

OTA Loading of *smartBASIC* Applications (BL652 to BL652)

BL652

Application Note

v1.0

INTRODUCTION

You can program Laird BL652 modules remotely using the Over the Air (OTA) application using a BL652-DVK. This allows you to wirelessly program the Laird BL652 Bluetooth Low Energy (BLE) module with *smartBASIC* programming language. This application can only run when the peripheral BL652 module is in vSP command mode (Bridge mode does not work).

Requirements for OTA Using BL652 Modules

The following are required for OTA using ModuleLink for BLE:

- Two DVK-BL652 kits running firmware version 28.6.1.2 or later
- DVK-BL652 User Guide available from the [BL652 product page](#) of the Laird website
- UwTerminalX application available from Github: <https://github.com/LairdCP/UwTerminalX/releases>
- BL652 sample applications available from Github: <https://github.com/LairdCP/BL652-Applications>

SETUP PREPARATION

To prepare your setup, follow these steps:

1. Download and install UwTerminalX from the Releases tab in GitHub:
<https://github.com/LairdCP/UwTerminalX/releases>
2. Extract the downloaded zip file and run *UwTerminalX.exe*.
3. Download the BL652 Sample Applications from the BL652 GitHub page:
<https://github.com/LairdCP/BL652-Applications>

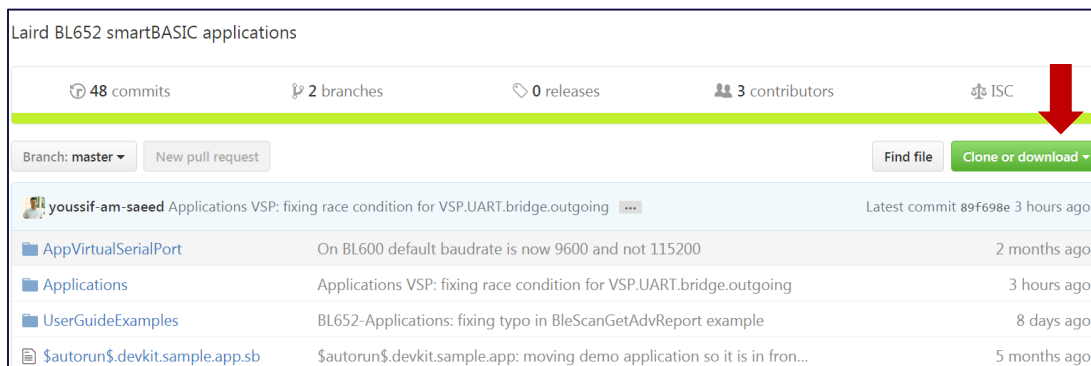


Figure 1: BL652 GitHub page

PERIPHERAL DEVELOPMENT KIT SET UP

Note: The *smartBASIC* application is loaded over-the-air to this module.

To set up the peripheral development kit, follow these steps:

1. Connect the first BL652-DVK to the PC and note the COM port.
 - a. Place a J12 jumper on pins 1 and 2 (Develop mode – SIO_13 High).
 - b. Remove the J5 vSP jumper (SIO_02 Low).
 - c. Connect it to the PC using a USB cable.
 - d. Power on the development kit.

