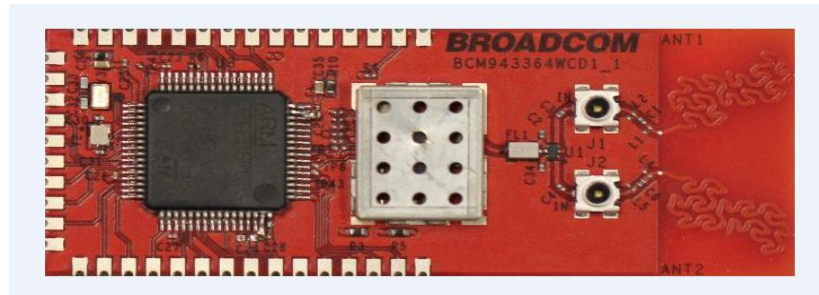
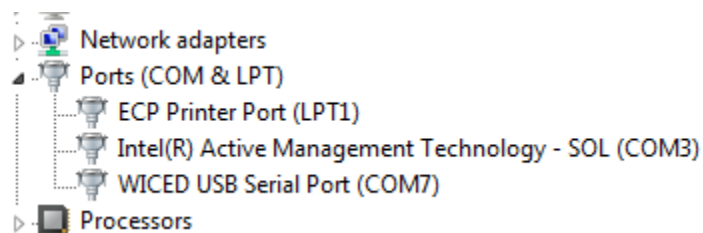


## Forcing the antenna port

Build the test application "mfg\_test" and download to the eval board. For these tests I am using the BCM43364WCD1 eval board.



Using device manager, confirm the USB serial port, in this case the WICED eval board is connected to COM7



Open a command line interface (in this case I'm using windows). and navigate to the directory where the WICED SDK is installed and navigate further to WICED-SDL\libraries\test\wl\_tool.

```
C:\Users\darmour\Documents\WICED\WICED-SDK-MFi-3.7.0\WICED-SDK\libraries\test\wl_tool>
C:\Users\darmour\Documents\WICED\WICED-SDK-MFi-3.7.0\WICED-SDK\libraries\test\wl_tool>
C:\Users\darmour\Documents\WICED\WICED-SDK-MFi-3.7.0\WICED-SDK\libraries\test\wl_tool>
C:\Users\darmour\Documents\WICED\WICED-SDK-MFi-3.7.0\WICED-SDK\libraries\test\wl_tool>
C:\Users\darmour\Documents\WICED\WICED-SDK-MFi-3.7.0\WICED-SDK\libraries\test\wl_tool>wl43364a1 --serial 7 ver
7.45 RC41.0
wl0: Jun 24 2015 17:47:50 version 7.45.41 (r554772) FWID 01-5eb3f26a
C:\Users\darmour\Documents\WICED\WICED-SDK-MFi-3.7.0\WICED-SDK\libraries\test\wl_tool>
```

The wl tool allows commands to be sent directly to the radio to configure or report parameters. It is key to use the wl tool.exe that corresponds with the exact wlan radio chip on the evaluation board, in this case it is 'wl43364a1'.

Confirm communications with the eval board by issuing the "ver" command, in this case the command sequence is shown. If your com port is different the change the '-- serial 7' portion on the

command to use the correct port number.

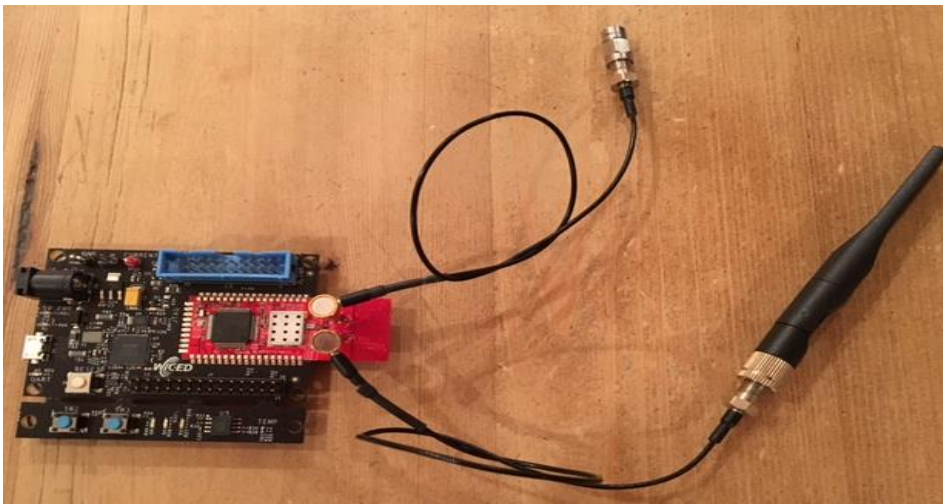
The default setting for the wlan radio is to allow the firmware to control which of the two antenna ports are used at any moment in time, either for transmitting a packet, or receiving one. The detailed description of the algorithms is proprietary and will not be addressed here.

For rf test purposes, it is necessary to force the radio to use a single port. This is controlled using the following combination of commands

```
\wl_tool>wl43364a1 --serial 7 txant  
3  
  
\wl_tool>wl43364a1 --serial 7 antdiv  
3
```

This reports back that the antenna controls are in default and under control of the radio firmware.

We will now force the radio to use first ant0 and then ant1. In order to differentiate the ports, rf test leads are fitted to both rf test ports, J1 and J2 as shown below. The rf test connectors when fitted, disconnect the rf path to the PCB antennas and allow a conducted path only through the cables.



On antenna connector 1 (ant0) the cable is terminated in a 50 ohm load.

On antenna connector 2 (ant1), the cable is connected to a short antenna.

Now by using the commands to control the antenna port, we can readily confirm if the antenna is indeed forced to the specified port. In this configuration, if the antenna switch is set to use ant2 (antenna connected) then the radio will be able to hear nearby access points. If the antenna switch is set to use ant0, then the radio may still hear nearby access points but the rssi will be very significantly reduced (>>20dB).

Let's test.

```
\wl_tool>wl43364a1 --serial 7 antdiv 1
```

```
\wl_tool>wl43364a1 --serial 7 txant 1
```

```
\wl_tool>wl43364a1 --serial 7 scan
```

```
\wl_tool>wl43364a1 --serial 7 scanresults
```

```
SSID: "BTHub3-9TMK"
```

```
Mode: Managed    RSSI: -62 dBm    SNR: 0 dB        noise: 0 dBm     Flags: RSSI  
on-channel    Channel: 1
```

So, with the radio instructed to use the second antenna port (aux) then the nearby AP can be seen with an RSSI of -62dBm.

Changing the radio configuration to use the primary antenna port (ant 0 - terminated with a 50ohm load), we would expect the rssi to be significantly reduced.

```
\wl_tool>wl43364a1 --serial 7 antdiv 0
```

```
\wl_tool>wl43364a1 --serial 7 txant 0
```

```
\wl_tool>wl43364a1 --serial 7 scan
```

```
\wl_tool>wl43364a1 --serial 7 scanresults
```

```
SSID: "BTHub3-9TMK"
```

```
Mode: Managed    RSSI: -82 dBm    SNR: 0 dB        noise: 0 dBm     Flags: RSSI on-channel  
Channel: 1
```

--> the same access point is now ~20dB lower received signal strength.

This confirms that the antenna rf switch is being correctly controlled using the `wl mfg_test` commands.