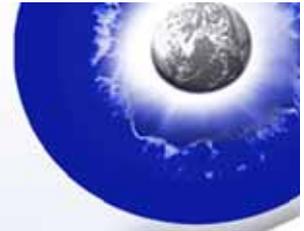




MainConcept
ShowCase
Media Decoding Application



www.mainconcept.com



User's Guide MainConcept ShowCase 2.8

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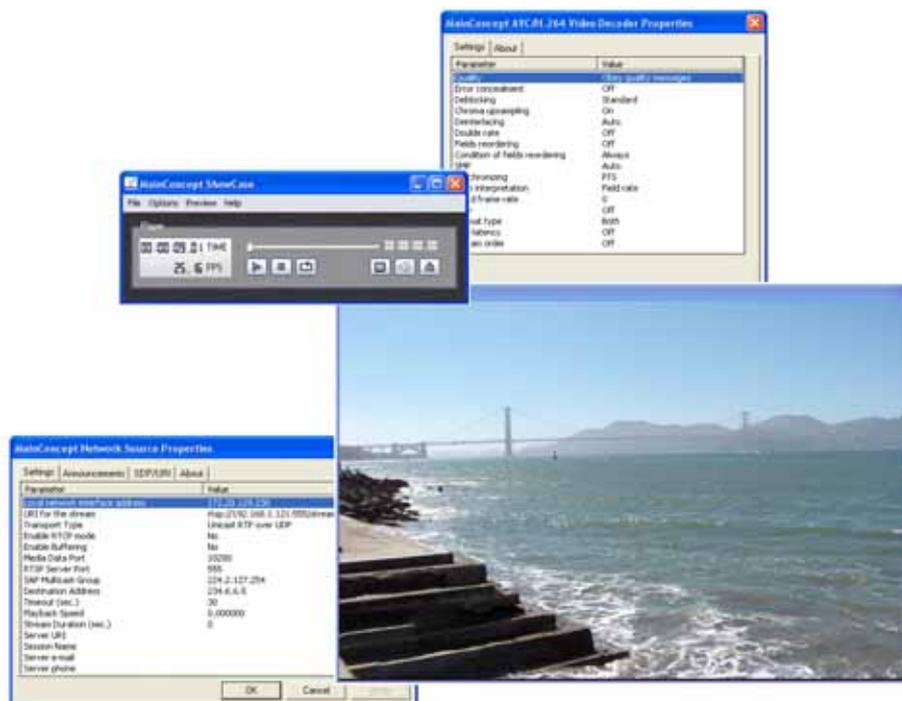
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Edition: March 16, 2011

Introduction



Congratulations!

The MainConcept ShowCase player is a simple sample tool for experts and developers who want to evaluate the power of some of the most important MainConcept decoders themselves. The player makes only use of the MainConcept DirectShow filters, which come with it, in order to allow video and audio playback in highest quality. Other filters installed on the system do not interfere with our new standalone product. It is the perfect way to evaluate the MainConcept DirectShow filters, because it includes the same filter versions as our renowned Codec SDK, and it gives you an idea of their versatile functionalities if you plan to license and include them into your own software. Testing the power as well as the high decoding quality of the MainConcept DirectShow filters is only a matter of drag-and-drop now!

MainConcept ShowCase supports H.264/AVC, SVC Baseline Profile, MPEG-1, MPEG-2, VC-1, VC-3, DV/DVCPRO 25/50/HD, Motion JPEG, JPEG2000 and MPEG-4 Part 2 as video formats. For audio, you are able to play back streams that include MPEG, LPCM and AAC audio. Please note that the player is only a demo version, i.e. it always adds a watermark to the preview and has a audio limitation for AAC.

As file formats MPEG-2 Program/Transport Stream, AVI, DIF, WMV (including VC-1 video streams), MXF, 3GP, and MP4 are supported. Of course, you are also able to play back MPEG-2, H.264/AVC and MPEG-4 Part 2 Elementary Streams.

