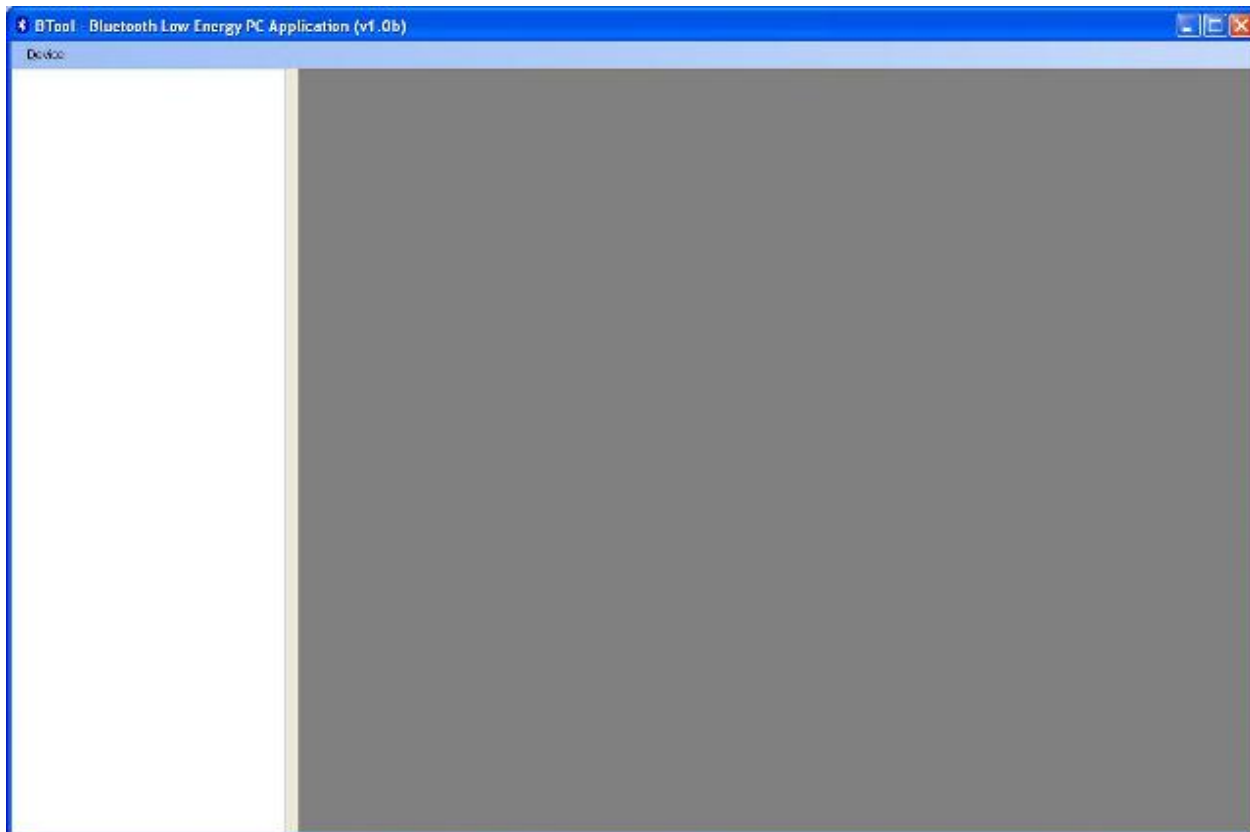


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Starting the Application

To start the application go into your programs by choosing Start > Programs > Texas Instruments > Bluetooth-LE > BTool. You should see the following window open up:

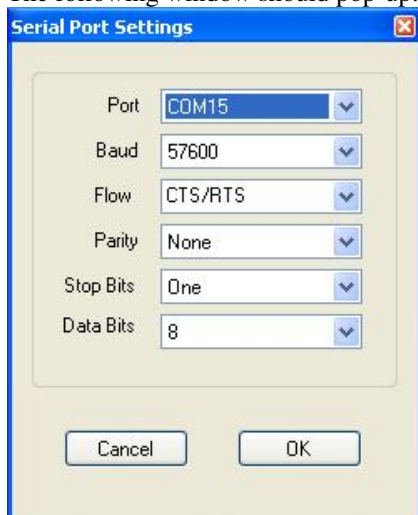


COM Port Setup

In the upper left corner of the window, click the "Device" drop menu and select the option "New Device":

