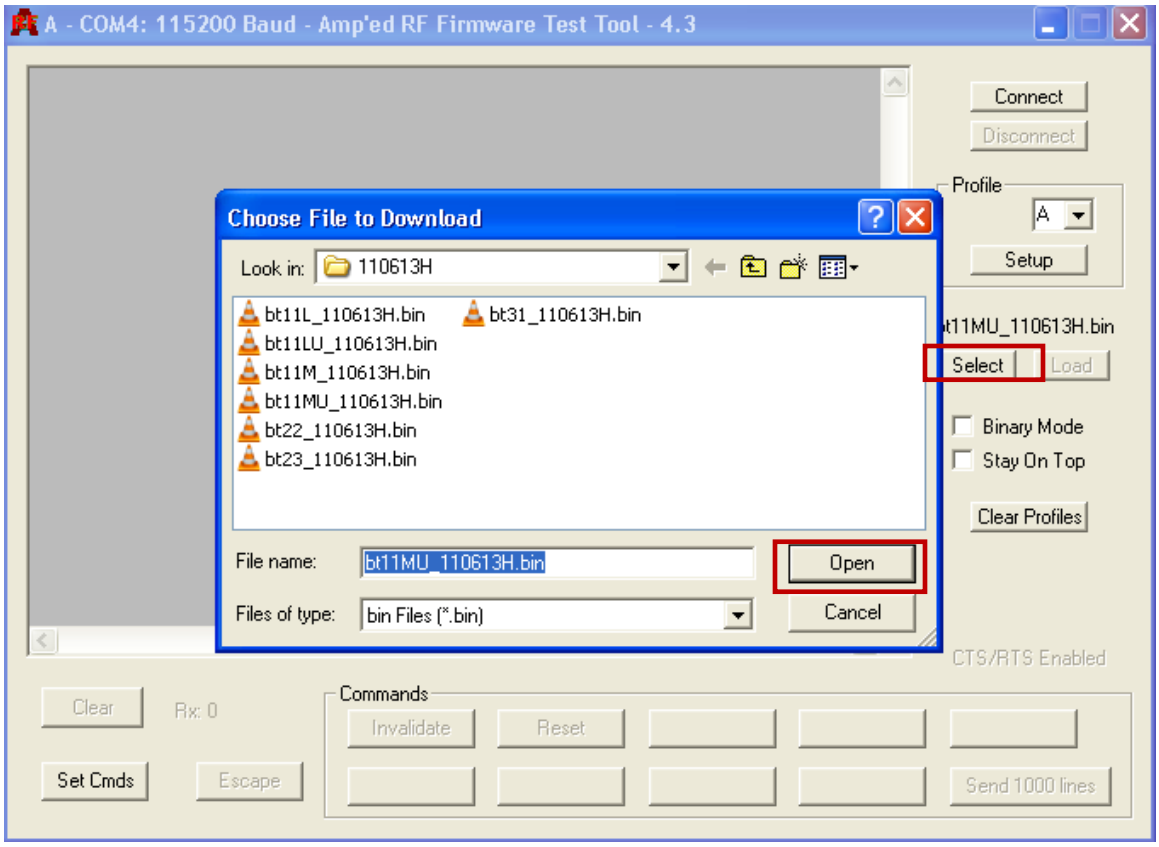


Change the COM Port, Baud Rate, or Screen Color as needed. RTS/CTS flow control must remain disabled when re-flashing and also same for small packets. Please confirm your changes by pressing the “OK” button

