Elecard StreamEye 3.0

User Guide

Notices

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1. Introduction

1.1 Preface

Elecard StreamEye is a powerful software tool designed for professionals and prosumers in video compression field. Elecard StreamEye enables the user to perform an effective in-depth analysis of video sequences.

Elecard StreamEye provides a visual representation of the encoded video features and a stream structure analysis of MPEG-1/2/4 or AVC/H.264 Video Elementary Streams (VES), MPEG-1 System Streams (SS), MPEG-2 Program Streams (PS) and MPEG-2 Transport Streams (TS).

Elecard StreamEye is based on the Elecard Media Indexing technology that allows quick navigation through a stream with frame accuracy. The program displays frames, their size, type, time position, and order in a stream. It indicates average bitrate and bitrate declared in sequence headers as well as other common video stream parameters.

Elecard StreamEye provides the following features:

- Visual quality control of each single picture.
- Type, size, and time stamp displaying for each single picture.
- Video stream indexing for instant frame-accurate positioning.
- Visual streams comparison by picture quality and picture size.
- Displaying of detailed information about macroblocks in MPEG-1 (ISO/IEC 11172-2), MPEG-2 (ISO/IEC 13818-2), MPEG-4 (ISO/IEC 14496-2), H.263 (ITU-T Recommendation H.263) and AVC/H.264 (ISO/IEC 14496-10) video streams.

1.2 Using this Guide

1.2.1 Purpose

This guide is intended to help MPEG video encoder developers quickly analyze MPEG-compliant video streams (including AVC/H.264 streams).

1.2.2 Topics Covered

The following lists the topics covered in this document:

- **Section 1: Introduction** – provides a general overview of the Elecard StreamEye program and describes the purpose of the document and its contents.
- **Section 2: Getting Started** – describes how to install, uninstall, and run the Elecard

StreamEye program.

- **Section 3: Describing Elecard StreamEye** – provides a detailed description of the Elecard StreamEye program including features and supported stream formats.
- **Section 4: Usind Elecard StreamEye** – describes the Elecard StreamEye GUI and how to use the program to open MPEG streams and save index files.

1.2.3 Related Documentation

For additional information on MPEG video compression, review the following documents:

- ISO/IEC 11172-2 for MPEG-1 video
- ISO/IEC 13818-2 for MPEG-2 video
- ISO/IEC 14496-2 for MPEG-4
- ISO/IEC 14496-10 for AVC/H.264 video
- ITU-T Recommendation H.263 for H.263

1.3 System Requirements

1.3.1 Hardware Requirements

- SSE-enhanced CPU (Intel® Pentium III, Celeron, AMD® Athlon, Opteron etc.)
- 128 MB RAM
- DirectX 7.0 (and higher) VGA card

1.3.2 Software Requirements

- Windows® 2000/XP/2003 Server

1.4 Licensing and Technical Support

By installing, copying, or otherwise using the SOFTWARE PRODUCT or any UPDATES, you agree to be bound by the terms of the "Elecard" End-User License Agreement ("EULA"). This EULA is a legal agreement between you (either an individual or a single entity) and Elecard for the "Elecard" software product(s) accompanying this EULA, which include(s) computer software and may include "online" or electronic documentation, associated media, and printed materials ("SOFTWARE PRODUCT").

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2. Getting Started

The following section details the procedures for installing and running Elecard StreamEye.

2.1 Installing Elecard StreamEye

1. Download the Elecard StreamEye installation file from the Elecard download page or its mirrors.
2. Run **Elecard StreamEye Setup.**
   To run, unzip the Elecard StreamEye and run the program *Elecard StreamEye X.X.exe* (*X.X* is the version number).
3. The *Elecard StreamEye setup* window will appear. Read the recommendations and warnings. Click **Next**.
4. The license agreement will appear. Read the agreement and if you accept the terms within, check the *"Yes I agree with the terms of this license agreement*"check box. Click **Next**.
5. Select the installation folder in which you want to install Elecard StreamEye. To select an installation folder, click **Browse** and find the folder in which you would like to install Elecard StreamEye. Click **Next**.
6. Select program group. Click **Next** twice.
7. To complete installation, follow the onscreen instructions.
   When setup has finished installing all of the necessary files on your computer, the *Elecard StreamEye has been successfully installed* dialog box will appear, and the program is ready to run. You do not need to reboot your computer.

2.1.1 Elecard StreamEye Registration

1. Run the Elecard Registrator. Click *Start->Programs->Elecard->Elecard StreamEye X.X->Registrator* . The **Registrator** window opens.
2. Select the Elecard StreamEye from the product list and press **Activate** button.
3. Use your Serial number to complete the activation process.

2.2 Uninstalling Elecard StreamEye

To uninstall Elecard StreamEye

1. Click *Start->Programs->Elecard->Elecard StreamEye X.X->Uninstall Elecard StreamEye X.X.*
2. Follow the on-screen instructions to complete the Elecard StreamEye unistalling.

2.3 Running Elecard StreamEye

To run Elecard StreamEye click *Start->Programs->Elecard->Elecard StreamEye X.X->Elecard StreamEye X.X.*

3. Describing Elecard StreamEye

3.1 Overview

Elecard StreamEye performs a detailed analysis of MPEG video streams (including AVC/H.264 video, MPEG-4 video). Video streams have a layered structure and an embedded hierarchy. Structurally, a video stream consists of a video sequence. Video sequences consist of a start code, end code, sequence header and any number of groups of pictures (GOP). Each GOP consists of a GOP header and a group of pictures. MPEG-1 (ISO/IEC 11172-2) and MPEG-2 (ISO/IEC 13818-2) streams are composed of pictures of different types (I, B, or P). The structure of AVC/H.264 and MPEG-4 video is slightly different (see ISO/IEC 14496-10 and ISO/IEC 14496-2 standards).

Elecard StreamEye presents a video stream picture-by-picture (I, P, and B pictures as they appear in stream order). For ease of analysis and navigation, the entire diagram can be scaled. Pictures can also be frame pictures that correspond to progressive video or field pictures that correspond to interlaced video. Pictures are broken down into a slice structure, and each slice consists of macroblocks.

Elecard StreamEye provides the following features:

- Navigates and displays a media stream picture-by-picture (I frames, P frames, B frames)
- Observes the video quality dependency both on a current bitrate within GOP and on a current frame size
- Determines the frame location in the stream order or display order
- Determines the frame size, type and time
- Accounts for minimum, maximum and average frame size in stream
- Visualizes detailed information about macroblocks in MPEG-1 (ISO/IEC 11172-2), MPEG-2 (ISO/IEC 13818-2), MPEG-4 (ISO/IEC 14496-2), H.263 (ITU-T Recommendation H.263) and AVC/H.264 (ISO/IEC 14496-10) video streams

3.2 Specifications

Elecard StreamEye operates with MPEG-1, MPEG-2, MPEG-4, AVC/H.264 Video and MLMIX (media index) files.

