WiQuest Wireless USB 4-Port Hub
OEM Evaluation Manual

Version 0.1

Wireless 4-Port USB Hub Users Guide
WQST110RDK-HUB-USB4 UG Revision 0.1, September 21, 2007

WiQuest™

CONTENTS :

Rights

Regulatory Notices

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.

CAUTION: Any changes of modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

This equipment may only be operated indoors. Operation outdoors is in violation of 47 U.S.C. 301 and could subject the operator to serious legal penalties.

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 ACCESIBLE 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.

Introduction

This document outlines how to install the WiQuest USB drivers and software of the WiQuest WQST110RDK-HUB-USB4.

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 WQST110RDK-HUB-USB4 Features

The WQST110RDK-HUB-USB4 Wireless USB Hub Reference Design allows for flexibility, quick prototyping, and easy integration into existing or new embedded platforms.

The WQST110RDK-HUB-USB4 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 Wireless USB Hub includes the following hardware features:

- Integrated, high-speed, 480Mbps, Universal Serial Bus (USB) 2.0 interfaces, 4 Type A female, 1 Type B female
- WiMedia standard data rates from 53.3 and 480 Mbps
- WiQuest extended data rate of 1024 Mbps
- 5V 3A Wall Brick powered
- Integrated antenna
- Wireless USB Hub enclosure

1.2 System Requirements

The WQST110 ECC drivers and software require the following minimum system configuration

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

2 Installing the WQST110RDK-HUB-USB4 Wireless USB Hub Driver and Software

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

DO NOT connect the WQST110RDK-HUB-USB4 until the drivers and software have been installed.

2.1 Installing the WQST110RDK-HUB-USB4 Wireless USB Driver

NOTE: From a driver perspective, the Wireless USB Hub represents two 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 Wireless USB Hub might be installed. The WQST110 Wireless USB driver will always be loaded and at least one other driver will be loaded when the EVK Control Center application is executed. The drivers installed are:

WQST110 DFU Device:

Figure 1- DFU Device Driver

WQST110 USB Test Device:

Figure 2 - WQST110 USB Test Device

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

Step 1

From the WQST110RDK-HUB-USB4 CD, run the EVKCCCCSetup.exe.

Once the "wqevksetup.exe" 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.
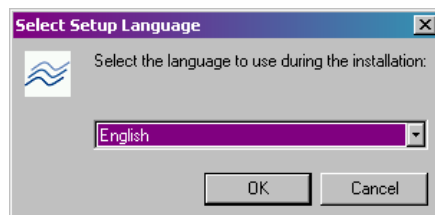
Figure 3 - Select Setup Language

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 - WiQuest EVK Control Center

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.
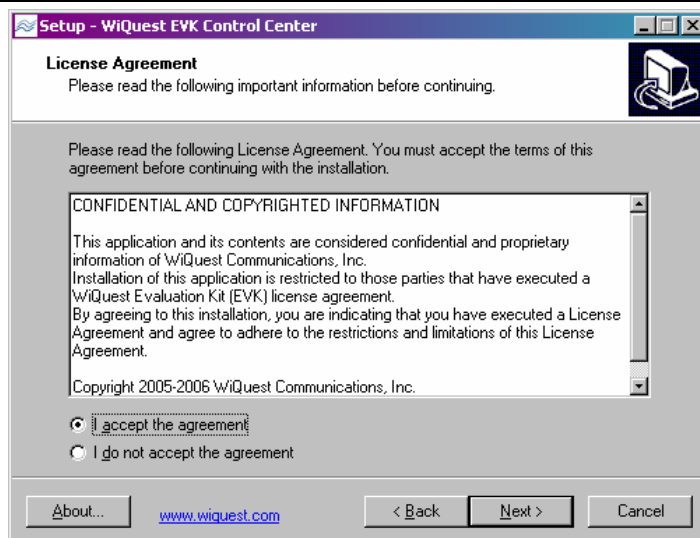
Figure 5 - Accept License Agreement

