



Elecard XMuxer Pro

User Guide

Version 2.6

Notices

Elecard XMuxer Pro User Guide

First edition: May 2005

Date modified: July 15, 2009.

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1. Introduction

1.1 Preface

Elecard XMuxer Pro is an audio/video editing program designed for prosumers. It supports all popular formats like MPEG-1 System Stream, MPEG-2 Program Stream (including SVCD and DVD), MPEG-2 Transport Stream, Sony AVCHD Stream, MP4 (Sony PSP, ISMA, iPod), AVI (DV, XviD, DivX, 3ivX).

Elecard XMuxer Pro allows the user to preview video and audio content with the indexing possibility for accurate stream positioning, to multiplex video and audio elementary streams, to merge similar files, and provides multipart GOP-accurate trimming without re-encoding and quality loss, multipart frame-accurate MPEG-2 trimming and many other functions.

Elecard XMuxer Pro includes the following components:

Table 1. Elecard XMuxer Pro Components

| Component | File Name | Description |
|-------------------------------------|-------------|---|
| Elecard File List Source | eflsu.ax | DirectShow filter providing operations with a list of source files as with a single file. |
| Elecard MPEG-2 Video Decoder | em2vd.ax | DirectShow filter for software-only real-time decoding of MPEG-2 (ISO/IEC 13818-2) and MPEG-1 (ISO/IEC 11172-2) video streams. Provides high resolution, full quality decoding, optimized for the most efficient CPU usage. |
| Elecard MPEG-4 Video Decoder | em4vdec.ax | DirectShow filter for software-only real-time decoding of MPEG-4 SP-ASP (ISO/IEC 14496-2) video streams. |
| Elecard AVC Video Decoder | eavcdex.ax | DirectShow filter for software-only real-time decoding of AVC/H.264 video (MPEG-4 P.10 ISO/IEC 14496-10) video streams. |
| Elecard AAC Decoder | eaacd.ax | DirectShow filter for software-only real-time audio decoding of AAC streams. |
| Elecard Audio Decoder | elaudec.ax | The Elecard Audio Decoder filter enables the software-only decoding of MPEG-1, MPEG-2, MPEG-2.5, LPCM audio streams. |
| Elecard MPEG Demultiplexer | empgdmx.ax | DirectShow filter for software-only splitting of MPEG-1 System Streams (ISO/IEC 11172-1), MPEG-2 Program Streams (ISO/IEC 13818-1) or MPEG-2 Transport Streams (ISO/IEC 13818-1), PVA streams into video and audio streams. |
| Elecard Stream Parser | empgdmx.ax | DirectShow filter for software-only splitting of audio streams (AC-3, AAC etc.). |
| Elecard MPEG Multiplexer | empegmux.ax | DirectShow filter that provides the MPEG- |

| Component | File Name | Description |
|---|--------------------|---|
| | | 2 Transport Stream (TS) or MPEG-2 Program Stream (PS) generation. |
| Elecard MP4 Demultiplexer | emp4demux.ax | DirectShow filter that provides demultiplexing of ISO/IEC 14496-14 file format (MP4) and 3GPP2 System streams into a MPEG-4, H.263, AVC/H.264 video streams and AAC, AMR, MPEG-1/2 Audio Layer 3 audio streams. |
| Elecard MP4 Multiplexer | emp4mux.ax | DirectShow filter intended for generation of MPEG-4 (Intermedia Format (MP4)) System Streams. |
| Elecard Indexator | elmpgindexator.dll | MPEG Indexator is a COM object that allows an application to create an index file for MPEG audio/video files. |
| Elecard IndexReader | Elmixreader.dll | MPEG Indexreader is a COM object that allows an application to read indexed files. |
| Elecard Sink Filter | esf.ax | DirectShow filter that dumps a stream to a file. |
| Elecard XMuxer Engine | exmuxengine.dll | XMuxer Engine is a COM object that allows an application to multiplex and demultiplex streams according to the user interface prepared script. |
| Elecard MPEG-2 Video Encoder | em2venc.ax | DirectShow filter for real-time video encoding into MPEG-2 (ISO/IEC 13818-2) and MPEG-1 (ISO/IEC 11172-2) formats. |
| Elecard-SolveigMM MPEG2 Trimmer FA | mp2trimmerfa.ax | DirectShow filter providing frame accurate trimming operations. |
| Elecard GOP Accuracy Trimmer | egatrimmer.ax | DirectShow filter providing GOP accurate trimming operations. |

Note: Elecard AVC Video Decoder and Elecard AAC Decoder are included into the additional package (Elecard AVC PlugIn).

1.2 Describing Elecard XMuxer Pro

The following section defines specifications and features of Elecard XMuxer Pro. It includes definitions and descriptions of the supported stream formats.

1.2.1 Specifications

Remultiplexing mode:

Supported Input formats:

- MPEG-1 video stream
- MPEG-2 video stream
- MPEG-1 audio stream
- MPEG-2 audio stream
- AC-3 audio stream

- AAC audio stream (with ADTS headers)
- MPEG-1 System Stream
- MPEG-2 Program Stream
- MPEG-2 Transport Stream
- Sony AVCHD Stream
- AVC/H.264 video stream
- MPEG-4 (Part 2) video stream
- MP4 file
- AVI file

Output formats:

- MPEG-2 Program Stream
- MPEG-2 Transport Stream
- MP4 file (including Sony PSP and iPod compatible files)
- AVI file

Demultiplexing mode:

Supported Input formats:

- MPEG-1 System Stream
- MPEG-2 Program Stream
- MPEG-2 Transport Stream
- Sony AVCHD Stream
- MP4 file
- AVI file

Output formats:

- MPEG-1 video stream
- MPEG-2 video stream
- AVC/H.264 video stream

- MPEG-4 video stream
- MPEG-1 Audio Layer (I, II, III) (ISO/IEC 11172-3)
- MPEG-2.5 audio stream
- MPEG-2 audio stream
- LPCM Linear PCM (an audio standard for DVD)
- AC-3 audio stream
- AAC audio stream (with ADTS headers)

Multiplexing mode:

Supported Input formats:

- MPEG-1 video stream
- MPEG-2 video stream
- AVC/H.264 video stream
- MPEG-4 video stream
- MPEG-1 Audio Layer (I, II, III) (ISO/IEC 11172-3)
- MPEG-2.5 audio stream
- MPEG-2 audio stream
- LPCM Linear PCM (an audio standard for DVD)
- AC-3 audio stream
- AAC audio stream (with ADTS headers)

Output formats:

- MPEG-2 Program Stream
- MPEG-2 Transport Stream
- MP4 file

A Transport Stream can consist of the following streams:

- ✓ MPEG-1 video stream
- ✓ MPEG-2 video stream

- ✓ AVC/H.264 video stream
- ✓ MPEG-4 (Part 2) video stream
- ✓ MPEG-1 audio stream
- ✓ MPEG-2.5 audio stream
- ✓ MPEG-2 audio stream
- ✓ MPEG-2 program stream
- ✓ AC-3 audio stream
- ✓ AAC audio stream (with ADTS headers)

A Program Stream can consist of the following streams:

- ✓ MPEG-1 video stream
- ✓ MPEG-2 video stream
- ✓ AVC/H.264 video stream
- ✓ MPEG-4 (Part 2) video stream
- ✓ MPEG-1 audio stream
- ✓ MPEG-2.5 audio stream
- ✓ MPEG-2 audio stream
- ✓ LPCM Linear PCM (an audio standard for DVD)
- ✓ AC-3 audio stream
- ✓ AAC audio stream (with ADTS headers)

A Sony AVCHD file can consist of the following streams:

- ✓ AVC/H.264 video stream
- ✓ AC-3 audio stream
- ✓ Linear PCM

A MP4 file can consist of the following streams:

- ✓ AAC audio stream (with ADTS headers)
- ✓ MPEG-4 (Part-2) video stream

- ✓ AVC/H.264 video stream

Note: Previewing AC-3, MPEG-1 L3, MPEG-2, MPEG-2.5 and LPCM audio streams is available only if corresponding decoder is installed in the system.