Moreover, MainConcept ShowCase includes a Network Source filter that allows stream receiving of MPEG-2 PS/TS, MP4, and Elementary streams with the above formats. So the application works like a receiver tool when the video is streamed over a network.

MainConcept ShowCase includes the following DirectShow filters:

- H.264/AVC Video Decoder filter
- SVC Video Decoder filter
- MPEG-2 Video Decoder filter
- MPEG-4 Part 2 Video Decoder filter
- VC-1 Video Decoder filter
- VC-3 Video Decoder filter
- DV/DVCPRO 25/50/HD Video Decoder filter
- JPEG2000Video Decoder filter
- Motion JPEG Video Decoder filter
- AAC Decoder filter
- MPEG Audio Decoder filter
- MP4 Demuxer filter
- DV Splitter filter
- DV Dif Parser
- MPEG Push Demultiplexer filter
- MPEG Pull Demultiplexer filter
- MXF Demultiplexer filter
- Network Source filter

ShowCase now also includes a SVC Decoder Beta version, so that you can have a first look at this exciting new format. SVC (Scalable Video Coding) is a new extension to the H.264/AVC standard that allows a video stream to be encoded with multiple quality layers. In a single step and into a single bitstream, quality layers are encoded with different resolutions (Spatial), different quality levels (SNR/Quality/Fidelity) or different frame rates (Temporal) and combinations of these features. The SVC Decoder and a SVC enabled Streaming Server can skip layers based on the decoding device abilities or the bandwidth restrictions of the delivery network.

If the DivX Decoder filter is registered on your system, you can use it for playing back DivX encoded clips in MainConcept ShowCase as well.

In case of VC-1 decoding, MainConcept ShowCase uses the WMA Audio Decoder and ASF Reader that comes with the Windows operating system.

After successful evaluation, we are pretty sure that you want to know where to get the powerful decoding technology of MainConcept ShowCase that works behind the scenes, in order to implement it in your own application. That's almost as easy as testing the MainConcept DirectShow filters. For detailed information on licensing and pricing, please contact your local sales representative or write an e-mail to sales@mainconcept.de.

If you have already registered full versions of the MainConcept Decoder filters on your system, these are automatically used when working with the ShowCase player.

And now we wish you a lot of fun working with our ShowCase sample player, and of course, reading this manual.

Supported Streams and Formats

Here is an overview on the streams and formats that are currently supported by MainConcept ShowCase demo application:

- MPEG-1 System Stream (ISO/IEC 11172-1)
- MPEG-2 Program Stream (ISO/IEC 13818-1)
- MPEG-2 Transport Stream (ISO/IEC 13818-1)
- MPEG-1 Video (ISO/IEC 11172-2)
- MPEG-1 Audio (ISO/IEC 11172-3)
- MPEG-2 Video (ISO/IEC 13818-2)
- MPEG-2 Audio (ISO/IEC 13818-3)
- H.264 Video Streams (ISO/IEC 14496-10) or H.264 packetized into Transport Stream (ISO/IEC 13818-1)
- AAC (ISO/IEC 13818-7 and ISO/IEC 14496-3)
- MPEG-4 (ISO/IEC 14496-2)
- MPEG-4 System Streams (ISO/IEC 14496-14)
- 3GPP2 System Streams (3GPP TS 26.234)
- H.263 Video (ITU-T Recommendation)
- DV Video Streams (IEC-61834)
- DVCPRO 25/50 Video Streams (SMPTE 314M)
- DVCPRO HD Video Streams (SMPTE 370M)
- VC-1 Video Streams (SMPTE 421M-2006)
- VC-3 Video Streams (SMPTE 2019-2006)
- JPEG2000 Video Streams (ISO/IEC 15444-1)
- Motion JPEG Video Streams
- Panasonic P2 AVC-Intra Class 50 and Class 100 Streams
- Sony XDCAM HD, XDCAM DV (DVCAM) and XDCAM IMX MXF Streams
- Sony XDCAM EX Streams
- Panasonic P2 DVCPRO MXF Streams
- JPEG2000 MXF Streams
- SVC Baseline/Main Profile Streams

