VQS1000
Video Quality Software

Quick Start User Manual

Tektronix

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Contacting Tektronix

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Table of Contents

Compliance Information

This section lists the environmental standards with which the product complies.

Environmental Considerations

This section provides information about the environmental impact of the product.

Product End-of-Life Handling

Observe the following guidelines when recycling an instrument or component:

Equipment recycling. Production of this equipment required the extraction and use of natural resources. The equipment may contain substances that could be harmful to the environment or human health if improperly handled at the product's end of life. To avoid release of such substances into the environment and to reduce the use of natural resources, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately.

This symbol indicates that this product complies with the applicable European Union requirements according to Directives 2002/96/EC and 2006/66/EC on waste electrical and electronic equipment (WEEE) and batteries. For information about recycling options, check the Support/Service section of the Tektronix Web site (www.tektronix.com).

Restriction of Hazardous Substances

This product is classified as Monitoring and Control equipment, and is outside the scope of the 2002/95/EC RoHS Directive.

Preface

This manual describes the installation and use of the Tektronix VQS1000 Video Quality Software.

Key Features and Benefits

■ Video quality analysis software for single-ended QoE (Quality of Experience) analysis of video content

■ Available for installation on your own personal computer (PC)

■ Can be used with all Tektronix DTV monitoring probe configurations providing robust private backhauled video from the monitoring probes

■ Multiple instances can be run per license to enable service comparison at different network locations (dependent on PC processing power and video content type)

■ Triggered capture with pretrigger buffer enables archive of impairments or offline video quality analysis to be performed

■ QoE results are reflected in monitoring probe's Remote User Interface and event log

■ Results available to management systems through DTV monitoring probes SNMP MIB

■ Automated round-robin polling sequentially checks services within an MPTS

NOTE. Polling is not applicable for offline file analysis.

■ Can be used standalone for offline file analysis, with support for MPTS and SPTS files, or for analyzing IP traffic from a switch or router

■ Reliable and sophisticated analysis algorithms applied to decoded MPEG 2 or H.264 video to identify frozen, black, macro-blocking and blocky compression artifacts. This enables operators to distinguish between impairments resulting from network distribution versus artifacts resulting from over-compression.

■ Industry-first unique visualization tool with innovative impairment displays highlights the location and severity of video defects enabling engineers to clearly see and validate the presence of impairments on the image.

■ Triggered-capture of streams and logging of live data enable offline analysis of service quality issues.

Applications

■ Affordable QoE Monitoring; live monitoring

■ Network performance optimization; in-service tuning of network

■ Network diagnostics; in service troubleshooting

Product Documentation

The following table lists the product documentation supporting the VQS1000.

Table i: Product documentation

Item (Tektronix part number)	Purpose	Location
VQS1000 Quick Start User Manual (077-0489-XX)	Provides installation and high-level operational overviews (this document)	www.Tektronix.com
VQS1000 Online Help –Printed (077-0490-XX)	Provides in-depth operating information in context-sensitive form	www.Tektronix.com
VQS1000 Release Notes (077-0492-XX)	Describes late breaking product information and operational issues	www.Tektronix.com

Related Products

MTM400A DTV Monitor

The MTM400A DTV Monitor provides a complete solution for multilayer, multichannel, remote monitoring to DVB, ATSC, DCII, and ISDB-T/Tb standards with content-checking support for MPEG-2 and H.264/AVC. Optional RF measurement interfaces provide a powerful and cost-effective solution for monitoring DVB-T transmitter sites or DVB-S/S2 uplinks and downlinks. An in-depth, real-time MPEG analysis option allows diagnostics to be performed on live broadcast signals without having to use deferred-time analysis of captured streams.

IPM400A DTV Monitor

The IPM400A DTV Monitor is a powerful solution for remote monitoring of IP video national and regional headends. The IPM400A simultaneously verifies both IP and TS integrity on all IP Video flows (sessions) on a GbE link. It is ideal for monitoring networks which carry both Multi-Program Transport Streams (MPTS) or Single-Program Transport Streams (SPTS), at either constant bit rate (CBR) or variable bit rate (VBR). An in-depth, real-time MPEG analysis option allows diagnostics to be performed on live payload without having to use deferred-time analysis of captured streams.

QAM400A DTV Monitor

The QAM400A DTV Monitor provides a complete solution for remote real-time monitoring of cable broadcast signals. The comprehensive QAM RF and SI/PSI and PSIP confidence-monitoring capabilities provide a powerful and cost-effective solution for monitoring HFC (hybrid fibre-coaxial) cable headends. An in-depth, real-time MPEG analysis option allows diagnostics to be performed on live ATSC signals without having to use deferred-time analysis of captured streams.

RFM300 DTV Monitor

The RFM300 DTV Monitor provides a complete solution for remote real-time DTV monitoring of ATSC signals. The comprehensive 8VSB RF and PSIP confidence-monitoring capabilities provide a powerful and cost-effective solution for monitoring DTV transmitter sites, including contribution and distribution feeds at local and national operation centers for FCC compliance. An in-depth, real-time MPEG analysis option allows diagnostics to be performed on live ATSC signals without having to use deferred-time analysis of captured streams.

VQNet™ Element Management System

VQNet is a Tektronix Video Monitoring EMS that supports all Tektronix IP Video and DTV Monitor probe types to alert, locate and diagnose video network problems. It is a software product which will run on a server (not Tektronix supplied) to aggregate and report on the status of broadcast signals measured by up to 500 distributed probes across a video distribution network, providing alarms, logs, trending and reporting of key performance metrics.

Related Product Documentation

The following table lists the documentation for Tektronix products related to the VQS1000.

Table ii: Related product documentation

Item	Tektronix part number	Description
MTM400A DTV Monitor Quick Start User Manual	071-2492-XX English 071-2493-XX Japanese 071-2632-XX German	Provides installation and high-level operational overviews
IPM400A DTV Monitor Quick Start User Manual	071-2698-XX	Provides installation and high-level operational overviews
QAM400A DTV Monitor Quick Start User Manual	071-2784-XX	Provides installation and high-level operational overviews
RFM300 DTV Monitor Quick Start User Manual	071-2700-XX	Provides installation and high-level operational overviews
MTM400A, IPM400A, QAM400A, and RFM300 DTV Monitor Read This First	071-2654-XX	Describes late breaking product information and operational issues
MTM400A, IPM400A, QAM400A, and RFM300 DTV Monitor Technical Reference	077-0175-XX	Provides in-depth operating information

Installation

This section includes instructions for installing and opening the VQS1000 software. The section also describes the networking that may be required for basic operation.

NOTE. Some of the installation instructions require you to use the DTV monitor remote user interface (RUI). If you are unfamiliar with the RUI, refer to the appropriate manual.

Before Installation

Check that you have received or downloaded all of the standard accessories. All components of the VQS1000 application are downloaded from the Tektronix Web site (www.tektronix.com/software). This will make sure that you will always receive the most current release of the application.

System Requirements

The following minimum PC configuration is recommended for installing the VQS1000:

- Operating system: Microsoft Windows XP, SP3 or Windows 7

- PC processor requirements: Xeon 5500 series (i7 based) quad-core processor or equivalent

- Memory: 4 GB RAM minimum

- Hard disk space: 250 GB minimum

NOTE. The VQS1000 application will run satisfactorily on a PC with the preceding specifications. However, some of the more intensive operations will benefit from using a more powerful PC.

- NVidia GPU (General Processor Unit) card with hardware video decoder support. For example, the NVidia GeForce GT240 graphics card.

NOTE. The inclusion of hardware graphics processing reduces the processing overhead of video decoding, allowing processing at higher bit rates or using a larger processing graticule area.

NOTE. If the card is present, the CUDA acceleration feature is available. Enable the CUDA acceleration decoding check box in the Advanced Configuration tab to take full advantage of the card's processing capabilities.

Alternatively, you can install the VQS1000 application on an MTS400 Series MPEG Test System.

If you intend using a Tektronix DTV Monitor as a stream source, the minimum monitor firmware version is Version 4.5.

Software applications.   The third-party software application '.NET Framework 3.0' is required by the VQS1000 application. If it is not already installed on your computer, the VQNet application installer will automatically install this during the installation process.

