

Android Application – Laird Toolkit (Proximity Functionality) BT900 Development Kit

Application Note

v1.2

INTRODUCTION

This guide demonstrates how to load a *smart*BASIC Proximity Sensor Service application (prx.proximity.custom.sb) onto the BT900 development board and to view the data on an Android device supporting BT 4.0.

REQUIREMENTS

- PC running Windows XP or later
- UWTerminalX <https://github.com/LairdCP/UwTerminalX/releases>
- DVK-BT900 running firmware v9.1.2.0 or later
- prx.proximity.custom.sb BT900 *smart* BASIC sample application which can be downloaded from GitHub: <https://github.com/LairdCP/BT900-Applications>
- USB A to mini B cable
- Android device running android 4.3 or higher with BT4.0
- Internet connection on Android device (to download the Laird Toolkit application from the PlayStore)
- DVK_BT900 User Guide
- FTDI Drivers <http://www.ftdichip.com/Drivers/VCP.htm> (for some versions of Windows)

DEVELOPMENT KIT SETUP

To setup the BT900 development kit, follow these steps:

1. Configure the BT900 development kit to the following settings:
 - DC/USB power source switch (SW4) – USB
 - 1.8V/3.3V switch (CON17) – 3.3V

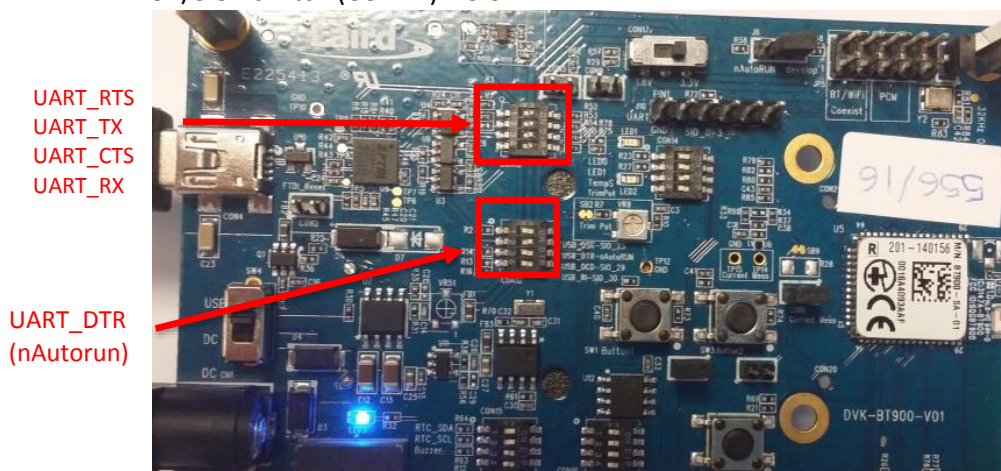


Figure 1: UART_TX/RX/CTS/RTS/DTR (nAutorun) is switched ON all other switched OFF

2. Connect one end of the mini USB cable to CON4 on the development board and the other end of the cable to your PC.
3. Follow the on-screen prompts. Depending on your version of Windows, you may need to install the FTDI drivers.
4. When complete, the development board appears in the Windows device manager as a *USB Serial Port*. Make a note of the COM port number to use in step 5.
5. Extract UWTerminalX to a selected folder and run the program.
6. Select BT900 in the Device tab and confirm the proper port via the dropdown box:

- Baudrate – 115200
- Parity – None
- Stop Bits – 1
- Data Bits – 8
- Handshaking – CTS/RTS

