

UWB PCIe Express Mini Card Users Guide

Version 0.1

UWB PCIe Express Mini Card Users Guide

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Regulatory Notices

This device complied 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.

THIS DEVICE MUST BE INSTALLED IN A LOCATION THAT IS NOT ACCESSIBLE TO THE GENERAL PUBLIC. INSTALL THE DEVICE SO THAT THE ANTENNA IS MORE THAN 20 cm FROM UNSUSPECTING PERSONNEL. FAILURE TO INSTALL THIS DEVICE AS DESCRIBED WILL RESULT IN A FAILURE TO COMPLY WITH FCC RULES FOR RF EXPOSURE AND IS DISCOURAGED. ONLY ANTENNAS APPROVED WITH THE DEVICE MAY BE USED. THIS DEVICE MAY NOT BE CO-LOCATED WITH OTHER TRANSMITTERS WITHOUT FURTHER APPROVAL BY THE FCC.

This device complied with 47CFR15.519(a)(1) of FCC Rules.

47CFR15.519(a)(1)

A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgement of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

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Introduction

This document outlines how to install the WiQuest USB drivers and software of the UWB PCIe Express Mini Card.

One of the most important parts of this document is the driver and software installation procedure. Make sure to follow the step-by-step procedures. These procedures are proven to work. If followed, the setup, installation, and evaluation will go smoothly.

1 Features

The UWB PCIe Express Mini Card Reference Design allows for flexibility, quick prototyping, and easy integration into existing or new embedded platforms.

The package also includes Windows-based USB drivers and a diagnostic utility which allows users to evaluate transmitter PSD and to test overall transceiver performance.

1.1 Hardware Features

The USB Adapter includes the following hardware features:

- Integrated, high-speed, 480Mbps, Type A female Universal Serial Bus (USB) 2.0 interface
- WiMedia standard data rates from 53.3 and 480 Mbps
- WiQuest extended data rate of 1024 Mbps
- USB bus powered
- Integrated antenna
- USB adapter enclosure

1.2 System Requirements

The Toshiba WQST100 drivers and software require the following minimum system configuration

- Platform: 750 MHz PC
- Media Reader: CD-ROM
- Operating System: Windows XP

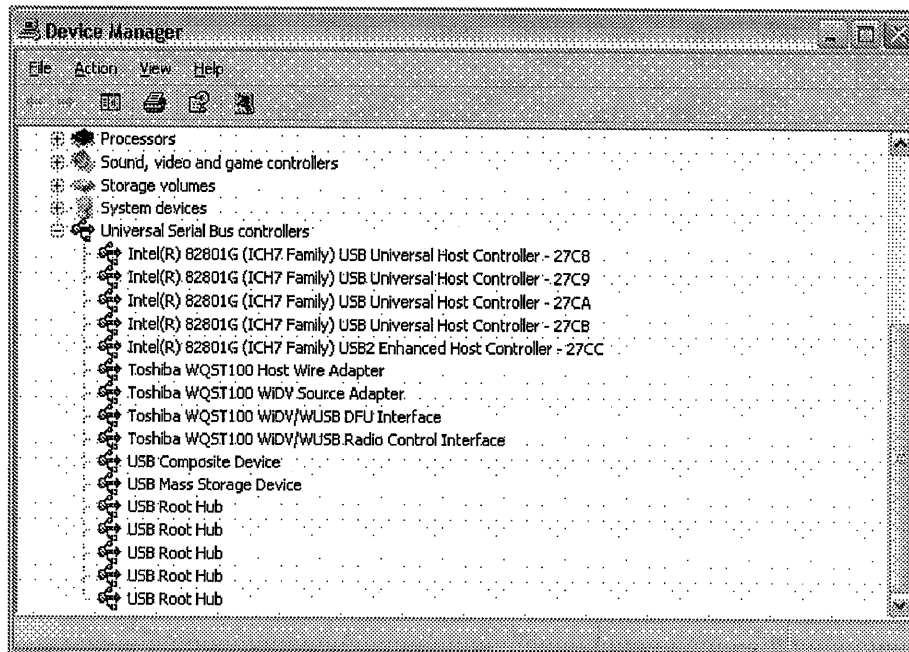
2 Installing the Driver and Software

First, install the software and drivers. After installing the software and drivers, connect the hardware.