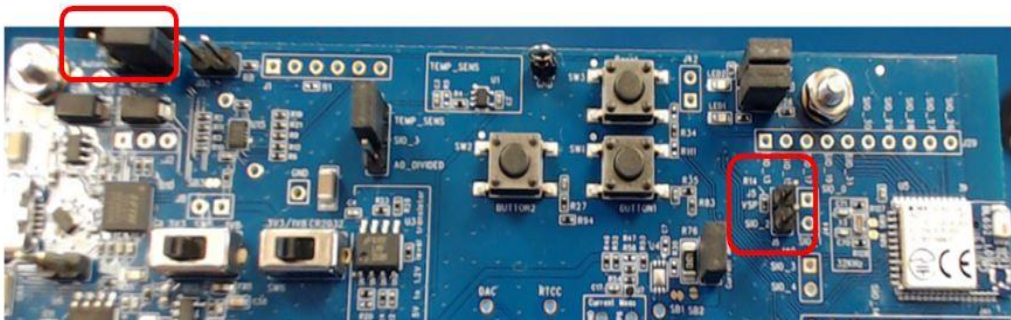


Figure 2: Peripheral development board

2. Open UwTerminalX and open the COM port for the peripheral development kit.
 - a. Type **at** and press **Enter**. The module should respond with **00** which confirms it is in Command mode.
 - b. Issue the **ati 3** command to verify that you are working with the most current firmware.
 - c. Issue the **ati 4** command to obtain the module's MAC address.
Note the address. You'll need this for the Central DVK setup.
3. Issue the **ati 0** command to verify that you are working with the BL652.
4. Enter **at+dir** to verify that there are no \$autorun\$ applications loaded to the module.
5. If any applications are loaded, enter **at&f*** to clear all loaded applications.

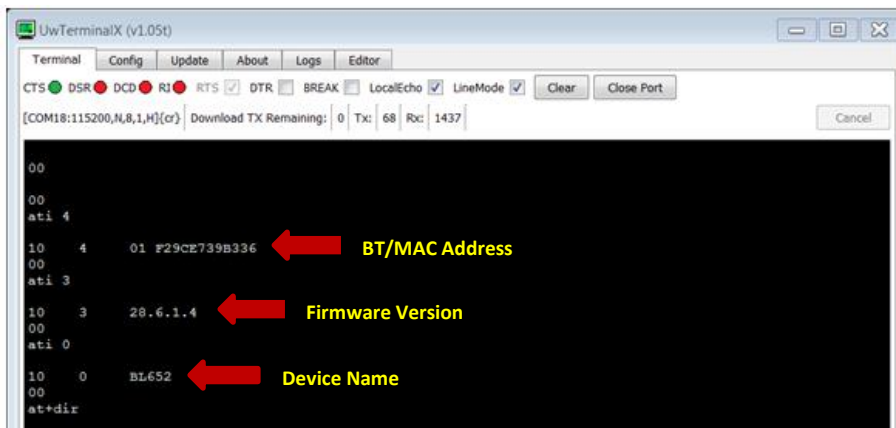


Figure 3: UwTerminalX

6. Place the peripheral DVK-BL652 in vSP Command mode.
 - a. Place a jumper on the J5 (vSP) pins (SIO_02 High).
 - b. Move the J12 jumper to pins 2-3 (SIO_13 Low).
 - c. Press the reset button to be advertising.

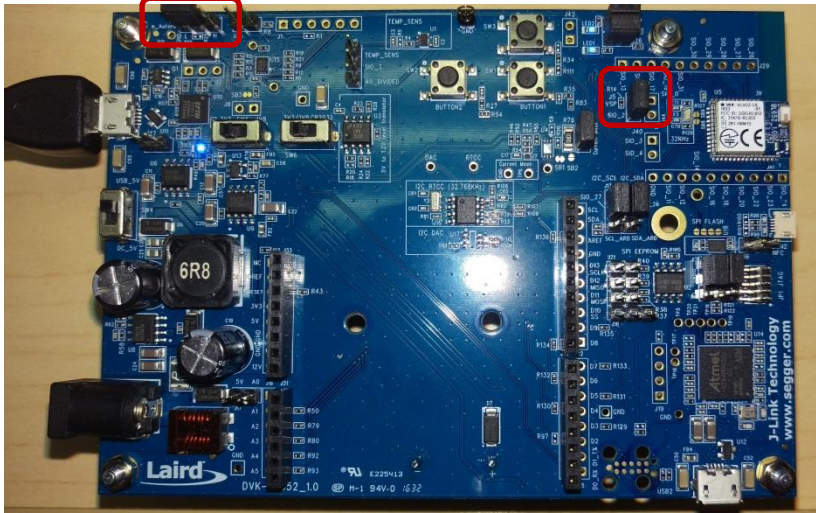


Figure 4: Peripheral DVK-BL652

CENTRAL DEVELOPMENT KIT SET UP

Note: The *smartBASIC* application is loaded over-the-air from this module.

To set up the central development kit, follow these steps:

1. Open `$autorun$.vsp.uart.bridge.outgoing.sb` from the previously downloaded *smartBASIC* sample applications.

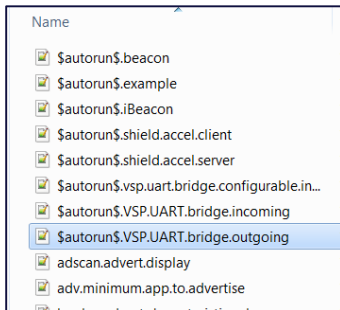


Figure 5: Open `$autorun$.vsp.uart.bridge.outgoing.sb`

- Find and edit the `#define BTAddr` line (Figure 6).