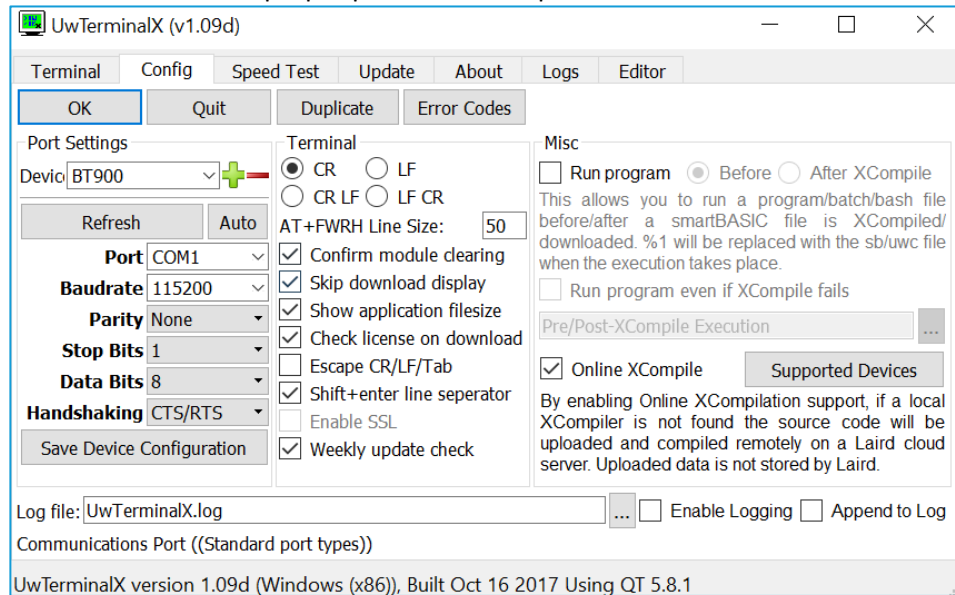


Figure 2: Comms Settings

7. Confirm you can communicate with the development board by typing **at** followed by a <carriage return>. The module responds with **00**.

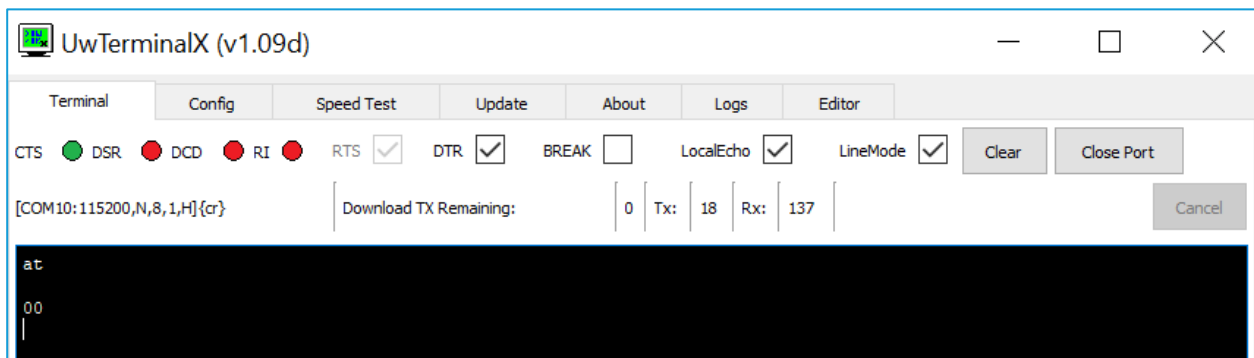


Figure 3: Comms OK

LOADING A SMARTBASIC APPLICATION

Note: When swapping between profiles on the same device, it may be necessary to clear any existing pairings on the module and Android device. On the module, this can be done with the command `at+btd*`; and on the Android device this can be done in Bluetooth settings by selecting Unpair.

To load a *smartBASIC* application, follow these steps:

1. UwTerminalX uses an online Xcompiler but if an internet connection is not available, the XComp file can be found in the Firmware folder available for download from the BT900 product page. If XCompiling with this method, the Xcomp file and UwTerminalX utility must be placed in the same smartBASIC sample application folder.
2. To compile and load a *smartBASIC* application, right-click in the main UWTerminalX window and select **XCompile + Load**.

