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VIDEO COMPRESSION GURU

Elecard Stream Analyzer v.4.2

User Guide

User Guide Notices

Elecard Stream Analyzer v 4.2 User Guide

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1 Introduction

1.1 Preface

Elecard Stream Analyzer is a powerful tool designed for syntax analysis of encoded media streams and presentation of the analysis log in a human readable form. Stream Analyzer operates with MPEG-1 Video/Audio, MPEG-2 Video/Audio, AAC, Dolby Digital Audio, AVC/H.264, VC1, HEVC/H.265, AV1 and VP9 contained in TS, PS, MP4, AVI, FLV, IVF and MKV (Matroska) files.

1.2 Describing Elecard Stream Analyzer

The following section defines the specifications and features of Elecard Stream Analyzer.

1.2.1 Supported Media Types

Elecard Stream Analyzer supports the following formats:

- MPEG-1 Video stream (ISO/IEC 11172-2);
- MPEG-2 Video stream (ISO/IEC 13818-2);
- AVC/H.264 Video stream (ISO/IEC 14496-10) and its Annex G (SVC) and Annex H (MVC);
- HEVC/H.265 Video stream (ISO/IEC 23008-2, MPEG-H Part 2);
- VP9 Bitstream Overview for Google VP9;
- AV1 Bitstream & Decoding Process Specification;
- MPEG-4 Video stream;
- VC-1 Video;
- MPEG-1/2 Audio Layer 1/2/3 (ISO/IEC 11172-3 and ISO/IEC 13818-3);
- Dolby Digital Audio (ATSC A-52);
- AAC (Advanced audio coding);
- LPCM (Linear Pulse Code Modulated Audio);
- SCTE-35 (ANSI/SCTE-35);
- DVB Subtitle (ETSI EN 300 743);
- MPEG-1 System Stream (MPEG-1, MPEG-1/2 Audio Layer 1/2/3, LPCM) (ISO/IEC 11172-1);
- MPEG-2 Transport Stream (MPEG-1/2, AVC, HEVC, MPEG-1/2 Audio Layer 1/2/3, LPCM, AC-3, AAC, SCTE-35, DVB Subtitle) (ISO/IEC 13818-1);
- MPEG-2 Program Stream (MPEG-1/2, AVC, HEVC, MPEG-1/2 Audio Layer 1/2/3, LPCM, AC-3, AAC) (ISO/IEC 13818-1);
- AVI file container (MPEG-1/2, AVC, HEVC, LPCM, AC-3, AAC);
- MP4 file container (MPEG-1/2, AVC, HEVC, VP9, AV1, VC-1, AC-3, AAC);
- MKV file container (MPEG-1/2, AVC, HEVC, VP9, AV1, MPEG-1/2 Audio Layer 1/2/3, AC-3, AAC);
- WebM file container based on MKV (VP9, AV1);
- IVF file container (VP9, AV1);
- FLV file container (AVC, AAC, LPCM).

1.2.2 Features

Elecard Stream Analyzer implements the following features:

- Selection of packets in a text;
- Selection of packets by PID and StreamID;
- Stream viewing in the hex, ascii and binary modes;
- Storing information about the stream and currently selected packets into a .CSV file;
- Search of elements by offset, PID and text;
- Transport stream error detection (ETSI TR 101 290) and analysis, error report generation;
- Interleaving analysis;
- Presentation of the interleaving between two streams as a diagram;
- Calculation of the overhead in transport, program and system streams;
- Bandwidth information;
- Customization main control output;
- MP4, AVI, MKV, FLV, IVF support;
- Cross platform (Windows, Mac, Linux version);
- Selection of the data portion for further saving;
- Dump elementary streams to file;
- Build graphics from parameters;
- Sharing comments between application instances and/or applications of Elecard StreamEye Studio set;
- Synchronization between applications of Elecard StreamEye Studio set (Binding mode);
- Console version.

1.3 Using this Guide

1.3.1 Purpose

This guide is intended to help the user utilize Elecard Stream Analyzer. It describes the Stream Analyzer GUI, settings and functions and provides instructions for Stream Analyzer use.

1.3.2 Topics Covered

Section 1: Introduction – provides a general overview of Stream Analyzer and describes the purpose of the document and its contents.

Section 2: Getting Started – describes how to install, uninstall, and run the Elecard Stream Analyzer program.

Section 3: Using Elecard Stream Analyzer – describes the Stream Analyzer GUI and provides instructions for comparing video streams and viewing the results of comparison.

1.4 System Requirements

1.4.1 Software Requirements

- Windows® 7/8/10 (64-bit)

1.5 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").

For technical support, please contact Elecard Technical Support Team: tsup@elecard.com.

For sales and licensing information contact Elecard Sales Department: sales@elecard.com.

1.6 Activation

Make sure that Sentinel License Manager software has been installed on your computer. License Manager is provided within the product installation pack for Windows OS and macOS and installed automatically.

License Manager is provided as a separate installation pack for Linux OS and should be installed manually.

Please note, Windows OS reinstallation will make the activated product license invalid.

To check that License Manager is properly installed, go to Sentinel Admin Control Center at http://localhost:1947. If you see your license information, the installation is successfully completed.

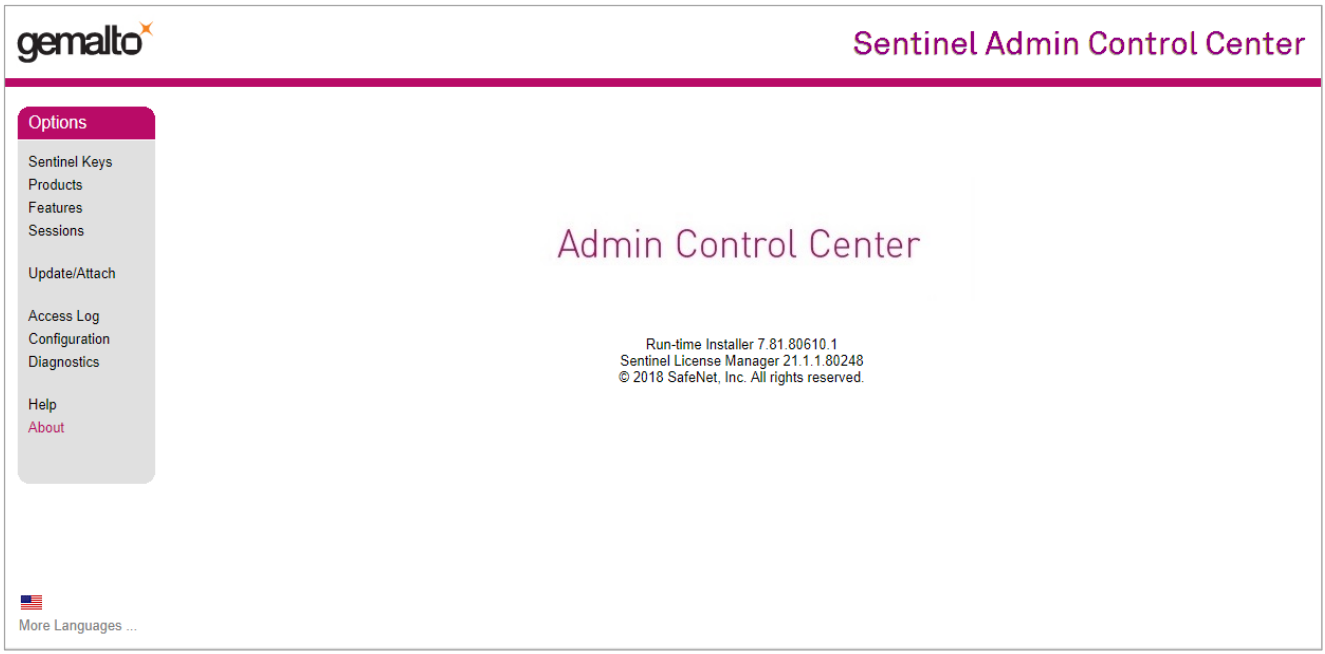

Figure 1. The License Manager with license information

License Manager allows configuring, controlling, monitoring and looking through a list of available licenses. For more details on License Manager operation click the Help tab.

***Note**, each page contains the Help tab related to this page only.*

There are two ways to activate Elecard Stream Analyzer: on-line and offline.

On-line activation

1. Be advised, that Internet connection is required for this type of activation.
2. Your purchase confirmation e-mail will contain a product key serial number for on-line activation. Make sure you inform your account manager that you are looking to activate the product on-line.
3. Enter the received product key XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX in the *On-line activation with a product key* field, as shown below, and click Activate. Your application is successfully activated.

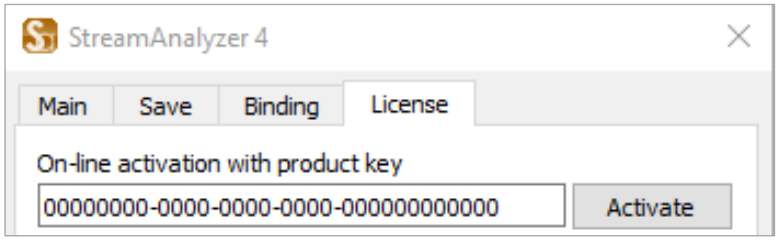

Figure 2. On-line activation with product key

Offline activation

For Elecard Stream Analyzer activation, a C2V (client-to-vendor) file should be created. To create the C2V file follow the steps:

1. Open the **File** tab and select **Options** in the drop-down menu.
2. A dialog window should open. Open the **License** tab.
3. Select HASP-SL for PC-based or HASP-HL for dongle-based activation in the *Offline activation with license files* field. Note, if you select a PC-based (HASP-SL) activation, full featured activated Elecard Stream Analyzer will run only on this particular hardware. If you have Elecard dongle, plug it into a free USB port on your computer and select dongle-based (HASP-HL) activation. It will be possible to use Elecard Stream Analyzer on any hardware with the dongle plugged in.

