

WQST100 Evaluation Kit Users Guide

Version 0.4



WiQuest Communications, Inc.

WQST100UG

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WQST100 Evaluation Kit Users Guide

WQST100UG Revision 0.3, December 21, 2005



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0.1	December 7, 2005	Chris Reed	Initial Release
0.2	December 14, 2005	Chris Reed	Added additional pictures and overall clarification
0.3	December 21, 2005	Pam Johnson	Updated pictures; other minor fixes
0.4	February 1, 2006	Chris Reed	Removed the Preliminary watermark to make viewing easier Added Statement from FCC

Regulatory Notice

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.

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1 Introduction

The WQST100 **E**valuation **K**it (WQST100EVK) allows users to quickly and conveniently test and assess the capabilities and operation of the WQST100 product family, including silicon hardware, drivers, software, firmware, and diagnostics. The WQST100EVK is built with a modular design. The main EVK board includes the ultrawideband (UWB) radio subsystem, a high-speed USB 2.0 interface, power supply, and an expansion interface for optional add-on I/O cards.

This document outlines how to use the hardware and software and get the most out of the WQST100 Evaluation Kit. 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 outlined in this document. These procedures are proven to work; and if followed the setup, installation, and evaluation will go smoothly. This document also provides details on how to fully evaluate the silicon and firmware for radiated emissions compliance and interoperability.

2 WQST100EVK Features

The EVK design allows for flexibility, quick prototyping, and easy integration into existing or new embedded platforms. The EVK has a broad range of connectors and on-board test headers which allow users to evaluate and measure a variety of signals, interfaces, and other system details including antennas, RF transceiver performance, baseband processor performance, and Power Spectral Density (PSD).

The EVK ships with fully-functional application software and UWB firmware. The firmware allows the customer to perform interoperability, performance, throughput, rate / range, and packet error rate (PER) testing. The WQST100EVK package also includes Windows-based USB drivers, configuration software, and a diagnostic utility which allows customers to test each interface, perform calibration and compliance testing, and perform system throughput testing.

2.1 Hardware Features

The EVK 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 – 480 Mbps
- WiQuest extended data rates from 640 – 1024 Mbps
- Power to USB port for host wired adapter (HWA) applications
- Configurable to power the WQST100EVK via the USB bus power when configured as a device wired adapter (DWA).
- SMA antenna connector for PSD and external antenna evaluation
- UWB external reference antenna
- Firmware Configurable Parallel Interface (CPI) header to monitor all pins
- GPIO switches for control of boot modes, power, and reset
- LED indicators for status display and operational modes
- GPI expansion connector for connection to various host and device systems
- Convenient enclosure

2.2 Firmware, Software Features and System Requirements

The EVK includes the following firmware/software features:

- Convenient Microsoft Windows-based utilities for EVK configuration, monitoring and reporting
- Windows XP USB drivers and firmware *Device and host support*

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- The EEPROM is host or EVK loadable.

The WQST100EVK drivers and software require the following system requirements

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

2.3 Diagnostic Features

The EVK includes the following diagnostic features:

- Interface test routines for all standard I/O
- Calibration and compliance testing
- Functional tests
- System rate, range, and throughput performance
- TX/RX power and PSD measurements

3 Unpacking the WQST100EVK

Upon opening the WQST100EVK shipping enclosure one will find the contents laid out as shown in Figure 1.

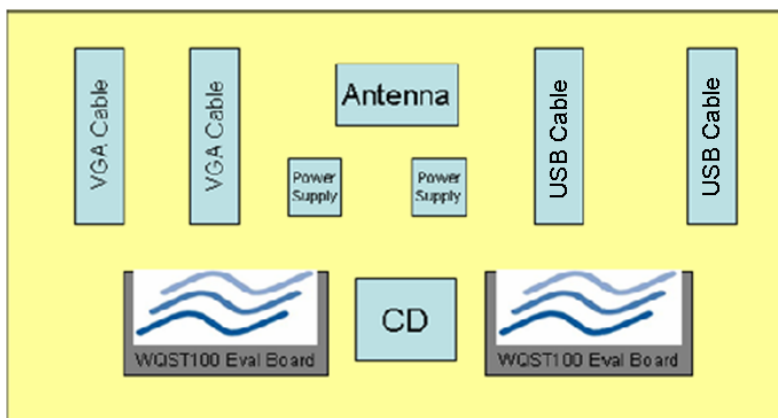


Figure 1: EVK Contents

After unpacking the WQST100EVK check to ensure you have the items listed in Table 1. If items are missing contact WiQuest immediately.

Item Description	Quantity	Note
WQST100EVK	2	
12 Volt DC universal power supply	2	
WQST100EVK CD	1	Contains drivers and the EVK Control Center application
Standard USB Type-A male, Type-B male cable	2	

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UWB antenna	1	Need to install on the board after unpacking
Quick Start Guide	1	Printed material

Table 1: EVK Contents

Then the WQST100EVK CD is installed in a Windows based PC, it should auto-load and an HTML page will automatically open to show all the different items listed in Table 2.

Item Description	Note
WQST100EVK quick start guide	This document
WQST100EVK quick start guide	A couple of pages to get the EVK up and running quickly
WQST100EVK release notes	Provides all known issues associated with the hardware
WQST100 data sheet	
WQST101 data sheet	
WQST110 data sheet	
WQST100EVK schematics	
WQST100EVK bill of material	
WQST100SSP release notes	Software support package release notes
WQST100 Software Support Package	Software support package which includes drivers, EVK Control Center application, and documentation which is automatically loaded when the wqevksetup.exe is executed.

Table 2: WQST100EVK CD contents

4 The WQST100 EVK Enclosure at a Glance

The WQST100EVK enclosure has several ports, a reset switch and one LED. Depending upon your model of EVK, your EVK enclosure may have some or all of the features listed in this section. This section of the document will cover the front and right side panels of the EVK enclosure. The back panel contains vents and the right side is blank. At the time of printing this document, the antenna is installed into the top of the enclosure; antenna installation is covered in detail later.

4.1 EVK Enclosure Front Panel Ports and Buttons

Figure 2 illustrates the front view of the WQST100EVK enclosure.



Figure 2: WQST100EVK Enclosure Front Panel

Power: The EVK requires a 12 volt DC ~200 mA power supply.

USB: The provided USB cable connects to a PC's USB port and the EVK's USB port. The EVK only supports Window's based PCs via a Jungo driver (included in the software).

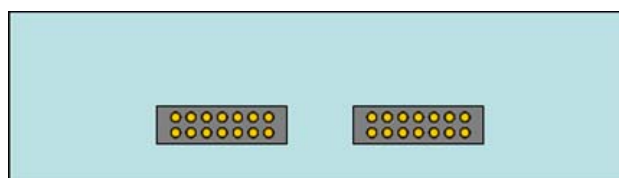
Power LED: On indicates that the power is supplied to the EVK. Off indicates that the power is not supplied properly.