Step 4

An information window is shown with instructions for this installation. Follow the instructions and click "Next" to continue the install process.
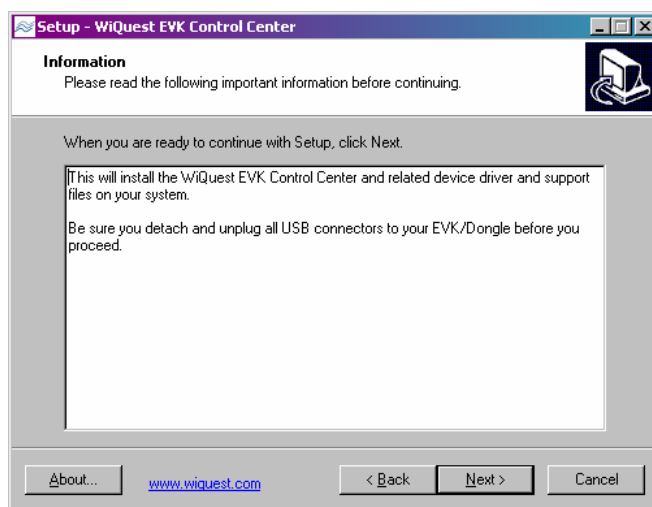
Figure 6 - Information Window

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.
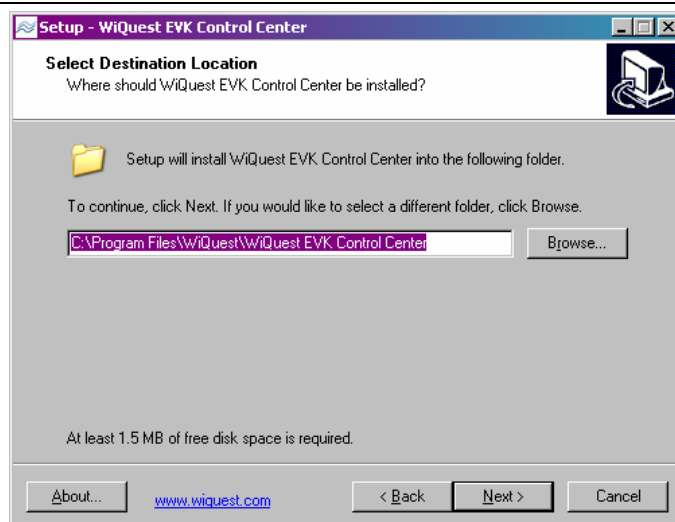
Figure 7 - Select Destination Location

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.
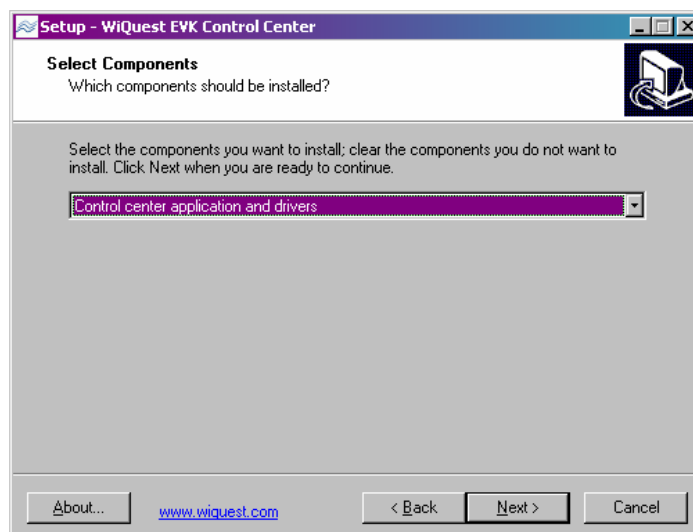
Figure 8 - Select Components