2.1 Installing the Driver

NOTE: From a driver perspective, the USB Adapter represents four separate and unique USB devices. At least two drivers must be installed on the PC. The installed driver is tied to a PC's particular USB port, so you will need to install the drivers for each port where the USB Adapter might be installed.

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2.2 Installing the USB Drivers and the EVK Control Center (ECC)

Step 1

From the CD, run the SetupSSp-toshiba.exe.

Once the file is executed the user is prompted to select a language option as shown in Figure 3 - Select Setup Language. Click "OK" once a language for the installer has been selected.

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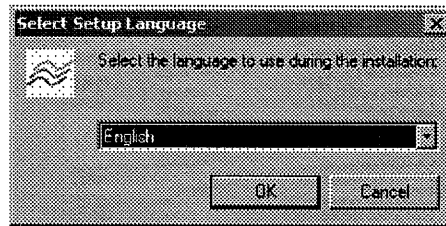


Figure 3 - Select Setup Language

Step 2

The WiQuest EVK Control Center Setup wizard will start as shown in shown in Figure 4 - Setup - WiQuest EVK Control Center.

Note: It is recommended that all user applications be closed while running the install shield; this will ensure that any open work is not unexpectedly closed or destroyed.

Click "Next" to continue with the install process.

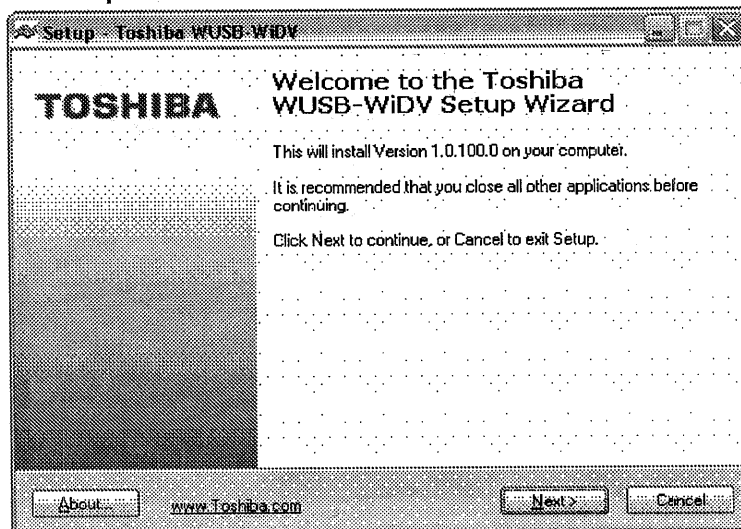


Figure 4 - Setup

Step 3

Read and accept the license agreement as shown in Figure 5 - Accept License Agreement.

Once the "I accept the agreement" radio button is selected, click "Next" to continue the setup.

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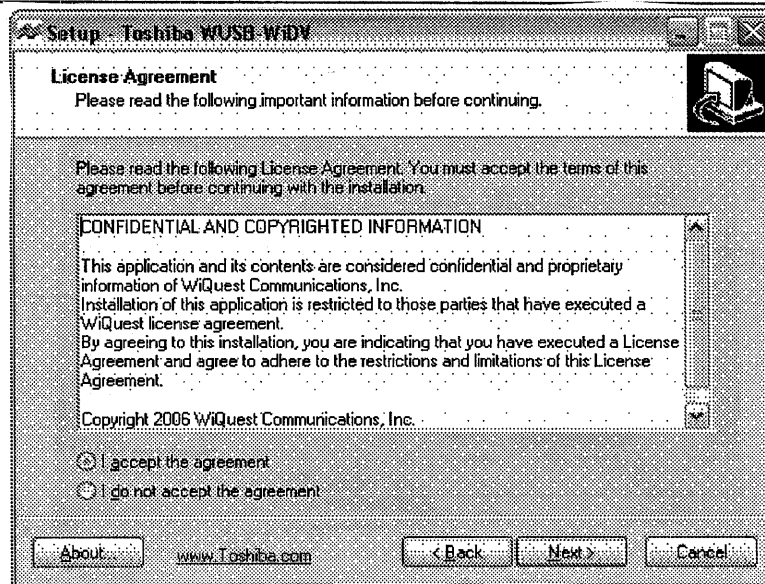


Figure 5 - Accept License Agreement

Step 4

An information window is shown with instructions for this installation. Follow the instructions and click "Next" to continue the install process.