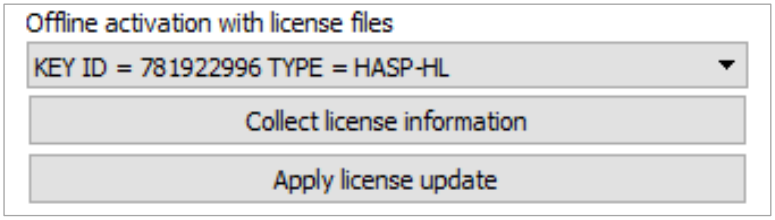

Figure 3. Offline activation with license files

4. Click the **Collect license information** button. The Save File dialog box should open. Click **Save** and save the C2V file to a required directory. Send the saved C2V file to Elecard Sales at sales@elecard.com.

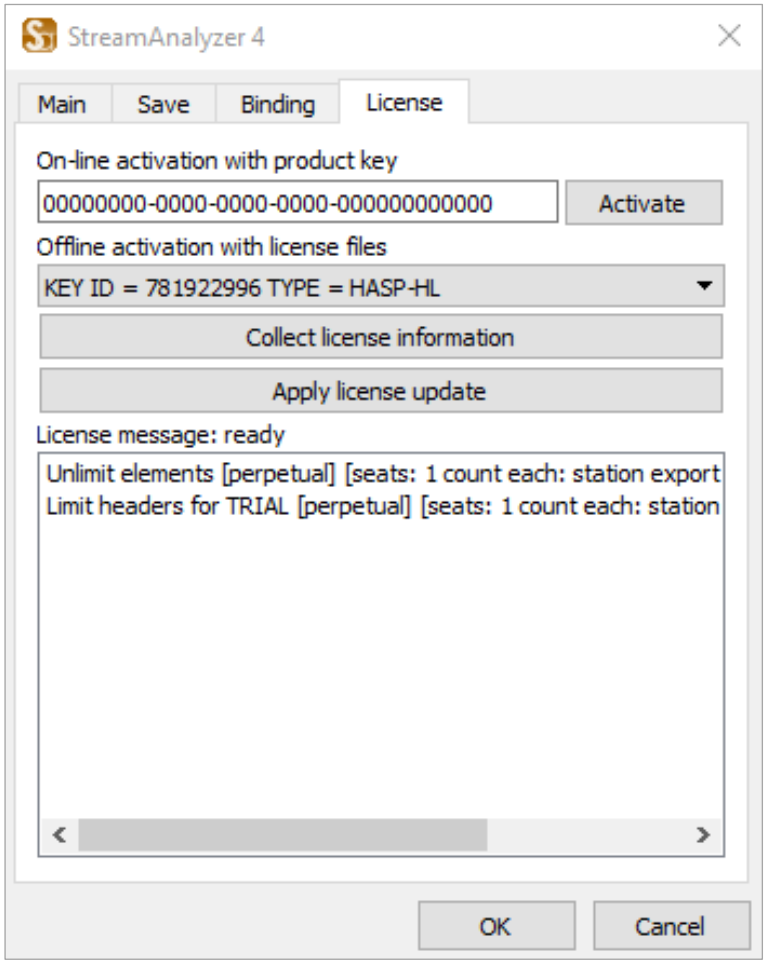

Figure 4. Creating a C2V file: License tab

5. After receiving the V2C file containing license information back from Elecard Sales save the received file to a required directory. Open the **File** tab and select **Options** in the drop-down menu again. Open the **License** tab and click **Apply license update** (see Figure 4). The file selection dialog box should appear. Choose the received V2C file and click **OK**. Your application is successfully activated.

2 Getting Started

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

2.1 Installing Elecard Stream Analyzer

Elecard Stream Analyzer is supplied as part of Elecard StreamEye Studio or as a standalone application. The application is installed via Elecard StreamEye Studio installer or Elecard Stream Analyzer installer.

Depending on the purchased product or version, the installation file is located:

- in Elecard folder as a separate application;
- in Elecard folder as part of Elecard StreamEye Studio.

1. Run **Elecard Stream Analyzer Setup.**
2. To complete installation, follow the onscreen instructions.
3. When setup has finished installing all the necessary files on your computer, the *Elecard Stream Analyzer has been successfully installed* dialog box will appear, and the program is ready to run. You do not need to reboot your computer.

2.2 Uninstalling Elecard Stream Analyzer

To uninstall Elecard Stream Analyzer:

1. Click *Start → Programs → Elecard → Elecard Stream Analyzer X.X → Uninstall Elecard Stream Analyzer X.X.*
2. Follow the on-screen instructions to complete the Elecard Stream Analyzer uninstallation.

2.3 Running Elecard Stream Analyzer

To run Elecard Stream Analyzer click *Start → Programs → Elecard → Elecard Stream Analyzer X.X.*

3 Using Elecard Stream Analyzer

3.1 Introduction

The following section describes the Elecard Stream Analyzer GUI (graphic user interface), its features and instructions for stream analysis. The Elecard Analyzer is an advanced video analysis software tool standing out for its simple user-friendly interface and in-depth statistics analysis.

3.2 Describing Elecard Stream Analyzer GUI

The following section describes the Elecard Stream Analyzer GUI.

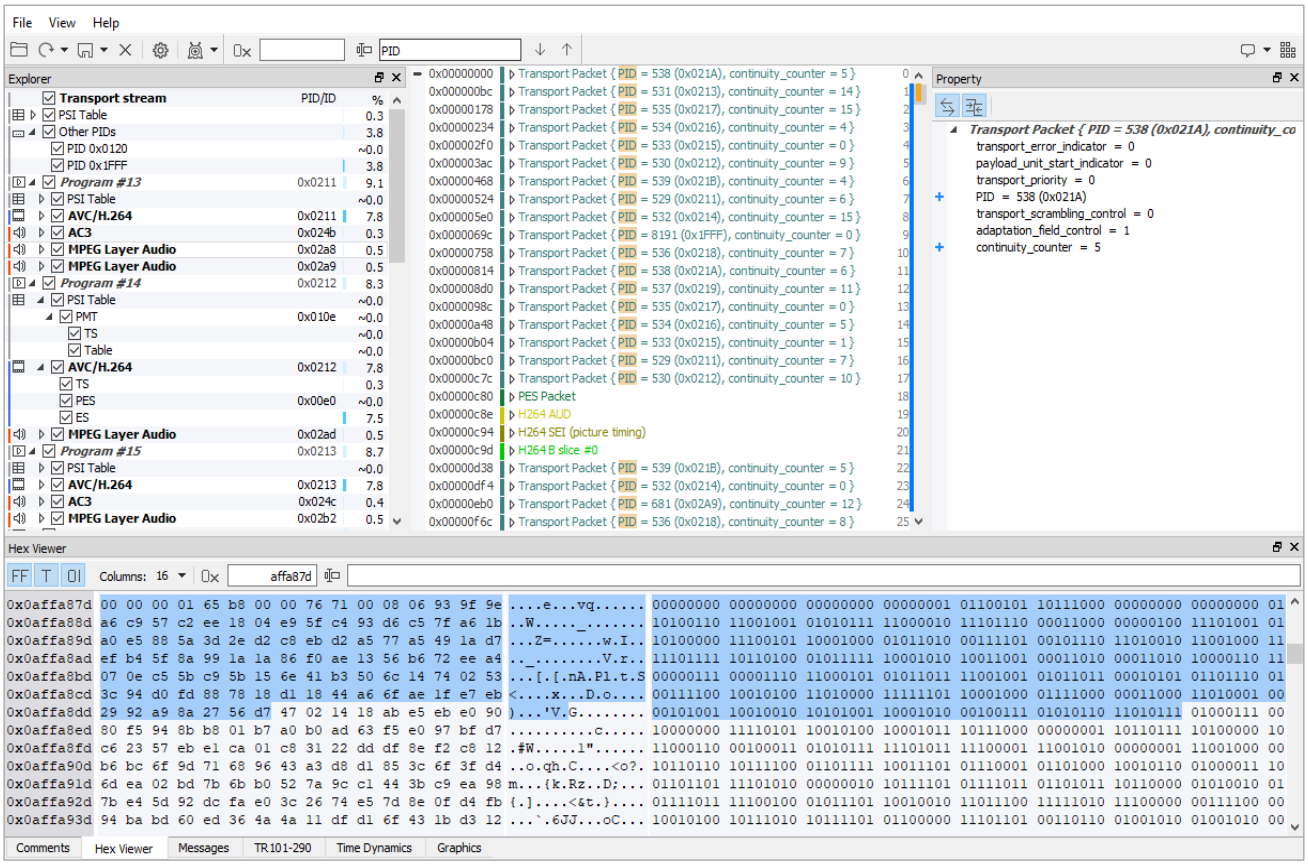

Figure 5. Elecard Stream Analyzer GUI

3.2.1 Menu

The following table describes the Elecard Stream Analyzer menu.