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.
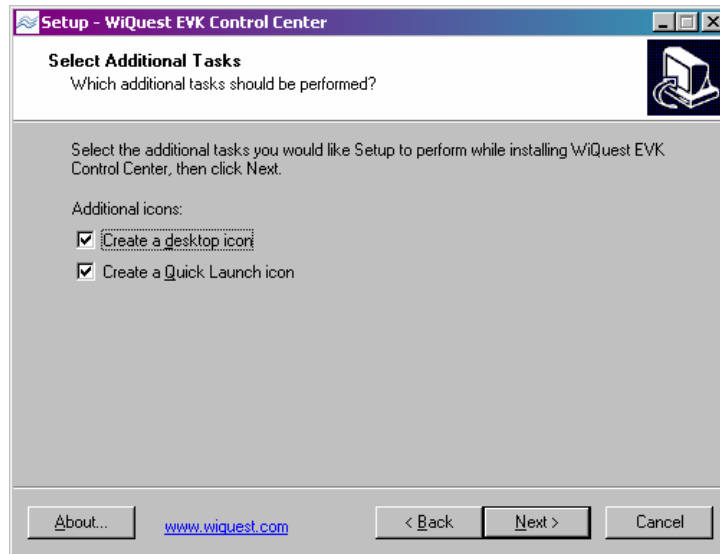
Figure 9 - Select Additional Tasks

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.
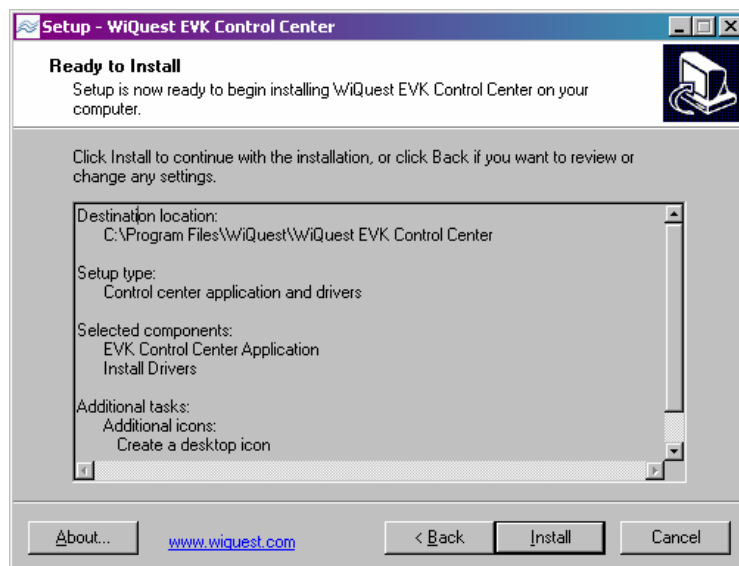
Figure 10 - Ready to Install

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.

Figure 11 - Click Finish to exit the installer.

2.3   Connect the WQST110RDK-HUB-USB4 Wireless USB Hub hardware

After installing the drivers and software, it is now time to install the hardware. Plug the WQST110RDK-HUB-USB4 into a USB port on 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.
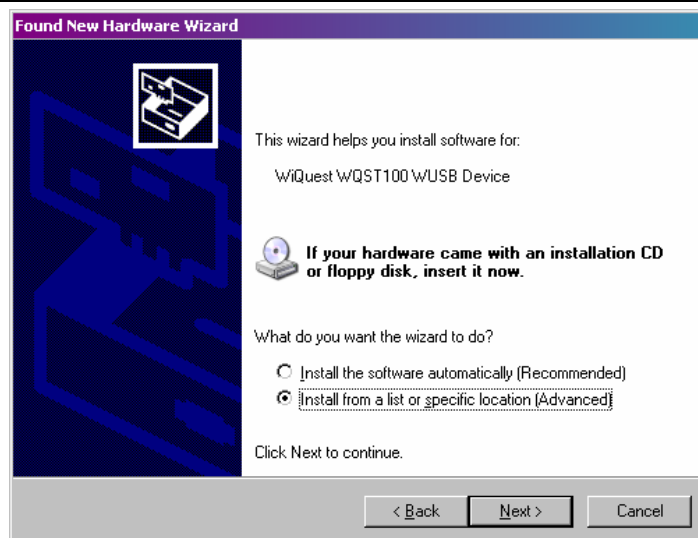
Figure 13 - Install from a list or specific location