1.2.2 Features

Elecard XMuxer Pro has the following features:

- Previewing the selected streams
- Remultiplexing only the selected (marked) streams
- High definition video multiplexing/demultiplexing
- Seek forward and Seek backward options
- Multipart GOP-accurate MPEG-2, MPEG-4, AVC/H.264 trimming
- Multipart frame-accurate MPEG-2 trimming
- Multipart GOP-accurate AVI (DV, XviD, DivX, 3ivX, etc) trimming
- Stream indexing
- Sony AVCHD files support
- MP4 files support
- Editing of Sony PSP and Apple iPod compatible streams
- T-STD compatible streams output support
- Program Specific Information (PSI) editing
- Ability to adjust the audio-video synchronization in the **Remux** and **Mux** modes (**Initial Time Shift** option)
- File list (.XPL files) support with ability to merge similar files
- Ability to open the index files created previously
- Auto rewind after the playback stop
- Ability to edit the hot keys

Note: The GOP-accurate AVI trimming function is available if the AVI Trimmer PlugIn from Solveig Multimedia is installed (see <http://www.solveigmm.com/?Products&id=AVITrimmerCOM>).

1.3 Using this Guide

1.3.1 Purpose

This guide is intended to help you view and edit video files using Elecard XMuxer Pro. It describes XMuxer Pro GUI, settings and functions and provides instructions for using the application.

1.3.2 Topics Covered

- **Section 1: Introduction** – provides a general overview of Elecard XMuxer Pro and describes the purpose of the document and its contents.
- **Section 2: Getting Started** – describes how to install, uninstall and run Elecard XMuxer Pro.
- **Section 3: Using Elecard XMuxer Pro** – describes XMuxer Pro GUI and provides instructions for XMuxer Pro basic operations such as remultiplexing, demultiplexing and multiplexing files.
- **Section 4: How to...** – describes how to perform most common operations.

1.4 System Requirements

Software Requirements

- Windows® 2000/XP/2003 Server/Vista

Hardware Requirements

- SSE-enhanced CPU (Intel® Pentium III, Celeron, AMD® Athlon, Opteron etc.)
- 128 MB RAM
- Any VGA card
- About 10 MB of free disk space

1.5 Licensing and Technical Support

Elecard XMuxer Pro is available as shareware or as a registered product. The shareware version has a time limit of 10 minutes for the duration of output streams. The registered version includes a registered Elecard MPEG2 Video Decoder.

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 sales and licensing information contact the Elecard sales department:
sales@elecard.net.ru

For technical support, please contact the Elecard Technical Support Team:
tsup@elecard.net.ru

2. Getting Started

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

2.1 Installing Elecard XMuxer Pro

1. Download the evaluation version or the registered version.
2. Run *Elecard XMuxer Pro Setup*.
To run, unzip and run the application *Elecard XMuxer Pro.exe*.
3. The **Elecard XMuxer Pro setup** window will appear. Read the recommendations and warnings. Click **Next**.
4. The **Release Notes** will appear with information about the current version of the program. Click **Next**.
5. 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**.
6. Activate Elecard XMuxer Pro (follow the onscreen instructions).
7. Select the installation folder in which you want to install Elecard XMuxer Pro. To select an installation folder, click **Browse** and find the folder in which you would like to install Elecard XMuxer Pro. Click **Next**.
8. Select program group. Click **Next** twice.
9. To complete installation, follow the onscreen instructions.
When setup has finished installing all of the necessary files on your computer, the '*Elecard XMuxer Pro has been successfully installed*' message appears, and the program is ready to run. You do not need to reboot your computer. Select **Run Registrator** check box. Click **Finish**.
10. The *Registrator* program is started. Click **Activate** and type the serial number in the corresponding field. Click **OK**.

2.2 Uninstalling Elecard XMuxer Pro

To uninstall Elecard XMuxer Pro accomplish the following instructions:

1. Click *Start-->Programs--> Elecard --> Elecard XMuxer Pro-->Uninstall Elecard XMuxer Pro*.

2. To remove the application, select **Uninstall Elecard XMuxer Pro** option button.
3. Follow the onscreen instructions to complete the removal of Elecard XMuxer Pro.

2.3 Running Elecard XMuxer Pro

To run Elecard XMuxer Pro click *Start-->Programs--> Elecard--> Elecard XMuxer Pro--> Elecard XMuxer Pro*.

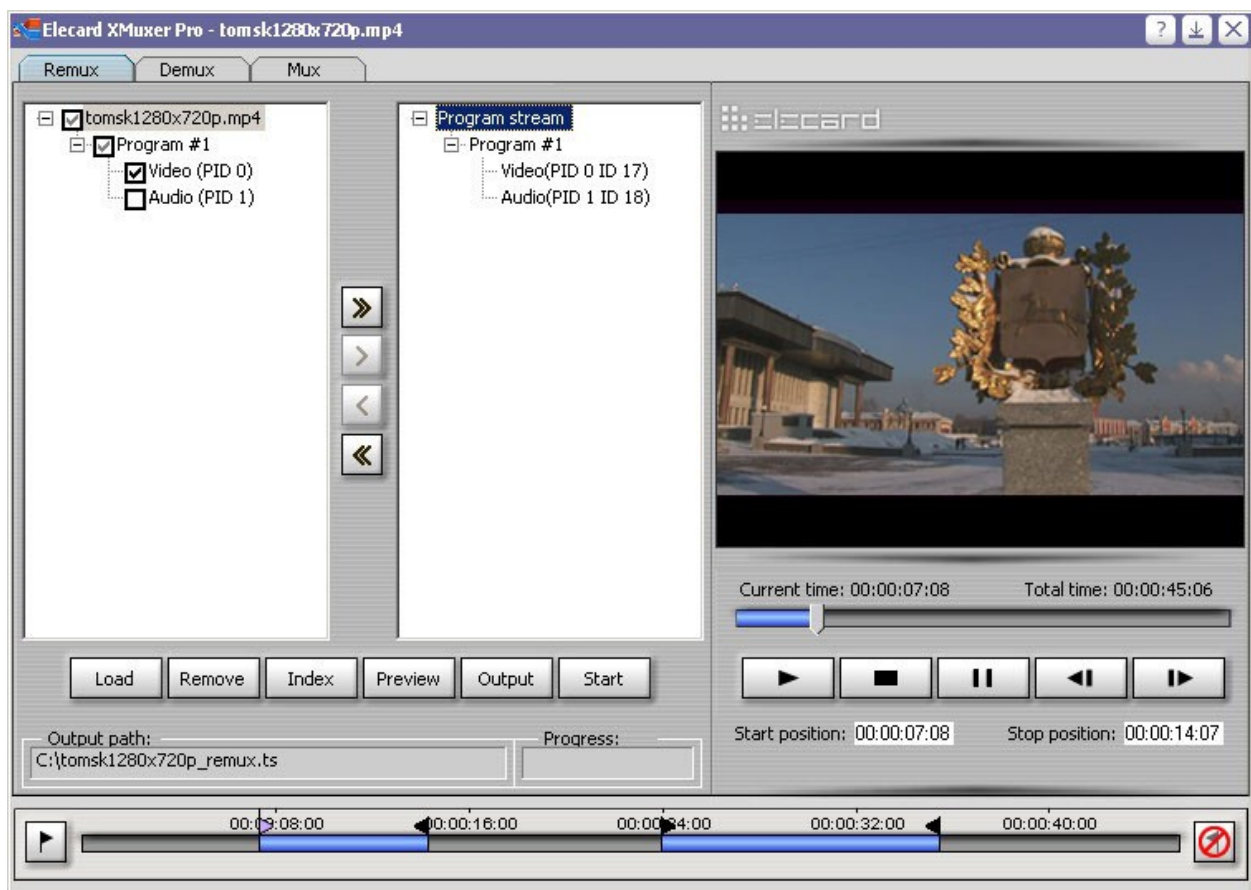
3. Using Elecard XMuxer Pro

The following section describes XMuxer Pro GUI (graphic user interface), its features, and gives instructions for XMuxer Pro basic operations.