Application licensing.   The VQS1000 software is enabled on your PC and on the MTS400 Series units by applying unique Option Key strings using the License Management dialog box; the option key string is unique to the dongle (software key) that is to be used. Enabling the software can be done as part of the installation procedure. If you have purchased and downloaded the standalone option, the USB dongle will be supplied separately. (See page 4, *Licensing the VQS1000 Application*.)

Installation requirements.   You will need the following items:

- A PC that meets the system requirements (See page 1, *System Requirements*.)

- VQS1000 installation software (downloaded from www.tektronix.com/software)

- Dongle

- Option key string

Standard Accessories

The VQS1000 software can be downloaded from the Tektronix Web site (www.tektronix.com/software). The following table lists the standard accessories that are shipped for the VQS1000 software.

Table 1: Standard accessories

Accessory	Tektronix part number
Thank You Letter	001-1532-XX
Option Key Certificate	NA
Identification stickers	NA
Security dongle	
Option USB provides a USB dongle to license a standalone VQS1000 software installation	NA
Option LUD provides no dongle since the VQS1000 software will be installed on a MTS400 Series product and will use the existing MTS400 Series dongle for licensing	NA

Installing the VQS1000 Software

Perform the following steps to install the VQS1000 software. Note that third-party software applications required by the VQS1000 software will also be installed if required.

1. Download the VQS1000 application installation file from the Tektronix Web site.

   a. In Internet Explorer, enter *www.tektronix.com* in the address bar and select enter.

   b. On the Tektronix home page, in the Downloads area, enter the Model Number, **VQS1000**, and select **Software** from the Select Download Type list. Select **Go**.

   c. On the Download Finder page, select the VQS1000 software download entry.

   d. On the VQS1000 software download page, check the Version and Release Date, and review the Release Notes and Installation Instructions.

   e. Select **Download File**.

   f. Identify a location for the download on your PC, and allow the file to finish downloading.

2. From the download location, double-click the VQS1000 setup file, *VQS1000_setup.exe*.

   Follow the on-screen instructions to perform the installation.

NOTE. Several message boxes are displayed during the installation process. A reboot of your PC may be required.

If needed, Microsoft .NET Framework will be installed or updated on your PC automatically during the installation process.

3. When the final installation screen is displayed, the installation is complete.

NOTE. Continue with Licensing the VQS1000 Application; (See page 4, Licensing the VQS1000 Application.). This activity must be completed before you can use the VQS1000 application. If you choose not to license the application at this point, you will have to do it when you open the application for the first time.

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4. In the final VQS1000 installation screen, select the **Launch Tektronix VQS1000** check box.

Licensing the VQS1000 Application

To license your VQS1000 for use on either a PC or an MTS400 Series system, a license key string must be applied to the instrument after the software has been installed.

Perform the following steps to license the VQS1000 application software:

1. Make sure that the dongle (software key), that you received when you ordered the VQS1000, is mounted in a USB port in your PC, or that your existing MTS400 dongle (software key), is mounted in the MTS400 instrument, and that your new license key string is available.

NOTE. If you get a message that your PC does not recognize the dongle hardware, you need to install the DESkey driver on your PC.

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2. Open the VQS1000 License Management dialog box.

   a. If you selected the **Launch Tektronix VQS1000** check box in the final VQS1000 installation screen, the License Management dialog box should already be displayed.

   b. or, select **Start > Tektronix > Tektronix VQS1000 Video Quality Test Suite**.
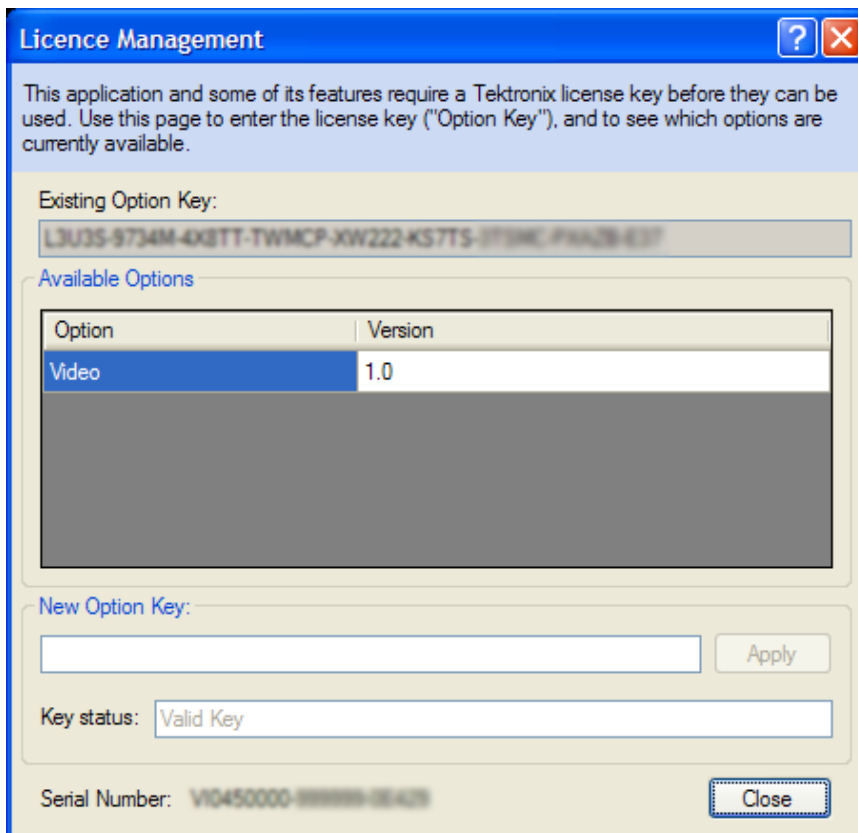
3. Enter the option key string that you received with your dongle in the **New Option Key** field.

4. Note the options that are now available, and that the option key string that you entered is now displayed in the **Existing Option Key** field.

5. After you close the dialog box, you can continue to use the VQS1000 software.

6. Attach the VQS1000 identification sticker to your PC. You may be asked for your product serial number if you contact Tektronix for product assistance.

Starting and Closing the VQS1000 Application

Starting the VQS1000 Application from your Desktop

Perform the following steps to start the VQS1000 application:

1. From a computer with the VQS1000 application software installed, select **Start > Tektronix > Tektronix VQS1000 Video Quality Test Suite**.

2. To start analyzing a stream, refer to the Application example in this manual, or in the application window, select **Help > Help**, and consult the online help to start analyzing a file either offline or in real-time.

Closing the VQS1000 Application

To close the VQS1000 application, select **Exit** from the **File** menu.

Using the Software

This section describes the basics of how to use the software.