3.2.1 Supported Formats

Elecard StreamEye supports the following formats:

- System Stream MPEG-1

- Video Only MPEG-1/2
- Program Stream MPEG-2
- Transport Stream MPEG-2
- AVC/H.264 Video stream
- MP4 (Intermedia Format)
- MPEG-4 Video stream
- H.263 Video stream

Note: *When opening files that contain an audio stream (e.g. MPEG-2 PS or TS)), the bitrate and frame size is overstated. Depending on the movie bitrate, the inaccuracy ranges from 1 – 10 percent. The inaccuracy is dependent on the relationship between the audio bitrate and the video bitrate.*

For correct viewing, it is suggested that Video Only (MPEG-1/2/4 or AVC/H.264) files be used.

3.3 Features

The following section lists the Elecard StreamEye features:

- Navigation and display of media stream picture-by-picture (I, P, B)
- Display of the current frame
- Display of the time, type, size and number of a current frame in a stream, decoding order and offset from the file beginning
- Display of bitrate and bit allocation lines
- Display of detailed information about macroblocks in MPEG-1 (ISO/IEC 11172-2), MPEG-2 (ISO/IEC 13818-2), MPEG-4 (ISO/IEC 14496-2), H.263 (ITU-T Recommendation H.263) and AVC/H.264 (ISO/IEC 14496-10) video streams

3.3.1 Exclusive Features

The following Elecard StreamEye features are exclusive:

- Frame-accurate positioning
- Selectable navigation modes: picture-by-picture in stream and display orders, or picture-by-picture respect to picture type (I, P, B)
- Display of the stream and gathering of statistics relating to the entire file
- AVC/H.264 support
- MPEG-4 support
- H.263 support
- Displaying of internal data partitioning for motion vectors and coefficients in the frame

3.3.2 Component Features

The following section lists the features of the Elecard StreamEye components. A more detailed

description can be found in the “Elecard Components Reference Manual” document.

- Elecard MPEG Demultiplexer (integrated into the program executable binary)

  Elecard MPEG Demultiplexer has the following features:

  - MPEG-2 Transport Streams (ISO/IEC 13818-1) and MPEG-2 Program Streams (ISO/IEC 13818-1) support
  - MPEG-1 System Streams (ISO/IEC 11172-1) support
  - MPEG-1, MPEG-2 and H.264 Video Elementary Streams (VES) support
  - Instant frame-accurate positioning using Elecard indexing technology
  - Subpicture stream support
  - Navigation via the **IMediaSeeking** Interface

- Elecard MPEG-2 Video Decoder (integrated into the program executable binary)

  Elecard MPEG-2 Video Decoder has the following features:

  - Software-only MPEG-2 (ISO/IEC 13818-2) and MPEG-1 (ISO/IEC 11172-2) stream decoding
  - High Profile @ High Level decoding – supports all MPEG-2 profiles/levels, excluding scalability extensions
  - Full-resolution, full-quality decoding/playback (high precision arithmetic, IEEE 1180-1190 compliant IDCT, half-pel motion compensation)
  - Optimized for the most efficient CPU usage – takes advantage of MMX™, SSE™, SSE2™, and 3DNow® extensions when available
  - Special control interface – programmatic control of decoding quality and frame capture interface
  - Software deinterlacing
  - ATSC Streams Decoding – supports 18 ATSC formats
  - High definition video decoding
  - Optional double precision IDCT
  - High performance – supports real-time high resolution video decoding (720x480 @ 30fps for NTSC, 720x576 @ 25fps for PAL and bit rate up to 15 Mbps) on Pentium II 500 MHz with a DirectX compatible video card that supports YUV overlay
  - Optimized for Hyper-Threading Technology, dual core and SMP systems
  - DXVA hardware acceleration support
  - Visual quality improving (HQ Upsample)
  - Closed Captions decoding

- Elecard AVC Video Decoder (integrated into the program executable binary)

  Elecard AVC Video Decoder has the following features:

- Software-only ISO/IEC 14496 part 10 AVC / ITU-T Recommendation H.264 stream decoding
- Supports both Annex B byte stream and RTP payload formats (FOURCC 'avc1')
- Supports all features of Baseline, Main and High Profiles
- Full-resolution, full-quality decoding/playback
- Special control interface – programmatic control of decoding quality
- Software deinterlacing
- Support of EIA-708 closed caption output
- Optimized for the most efficient CPU usage – takes advantage of MMX™ Extensions, SSE2™, and 3DNow® SIMD extensions when available
- High performance
- Optimized for Hyper-Threading Technology, multi core and SMP systems

- Elecard MP4 Demultiplexer (integrated into the program executable binary)

  Elecard MP4 Demultiplexer has the following features:

  - MPEG-4 System Streams (ISO/IEC 14496-14) support
  - 3GPP2 System Streams (3GPP TS 26.234 based on ISO/IEC 14496-12) support
  - Navigation using the **IMediaSeeking** interface

- Elecard MPEG-4 Video Decoder (integrated into the program executable binary)

  Elecard MPEG-4 Video Decoder has the following features:

  - Software-only ISO/IEC 14496-2 video stream decoding
  - Simple and Advanced Simple profiles support
  - Full-resolution, full-quality decoding and playback (high precision arithmetic, post-processing)
  - Optimized for the most efficient CPU usage – takes advantages of MMX™ and SSE™ extensions (when available)
  - DirectShow® Multimedia Streaming support
  - High definition video decoding
  - High performance – supports real-time high resolution video decoding (720x480 @ 30fps for NTSC, 720x576 @ 25fps for PAL and bit rate up to 15 Mbps) on 500MHz CPU (HD 1080i – on 2.0 GHz CPU) with a DirectX compatible video card that supports YUV overlay

4. Using Elecard StreamEye

4.1 Introduction

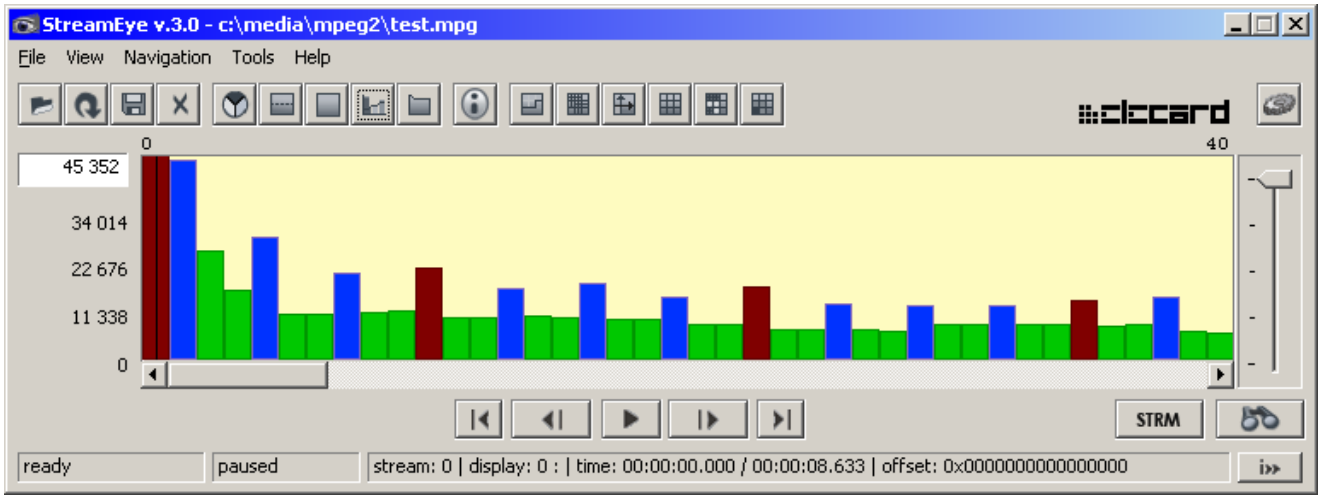
The following section describes the Elecard StreamEye program GUI.

