

VQS1000
Video Quality Software Application
Online Help



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- Worldwide, visit www.tektronix.com to find contacts in your area.

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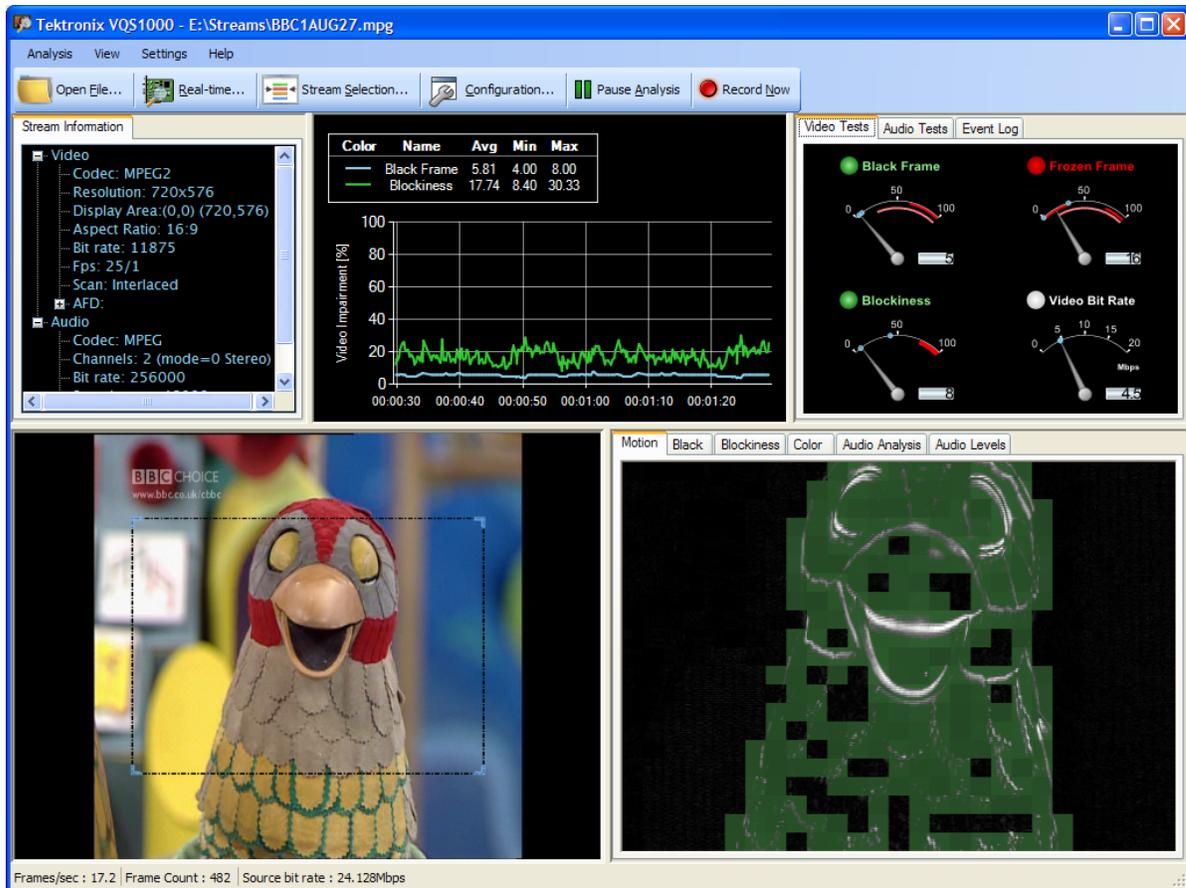
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VQS1000 Overview

The VQS1000 Video Quality Software application is used for single-ended QoE analysis of video and audio content. You can use it with all current Tektronix DTV Monitor configurations (MTM400A, IPM400A, QAM400A, RFM300) using private backhaul video and audio. Network traffic visible to the host PC network card can be accessed using IGMP (Internet Group Management Protocol). You can also use the VQS1000 for stand-alone file analysis.



Related Documentation

The following table lists the product documentation supporting the VQS1000:

Table 1: VQS1000 product documentation

Item (Tektronix part number)	Purpose	Location
VQS1000 Video Quality Software Application Quick Start User Manual (077-0489-XX)	Provides installation and high-level operational overviews	 +  www.Tektronix.com
VQS1000 Video Quality Software application online help (076-0223-XX)	Provides in-depth operating information	-
VQS1000 Video Quality Software application online help (077-0490-XX, printed)	Provides in-depth operating information	 +  www.Tektronix.com
VQS1000 Video Quality Software application Read This First (077-0492-XX)	Describes late breaking product information and operational issues	 +  www.Tektronix.com

Installation

The installation of the VQS1000 is described in the *VQS1000 Video Quality Software Application Quick Start User Manual*, Tektronix part number 077-0489-XX.

Requirements

The requirements for the VQS1000 are listed in the *VQS1000 Video Quality Software Application Quick Start User Manual*, Tektronix part number 077-0489-XX.

User Interface

This section provides brief descriptions of the screen display elements.

NOTE. *The elements displayed are dependent upon the license enabled. See [License Management \(see page 6\)](#).*

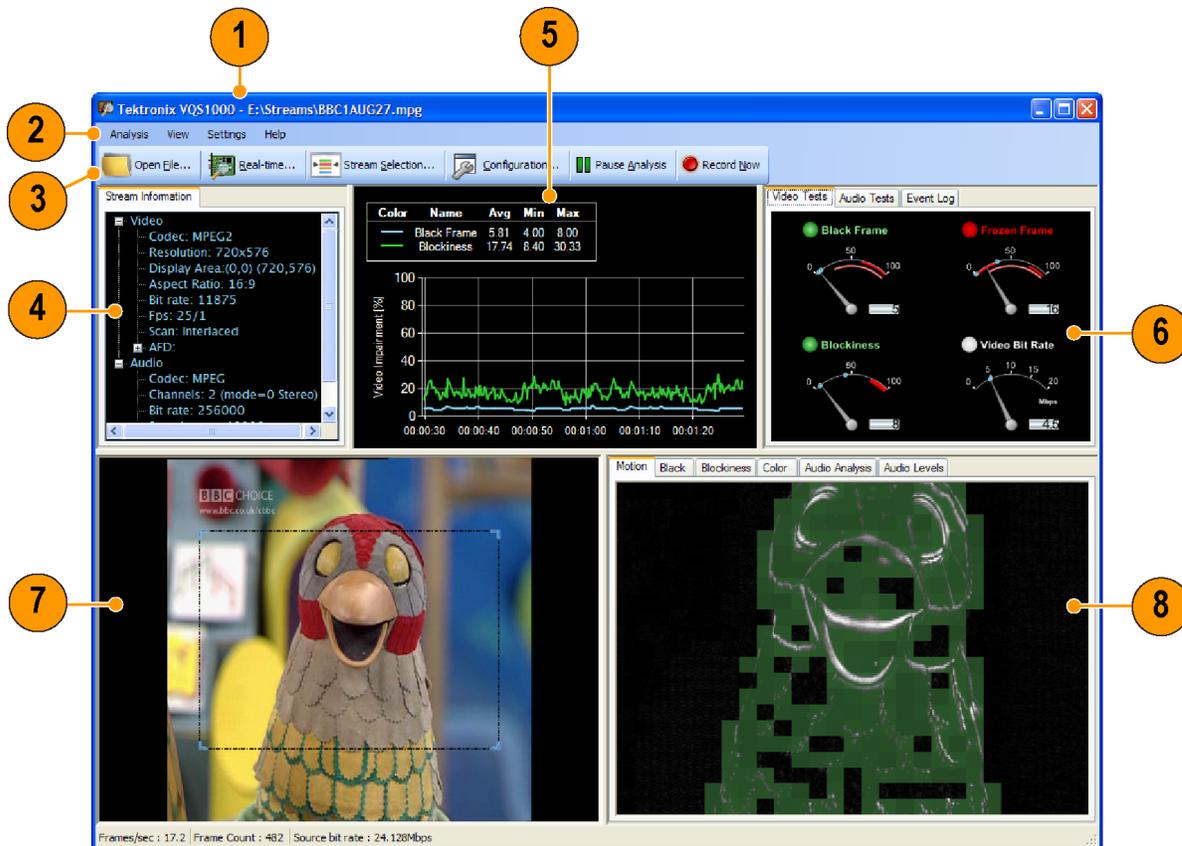


Table 2: VQS1000 screen display elements

	Brief description	Detailed description
1	Title Bar (see page 3)	–
2	Menu Bar (see page 4)	–
3	Toolbar (see page 5)	–
4	Stream Information (see page 5)	Stream Information (see page 12)
5	Trend Graphs (see page 5)	View Trend Graphs (see page 13)
6	Video and Audio Tests (see page 5)	Video and Audio Tests (see page 14)
7	Source Image (see page 6)	Source Image Processing Area Selection (see page 20)
8	Processed Images (see page 6)	Processed Images (see page 21)

Title Bar

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

Menu Bar

Where available, shortcut keys are displayed in the screen display next to the menu option. The menu bar options are as follows:

[Analysis Menu Options \(see page 4\)](#); [View Menu Options \(see page 4\)](#); [Settings Menu Options \(see page 4\)](#); [Help Menu Options \(see page 4\)](#)

Analysis menu options.