Getting Acquainted with the Software

This section provides brief descriptions of the screen display elements. You can modify the size of individual panels by dragging the borders as required.
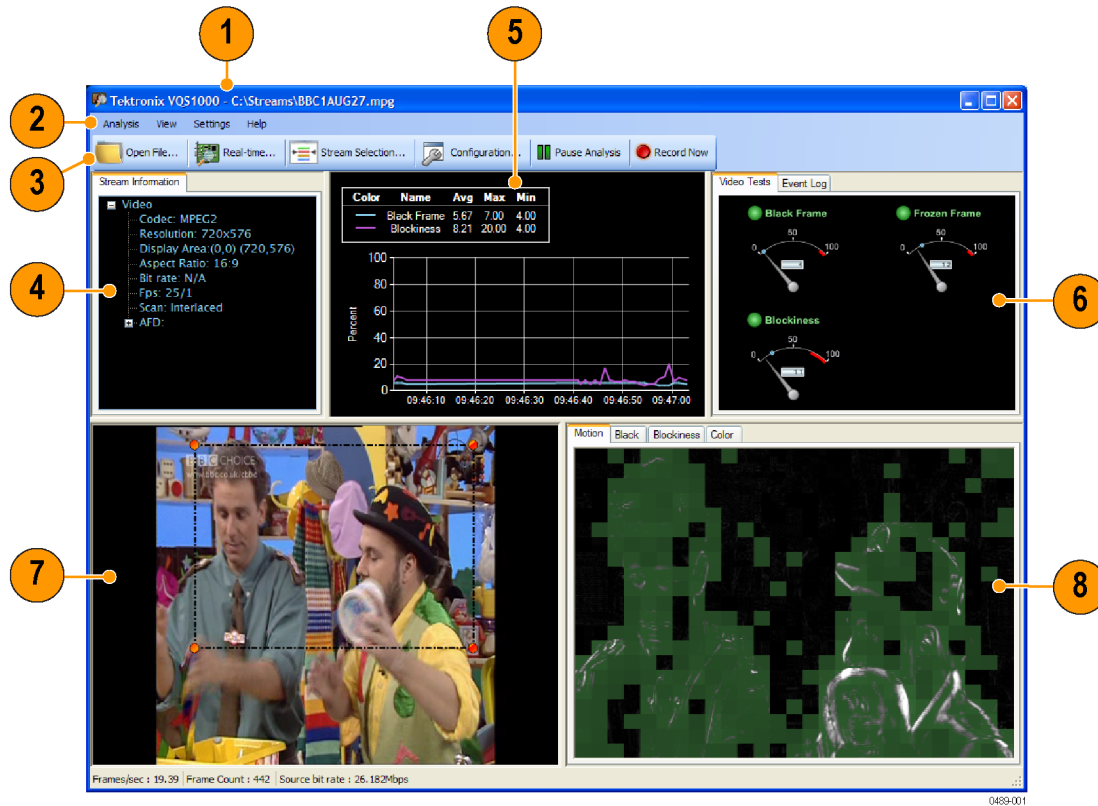

Table 2: VQS1000 display elements

Item	Element	Item	Element
1	Title Bar (See page 7.)	5	Trend Graphs (See page 8.)
2	Menu Bar (See page 7.)	6	Video Tests (See page 8.)
3	Toolbar (See page 8.)	7	Source Image (See page 8.)
4	Stream Information (See page 8.)	8	Processed Images (See page 8.)

Title Bar

The title bar displays the application title and the source file name.

Menu Bar

The Menu bar includes four menus, each containing related options; the menus are titled Analysis, View, Settings, and Help. Where available, shortcut keys are displayed next to the menu option.

Table 3: Menu bar options

Menu	Options	Description
Analysis menu	File Analysis	Select a file for offline analysis
	Real-time Analysis	Select IP traffic present on your network card for analysis. Alternatively, you can start analysis from an associated DTV monitor.
	Stream Selection	Select an elementary stream for analysis.
	Recent Files	Displays the names of the most recently opened files.
	Exit	Terminates analysis and closes the application.
View menu	Dashboard Layout	Selecting this option hides/shows the dashboard panels - Stream Information, Trend Graphs, and Video Tests. This provides more screen space for the visual analysis panels - Source view and Processed Image.
Settings menu	Configuration	Opens Configuration dialog box.
	Recording	Opens the Recording Settings dialog box.
	Use Polling	When enabled, the VQS1000 will poll services within an MPTS. *NOTE. Polling is not applicable for offline file analysis.*
	Reset All Peak Markers	Select this option to reset the peak markers on the video test meters.
Help	Help	Opens the VQS1000 online help window. Access your area of interest using the navigation pane of the help window. Context sensitive help is also available by selecting a screen display element and pressing F1 key on your keyboard.
	License Management	Opens the License Management dialog box.
	About Tektronix VQS1000	Displays the software version number. You will need this number if you call Tektronix for technical support.

Toolbar

The buttons displayed on the Toolbar provide links to set-up dialog boxes used to set up and run the application.

Table 4: Toolbar buttons

Button	Description
Open File	Select a file for offline analysis.
Real-time	Select IP traffic present on your network card for analysis. Alternatively, you can start analysis from an associated DTV monitor.
Stream Selection	Select an elementary stream for analysis.
Configuration	Opens configuration dialog box.
Pause/Resume Analysis	Select this button to pause or resume analysis.
Record Now	Select this button to start recording immediately.

Stream Information

This panel provides a summary of the video stream information, including the codec being used and the current bit rate.

Trend Graphs

This panel shows trend graphs for video measurements. You can select which measurements are displayed, and the time period over which data is displayed. The following graphs are available: Black Frame, Blockiness, Frozen Frame, and Video Bit Rate (real-time analysis only).

Video Tests

This panel contains test related meters which give a visual indication of the test status. The following video tests are available: Black Frame, Blockiness, Frozen Frame, and Video Bit Rate (real-time analysis only).

For each test, thresholds can be set which can generate an alarm. Where a stream is being received from a DTV Monitor, the alarm state will be passed back and flagged in their respective screen displays.

Event Log

The event log panel records alarm activity that has occurred since the last time that the log was cleared. The log file can be exported in CSV (comma separated values) format for detailed inspection.

Source Image

This panel displays the source image; the selected video stream. You can select the area of the source image to be processed and displayed in the processed image panel.

Processed Images

The processed image panels display analyses of the area that you have selected in the source image. The following processed images can be selected: Motion, Black, Blockiness, and Color.

Configuring a DTV Monitor for Use with the VQS1000 Software

For the VQS1000 application to work with the DTV Monitor, the VQS1000 player must be set up correctly in the DTV Monitor.

Setting Up the VQS1000 Player in the DTV Monitor

1. Open the DTV Monitor remote user interface (RUI).

2. Select Configuration on the Toolbar to open the Configuration dialog box.

3. In the dialog box, select **Preferences > Decode**.

4. In the Select Player panel, select the **Tektronix VQS1000** player.

> ⚠ **CAUTION.** *If the VQS1000 player is not present in the player list, check that the latest version of the firmware is installed in the DTV Monitor. The minimum firmware version is Version 4.5. Refer to the DTV Monitor documentation for details of how to update the firmware. (See page v, Related Product Documentation.)*

5. Select **OK** to enable the VQS1000 player.

Selecting a Stream for Analysis

Use the following steps to set up backhauling of a stream from a DTV Monitor:

1. Open the DTV Monitor Remote User Interface (RUI).

2. Select the **Analysis > Programs > Thumbnails** tab to display thumbnails of the stream content.

3. Select the Play (►) button below the thumbnail. The VQS1000 application will be opened and display analysis of the selected stream.

> **NOTE.** *If the video backhaul fails, check the presence and status of the firewall on the VQS1000 host PC.*

Application Examples

This section provides the following application examples:

- Analyzing video files

- Backhauling video from a DTV monitor

- Analyzing real-time IP video

Analyzing Video Files

Start Up

1. Ensure that the time and date on the VQS1000 host PC are set accurately.

   This will ensure that the VQS1000 timeline and log statistics are recorded properly.

2. Ensure that a dongle, with the appropriate licensing information, is attached to the host PC.

3. Select **Start > Tektronix > Tektronix VQS1000 Video Quality Test Suite**.

   Wait for the application to open.

Configuration and Setup

4. Ensure that **View > Dashboard Layout** is checked.

   This ensures that you can see all of the panels. These are needed to complete this example.

   If you clear the **View > Dashboard Layout** check box, only the two lower panels will be displayed (source image and processed image panels). Use this view when you want to analyze the stream visually only.

5. Drag the borders of the display panels to adjust the sizes, as required.

6. In the source image panel, select **Reset Graticule** from the right-click context menu.

   This sets the window to default size: that is, the graticule centered on two thirds of the standard SD/HD frame.
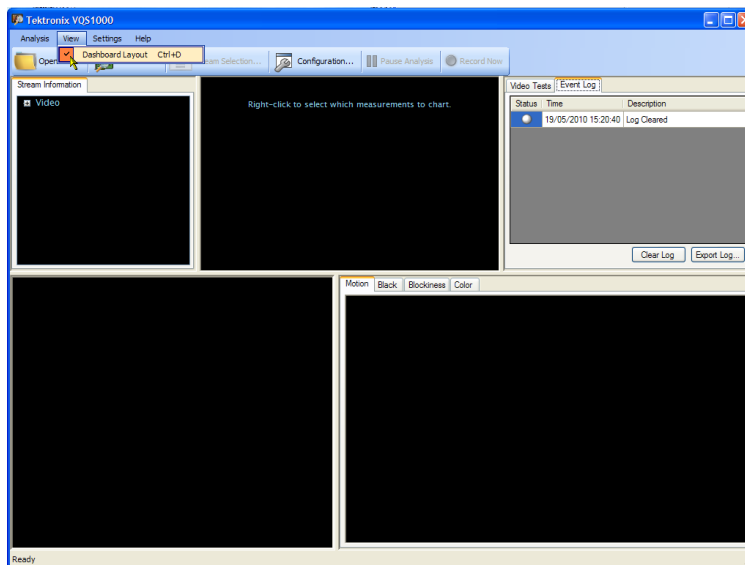
7. In the Trend Graphs panel, right-click and select **Time Interval > Last Minute** from the context menu.