The Elecard StreamEye program has a simple user friendly interface that allows the user to perform a number of operations including: opening media stream, extraction video elementary stream (VES), opening and saving index files, and displaying frame pictures.

4.2 Describing Elecard StreamEye GUI

The following section describes the Elecard StreamEye GUI.

Figure 1. Elecard StreamEye GUI – Main Window



4.2.1 Menu Bar

The following table describes the Elecard StreamEye program menus.

Table 1. Elecard StreamEye GUI - Menus

File Menu	
Open...	Opens a new media file or index file for analysis.
Save Index As...	Saves index as mlmix file (for VES, MPEG-2 PS and TS).
Close File	Closes the file.
Recent Files	Shows and opens recent files
Exit	Closes the StreamEye program.
View Menu	
Bar chart Info	Enables/disables the displaying of the bitrate lines, bit allocations lines, the transform coefficients data amount

	and the motion vectors data amount.
Color Space	Specifies what color space components should be displayed in the video window (YUV, Y, U, or V).
Presentation Mode	Sets the style of the interlaced video presentation: • *Pair Mb* – macroblocks from both fields are presented by pairs in a single frame; • *Solid Fields* – each field is presented in its own frame.
Video Scale	Sets the scale of the video window
Video Frame Details	Shows the macroblock information for MPEG-1/2/4 and AVC/H.264 streams: Slice Boundaries, Partitions, Motion Vectors, Quantizer, MB Types, MB Size, Coefficients Extra Info (see Toolbar description).
Navigation	
Play/Pause	Starts/pauses stream playback.
Start Position	Sets the current position to the first frame in the stream.
End Position	Sets the current position to the last frame in the stream.
Step Forward	Sets the current position to the next frame.
Step Backward	Sets the current position to the previous frame.
Step by	Sets the frame-by-frame navigation mode: display order, stream order or by I, P or B frames.
Tools Menu	
Options…	Shows **Options** dialog box.
Video Vindow	Shows/hides **Video** window.
MB Info	Shows/hides **MB Info** window.
Picture Info	Shows/hides **Picture Info** window.
Stream Info	Shows/hides **Stream Info** window.
Headers Info	Shows/hides **Headers Info** window.
File Info	Shows/hides **File Info** window.
Help Menu	
Contents	Shows the help contents.
About StreamEye	Displays the version number and copyright statement of StreamEye.

The **Options**… command on the **Tools** menu opens the **Options** dialog box.

There are two option groups in the **Options...** dialog box: **Main** and **Colors**.

Figure 2. Elecard StreamEye GUI − Options Dialog Box – Main Group

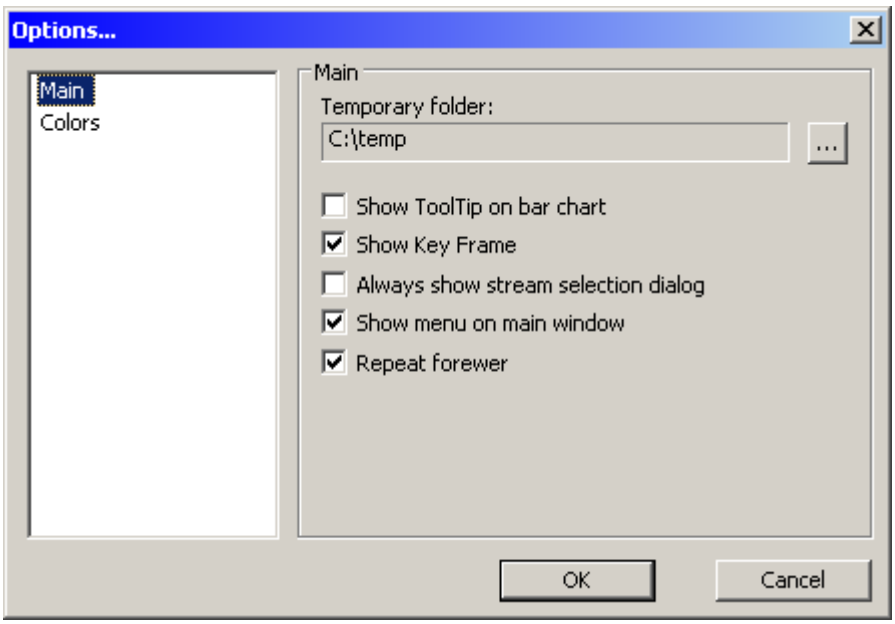
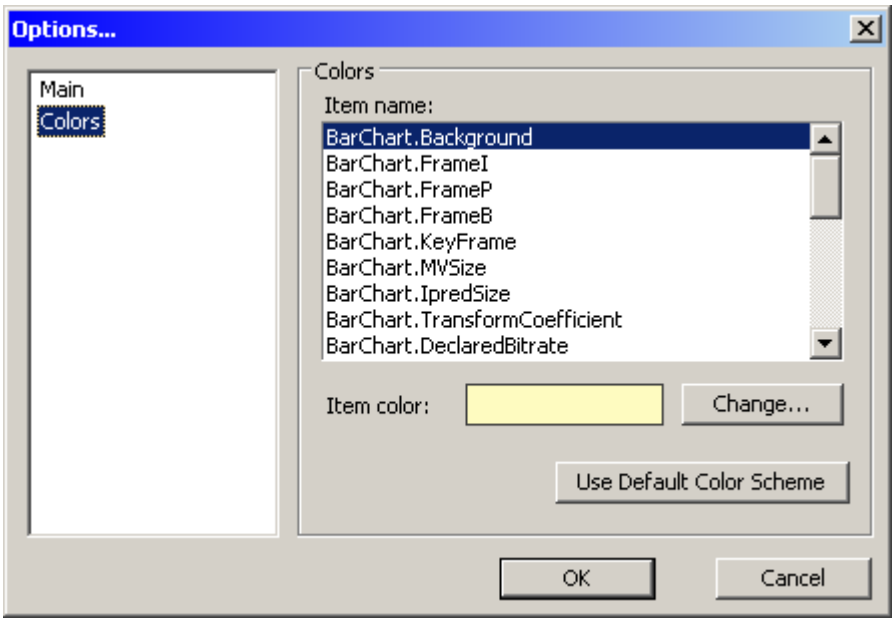


Figure 3. Elecard StreamEye GUI − Options Dialog Box – Color Group



The following table describes the Options dialog box settings.

Table 2. Elecard StreamEye GUI - Options Dialog Box Settings

Main	
Temporary Folder	Specifies the folder for temporary files (index and thumbnails) storage.
Show ToolTip on Bar Chart	Enables the Bar Chart tooltips displaying.
Show Key Frame	Enables the key frames color marking on the bar chart.
Always show stream description dialog	Enables the obligatory **Stream Description** dialog displaying (even through a video only stream is opened).
Show menu on main window	Enables the main window menu displaying.
Colors	
Colors	Selects the lines and background colors.