Table 1. Elecard Stream Analyzer GUI - Menu

Menu item	Button	Description
File		
Open file		Opens a new media file for analysis.
Reopen		Reopens a list of recently opened files.

Reopen Last File		Reopens the last opened file.
Save		Allows selecting file information to be saved: • Stream Info – saves all information on a stream; • Dump – extracts and saves a piece of a file or an elementary stream and allows choosing the required data portion.
Close		Closes the opened file.
Binding mode		Enables or disables the Binding mode: • Leader – allows sending comments, commands on interface or positioning changes to other applications; • Follower – allows receiving comments, commands from other applications.
Open comments		Opens comments from the XML file.
Save comments		Saves comments to the XML file.
Open with		Opens the current file with an external application (the application name and its path are set in the Open With List field by opening Options – Main. Player is set by default).
Options		Opens the program settings dialog (Main, Binding, License).
Exit		Exits the application.
Navigation		
Offset		Enables searching by the offset.
Search text box		Enables searching the necessary byte sequence in the file (helps to search for start-codes).
Previous / Next		Switches the searching results: previous / next.
View		
Explorer		Enables/disables the Explorer panel
Property *Sync mode* *Compare mode* *Dump mode*	  	Enables/disables the Property panel: • automatically changes data displayed in the **Property** panel • compares the chosen packet with the selected one. • saves an elementary stream selected in the **Explorer** panel.
Hex Viewer		Enables/disables the Hex Viewer panel
Time Dynamics		Enables/disables the Time Dynamics panel
Messages		Activates the Messages panel
TR101-290		Activates the TR101-290 panel
Graphics		Enables/disables the Graphics panel
Comments		Enables/disables the Comments panel
Help		
Contents		Opens the current User Guide in .pdf format
Feedback		Sends the feedback on Stream Analyzer via e-mail, if it is registered in the system with the following subjects: *Submit an Idea*, *Ask a Question*, *Report a Bug*.
About		Shows the **About** window.

3.2.2 Explorer Panel

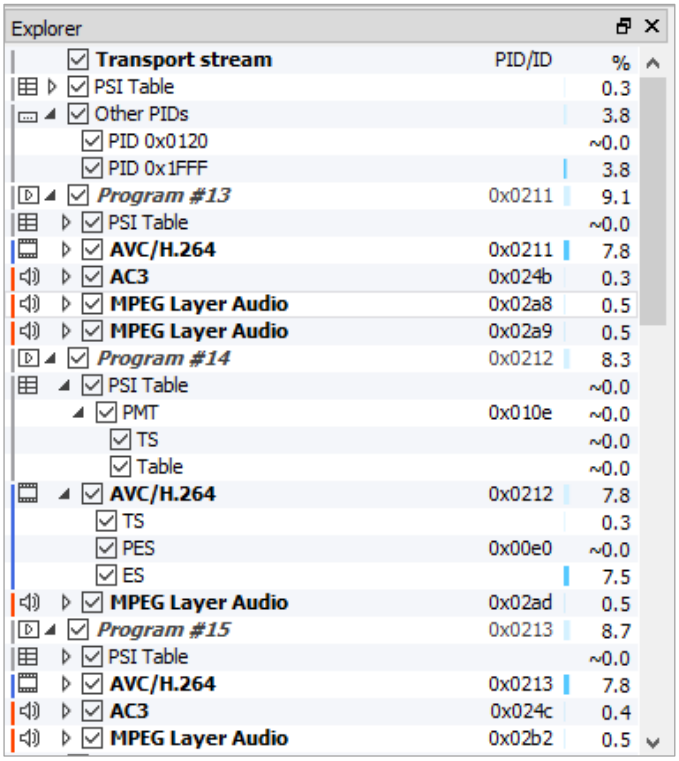

Figure 6. Explorer Panel – TS Stream

To open the **Explorer** panel, click **View – Explorer**.

This panel shows the stream hierarchical tree and allows managing information display in the **Main window** panel. Left-click on the element shows all properties in the **Property** panel. Right-click on the element shows the shortcut menu.

The **Percentage** field shows the percentage rate of an element in the whole stream.

When choosing some stream element, you can see two more functions in the **Property** panel.

The **Dump** button saves the dump file.

Use checkboxes to select data that you need displayed in the **Main Window** panel.

MP4 streams have descriptive headers that contain detailed information about MP4 boxes (atoms), which is displayed in the panel.

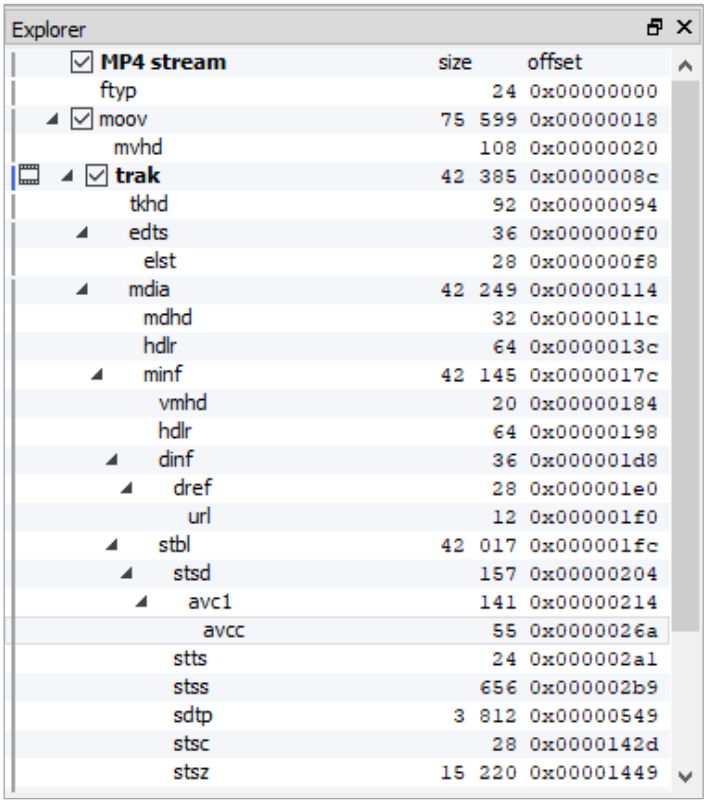

Figure 7. Explorer Panel – MP4 Stream

AVI streams have descriptive headers that contain detailed information about AVI chunks, which is displayed in the panel.

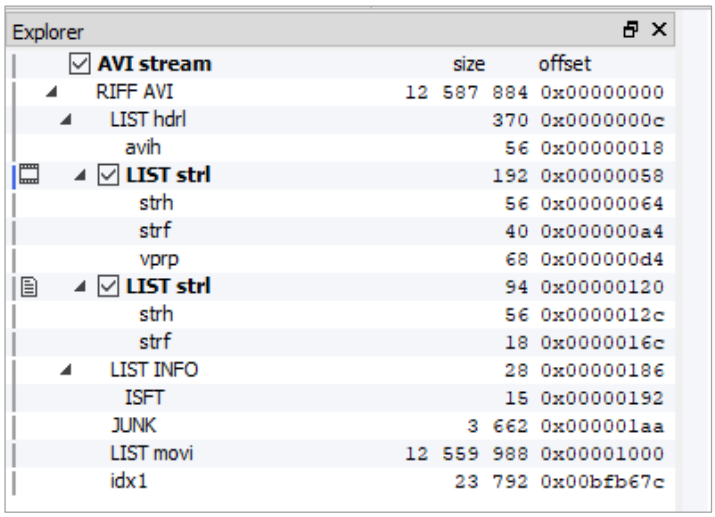

Figure 8. Explorer Panel – AVI Stream

MKV streams have descriptive headers that contain detailed information about MKV elements, which is displayed in the panel.

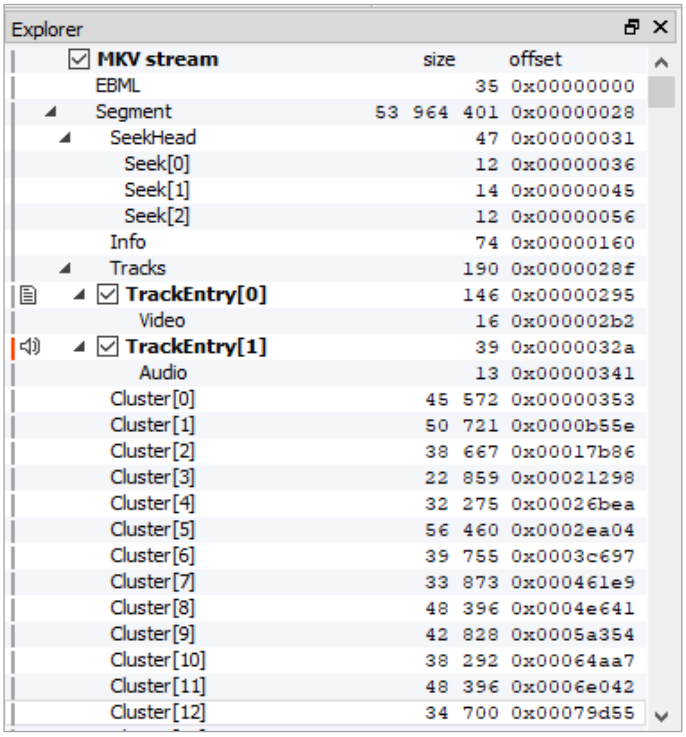

Figure 9. Explorer Panel – MKV Stream

3.2.3 Main Window Panel

This panel contains information about packets.