3.1 Describing Elecard XMuxer Pro GUI

The following section describes, in detail, XMuxer Pro features and controls.

















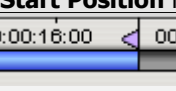

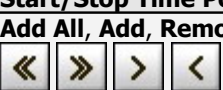


Figure 1. Elecard XMuxer Pro GUI



The following table describes each button and its function.

Table 2. Elecard XMuxer Pro GUI Description

| Button | Function |
|--------------------------|---|
| Input streams box | Allows the user to select streams from all available for preview. |


| Button | Function |
|--|--|
|  <input checked="" type="checkbox"/> Program# 1 <input checked="" type="checkbox"/> H264 Video (ID 224 @ Prog#1) | |
|  Load | Selects an input media file and loads it. |
|  Remove | Removes the loaded stream from the input list. |
|  Index | Creates the index file. |
|  Preview | Turns on the preview mode for selected streams. |
|  Output | Opens a folder where a resulting file will be saved. |
|  Start | Makes a resulting file. |
|  Play | Starts playback of a file from the current position. |
|  Stop | Stops playback of a file. |
|  Pause | Pauses playback of a file. |
|  Step Backward by Frame | Rewinds a movie backward by frame. |
|  Step Forward by Frame | Rewinds a movie forward by frame. |
|  Pointer | Marks the current playback position. |
|  Set Position flag | Sets the position flag for trimming. |
|  Delete Position flag | Removes the position flag for trimming. |
|  Start Position flag | Marks the start position for trimming. |
|  Stop Position Flag | Marks the end position for trimming. |
|  Start/Stop Time Position | Sets the time interval for trimming. |
| Add All, Add, Remove and Remove All buttons  | Adds/removes streams to/from the output stream. |
| Help  | Opens the Help file. |
|  | Closes the XMuxer Pro program and file. |

3.1.1 Hot Keys

The following table describes all the hot keys available for Elecard XMuxer Pro users.

Table 3. Elecard XMuxer Pro Hot Keys



| Default Hot Key | Description |
|-----------------|---|
| CTRL+O | Selects the input file. |
| CTRL+T | Selects the output file. |
| CTRL+I | Creates the index file. |
| CTRL+R | Removes the loaded stream from the input list and unloads it. |
| CTRL+P | Previews the selected streams. |

| Default Hot Key | Description |
|--|--|
| F5 | Starts/stops the work process. |
| ALT+P | Toggles between play/pause. |
| ALT+ RIGHT ARROW | Step Forward. |
| ALT + LEFT ARROW | Step Backward. |
| CTRL+ RIGHT ARROW | Adds the selected stream. |
| Delete | Removes the selected stream from the input list. |
| SPACEBAR | Selects/deselects input streams. |
| APPLICATION Key  | Displays the selected stream menu. |
| CTRL+F | Shows the current playback graph. |
| CTRL+S | Shows Settings dialog. |
| CTRL+~ | Toggles between modes. |
| CTRL+Q | Closes the program. |
| CTRL+M | Sets current position to the next marker on timeline and displays the marked frame in Preview window. |

3.2 XMuxer Pro Settings

The following section describes the **XMuxer Pro Settings** window.

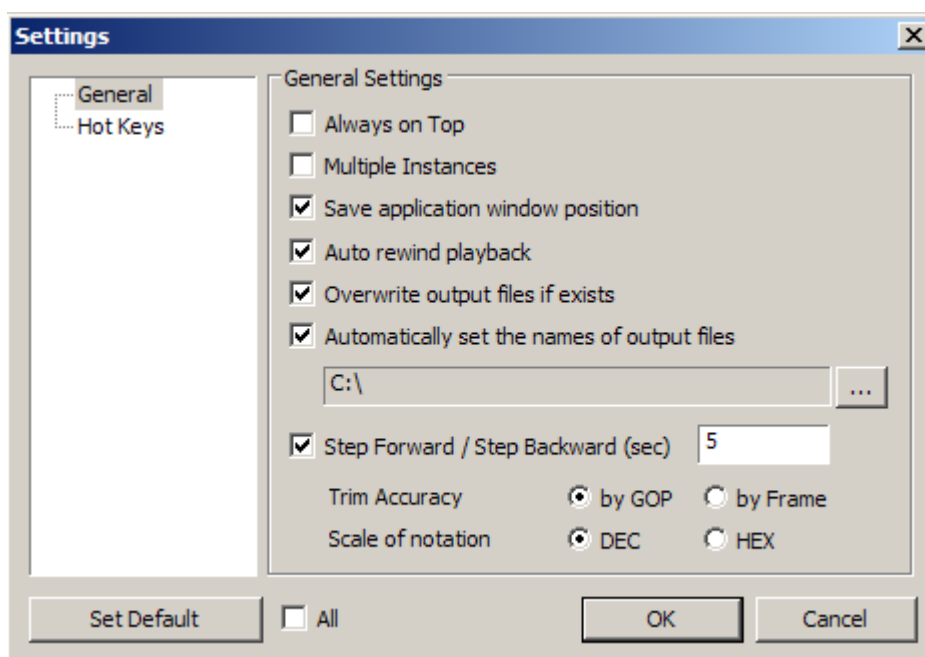
To open the **Settings** window, press **Ctrl+S** or select **Settings** in the system menu.

To set default settings for the selected page, click the **Set Default**  button. To restore all application settings to its default values, select the **All** **All** check box and click the **Set Default**  button.

3.2.1 General Settings

To adjust the basic settings, click **General** in the **Settings** window.

Figure 2. Elecard XMuxer Pro Settings Window - General Settings



The following table defines the **General Settings** options:

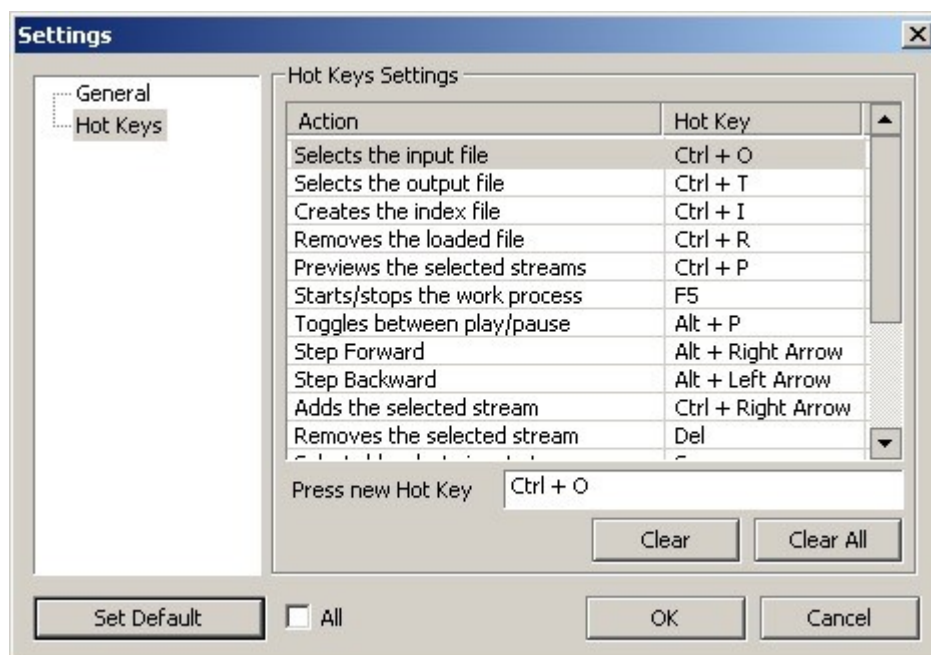
Table 4. General Settings Options

| Settings | Description |
|--|---|
| Always on Top | If the box is selected, the XMuxer Pro window is always displayed above all other windows. |
| Multiple Instances | If the box is selected, the multiple XMuxer Pro instances are allowed. |
| Save application window position | If the box is selected, the XMuxer Pro window position is saved automatically. |
| Auto rewind playback | In Stop mode, rewinds playing position to the beginning of the stream. |
| Overwrite output files if exists | If the box is selected, the output file will be overwritten. |
| Automatically set the names of output files | If the box is selected, names of output files will be set automatically in all modes. There is also an option to select the folder for saving the output files. |
| Trim Accuracy | <ul style="list-style-type: none"> • By Frame Ability to set the start and stop trimming positions with the frame accuracy. This feature is available for MPEG-2 streams only. • By GOP Ability to set the start and stop trimming positions with the I-frame accuracy. |
| Scale of notation | <ul style="list-style-type: none"> • DEC Parameter values (StreamID, ProgramID, etc.) are presented as decimal numbers. • HEX Parameter values (StreamID, ProgramID, etc.) are presented as hexadecimal numbers. |
| Step Forward / Step Backward (sec) | If the box is selected, stream positioning in the Preview window is performed by time steps (not by frames). The time step value is set in seconds. |

3.2.2 Hot Keys Settings

To open the **Hot Keys Settings** pane, click **Hot Keys** in the **Settings** window. The **Hot Keys Settings** pane allows viewing and setting Hot Keys to invoke XMuxer Pro functions.

Figure 3. Elecard XMuxer Pro Settings Window - Hot Keys Settings



- To change Hot Keys combination, select an action which should be performed by a Hot Key in the **Hot Keys Settings** pane. Then type a new key combination in the **Press new Hot Key** box. New Hot Key appears in the column **Hot Key** of the **Hot Keys Settings** pane.
- New Hot Keys can also be set using the **Press new Hot Key** box shortcut menu.
- To save new Hot Keys, click **OK** or **Apply**.
- To restore the default Hot Keys, click **Set Default**.
- To delete the applied Hot Key, select the corresponding Action and click **Clear**.
- To delete all the Hot Keys, click **Clear All**.

3.3 XMuxer Pro Basic Operations

3.3.1 Remultiplexing files

To remultiplex files follow the instructions below:


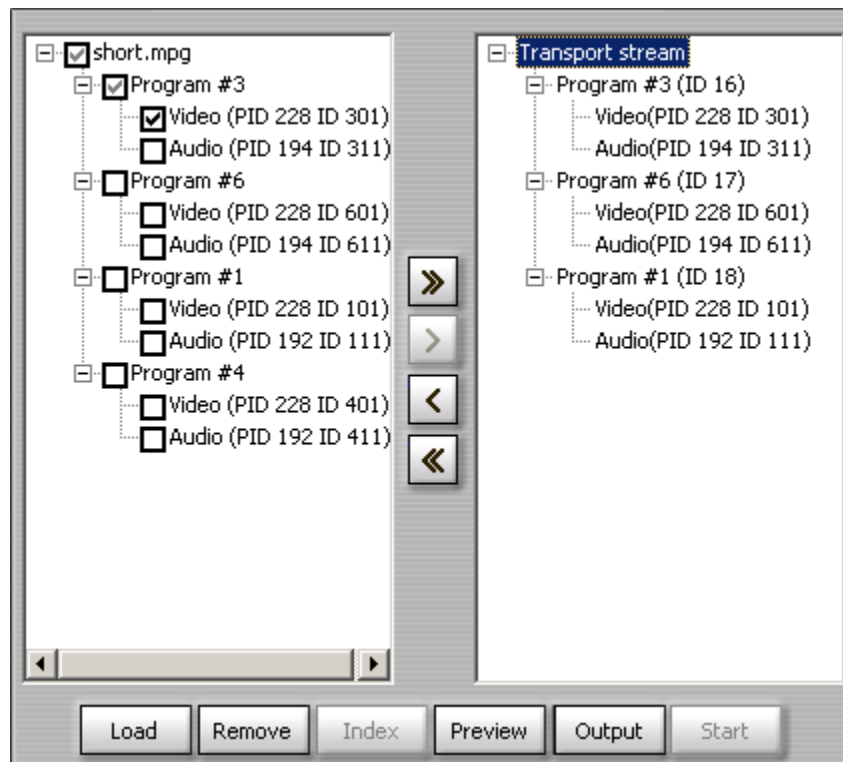






1. Start XMuxer Pro by clicking “*Elecard XMuxer Pro*” from the **Start** menu or double-clicking the *XMuxer Pro* icon.
2. Click **Load** .
3. Select the folder and then the file you want to remux. Open the file by clicking the **Open** button or double-clicking the file name. Select streams to remultiplex. You can preview only one video stream simultaneously.





Figure 4. Remux Mode Dialog Box

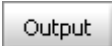


4. To preview the selected streams click the **Preview**  button.

The following lists different actions for previewing files:

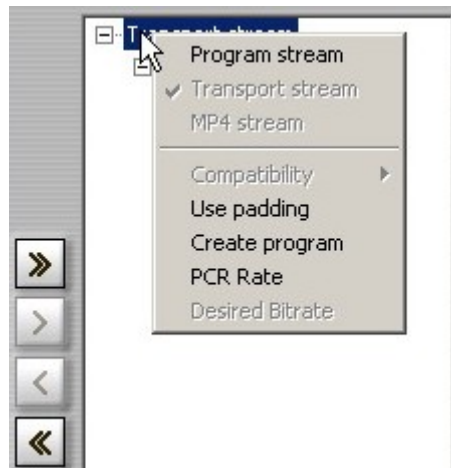
- To start previewing, click **Play** .
- To stop previewing, click **Stop** .
- To pause previewing, click **Pause** .
- To view a movie by frame or by Key frame when stream is indexed, click **Step backward by frame**  or **Step forward by frame** .

5. To form the output stream structure use the buttons   and  .

6. Click **Output**  to select an output path and output file name.

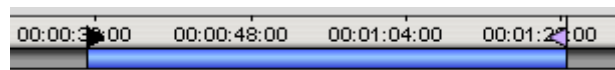
7. Right-click the upper line of the right (output) pane and select the output stream type.

Figure 5. Output Stream Shortcut Menu: Stream Type Selection



8. If you want to remultiplex only a part of the stream, you must set the limits of the output file on the **Trim** slider.

Figure 6. Trim Slider





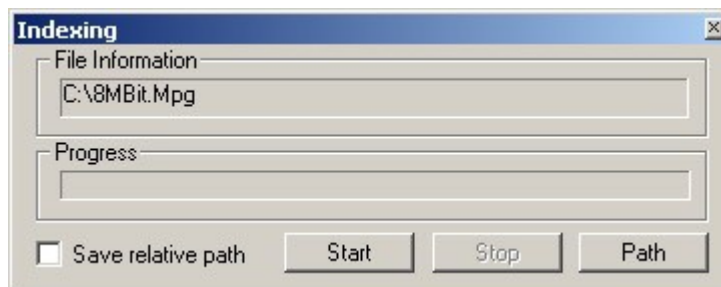

9. To make a file with the specified parameters click **Start** .
10. To make seeking and positioning in the file more precise and fast you can index an input file. Click **Index**  and the following dialog box will appear.