- **Open File:** Select a file for off-line analysis, see [Offline File Analysis \(see page 8\)](#).
- **Real-time:** Select a source of traffic for real-time analysis, see [Real-time File Analysis \(see page 8\)](#).
- **Pause/Resume Analysis:** Select this button to pause or resume analysis.
- **Record Now:** See [Recording Streams \(see page 17\)](#).
- **Stream Selection:** See [Stream Selection \(see page 10\)](#).
- **Recent Files:** Displays the names of the most recently opened files.
- **Exit:** Terminates analysis and closes the application.

View menu options.

- **Dashboard Layout:** Selecting this option hides/shows the dashboard panels - Stream Information, Trend Graphs, and Video and Audio Tests. This provides more screen space for the visual analysis panels - Source view and Processed Image.

Settings menu options.

- **Configuration:** See [File Configuration \(see page 33\)](#)
- **Recording:** See [Recording Streams \(see page 17\)](#)
- **Use Polling:** When enabled, the VQS1000 will poll services within a real-time MPTS. See also [Real-time File Analysis \(see page 8\)](#).
- **Reset All Peak Markers:** Select this option to reset the peak markers on the [test meters \(see page 14\)](#).

Help menu options.

- **Help:** Opens the VQS1000 online help window. Access your area of interest using the navigation pane of the help window. shortcut sensitive help is also available by selecting a screen display element and pressing F1 key on your keyboard.
- **License Management:** See [License Management \(see page 6\)](#).
- **About Tektronix VQS1000:** The Tektronix VQS1000 Video Quality Test Suite information box displays the test suite version number. You will need this number if you call Tektronix for technical support.

Toolbar

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

See also [Open File \(see page 8\)](#); [Real-time \(see page 8\)](#); [Stream Selection \(see page 10\)](#); [Configuration \(see page 23\)](#).

Pause/Resume analysis. Select this button to pause or resume analysis.

Record Now. Select this button to start recording immediately. See [Recording Streams \(see page 17\)](#).

Stream Information

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

Trend Graphs

This panel shows trend graphs for video and audio measurements. You can select which measurements are displayed, and the time period over which data is displayed; also a variety of plot line displays can be selected.

A legend panel, displayed at the top of the trend graph panel, can be toggled on and off either by double-clicking in the panel, or selecting or clearing the option in the shortcut menu.

See also [Black Frame \(see page 24\)](#); [Blockiness \(see page 26\)](#); [Frozen Frame \(see page 28\)](#); [Video Bit Rate \(see page 32\)](#); [Loudness \(Short and Long Term\), True Peak, Target \(DialNorm\), \(see page 29\)](#).

Video and Audio Tests

Video Tests. This panel contains test related meters which give a visual indication of the video test status.

See [Black Frame \(see page 24\)](#); [Blockiness \(see page 26\)](#); [Frozen Frame \(see page 28\)](#); [Video Bit Rate \(see page 32\)](#)

You can set upper and lower thresholds for each test that will generate an alarm when the thresholds are crossed. Where a stream is being received from a DTV Monitor, the alarm state will be passed back and flagged in their respective screen displays.

Audio Tests. This panel contains test-related meters which give a visual indication of the audio test status.

See [Audio Measurements and Configuration \(see page 29\)](#)

You can set upper and lower thresholds for each test that will generate an alarm when the thresholds are crossed. 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. See [Event Log \(see page 17\)](#)

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. See [Source Image Processing Area Selection \(see page 20\)](#).

Processed Images

The processed image panels display analyses of the area that you have selected in the source image. See [Source Image Processing Area Selection \(see page 20\)](#). See [Motion \(see page 23\)](#); [Black \(see page 24\)](#); [Blockiness \(see page 26\)](#); [Color \(see page 28\)](#); [Audio Analysis \(see page 31\)](#); [Audio Levels \(see page 32\)](#).

License Management

Menu Bar: **Help > License Management**

The VQS1000 application and its constituent functions are enabled using a USB security [dongle \(see page 6\)](#) and an [option key string \(see page 7\)](#).

When you start the VQS1000 application, the software compares a serial number stored on the dongle with the encrypted option key string. The option key string also contains code which enables specific functions in the application, for example, video and audio.

When you start the application for the first time, the License Management dialog box is opened automatically to allow you to enter the option key string that you were issued with. [\(see page 7\)](#)

NOTE. *A valid license enables up to two instances of the VQS1000 to be run simultaneously.*

If you purchase an upgrade, that is, permission to access and use more functions, a new option key string will be issued to you.

Dongle

A USB device that, with the option key string, unlocks and enables software functions in the application.

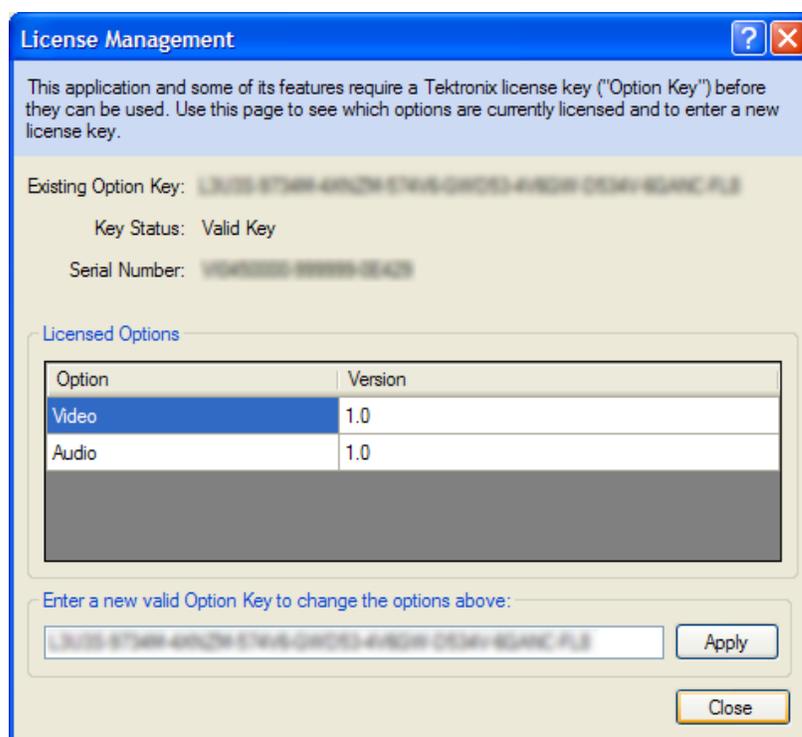
Option Key String

The option key string is an encrypted code that, with the dongle, unlocks and enables software functions in the application.

Applying an Option Key String

1. Ensure that the dongle is present in a USB port of the client PC.
2. Select **Help > License Management** to open the License Management dialog box.

NOTE. If a valid option key is already installed, it will be shown in the **Existing Option Key** field and the **Key Status** field will display **Valid Key**. The enabled options will be listed in the **Licensed Options** panel.



3. Enter your new option key string in the new option key field.
4. Select **Apply**.

The status of the key is displayed in the **Key Status** field; in this example, the key status is valid. The Serial Number is extracted from the dongle. The enabled options will be shown in the **Licensed Options** panel.

5. Click **Close**.

Offline File Analysis

Menu Bar: **Analysis > Open File**

You can select [MPTS \(see page 8\)](#) and [SPTS \(see page 8\)](#) files for analysis off-line - only MPEG format transport streams are accepted.

The selected stream can be locally stored, on the PC hard drive for example, or accessed over the network. Elementary streams can contain either 188 byte or 204 byte packets. To modify the speed of analysis, select **Settings > Configuration > File** and adjust the **Analysis Speed** slider. See [File Configuration \(see page 33\)](#).

The adjusted analysis bit rate is displayed in the status bar, **Source Bit Rate**.

To repeat (or loop) streams, use the **Settings > Configuration > File** dialog box. Repeating a recorded stream will almost certainly produce artifacts, and may generate errors, at the loop point; this will not invalidate the analysis, but you should be aware of it happening.

Opening a File

1. Select **Analysis > Open File (Toolbar > Open File)**.
2. In the **Select a File** dialog box, highlight the file to be analyzed and select **Open**.
3. The dialog box will close and analysis will start immediately.

When a stream has been selected, and analysis has started, you can select individual flows (program, video, or audio) using **Analysis > Stream Selection**. See [Stream Selection \(see page 10\)](#).