Reset Button: The reset button is used to reset the EVK. The reset button is recessed and may require a pointed, non-conductive instrument to actually press the button. To reset the EVK, simply press the reset button and release.

4.2 EVK Enclosure Right Panel Ports

Figure 3 illustrates the right side view of the WQST100EVK enclosure. Figure 3 illustrates a video-source interface; the VGA connector is on the right side. This interface connects to a PC's VGA connector via a male-to-male VGA cable.

Note: The video-source port is also called a video-in port. The video-sink port is also referred to as the video-out port.



DVI

VGA

Figure 3: WQST100EVK Enclosure Right Panel

VGA: The VGA connector is a standard DB-15 female connector. For the video-source interface, the VGA connector is on the right side. For the video-sink interface, the VGA connector is on the left side.

DVI: The DVI connector is a standard female DVI-I connector. For the video-source interface, the DVI connector is on the left side. For the video-sink interface, the DVI connector is on the right side.

5 Setting up your EVK

Now that you have unpacked the EVK, checked its contents, and verified that the interfaces match what is described in the previous sections, the next step is to begin the setup process.

5.1 Install the Antenna

The EVK is shipped with either one or two external antennas for each EVK. The antennas must be installed prior to transmitting/receiving UWB data. The antenna(s) simply screws onto the SMA connection which is on top of the EVK enclosure. Care should be taken with the antenna because they are delicate and may bend or break.

5.2 Power up the EVK

After the Antenna is installed, connect the 12 volt DC power to the EVK. The power LED should immediately light. If it does not light, proceed to Appendix A of this document for troubleshooting

5.3 Connect the USB Cable to the EVK

Once the power LED is on, connect the USB cable between one of the PC's USB ports and the USB port on the EVK. Windows will report that a new device is found and ask for a driver. Stop here. Don't do anything until you have read the following section. At this point you have configured the EVK to perform UWB physical layer testing and wireless USB performance testing. Figure 4 illustrates the wireless USB end-to-end test configuration.

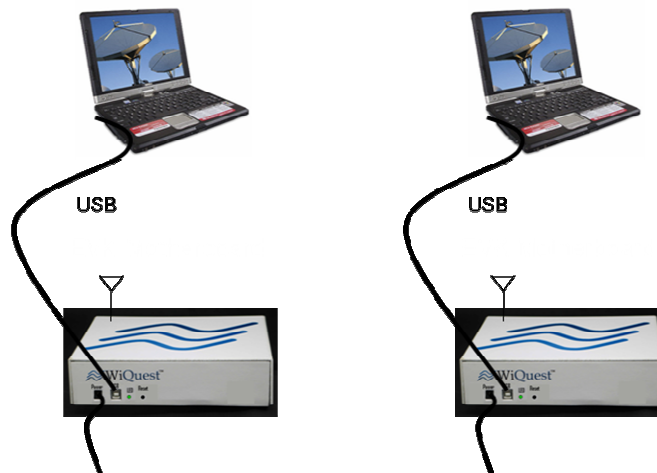


Figure 4: Wireless USB end-to-end Test Configuration

6 Installing the WQST100EVK Wireless USB Driver

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From a driver perspective, the EVK represents four separate and unique USB devices. To evaluate the EVK at least two drivers (per port) must be loaded onto the PC. This means that the installed driver is tied to a PC's particular USB port. If after installing the driver the first time the you move the USB cable to another USB port on the same PC, you will need to install the drivers again for this USB port. The WQST100EVK 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 which may be installed are listed below:

WQST100EVK Wireless USB driver
WQST100EVK TX/RX driver
WQST100EVK Video-source driver
WQST100EVK Video-sink driver

6.1 Installing the drivers and the EVK Control Center

The drivers and ECC application can be loaded prior to connecting the system as shown in Figure 4 or one can install the drivers after being prompted by the PC. The drivers are installed by running the wqevksetup.exe executable. This executable will launch an install wizard. Simply follow the install wizard instructions outlined in the steps below. After the drivers and ECC application are loaded make sure to reboot the PC. Rebooting the PC completes the install procedure.

Note: To perform a transmit/receive test or to transmit video over the UWB link you will need to install the drivers and run the EVK Control Center on two separate PCs. The drivers do not allow the user to utilize one PC to perform the transmit/receive or video tests.

6.1.1 Step 1

Once the wqevksetup.exe file is executed the user is prompted to select a language option (shown in Figure 5). Select OK once a language has been selected. To exit out of the install wizard select cancel. The following languages are supported: French, German, English, Italian, Norwegian, and Portuguese.

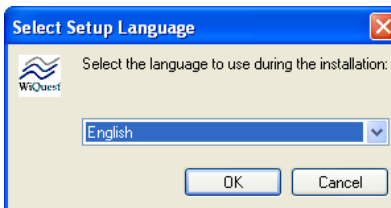


Figure 5: Select Setup Language

6.1.2 Step 2

The EVK Setup wizard shown in Figure 6 displays the install version number; make sure you are installing the software version that your hardware supports. If you are unsure if your hardware supports this software version, refer to the software release notes.

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

The About button provides information related to the ECC application.

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Also for questions related to the install wizard, click on www.wiquest.com and the user is taken to the WiQuest home page; from here the user can log onto the support portal.

Select Next to continue with the install process. Select Cancel to stop and exit out of the install process.



Figure 6: Setup-WQST EVK

6.1.3 Step 3

The License Agreement (shown in Figure 7) must be accepted before the installation wizard will continue. Carefully read the agreement and chose "I accept the agreement" to accept the terms of the agreement. Once the "I accept the agreement" radial button is pressed the next button is highlighted. Choosing "I do not accept the agreement" still enables the user to choose "Cancel" to cancel the install or choose "Back" or go back to the pervious screen.

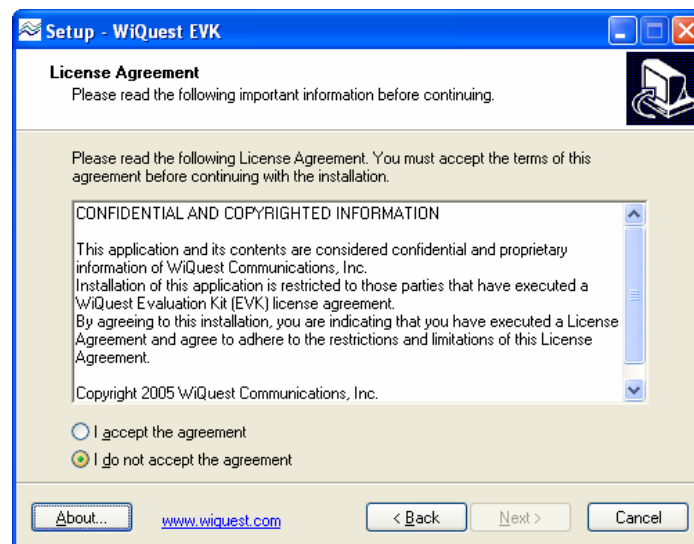


Figure 7: License Agreement

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6.1.4 Step 4

The information window is shown in Figure 8. The install wizard allows one final chance to cancel the installation or go back to a previous menu before actually installing the drivers. It is important to read the information presented in this page; this page main contain details which are specific to a software or hardware version. Select "Next" to continue with the install process. Select "Cancel" to stop and exit out of the install process.