Figure 7. Indexing Dialog Box



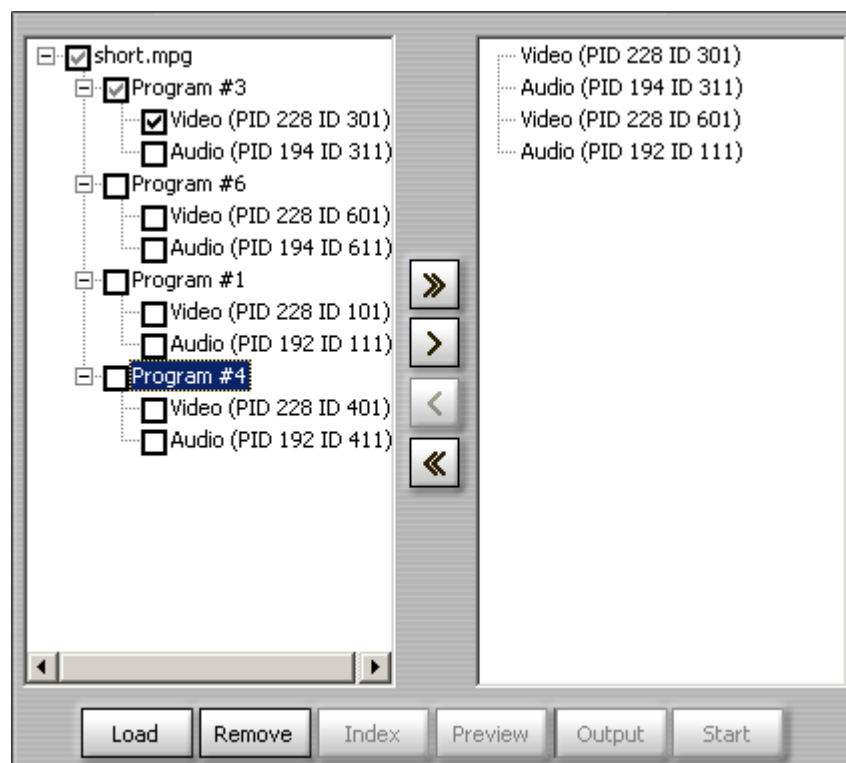
11. Click **Start** and an index file will be saved in the current folder. To save an index file in another folder clear the **Save relative path** check box.
12. To close XMuxer Pro and exit the program, click .







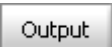

3.3.2 Demultiplexing files

To demultiplex files accomplish the following instructions:

1. To switch on the demultiplexing mode select the **Demux** tab.

Figure 8. Demux Mode Dialog Box



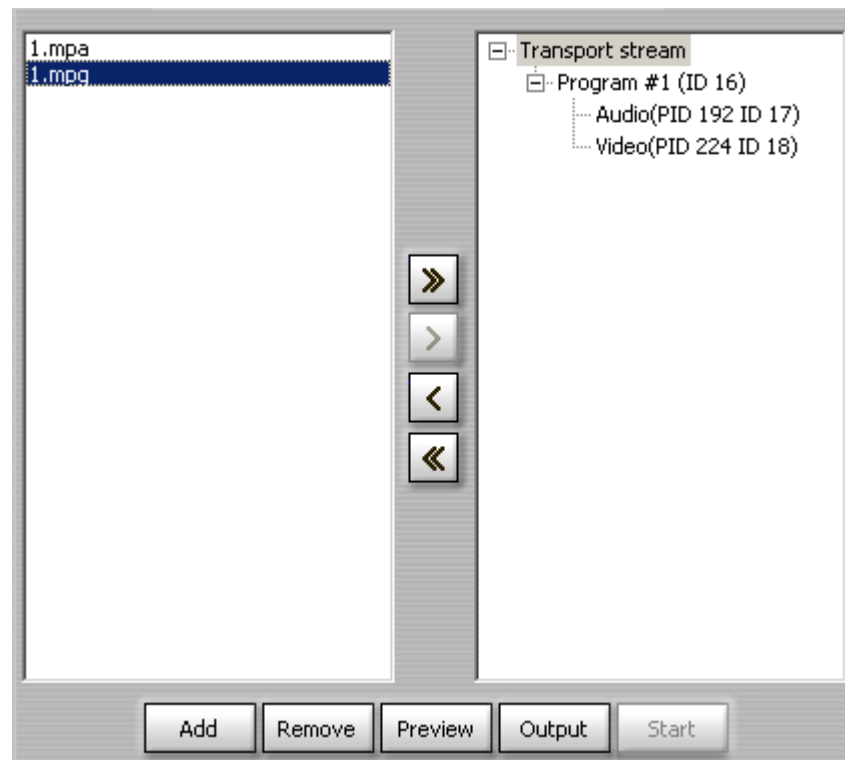
2. Click **Load** .
3. Select the folder and then the file you want to demux. To open the file click the **Output**  button or double-click the file name.
4. To select the streams for demultiplexing use the buttons   and  . Only single video stream is available for preview.
5. Select the stream you want to save and then click on **Output**  to select an output path and output file name.
6. If you want to demultiplex only a part of the stream, you must set the limits of the output file on the **Trim** slider (see the **Trim Slider** figure).
7. To make an output file with the specified parameters click **Start** .

3.3.3 Multiplexing files

To multiplex files accomplish the following:

1. To switch on the multiplexing mode select the **Mux** tab.

Figure 9. Mux Mode Dialog Box




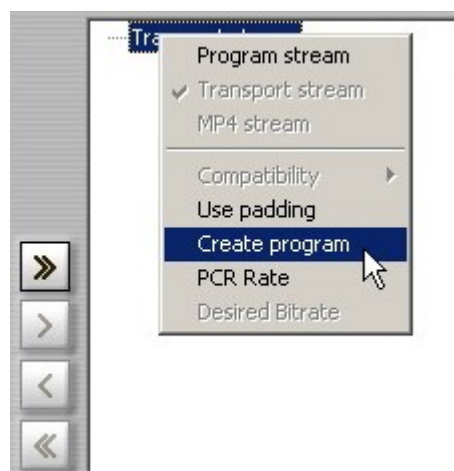





2. Click **Add** .
3. Select the folder and then the file you want to mux. Open the file by clicking the Open button or double-clicking the file name.
4. If it is necessary to multiplex several streams you should repeat items 2 и 3.
5. To create program in the output stream right-click the upper line of the right (output) pane and select the **Create program** command.

Figure 10. Output Stream Shortcut Menu: Program Creation



6. Select the created program and form the program structure using the  and .

buttons.

7. Click **Output**  to select an output path and output file name.
8. Right-click the upper line of the right (output) pane and select the output stream type.
9. To remove a stream from the project select the stream and click **Remove** .
10. To make an output file with the specified parameters click **Start** .

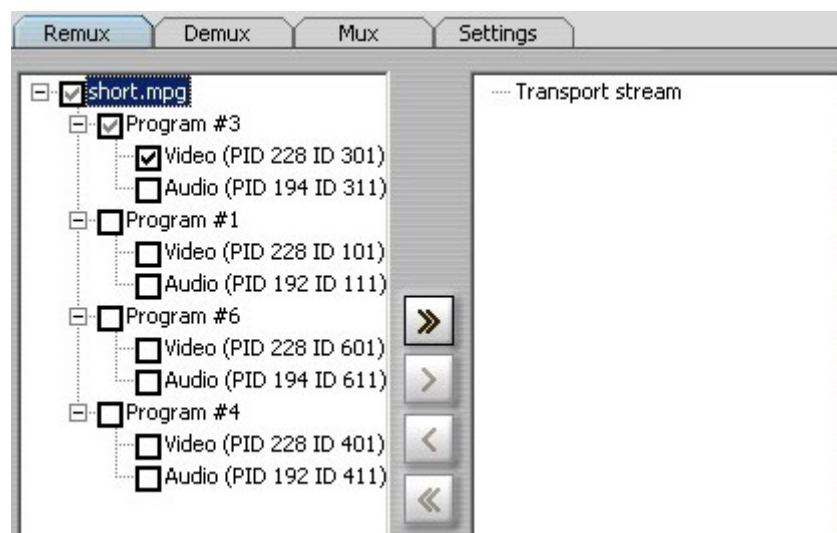
4. How to ...