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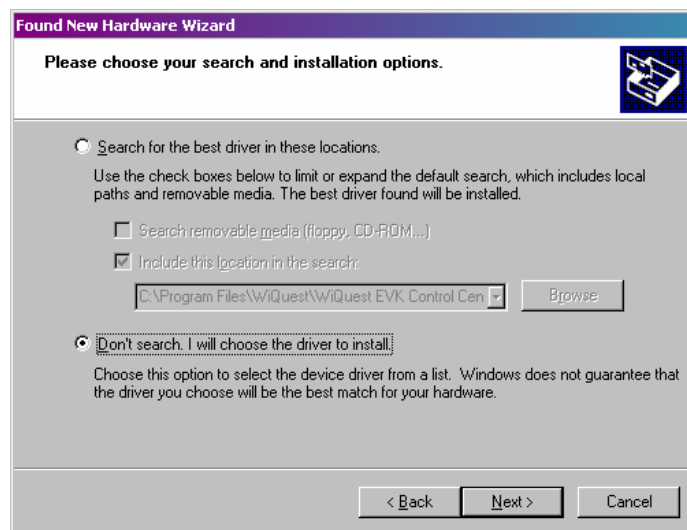
Figure 14 - Don't search, I will choose the driver to install

Click "Have Disk" when asks you to select the devices driver you want to install.
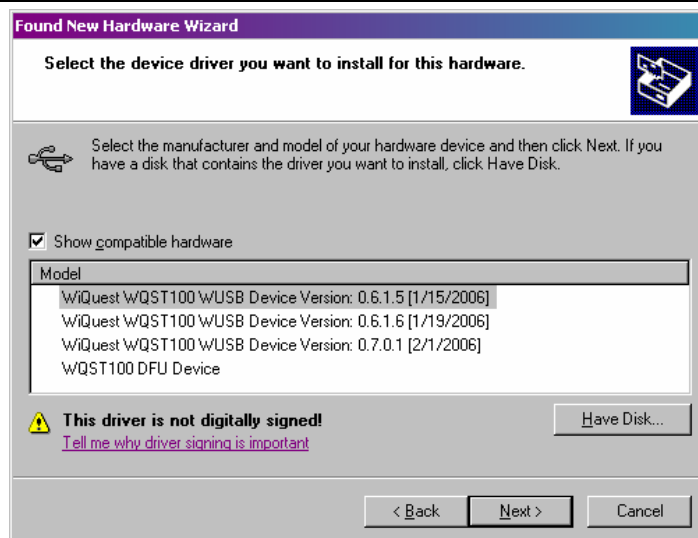
Figure 15 - Choose "Have Disk"

Select the path to the driver directory under the installation directory you chose during the installation (Defaults to: C:\Program Files\WiQuest\WiQuest EVK Control Center\driver) Click "OK" to continue.
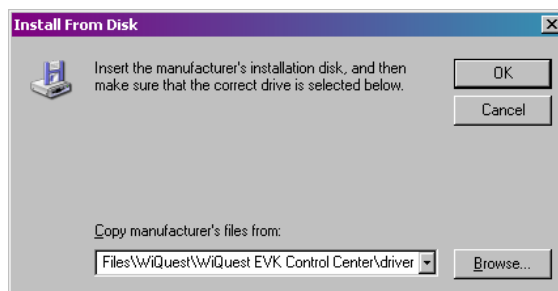
Figure 16 - Enter the path to the driver directory.

Select "WQST110 DFU Device" when it asks the 2nd time for the device driver to install. Click "next" to continue.

