

BtUSB Tool User's Guide

March 2008

Model name: T77H056



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Document Conventions

Text Conventions

bold Bold type within paragraph text indicates commands, file names, directory names, paths, output, or returned values.

Example: The DK_Client package will not function unless you use the **wdreg_install** batchfile.

italic Within commands, italics indicate a variable that the user must specify.

Example: **mem_alloc** *size_in_bytes*

Titles of manuals or other published documents are also set in italics.

`Courier` The Courier font indicates output or display.

Example:

```
Error:Unable to allocate memory for transfer!
```

[] Within commands, items enclosed in square brackets are optional parameters or values that the user can choose to specify or omit.

{ } Within commands, items enclosed in braces are options from which the user must choose.

| Within commands, the vertical bar separates options.

... An ellipsis indicates a repetition of the preceding parameter.

> The right angle bracket separates successive menu selections.

Example: Start > Programs > DK > wdreg_install.

Notices

NOTE: This message denotes neutral or positive information that calls out important points to the text. A note provides information that may apply only in special cases.

Revision History

Revision	Description of Changes
October 2007	Initial release
January 2008	Updated release
March 2008	Added Master Blaster mode commands and made minor editorial changes

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Preface

This document describes the BtUSB Tool which is a Windows support tool used with Atheros' AR3011 USB Bluetooth IC.

The BtUSB Tool allows you to control and configure the AR3011 chip via a USB port. Through its simple Windows command line interface, it allows the user to apply reset, initialize, and configure the BD address. In addition, it allows you to put the AR3011 in Device Under Test (DUT) mode for Bluetooth RF testing.

The BtUSB Tool is designed specifically to work with the AR3011 Bluetooth device.

This document is intended for ODMs (Original Design Manufacturers) and hardware and software engineers who are developing applications around the AR3011 device.

About this Document

The document consists of the following chapters:

- Chapter 1 **Introduction**—Provides an overview of the BtUSB Tool and describes how to install the software, setup the hardware, and install/update the BtUSB Device driver.
- Chapter 2 **Using the BtUSB Tool**—Explains how to launch and use the BtUSB Tool.

Reference Documentation

The following documents provide additional reference material related to this product:

- *AR3011 Data Sheet*
- *AR3011 Hardware Design Guide*
- *AR3011 Bluetooth USB Adapter Quick Start Guide*
- *Blue Manager 4.0 User's Guide for PC*

1

Introduction

This chapter provides an introduction to BtUSB Tool. BtUSB is a versatile software tool used to support AR3011 evaluation and development. This chapter also describes how to install the software, set up the hardware, and install/update the Atheros BtUSB Device driver.

BtUSB Tool Overview

The BtUSB Tool allows you to configure and control the chip via a USB port. Through its simple Windows command line interface, it allows you to apply reset, initialize, and configure BD address. In addition, it allows you to put the AR3011 in Device Under Test (DUT) mode for Bluetooth RF testing.

Downloading the BtUSB Tool Software

1. To download the software, browse to the Atheros Support web site: <https://support.atheros.com/>
2. Login to this web site using your user name and password provided by Atheros Support.
3. Navigate to the Atheros AR3011 download location.
4. Click on the Atheros BtUSB tool downloading link.
5. Download and save the `BtUSBT001_Setup.exe` file to your system.
6. Double click on this file to install the BtUSB Tool. You will see the screen shown in [Figure 1-1](#).