This section describes methods for solving generic problems encountered when using the application.

4.1 Trim MPEG stream or MP4 file

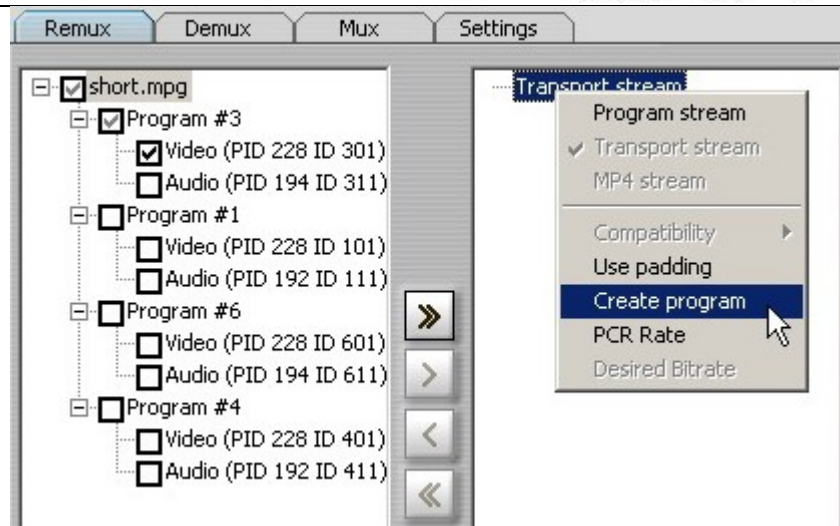
XMuxer Pro application allows trimming and saving the selected file segment only. Please use **Remux** mode to perform the task.

After the file is successfully loaded, the following input and output panes are displayed:

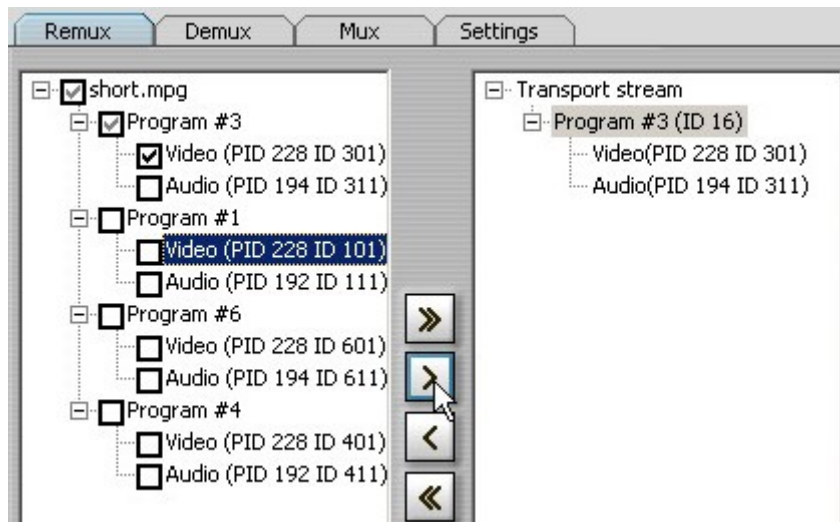


To cut out the segment of multi-program transport stream, do the following:

1. Right-click the item **Transport stream** and select **Create Program** command in a shortcut menu.

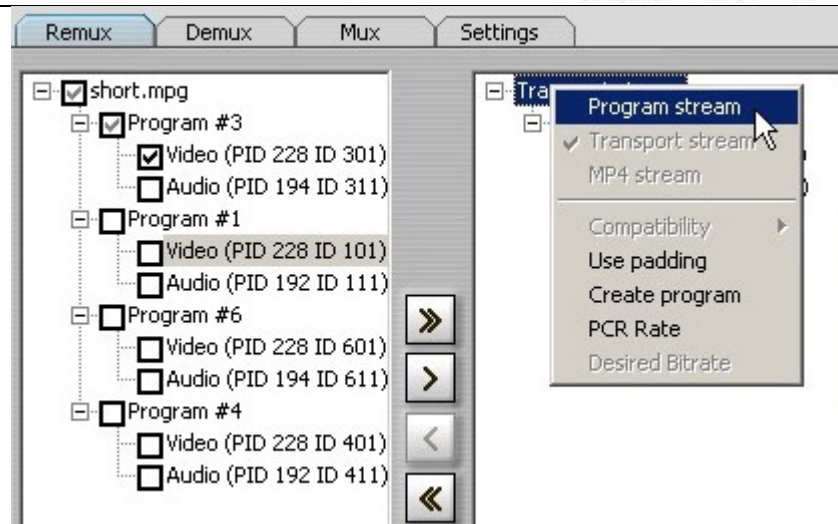


2. Use  button to add streams into the created program.

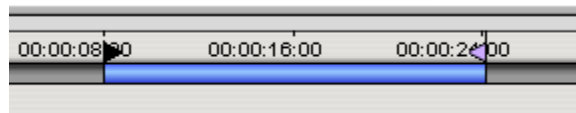



3. Right-click the item **Transport stream** and select the output stream type.

***Note:** You can select **MP4 stream** command using the following input stream types only: AVC/H.264 or MPEG-4 video and AAC audio. The restrictions for iPod and PSP compatible files creation are covered later.*



4. Mark the required stream segment using the **Trim** slider. Drag the respective flag to set the *start* and *stop* positions.



5. Choose the location and name of the output file and click **Start** .

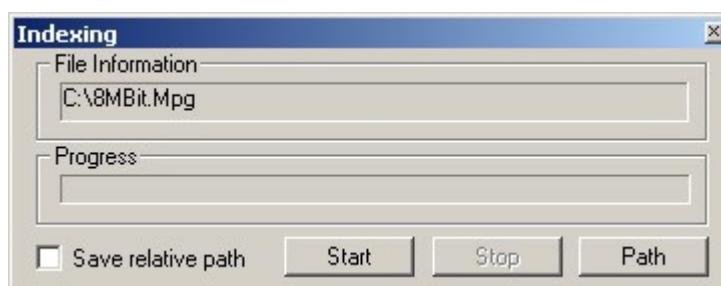
4.2 Trim MPEG-2 stream with frame-accurate

XMuxer Pro allows trimming of MPEG-2 stream with frame-accurate to I-frame. Such trimming requires prior indexation of the stream.

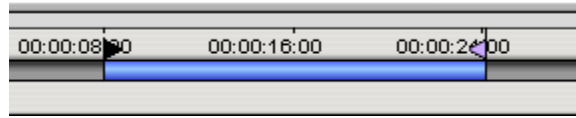
Note: You can index the stream only once and then use this indexed file for further trimmings.

To perform frame-accurate trimming, do the following:

1. Click the button **Load** or press <Ctrl+O> and select the required file for editing.
2. To create the indexed file, click the button **Index** or press <Ctrl+I>. In the appeared dialog box click **Start** and the indexed file will be saved in the current directory. To select another directory, clear **Save relative path** and click the **Path** button.



3. In the **Settings** tab select **Trim Accuracy by Frame**.
4. Select the required stream segment using the **Trim** slider. Drag the respective flags to set the *start* and *stop* positions.