4.2.2 Toolbar

The following table describes the Elecard StreamEye toolbar:

Figure 4. Elecard StreamEye GUI − Toolbar

 − **Open Media** − The button opens a new media file for analysis.

 − **Recent Media** − The button opens the recently opened media file for analysis.

 − **Save Index** − The button saves the index file.

 − **Close Media** − The button closes the currently opened file.

 – **Color Space** – The button specifies what color space components should be displayed in the video window (YUV, Y, U, or V).

 – **Presentation Mode** – The button sets the style of the interlaced video presentation:

Pair Mb – Macroblocks from both fields are presented by pairs in a single frame

Solid Fields – Each field is presented in its own frame

 – **Video Scale** – The button sets the scale of the video window.

 – **Bar Chart Info** – The button enables/disables the displaying of bitrate lines, transform coefficients and motion vectors size.

 – **Show ToolTip** – The button enables/disables the Bar Chart tooltips displaying.

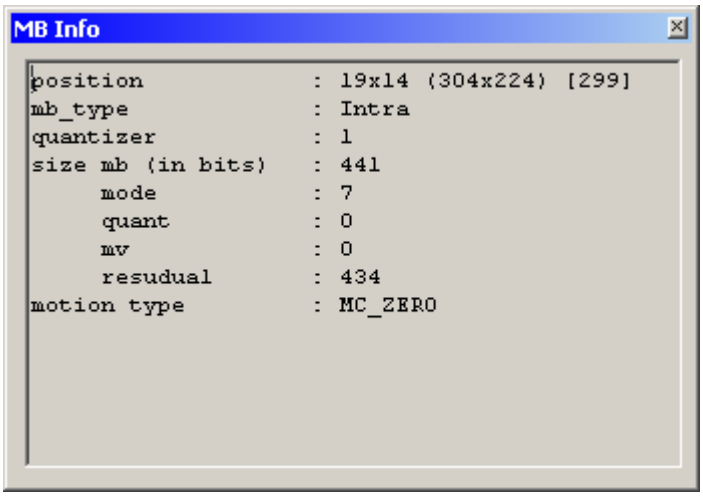
 – **Info Dialogs** – The button opens additional information windows (described below).

The **Video** window visualizes the currently opened video stream.

Figure 5. Elecard StreamEye GUI – Information Windows – Video Window

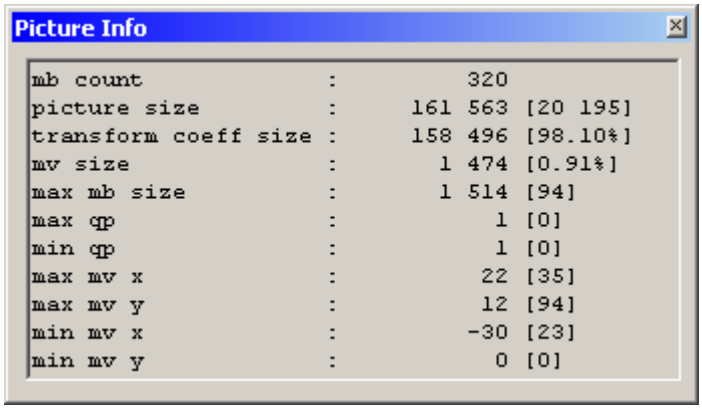
The **MB Info** window shows the following information regarding macroblocks in the MPEG-1/2/4 or AVC/H.264 streams (macroblock is selected in the video window by mouse pointer, marked as a white square and fixed by mouse click): macroblock position, macroblock address, macroblock size (in bits), macroblock type, slice number, cbp bits, quantizer parameter, partition mode, sub partition modes, inta prediction mode, sub prediction directions, motion vectors L0 and L1.

Figure 6. Elecard StreamEye GUI − Information Windows − MB Info Window



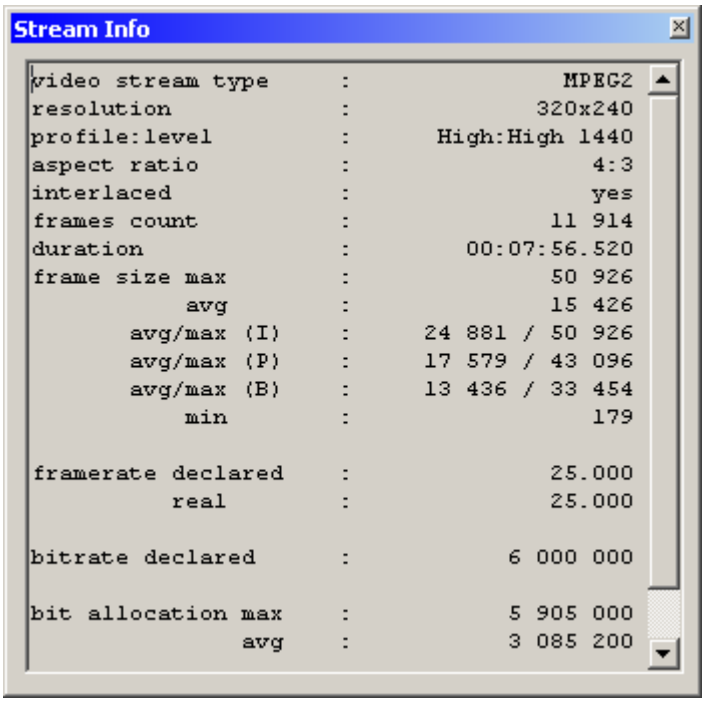
The **Picture Info** window shows the current frame statistics: the macroblock count, the frame size excepting the headers data size (total size of the macroblocks, bits [bytes]), the transform coefficients data amount (bits [percentage in the frame size]), the motion vectors data amount (bits [percentage in the frame size]), the maximum macroblock size (bits [macroblock address]), the maximum and minimum values of the motion vector components (X and Y [macroblock address]).

Figure 7. Elecard StreamEye GUI − Information Windows − Picture Info Window



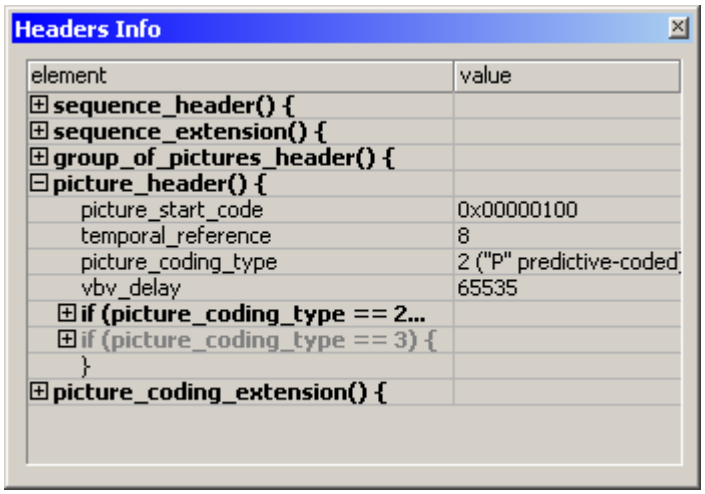
The **Stream Info** window shows stream type (MPEG-1/2/4 or AVC/H.264), resolution, profile, level, aspect ratio, frames count, duration, framerate (real and declared), declared bitrate and bit allocation (maximal, minimal and average).