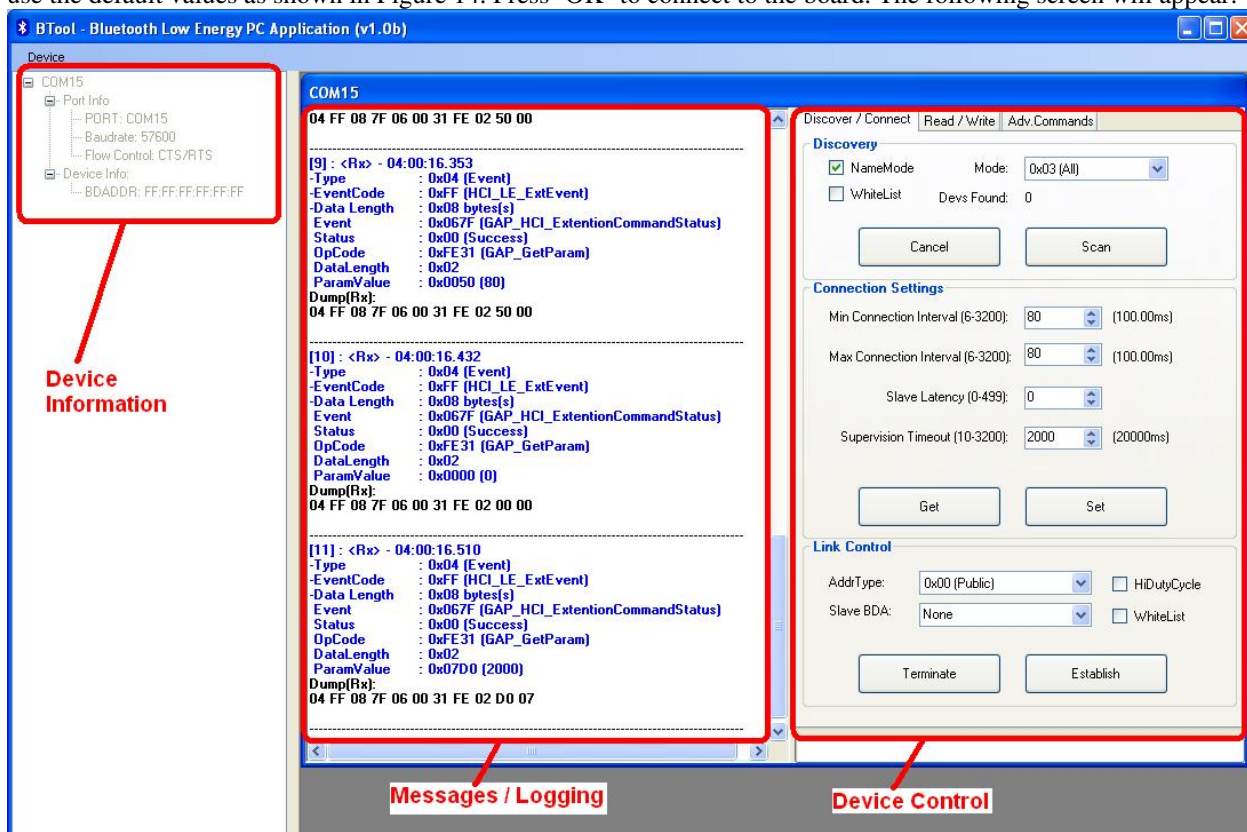


The following window should pop-up:



Connect to USB Dongle

If using the USB Dongle, set the "Port" value to the COM port of the USB Dongle from step 1. For the other settings, use the default values as shown in Figure 14. Press "OK" to connect to the board. The following screen will appear:



This

screen indicates that you are now connected to the USB Dongle. The screen is divided up into a few sections: the left sidebar contains information on the USB Dongle's status. The left side of the sub-window contains a log of all messages sent from the PC to the dongle and received by the PC from the dongle. The right side of the sub-window contains a GUI for control of the USB Dongle.