MPTS

Multiprogram Transport Stream

SPTS

Single Program Transport Stream

Real-time Analysis

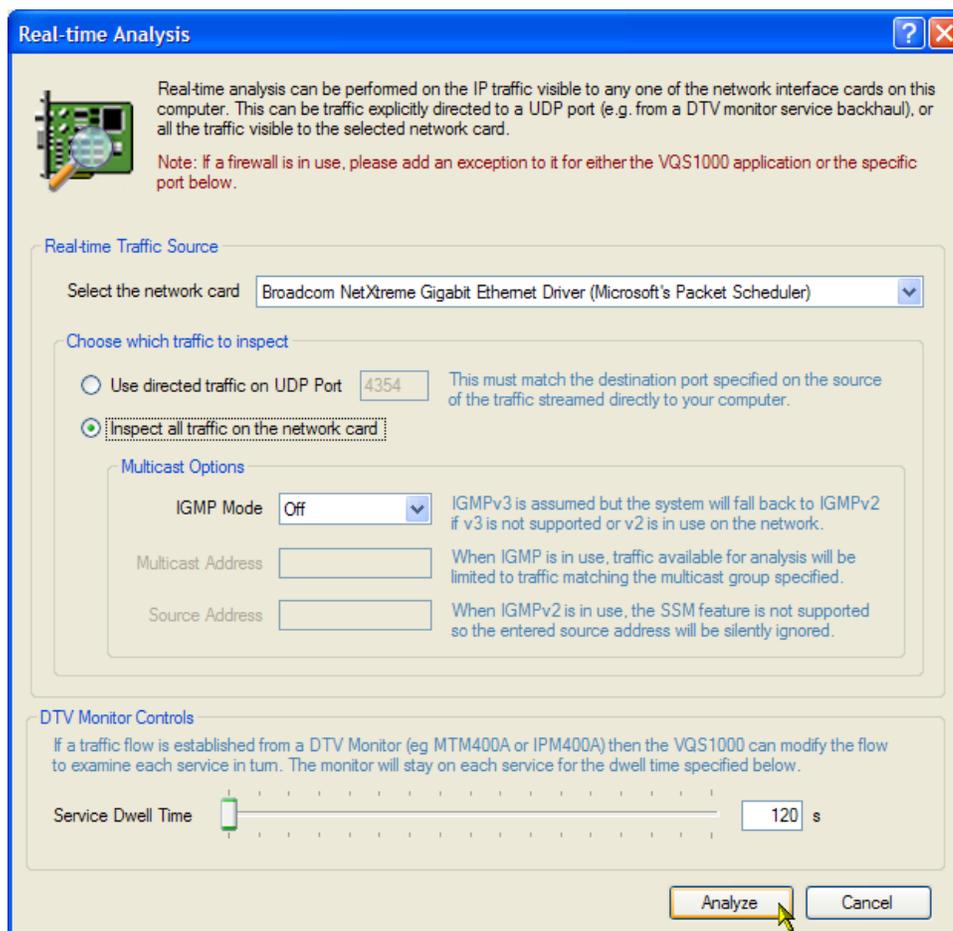
Menu Bar: **Analysis > Real-time**

The VQS1000 provides real-time video analysis of content [backhauled \(see page 10\)](#) from a DTV Monitor (including MTM400A, IPM400A, QAM400A, and RFM300). The VQS1000 player must be selected in the DTV Monitor; refer to the DTV Monitor product documentation. See [Related Documentation \(see page 1\)](#).

You can initiate stream analysis directly from a DTV Monitor thumbnail screen by pressing the play button or use the following procedure to initiate analysis of a stream carried in IP traffic present on your PC's network interface.

Opening a Stream Flow

1. Select **Analysis > Real-time**.



2. In the Real-time Analysis dialog box, select the network card that is connected to the flow and/or DTV Monitor you want to work with.
3. Select **Analyze**.

Analysis will start on the first program encountered and the dialog box will close. If you later select **Analysis > Stream Selection**, the **Stream Selection** dialog box opens and you will be able to view all of the available traffic flows and select an alternative flow. See [Stream Selection \(see page 10\)](#).

When packets are dropped from the streamed content due to performance or network issues, the application recognizes it from any discontinuity in the RTP sequence numbers. When dropped packets are detected, the VQS1000 measurements are disabled to avoid false alarms being generated.

DTV Monitor Controls. Where a traffic flow is established from a DTV Monitor and you enable [Polling](#), you can specify for how long each service should be monitored for by adjusting the Service Dwell Time slider. The range is from 120 s to 600 s.

Backhaul

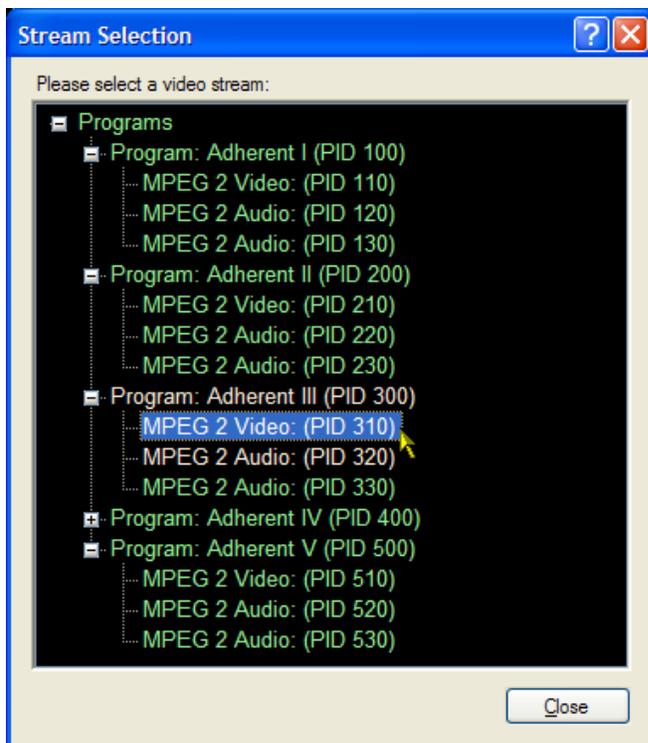
Refers to a video and audio streams received directly from a DTV monitor.

Stream Selection

Menu bar: **Analysis > Stream Selection**

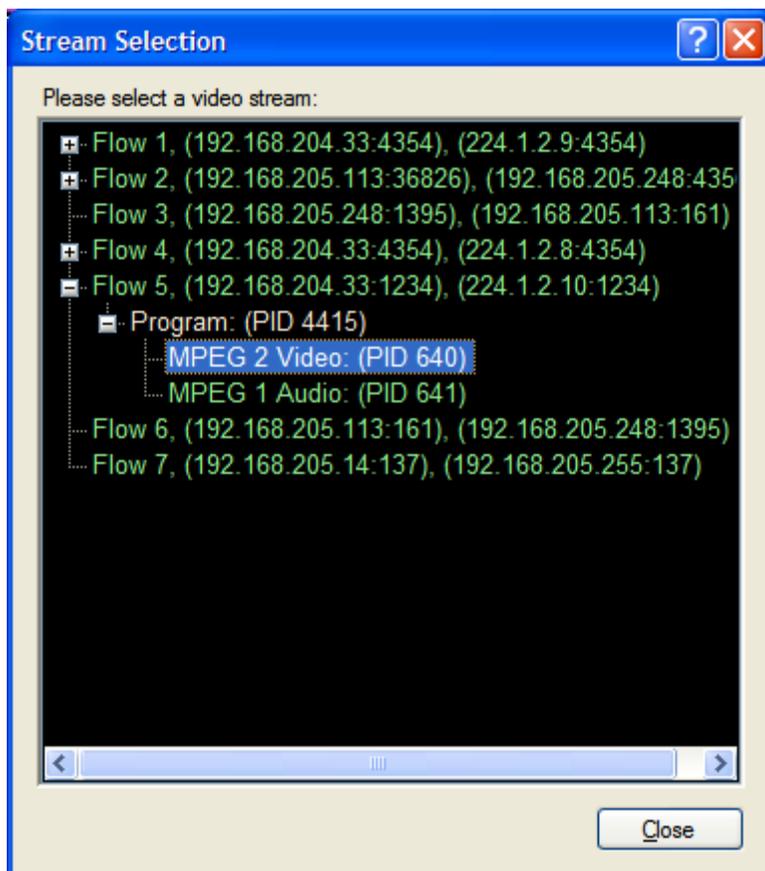
Using Directed Traffic on a UDP Port

When directed traffic is first selected for analysis, the application displays video and audio content of the first elementary stream encountered. In the case of MPTS, the remaining elementary streams may be selected in the Stream Selection dialog box; the current elementary stream is highlighted. To change the displayed stream, highlight the video or audio PID in the new stream and select **Close**. Note that if an audio stream is selected, the associated video stream will also be analyzed.



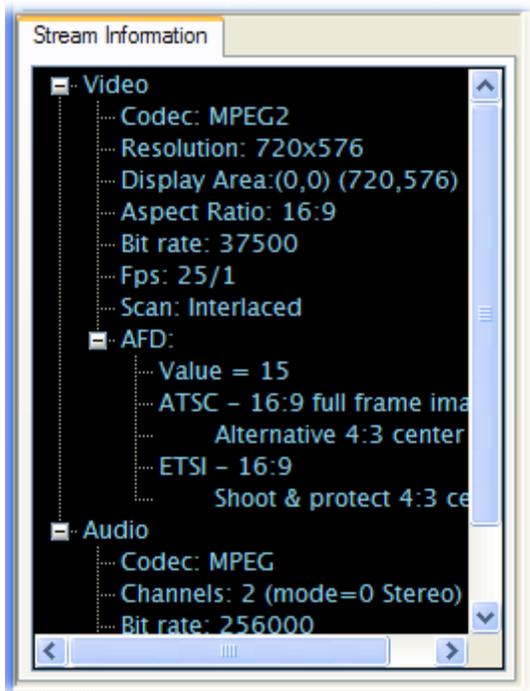
Inspecting All Traffic on the Network Card

If all traffic on the network card is being inspected, all IP traffic is displayed in the Stream Selection dialog box. If the IP flow contains video traffic, it has a plus sign and can be expanded so that a video or audio service can be selected for analysis. Note that if an audio stream is selected, the associated video stream will also be analyzed.