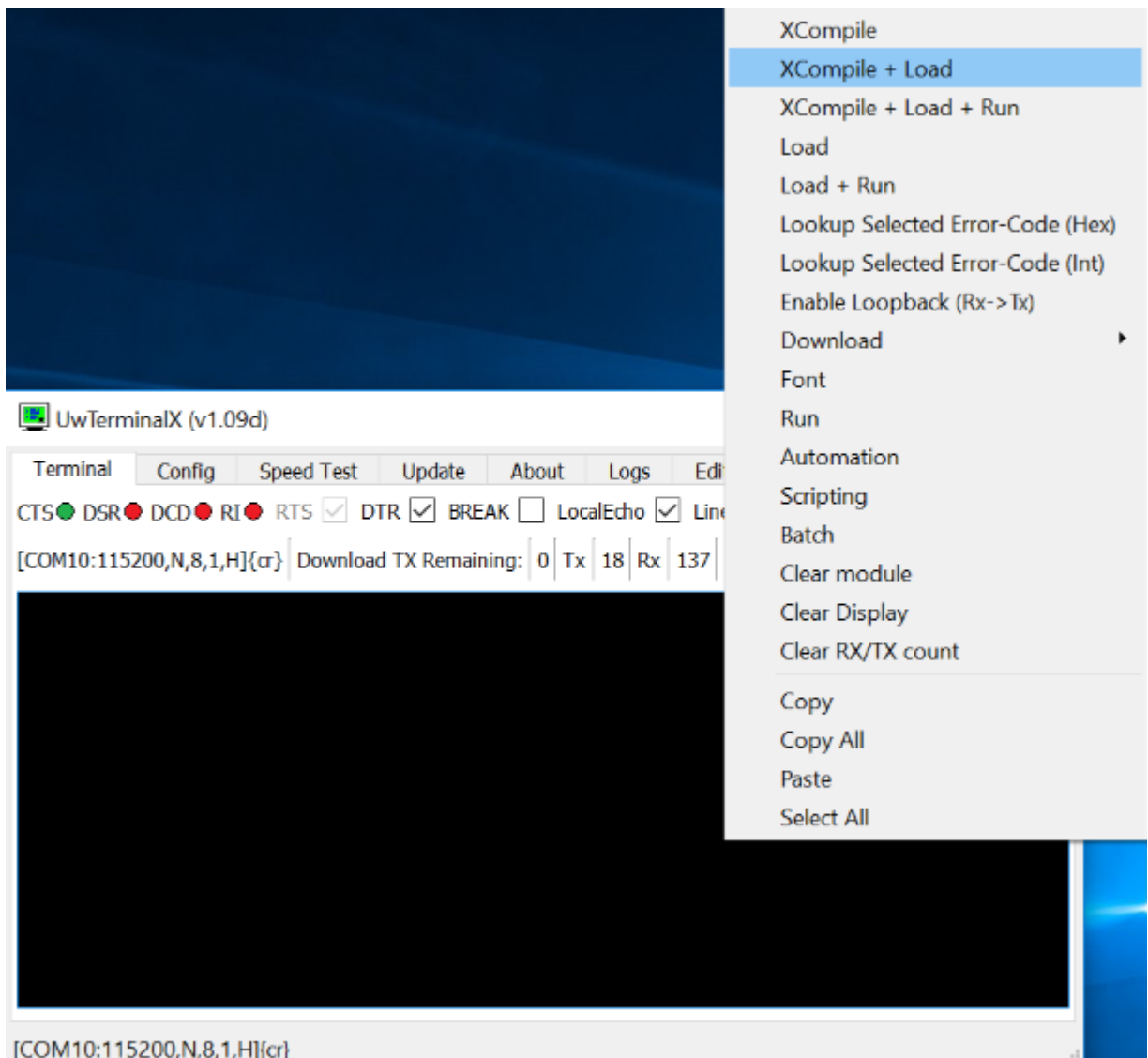


Figure 4: Right-click menu

3. Locate and open the *prx.proximity.custom.sb* application located in the supplied *BT900-Applications-master* folder (downloaded from Github at: <https://github.com/LairdCP/BT900-Applications>). When the application is successfully compiled and loaded, the console displays -- **Finished Downloading File** --

