# Loading a *smart*BASIC Heart Rate Service Application

*Quick Start Guide* *v1.1*

This guide demonstrates how to load a *smart*BASIC Heart Rate Service application (hrs.heart.rate.SB) onto the BL600 development board and view the data on a BT4.0 iPad/iPhone. For this example, the heart rate data originates from a fictional sensor attached to the UART in the format "hr 60".

## Requirements

- PC running Windows XP or later
- UWTerminal 6.50 or later
- hrs.heart.rate.SB *smart*BASIC sample application
- Library files inside the "lib" folder
- USB A to mini B cable
- iPad 3/ iPhone 4S or newer with BT4.0 support
- Internet connection on iOS device (to download the BL600 app)
- DVK_BL600 User Manual
- FTDI Drivers http://www.ftdichip.com/Drivers/VCP.htm (for some versions of Windows)

## Development Kit Setup

To setup the BL600 development kit (DVK), follow these steps:

1. Configure the BL600 development kit to the following settings:
   - DC/USB power source switch (SW4) set to USB
   - VCC_1V8/VCC_3V3 switch (SW5) set to VCC_3V3
   - CR2033/VCC_3V3/1V8 switch (SW6) set to VCC_3V3/1V8
2. Connect one end of the mini USB cable to CON4 on the DVK board and the other end to your PC.
3. Follow the on screen prompts. Windows may prompt you to install FTDI drivers.
   When complete, the DVK board appears in the Windows device manager as a *USB Serial Port*.
4. Note the port number shown in the device manager.
5. Extract UWTerminal and run the program.
6. Configure the COM port with the port number seen in device manager with the following settings (Figure 1):
   - Baudrate – 9600
   - Stop Bits – 1
   - Data Bits – 8
   - Handshaking – None

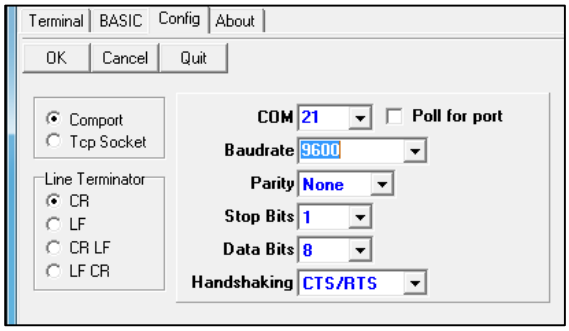


*Figure 1: Comms Settings*

7. Verify that you can communicate with the board by typing ***at*** followed by a return. The module responds with *00*.

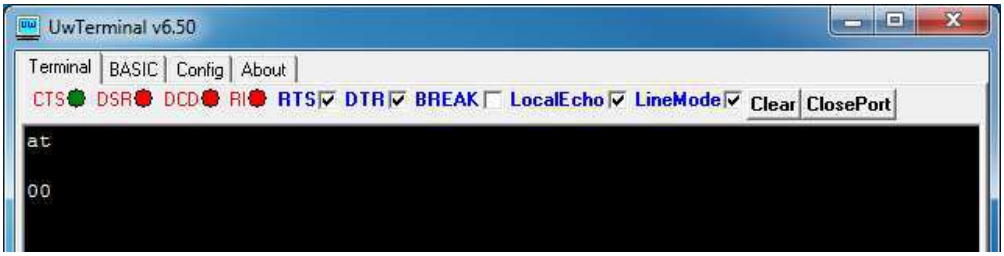


*Figure 2: Comms OK*

## Loading a *smart*BASIC Application

**Note:** When swapping between profiles on the same device, it may be necessary to clear any existing pairings on the module and iOS device. On the module, this can be done with the command **at+btd***; and on the iOS device this can be done in Bluetooth settings.
The BL600 app also allows you to manage devices through its connection manager available via the gears icon, swipe left any existing devices to delete them.

To load a *smart*BASIC application, follow these steps:

1. Ensure that the cross compiler is located in the same folder as UWTerminal. Its name is formatted similar to XComp_BL600r2_0B41_1483, where 0B41_1483 indicates a hash key. Every firmware version requires its corresponding cross compiler with a matching hash key.