MainConcept ShowCase can receive the following streams and formats over a network:

- MPEG-1 System Stream
- MPEG-2 Transport Stream
- MPEG-2 Program Stream
- MPEG-1 Video
- MPEG-1 Audio
- MPEG-2 Video
- MPEG-2 Audio
- AVC/H.264 Video
- SVC Video
- MPEG-4 Video
- VC-1 Elementary Stream
- AAC

Getting Started

System Requirements

Decoding can be very resource-intensive. To achieve acceptable playback speeds, we recommend at least these minimum specifications:

Operating system: Microsoft® Windows® XP, Vista or Windows 7 (32-bit and 64-bit).

Processor: For HDV playback, the recommended minimum requirements are an Intel® Pentium® 4 processor 3.06 GHz or faster with Hyper Threading Technology. For HD and AVCHD decoding, the recommended minimum requirements are an Intel® DualCore processor 2.4 GHz or faster. We also recommend to install always the current Service Pack for the used operating system.

RAM: 1 GB or more

MainConcept ShowCase will work on many systems not meeting these specifications, although decoding speed will be slower.



The demo version of MainConcept ShowCase has a decoding limitation of 30 seconds for files which include AAC audio, i.e. after this period of time audio is muted and only video is played back correctly.

Streams containing Dolby Digital (AC-3), the audio cannot be decoded due to license restrictions. You will only have video playback in this case after muting audio.

Installing the MainConcept ShowCase Player

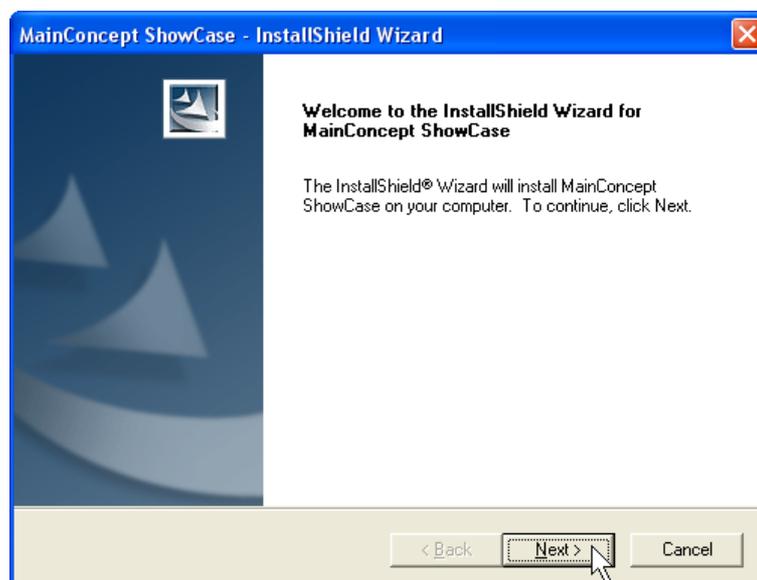
If you received the MainConcept ShowCase demo application on a CD, follow the included installation instructions. If you downloaded it, please follow these steps:

1. Double-click on the **ShowCase Setup** file if necessary. A splash screen and progress indicator will appear.

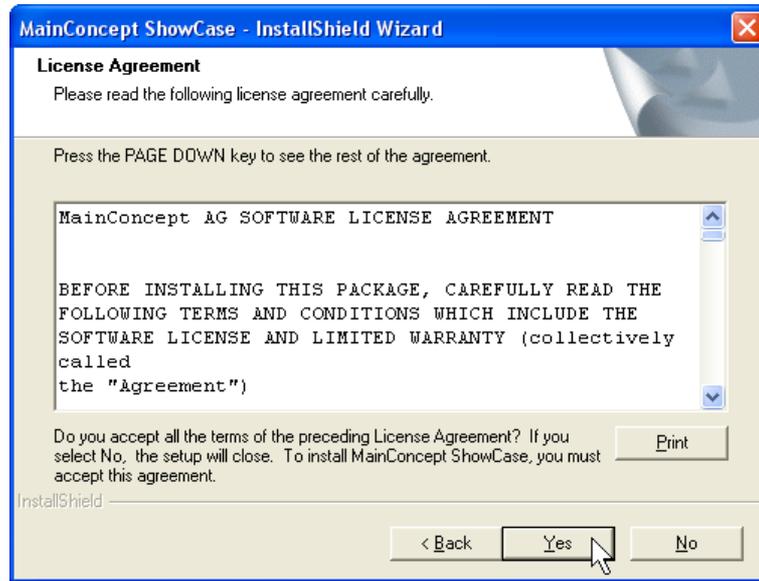


It may take a few moments until the installation process begins.

- 2 The **Welcome** dialog will appear on the screen. Please click **Next** to continue.

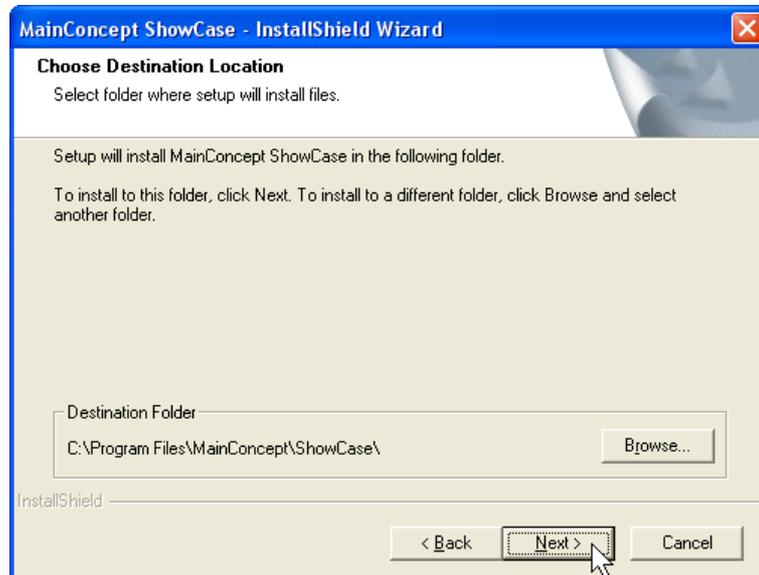


- 3 When the license agreement appears on the screen, review it carefully, then click **Yes** if you agree to the terms and you want to continue the installation.



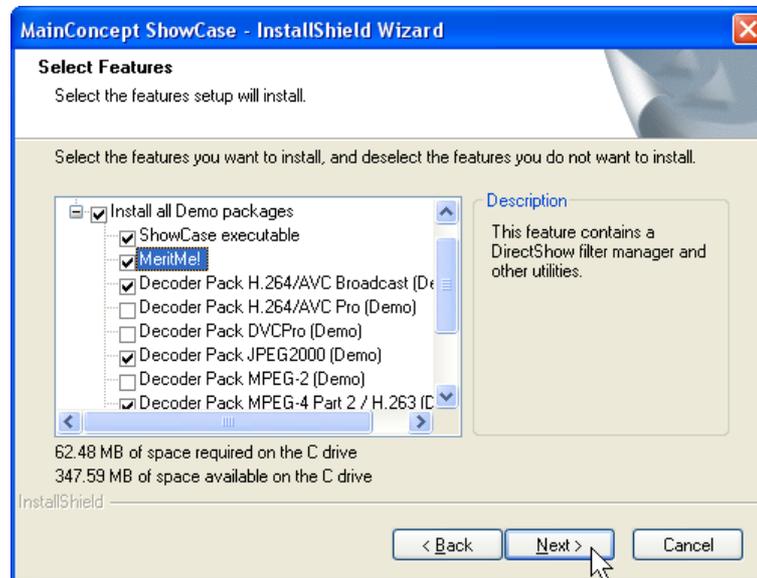
If you do not click **Yes**, the installation process will be aborted.