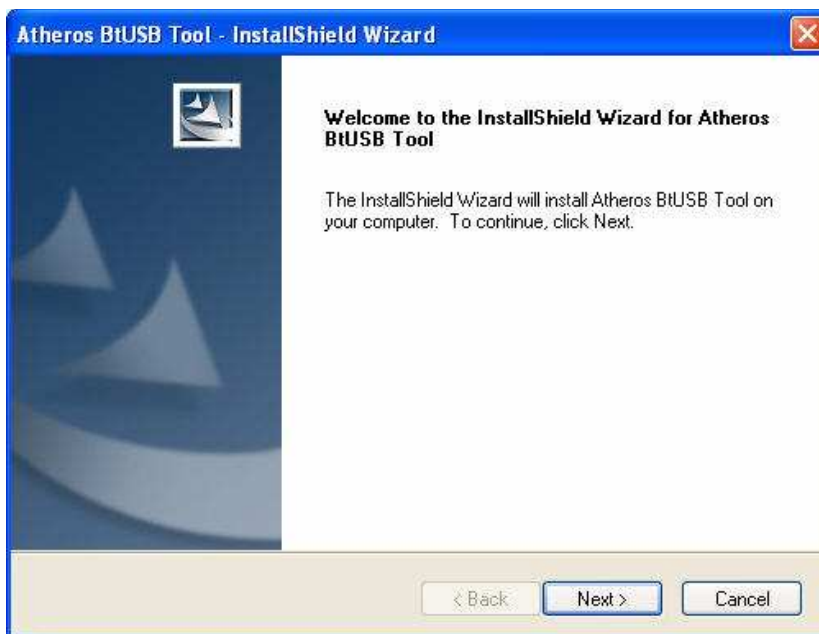


Figure 1-1. Launching the BtUSB Tool InstallShield Wizard

7. Click Next which displays the Choose Destination Location screen showing the default location. See Figure 1-2.

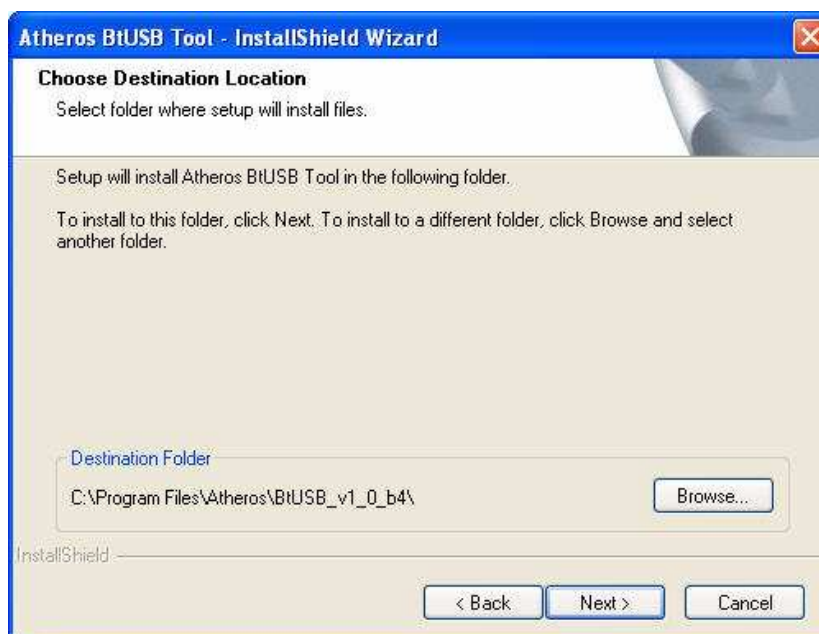


Figure 1-2. BtUSB Tool InstallShieldChoosing Destination Location

- Click Next or Browse to a different location if you do not want to install at the default location. (Default installation location is assumed here.) This displays Start Copying Files screen. See [Figure 1-3](#).

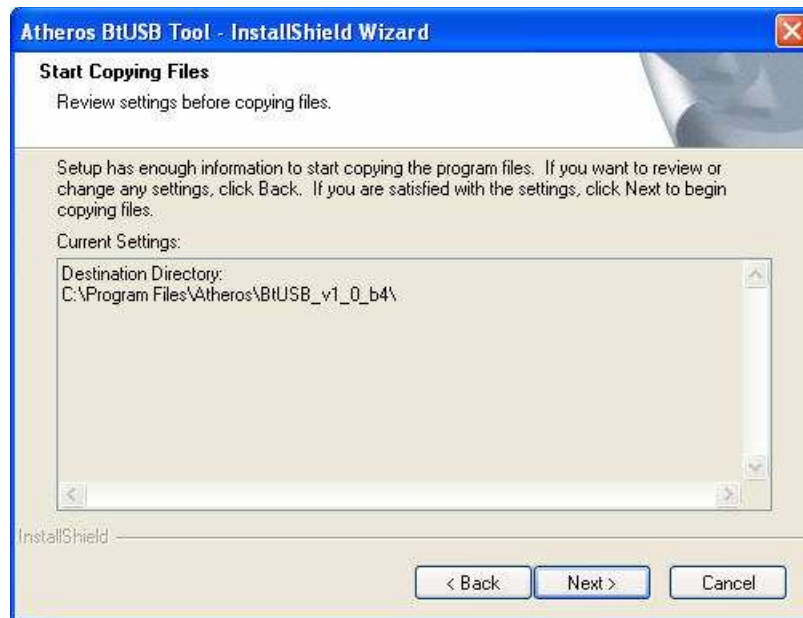


Figure 1-3. BtUSB Tool InstallShield Copying

- Click Next. It starts copying the necessary files. When done, the InstallShield Wizard Complete screen is displayed. See [Figure 1-4](#).

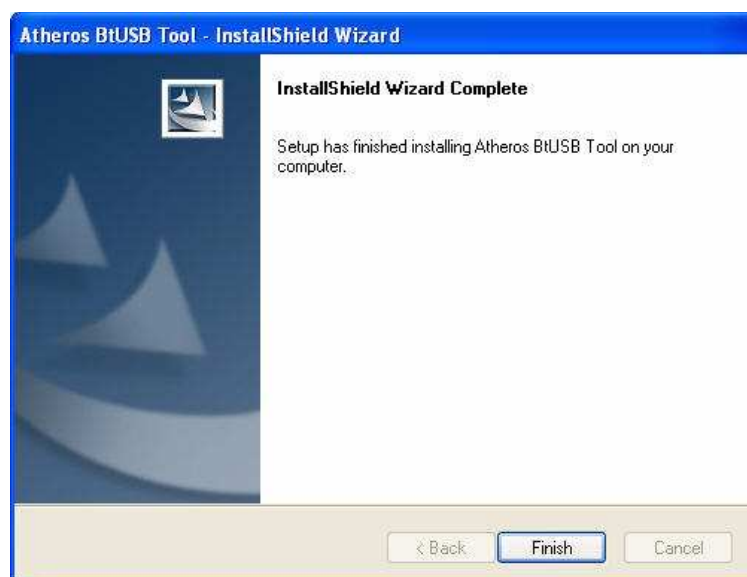


Figure 1-4. InstallShield Wizard Complete

10. Click **Finish**.

If you have any difficulties downloading the software, please contact Atheros Support.

Hardware Setup for RF Testing

This section describes how to setup the Atheros USB Adapter and test hardware for RF performance evaluation with the BtUSB tool.

Prerequisites

You need to install the Bluetooth driver and BtUSB Tool before you can perform testing on the AR3011 USB Adapter.