Creating a BLE Connection between USB Dongle and Keyfob

At this point the USB Dongle (central) is ready to discover other BLE devices that are advertising. At this time you will want to insert the battery (or remove and re-insert the battery to reset the device) into the keyfob (peripheral).

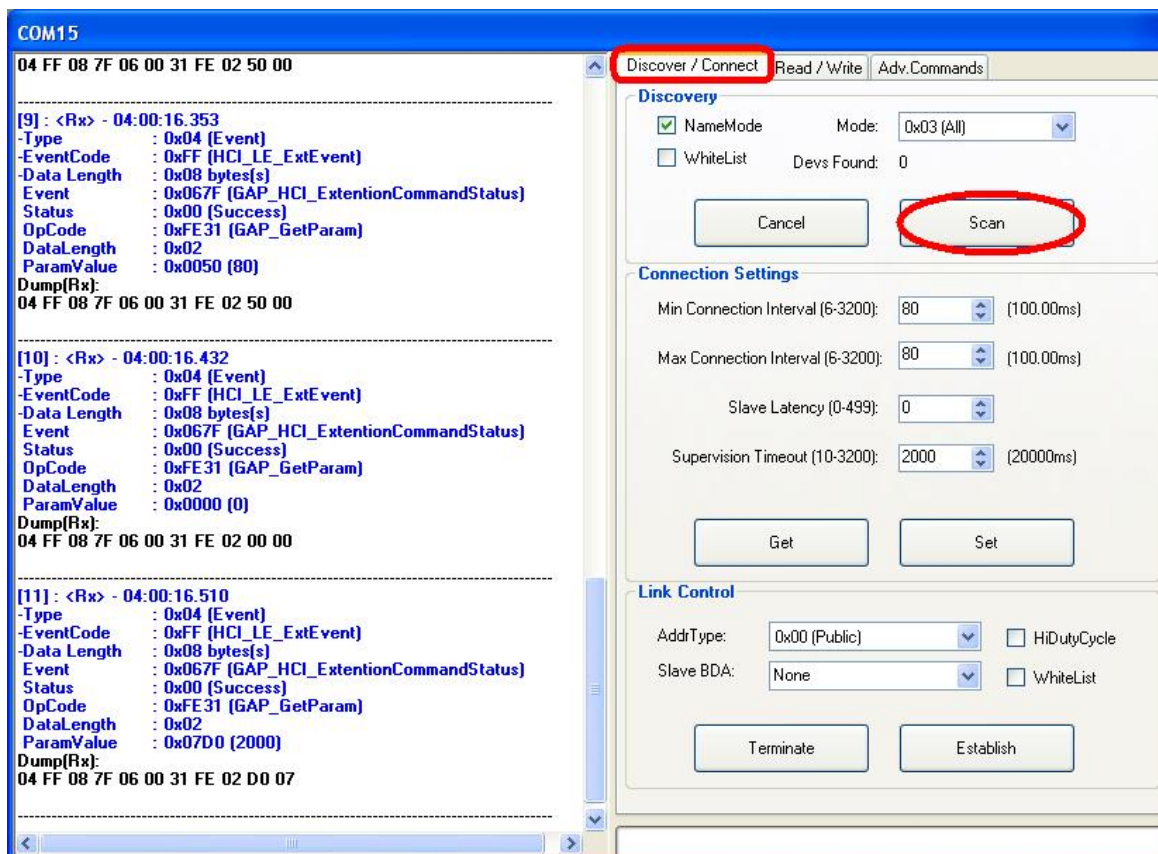
Making the KeyFob Discoverable

When the keyfob powers up, it will not immediately go into a discoverable state. To enable advertising and make the keyfob discoverable, press the right-hand button on the keyfob once. This will turn advertisements on; making the device discoverable for 30 seconds (this value is defined in [5]). After that time, the device will return to standby mode. To make the device discoverable again, simply press the button once again.