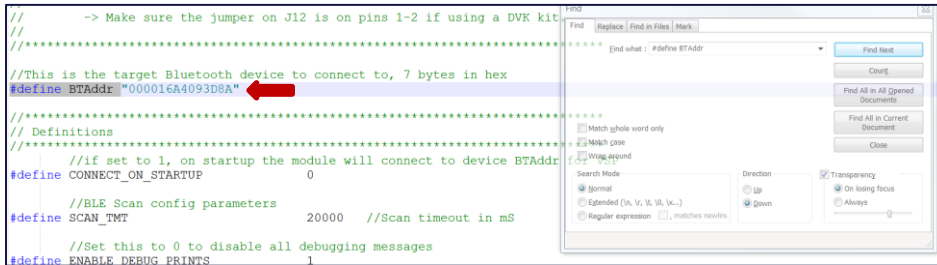
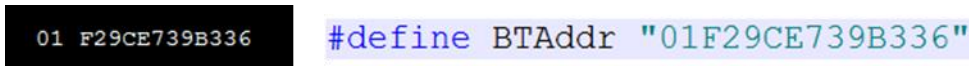


Figure 6: `#define BTAddr` line

- Edit the file. Enter the MAC address you obtained from step 2c in the [Peripheral Development Kit Set Up](#) section.

Note: BT/BLE MAC addresses are seven bytes, not six bytes as in BT Classic devices. The 01 with a space (see below) is prepended to the displayed Bluetooth Classic address (which is the module’s BLE address).



- Locate and change `#define CONNECT_ON_STARTUP 0` to `#define CONNECT_ON_STARTUP 1`.

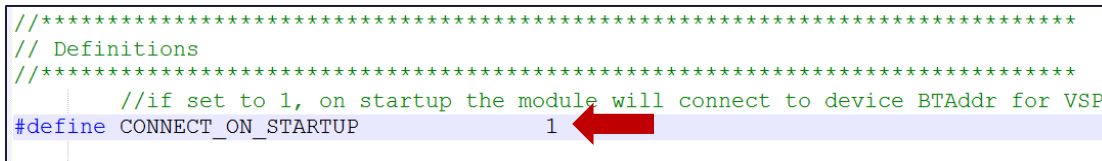


Figure 7: Change `#define CONNECT_ON_STARTUP 0`

- Save and close the file.
- Connect the second DVK-BL652 to the PC and note the COM port.
 - Place the J12 jumper on pins 1-2 (Develop Mode – SIO_13 High).
 - Remove the J5 vSP jumper (SIO_02 Low).
 - Connect to the PC using USB cable and power on the DVK.
- Open another instance of UwTerminalX and do the following:
 - Type **at** and press **Enter**. The module should respond with `00` which confirms it is in Command mode.
 - Issue the **ati3** command to verify that you have the most current firmware.
 - Right-click the terminal window and select **Xcompile+Load+Run**.

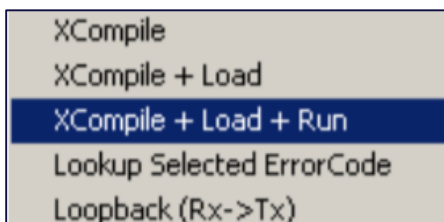


Figure 8: Select **Xcompile+Load+Run**

- Select the ***\$autorun\$.vsp.UART.bridge.outgoing.sb*** file that you previously edited and saved.