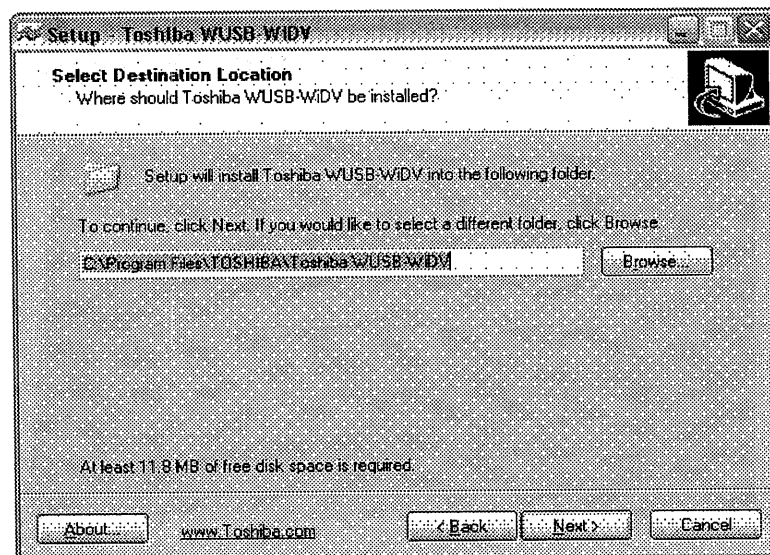


Figure 6 - Information Window

Step 5

The install wizard allows you to select where to install the WiQuest EVK Control Center and driver files. If desired, change the installation directory and click "Next" to continue the installation.

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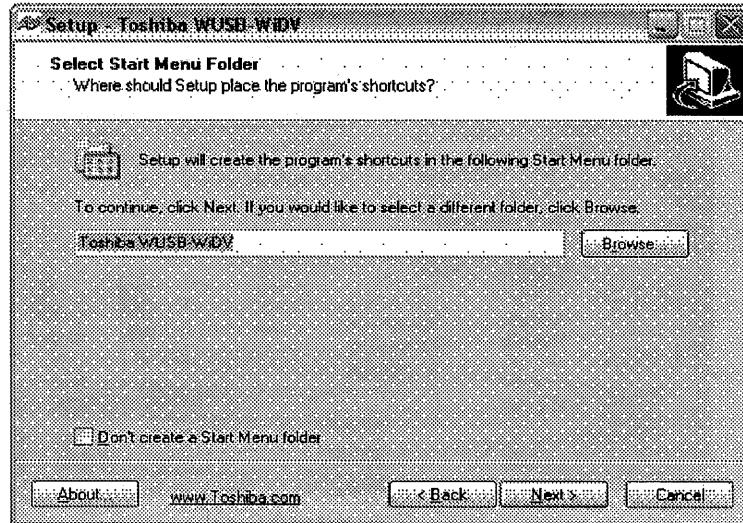


Figure 7 - Select Destination Location

Step 6

Next, the wizard will ask you to select whether you want to install the Application, Drivers, or Both. It is recommended that you install both at this time. Select "Control center application and drivers" as shown in Figure 8 - Select Components and click "Next" to continue the installation.