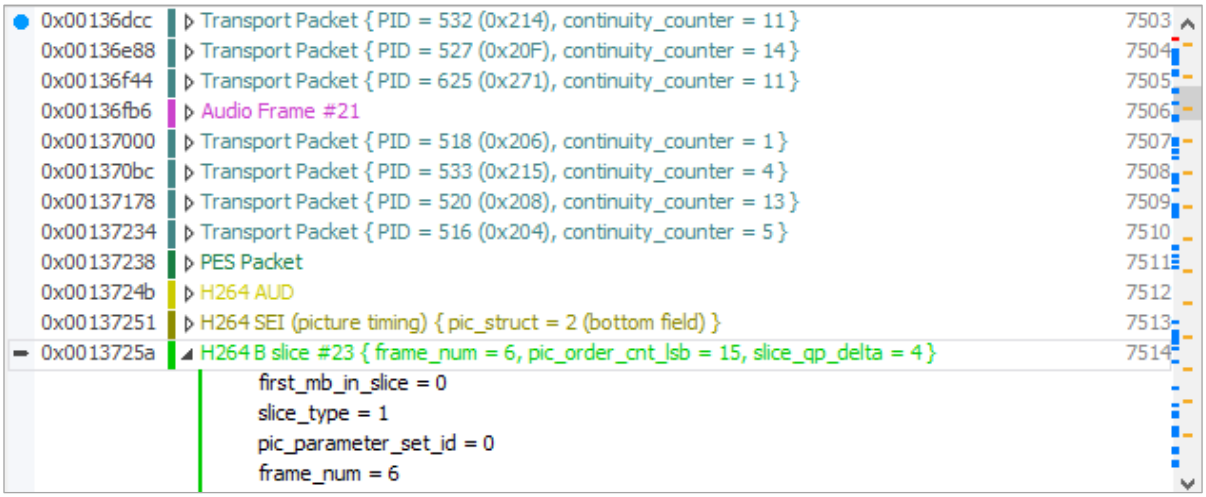

Figure 10. Main Window Panel

Circles on the left side of the panel indicate type of information displayed.

The red circle stands for an error, the blue one is either a warning or a message.

Offset indicates the beginning of the packet position in the file. Types of packets are color coded. Braces show the parameters that can be chosen in the **Property** panel.

The scrollbar indicates red and blue messages found in the displayed packets. Search results are highlighted orange.

Click the packet to see corresponding data in the **Property** panel, **Hex Viewer** panel and **Messages** panel. Double left-click on the packet in the **Main Window** panel opens property data of the

corresponding packet. To select the required data range, left-click or right-click and press the Shift key.

3.2.4 Property Panel

This panel indicates properties of the chosen packet.

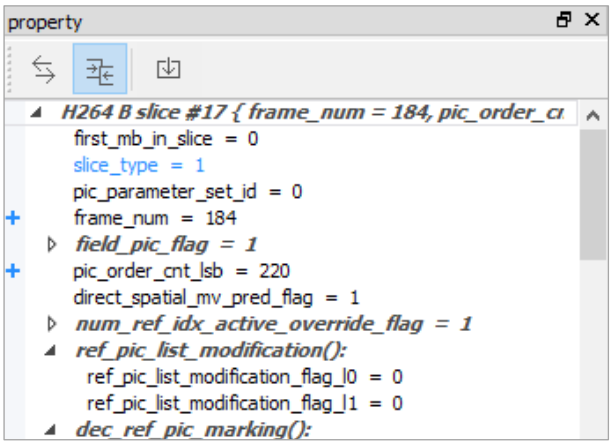

Figure 11. Property Panel – Detailed Information about packet (from the Main Window Panel)

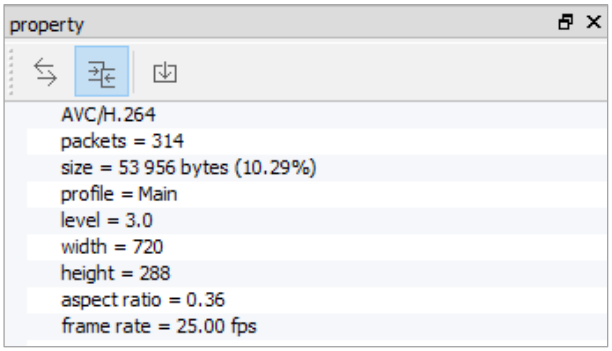

Figure 12. Property Panel – Detailed Information about stream (from the Explorer Panel)

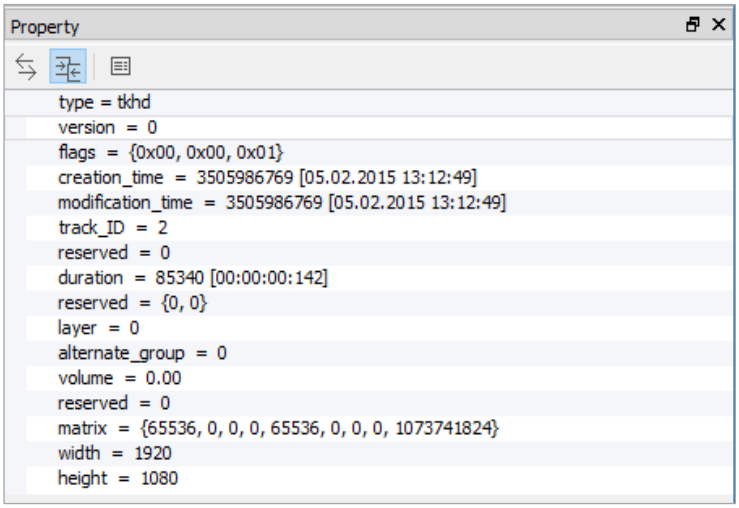

Figure 13. Property Panel – Detailed Information about chosen box (atom) (from the Explorer Panel)

Compare mode – the chosen packet will be compared with the previous chosen one. The differences in parameters will be highlighted blue.

Sync mode – automatically changes data displayed in the **Property** panel without left-clicking the **Main Window** panel

Dump – a function in the explorer mode for saving elementary stream.

3.2.5 Hex Viewer Panel

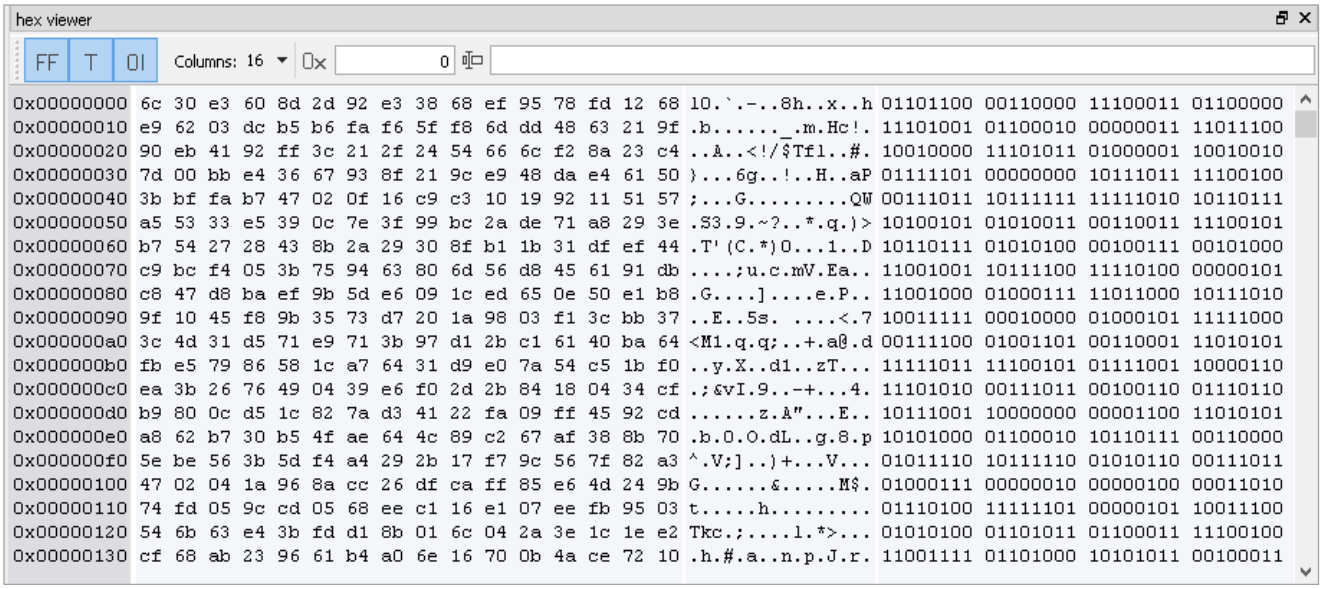

Figure 14. Hex Viewer Panel

The HEX viewer represents a file in the hex mode and allows navigation by the offset. The buttons also provide ascii T and binary 01 modes.

In the **Columns** drop-down list, you can choose number of bytes to show in the panel.

The Offset field 0x allows searching by the offset.

The **Search** text box allows searching the necessary byte sequence in the file (helps to search for start-codes).