8. In the Trend Graphs panel, select **Selected Measurements > Add All**.
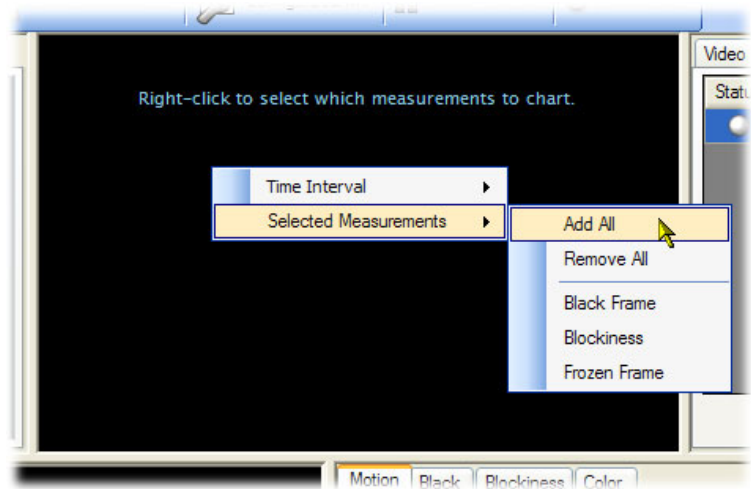

9. Select **Settings > Recording** to open the Recording Settings dialog box.

   Make a note of the folder that will be used for recordings. You can change this if you want to.

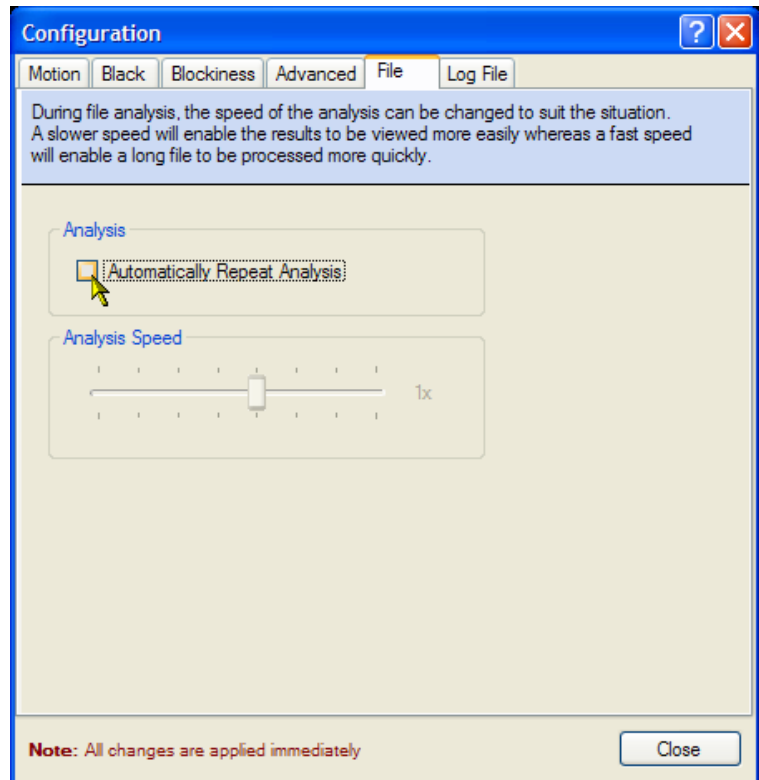10. Select the Video Triggers **Blockiness** check box.

11. Close the dialog box.
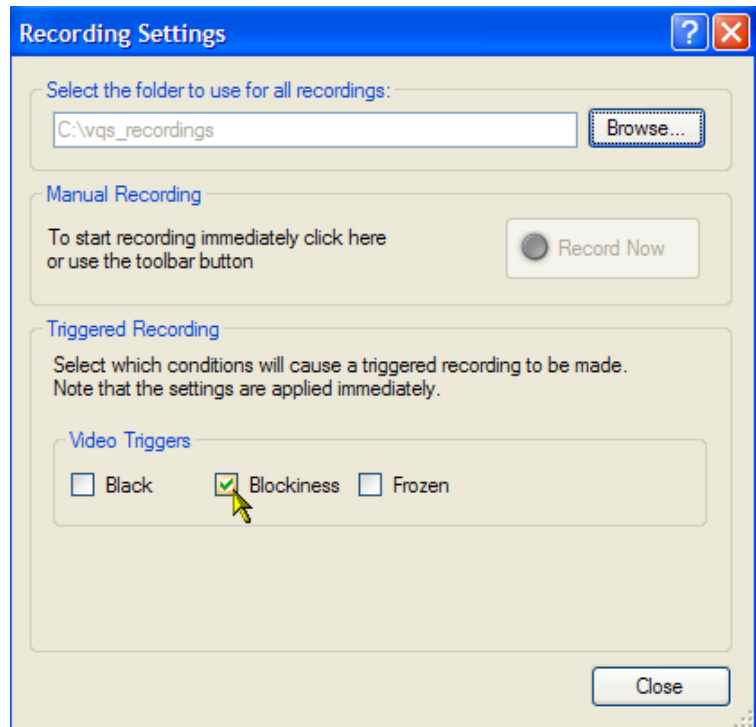
12. Select **Settings > Configuration** to open the Configuration dialog box.

13. In the Configuration dialog box, select the **Blockiness** tab.

14. Set the **Macroblock Size** slider to **8**.
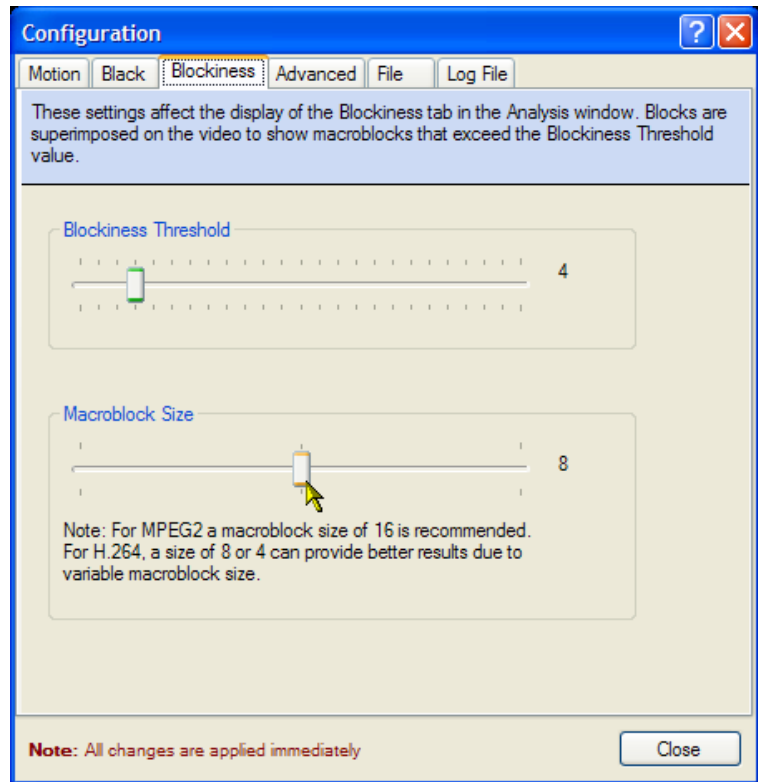
15. In the Configuration dialog box, select the **Advanced** tab.