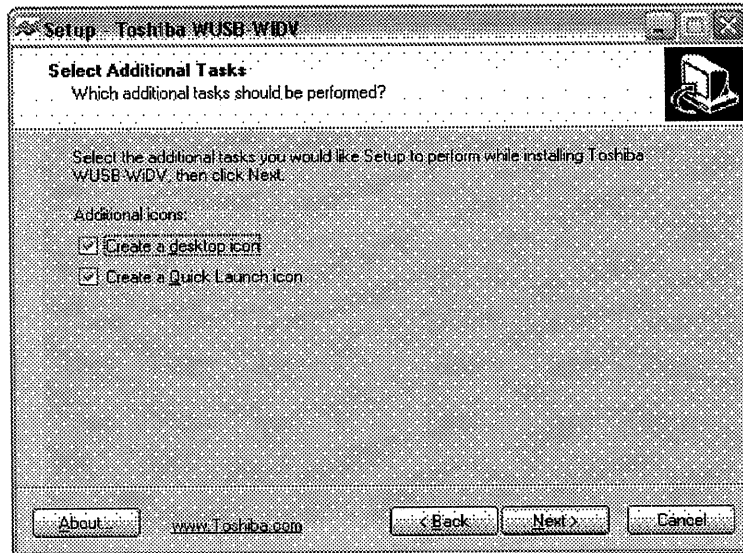


Figure 8 - Select Components

Step 7

The install wizard allows you to create desktop and quick launch icons. The desktop and quick launch icons will allow the user to quickly start the ECC application. Select both and click "Next" to continue.

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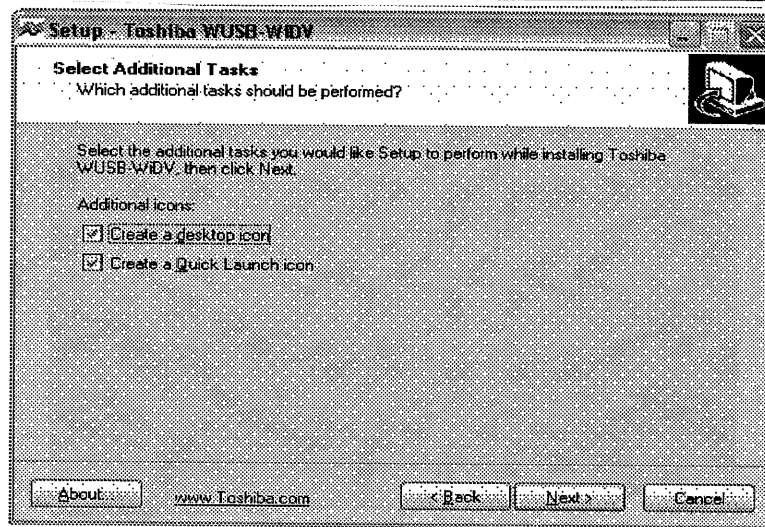


Figure 9 - Select Additional Tasks

Step 8

The next window shows the destination location for the installation, as well as the components and installation tasks indicated in the previous steps. Verify the selections. If they are correct, click "Install" to install the selected items; otherwise click the "Back" button to correct any mistakes.

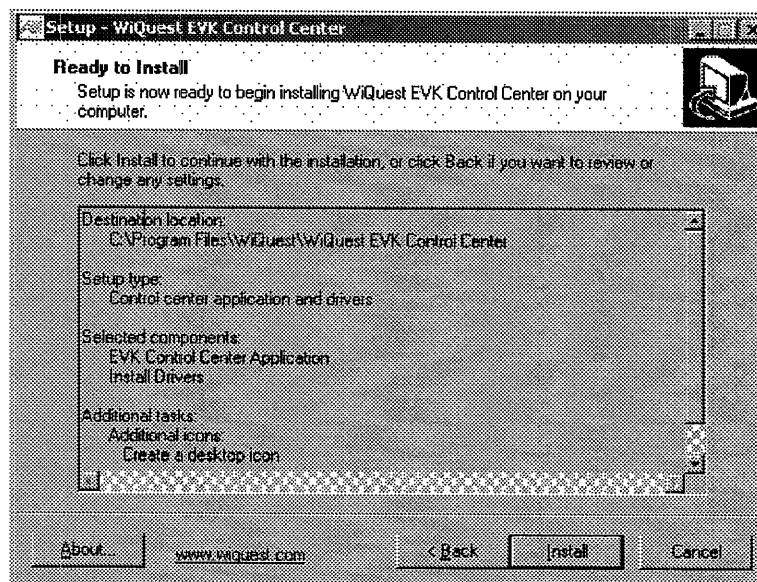


Figure 10 - Ready to Install

The installer will now install the application and copy the necessary drivers to the installation directory. This may take a few minutes.

Step 9

Once the driver has finished installing the EVK Control Center, click "Finish" to exit the installer.