3.2.6 Messages Panel

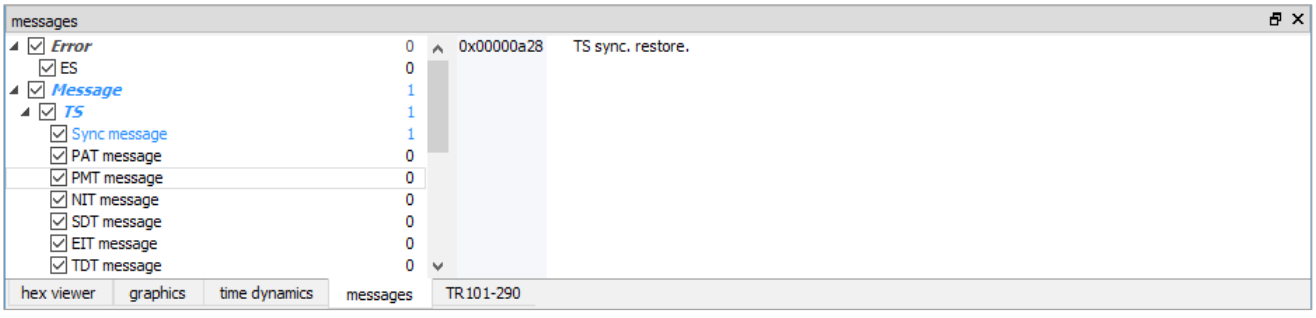

Figure 15. Messages Panel

The **Messages** panel displays a log of the stream errors analysis. The left panel is used to form the list of errors indicated in the log. It also provides a list of possible error or message types. If an error occurs, it is highlighted blue and you see the number of errors or messages found in the file. The right

panel provides a list of occurred errors or messages. The red color stands for first priority errors. The blue color is the indicator of warnings and errors of second and third priority.

Double-clicking the line in the right panel sets position in **Main Window** to the packet comprising the selected error.

3.2.7 TR101-290 Panel

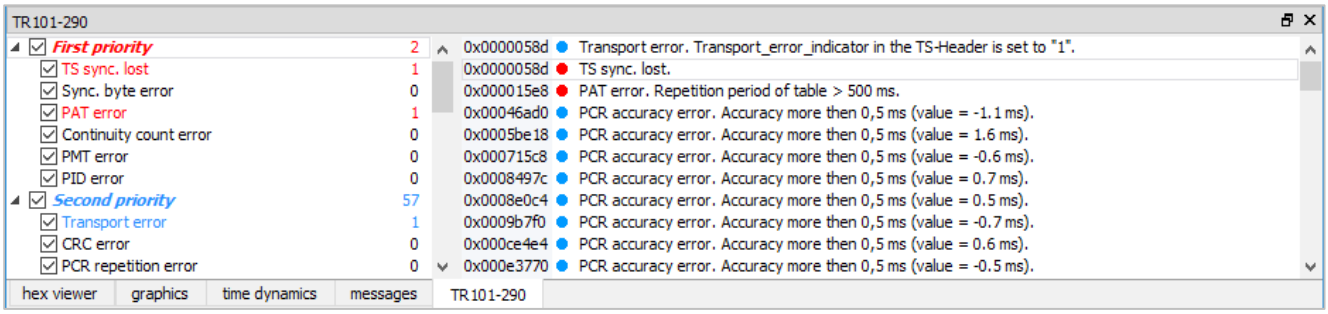

Figure 16. TR101-290 Panel

The **TR101-290** panel displays a log of the transport stream analysis. The left panel is used to form the list of errors indicated in the log. It also provides a list of possible error or message types. If an error occurs, it is highlighted blue and you see the number of errors or messages found in the file. The right panel provides a list of occurred errors or messages. The red color stands for first priority errors. The blue color is the indicator of warnings and errors of second and third priority.

Double-clicking the line in the right panel sets position in **Main Window** to the packet comprising the selected error.

If an indicator is set, then the TS is in error. However, since the indicators do not cover the entire range of possible errors, it cannot be concluded that there is no error if the indicator is not set.

If the **TS sync loss** indicator is activated then all other indicators are invalid. Each indicator is activated **only as long as** at least one of the description lines is fulfilled.

Note: *In the case of indicators requiring a minimum repetition rate of sections, it means that each and every section that is present for this table should have the stated repetition rate.*

Any test equipment intended for the evaluation of these parameters should report test results by means of the indicators itemized in the second column of the tables followed below. The tables describe detectable errors according to their priority types.

Table 2. First Priority Errors

Error	Description
TS sync loss	Loss of synchronization with consideration of hysteresis parameters.
Sync. byte error	Sync_byte is not equal to 0x47
PAT error	Sections with table_id 0x00 do not occur at least every 0,5 s on PID 0x0000 Section with table_id other than 0x00 found on PID 0x0000 Scrambling_control_field is not 00 for PID 0x0000
Continuity count error	Incorrect packet order a packet occurs more than twice lost packet
PMT error	Sections with table_id 0x02, (i.e. a PMT), do not occur at least every 0,5 s on each program_map_PID which is referred to in the PAT. Scrambling_control_field is not 00 for all packets containing information of sections with table_id 0x02 (i.e. a PMT) on each program_map_PID which is referred to in the PAT.
PID error	Referred PID does not occur for a user specified period.

Table 3. Second Priority Errors

Error	Description
Transport error	Transport_error_indicator in the TS-Header is set to "1"
CRC error	CRC error occurred in CAT, PAT, PMT, NIT, EIT, BAT, SDT or TOT table
PCR repetition error	Time interval between two consecutive PCR is longer than 40 ms
PCR discontinuity indicator error	The difference between two consecutive PCR values (PCRi+1 – PCRi) is outside the range of 0...100 ms without the discontinuity_ indicator set
PCR accuracy error	PCR accuracy of selected program is not within ±500 ns
PTS error	PTS repetition period is longer than 700 ms
CAT error	Packets with transport_scrambling_control not 00 present, but no section with table_id = 0x01 (i.e. a CAT) present Section with table_id other than 0x01 (i.e. not a CAT) found on PID 0x0001

Table 4. Third Priority Errors

Error	Description
NIT actual error	Section with table_id other than 0x40 or 0x41 or 0x72 (i. e. not an NIT or ST) found on PID 0x0010 No section with table_id 0x40 (i.e. an NIT_actual) in PID value 0x0010 for longer than 10 s. Any two sections with table_id = 0x40 (NIT_actual) occur on PID 0x0010 within a specified value (25 ms or lower).
NIT other error	Interval between sections with the same section_number and table_id = 0x41 (NIT_other) on PID 0x0010 longer than a specified value (10s or higher).
SI repetition error	Repetition rate of SI tables is outside of the specified limits
Unreferenced PID	PID (other than PMT_PIDs, PIDs with numbers between 0x00 and 0x1F or PIDs user defined as private data streams) is not referred to by a PMT or a CAT within 0,5 s
SDT actual error	Sections with table_id = 0x42 (SDT, actual TS) is not present on PID 0x0011 for more than 2 s Sections with table_ids other than 0x42, 0x46, 0x4A or 0x72 found on PID 0x0011. Any two sections with table_id = 0x42 (SDT_actual) occur on PID 0x0011 within a specified value (25 ms or lower)
SDT other error	Interval between sections with the same section_number and table_id = 0x46 (SDT, other TS) on PID 0x0011 longer than a specified value (10s or higher)
EIT actual error	Section '0' with table_id = 0x4E (EIT-P, actual TS) is not present on PID 0x0012 for more than 2 s Section '1' with table_id = 0x4E (EIT-F, actual TS) is not present on PID 0x0012 for more than 2 s Sections with table_ids other than in the range 0x4E - 0x6F or 0x72 found on PID 0x0012 Any two sections with table_id = 0x4E (EIT-P/F, actual TS) occur on PID 0x0012 within a specified value (25ms or lower)
EIT other error	Interval between sections '0' with table_id = 0x4F (EIT-P, other TS) on PID 0x0012 longer than a specified value (10s or higher); Interval between sections '1' with table_id = 0x4F (EIT-F, other TS) on PID 0x0012 longer than a specified value (10s or higher).
EIT PF error	If either section ('0' or '1') of each EIT P/F subtable is present both must exist. Otherwise EIT_PF_error should be indicated
RST error	Sections with table_id other than 0x71 or 0x72 found on PID 0x0013. Any two sections with table_id = 0x71 (RST) occur on PID 0x0013 within a specified value (25 ms or lower)

3.2.8 Time Dynamics Panel

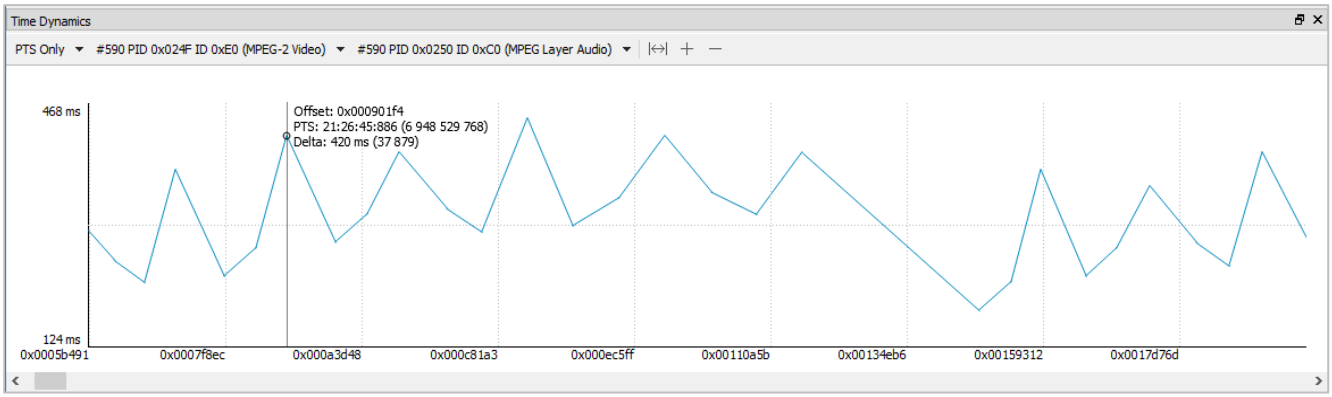

Figure 17. Time Dynamics Panel

The **Time Dynamics** panel represents the interleaving between two streams as a diagram. To specify the streams, use the drop-down lists in the panel.