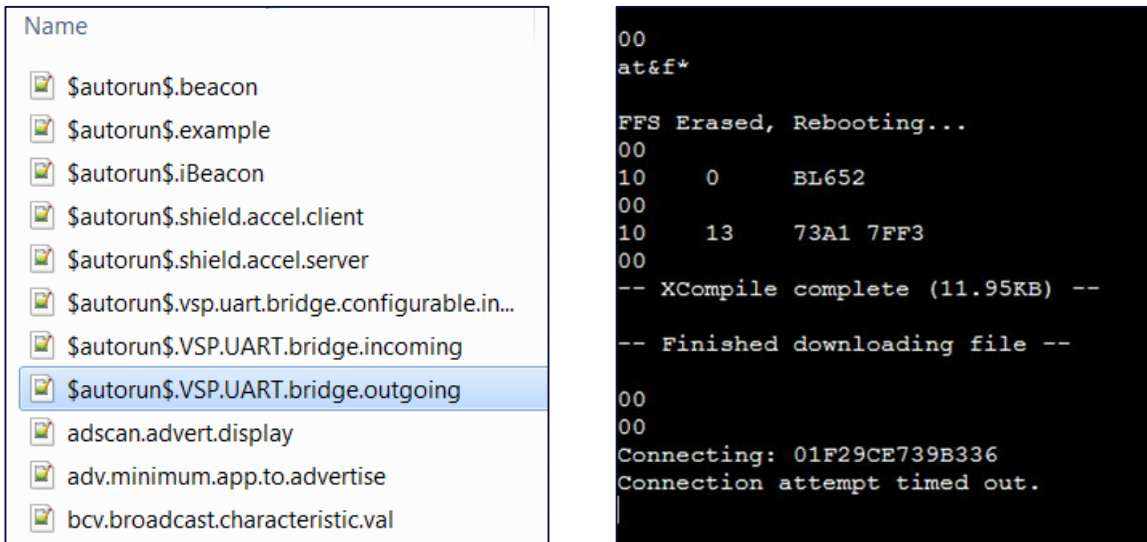


Figure 9: *\$autorun\$.vsp.UART.bridge.outgoing.sb* file

- Press the reset button on each of the BL652-DVKs to enter vSP Command mode.

If *Connected! Ready to transmit/receive!* displays, you are now remotely connected to the peripheral DVK. All AT command interfaces and responses are now to and from this peripheral device. For example, the ATI 3 command obtains the MAC address of the peripheral BL652.

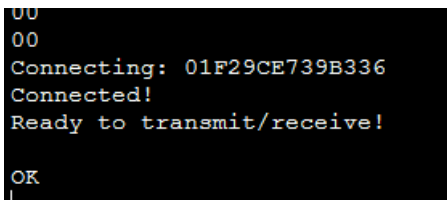


Figure 10: Successfully entered vSP Command mode

- Right-click the terminal window and select ***XCompile + Load***.
- Select the applicable *smartBASIC* application to transmit to the first BL652-DVK.
- Click **Open**.

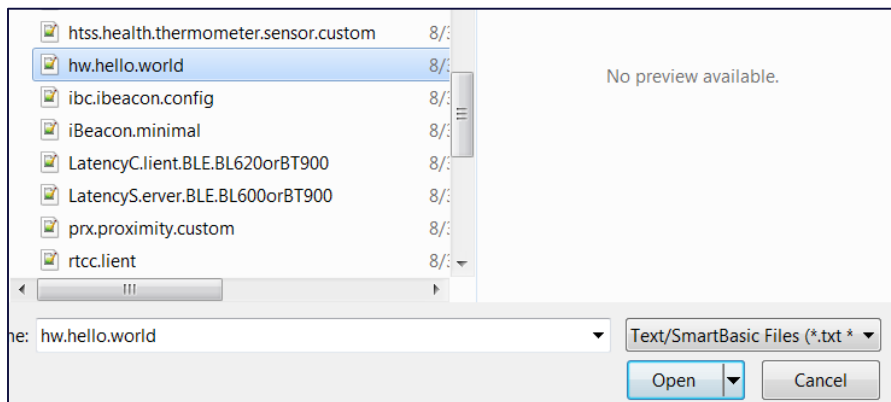


Figure 11: Open the applicable *smartBASIC* application

The terminal XCompiles and load the application OTA to the first DVK. It displays the following when finished:

```
Connecting: 01F29CE739B336
Connected!
Ready to transmit/receive!

OK
0      BL652
00
10     13     73A1 7FF3
00
-- XCompile complete (76B) --
-- Finished downloading file --
00
```

Nothing displays in the UwTerminal console of the peripheral DVK-BL652 while it's loading.

- 13. Once completed, enter the **at+dir** command in the Peripheral terminal window. The application should be listed as loaded to the module.

```
00
at+dir
06     hw
00
```

REVISION HISTORY

Version	Date	Notes	Approver
1.0	22 Feb 2017	Initial Release	Jonathan Kaye