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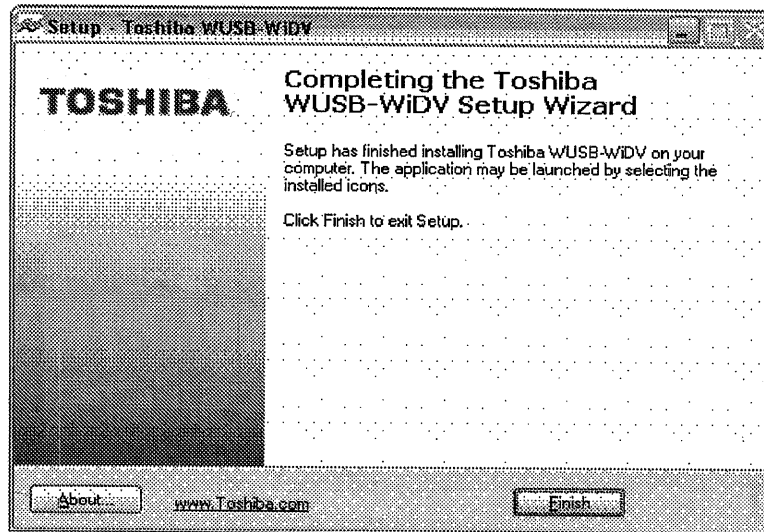


Figure 11 - Click Finish to exit the installer.

2.3 Connect the UWB PCIe Express Mini Card hardware

After installing the drivers and software, it is now time to install the hardware. Restart the PC.

The PC will make a sound indicating the detection of new hardware and will display a dialog box for installing the new hardware.

Select "No, not this time" if it asks to connect to live update for the driver. Click "next" to continue.



Figure 12 - Select No, not this time.

Select "Install from a list or specific location (Advanced)" when it says insert the cd or floppy disk. Click "next" to continue.

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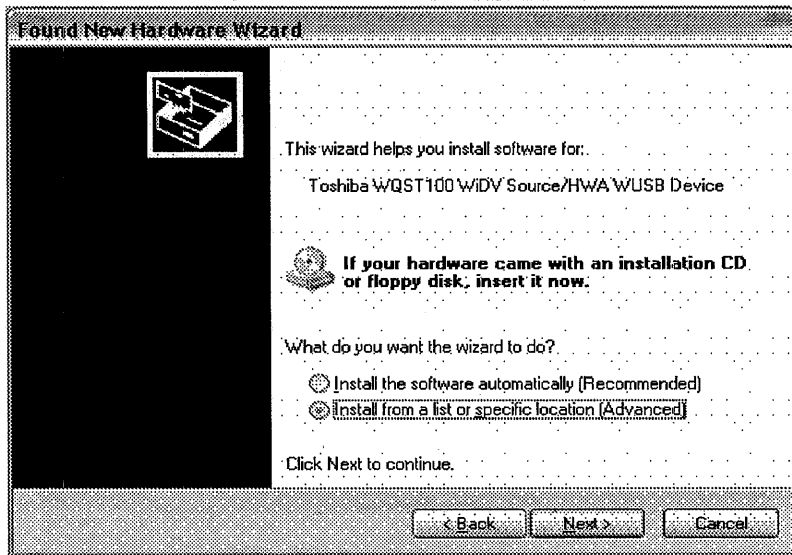


Figure 13 - Install from a list or specific location

Select “Don’t search. I will choose the driver to install” when it asks you to choose your search and installation options. Click “next” to continue.

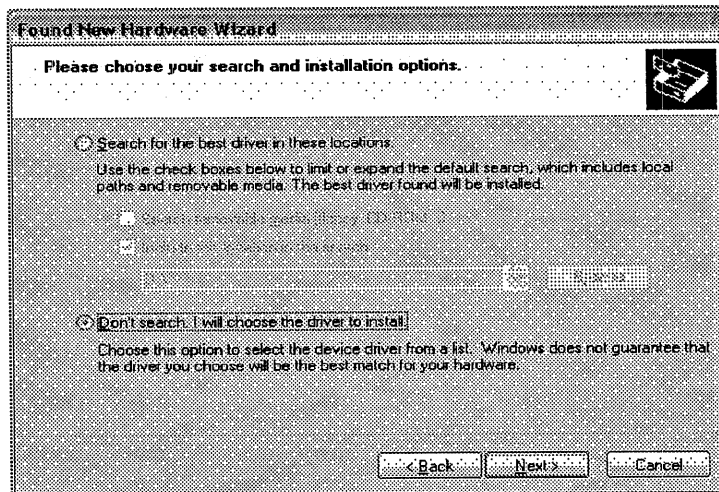


Figure 14 - Don't search, I will choose the driver to install

Click “Have Disk” when asks you to select the devices driver you want to install.