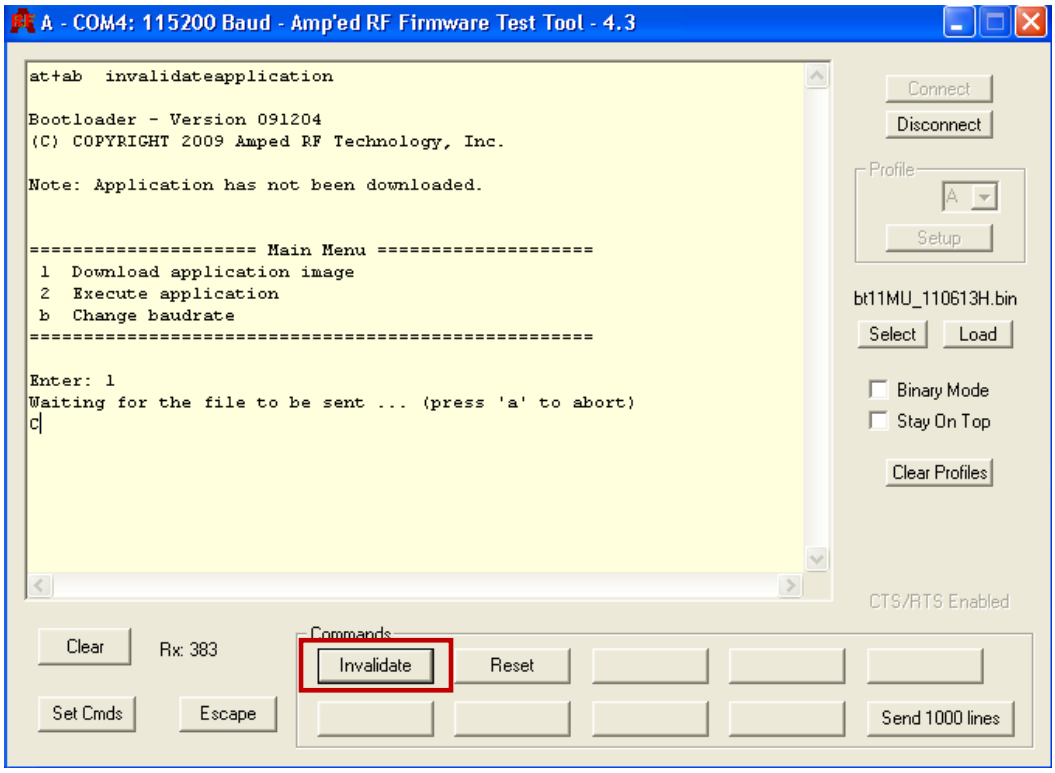
Step 3: Click on Connect then SetUp Cmds, and add the AT+AB InvalidateApplication command to one of these buttons. When finished, press the OK button to add it.

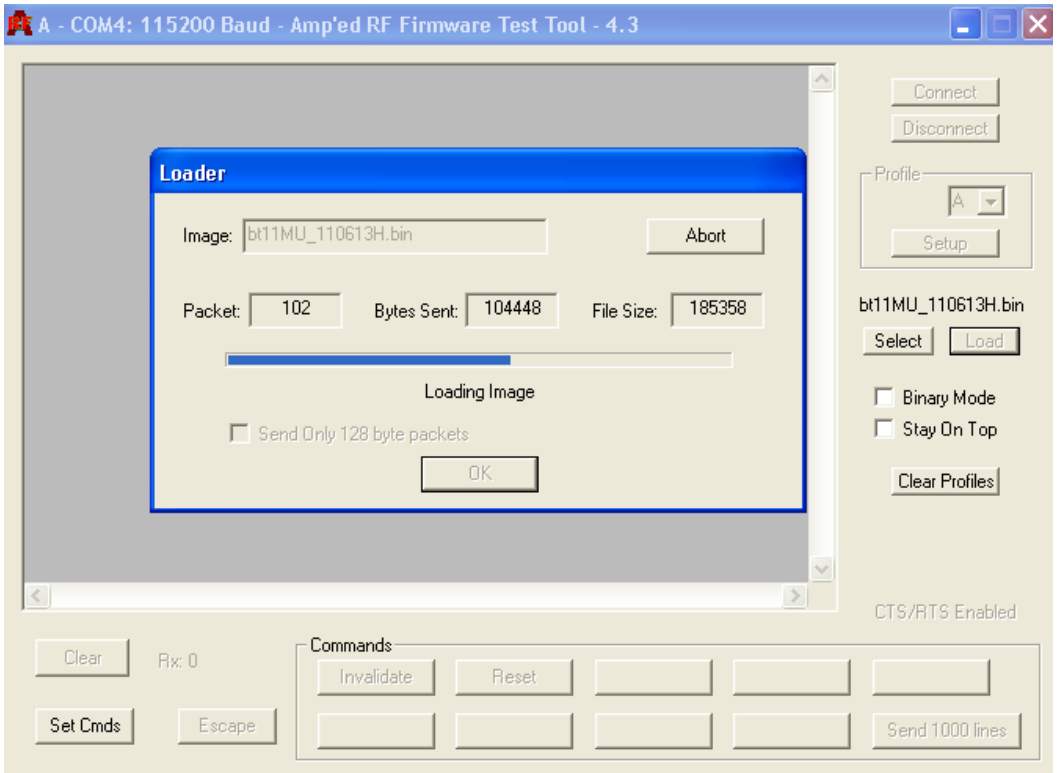


Step 4: Please click on the “Select” button to add the desired FW image.



Step 5: Now press user defined button for invalidate application, and the “Load” button to load application.





Step 6: After finishing the loading process, a second reset must be performed to configure the NVM settings.