Stream Information

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

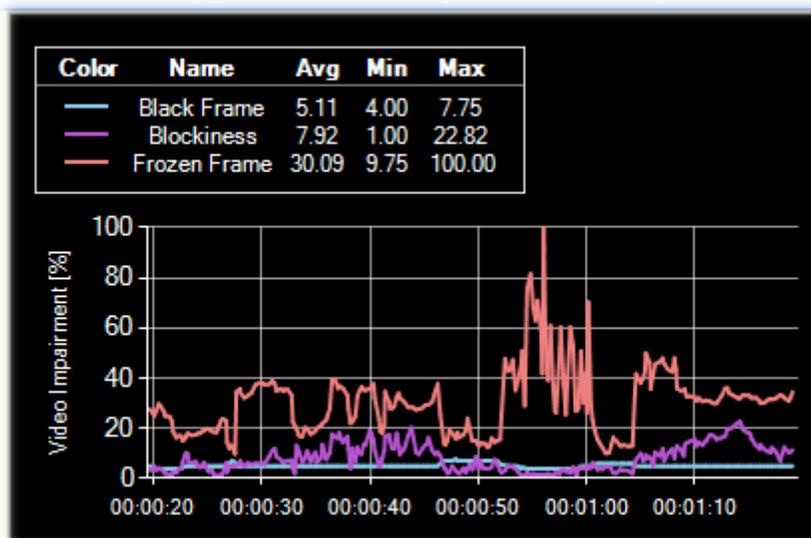


The Active Format Description (AFD) node shows a standard set of codes that can be sent in the video stream to convey information about the intended display aspect ratio. The codes have similar effects and descriptions in different regions.

The Dial Norm value which may be reported in the audio section of the tree provides a reference value for permissible loudness. It is also used as reference value for some of the audio measurements. See [Audio Measurements and Configuration \(see page 29\)](#).

View Trend Graphs

This panel displays selected measurement trend graphs. You can select which graphs are displayed, and the time period over which the measurements are displayed.



1. Right-click in the graph panel and select **Selected Measurements** from the shortcut menu.

See video measurements: [Black Frame \(see page 24\)](#), [Blockiness \(see page 26\)](#), [Frozen Frame \(see page 28\)](#), [Video Bit Rate \(see page 32\)](#).

See audio measurements: [Loudness \(Long and Short Term\)](#), [Target \(Dial Norm\)](#), [True Peak \(see page 29\)](#).

2. Select the required graph from the list.

A legend panel displays the color that will be used to draw the graph, the selected measurement name, and the average, maximum, and minimum values over the displayed timespan.

The legend panel can be hidden by double-clicking in the Trend Graph panel area, or by selecting Show Legend in the Trend Graph panel shortcut menu.

3. Right-click in the graph panel and select **Time Intervals** from the shortcut menu.

Use this menu to select the time scale range to be used for the selected graph measurements.

4. Select the required time scale.

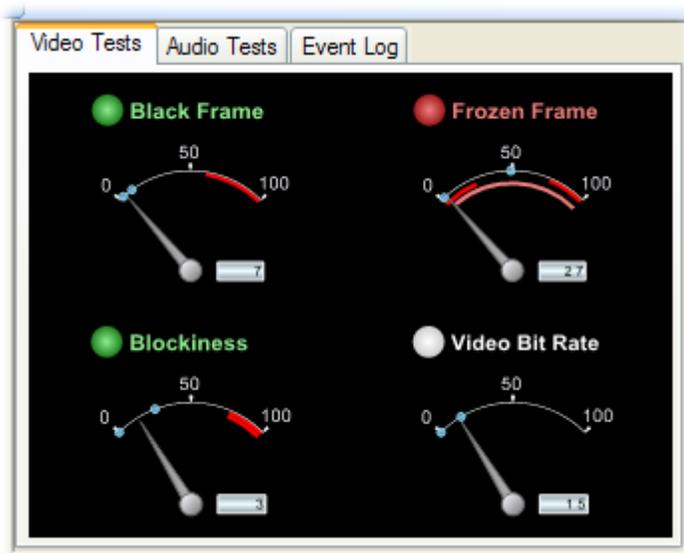
The X axis is redrawn when the scale is changed.

Video and Audio Tests

This panel displays meters that give a visual indication of the status of the video and audio analysis measurements.

The following video analysis measurements are made: [Black Frame \(see page 24\)](#); [Blockiness \(see page 26\)](#); [Frozen Frame \(see page 28\)](#); [Video Bit Rate \(see page 32\)](#).

Similarly, the following audio analysis measurements are made: [Loudness \(Long and Short Term\)](#); [Target \(Dial Norm\)](#); [True Peak \(see page 29\)](#).



For each test, thresholds can be set which, when exceeded, will 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. See [Setting Alarm Parameters \(see page 15\)](#).

Each meter consists of the following indications:

Meter dial: Provides a dynamic indication of the current measurement level.

Peak markers: Blue beads indicate the maximum and minimum measurements since the meters were last reset.

The markers can be reset by selecting **Reset Peak Marker** from each meter's shortcut menu. The menu bar option **Settings > Reset All Peak Markers** resets all meter peak markers.

Consecutive frame indicator: A red arc indicates the limit set on consecutive frames before an alarm is raised.

Event count indicator: A pink arc indicates the limit set on the event count before an alarm is raised.

In addition to the value displayed in the gauge, you can set thresholds that, when exceeded, generate an alarm. The alarm state will be shown by the LED icon above the gauge. The LED colors are as follows:

-  – Green: The measurement is not exceeding the set threshold.
-  – Red: The measurement is currently exceeding the set threshold.

See also [Black Frame \(see page 24\)](#); [Blockiness \(see page 26\)](#); [Frozen Frame \(see page 28\)](#); [Video Bit Rate \(see page 32\)](#).

See also audio measurements: [Loudness \(Long and Short Term\)](#); [Target \(Dial Norm\)](#); [True Peak \(see page 29\)](#).

Alarm Parameters

There are two types of test that can be performed on a measurement value: Consecutive and Windowed. Both types measure the value against a threshold over a period of time.

A Consecutive test generates an alarm if the threshold violation repeats consecutively for the specified period.

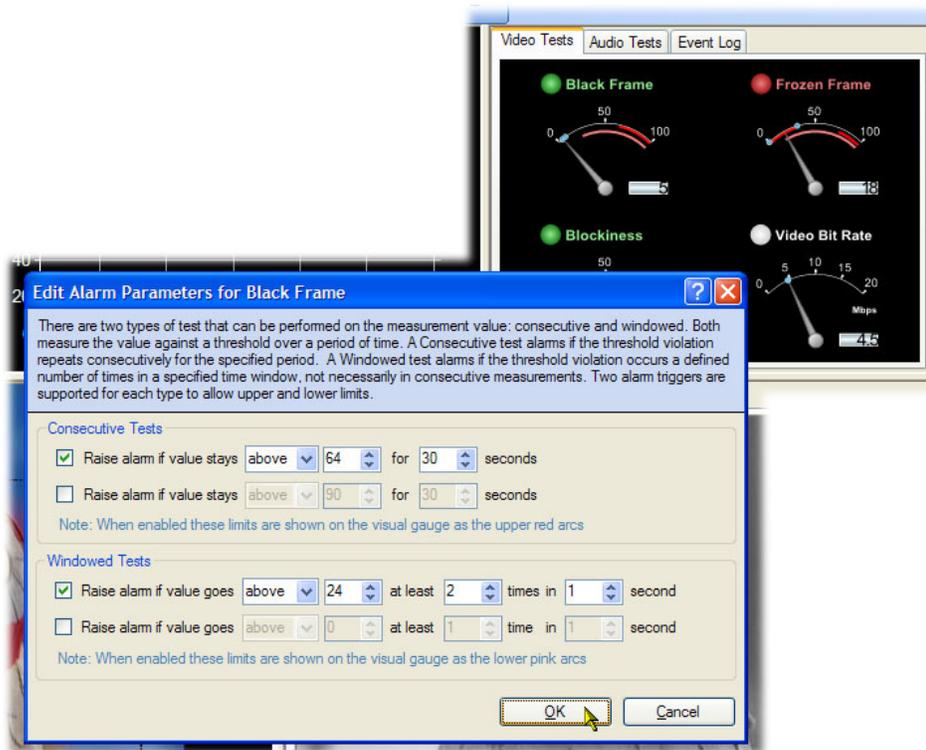
A Windowed test generates an alarm if the threshold violation occurs a defined number of times in a specified time window, not necessarily in consecutive measurements.

Two alarm triggers are supported for each type to allow upper and lower limits, or to cater for two different threshold/duration constraints. For example, in the case of Dial-Norm measurement, an alarm can trigger if the audio is over -15 dB for 30 seconds, or over -5 dB for 1 second.

The measurement interval used for the video tests is based on frames so that there can be many failures per second. The interval used for the audio tests and video bit rate test is one second, meaning there can only be one failure per second. This constraint is reflected in the user interface - for audio and video bit rate tests the number of occurrences cannot be set to be more than the number of seconds.