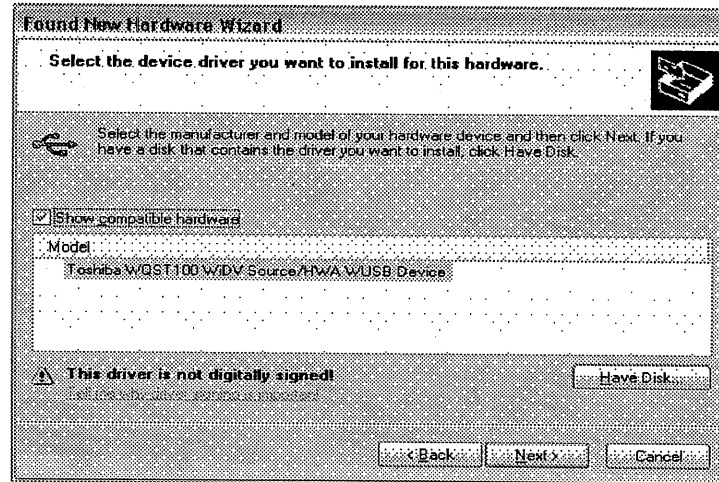


Figure 15 - Click “next”

When it says “Completing the Found New Hardware Wizard,” select “finish.”

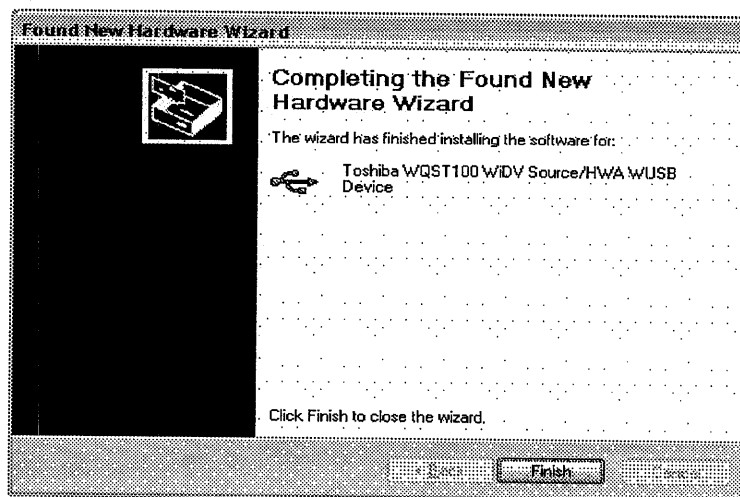


Figure 19 - Click finish to complete installing the driver

The driver is installed according to a procedure similar as for the following devices.

- Toshiba WQST100 WiDV /WUSB Radio Control Interface
- Toshiba WQST100 Host Wire Adapter
- Toshiba WQST100 WiDV /WUSB DFU Interface

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It is recommended that you reboot at this time. This may not be required, but could be in some situations.

NOTE: The first time you use EVK control center, windows may detect a new driver, select the driver directory in the installation directory if this occurs. (Default is: C:\Program Files\WiQuest\WiQuest EVK Control Center\driver)

3 EVK Control Center (ECC)

The EVK Control Center (ECC) allows the user to perform the following:

- Transmit/receive data packets at several Modulation / Data Rates – Requires radio control driver

As previously stated, when you run the radio functions the first time, you may be prompted to install the appropriate driver. If Windows does not automatically find the correct driver, you may direct the new hardware wizard to find the driver in the driver

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directory in the directory you chose to install the test app in (if you kept the default location, it is: C:\Program Files\WiQuest\WiQuest EVK Control Center\driver).