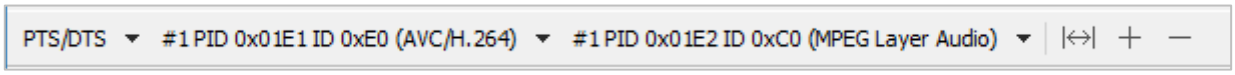

Figure 18. Time Dynamics Panel - Panel

The chart can be built using DTSs or PTSs. If DTSs and PTSs are used together, the DTS values are used as primary ones. If DTS is absent, the PTS values are used.

These visualization options allow selecting the following Base stream characteristics for analysis (if data exists in the stream):

- **PTS/DTS Dynamics** – indicates variation of PTS/DTS with the Offset changing for the selected PID
- **PCR Dynamics** – indicates variation of PCR with the Offset changing for the selected PID
- **PCR/PTS Dynamics** – indicates variation of PTS/DTS in relation to the PCR values with the Offset changing for the selected PID
- **Offset/PCR Dynamics** – indicates variation of Offset between the PCR values for the selected PID

Moving the cursor over the window, you can see the values corresponding to the given points of the graph. Left click pins the cursor on the graph. Double-click displays the given packet in **Main Window**.

Clicking the **Fit** button |↔| you can resize the graphic, fitting it to your screen.

Buttons + and − zoom the graphic in and out, respectively.

3.2.9 Graphics Panel

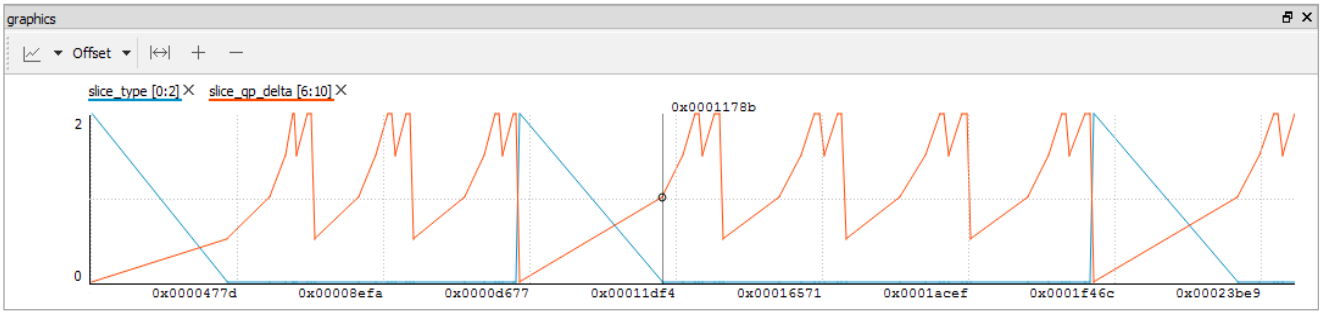

Figure 19. Graphics Panel

The **Graphics** panel serves to compare parameters of the streams.

You can add several parameters to compare. Go to the **Property** panel, right-click on the necessary parameter, choose ***Add to Graphic Control***. The parameter will be added to the **Graphics** panel.

The panel allows setting up visual representation of data. The graphic can be viewed in **Line**, **Bar** and **Transition** modes. Also, you can choose ranging by **Offset** or by **Count** in the drop-down menu.

Clicking the **Fit** button |↔| you can resize the graphic, fitting it to your screen.

Buttons + and − zoom the graphic in and out, respectively.

Stream structure – saves stream structure in the **Explorer** panel.

Full stream structure – saves only checked elements in the **Explorer** panel.

Messages – saves general info about errors.

Message details – saves all errors with their descriptions.

Visible elements – saves only opened elements in the **Main Window** panel.

Element data – saves all elements in the **Main Window** panel.

3.2.10 Comments Panel

The **Comments** panel is designed for team work: share comments on a specific frame or group of frames in the stream, navigation and switching between different instances of the same application or different applications contained in Elecard StreamEye Studio. Comments are created in the **Main Window** panel of the application by left-clicking (or right-clicking and pressing the shift button) and selecting the required field.

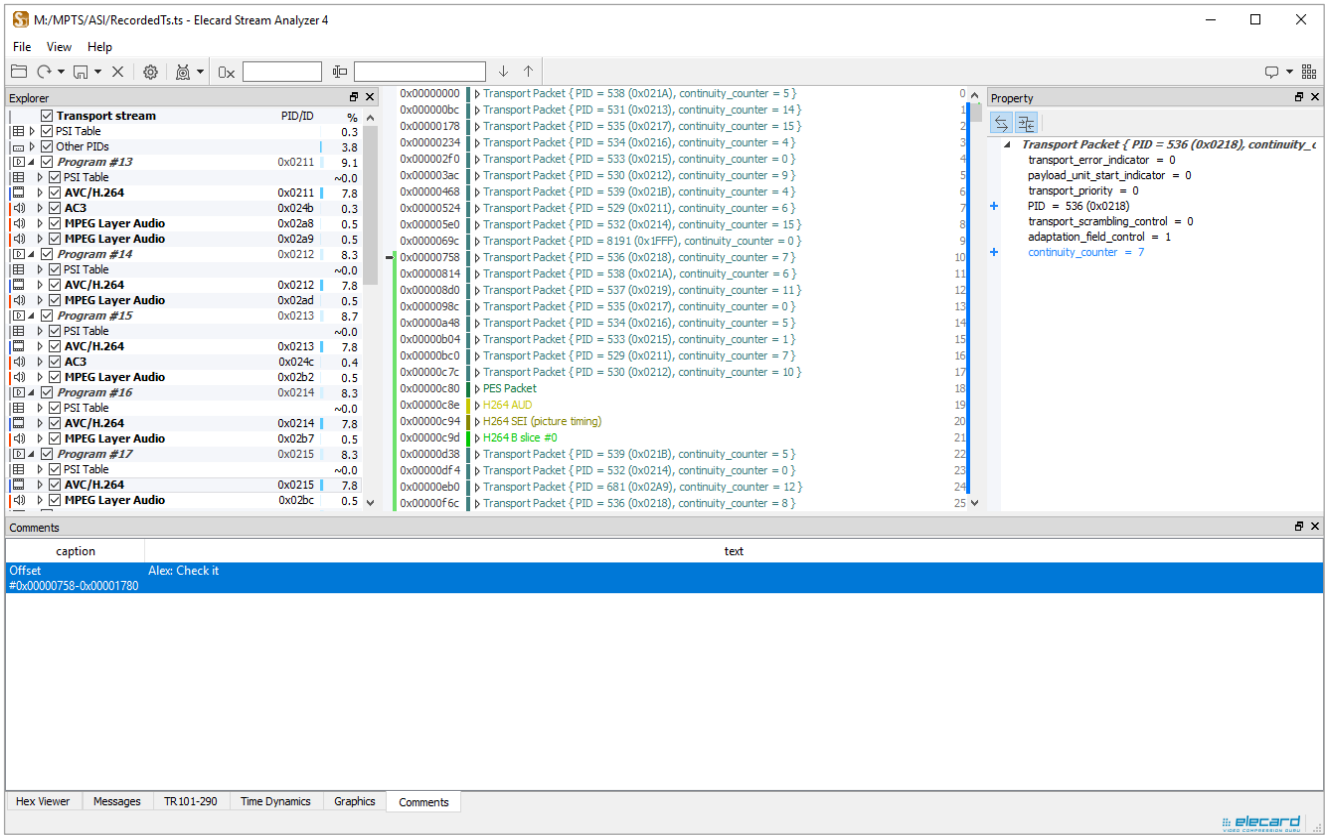

Figure 20. Commnets Panel

The **Comment** dialog should open. Enter comments in the corresponding field.

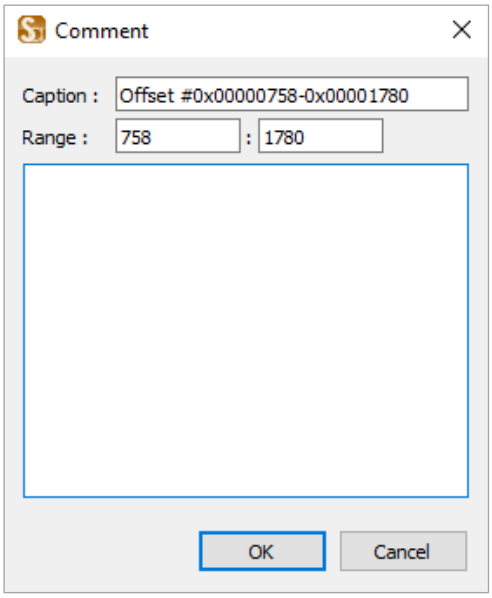

Figure 21. Comment Dialog

The comment parameters can be edited or changed before or after they are saved. To save the comment click **File ->Save Comments** and select the folder. When the comment is chosen, its position is displayed in **Main window** and highlighted green.