5. Select the location and name of the output file and click **Start**.

4.3 Merge several similar files

XMuxer Pro allows merging of similar files in the Remux and Demux modes without re-encoding and quality loss.


1. In order to merge homogeneous files, create an .xpl file with a list of file paths. Below is the sample of such file (*test.xpl*):

M:\video\DVD\Perl Harbor\Video_ts\mts_01_1.vob

M:\video\DVD\Perl Harbor\Video_ts\mts_01_2.vob

M:\video\DVD\Perl Harbor\Video_ts\mts_01_3.vob

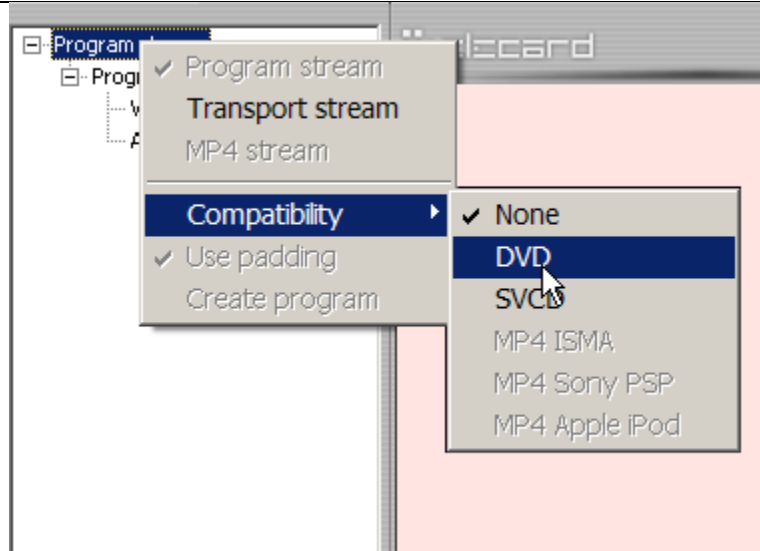
M:\video\DVD\Perl Harbor\Video_ts\mts_01_4.vob

2. When you create an .xpl file you can use it in XMuxer Pro in the same manner as a common media file – click the **Load** button  and in the appeared dialog box select the created .xpl file.
3. Follow the instructions from p.3.3.1 *Remultiplexing files*.

Note: For similar files merging the following formats are supported: MPEG-1 System Stream, MPEG-2 Program Stream and MPEG-2 Transport Stream.

4.4 Create file for DVD recording (from multiprogram TS)

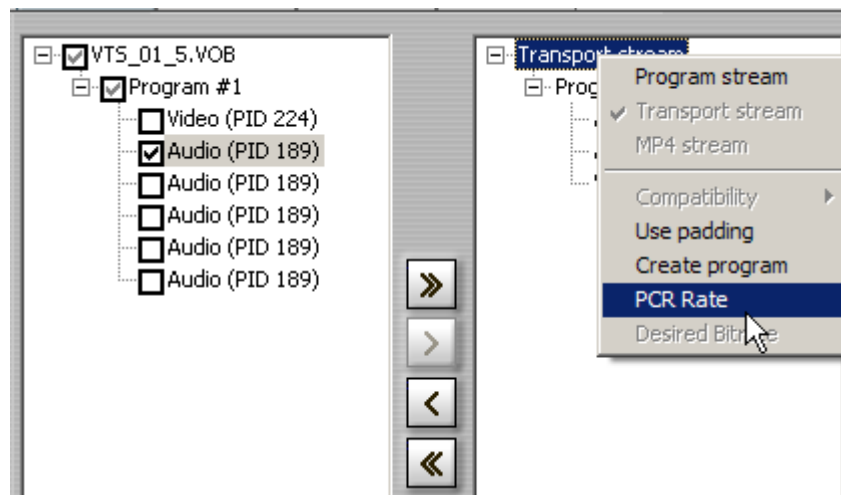
1. Perform the steps described in the previous section for one of the program.
2. Set the output stream type as **Program stream**.
3. In the **Compatibility** submenu select the **DVD** command. To do this, right-click the **Program** and the shortcut menu appears.

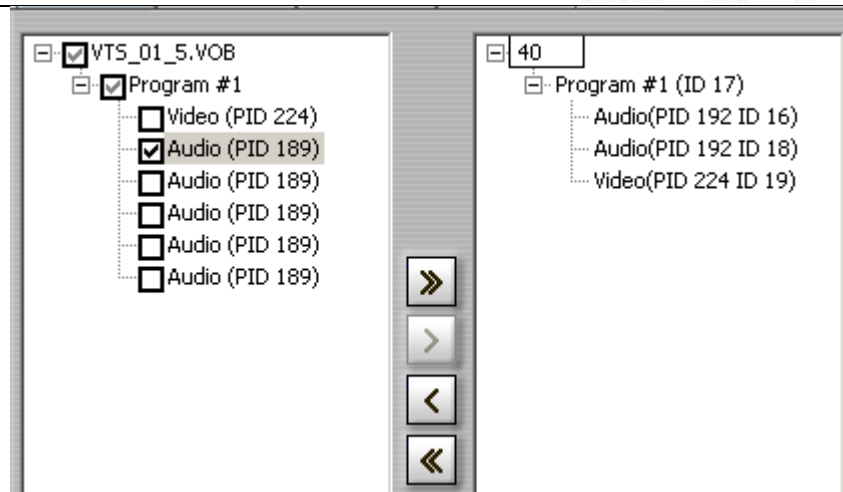


4.5 Create Transport Stream for ATSC broadcasting

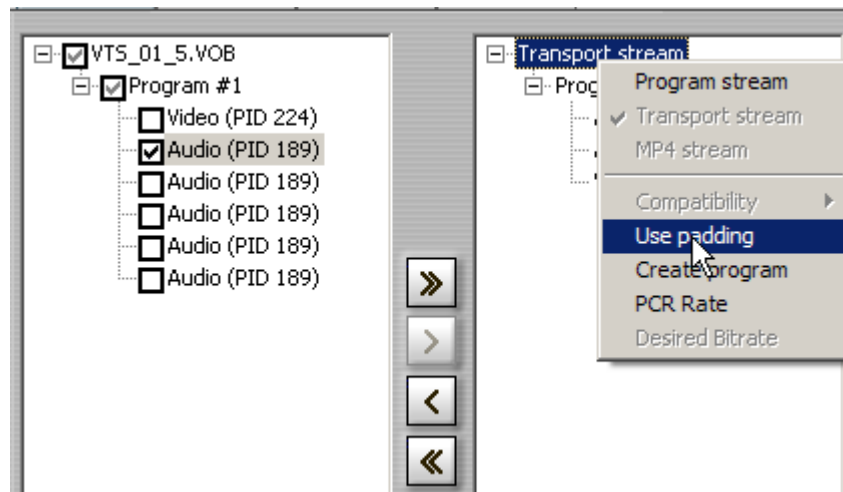
To create TS for ATSC broadcasting follow the instructions below:

1. Perform the steps described in section 4.1.
2. Set PCR Rate value as 40 milliseconds. To do this, right-click the upper line of the right (output) pane and select the **PCR Rate** command.