Setting Alarm Parameters

1. With the cursor over a video test dial, double-click to display the Edit Alarm Parameters dialog box. You can also select **Edit Alarm Parameters** from the right-click shortcut menu. Note that the dialog box format is visually the same for all tests; however the settings that you make are unique to the test. The settings shown in the following screen capture are applicable to the Black Frame test.



2. Enable and set the consecutive count parameters, if required.
3. Enable and set the event count parameters, if required.

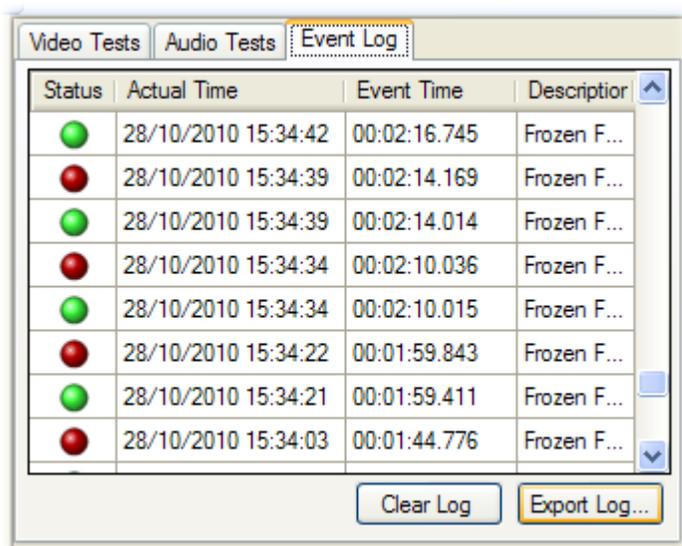
An event is counted each time that it occurs, not the as the time spent in the event failed state.

See also [Black Frame \(see page 24\)](#); [Blockiness \(see page 26\)](#); [Frozen Frame \(see page 28\)](#); [Video Bit Rate \(see page 32\)](#).

See also [Loudness \(Long and Short Term\)](#); [Target \(Dial Norm\)](#); [True Peak. \(see page 29\)](#).

Event Log

The event log records errors and events with a corresponding time stamp.



Status	Actual Time	Event Time	Description
●	28/10/2010 15:34:42	00:02:16.745	Frozen F...
●	28/10/2010 15:34:39	00:02:14.169	Frozen F...
●	28/10/2010 15:34:39	00:02:14.014	Frozen F...
●	28/10/2010 15:34:34	00:02:10.036	Frozen F...
●	28/10/2010 15:34:34	00:02:10.015	Frozen F...
●	28/10/2010 15:34:22	00:01:59.843	Frozen F...
●	28/10/2010 15:34:21	00:01:59.411	Frozen F...
●	28/10/2010 15:34:03	00:01:44.776	Frozen F...

The **Actual Time** displays real time (host PC). The **Event Time** is the time from the start of analysis and gives some indication of where in the file the event occurred.

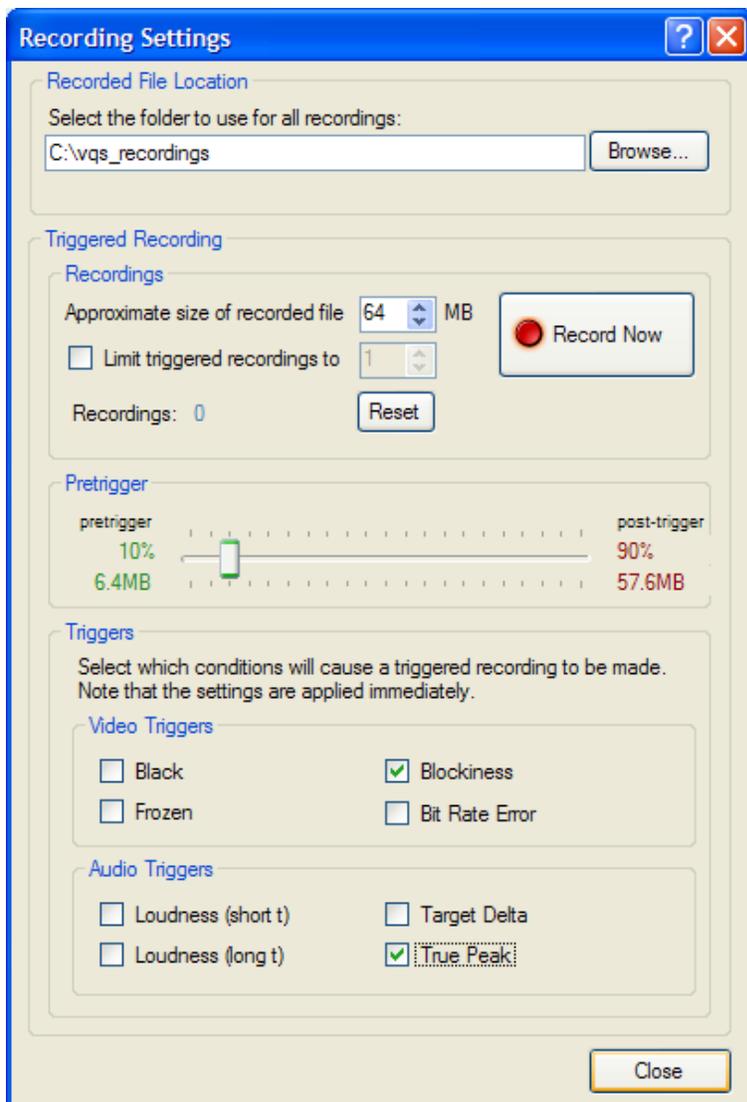
Select **Export Log** to export the contents of the log in CSV (comma separated value) format. The exported log can be imported into a spreadsheet for further analysis, for example Microsoft Excel.

Select **Clear Log** to clear the log.

Recording Streams

By specifying a destination file and one or more recording triggers, you can initiate recording of a stream to be able to analyze it in more detail, for example, using the Transport Stream Compliance Analyzer, part of the Tektronix MTS400 Series MPEG Test Systems.

You can also initiate recording immediately.



Setting up a Recording

1. Select **Settings > Recording**.
2. In the Recording Settings dialog box, select a folder to use for all recordings. With the cursor in this field, **Ctrl - left mouse click** to open the named folder.
3. Set an approximate size for the recorded file.
4. If recordings are to be triggered by video or audio events, you can limit the number of recordings by selecting the **Limit triggered recordings** check box and entering a value. This ensures that when recordings are triggered by one or more events (video or audio) occurring multiple times, only one (or the number set) recording is made.

5. For recordings to be triggered by a video or an audio event, select the check boxes required.

Set the trigger threshold, which must be set and exceeded before recording occurs, in the video and audio measurements panel. See [Video and Audio Tests \(see page 14\)](#).

6. You can also initiate manual recording immediately by selecting the **Record Now** button.

Recorded files are automatically named “VQS1000_recording.<date>T<time>.trp”, where <date> format is yyyy.mm.dd, and the <time> format is hh.mm.ss, for example, “VQS1000_recording.2010-11-02T14-54-01.trp”. Recording ends when the recorded file, including the pre-trigger section reaches the file size set. During recording, new trigger events are ignored.

Pre-trigger Buffer. The stream is recorded in memory at all times, with the available memory being used as a circular buffer, which is filled and written over continuously until a trigger event occurs. The pretrigger setting allows the proportion of data saved before a trigger event to be specified as a percentage of the final recorded file. This allows a section of the stream before a trigger event to be examined as part of the whole recorded file.

Source Image - Processing Area Selection

The Source Image panel displays the result of decoding the currently selected elementary video stream. The decoded image is displayed, whether derived from off-line or real-time analysis.

You can also select the area to be processed, tested, and subsequently displayed in the [Processed Images](#) (see page 21) panels.



1. With the cursor over the source image, select **Show Graticule** from the shortcut (right-click) menu.

The graticule displayed outlines the approximate area that you want displayed in the processed image panels; the application will select the nearest rectangle that can be successfully tested.

2. Adjust the size and shape of the graticule by dragging the corner handles of the graticule.

The processed image display is adjusted immediately.

Select **Show Graticule** again to hide the graticule. The processed image continues to display the selected area.

Select **Reset Graticule** to reset the graticule to its default size. Options are also available in the shortcut menu to set the height and width of the graticule.

Processed Images

The processed image panels display analyses of the area that you have selected in the [Source Image - Processing Area Selection](#) (see page 20).

See [Motion](#) (see page 23); [Black Frame](#) (see page 24); [Blockiness](#) (see page 26); [Color](#) (see page 28); [Audio Analysis](#) (see page 31); [Audio Levels](#) (see page 32).

Configuring the VQS1000

Using the tabbed screens in the configuration dialog box, you can configure the VQS1000:

[Motion](#) (see page 23); [Black](#) (see page 24); [Blockiness](#) (see page 26); [Audio](#) (see page 29); [File](#) (see page 33); [Log File](#) (see page 34); [General](#) (see page 34).