Figure 17 - Select WQST110 DFU Device

If it asks to overwrite a file, select click "yes."
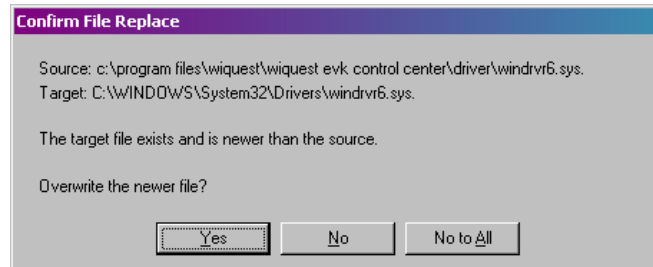
Figure 18 - Select "yes" if asked to overwrite a file

When it says "Completing the Found New Hardware Wizard," select "finish."
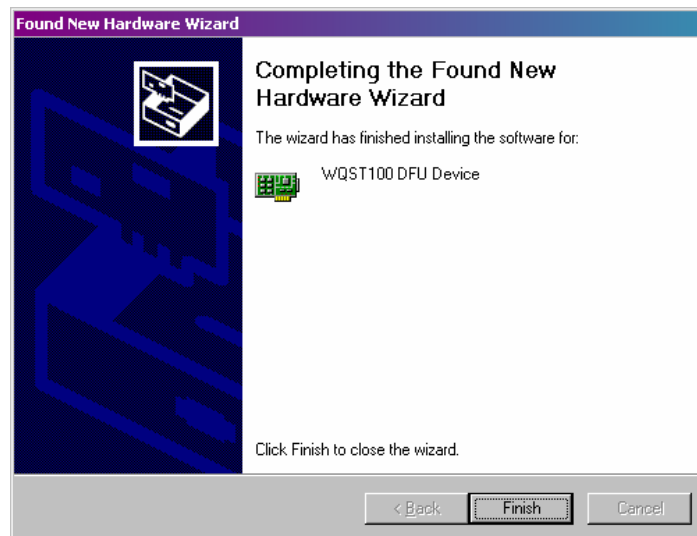
Figure 19 - Click finish to complete installing the driver

The drivers are now installed for the port the WQST110RDK-HUB-USB4 is currently connected to. If you wish to use the Wireless USB Hub on additional ports, you will have to complete this process for each port.
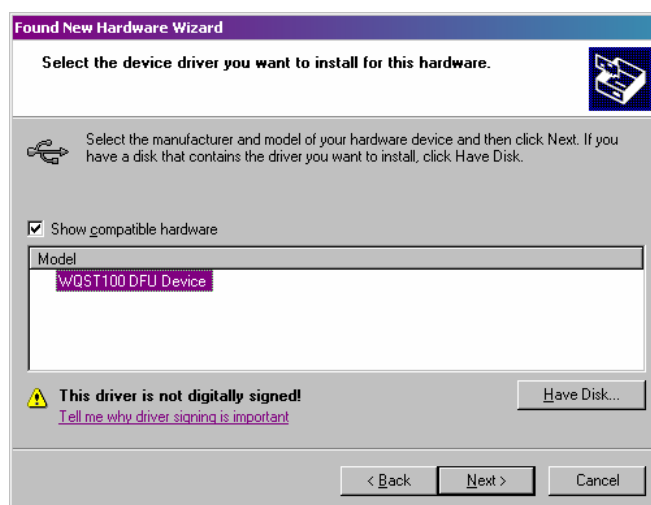
It is recommended that you reboot at this time. This may not be required, but could be in some situations.