3.1 Running the EVK Control Center Application

Double-click the “WiQuest EVK Control Center” icon on your desktop, or select Start -> All Programs -> WiQuest EVK Control Center -> WiQuest EVK Control Center to start ECC.

3.2 Select the Host Interface

Once the EVK Control Center has started, select “Target”, “Host Interface” and click on “USB”. This will ensure that the USB interface is used. See Figure 20 for details.

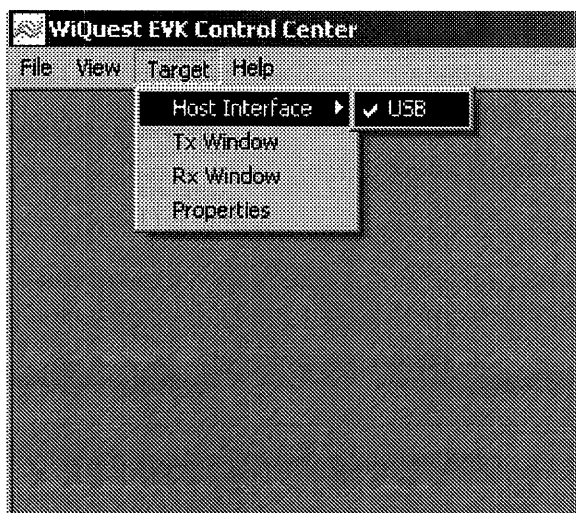


Figure 20 – Target Menu

3.2.1 Select the Device Identifier (Address) and Time Frequency Code

EVK Control center supports changing the Device Identifier and Time Frequency Code (TFC#). Select Target -> Properties from the main window to see current setting and to change it.

By default, most units are configured with a device identifier of “café” and a TFC of 6. To change the TFC, type in the desired value and click apply. (Note: TFCs 1 through 7 are supported. The Device Identifier is a four digit hexadecimal number.) Click the “X” button to close the Device Settings window.

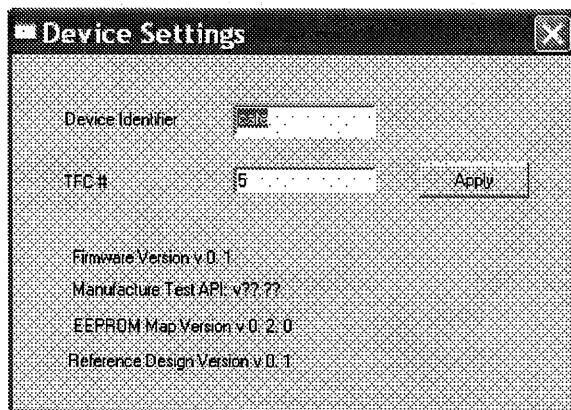


Figure 21 - Device Settings, TFC, Device Identifier

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3.2.2 Receive Window

The receive window displays information on all received packets.

Figure 23 illustrates the features and functions of the Receive Window.

The receive window is split up into different sections. The multiple receive stream window provides details on the current receive stream. The system statistics section provides detailed statistics on the selected receive stream and for the entire system. By default the receive stream is 0.

NOTE: TWO WQST devices are required to do receive testing. One for transmit, and one for receive. The drivers must be installed on separate PCs – two PCs are required as well.