Equipment and Software Needed for RF Testing

- Bluetooth driver and BtUSB Tool pre-installed on the host computer
- Bluetooth RF tester (Anritsu tester is used in this case)
- Desktop computer system with monitor and keyboard (optional).
- AR3011 USB Bluetooth Adapter
- USB port interface
- Atheros BtUSB Tool Interface (with computer and monitor)
- RS-232 or GPIB cable
- RF cable
- Shield box (metal enclosure lined with appropriate shielding material, for shielding the device under test from interference)

USB Adapter Configuration

NOTE: If AR3011 USB Adapter is used, an antenna connector must be installed to perform BT RF tests. USB Adapters are configured with an antenna connector for RF evaluation. If you have any questions contact your local Atheros representative.

See [Figure 1-5](#) for properly configuring AR3011 USB Adapter and installing the correct components.

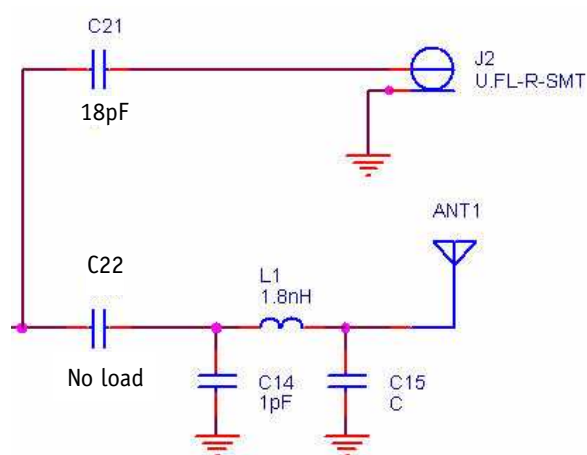


Figure 1-5. **AR3011 USB Adapter Antenna Option**

When the AR3011 USB Adapter is connected to the USB port, it will reset automatically. If an optional LED is configured, as per [Figure 1-6](#), on the AR3011 USB device, then the LED turns ON.

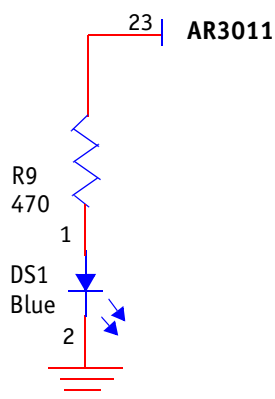


Figure 1-6. **Optional LED configuration on board the AR3011 USB device**

[Figure 1-7](#) shows a typical hardware setup to be used with the BtUSB tool.

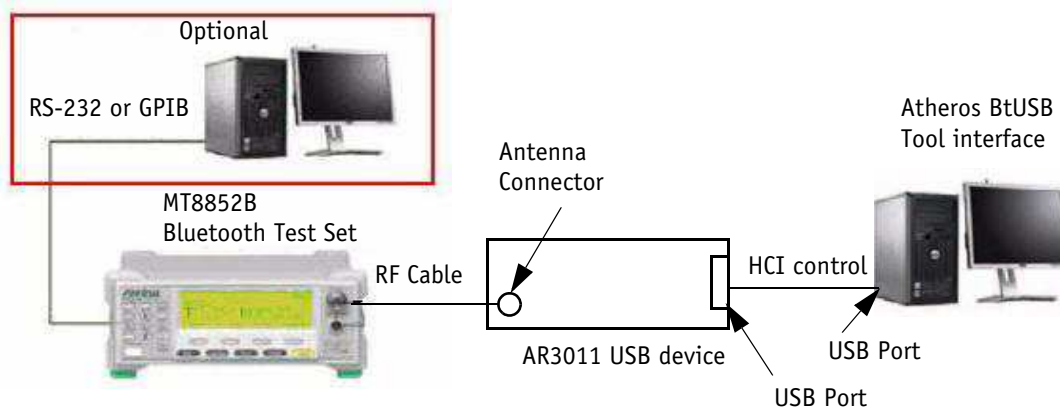


Figure 1-7. Atheros BtUSB Tool Hardware Set Up for Testing

For testing the AR3011 USB Adapter, follow these steps in order to set up the test equipment and the AR3011 USB device board.

1. Plug in the AR3011 USB Adapter to the USB cable which is attached to the USB port of the PC.
2. Connect the RF cable between the AR3011 USB Adapter and the RF tester by connecting an RF cable to the antenna connector (J2 on the AR3011 USB Adapter) as shown in [Figure 1-7](#).
3. Put the device under test inside the shield box as shown in [Figure 1-8](#).
4. Power up the PC and the RF tester.

The AR3011 Adapter powers up through the USB cable and initializes. After the AR3011 Adapter is reset properly, the blue LED is lit. See [Figure 1-6](#) for blue LED circuitry details.

NOTE: If the USB Adapter is not reset (blue LED is not lit), the board is not functional. Contact your local Atheros representative for support.

5. Close the shield box.
6. Perform the necessary testing on the board using the RF tester. Put the device into test mode with the DUT command.

Refer to the RF tester documentation on how to perform various tests on the USB device.

[Figure 1-8](#) shows the shield box with the physical connections to the AR3011 device.