16. Select **Full** deinterlacing.
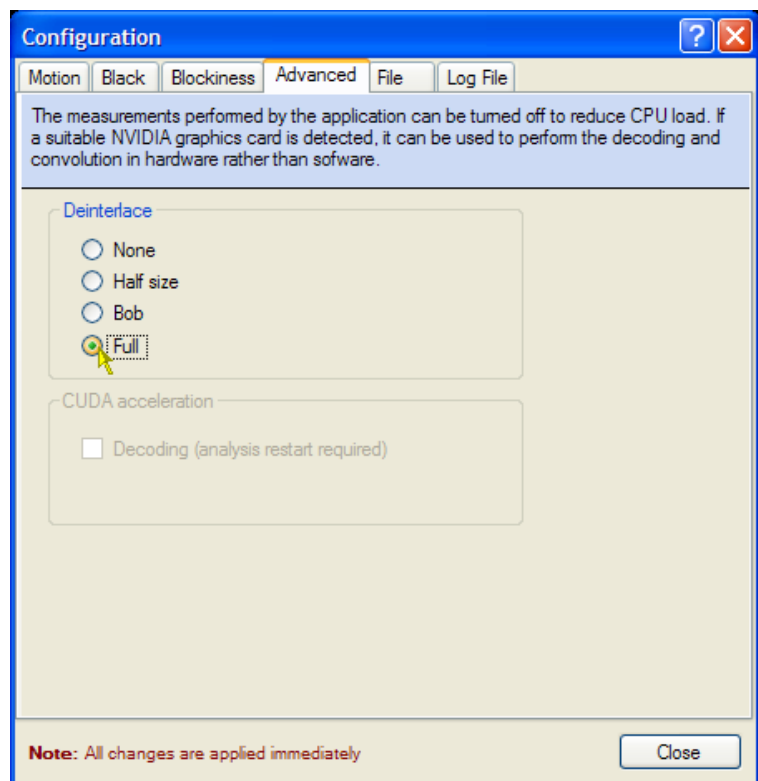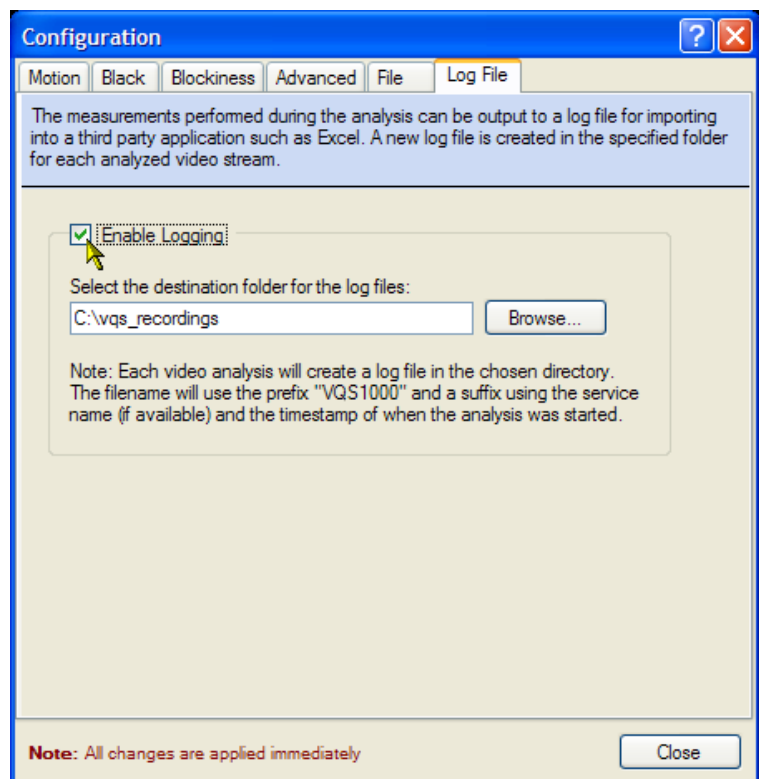
Edit Alarm Parameters

22. In the Video Tests panel, select **Edit Alarm Parameters** from the Black Frame test meter context menu to display the Edit Alarm Parameters dialog box.

23. In the Consecutive frames panel, select the **Raise alarm** check box.

24. Set **Raise alarm if value stays above 95% for 30 seconds**.

25. In the Event count panel, clear the **Raise alarm** check box.

26. Select **OK**.

27. In the Video Tests panel, select **Edit Alarm Parameters** from the Frozen Frame test meter context menu to display the Edit Alarm Parameters dialog box.

28. In the Consecutive frames panel, select the **Raise alarm** check box.

29. Set **Raise alarm if value stays above 97% for 3 seconds**.

30. In the Event count panel, select the **Raise alarm** check box.

31. Set **Raise alarm if value stays above 90% for at least 10 times in 100 seconds**.

32. Select **OK**.

33. In the Video Tests panel, select **Edit Alarm Parameters** from the Blockiness test meter context menu to display the Edit Alarm Parameters dialog box.

34. In the Consecutive frames panel, select the **Raise alarm** check box.

35. Set **Raise alarm if value stays above 95% for 3 seconds**.

36. In the Event count panel, select the **Raise alarm** check box.

37. Set **Raise alarm if value stays above 60% for at least 2 times in 6 seconds**.

38. Select **OK**.
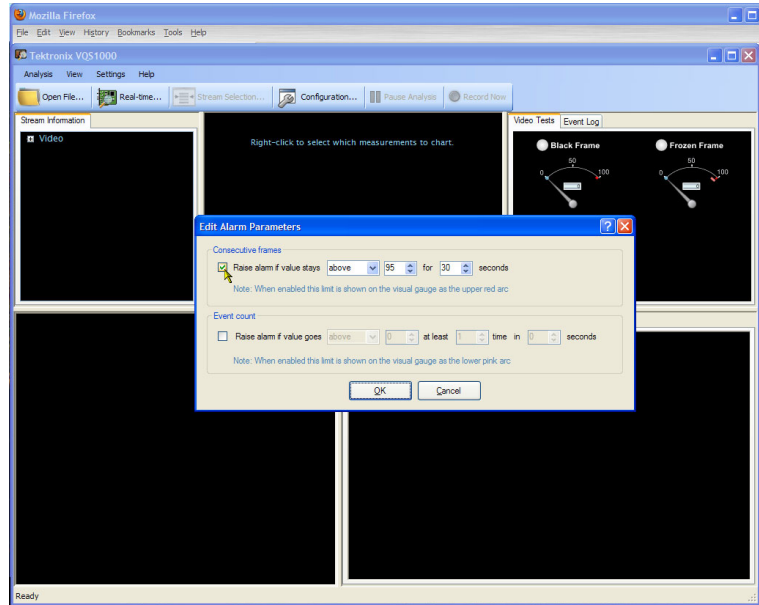
File Analysis

39. Select Analysis > File Analysis.

40. In the Select a file dialog box, locate and select a file for analysis.

In this application example, the file `525_02_5M_Sports.trp` is used. If you use a different file, some of the data displayed will be different.