Motion Test

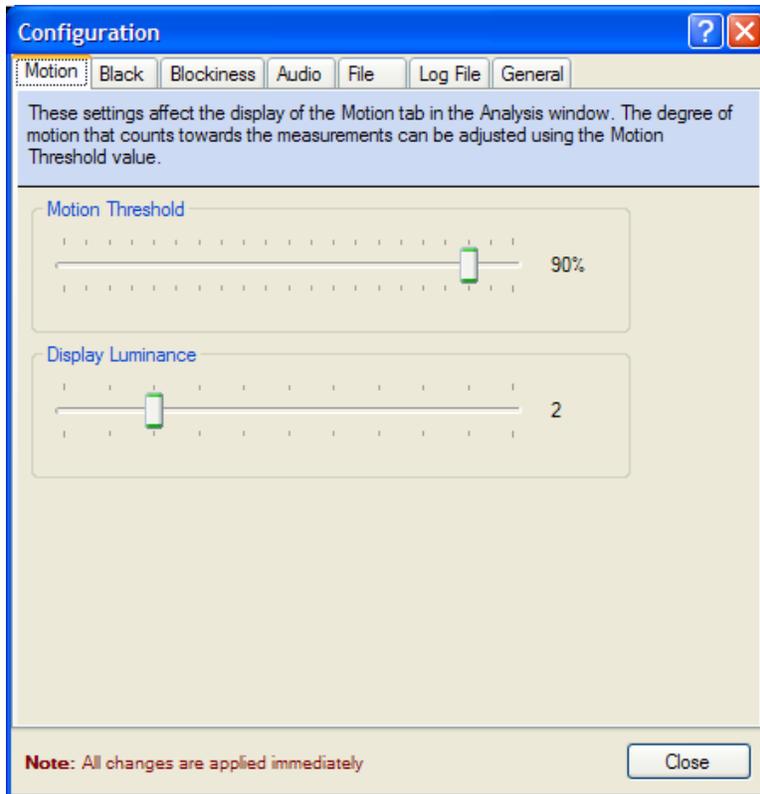
NOTE. The Motion test is referred to as Frozen Frame in the [Video and Audio Tests](#) (see page 14) panel.

By superimposing green blocks on the processed image view, this display shows the differences between successive frames of video. The extent of the processed image view is governed by the graticule selection made in the [source image](#) (see page 20) view. Adjust the motion detection and display luminance thresholds for the display of motion differences from the Configuration dialog box.



Configuration

Settings > Configuration > Motion tab: Use the controls on this tab to adjust the motion detection and display luminance thresholds.



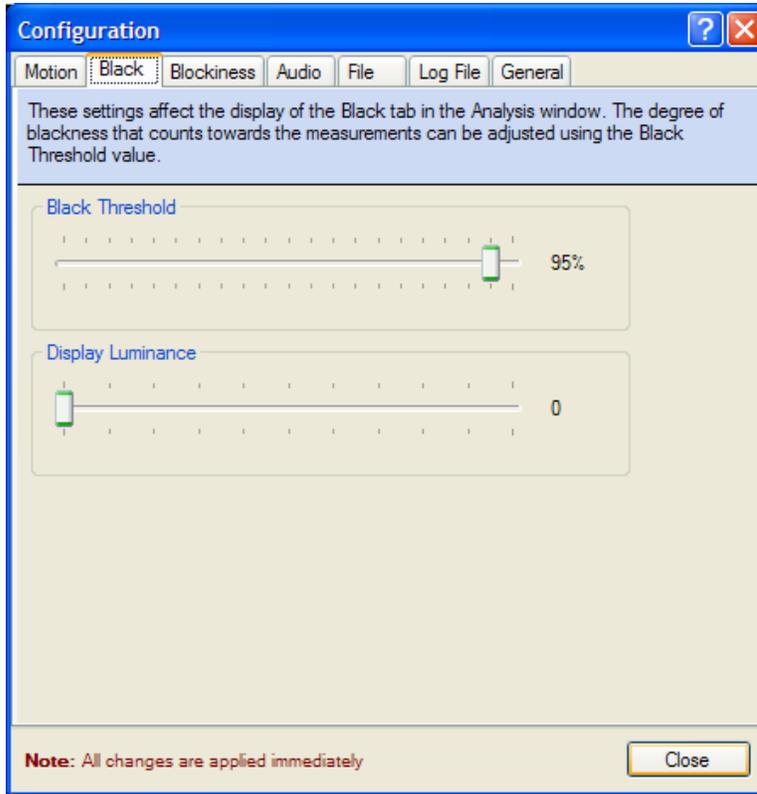
- **Motion Threshold:** Changes the sensitivity of the motion detection. Higher values require greater differences between frames before they are marked as motion between frames. Motion is marked by superimposing green blocks on the picture displayed in the Processed Image Motion tab.
- **Display Luminance:** Increases the luminance of the picture displayed in the Processed Image Motion panel. This allows detail in the darker areas of the picture to be examined more closely. Note that the motion calculation is not affected by this value.

Black Test

By superimposing green blocks on the processed image view, this display shows the amount of [blackness](#) (see page 25) in each [macroblock](#) (see page 25). The extent of the processed image view is governed by the graticule selection made in the [source image](#) (see page 20) view. Adjust the black and display luminance thresholds for the display of blackness from the Configuration dialog box.

Configuration

Settings > Configuration > Black tab: Use the controls on this tab to adjust the black and display luminance thresholds.



- **Black Threshold:** Changes the sensitivity of the blackness detection feature. Higher values make the detection feature less sensitive to blackness in a macroblock.
- **Display Luminance:** Increases the luminance of the picture displayed in the Processed Image Black panel. This allows detail in the darker areas of the picture to be examined more closely. Note that the blackness calculation is not affected by this value.

Blackness
 Pixels with luminance below a level defined as black for this test.

Macroblock
 Square shaped groups of neighboring pixels.

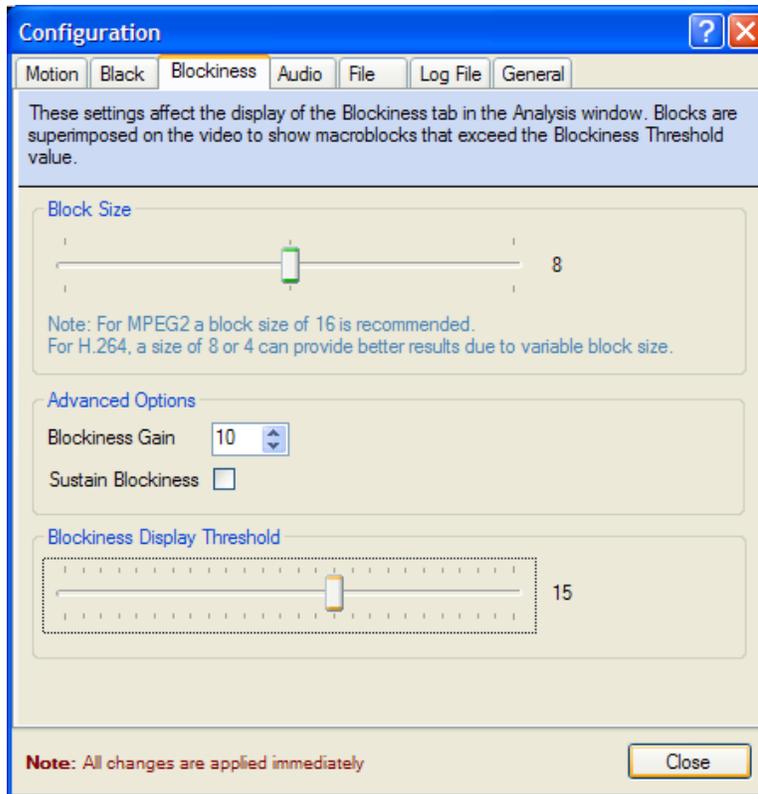
Blockiness Test

Blockiness or macro-blocking is evidence of limitations of the throughput of compression. It can be seen in the fine details of quickly moving images, where the video information requires more bandwidth to convey than has been allocated, forcing the encoder to discard detail. It may also happen when source material has suffered a transmission data loss and the resultant video has been re-encoded. Occurrences of blockiness are outlined in the processed image panel. The extent of the processed image view is governed by the graticule selection made in the [source image \(see page 20\)](#) view. Adjust the blockiness and macroblock size thresholds for the display of blockiness from the Configuration dialog box.



Configuration

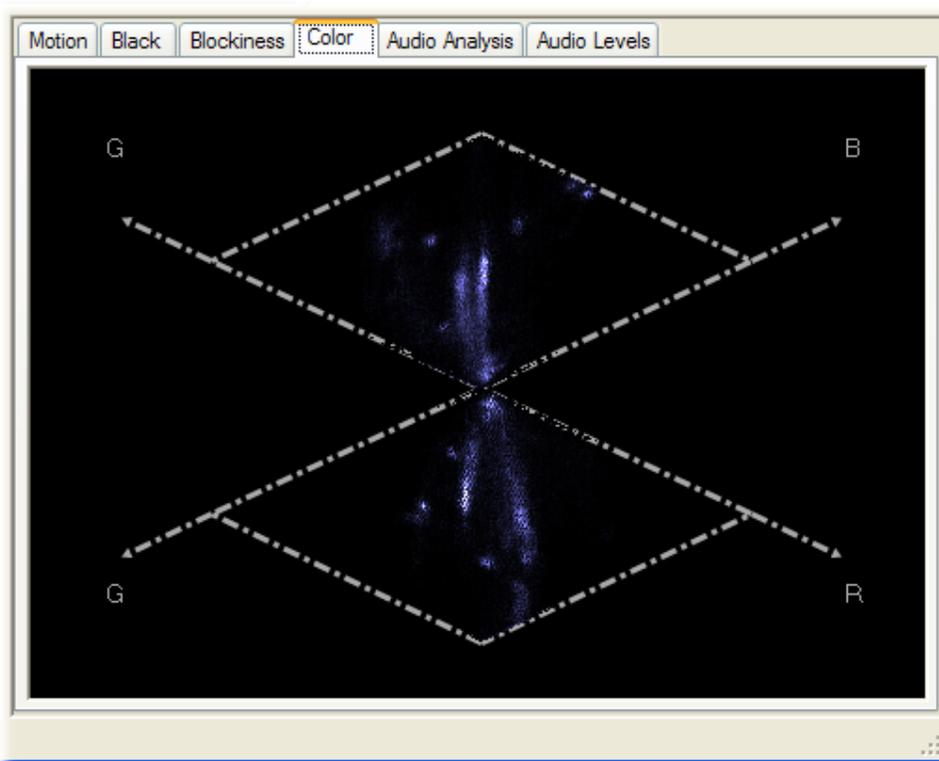
Settings > Configuration > Blockiness tab: Use the controls on this tab to adjust the blockiness and macroblock size thresholds.