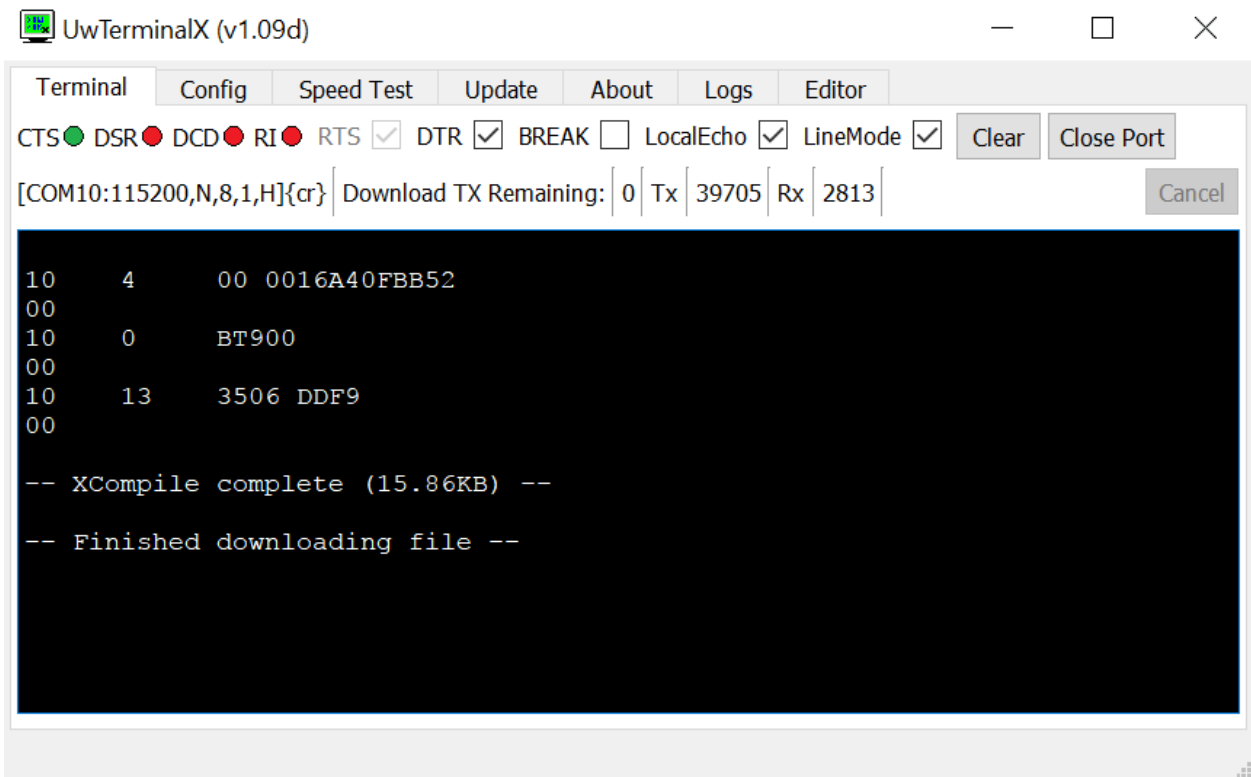


Figure 5: Compiled and loaded

4. If the if online xcompile or correct version of cross compiler is not present, an error displays. Locate the correct version and place it in the same folder as UWTerminal.
5. Confirm that the *prx* application is loaded by using the command **at+dir**.

Note: All characters after the first ‘.’ are truncated from the filename when smartBASIC applications are loaded into the BT900 module. Therefore, when *prx.proximity.custom.sb* is copied to the device, its name becomes *prx*.