41. Select **Open**.
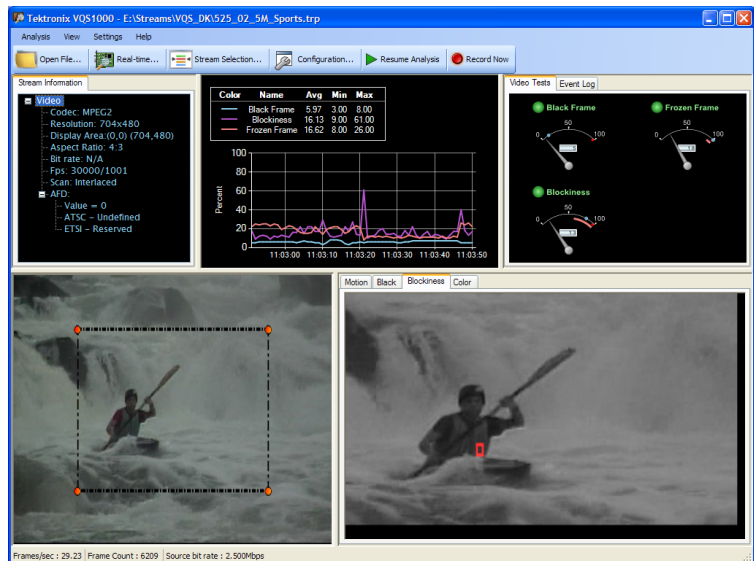
42. In the Stream Information panel, note that the Resolution is 704 x 480, and the Scan is Interlaced. In the status bar, the source bit rate is reported as 2.500 Mbps.
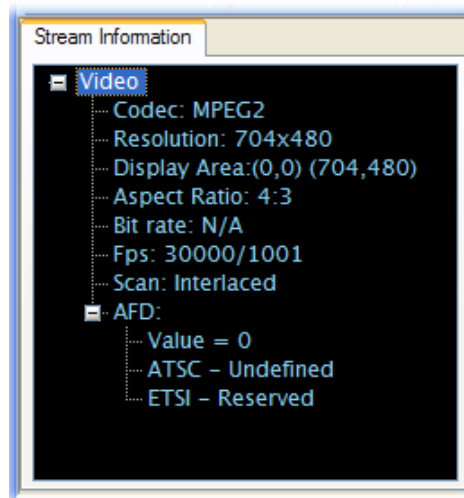
43. Select the Event Log tab in the Video Tests panel. Note that any triggered events are recorded; the recorded file will be stored in the folder specified in the Log file configuration settings.

44. Select **Export Log** to export the event log to a csv (comma separated value) file.
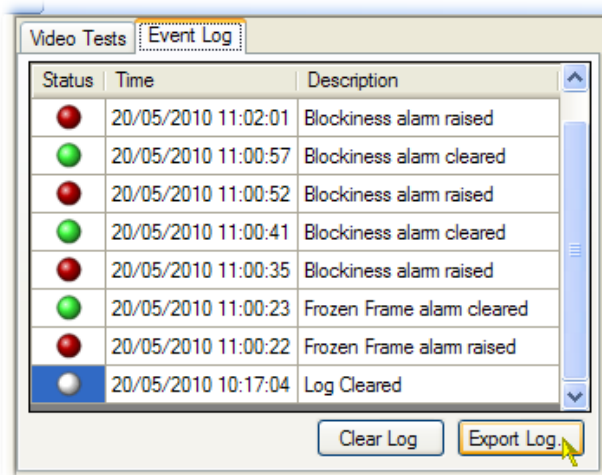

45. After about two minutes, use Windows Explorer to locate and open a triggered file report. The file name will be of the format, `VQS1000.<date><time>.xml`, for example, `VQS1000.201005201144.xml`.

You can open this file in Microsoft Excel or similar spreadsheet tool. Each row in the file represents 60 seconds of event data. Each row, in addition to the time and date, contains the minimum, mean, and maximum values recorded for each of the video tests.

Date	Time	Span (s)	Black Frame Min	Black Frame Mean	Black Frame Max	Blockiness Min	Blockiness Mean	Blockiness Max	Frozen Frame Min	Frozen Frame Mean	Frozen Frame Max
20/05/2010	11:44	60	6.00	6.58	8.00	22.00	30.54	64.00	7.00	10.25	15.00
20/05/2010	11:45	60	2.00	6.00	13.00	6.00	31.30	82.00	0.00	18.57	100.00
20/05/2010	11:46	60	5.00	7.43	12.00	10.00	28.73	77.00	7.00	12.92	27.00
20/05/2010	11:47	60	4.00	5.60	7.00	8.00	16.23	45.00	9.00	18.68	25.00
20/05/2010	11:48	60	3.00	6.05	8.00	9.00	17.65	61.00	9.00	15.50	25.00
20/05/2010	11:49	60	2.00	6.20	8.00	6.00	29.28	64.00	8.00	19.87	100.00
20/05/2010	11:50	60	2.00	4.81	8.00	6.00	32.94	82.00	7.00	30.91	100.00
20/05/2010	11:51	60	5.00	6.74	9.00	10.00	28.40	77.00	6.00	12.81	24.00
20/05/2010	11:52	60	4.00	5.55	7.00	8.00	16.22	45.00	9.00	18.68	25.00
20/05/2010	11:53	60	3.00	6.13	8.00	9.00	17.53	61.00	9.00	15.37	26.00
20/05/2010	11:54	60	2.00	6.08	8.00	6.00	29.78	64.00	7.00	21.33	100.00
20/05/2010	11:55	60	2.00	5.87	13.00	6.00	29.60	82.00	6.00	24.13	100.00
20/05/2010	11:56	60	5.00	7.54	11.00	10.00	28.10	77.00	6.00	12.75	24.00

46. With the cursor in the source image panel, drag and drop the graticule corner handles and edges to adjust the area being displayed in the processed image panels.

Larger graticule windows require more intensive processing.
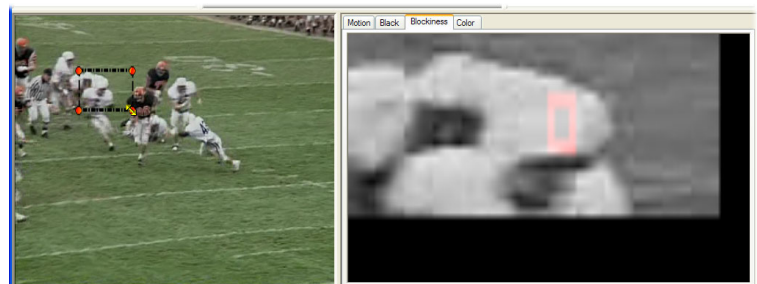
47. Note that where a measurement exceeds the set video test thresholds, the LED icon at the top left of meter will show red. Normally, when there is no error, it will display green.
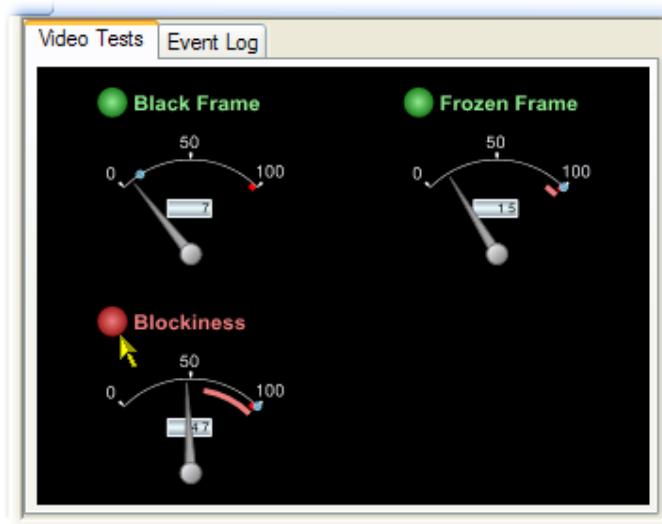
48. Select **Analysis > Stream Selection**.

49. Expand the Program tree.

Select any of the elementary streams for display. The analysis of the newly selected stream will start immediately.

50. Close the Stream Selection panel.
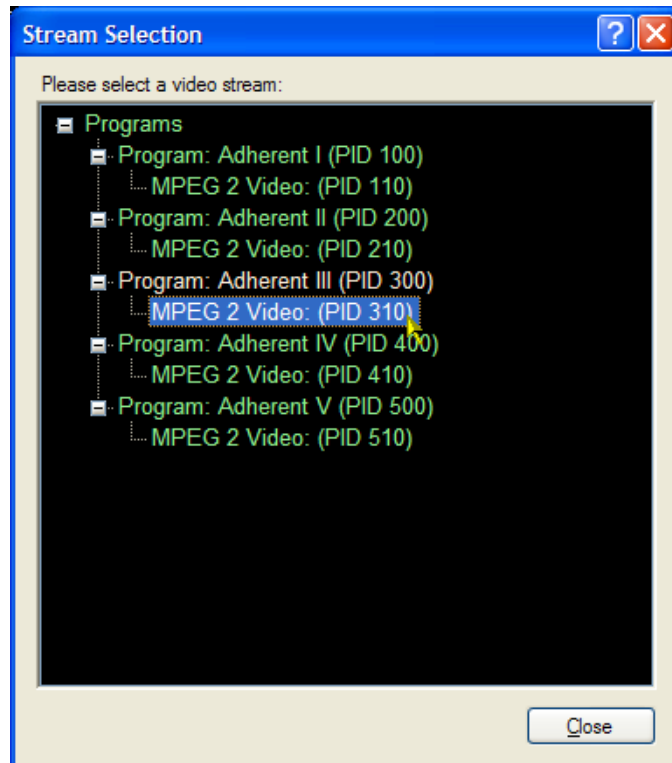
Analyzing Backhauled Video from a DTV Monitor

This application example describes how to analyze video that is backhauled from a Tektronix DTV monitor such as an MTM400A, IPM400A, QAM400A, or RFM300. This example uses an MTM400A for illustrative purposes, but you can use any DTV monitor since the operation is the same for any of the monitors.