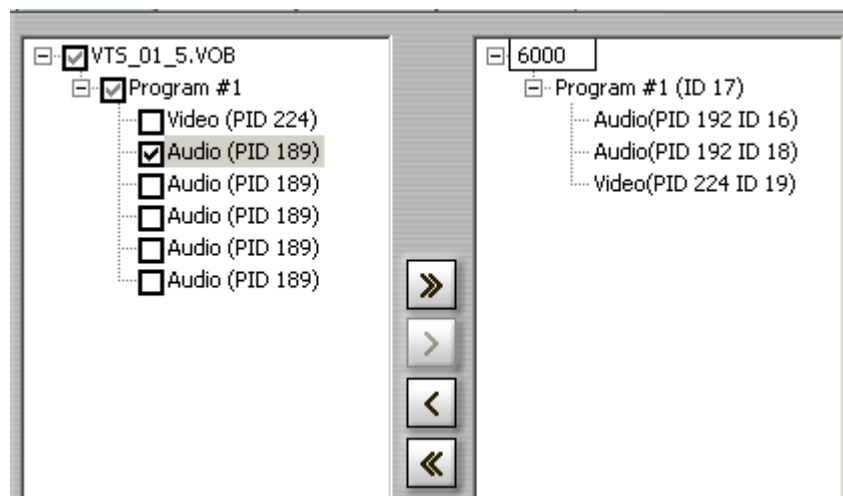
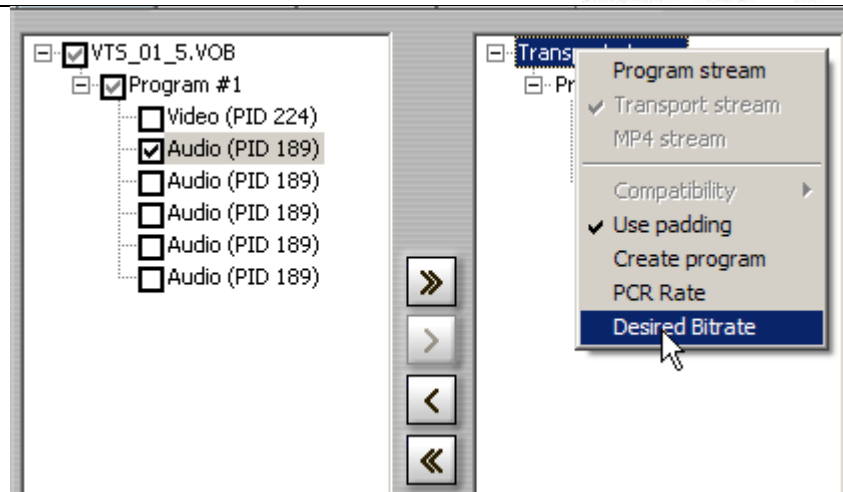




3. To switch on the **Use Padding** flag, right-click the upper line of the right (output) pane and select the **Use Padding** command.

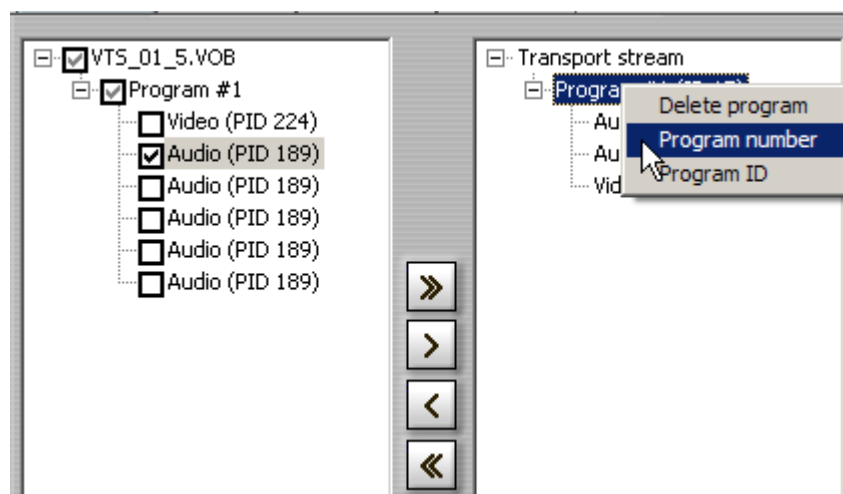


4. Set the required bitrate by selecting the **Desired Bitrate** command in the shortcut menu. The bitrate value of the output stream should be at least 5% greater than the sum of the input streams bitrates.
In case the value in the **Desired Bitrate** is null (0), the value for output bitrate is retrieved from the stream Sequence Header.

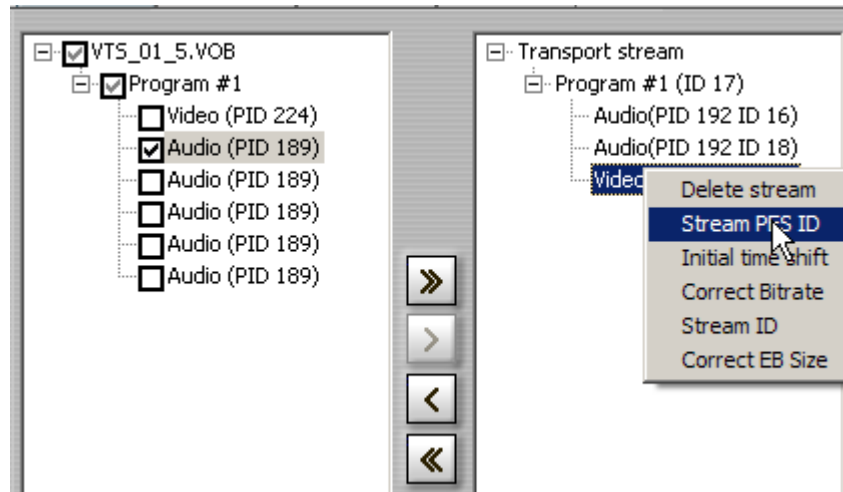


Note: As the bitrate value in the Sequence Header can be often different from the real bitrate value, the maximum possible bitrate for the given Profile&Level is automatically set.

5. Set the required program number. To do this, right-click the **Program** item and select the **Program number** command in the shortcut menu.



6. Set Program ID, Stream PES ID and Stream ID.



4.6 Create MP4 file

You can create MP4 file in two modes: **Remux** and **Mux**.

*Note: You can select **MP4 stream** command using the following input stream types only: AVC/H.264 or MPEG-4 video and AAC audio.*

4.7 Create PSP and iPod compliant file

You can create PSP or iPod compliant file using streams with the parameters specified in the tables below.

Table 5. Elementary Stream Parameters for Multiplexing into PSP or iPod Compliant Files

| Parameters | PSP | iPod |
|-------------------------------|-------------------|---------|
| AAC for Mpeg4 profiles | | |
| SampleRate (hz) | 24000 | 48000 |
| BitRate (Kbit) | 64 | 128 |
| MpegVersion | Mpeg4 | Mpeg4 |
| Type | Main | Low |
| Header Type | RAW | RAW |
| AAC for AVC profiles | | |
| SampleRate(hz) | 48000 | 48000 |
| BitRate (Kbit) | 128 | 128 |
| MpegVersion | Mpeg4 | Mpeg4 |
| Type | Main | Low |
| Header Type | RAW | RAW |
| Mpeg4 | | |
| Resolution | 368x208 (320x240) | 320x240 |
| Frame rate | 29.97 | 30 |
| Profile | ASP | ASP |
| Level | 5 | 5 |
| Max key | 50 | 50 |
| Encode B count | 0 | 0 |

| | | |
|--------------------------|-------------------|----------|
| SCD | Yes | Yes |
| Quantization type | H263 | H263 |
| Rate Control | VBR | VBR |
| Avg. rate (Kbit) | 800 | 800 |
| Max. rate (Kbit) | - | 2500 |
| AVC (H.264) | | |
| Resolution | 368x208 (320x240) | 320x240 |
| Frame rate | 29.97 | 30 |
| Video Format | Auto | Auto |
| Profile | Main | BaseLine |
| Level | 1.3 | 1.3 |
| Max IDR | 120 | 120 |
| Max B count | 2 | 0 |
| Rate Control | VBR | VBR |
| Avg. rate(Kbit) | 550 | 700 |
| Max. rate(Kbit) | 900 | 768 |
| Reference frames | 2 | 2 |