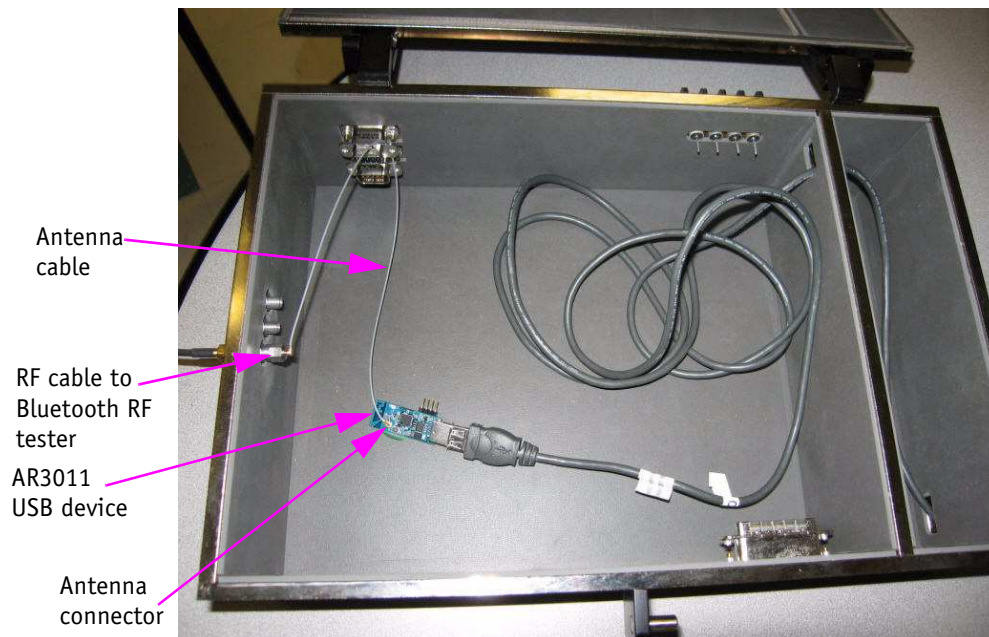


Figure 1-8. AR3011 USB Adapter in a Shield Box (open position)



Figure 1-9. Location of the Capacitor on the Bluetooth Adapter

NOTE: The orientation of C21 may be different depending on the direction at which the output signal is sent.

Installing/Updating Atheros BtUSB Device Driver

The BtUSB Device driver must be installed before the BtUSB tool can be used. Please follow the instructions below to install/update Atheros BtUSB Device driver:

1. Plug in the AR3011 USB Adapter and wait until it resets and its blue or green LED is lit.

The PC should display Found New Hardware Wizard. See [Figure 1-10](#).



Figure 1-10. Found New Hardware Wizard

2. Click **No, not at this time**.
3. Click **Next**.

NOTE: If you are using the BtUSB tool and you also have some other Bluetooth application installed on your system such as Blue Manager Suite, you will see Atheros Bluetooth USB driver, you need to go to the Device Manager, click on the Atheros Bluetooth USB driver and choose Update as shown in [Figure 1-11](#). If you do not have any other Bluetooth application installed on your system such as Blue Manager Suite, ignore the next four steps.

1. Go to the Device Manager by right clicking on **My Computer > Manage > Device Manager**.
2. Right click on the **Atheros Bluetooth USB Adapter** and choose **Update Driver**. See [Figure 1-11](#).

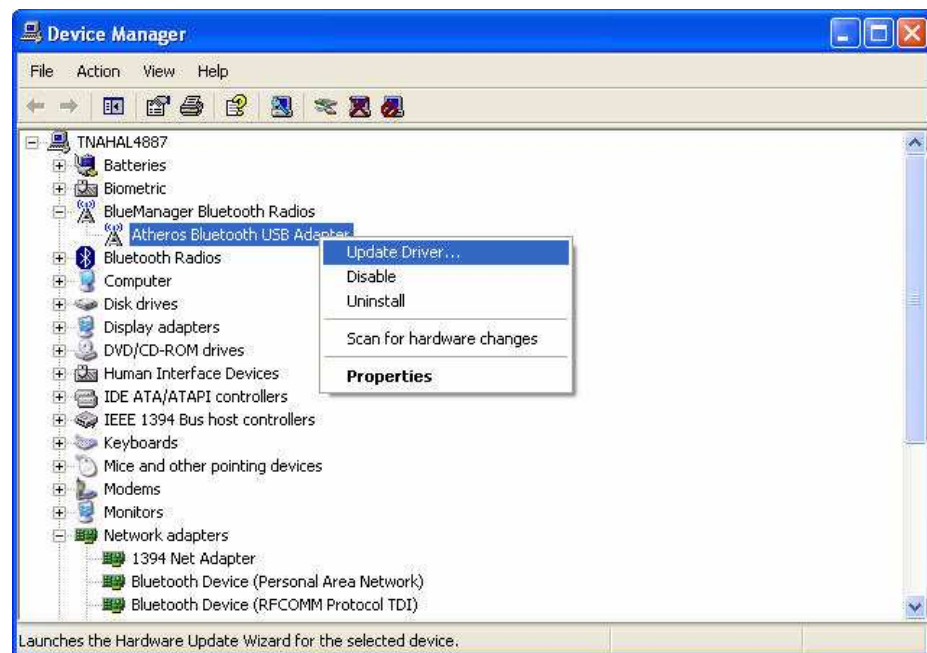


Figure 1-11. Updating the Atheros BtUSB Driver

You will see Hardware Wizard as shown in Figure 1-12.

3. Click No, not this time.



Figure 1-12. Welcome to the Hardware Update Wizard

4. Click **Next**.
5. This displays another screen that allows you to install from a particular location. See [Figure 1-13](#).