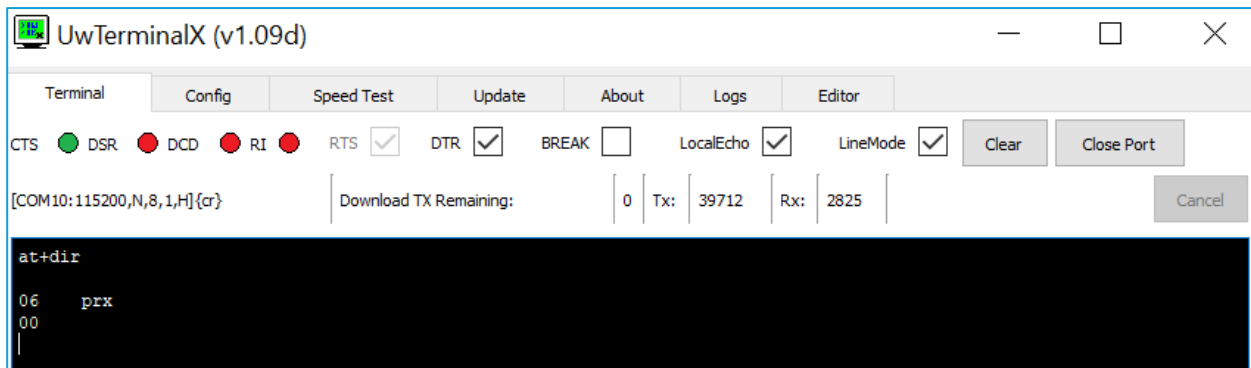


Figure 6: Directory showing prx app loaded

ANDROID SETUP

For Android setup, follow these steps:

1. Install the Laird Toolkit from the Google Play Store and ensure Bluetooth is enabled in the device settings. The download can be found here: <https://play.google.com/store/apps/details?id=com.lairdtech.lairdtoolkit>

Note: The Laird Toolkit is also valid for the following Laird BT4.0+LE module applications: Proximity, Blood Pressure, Proximity, Virtual Serial Port, Over-the-Air Downloads, and Batch Command Manager.