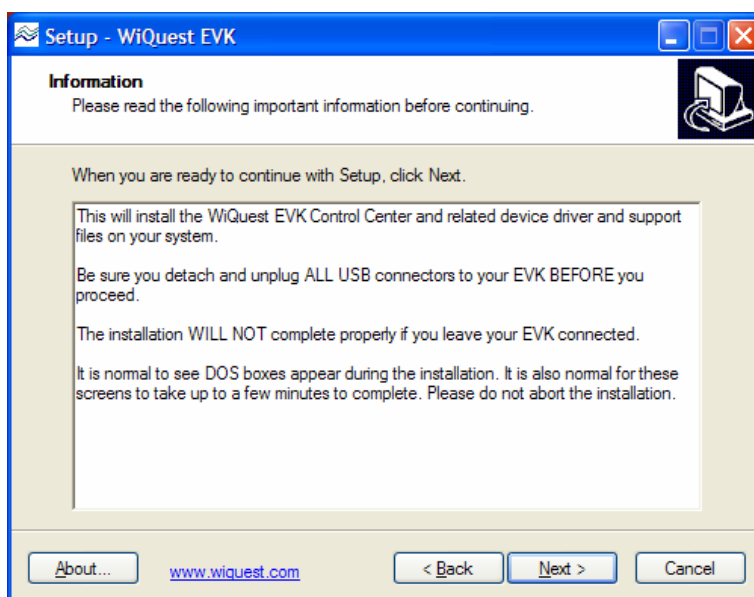


Figure 8: Information

6.1.5 Step 5

The install wizard allows you to select where the install files may be placed (see Figure 9). In the event that you want to change the default settings, simply type the new path or select Browse and use the mouse to select the new path. Once the path selection is made, select Next. The install wizard allows one final chance to cancel the installation or go back to a previous menu before actually installing the drivers.

Select Next to continue with the install process. Select Cancel to stop and exit out of the install process.

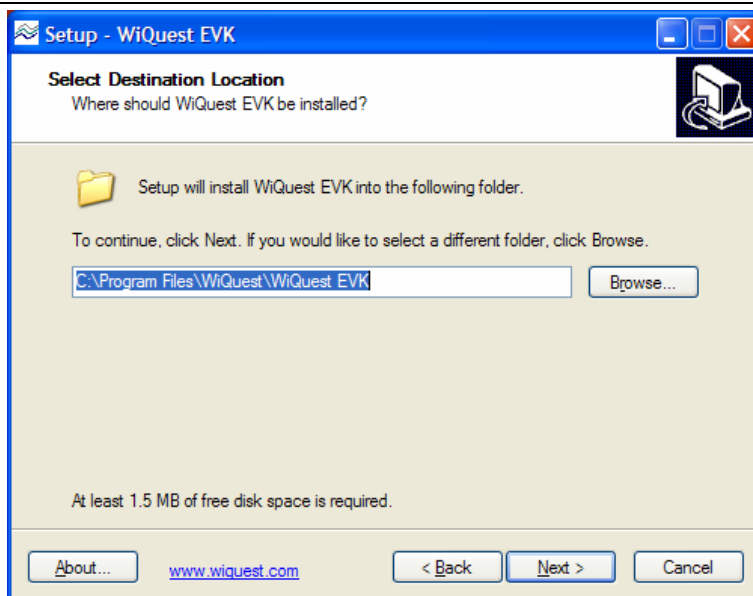


Figure 9: Select Destination Location

6.1.6 Step 6

Figure 10 allows the user to select which components to install. If no checkboxes are selected, nothing is installed. It is recommended to accept the default settings.

Select Next to continue with the install process. Select Cancel to stop and exit out of the install process.

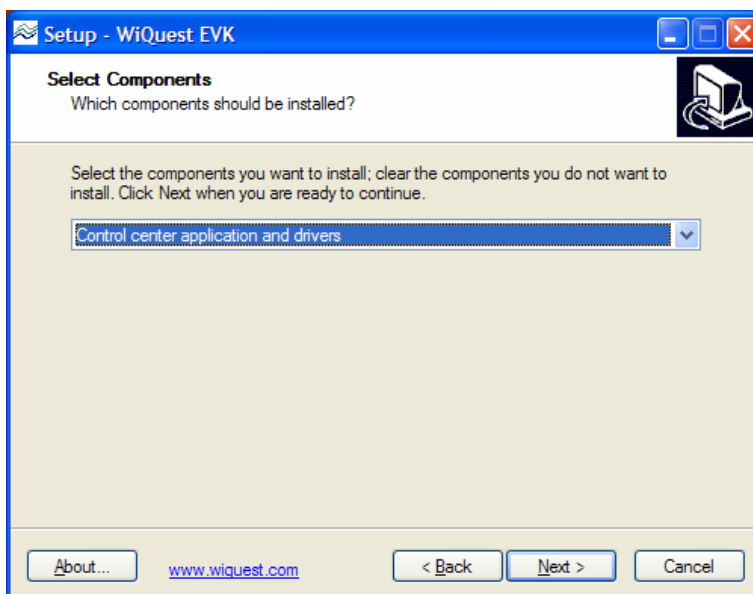


Figure 10: Select Components

6.1.7 Step 7

The install wizard allows you to create a desktop and a quick start icon. The desktop and quick start icon will allow the user to quickly start the ECC application. Figure 11 illustrates the additional tasks.

Select "Next" to continue with the install process. Select "Cancel" to stop and exit out of the install process.

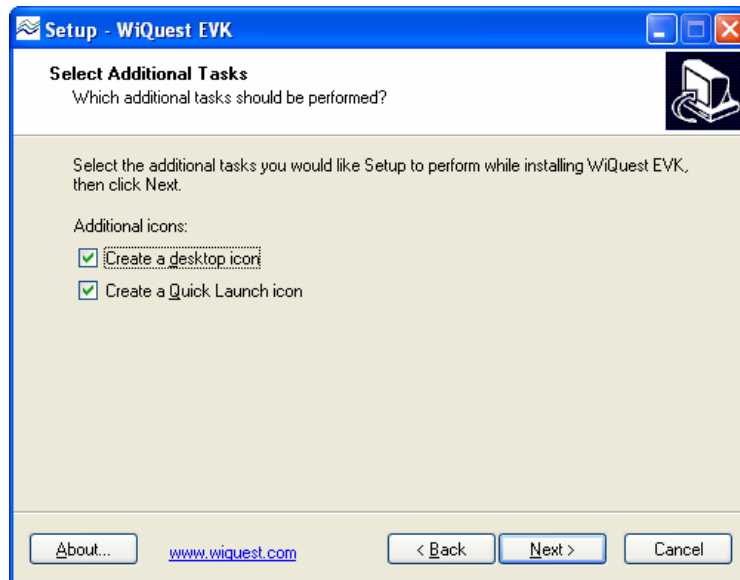


Figure 11: Select Additional Tasks

6.1.8 Step 8

The Ready to Install window is shown in Figure 12. The install wizard allows one final chance to cancel the installation or go back to a previous menu before actually installing the drivers. It is important to read the information presented in this page; this page main contain details which are specific to the selected software installation.