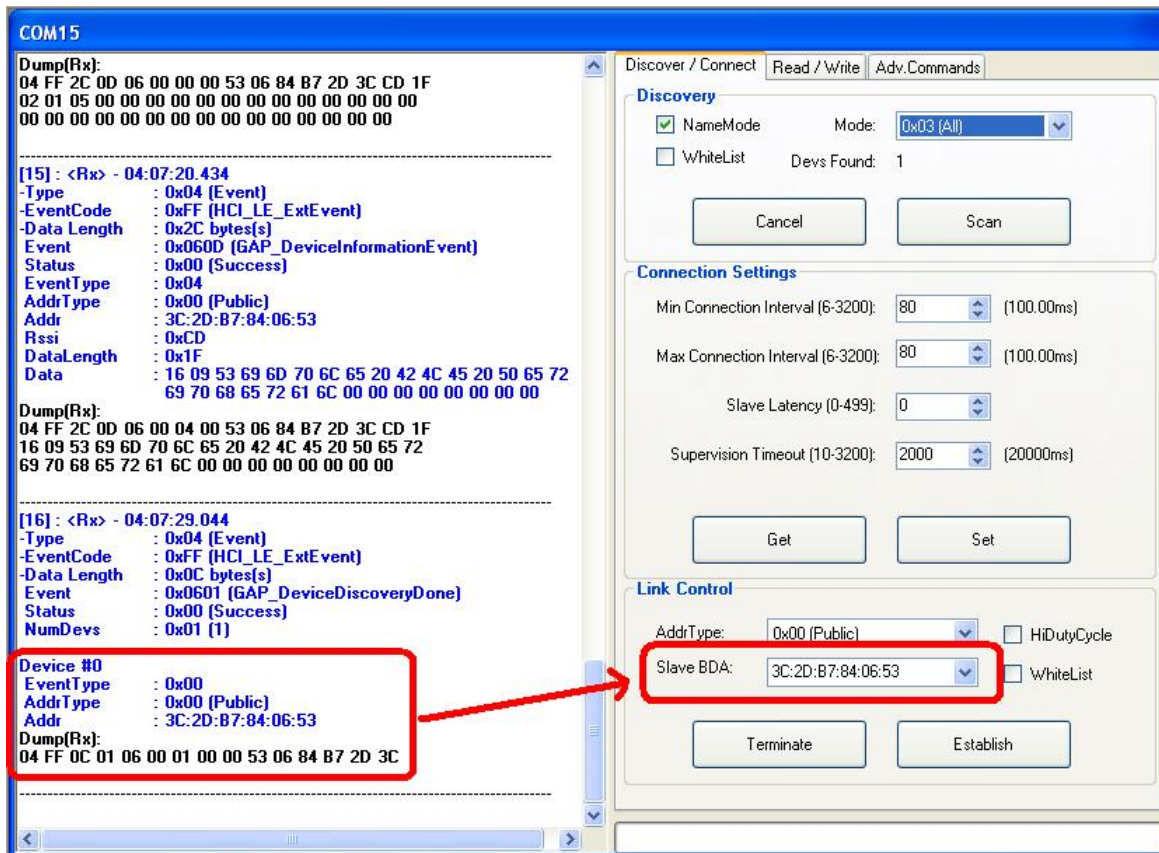
Scanning for Devices

Press the “Scan” button under the “Discover / Connect” tab:



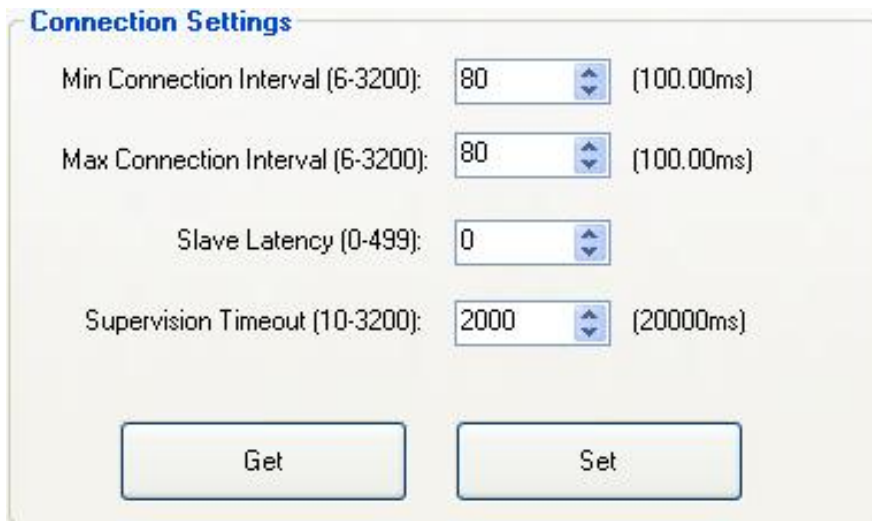
The USB Dongle will begin search for other BLE devices. As devices are found, the log on the left side of the screen will display the devices discovered. After 10 seconds, the device discovery process will complete, and the USB