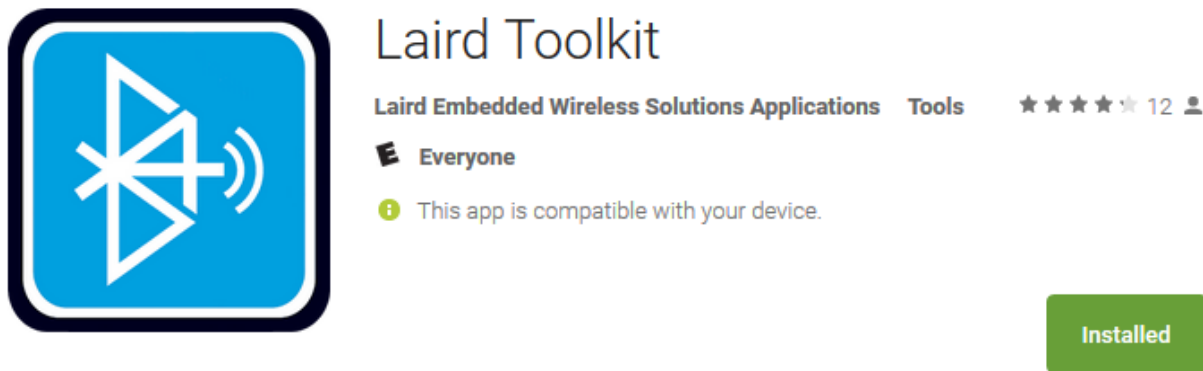


Figure 7: Laird Toolkit app installed

2. Once installed, run the Laird Toolkit application on your Android device.
3. Select **Proximity**.

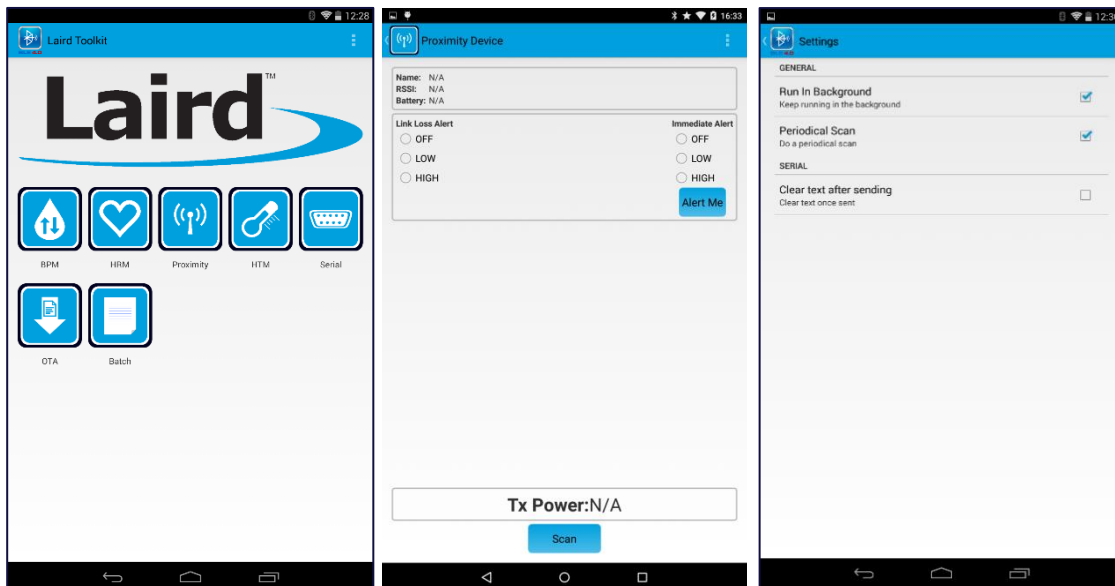


Figure 8: Laird Toolkit app - Intro screen, Proximity Sensor screen, and Settings screen

RUNNING PRX.PROXIMITY.CUSTOM.SB AND CONNECTING WITH THE ANDROID DEVICE

To run prx.proximity.custom.sb and connect with the Android device, follow these steps:

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

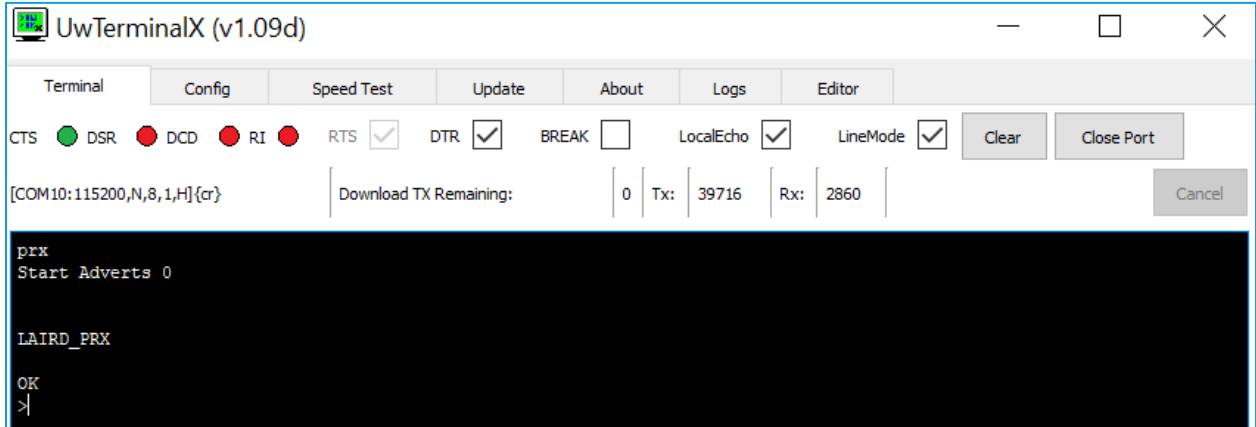


Figure9: prx.proximity.custom.sb running

2. Press the **Scan** button on the Android device and select **LAIRD_PRX** to connect to the module.

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. Due to known bugs in the Android BT4.0 BLE stack sometimes descriptors are not written, just retry connecting to the module will resolve the issue.