Select "Next" to continue with the install process. Select Cancel to stop and exit out of the install process.

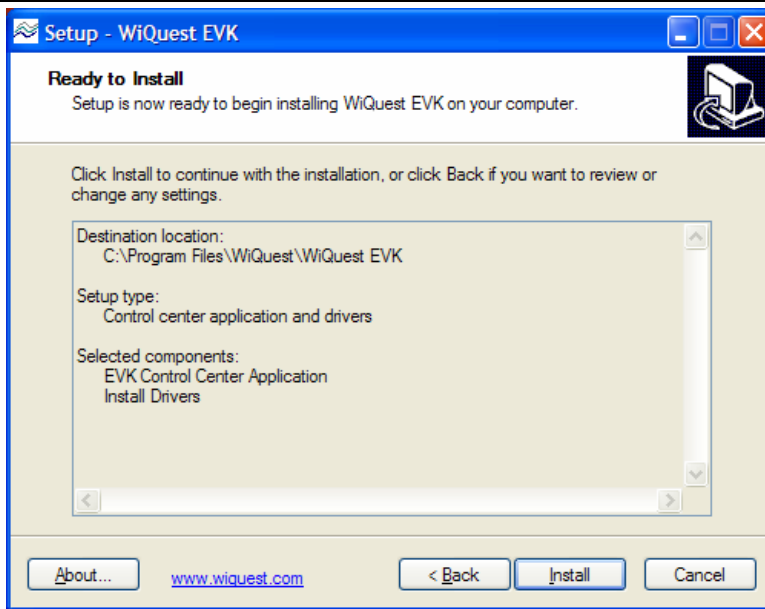


Figure 12: Ready to Install

6.1.9 Step 9

Now that the driver is installed, you are then prompted to install the EVK control center application. Another EVK screen is shown in Figure 13.

Select "Next" to continue with the install process. Select "Cancel" to stop and exit out of the install process. At this point the drivers have already been installed.

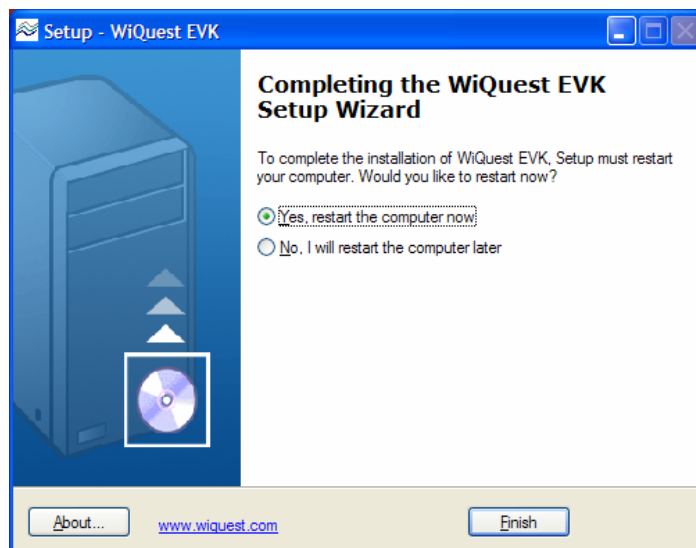


Figure 13: Launch Application

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6.2 EVK Control Center

The EVK Control Center is a multi-feature PC application which allows the user to perform the following:

- Transmit/receive data packets – Requires radio control driver
- Perform receive DC and transmit DC control – Requires radio control driver
- Perform receive DC calibration – Requires radio control driver
- Access of registers – Requires radio control driver
- Video source support - Requires video source driver
- Video sink support – Requires video sink driver

As previously stated, when the radio functions, video source, or video sink targets are run the first time you will be prompted to install the appropriate driver. The correct USB driver is automatically installed by simply running the install.bat file again.

6.3 Installing the EVK Control Center Application

With the WQST100EVK CD still installed in the CD ROM drive, select the “Install EVK Control Center” button; a standard Windows install wizard will guide you through the install process. Once the install process is complete run the EVK Control Center application (ECC.exe).

Once the EVK Control Center is opened select Target, Host Interface and click on USB. This will ensure that USB interface is used. See Figure 14 for details

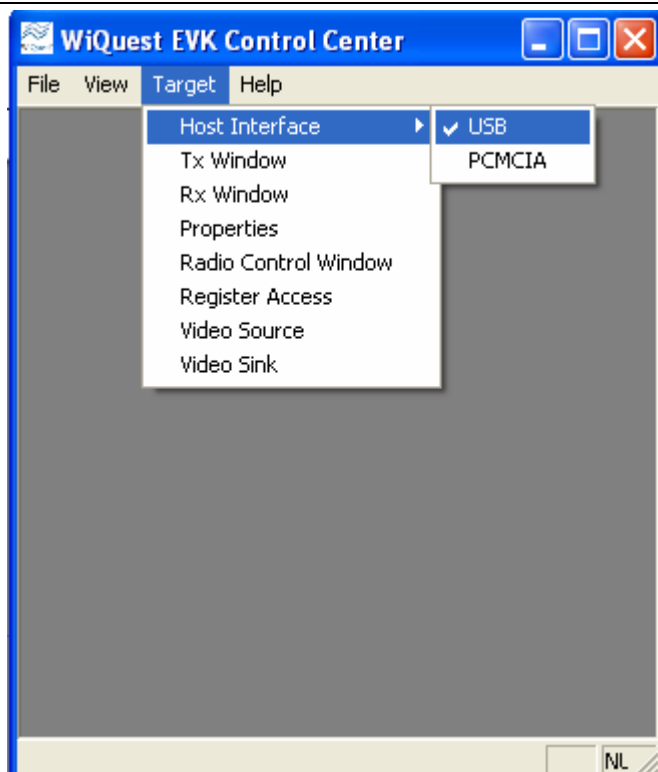


Figure 14: USB Host Interface Selection Window

Figure 15 illustrates the default device settings. By default all EVKs are configured with a device identifier of cafe and a TFC of 5. The device identifier can be any 4 character hexadecimal value. The TFC can be 5, 6, or 7. For normal EVK testing the EVK defaults are acceptable. If performing tests with more than two EVKs the device identifier and TFC values may need to be changed.

The firmware, manufacturing test API, EEPROM, and EVK version number are also provided via the Device Settings window.