To edit, remove or send comments using the **Binding** mode, open the context menu by right-clicking. The **Send** option enables you to pass the selected comment to the other application of StreamEye Studio set or the other instance of Stream Analyzer. To select an application from which messages

should be received or to select a type of messages to be received, go to the **Options tab – Binding** or see more details in the Options Window section.

3.2.11 Saving Stream Information

The **Save** option allows saving different types of data: the stream itself, stream structure and information, headers, messages, errors, elements, comments and etc. To select and configure the data to be saved, open the **Save** tab from the File drop-down menu or click the button.

To save only information about the stream (without saving the stream as it is), select the **Stream Info** tab. A dialog window should open.

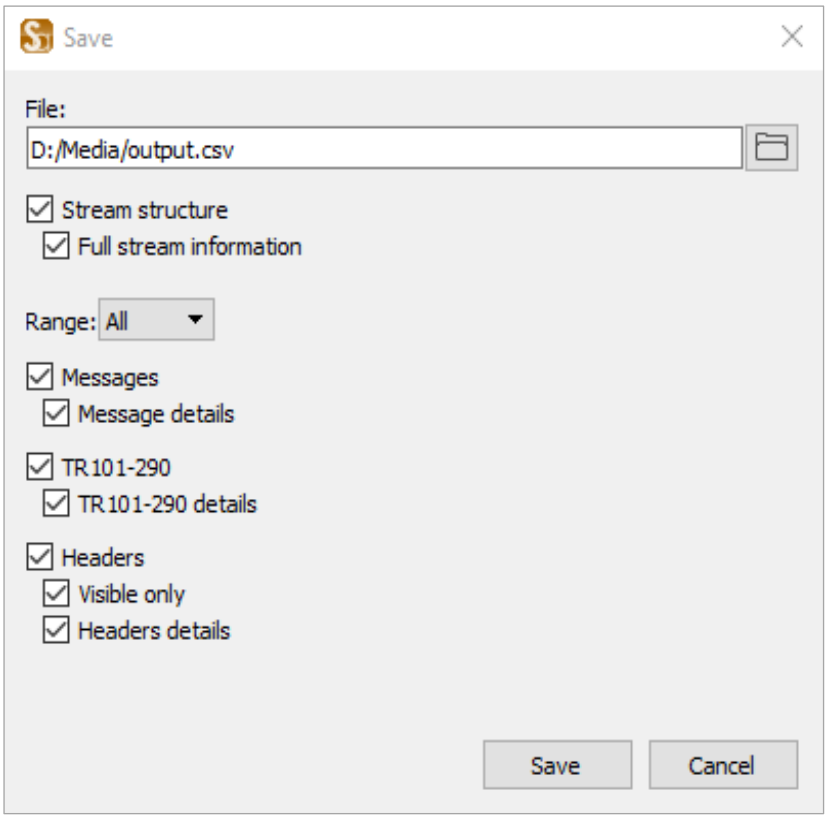

Figure 22. Save Window – Stream Info

Stream structure – saves stream structure in the **Explorer** panel.

Full stream information – saves only checked elements in the **Explorer** panel.

Range – allows selecting a range to save data contained there:

- All – saves information on the whole stream;
- Offset – saves information on a stream portion limited by the specified offsets.

Messages – saves general information about errors.

Message details – saves errors with all details.

TR101-290 – saves general information about types of errors and their number.

TR101-290 details – saves detailed information about errors.

Headers – saves all headers without their structure.

Visible only – saves only headers selected in the **Explorer** panel and displayed in the **Main Window** panel.

Headers details – saves all headers with their structures selected in the **Explorer** panel and displayed in the **Main Window** panel.

To save a stream or its portion, select the **Dump** tab. A dialog window should open.

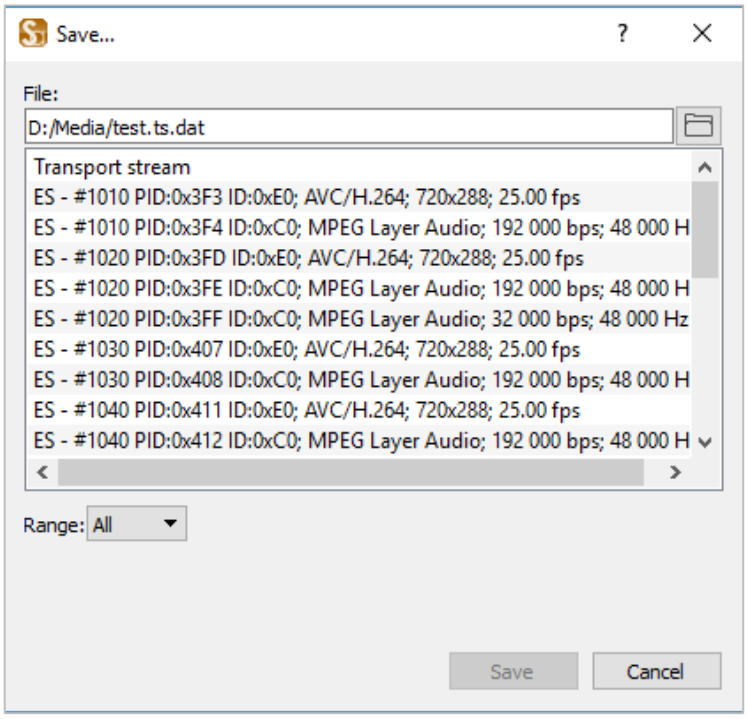

Figure 23. Save Window – Dump

Select an Elementary stream to be dumped as a whole or within a specified range.

Range – allows selecting a range to save data contained there:

- All – saves information on the whole stream;
- Offset – saves information on a stream portion limited by the specified offsets.

3.2.12 Options Window

To open the Options window, select the **Options** tab from the File drop-down menu or click the ⚙ button. The Options window allows opening a file with an external application, specifying the application name and path, specifying the number of files in a list, saving data, configuring **Binding mode** settings.

Specify the number of recent files to be displayed in a list. The default value is 10 files.

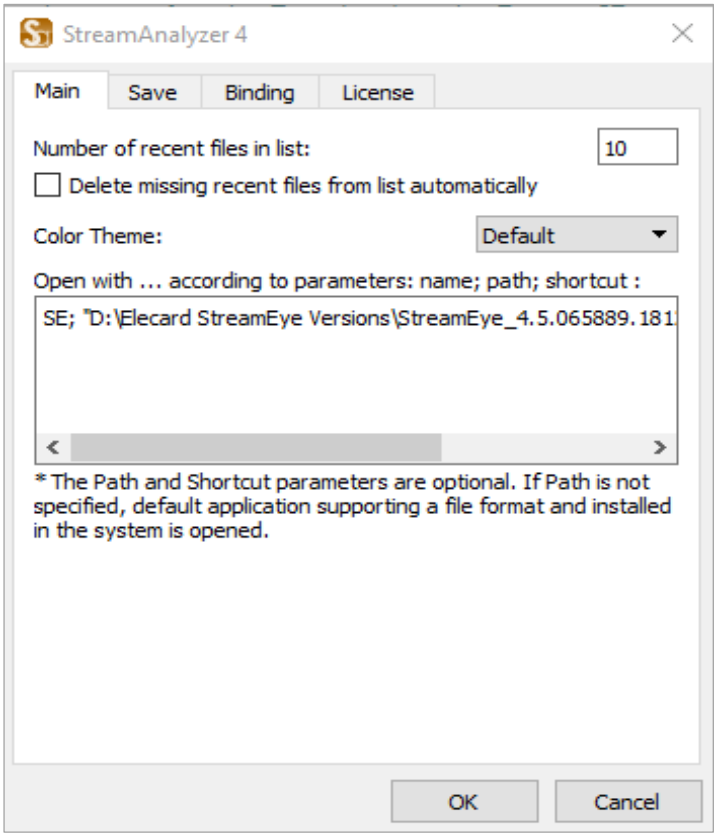

Figure 24. Options – Main Tab

On attempt to open a file from a list that does not exist any longer, a message notifying that the file is missing occurs. It is recommended to delete missing files from the list. To enable automatic deletion of missing files, set the checkbox for **Delete missing recent files from list automatically**.

Color theme allows selecting light (default) or dark colors of the GUI background.

To open the file currently opened in Stream Analyzer with another application, specify its name and path in the **Open with** field according to parameters specified there. The parameters path and shortcut are optional. If the path parameter is not specified, default application or player supporting a file format and installed in the system is opened. Each string specified in the **Open with** field corresponds to an individual item in the menu **File – Open with**, that allows easy switching between applications or players after configuring the field.