⚠️ **CAUTION.** *Before the DTV monitor will operate with the VQS1000 software, firmware version 4.5 or later must be installed on the DTV monitor.*

The following application assumes that you have already worked through the previous example and have retained the settings that you made. (See page 10, *Analyzing Video Files*.) It is also assumed that you are familiar with the basic operating procedures for a DTV monitor. If necessary, refer to the DTV monitor user documentation. (See Table ii on page v.)

1. Open the MTM400A DTV monitor remote user interface (RUI).

2. Ensure that the stream is being monitored by observing the activity.

3. In the MTM400A RUI, select **Configuration (toolbar) > Preferences > Decode** to display the Decode configuration dialog box.

4. In the Select Player pane, select the **Tektronix VQS1000** player.

   This ensures that when the thumbnail play button is selected, the VQS1000 application launches.
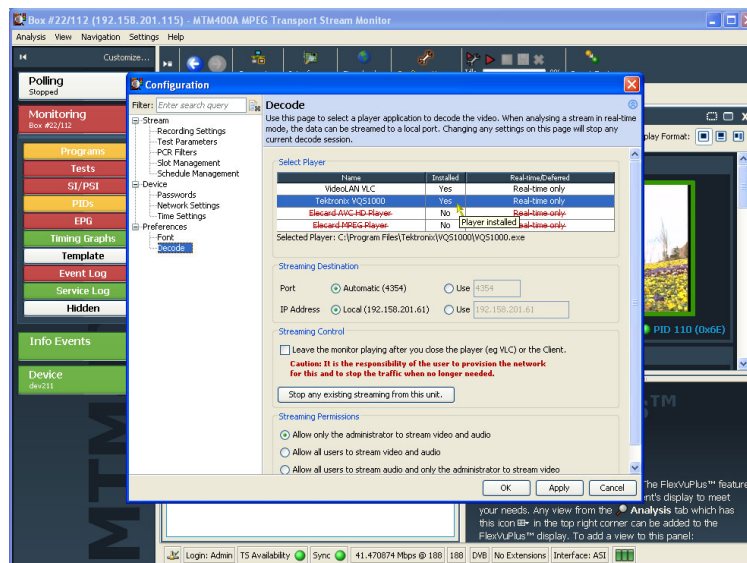
5. In the Streaming Destination pane, note the Automatic Port setting and the Local IP Address (the latter should be the IP address of your PC).

6. Select **OK** to close the dialog box.
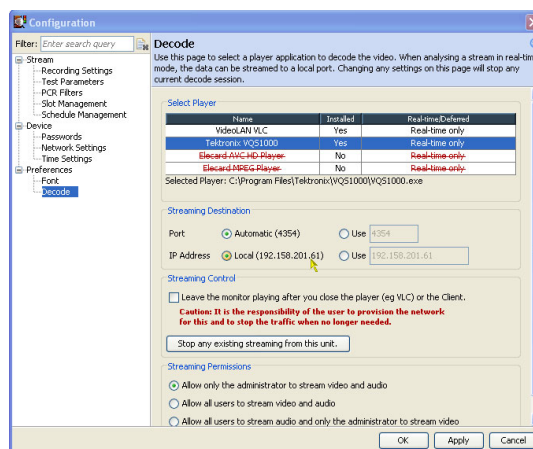
7. Select **Analysis tab > Programs > Thumbnails**.

**8.** Identify the program to be analyzed by the VQS1000 and select the (blue) play button.
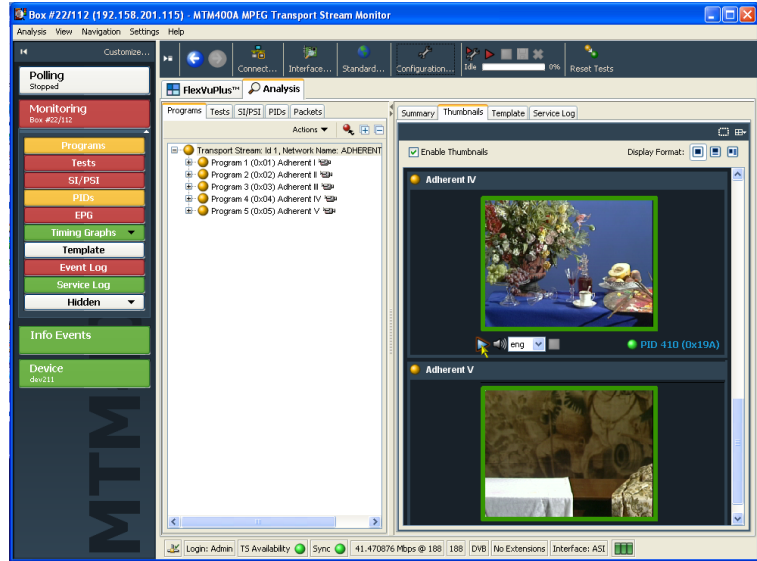
9. The VQS1000 is launched and begins decoding the program frame by frame. The IP address of the source MTM400A is displayed in the VQS1000 status bar.

The Decode Buffer progress indicator, in the status bar, shows you the state of the decode buffer as the file is analyzed. If your PC is unable to process the stream in real-time, you may see breaks in the continuity of the stream.

10. If you have set video measurement thresholds, the LED icons in the Video Tests panel will turn red when the threshold is exceeded.

In this example, the frozen frame video test has exceeded the setting that you entered, that is **Raise alarm if value stays above 25 for 1 second**.

11. You can also see the frozen frame activity in the trend graph panel.
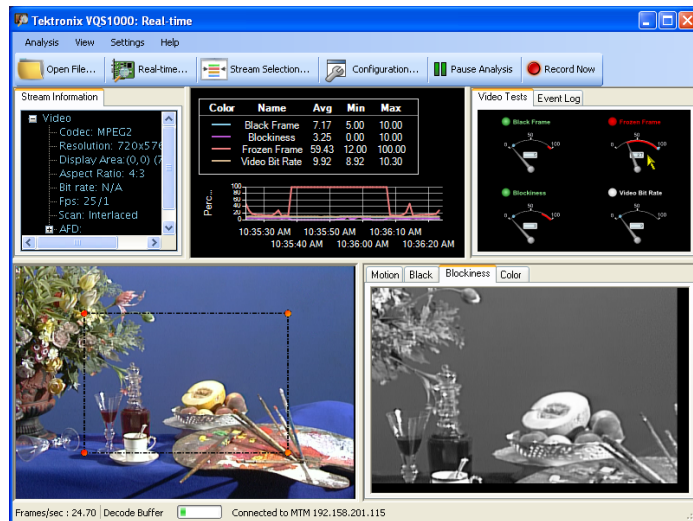
Information is fed back to the DTV monitor, which can be used, as with any other alarm, for logging, recording, and sending traps or enabling physical outputs.

12. In the MTM400A, select the **Tests** tab and in the navigation pane, expand the Stream Tests tree until the AV Quality Tests node is visible.

13. Expand the AV Quality Tests node, and note that the Video Frozen node is indicating either an active error (red) or a that an error has occurred (yellow).