- **Block Size:** Changes the sensitivity of the blockiness detection feature by changing the block size used in the measurement.
- **Advanced Options - Blockiness Gain:** The blockiness gain increases the measured amount of blockiness used in testing and the trend graphs. The delay value affects testing when there are many short duration problems, for example, in alternate frames. Selecting the **Sustain Blockiness** check box causes these errors to decay more slowly, so that the level test can trigger.
- **Blockiness Display Threshold:** Changes the threshold value beyond which a macroblock is marked in the processed image blockiness panel. This setting interacts with the display only, not the actual measurement.

Color Display

The color display uses a diamond display to plot color data in terms of RGB (red, green, blue) relationships and limits. The upper diamond plots Green plus Blue versus Green minus Blue. The lower diamond plots Green plus Red versus Green minus Red. For a signal to be in gamut, that is, to predictably display all three color components, all signal vectors must lie within the G-B and G-R diamonds. If a vector extends outside the diamond, it is said to be 'out of gamut'. The extent of the processed image view is governed by the graticule selection made in the [source image \(see page 20\)](#) view.



There are no configurable settings for the color processed image.

Frozen Frame

See [Motion \(see page 23\)](#).

Audio Measurements and Configuration

Use the settings on this tab to enable and set the audio function and testing levels.

You can monitor the audio levels in the audio tests panel. See [Video and Audio Tests \(see page 14\)](#) and [Alarm Parameters \(see page 15\)](#).

Audio Measurements

The following measurements are displayed on the Audio tests panel meters:

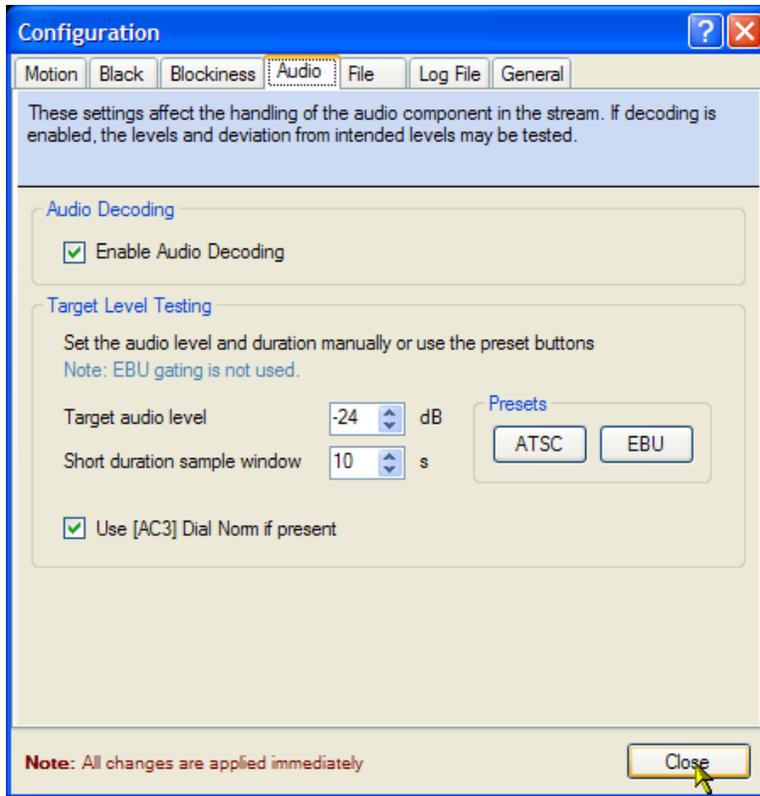
Loudness. (LKFS - Loudness, K-weighted, relative to Full Scale) The loudness test results, Loudness (short term) and Loudness (long term), measured over short (3 s) and long (>3 hour) terms.

Target Delta. (dB) Indicates the difference between the DialNorm value or the equivalent setting and the Loudness (short term) measurement. See [Audio Configuration \(see page 29\)](#).

True Peak. (dBFS - decibels relative to Full Scale) Indicates the calculated true peak of the digital audio signal. It is calculated every 1/40th of a second.

Audio Configuration

Settings > Configuration > Audio tab: Use the controls on this tab to select audio decoding and set the testing levels.



Enable Audio Decoding. Select the check box to enable audio decoding. This assumes that the audio features are licensed and available.

Target Level Testing. These settings allow the programme loudness level to be normalized to a Target Audio Level measured over a defined duration.

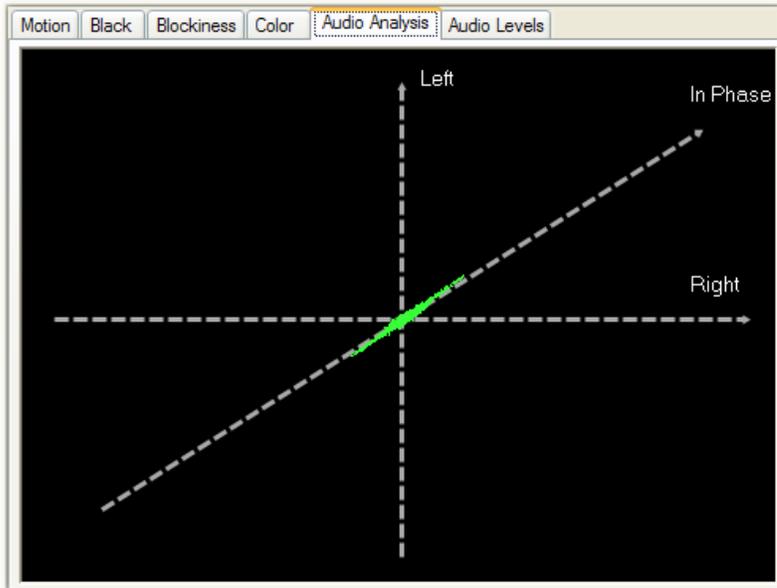
Two predefined standards settings are available, that is ATSC (Target audio level: -24 dB, and Short duration sample window: 10 s) and EBU (Target audio level: -23 dB, and Short duration sample window: 3 s). You can also preset values using the spin boxes.

Select the Use (AC3) DialNorm check box to use the DialNorm value when it is present in the audio section of the stream.

DialNorm (dialogue normalization) is a value which may be carried in audio streams which conform to the Dolby AC3 compression system. DialNorm controls the AC3 decoder gain.

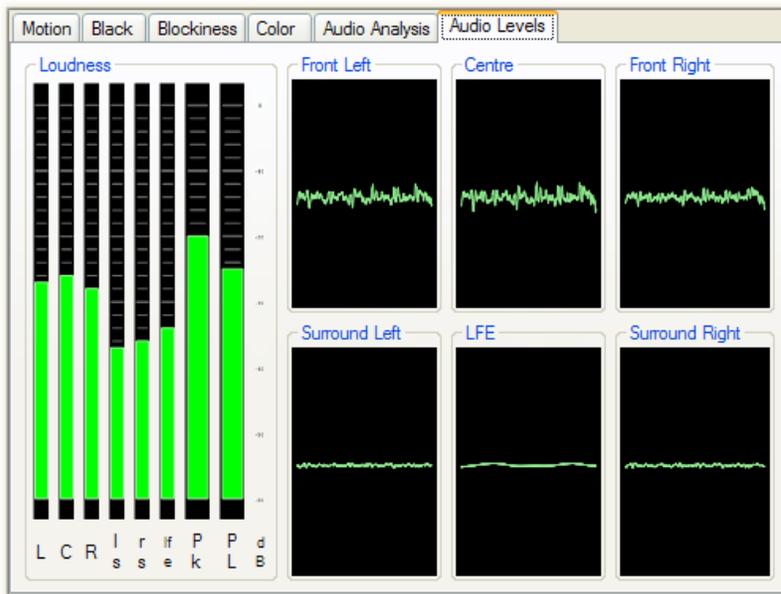
Audio Analysis

The audio analysis diagram represents the relative amplitude, and the phase characteristics of the left and right audio channels. Alignment of the plot points with the In Phase axis indicates that the left and right audio channels are in phase with each other.



Audio Levels

The audio levels panel shows the loudness and waveforms of all audio channels present.