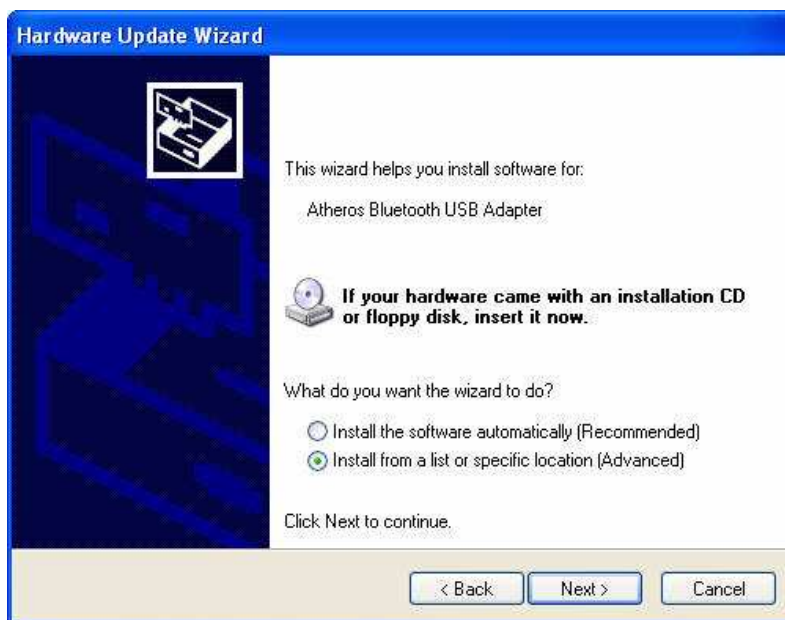


Figure 1-13. Installing from a list or specific location

6. You will see the installation option. See [Figure 1-14](#).

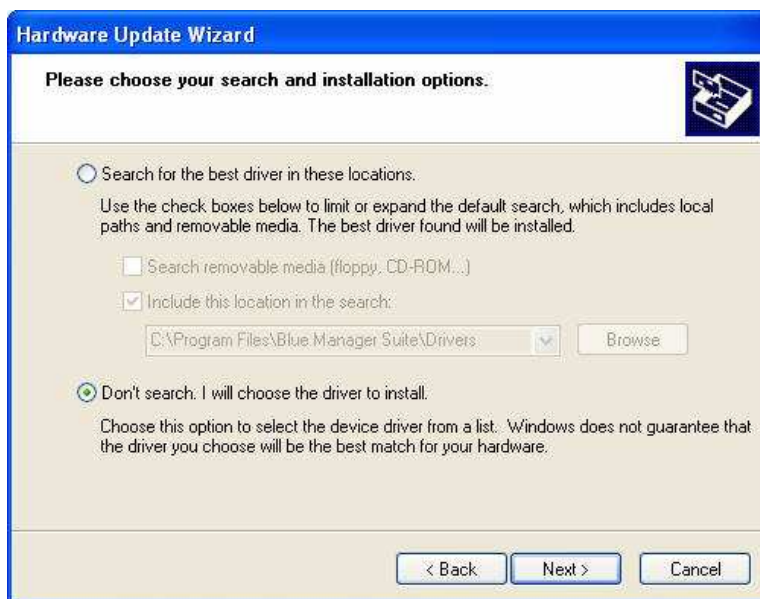


Figure 1-14. Atheros Driver Updating Options

7. Check **Do not search. I will choose the driver to install** option. This initiates the driver update process. In few seconds, you will see another screen displaying available drivers. See [Figure 1-15](#).

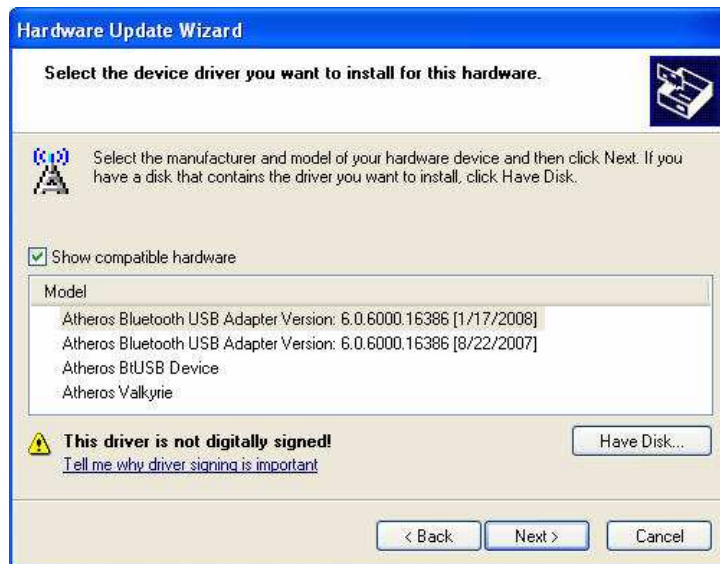


Figure 1-15. Finishing the Drive Installation

8. Click on **Have Disk** button. This displays another screen. See [Figure 1-16](#).

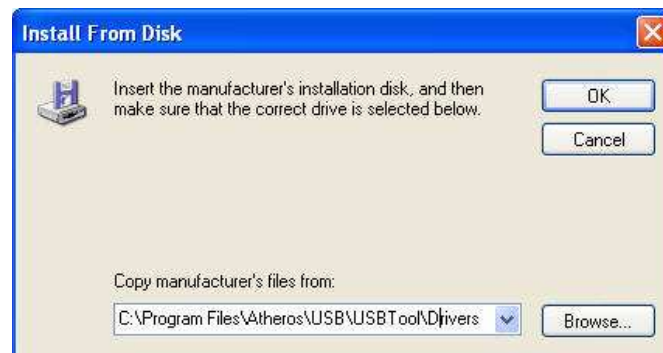


Figure 1-16. Copying the Driver

9. Browse to the BtUSB_v1_0_b4\Drivers folder (default pathname where you installed the BtUSB Tool drivers).
10. Select **AthBtUsb.inf** driver and click **Open**.
11. Select the correct pathname for the driver and click **OK** as shown in [Figure 1-17](#).