- 4 In the following dialog box, you can choose the location where the software player files will be stored on your computer.



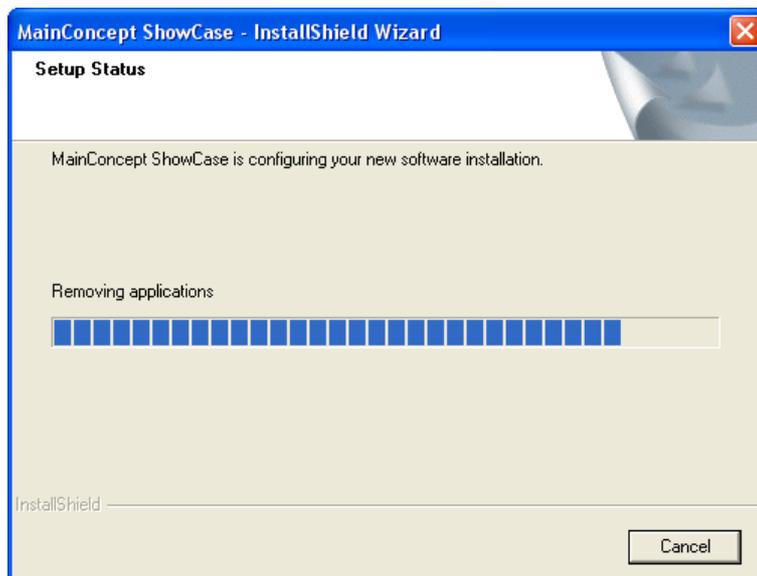
You can accept the default settings or click the **Browse...** button and select a different destination directory. Click **Next** to proceed. You can accept the default settings, enter a new folder name or select any existing folder. Then click **Next**.

- 5 In the **Select Features** window, you can select the features and components you want to install. You do not necessarily need to install the ShowCase player. For example you can only install the demo decoders or a set of demo decoders you require for testing. Simply select the desired item you want to install from the list. After you are done, click **Next** to install them.

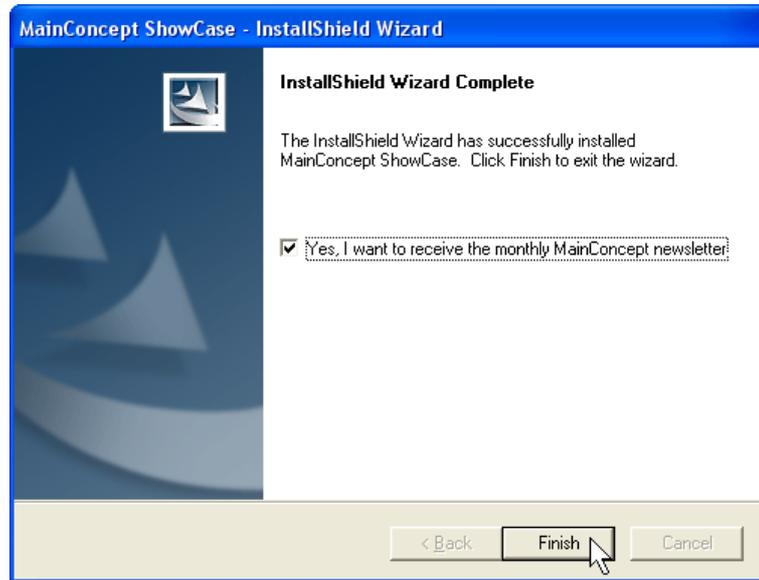


If you want to add components or features that have not installed during the first installation, please start the ShowCase setup file again, and choose **Modify**. During the installation process, select the items you want to add or even remove now.