Figure 8. Elecard StreamEye GUI − Information Windows − Stream Info Window



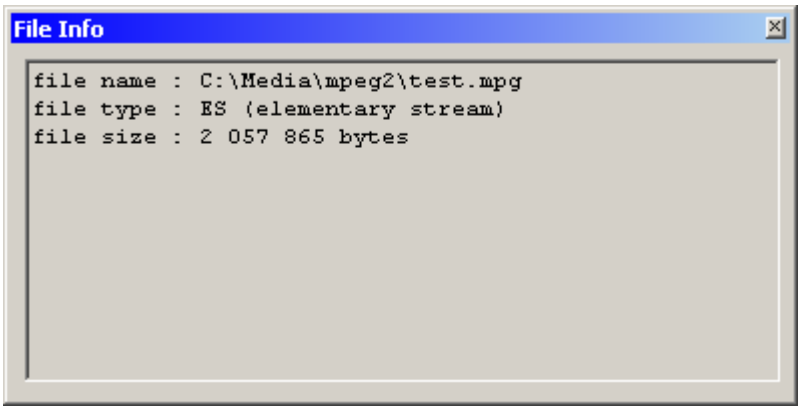
The **Headers Info** window shows the following header structures for the current frame: for AVC/ H.264 - seq_parameter_set_rbsp(), pic_parameter_set_rbsp(), slice_header(), sei(); for MPEG-2 - sequence_header(), sequence_extension(), sequence_display_extension(), group_of_pictures_header(), picture_header(), picture_coding_extension(); for MPEG-4 – VisualObjectSequence(), VideoObjectLayer(), Group_of_VideoObjectPlane(), VideoObjectPlane().

Figure 9. Elecard StreamEye GUI − Information Windows − Header Info Window



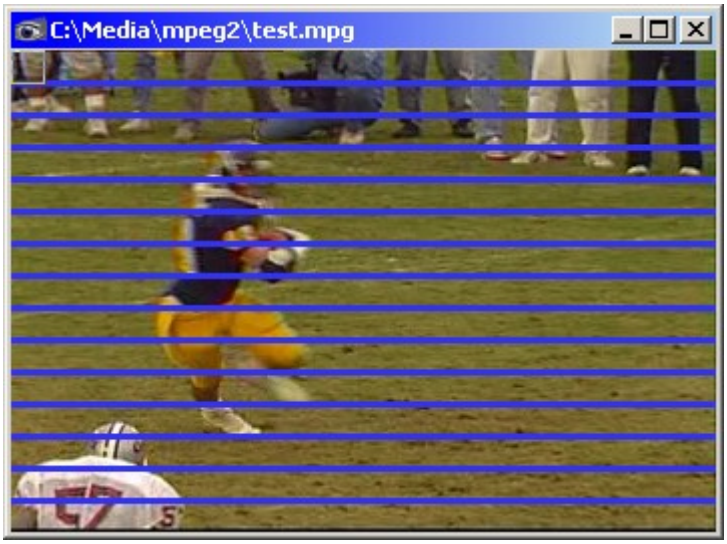
The **File Info** window shows the opened file information: name, type (PS, TS, AVI, MP4 or Video only), and size.

Figure 10. Elecard StreamEye GUI − Information Windows − File Info Window



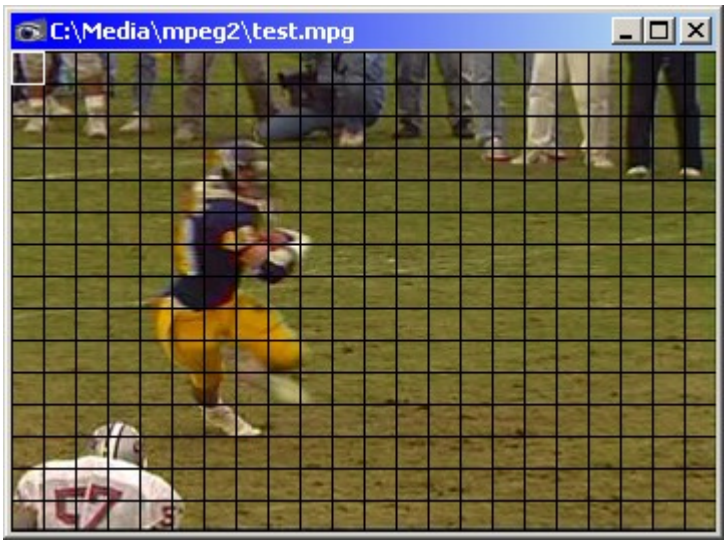
 − **Slice Boundaries** − The button visualizes slice boundaries in the video window (blue lines – slice boundaries; white square – macroblock marker).

Figure 11. Elecard StreamEye GUI − Information Windows − Video Window With Slice Boundaries



 − **Partitions** − The button visualizes partitions in the video window.

Figure 12. Elecard StreamEye GUI − Information Windows − Video Window With Partitions

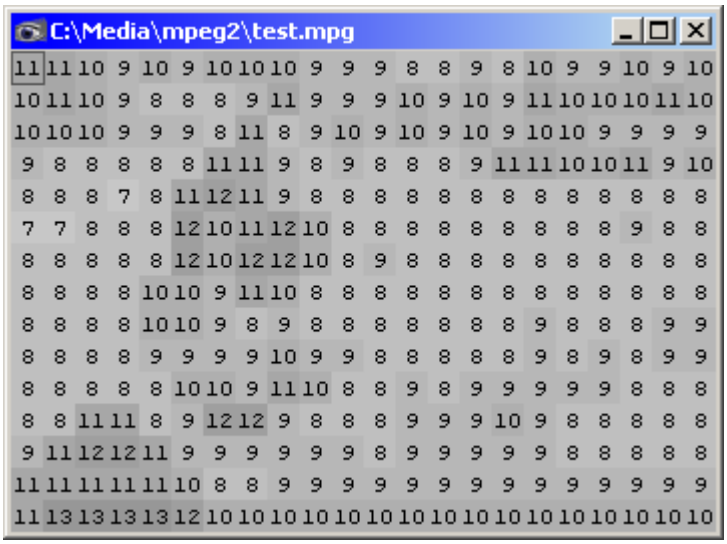


 − **Motion Vectors** − The button visualizes motion vectors in the video window.

Figure 13. Elecard StreamEye GUI − Information Windows − Video Window With Motion Vectors

 − **Quantizers** − The button visualizes quantizer values in the video window: white – 0; black – 31 (MPEG-1/2/4) or 51 (AVC/H.264).

Figure 14. Elecard StreamEye GUI − Information Windows − Video Window With Quantizers



 − **MB Types** − The button visualizes macroblock types in the video window.

For MPEG-1/2 streams:

- Red circles – Intra.
- Yellow circles – Not Coded (in B- and P-pictures).
- Blue circles – Forward (in B- and P-pictures).
- Green circles – Backward (in B- and P-pictures).
- Green-blue circles – Forward, Backward (in B-pictures).
- Stroked circles (horizontal line) – Field motion compensation is performed.