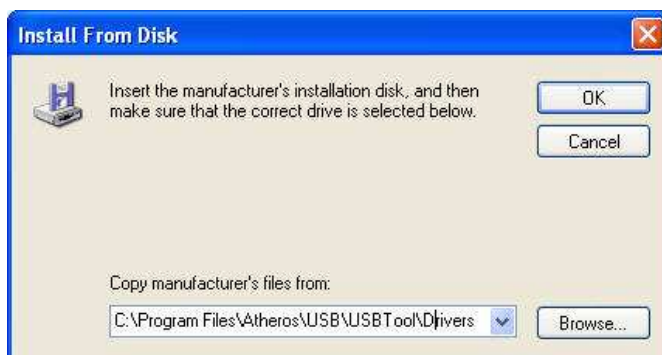


Figure 1-17. Copying the Driver

It displays another screen that allows you to select the driver. It also shows a warning that the this driver is not digitally signed.

12. Click **Next**.



Figure 1-18. Selecting the Driver from the Disk or Pathname

You will see a warning message indicating that the device that you are trying to install has not passed Windows Logo testing.

13. Click **Continue Anyway**.

The installation will be completed in few seconds.



Figure 1-19. Finishing Installation Restarting the Computer

14. Click Finish to close the wizard.
15. Restrat the computer for the new driver to take effect.

Checking the Atheros Bluetooth USB Adapter Driver

After installing the Bluetooth USB Adapter driver, you can check it and make sure it present on the Device Manager.

Do the following to check Bluetooth USB Adapter driver (in this case Atheros BtUSB Device):

1. Open the Device Manager in Windows environment **start > Control Panel > System > Hardware > Device Manager**.
2. Scroll down to **Universal Serial Bus controllers** and expand it. The Atheros BtUSB Device driver will be present as shown in [Figure 1-20](#).

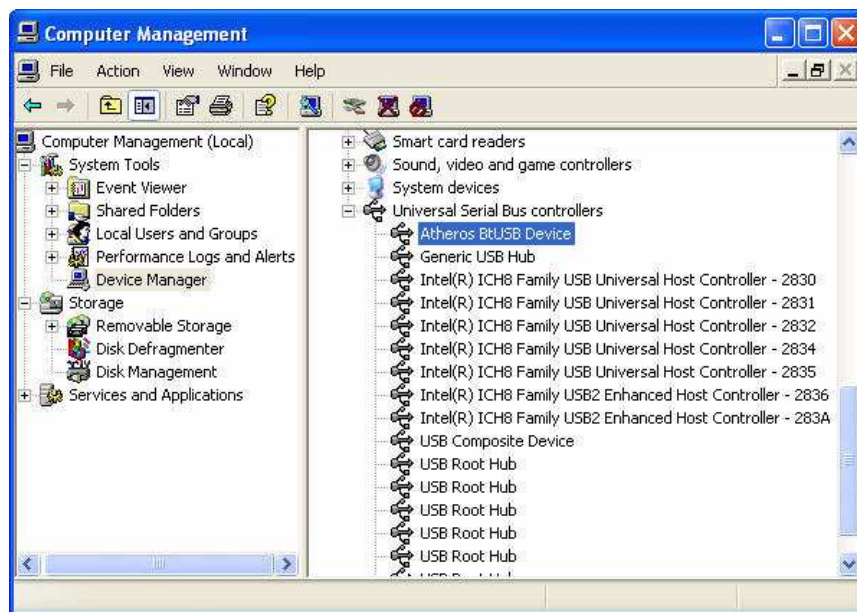


Figure 1-20. Checking the Bluetooth USB Driver Under Device Manager

3. Close the window.

You are ready to use the Atheros BtUSB tool.

Updating the Atheros BtUSB Driver

1. Open the Device Manager in Windows environment **start > Control Panel > System > Hardware > Device Manager**.
2. Scroll down to **Universal Serial Bus controllers** and expand it. The Atheros BtUSB Device will be present as shown in [Figure 1-20](#).
3. Right click on the Atheros BtUSB Device driver and choose **Update Driver**.

It displays the hardware update wizard. See [Figure 1-21](#).



Figure 1-21. Welcome to the Hardware Update Wizard

4. Follow the same steps that you took when you installed the Atheros BtUSB Device driver.

Checking Indicator LED (AR3011 USB Adapter Application Only)

For the AR3011 USB Adapter application designer can connect an LED (external driver is not needed) from pin 23 to ground; so, if the firmware is downloaded correctly and the power ON sequence is finished, then the LED will turn on. For electrical connections, please refer to AR3011 USB Adapter demo board schematic (245-01582-021) and [Figure 1-22](#) below.

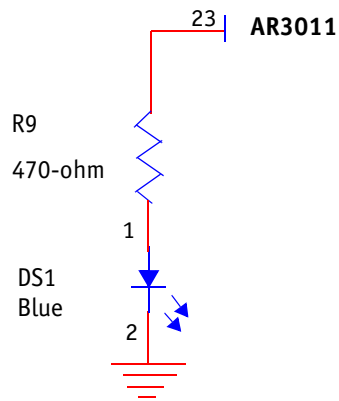


Figure 1-22. Indicator LED (AR3011 USB Adapter Application Only) Circuitry

2

Using the BtUSB Tool

This chapter describes how to launch and use the BtUSB Tool.

Launching the BtUSB Tool Software

It is assumed that you have already downloaded the BtUSB Tool software.

To launch the software, do the following:

1. Insert the USB Bluetooth Adapter into your system's USB port.
2. Go to the folder where you installed the Atheros BtUSB tool and double click on **BtUSB** icon.

It launches the software and displays the BtUSB welcome screen with Window command line interface. It also shows the software version, for example, BtUSB_V1_0_B4. See [Figure 2-1](#) for details.

At this point you are ready to use the software.