The legends used on the Loudness scales are as follows: **L** - left; **C** - centre; **R** - right; **ls** - left surround; **rs** - right surround; **lfe** - low frequency effects; **Pk** - peak; **PL** - program loudness.

L, C, and R are the true peak values for the associated channels. Pk is the maximum true peak value over all channels. PL is the short term loudness of the program.

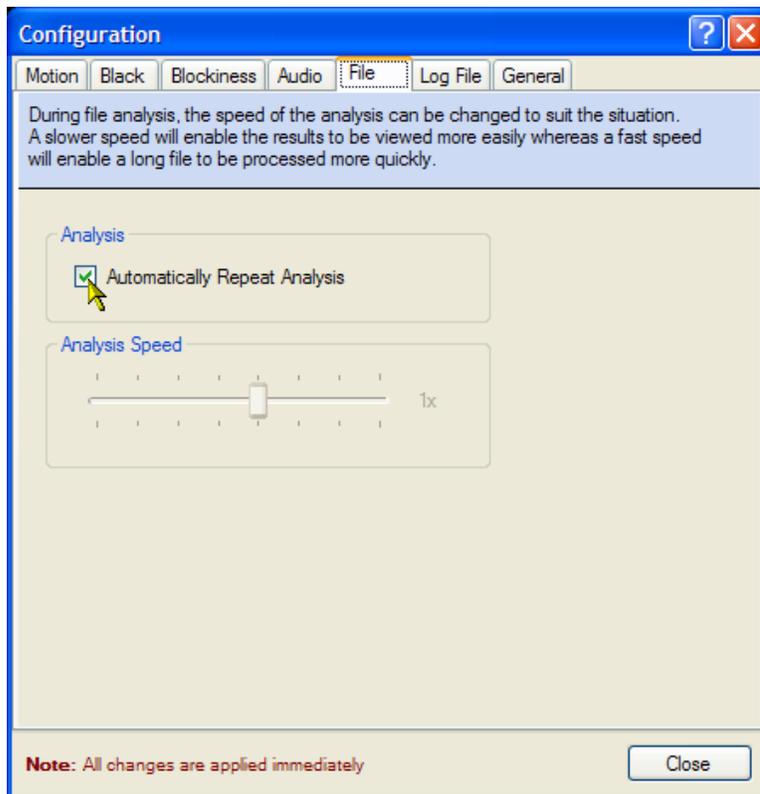
Video Bit Rate

The whole stream bit rate is calculated as a running average over one second. It is displayed in the status bar.

The Video Bit Rate test meter reports the bit rate of the video PID elementary stream currently being analyzed. This value is often constant. For a VBR (variable bit rate) stream received over a network, or as part of a statistical multiplexer constrained MPTS, the value will vary; this may affect the video quality of the stream.

File Configuration

Use the control on this tab to change the speed of analysis.



Analysis Repeat

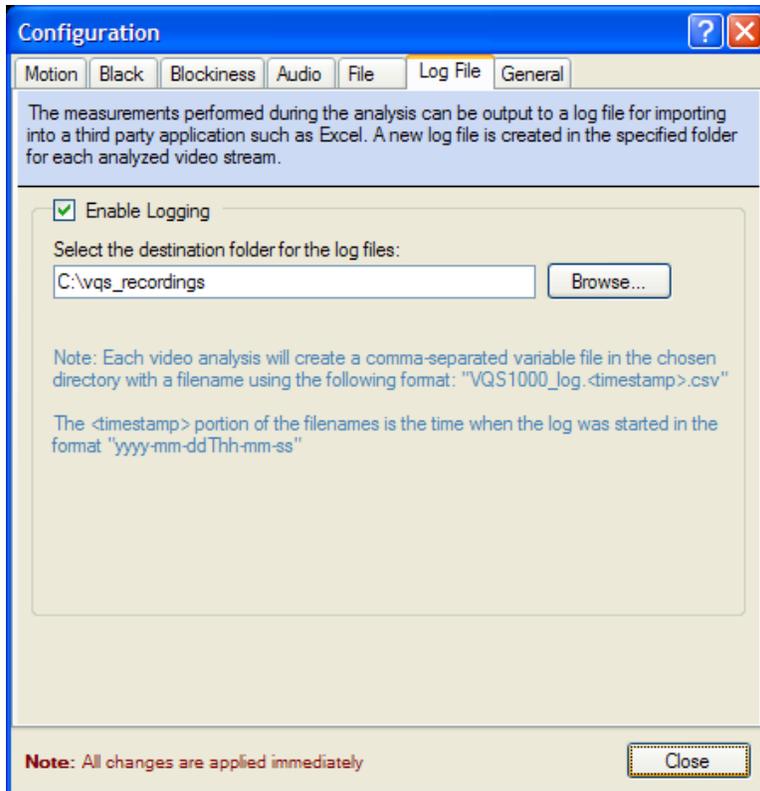
Select the Automatically Repeat Analysis check box to loop the analysis of offline files.

Analysis Speed

A slow speed enables the results to be viewed more easily; a fast speed enables long files to be processed more quickly. Analysis can be paused from the toolbar.

Log File Configuration

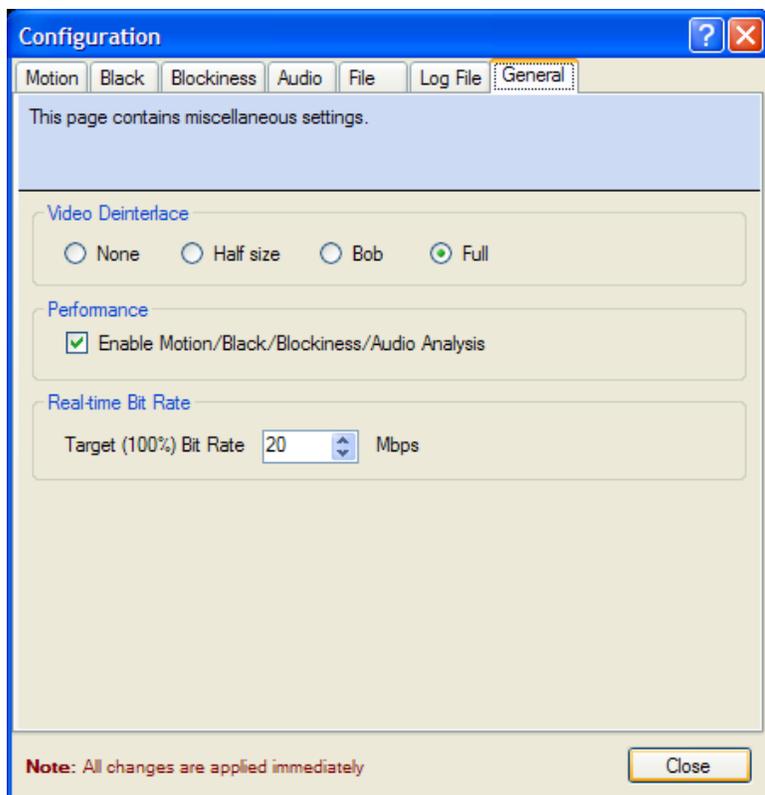
When the **Enable Logging** check box is selected, a log file in csv format is created during analysis. This log file can be later opened in Microsoft Excel or similar product that can interpret the csv format. Browse to or enter the name of the folder or directory where the log file is to be stored. The file name will be prefixed with *VQS1000* and include a timestamp of when the log file started recording, for example *VQS1000_log.2010-10-26T14-26-35.csv*.



A new log file is created each time that a new program is selected. See also [Stream Selection \(see page 10\)](#).

General Configuration

Use the controls on this tab to control the load on the processor.



Video Deinterlace

Deinterlace: Each frame in a television picture consists of two consecutive fields (odd and even) interlaced. The option buttons in this panel allow you to choose the interlacing method used in displaying the [source image](#) (see page 20).

- **None:** No video interlacing is performed. Consecutive fields are added together. Changes between fields will result in artifacts known as ‘combing’. Combing occurs when pixels in one frame do not line up with the pixels in the other, forming a jagged edge.
- **Half size:** Displays only one field; odd only or even only. The image is stretched to fill the image area in the interface.
- **Bob:** (Also known as Line Doubling) Takes the lines of each interlaced field, consisting of only odd or even lines, and doubles them, filling the entire frame. In practice, Bob deinterlacing is promoted to Full deinterlacing.
- **Full:** Full interlacing is performed giving a ‘normal’ picture.

Performance

Selecting this check box disables all testing and analysis and simply displays the video stream in the [Source Image](#) panel (see page 20).

Real-time Bit Rate

This setting dictates the maximum value (Mbps) that can be displayed by the Video Bit Rate test measurement dial. The equivalent trend graph will show the video bit rate as a percentage of this setting.

Polling

During real-time analysis of [MPTS \(see page 8\)](#) files backhauled from DTV Monitors, select **Settings > Use Polling** to analyze each service for between two and ten minutes.

DTV Monitor Controls. Where a traffic flow is established from a DTV Monitor, you can specify for how long each service should be monitored by adjusting the Service Dwell Time slider in the Real-time Analysis configuration dialog box. See [Real-time File Analysis \(see page 8\)](#).

About Tektronix VQS1000

The Tektronix VQS1000 Video Quality Test Suite information box displays the test suite version number. You will need this number if you call Tektronix for technical support.

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