14. Highlight the PID causing the error, and note that the Event Log records details of the error.

Remember that when video test thresholds are exceeded, the events are recorded in the event log. Also, if you have set recordings to be made when video test thresholds are exceeded, the VQS1000 will be logging and recording the minimum, mean, and maximum values in 60 second segments.
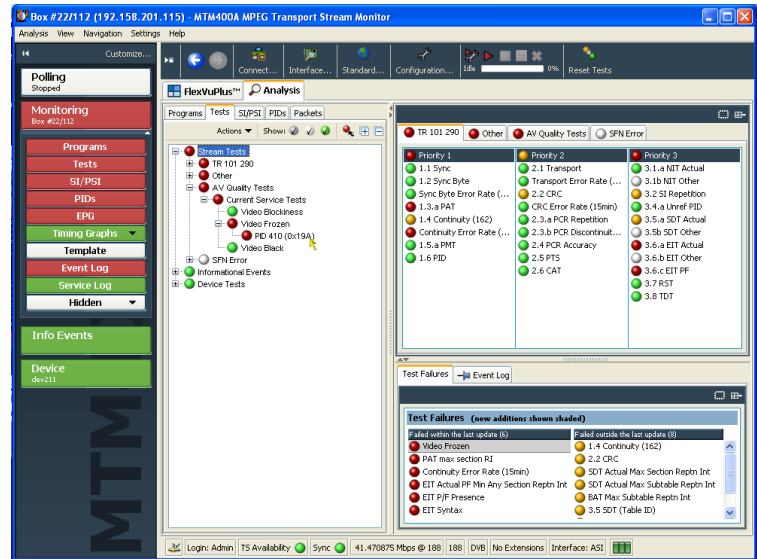
Analyzing Real-time Video Over IP

In this application, you will select a network card and identify a stream for analysis in real-time. You must ensure that the PC that the VQS1000 software is installed on is connected to an IP switch that is serving multicast or unicast traffic; consult your network administrator if necessary.

It is assumed that you have worked through the previous two example applications; in particular, the Start Up and Configuration and Set Up procedures. (See page 10.)

1. Select **Start > Tektronix > Tektronix VQS1000 Video Quality Test Suite**.

   Wait for the application to open.

2. Select **Analysis > Real-time** to open the Real-time Analysis dialog box.

3. Select a Network card from the drop-down list.

4. Choose either:

   ■ to use directed traffic on a designated UDP port, or

   ■ to inspect all traffic present on the selected network card.

   For this example, select the **Inspect all traffic** option button.

   NOTE. If the video backhaul subsequently fails, check the presence and status of any firewall on the VQS1000 host PC. The firewall should allow communication with the VQS1000.

5. Select **Analyze** to close the Real-time Analysis dialog box and start the analysis.

6. Initially, **Waiting for Data** is displayed in the left side of the status bar. When there is enough data in the Decode Buffer, the status bar message changes to **Frames/sec** and analysis begins.
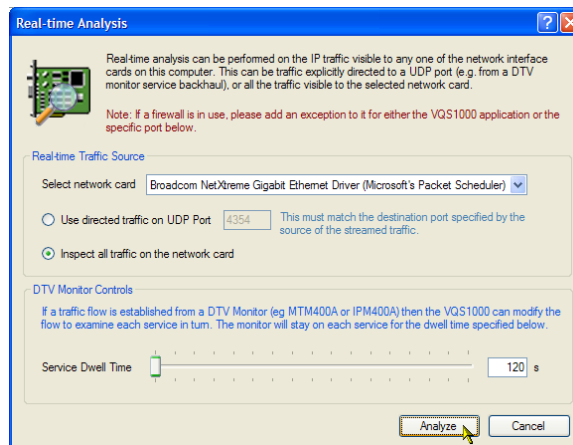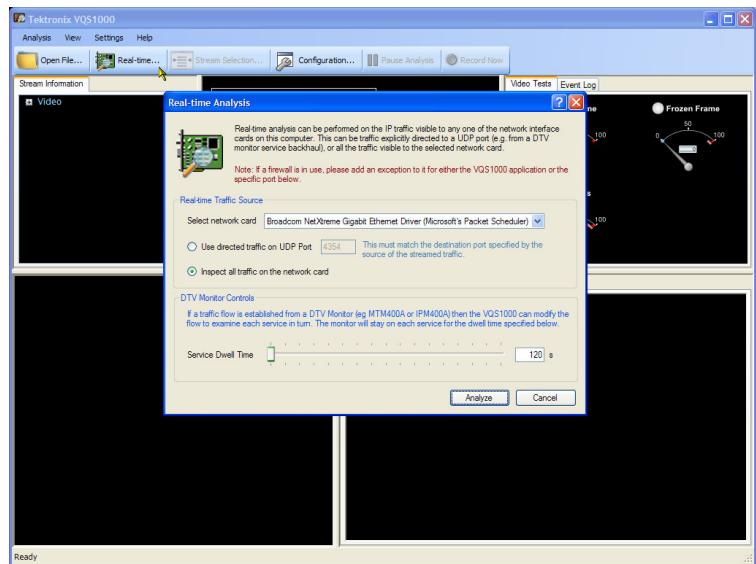
7. Select **Analysis > Stream Selection** to open the Stream Selection dialog box.

The Stream Selection dialog box displays all of the traffic available to the selected network card. You may need to wait for a short time until all of the traffic details are available to display.

8. Expand each of the program nodes to see all of the video streams that are available.

9. Select a stream. Analysis starts almost immediately.

10. Close the Stream Selection dialog box.
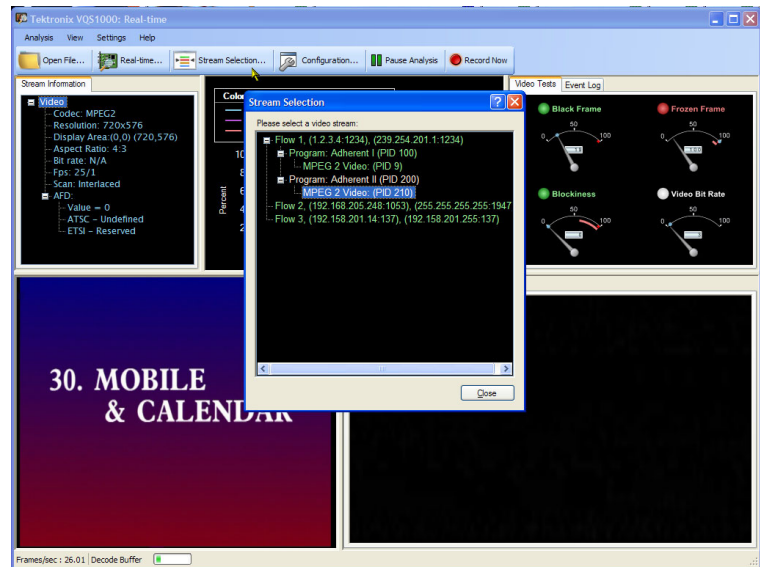
11. Continue with the analysis and measurements as described in the previous application examples. (See page 10.)
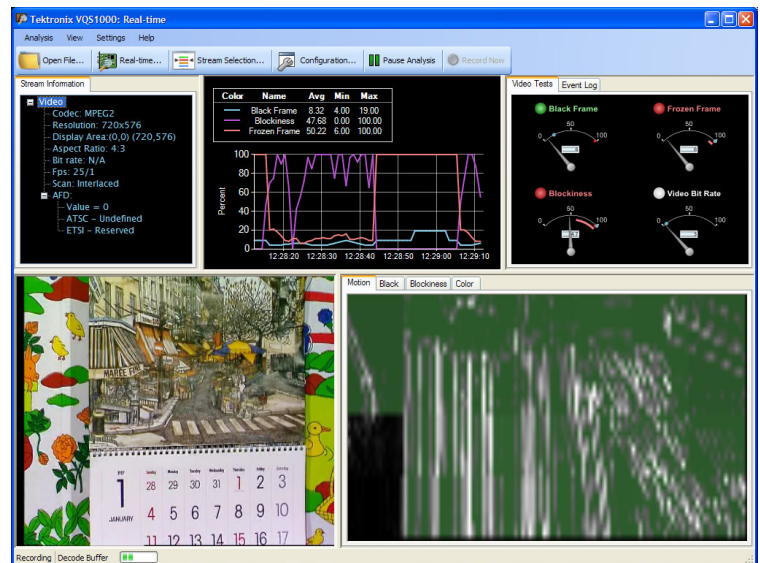
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