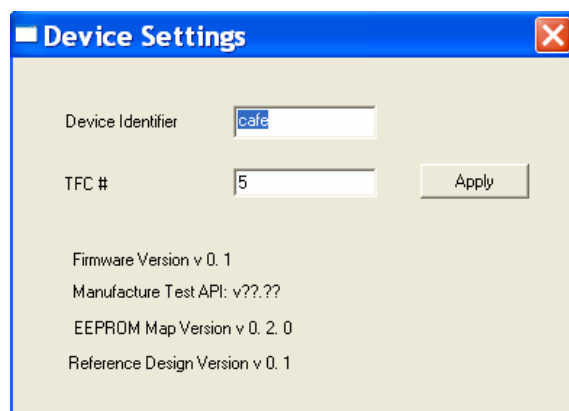


Figure 15: Device Settings Window

6.4 Transmit Window

The transmit window allows transmission of data packets. Figure 16 illustrates the features and functions outlined below. The transmit window allows the user to configure multiple transmit streams. The default transmit stream is 0. The user can also configure multiple transmit modes, payload types, payload sizes, and allows the user to configure the local and destination IDs.

Note: The USB interface is simply used to create and control the data packets. The data packets are actually generated inside the WQST100 by the WiMAC engine.

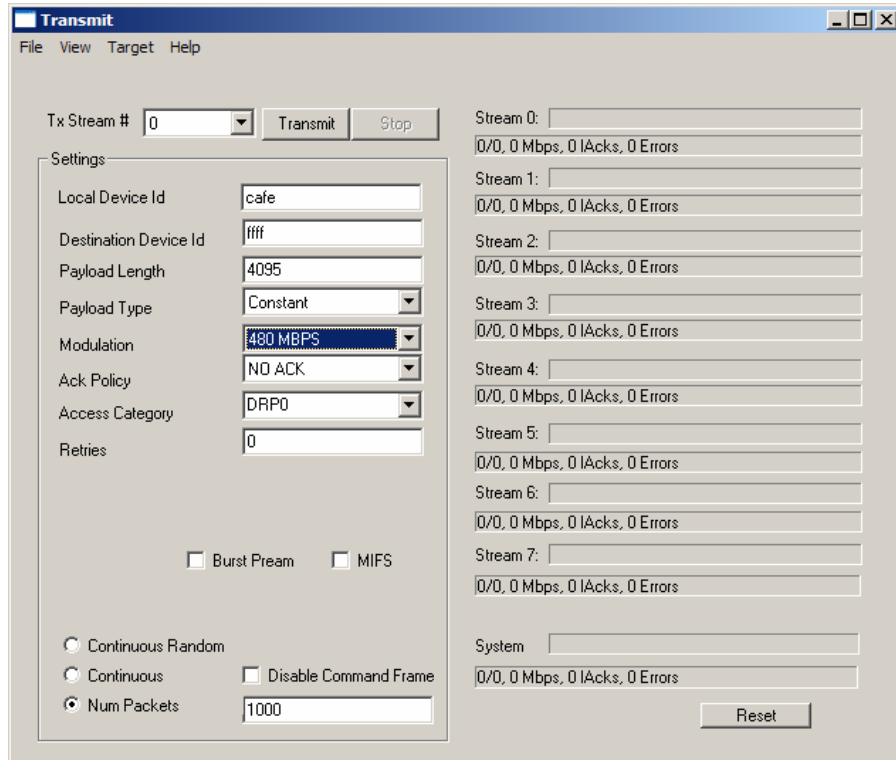


Figure 16: Transmit Window

6.4.1 Transmit Configuration Options

The Transmit window provides the following options:

1. Transmit stream # - Simultaneous transmit data streams. You can choose up to 8 streams.
2. Destination Device Id - 4 byte identifier of the destination device.
 - a. Broadcast Id is 0xFFFF
 - b. Multicast Id is in the range 0xFF00 to 0xFFFF
 - c. Unicast Id is in the range 0 to 0xFEFF
3. Payload Length - Length of data packet to transmit (in number of bytes). A valid range is between 1 and 4095 bytes.
4. Payload Type - The type of payload of the data packet
 - a. Payload Type - The type of payload of the data packet.

- b. Constant - Payload is set to a constant value.
 - c. Sequential - Payload is set to a sequential pattern
 - d. Random - Payload is set with a random pattern
 - e. Random Seeded - Payload is set with a random pattern generated with the C random generator.
5. Modulation - Physical layer transmit modulation to use for the packet. The supported modulations are as follows:
 - a. WiMedia rates: 53.3, 80, 106.7, 160, 200, 320, 400, and 480 Mbps
 - b. WiQuest rates: 640, 906, and 1024 Mbps
6. Ack Policy - Acknowledgement policy to use. The ECC application currently supports the following:
 - a. No acknowledgement. This is the default acknowledgement option. In this mode no retransmits are performed on lost or dropped packets.
 - b. Immediate acknowledgement. To enable this mode the user must configure the Destination Device ID to be a unicast value in the range 0 to 0xFEFF. Once a unicast value is selected immediate acknowledgement is a valid selection
7. Access Category - MAC MBOA access categories.
8. Retries - Number of retries if an acknowledgement packet is not received by the transmitter. Note: Retries are used only with IMM ACK policy.
9. Burst Pream - Use burst preamble instead of the normal preamble. The burst preamble is shorter and provides better throughput.
10. MIFS - Minimal inter-frame spacing. Minimizes the time between transmit frames. Enabling MIFS provides better throughput. Note: Burst Pream needs to be enabled for MIFS to work.

6.4.2 Transmit Modes

1. Continuous Random - Transmit packets with random modulations and random payload sizes continuously.
2. Continuous - Transmit packets with the selected settings continuously
3. Num Packets - Transmit a specified number of packets with the selected settings.

6.4.3 Transmit Statistics

Provides feedback information on the current transmit state for each transmit stream and for the entire WQST100.

6.4.4 Operational Instructions

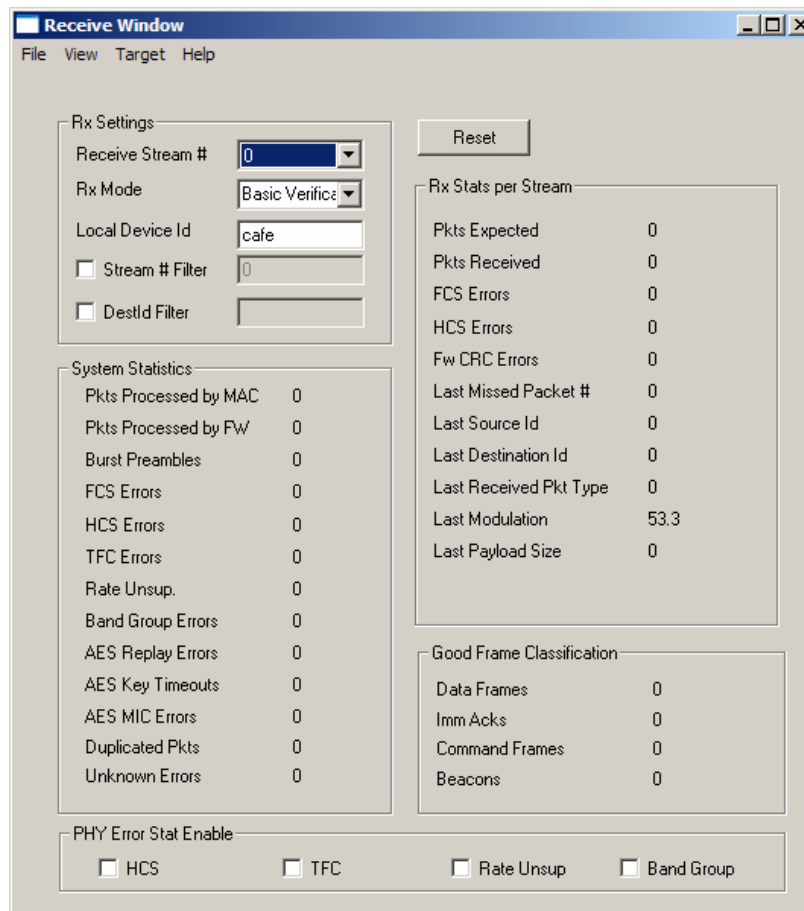
Configure the hardware as shown in Figure 4. Double-click on the EEC icon. To open the transmit window, go to Target and select Tx Window. Once open, configure the transmit settings and click on the "Transmit" button. To stop transmit click on the "Stop" button.