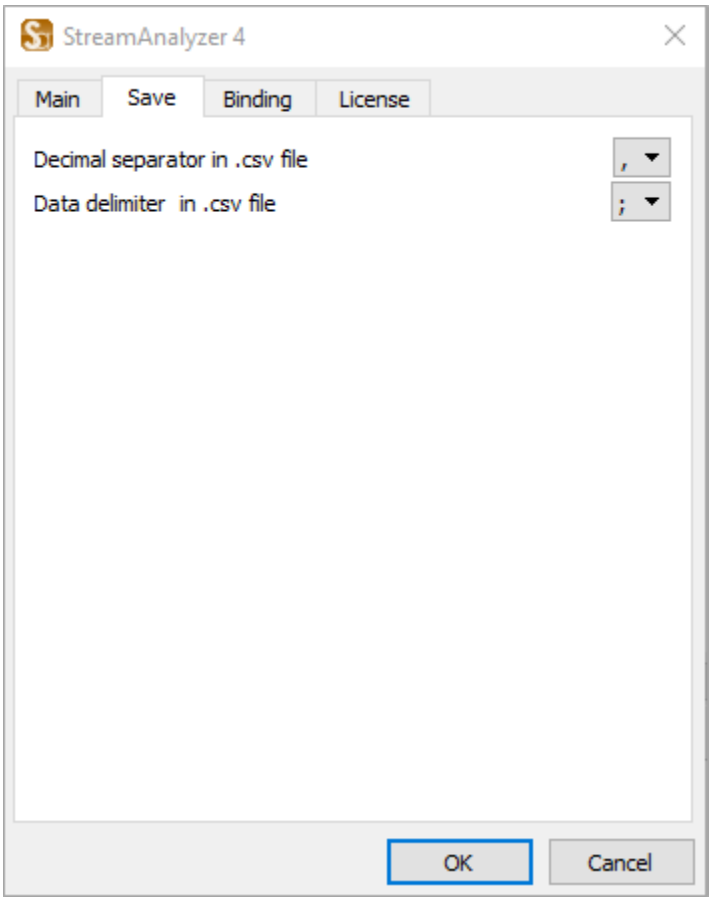

Figure 25. Options – Save Tab

The Save tab in the Options dialog allows saving data using the following options:

- **Decimal separator in .csv file** - allows selecting decimal comma or decimal dot to separate an integer part from a fractional one of a real number.
- **Data delimiter in .csv file -** allows selecting comma or semicolon to specify boundaries in data stream.

To configure the **Biding mode** settings, open the corresponding tab. The **Binding mode** allows exchanging information between applications contained in Elecard StreamEye Studio, selecting applications from which messages should be received, type of the messages to be received, synchronizing application window size and switching between controls.

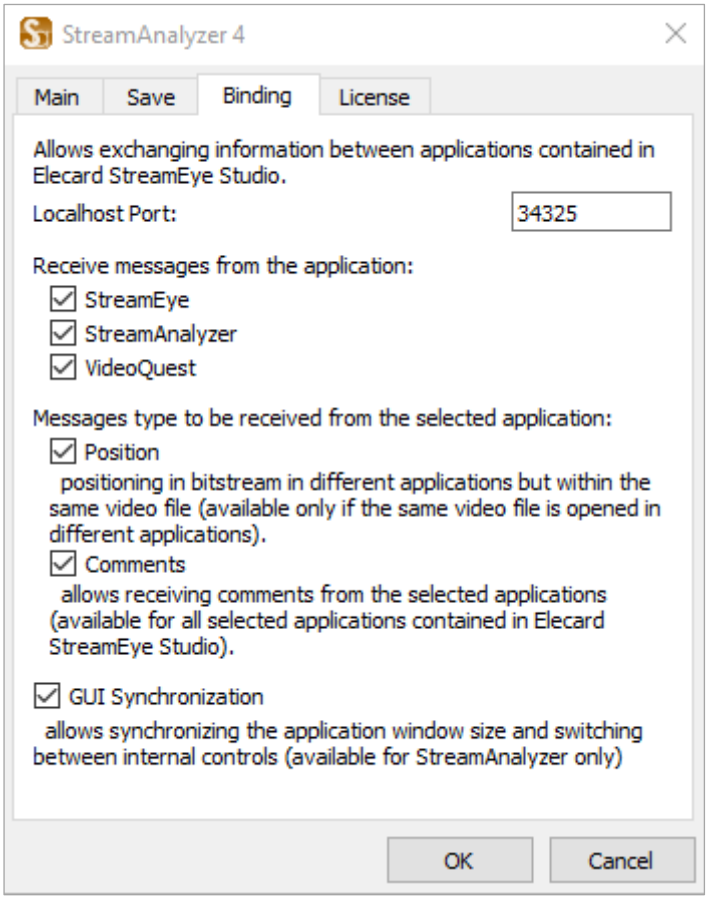

Figure 26. Options – Binding Tab

Receive messages from the application – allows selecting the applications contained in Elecard StreamEye Studio from which messages are received: StreamEye, StreamAnalyzer, VideoQuest.

Messages type to be received from the selected application – allows selecting a type of messages to be received from the selected applications:

- **Position** – positioning in bitstream in different applications but within the same video file (available only if the same video file is opened in different applications).
- **Comments** – allows receiving comments from the selected applications (available for all selected applications contained in Elecard StreamEye Studio)

GUI Synchronization – allows synchronizing the application window size and switching between internal controls (available for StreamAnalyzer only).

3.2.13 Command Line Tool

Elecard Stream Analyzer functionality is available in console version now, so you can run the tool from the command line.

Stream Analyzer Command Line tool is designed for insight into MPEG-1 Video/Audio, MPEG-2 Video/Audio, AAC, Dolby Digital Audio, AVC/H.264, VC1, HEVC/H.265, AV1 and VP9 contained in TS, PS, MP4, AVI, FLV, IVF and MKV (Matroska) file formats.

Stream Analyzer Command Line tool allows automatic analysis of video arrays. You can customize a sequence of commands to perform your specific tasks and automate your routine tasks.

3.2.13.1 Features of Stream Analyzer Command Line Tool

- Analysis the whole array of video files automatically;
- Addressing specific and complex challenges with a few lines of commands;
- Retrieving submitted results as a text file in CSV format for easy viewing in Excel;
- Customizing a sequence of commands to perform your specific tasks;
- Accelerating and automating your regular tasks;
- Getting access to most of Stream Analyzer functionality and resources through Stream Analyzer Console.

3.2.13.2 Launch of Stream Analyzer Command Line Tool

To streamline automatic analysis of several files the following rules are introduced. They reassign input and output parameters for configuration files.

Get to the command prompt by clicking Start->Run and type 'cmd'. Then enter the command to start the application first and proceed with the command line options. In general, the syntax is as follows:

```
SAConsole config.xml /in:input.ts /out:output
```

Note: *You should not relocate the <product> console without all the other applications of the product contained in the installation pack, otherwise the console application will not start.*

Notes on the command line rules:

1. Parameters with default value are not required and can be omitted;
2. Rules for input and output file names:
   - parameter /in:<file path> in the command line overwrites the value of the tag <input/> in the configuration file;
   - parameter /out:<file prefix> in the command line overwrites the value of the tag <output/> in the configuration file;
   - if <output/> tag is missing (or not specified), output file names are formed from input file name plus suffix (if the latter is specified);
   - if output file for a tag/section is not specified, the output file name for the tag/section is formed from the name specified in the <output/> tag plus suffix depending on the name of the tag/section, e.g. ".message.csv", ".header.csv", etc.

in	input file path
out	output files prefix
file path	path to the file
config path	path to the config file
sfx	suffix of all output files in config
dc	use current run directory as default path for files

Sample Config.xml file – contains all the commands performed by the application and reflects overall operation results:

```
<SA version="1">
<input file="..."/>
<output storage="union(default)/split" separator=";(default)/,"
delimiter=".(default)/," file="..."/>
```

```
<range start="(default: from file begin)" stop="(default: to file end)"
mode="hex(default)/dec"/>
<info>
      <stream full="on(default)/off" file="..."/>
      <message details="on(default)/off" file="..."/>
      <tr101290 details="on(default)/off" file="..."/>
      <headers details="on(default)/off" file="..."/>
            <condition parameter="name" comparison="full/substring(default)">
                  <range value="min-max"/>
                  <equal value="value"/>
                  <less value="min"/>
                  <more value="max"/>
                  <not value="value"/>
            </condition>
      </headers>
</info>
</SA>
```

3.2.13.3 List of Commands

List of commands contains information on the command and all parameters which may be used within a command, and their description.

Command	Description
<input/> file	The tag is used to configure the input file; Sets the input file path.
<output/> storage separator delimiter file	The tag is used to configure the input file; Save output information into split or union storage (union (by default) / split); Defines the symbol/string to separate the output data (; (by default) / ,)); Delimits the fractional part with floating point (. (by default) / ,)); Sets the output file path.
<info/>	The tag is used to define the type/-s of information for output.
<stream/> full file	The tag is used to output general information about the analyzed stream; Contains information on data (on (by default) / off); Sets the path for the output stream information.
<message/> details file	The tag is used to output messages that appear during analysis; Contains information on message tree data (on (by default) / off); Sets the output file path where the messages will be saved.
<tr101290/> details file	The tag is used to output TR101290 error that appear during analysis; Contains information on message TR101290 error (on (by default) / off); Sets the output file path where the messages will be saved.
<headers> details file	The tag is used to define the output headers information; Contains full information on header data (on (by default) / off); Sets the path to the output file with the headers information.