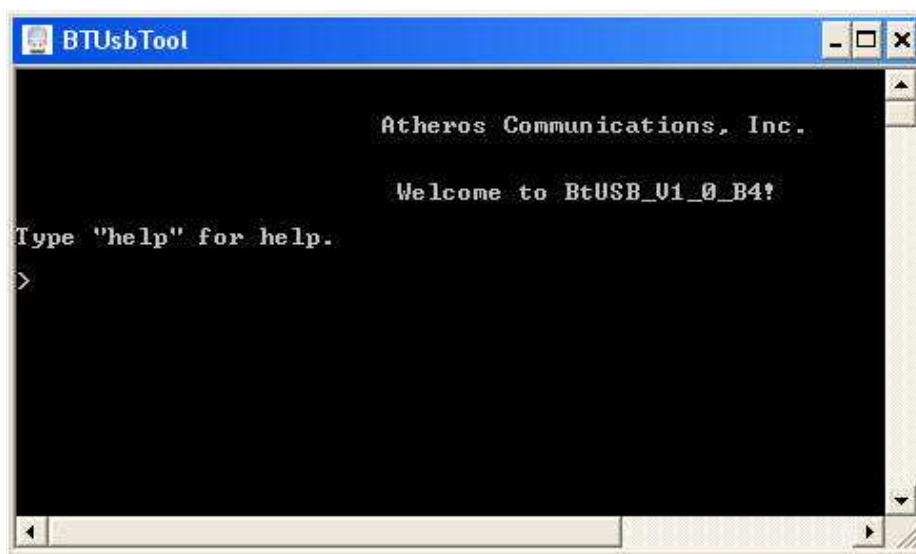


Figure 2-1. BtUSB Welcome Screen

NOTE: V1_0_B4 is the revision number. This is subject to change.

3. Enter the help command to list available commands.

>help

It displays the screen shown in Figure 2-2.

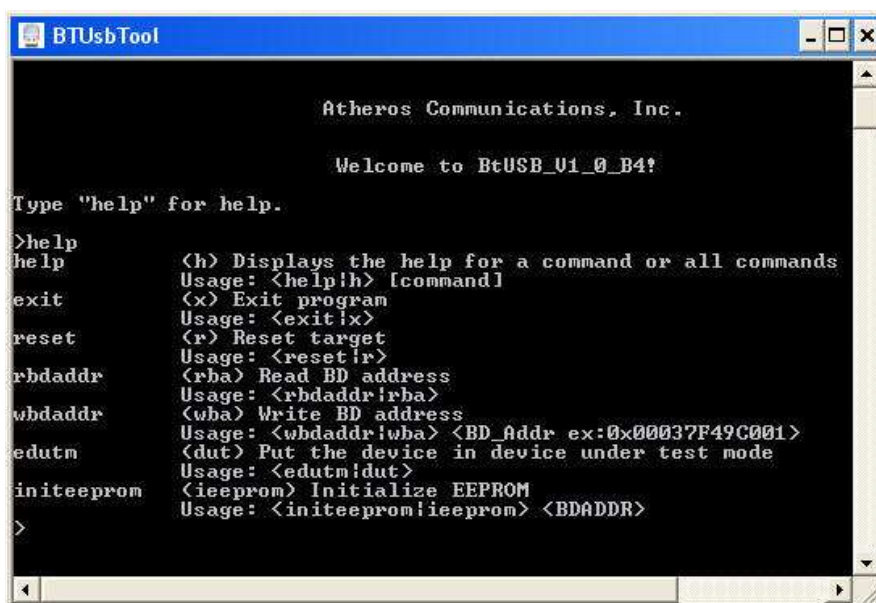


Figure 2-2. BtUSB Help Screen

You can execute any of the commands shown above.

Executing BtUSB Commands

Getting Help

Enter the help command to list available commands.

It displays all the commands available. You can also look for help for a particular command as shown below.

Usage:

```
> help <command>
```

Reading the BD Address

Enter `rbdaddr` or `rba` at the command prompt to see the BD address of the AR3011:

Usage:

```
> rbdaddr
```

Setting a new BD Address

By entering `wbdaddr` or `wba` at the command prompt, you can write a BD address to the AR3011 external EEPROM. Note, the BD address must be in HEX digits and 12 nibbles long. The BD address can be entered after the prompt, as `0XXXXXXXXXXXX` (i.e., `0x00037f402037`) or `XXXXXXXXXXXX` (i.e., `00037f402037`). If the BD address is not entered correctly per the stated format, the BD address will not be accepted, and you will receive an error message (for example, `ERROR: Syntax "wba 0x00037F49C0xy" - all 6 bytes`). Thus, you must re-enter the BD address in the specified format. Enter the following command to change the Bluetooth Device address:

Usage:

```
> wbdaddr <BD_Addr>
```

Enabling Device Under Test Mode

By entering the `edutm` or `dut` command at the command prompt, you put the AR3011 in DUT mode. Thus, a BT tester can be used with the AR3011 USB device to perform RF tests. Enter the following command to put the Bluetooth Device under test which puts the BD under DUT mode and makes is ready for RF testing:

Usage:

```
> edutm
```

Initializing EEPROM

NOTE: If you have already burnt the latest Atheros image on the EEPROM before placing on the final AR3011 USB design, then execution of this command is optional.