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

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.
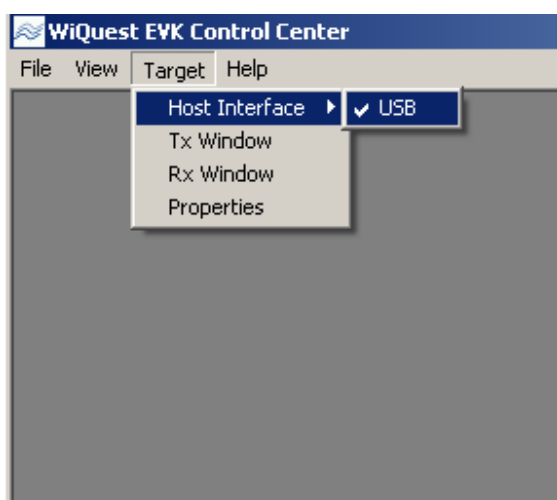
Figure 20 – Target Menu

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.
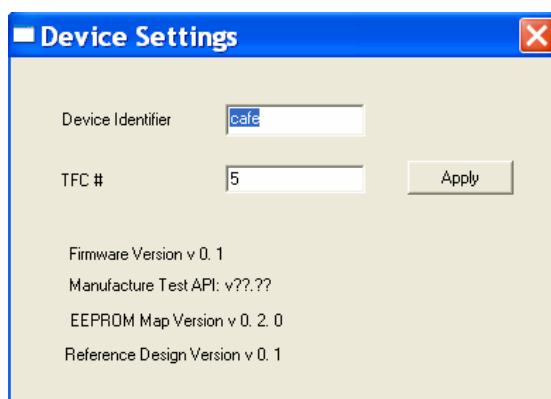
Figure 21 - Device Settings, TFC, Device Identifier

3.2.2 Transmit Window

The transmit window controls transmission of data packets from the WQST110RDK-HUB-USB4. Figure 22 illustrates the features and functions outlined below.

The transmit window is started by selecting Target -> Tx Window in the main program. (See Figure 20)
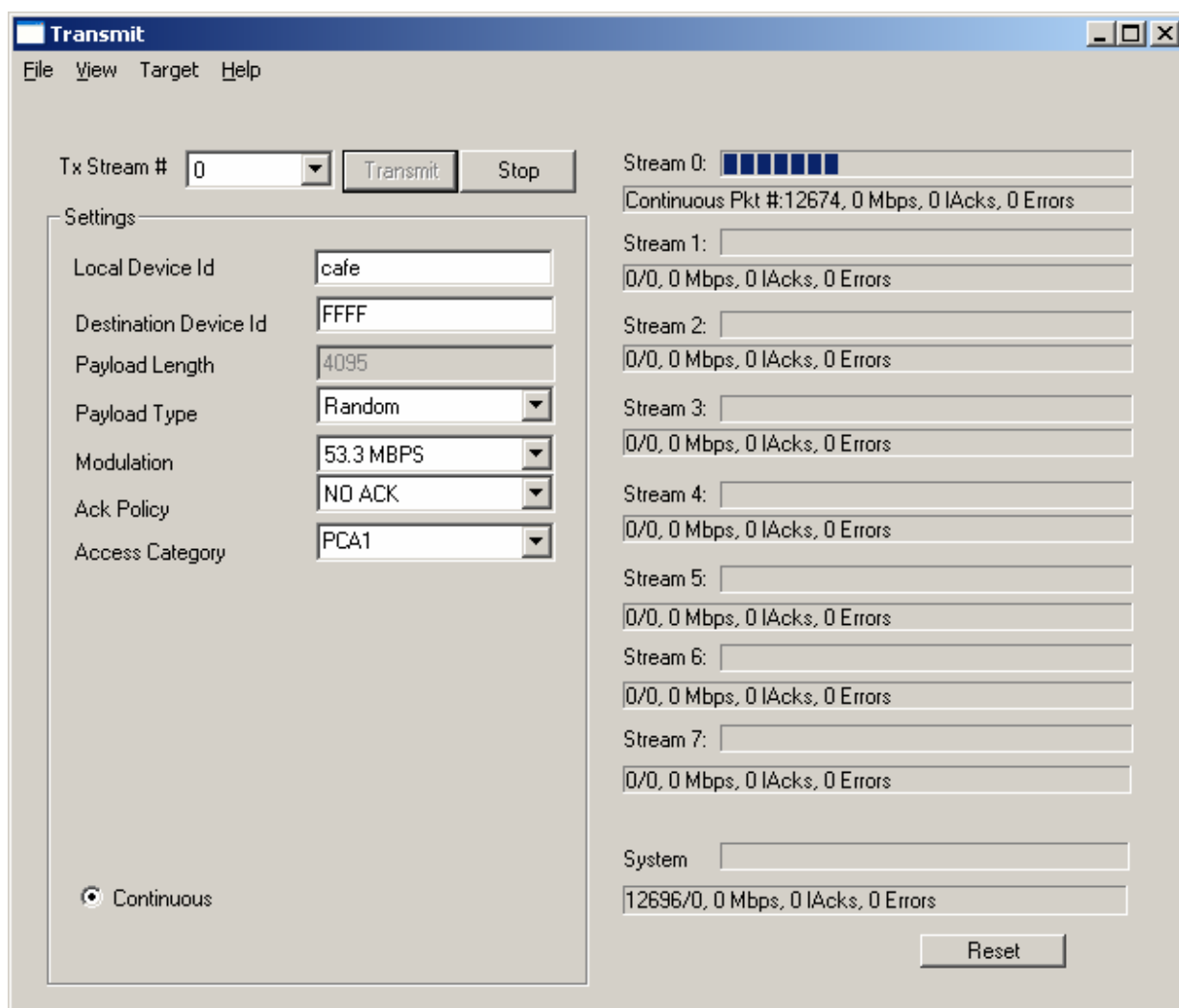
Figure 22 - Transmit Window