For AVC/H.264 streams:

- Red circles – Intra (Name of mb_type = I_4x4, I_16x16_0_0_0, I_16x16_1_0_0, I_16x16_2_0_0, I_16x16_3_0_0, I_16x16_0_1_0, I_16x16_1_1_0, I_16x16_2_1_0, I_16x16_3_1_0, I_16x16_0_2_0, I_16x16_1_2_0, I_16x16_2_2_0, I_16x16_3_2_0, I_16x16_0_0_1, I_16x16_1_0_1, I_16x16_2_0_1, I_16x16_3_0_1, I_16x16_0_1_1, I_16x16_1_1_1, I_16x16_2_1_1, I_16x16_3_1_1, I_16x16_0_2_1, I_16x16_1_2_1, I_16x16_2_2_1, I_16x16_3_2_1).
- Blue circles – Inter (B or P) (Name of mb_type = P_L0_16x16, P_L0_L0_16x8, P_L0_L0_8x16, P_8x8, P_8x8ref0, B_L0_16x16, B_L1_16x16, B_Bi_16x16, B_L0_L0_16x8, B_L0_L0_8x16, B_L1_L1_16x8, B_L1_L1_8x16, B_L0_L1_16x8, B_L0_L1_8x16, B_L1_L0_16x8, B_L1_L0_8x16, B_L0_Bi_16x8, B_L0_Bi_8x16, B_L1_Bi_16x8, B_L1_Bi_8x16, B_Bi_L0_16x8, B_Bi_L0_8x16, B_Bi_L1_16x8, B_Bi_L1_8x16, B_Bi_Bi_16x8, B_Bi_Bi_8x16, B_8x8).
- Yellow circles – Inter Skip (B or P) (Name of mb_type = P_Skip, B_Skip).
- Green circles – Inter B Direct (Name of mb_type = B_Direct_16x16).

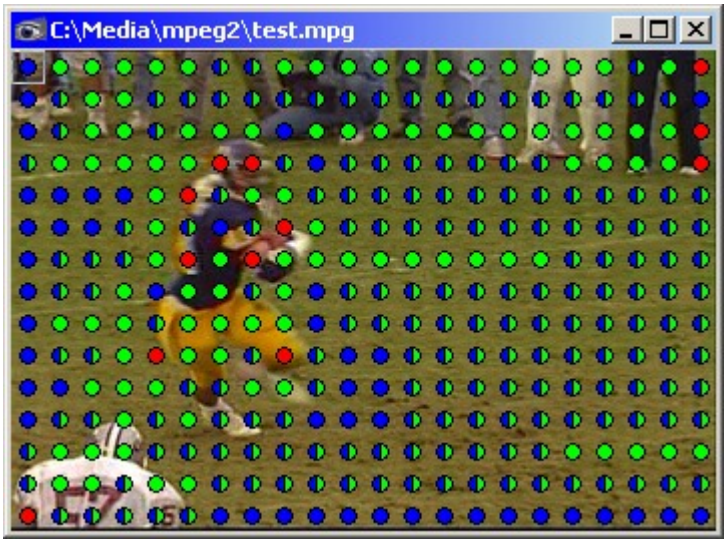
Blue circles with green quarter – Inter B 8x8 with Direct (Name of mb_type = B_8x8 and Name of sub_mb_type[mbPartIdx] = B_Direct_8x8).

For MPEG-4 and H.263 streams:

- Red circles – Intra.
- Yellow circles – Direct (in B).
- Blue circles – Forward (in B- and P-pictures).
- Green circles – Backward (in B- and P-pictures).
- Green-blue circles – Forward, Backward (in B-pictures).

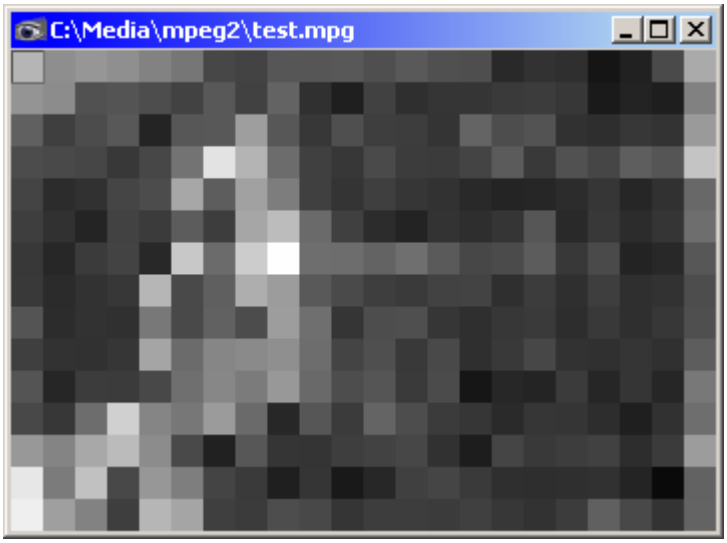
The **Options** command on the **Tools** menu allows adjustment of colors using the **Colors** group.

Figure 15. Elecard StreamEye GUI − Information Windows − Video Window With MB Types



 − **MB Sizes** − The button visualizes macroblock sizes (in bits) in the video window: black – 0; white – max for the current frame.

Figure 16. Elecard StreamEye GUI − Information Windows − Video Window With MB Sizes



 − **Options** − The button opens the **Options** dialog box.

4.2.3 Navigation Bar

 – **Start Position** – The button sets the current position to the first frame in the stream.

 – **Step Backward** – The button sets the current position to the previous frame.

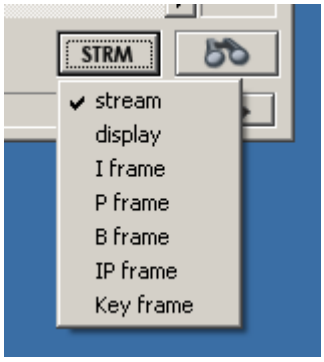
 – **Play/Pause** – The button starts or pauses stream playback.

 – **Step Forward** – The button sets the current position to the next frame.

 – **End Position** – The button sets the current position to the last frame in the stream.

– **Step by** – The button sets the frame-by-frame navigation mode: display order, stream order or by I, P or B frames.

Figure 17. Elecard StreamEye GUI – Information Windows – Navigation Mode Selection

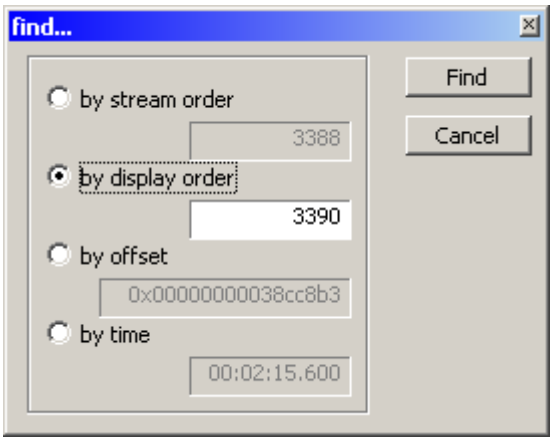


 – **Find** – The button opens the **Find…** dialog box.