When trying to send frames using IMM_ACK policy, set the local device Id to something different than the destination device Id. To set local device Id go to Target->Properties->Device Identifier

6.5 Receive Window

The receive window displays information on all received packets. Figure 17 illustrates the features and functions outlined below. 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.



The screenshot shows the 'Receive Window' application. It has a menu bar with 'File', 'View', 'Target', and 'Help'. The main area is divided into several sections:

- Rx Settings:** Includes a 'Receive Stream #' dropdown set to '0', an 'Rx Mode' dropdown set to 'Basic Verify', a 'Local Device Id' text field containing 'cafe', and two checkboxes for 'Stream # Filter' and 'DestId Filter', both of which are unchecked.
- System Statistics:** A list of 14 statistics, all showing a value of 0: Pkts Processed by MAC, Pkts Processed by FW, Burst Preambles, FCS Errors, HCS Errors, TFC Errors, Rate Unsup., Band Group Errors, AES Replay Errors, AES Key Timeouts, AES MIC Errors, Duplicated Pkts, and Unknown Errors.
- Rx Stats per Stream:** A list of 9 statistics, all showing a value of 0 except for 'Last Modulation' which is 53.3: Pkts Expected, Pkts Received, FCS Errors, HCS Errors, Fw CRC Errors, Last Missed Packet #, Last Source Id, Last Destination Id, Last Received Pkt Type, Last Modulation, and Last Payload Size.
- Good Frame Classification:** A list of 4 statistics, all showing a value of 0: Data Frames, Imm Acks, Command Frames, and Beacons.
- PHY Error Stat Enable:** Four checkboxes for 'HCS', 'TFC', 'Rate Unsup', and 'Band Group', all of which are unchecked.

A 'Reset' button is located between the Rx Settings and Rx Stats per Stream sections.

Figure 17: Receive Window

6.5.1 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.

6.5.2 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.

6.5.3 Stream Statistics

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

Behind the receive window is a packet error rate (PER) window which provides the packet error rate (in terms of %) for each modulation rate. Figure 18 illustrates that for 53.3, the PER was approximately 98%; this means that 98% of the transmitted packets were lost or errored. For 80 Mbps the PER was 0%; 0% does not show up in the graph. To clear the graph click reset on the receive window.

The PER data is saved in a text file called rxlog.txt. This can be found in the same directory as the EVK Control Center application.

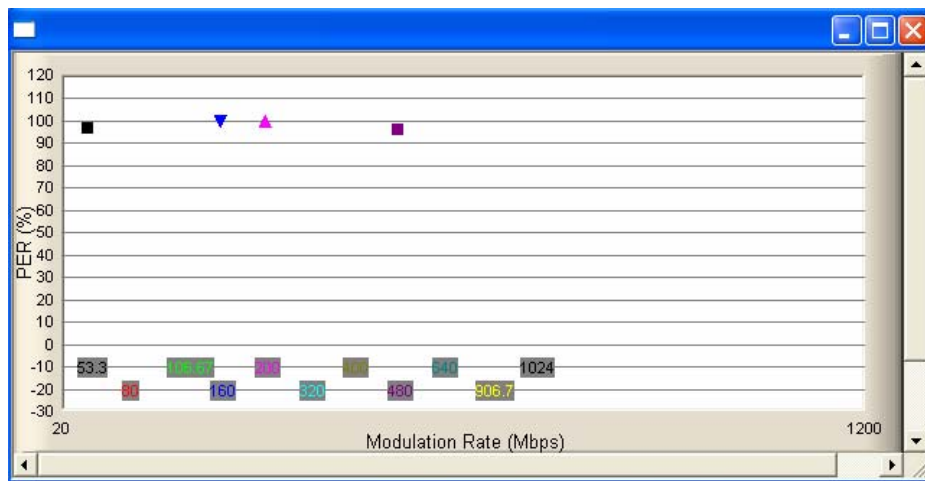


Figure 18: Packet Error Rate Window

6.5.4 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.

6.5.5 Operational Instructions

Configure the hardware as shown in Figure 4. 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.

6.6 Radio Control Window

The radio control window provides functionality for testing and verifying the WQST101 performance. Figure 19 illustrates the features outlined below. The receive control window is used for sending sinusoidal tones, performing PSD mask testing, and calibrating the receive DC offset value.

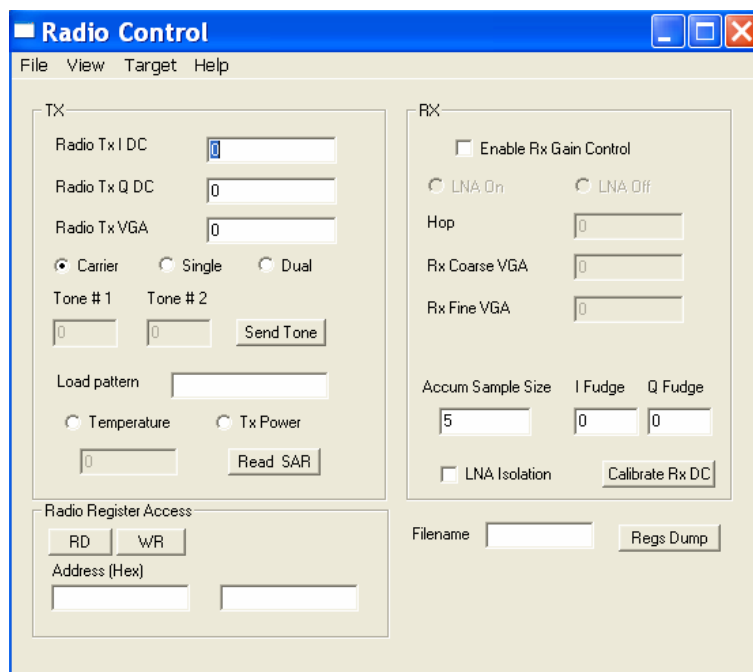


Figure 19: Radio Control Window

6.6.1 Transmitter

Transmit Settings

1. Radio Tx I DC/Radio Tx Q DC - Control of the transmit I and Q DC. Valid values are from -64 to 63
2. Tx VGA - Controls the transmit VGA. Valid values are from 0 to 31.