Dongle will stop scanning. A summary of all the scanned devices will be displayed in the log window. In the example in Figure 18, one peripheral device was discovered while scanning. If you do not want to wait through the full 10 seconds of scanning, the “Cancel” button can be pressed alternatively, which will stop the device discovery process. The address of any scanned devices will appear in the “Slave BDA” section of the “Link Control” section in the bottom right corner of the sub-window.



Selecting Connection Parameters

Before establishing a connection, you will want to set up the desired connection parameters. The default values of 100ms connection interval, 0 slave latency, and 20000ms supervision timeout should serve as a good starting point; however for different applications you may want to experiment with these values. Once the desired values have been set, be sure to click the “Set” button; otherwise the settings will not be saved. Note that the connection parameters must be set before a connection is established; changing the values and clicking the “Set” button while a connection is active will not change the settings of an active connection. The connection must be terminated and re-established to use the new parameters. (The Bluetooth specification does support connection parameter updates while a connection is active; however this must be done using either an L2CAP connection parameter update request, or using a direct HCI command.



Connection Settings

Min Connection Interval (6-3200): 80 (100.00ms)

Max Connection Interval (6-3200): 80 (100.00ms)

Slave Latency (0-499): 0

Supervision Timeout (10-3200): 2000 (20000ms)

Get Set

Establishing a Connection

To establish a connection with the keyfob, select the address of the device to connect with, and click the “Establish” button. If the set of connection parameters are invalid (for example, if the combination of connection parameters violates the specification), the message window will return a “GAP_EstablishLink” event message with a “Status” value of “0x12 (Not setup properly to perform that task)”. The parameters will have to be corrected before a connection can be established.

```

-----
[27] : <Rx> - 04:09:20.185
-Type           : 0x04 (Event)
-EventCode      : 0xFF (HCI_LE_ExtEvent)
-Data Length    : 0x13 bytes[s]
Event           : 0x0605 (GAP_EstablishLink)
Status          : 0x12 (Not setup properly to perform that task)
DevAddrType     : 0x00 (Public)
DevAddr         : 3C:2D:B7:84:06:53
ConnHandle      : 0x0000
ConnInterval    : 0x0000
ConnLatency     : 0x0000
ConnTimeout     : 0x0000
ClockAccuracy   : 0x00
Dump(Rx):
04 FF 13 05 06 12 00 53 06 84 B7 2D 3C 00 00 00
00 00 00 00 00 00
-----

```

If the keyfob is still in discoverable mode, a connection should be established (press the right button on the keyfob once again if the device if more than 30 seconds have passed since the device was previously made discoverable and the process has completed). Once a connection is established, the message window will return a “GAP_EstablishLink” event message with a “Status” value of “0x00 (Success)”:


```
-----  
[80] : <Rx> - 04:15:59.469  
-Type           : 0x04 (Event)  
-EventCode      : 0xFF (HCI_LE_ExtEvent)  
-Data Length    : 0x13 bytes(s)  
-Event          : 0x0605 (GAP_EstablishLink)  
-Status         : 0x00 (Success)  
-DevAddrType    : 0x00 (Public)  
-DevAddr        : 3C:2D:B7:84:06:53  
-ConnHandle     : 0x0000  
-ConnInterval   : 0x0050  
-ConnLatency    : 0x0000  
-ConnTimeout    : 0x00C8  
-ClockAccuracy  : 0x00  
Dump(Rx):  
04 FF 13 05 06 00 00 53 06 84 B7 2D 3C 00 00 50  
00 00 00 C8 00 00  
-----
```

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