To find frame:

1. Select the find mode.
2. Type the frame number, offset or time.
3. Click **Find** button.

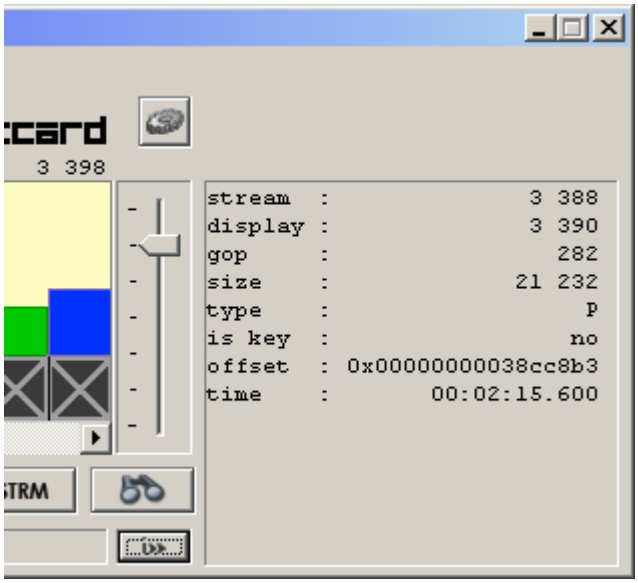
Figure 18. Elecard StreamEye GUI – Find Dialog Box



 – **Extra Frame Info** – The button shows the following information for the currently selected frame:

- Current frame number in decoder order.
- Current frame number in stream order.
- Frame presentation time/total stream time length.
- Frame size.
- Type of the current frame.
- Offset from the file beginning.

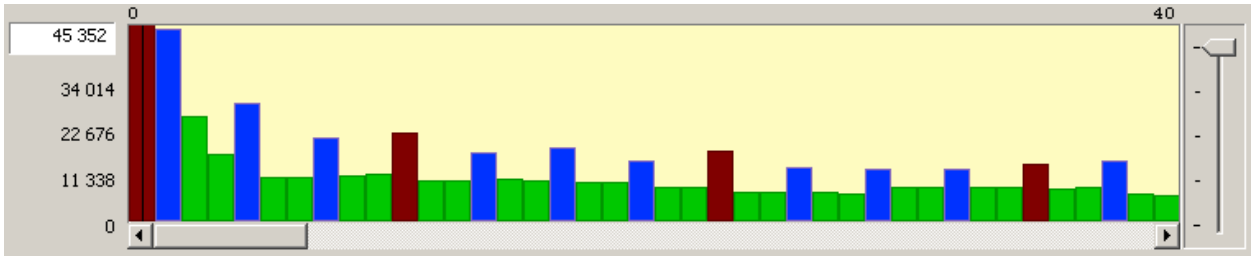
Figure 19. Elecard StreamEye GUI – Extra Frame Info



4.2.4 Bar Chart Control

The **Bar Chart** control represents a stream as a set of multicolored bars. The bar color indicates the frame type and the bar altitude indicates the frame size (in bytes).

Figure 20. Elecard StreamEye GUI – Bar Chart Control



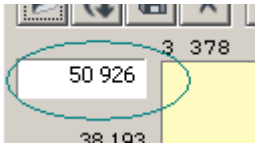
 – **Position** – The marker (vertical black line) specifies the current frame. The control allows positioning using mouse. Click the desired frame to reset the current position.

 – **Scale** – The slider changes the scale of the sequence of frames representation.

The scroll bar at the bottom of the **Bar Chart** control allows scrolling of the stream visible region. The digits at the top of the **Bar Chart** control indicate the visible region boundaries.

The **Maximum Scale** value appears in the edit box at the upper-left corner of the main window. This value is the maximum frame size available to the opened stream. The user can manually increase or decrease this value. For example, to visually compare bitrate behavior of different streams, the user may need to make this value identically for several Elecard StreamEye instances.

Figure 21. Elecard StreamEye GUI − Bar Chart Control − Maximum Scale Value



4.2.5 Hot Keys

The following table describes all the hot keys available for users of Elecard StreamEye.

Table 3. Elecard StreamEye Hot Keys

Hot Key	Description
CTRL+R	Opens the recently closed file.
CTRL+F	Opens the **Find** dialog box.
CTRL+I	Changes the Presentation Mode.
CTRL+N	Enables/disables the quantizer number displaying in the video window, if the quantizer visualization is turned on.
CTRL+O	Opens the **Open Media** dialog box.
CTRL+TAB	Switches between the opened windows.
SPACEBAR	Starts or pauses the stream playback.
HOME	Sets the current position to the first frame in the stream.
END	Sets the current position to the last frame in the stream.
LEFT ARROW	Sets the current position to the previous frame.
RIGHT ARROW	Sets the current position to the next frame.
PAGE UP	Sets the current position to the previous I-frame.
PAGE DOWN	Sets the current position to the next I-frame.
CTRL+1	Enables/disables the Slice Boundaries displaying in the video window.
CTRL+2	Enables/disables the Partitions displaying in the video window.
CTRL+3	Enables/disables the Motion Vectors displaying in the video window.
CTRL+4	Enables/disables the Quantizers displaying in the video window.
CTRL+5	Enables/disables the MB types displaying in the video window.
CTRL+6	Enables/disables the MB Size displaying in the video window.

4.3 Opening Media File or Index File

Elecard StreamEye opens media file and creates index file or opens existing index file.

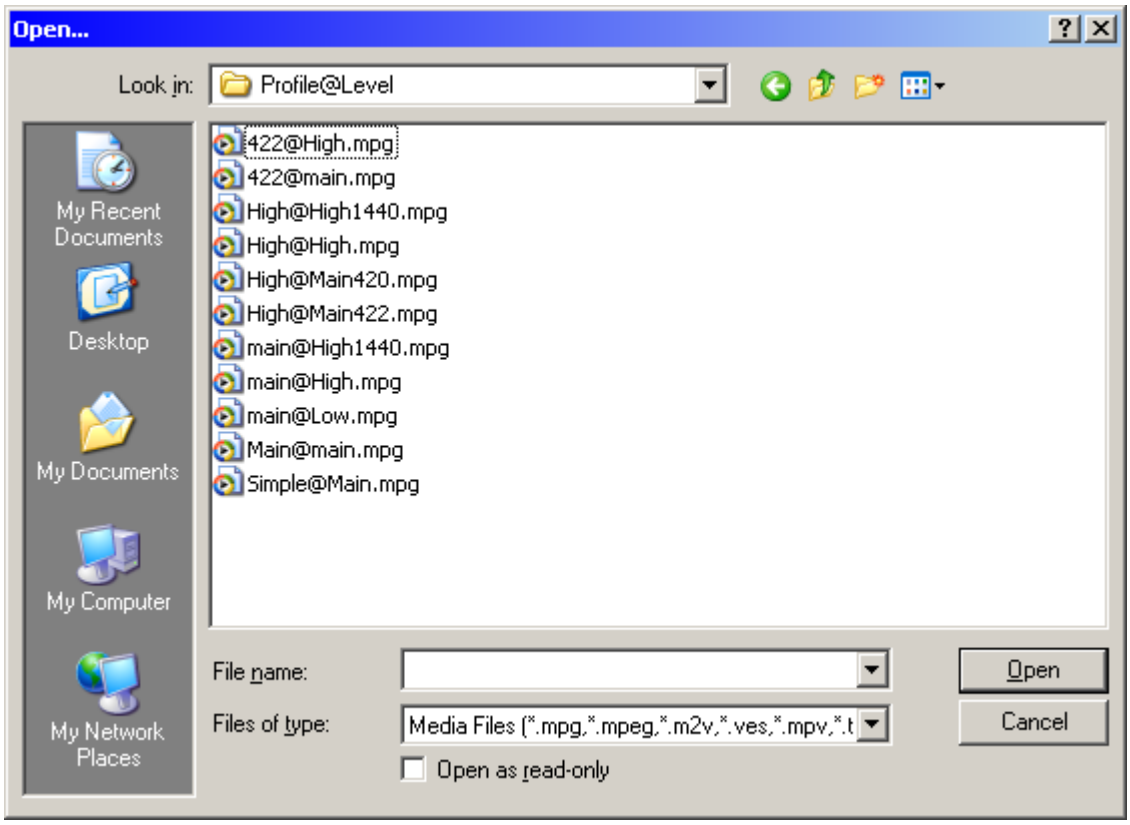
The index file contains the following information for each frame:

- Type (I frames, B frames, P frames)
- Number
- Offset
- Time

To open a media stream, do the following:

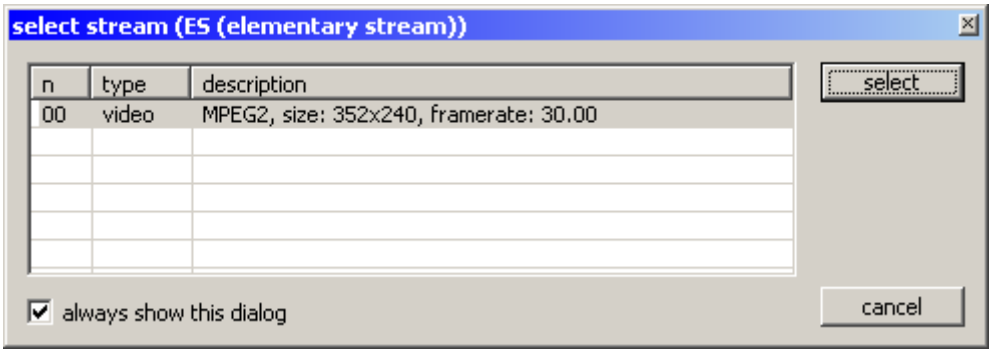
1. From the Windows *Start* menu, select *Programs→Elecard→Elecard StreamEye*.
2. From the **File** menu select **Open** or click the **Open File** button on the Toolbar. The **Open File** dialog box appears.

Figure 22. Open File Dialog Box



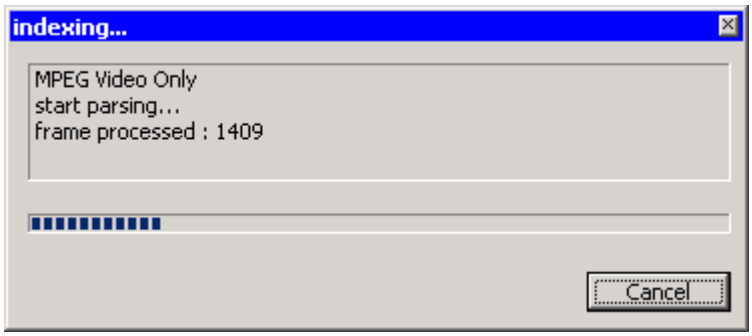
3. Select the file to be opened.
4. If the opened file does not contain video only, the Select Stream dialog box appears. Select the stream to be opened.

Figure 23. Select Stream Dialog Box



5. When the stream is selected, the indexing process is started. The **Indexing…** window appears.

Figure 24. Indexing Window



Note: *To abort the index creation process and close the* ***Indexing*** *dialog box, click* ***Cancel****.*

6. After the index is created (when the blue progress line reaches the end), the file is opened and the program is ready to analyze the stream. The Elecard StreamEye program parses and demultiplexes the opened media stream and displays the frame chart, current frame information, and the video window with the first frame.

4.4 Saving an Index File

Note: *The Index saving is applied to the MPEG-2 TS and PS only.*

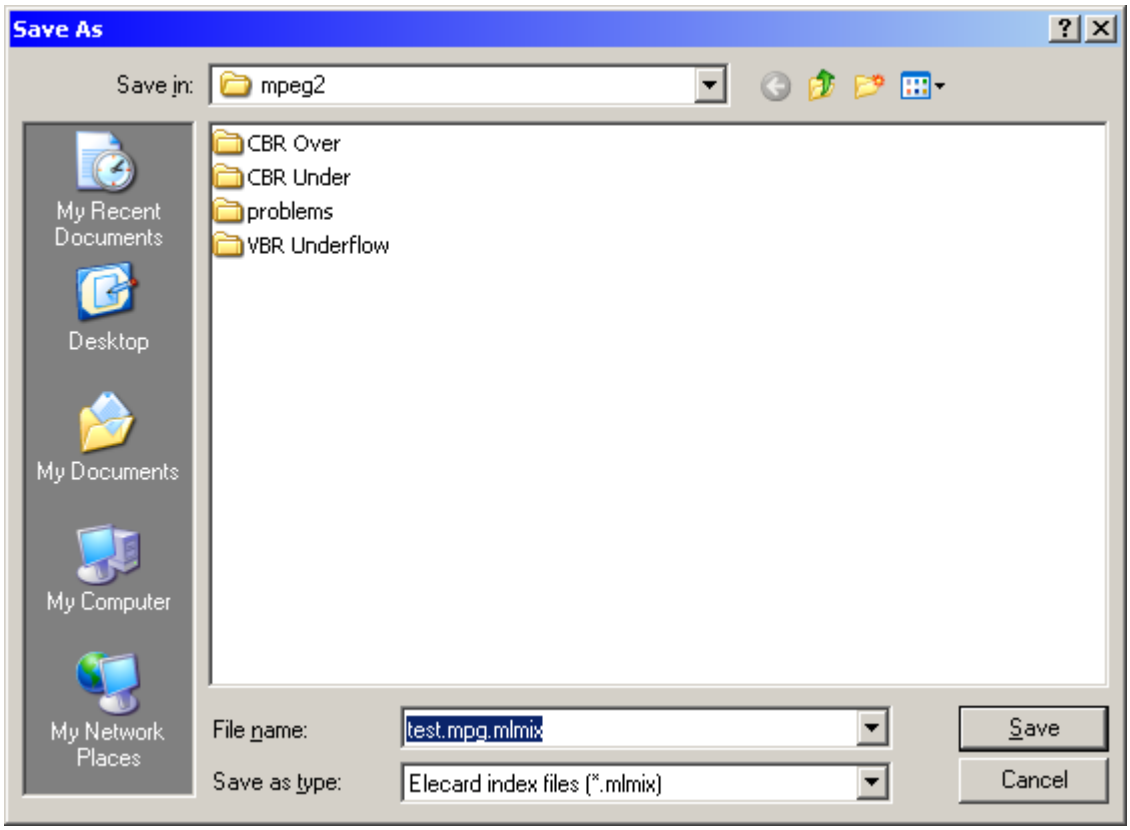
Indexing is performed in the virtual memory and you may save it to the .MLMIX file.

To save an index file:

1. Click *File→Open*….
2. Open a required MPEG file. The index process will complete.
3. Click *File→Save Index*….

The **Save As** dialog box appears.

Figure 25. Save As Dialog Box



4. Select or write an index file name and click **Save**.