**Note:** This smartBASIC application imports multiple library files. Please ensure that the source file *hrs.heart.rate.sb* and the "lib" folder containing the libraries are in the same directory, as organised in the firmware ZIP file.

2. To compile and load a *smart*BASIC application, right-click in the UWterminal main window and select **XCompile + Load**.

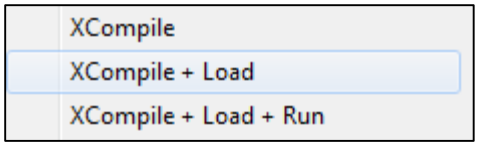


*Figure 3: Right-click menu*

3. Locate and open the *hrs.heart.rate.SB* application in the supplied *smart*BASIC *_Sample_Apps* folder. When the application successfully compiles and loads, the console reads **+++ DONE +++** (Figure 4). If the correct version of cross compiler is not present, an error displays (Figure 5).

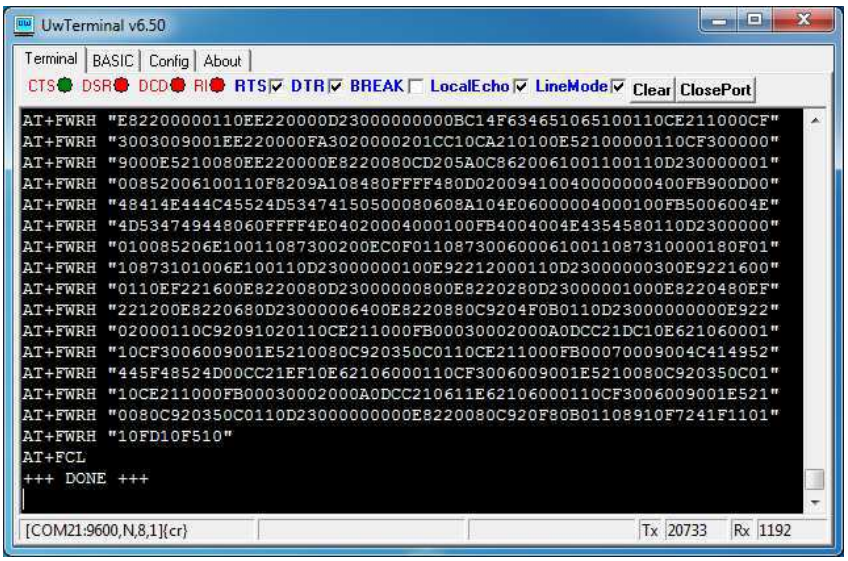


*Figure 4: Compiled and Loaded*

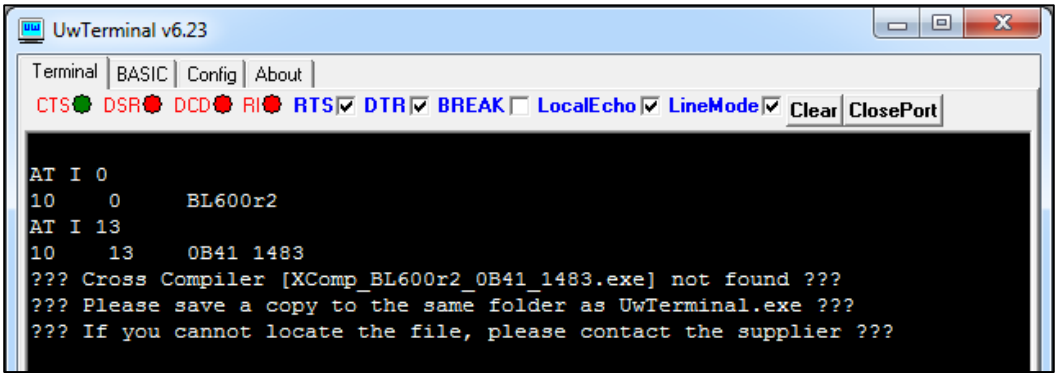


*Figure 5: Cross Compiler Error*

4. Locate the correct version and place it in the same folder as UWterminal.
5. Confirm that the *hrs* application is loaded by using the command **at+dir**.