- 6 Now the player installation starts. An indicator will show the installation process.

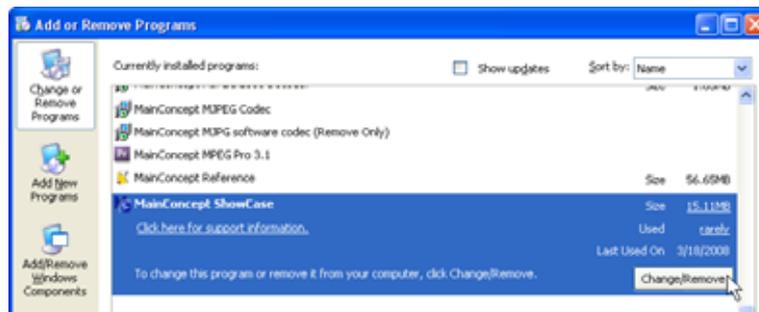


- 7 The installation process will finish then. When the following dialog box appears, click **Finish** to complete the ShowCase player setup.



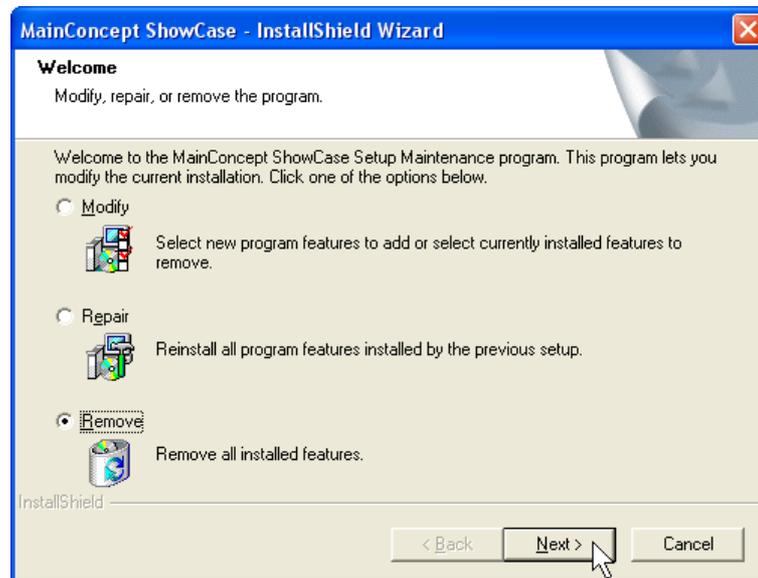
The MainConcept ShowCase evaluation player is now installed on your computer. You can launch it from your Windows start menu or from the shortcut on your desktop.

If you ever need to uninstall the program, you can launch the uninstaller from the **Add or Remove Programs** option in the Windows **Control Panel**.



Or, you can launch the uninstaller by running the **Setup** program again.

Enable the **Remove** option and click **Next** to uninstall the MainConcept ShowCase application from your system. Then follow the on-screen prompts.



You will need to confirm that you want to remove MainConcept ShowCase. Click **OK** to start the uninstall process.

You will be notified when uninstallation is complete. Click **Finish**.