Sending a tone

1. Choose what type of tone to send:
2. Set the tone numbers
 - a. Carrier - Sends a carrier signal at the current channel
 - b. Single - Sends a single tone at the specified tone number
 - c. Dual - Sends two tones at the specified tone numbersSelect "Send Tone"

6.6.2 Receiver

Rx DC Calibration - To calibrate out the receive DC, just click on "Calibrate Rx DC". Select the LNA Isolation option to isolate the LNA when performing the calibration.

6.7 Video Source

Figure 20 illustrates the Video Source Window. This window allows the user to select the resolution, compression ratio, physical data rate, acknowledgement policy, number of video lines per MAC frame, and the number of immediate acknowledgement retries. Once the transmitter is enabled, the transmit statistics are continually updated.

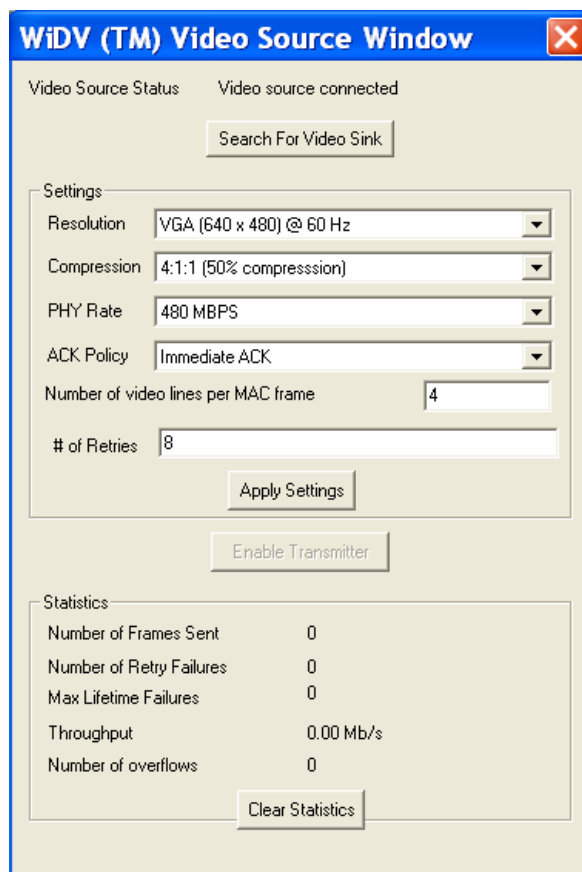


Figure 20: Source Window

6.7.1 Video settings

1. Resolution - Video resolution from the PC. The sink needs have the same resolution configured.
2. Compression - Video compression to use. The options are as follows:
 - a. 4:4:4 format which is the same as no compression
 - b. 4:2:2 format which is 25% compression
 - c. 4:1:1 format which is 50% compression

3. PHY Rate - Modulation to use for transmitting video data. Because of packet overhead and control information, the actual throughput will be less than the PHY rate.
4. ACK Policy - Acknowledgement policy to use for transmitting video data. The default acknowledgement policy is immediate acknowledgement.
5. Number of video lines per MAC frame - Number of video lines to fit into one MAC frame. Valid values will depend on the resolution selected. Make sure this setting is the same as the corresponding video sink setting.
6. Number of retries - Only valid for Imm ACK policy. This value is typically set to 8.

6.7.2 Video Statistics

Displays information about the transmitted packets.

6.8 Video Sink

The Video Sink Window shown in Figure 21 allows the user to set the number of frames received during clock synchronization. It also lets the user configure the number of lines before frame synchronization. If you are having difficulty getting the video to synchronize you can increase the synchronization time.

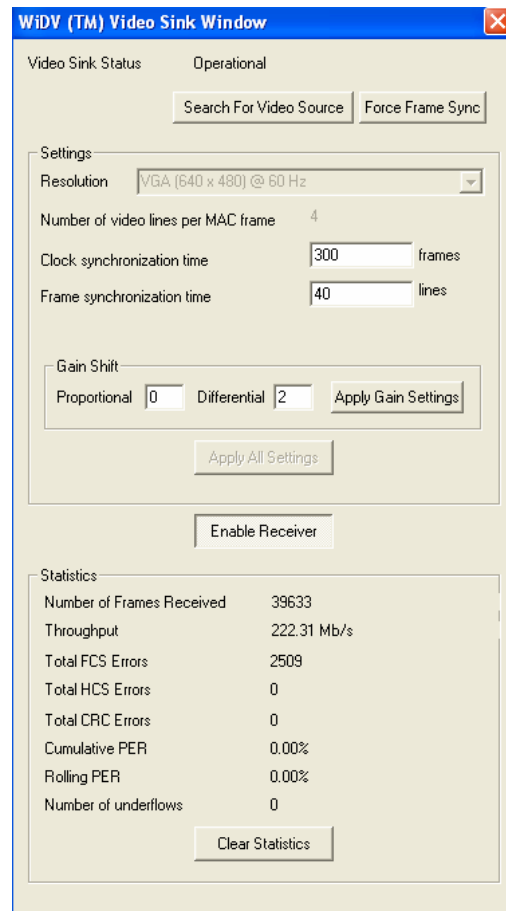


Figure 21: Video sink

6.8.1 Video settings

1. Resolution - Video resolution to the display. The video source needs to have this setting configured the same.
2. Clock synchronization time - Number of video frames to wait (for clock synchronization) before the video is displayed.
3. Frame synchronization time - Number of lines to buffer before video is displayed.
4. Number of video lines per MAC frame - Number of video lines to fit into one MAC frame. Valid values will depend on the resolution selected. Make sure this setting is the same as the corresponding video source setting.
5. Gain Shift - Parameters used by the clock synchronization algorithm.

6.8.2 Video Statistics

Displays statistics about the received packets from the video source.

6.8.3 Operational Instructions

Figure 22 illustrates the Video configuration. The PCs used in this illustration are connected to the EVKs via a USB link. The USB link provides configuration and control information for the EVK but the USB links are not part of the data path. The PC on the left is sourcing video via its DVI or VGA port. The EVK on the left transmits the UWB video stream to the EVK on the right. The DVI or VGA monitor on the right displays the video.