**Note:** The file extension is truncated from files copied onto the BL600 module. Therefore, when hrs.SB is copied to the device, its name becomes *hrs*.


*Figure 6: Directory showing "hrs" app loaded*

## iPad/iPhone Setup

For iPad/iPhone setup, follow these steps:

1. Install the BL600 app from the Apple App Store and ensure Bluetooth is enabled in the device settings. If using an iPad and after searching the BL600 app doesn't appear in the results, select **iPhone Only** from the dropdown menu.


"BL600" by Laird Technologies - https://itunes.apple.com/gb/app/bl600/id594855763?mt=8


*Figure 7: BL600 app installed*

2. Once installed, run the BL600 application on your iOS device.
3. Select **Sensors** > **Heart Rate Monitor**. Do not press **Connect** until hrs.SB is running on the development board.

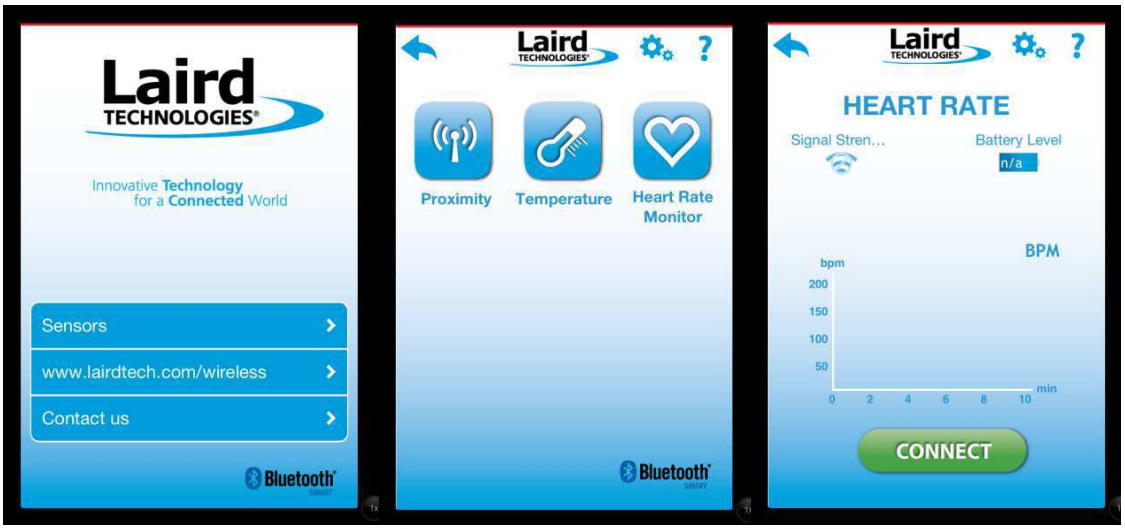


*Figure 8: BL600 App – Home screen, sensors menu, heart rate monitor*

**Note:** There is a bug with the BL600 iOS app which causes it to crash sometimes when you are in the "Manage Connections" screen and you tap "Search". To get around this, use the "Connect" button in the main Heart Rate screen as shown in Figure 8 above.

## Running hrs.SB and Connecting with the iPhone/iPad

To run hrs.SB and connect with the iPhone/iPad, follow these steps:

1. Return to UWterminal and type **hrs** followed by return in the main window to run the application. The module initialises and advertisements begin, and the log is printed to the console.