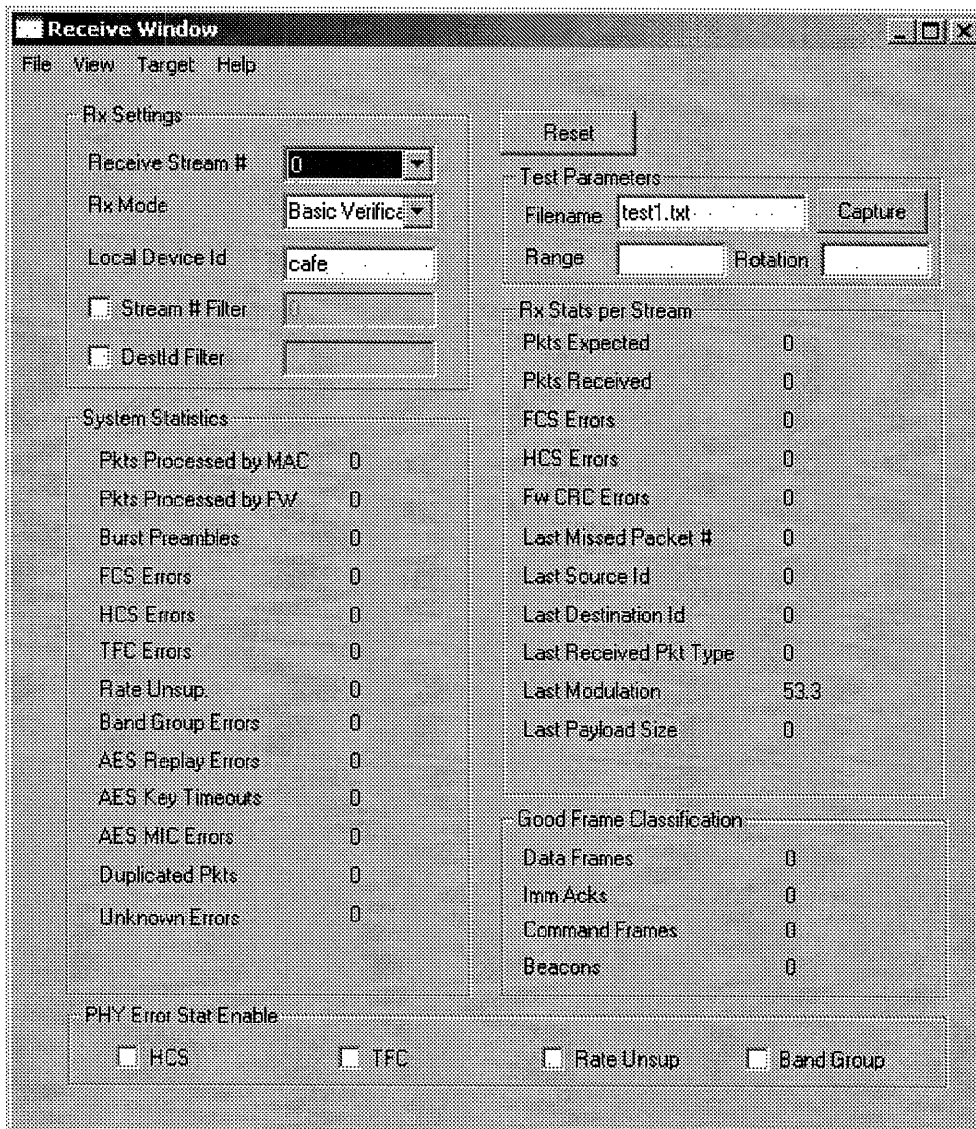


Figure 23 - Receive Window

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RX Settings

1. Receive Stream # - The active receive stream number.
2. Rx Mode - For the selected receive stream, the receiver can be placed into different verification modes.
 - a. Basic Verification - All received frames have their FCS value verified.
 - b. Fw CRC Verification -All received frames have their firmware computed checksum verified. This is in addition to the basic verification.
3. Stream # Filter - For the current selected stream, frames can be filtered in by the transmit stream number. All received data frames that are from the specified transmit stream # are classified to the current selected receive stream.
4. Destination Id Filter - For the current selected stream, frame can be filtered in by the 16-bit destination identifier. All received data frames with the specified destination Id are classified to the selected receive stream.

System Statistics

This section displays errors for the entire system. The exceptions are:

- Pkts processed by MAC - Number of received frames that the WQST100 sees.
- Pkts processed by FW - Number of received frames that the test firmware sees.
- Burst Preamble - Number of received frames with a burst preamble.

Stream Statistics

Displays statistics for the selected receive stream, including information from the MAC header, payload size, modulation etc.

PHY Error Statistics Enable

1. HCS - Enable counting of HCS errors.
2. TFC - Enable counting of TFC errors.
3. Rate Unsupported - Enable counting of rate unsupported errors.
4. Band Group - Enable counting of band group errors.

Operational Instructions

With two PCs, each with a WQST100 , . Double-click on the “ECC” icon. To open the receive window click on “Target” and select “Rx Window”, configure the receive settings. Click “update” to clear all statistics.