By typing `initeeprom` or `ieeprom` at the command prompt, the AR3011 onboard flash software image formats and initializes a blank external EEPROM on the AR3011 USB Adapter. During the process, you are asked to enter a BD address. Note, the BD address must be in HEX digits and 12 nibbles long. The BD address can be typed in, after the column, as `0XXXXXXXXXXXX` (i.e. `0x00037f402037`) or `XXXXXXXXXXXX` (i.e. `00037f402037`). If the BD address is not entered correctly per specified format, the BD address will not be accepted, and you will receive an error message (for example, `ERROR: Syntax "wba 0x00037F49C0xy" - all 6 bytes Fail`). So, in this case, you must restart the `initeeprom` or `ieeprom` command again. Enter the following command to EEPROM which is present on the Bluetooth Adapter:

Usage:

```
> initeeprom <BDADDR>
```

Resetting the Target

NOTE: This command is optional because, when the AR3011 USB Adapter is powered up, it automatically resets.

Enter `reset` or `r` at the command prompt to reset the AR3011 to an initialized state except for the AR3011 USB interface.

```
>reset
```

Initiating the Master_Blaster Mode

Starting with BtUSB_v1_0_b5 release, a "master blaster" mode has been added where the Atheros Bluetooth device is put under an Atheros proprietary mode in which various types of packets can be transmitted without establishing any Bluetooth link. This is quite useful for testing and board tuning.

By typing `master_blaster` or `mb`, the master blaster shell is presented where you can make the following selections :

- Test Mode (Data pattern : 0101, 11110000, 0000, 1111, PRBS, ...) [use key m]
- Enable/disable hopping [use key h]
- TX channel (once hopping is disabled) [use key t]
- RX channel (once hopping is disabled) [use key r]
- Packet Type (DH1, DH3, DH5, 2DH1, .., 3DH5, ..) [use key p]

- Packet Length (DH1, DH3, DH5, 2DH1, .., 3DH5, ..) [use key l. Enter size in bytes]
- Transmit Power Level [use key o]
- Set BDAAddr [use key a]

Once all the parameters have been set to the desired value, press the 'e' key to enable the transmission. If you need to change parameters in the middle of transmit, use any key to stop transmission and make new selection.

Get_ID

By typing `get_id` or `id`, you can obtain useful information to identify the type of chip, firmware build version, radio init, sysconfig version and content information.

Reading the IVT LicenseKey

This command returns the IVT license key stored in EEPROM.

Usage:

```
>rivtkey
```

or

```
>rivt
```

Writing the IVT LicenseKey

Programs the IVT license key to EEPROM.

Usage:

```
>wivtkey <KEY>
```

or

```
>wivt <KEY>
```

Exporting the Contents of EEPROM to a File

Dumps the content of the EEPROM to a file.

Usage:

```
>expeeprom <FILE_NAME>
```

or

```
>exp <FILE_NAME>
```

Importing the Contents of the Given File to EEPROM

Programs the EEPROM with the content from the customer specified image file.

Usage:

```
>impeeprom <FILE_NAME>
```

or

```
>imp <FILE_NAME>
```

Comparing the Contents of EEPROM and File

Compares the content of EEPROM with a sample image.

Usage:

```
>compeeprom <FILE_NAME>
```

or

```
>comp <FILE_NAME>
```

Formatting the EEPROM

Cleans all the settings stored in EEPROM

Usage:

```
>format_eeprom
```

or

```
>format
```

Reading the Subsystem ID

Returns the Subsystem ID stored in EEPROM.

Usage:

```
>read_subsysid
```

or

```
>rssid
```

Writing the Subsystem ID

Programs the Subsystem ID stored in EEPROM.

Usage:

```
>write_subsysid <SUBSYSID>
```

or

```
>wssid <SUBSYSID>
```

Reading the Subvender ID

Returns the Subvender ID stored in EEPROM.

Usage:

```
>read_subvenid
```

or

```
>rsvid
```

Writing the Subvender ID

Programs the Subvender ID stored in EEPROM.

Usage:

```
>write_subvenid <SUBVENID>
```

or

```
>wsvid <SUBVENID>
```

Reading the PID & VID

Returns the Product ID and Vender ID prompted by OS.

Usage:

```
>read_pidvid
```

or

```
>rpvid
```

Writing the PID to an Image File

Program the Product ID stored in the firmware binary image file.

Usage:

```
>wimagepid <PID>
```

or

```
>wipid <PID>
```

Writing the VID to an Image File

Program the Vender ID stored in the firmware binary image file.

Usage:

```
>wimagevid <VID>
```

or

```
>wivid <VID>
```

Reading the PID From an Image File

Returns the Product ID stored in the firmware binary image file.

Usage:

```
>rimagepid
```

or

```
>ripid
```

Reading the VID from an Image File

Returns the Vendor ID stored in the firmware binary image file.

Usage:

```
>rimagevid
```

or

```
>rivid
```

Exiting BtUSB

Enter `exit` or `x` at the command prompt to close the BtUSB program.

```
>exit
```


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Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device is intended only for OEM integrators under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna, As long as the condition above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that the condition can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

The final end product must be labeled in a visible area with the following: "Contains FCC ID: PPDT77H056".

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Industry Canada Statement

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions:

- 1) this device may not cause interference and
- 2) this device must accept any interference, including interference that may cause undesired operation of the device

IC Radiation Exposure Statement:

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. To maintain compliance with IC RF exposure compliance requirements, please follow operation instruction as documented in this manual.

This device is intended only for OEM integrators under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna.

As long as conduction above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the IC authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate IC authorization.

End Product Labeling

The final end product must be labeled in a visible area with the following: "Contains TX IC : 4104A-T77H056".

Manual Information That Must be Included

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove.

This RF module in the user's manual of the end product which integrates this module.

The user's manual for OEM Integrators must include the following information in a prominent location "IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements. The antenna must not be co-located or operating in conjunction with any other antenna or transmitter".

NCC 警語 :

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

本模組於取得認證後將依規定於模組本體標示審合格籤，並要求平台上標示「本產品內含射頻模組：ID編號」



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