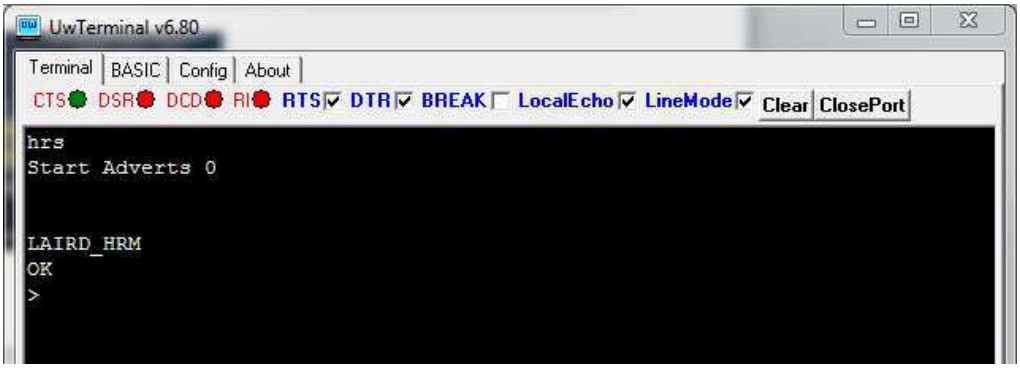


*Figure 9: hrs.sb running*

2. Press **Connect** on the iPhone/iPad.

> **Note:** If the module times out before you press Connect, press the reset button on the development board, allow the module to reset and run the application again.

3. Send heart rate data to the iPad using the following case-sensitive command:

```
hr 60<CR>
send<CR>
```

If successful, the module responds *OK* > in UWTerminal (Figure 10).

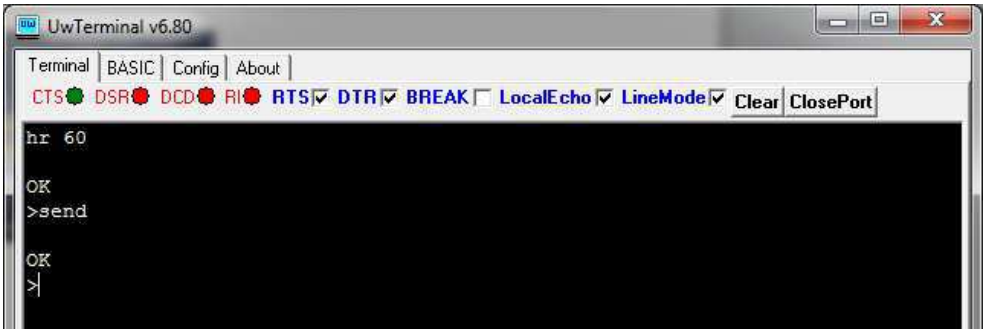


*Figure 10: Heart rate data sent*

The data now appears on the iPhone/iPad screen (Figure 11):

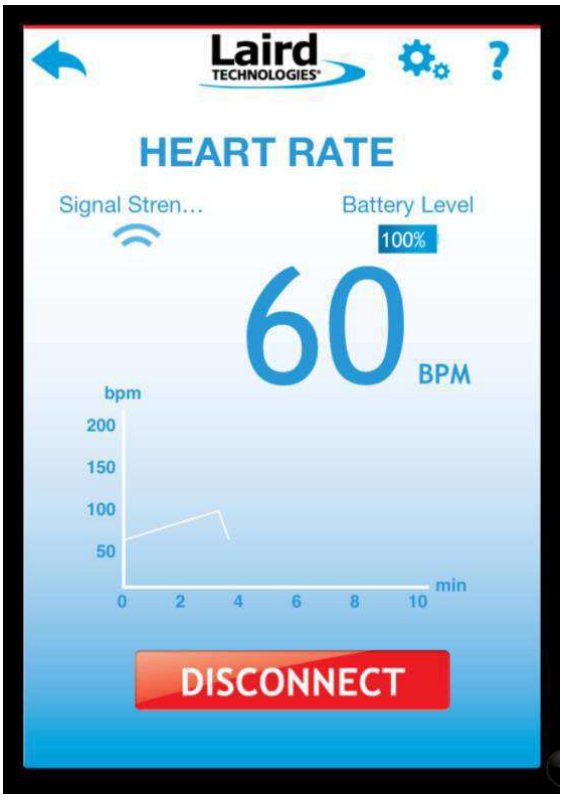


*Figure 11: Data received, provided by hrs.sb*

To update the iPad with new heart rate values, send the command as in the following example:

```
hr 96<CR>
send<CR>
```

Pressing reset button on the DVK board while hrs.SB is running returns the module ti interactive mode where you can reissue commands to the module.

## REVISION HISTORY

| Revision | Date | Description | Initiated By |
|---|---|---|---|
| 1.0 | 22 Feb 2013 | Initial Release | Jonathan Kaye |
| 1.1 | 24 Feb 2015 | Added Revision History and version number | Sue White |
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