Transmit Configuration Options

The Transmit window provides the following options:

1. Transmit stream # - Fixed at Tx stream # 0
2. Destination Device Id - 4 byte identifier of the destination device.

    a. Use the default broadcast Id is 0xFFFF

3. Payload Length - Length of data packet to transmit is fixed at 4095 bytes.
4. Payload Type - The type of payload type is fixed at random.

5. Modulation - Physical layer transmit modulation to use for the packet. The supported modulations are as follows:
   a. 53.3 Mbps
   b. 480 Mbps
   c. 1024 Mbps

6. Ack Policy – The ack policy is fixed at "No Ack."

7. Access Category - MAC MBOA access categories. PCA1.

Transmit Modes

1. Continuous - Transmit packets with the selected settings continuously

   NOTE: Per FCC regulations, an intentional radiator may only transmit when communicating with an associated receiver. This continuous transmit mode is for evaluation purposes only.

FCC 47 CFR Section 15.517 (a)(5)

A communications system shall transmit only when the intentional radiator is sending information to an associated receiver.

In end-user applications, this is handled through handshaking, acknowledgements, negotiation of the communication channel, and other mechanisms that ensure the transmitter is active when communicating with a receiver.

Transmit Statistics

Provides feedback information on the current transmit state for each transmit stream and for the entire WQST110.

Operational Instructions

To transmit continuous pseudo-random data at 53.3Mbps, open the transmit window, select 53.3 Mbps as the modulation, and click Transmit to start the transmitter.

3.2.3 Receive Window

The receive window displays information on all received packets. If you have two WQST110RDK-HUB-USB4 devices, or another WQST110 or WQST110-based device, you can use this window to configure the receiving device (MUST BE INSTALLED ON A SEPARATE PC).