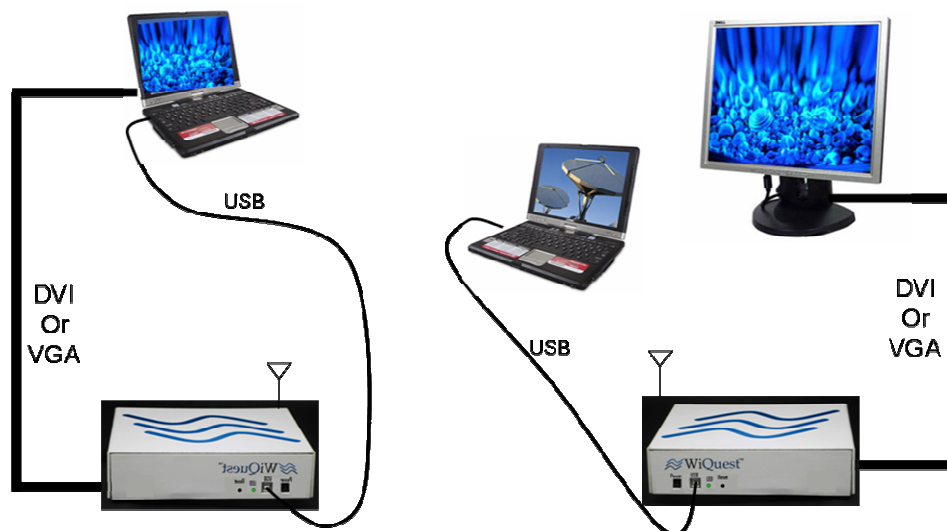


Figure 22: Video Configuration

To run a test like the one shown in Figure 21 follow these steps:

1. Make sure you are using a video source board and connecting it to a PC's DVI or VGA port.
2. Make sure you are using a video sink board and connecting it to a monitor's DVI or VGA port.
3. Make sure the VGA or DVI port on the PC is active. This is currently done by first connecting the PC's VGA or DVI port to a monitor and rebooting the PC. Once the VGA or DVI port is active, re-connect the cable to the EVK source board.
4. Ensure that the video resolution coming out of the PC's VGA or DVI port is one of the ECC's supported resolutions. To change the resolution perform the following:
 - a. Right click on the desktop and select properties. At the window shown in Figure 23, click Settings

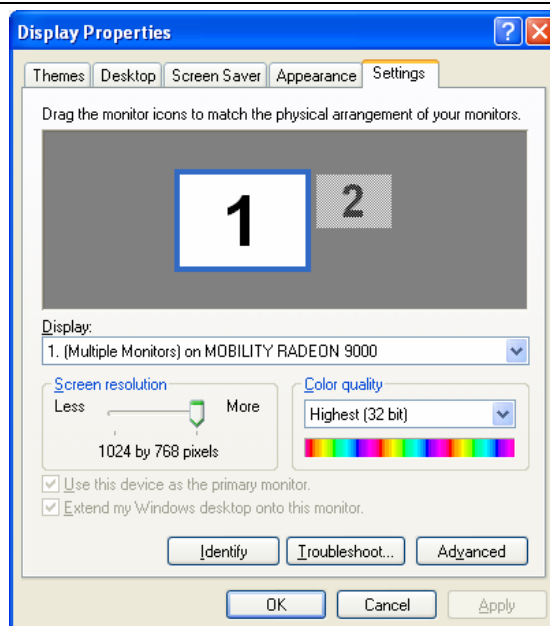


Figure 23: Display Properties

- b. To change the display settings, click on Advanced, click on Adapter and click on List all Modes.

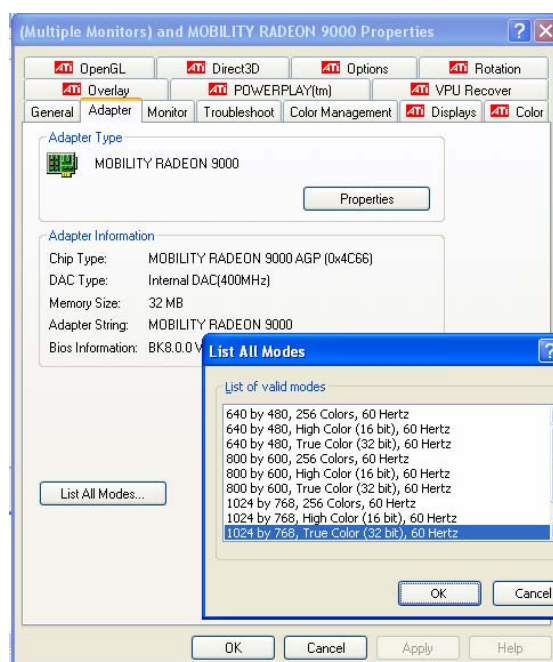


Figure 24: Display Properties

- c. In the List All Modes pull down box select the video resolution you wish to display on the DVI or VGA monitor and select OK. Click OK again to close the Adapter dialog box. Then select apply to apply your new resolutions settings.
5. Connect the VGA or DVI cable from the video sink card to a display.
6. Apply power to both EVK boards, connect the USB cables, and start the EVK Control Center. Position the EVK boards at a reasonable range; approximately 1 meter is good.
7. For the PC on the left, open the ECC application and then open the video source window on the left hand PC.
8. For the PC on the right, open the ECC application and then open the video sink window on the right hand PC.
9. At the video sink window:
 - a. Click on "Search for Video Source," and wait for the status to change to "Video source found.
 - b. Select the settings and click on "Apply All Settings"
 - c. Click on "Enable Receiver"
10. At the video source:
 - a. Click on "Search for Video Sink," and wait for the status to change to "Video sink found.
 - b. Select the settings and click on "Apply Settings"; typically the default setting is a good place to start.
 - c. Click on "Enable Transmitter"

If you do not see any video displayed, video look at the video source window. At the top of this window is a status. If it says waiting for resolution detection then there is mismatch between the PC's video setting and the resolution selected in the video source window. If both the video source and video sink windows show ready then check the antennas and ensure they are properly configured.

6.9 How to Enable Debug Logging?

In order to turn on debug information to be logged or display create a file in the directory where the executable file is (.exe) named "debugoptions.txt". The format of the file should be:

There are 4 debug levels:

- 0 – No debug info
- 1 – Basic debug info
- 2 – Moderate debug info
- 3 – Comprehensive debug info

There are 3 debug outputs:

- 0 – No output
- 1 – Output to the display
- 2 – Output to a file
- 3 – Output to the display and file

For example, selecting a debug level of 1 and a debug output of 3 will turn on basic debug info to output both the display and the file. The debug file name that it outputs to is called wqmttrace.txt

7 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.

7.1 The EVK is not functional

1. Check to see that the power LED is green and that the USB cable is installed correctly. Refer to the quick start guide for more details.
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.

7.2 I can't connect to the EVK.

1. Check to see that the power LED is green and that the USB cable is installed correctly. If the LED and the USB port are operational, you can check to insure that the Jungo driver is installed. On your desktop, right click on the My Computer icon and select properties, right click on hardware, and then right click on device manager. If you see a Jungo 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. It is recommended to uninstall the drivers and reinstall.

7.3 I can't get any data to pass between the two EVK platforms

1. Check to see that the antenna is installed correctly.
2. Change the orientation of the antenna. They need to be pointed towards each other
3. For best performance do not point the antennas directly at each other. Put them at a slight angle.
4. Slowly move the EVKs towards each other.