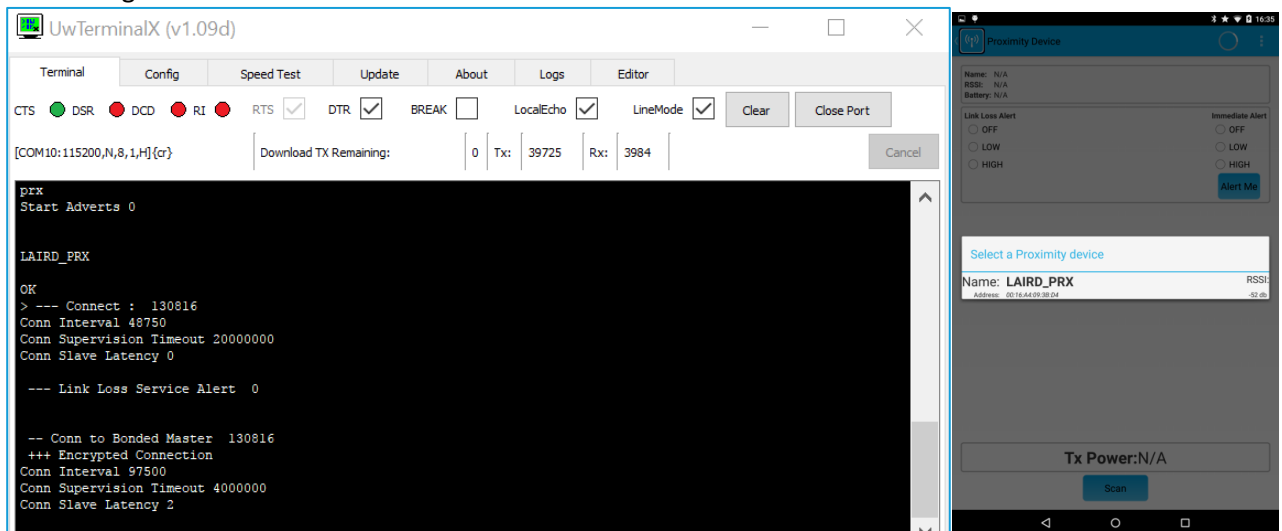


Figure 10: (Left)Android scanning for devices, (Right) Connection messages

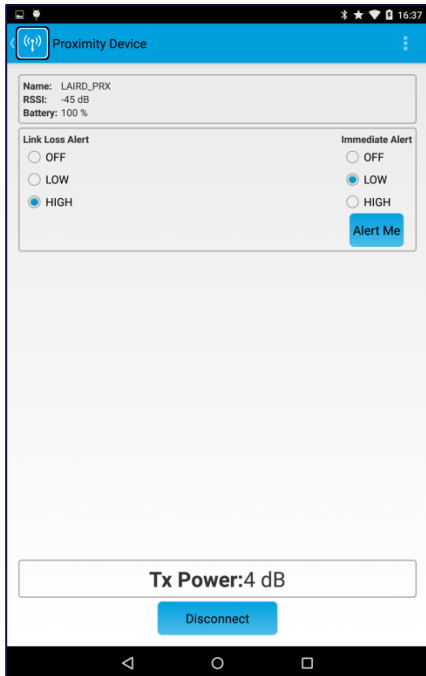


Figure 11: Active Proximity readings using Laird Toolkit app on Android device

REFERENCES

For more information on Proximity Profile, refer to the following documents:

- **prx.proximity.custom.sb sample application** – The comments in this document contain further information on the use of the Proximity Service *smart*BASIC program and can be opened in a text editor.
- **Proximity Profile** – <https://developer.bluetooth.org/TechnologyOverview/Pages/PXP.aspx>

REVISION HISTORY

Revision	Date	Description	Contributor(s)	Approved By
1.0	26 Nov 2014	Initial Release		Jonathan Kaye
1.1	22 Jan 2015	Added Revision History		Sue White
1.2	23 Jan 2018	Updated for UwTerminalX	Curtis Strong	Jonathan Kaye