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.
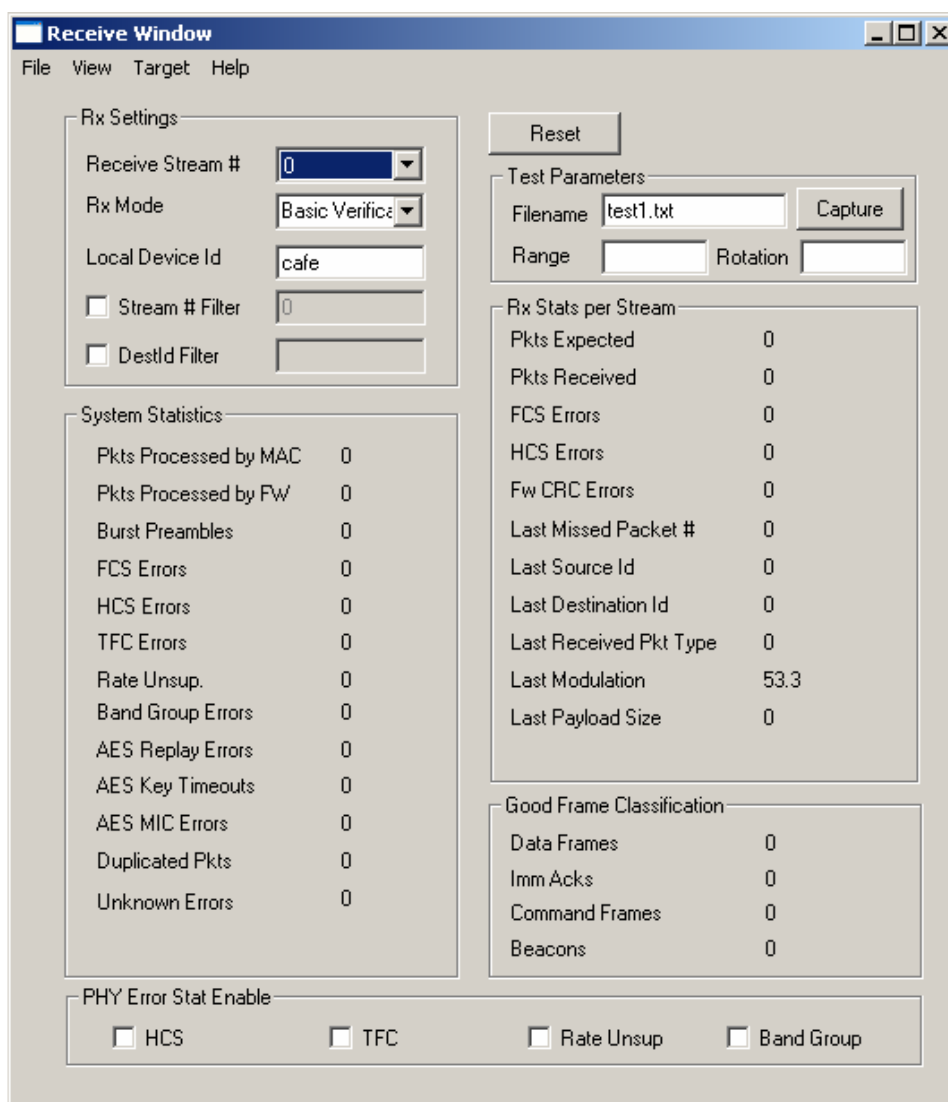

Figure 23 - Receive Window

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 WQST110 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 WQST110 HUB, 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.

4   Appendix A: Troubleshooting

Below is a list of commonly asked questions. Before calling technical support, please look through these issues to see if they help solve your problem.

4.1   The Wireless USB Hub is not functional

1. Check to see that the power LED is illuminated and that the Wireless USB Hub is installed correctly.
2. If your PC has a sound card, turn up the volume and plug in the USB cable. Do you hear an enumeration sound? If not, the USB driver is not installed correctly; it is recommended to reinstall the USB driver again.

4.2   I can't connect to the Wireless USB Hub.

1. Check to see that the power LED is illuminated and that the Wireless USB Hub is installed correctly.
2. If the LED is illuminated and the USB port is operational, check to insure that the driver is installed:
    a. On your desktop, right click on the My Computer icon and select properties, right click on hardware, and then right click on device manager. Alternatively, you can right-click MyComputer in the Start menu, or start -> run -> "devmgmt.msc".
    b. With the Wireless USB Hub connected, check to see if there is a "Jungo" device, with a "WQST110 DFU Device." If you see a Jungo icon and the WQST110 device under that icon, then the driver is installed correctly and the problem is related to the ECC application. If the Jungo icon is not displayed the problem is related to the driver, and it is recommended that you reinstall the drivers.