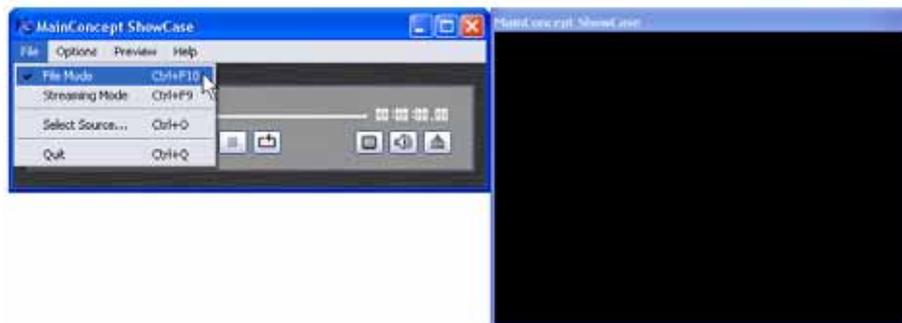
Quickstart Tutorial

The ShowCase application is designed for easy, efficient testing of the MainConcept Decoder DirectShow filters. The user-friendly software makes it easy to play back video and audio streams. Here is a short tutorial that will show you how to use the player.

- 1 Launch the MainConcept ShowCase application if it is not already running. The main window will appear on the screen.



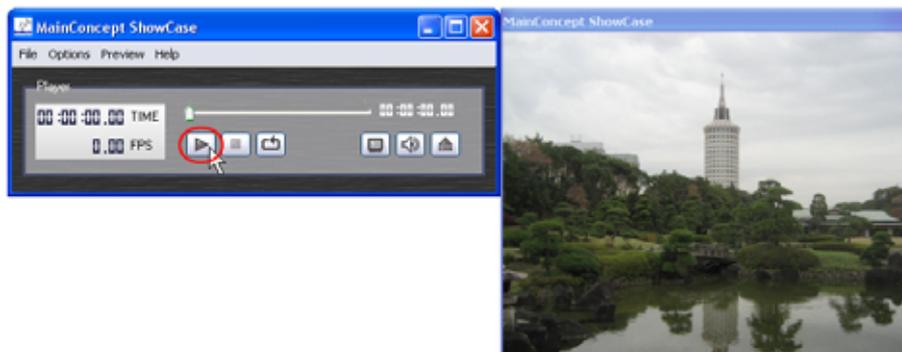
- 2 In this tutorial we want to play back a file, that is stored somewhere on your hard drive. For that reason we select **File Mode** in the **File** menu.



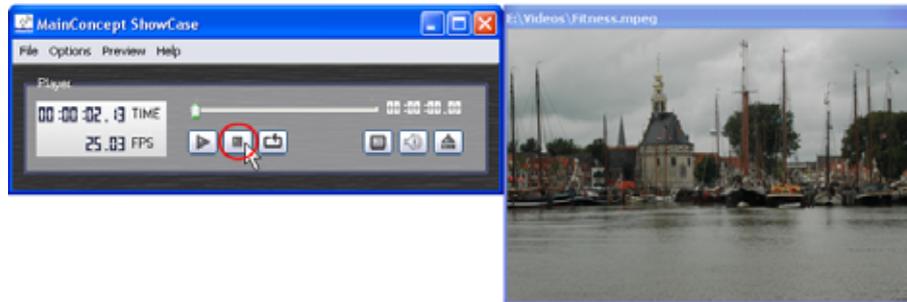
- 3 Then click the **Select the network stream or playback file...** button on the main window and select in the following dialog choose the desired file for playback. You can also choose **Select Source...** in the **File** menu to open **Load Playback File** dialog.



- 4 To start the decoding process in MainConcept ShowCase, click the **Play** button. During playback, it turns into a **Pause** button that enables you to pause the preview any time. Clicking the button again, continues the decoding again.



- 5 Click the **Stop** button to finish the playback.



Now you can open the next file for decoding or change the mode, so that you receive and playback streams that are streamed over a network. It is your decision what you want to do next in the MainConcept Decoder evaluation process!

Now we will take a tour through the MainConcept ShowCase interface and show you how to use the various components in detail.

The ShowCase Player Interface

The MainConcept ShowCase evaluation player application enables you to play back videos, streamed over the network or the files which are already on the system. It makes use of the renowned MainConcept video and audio decoder, demultiplexer and network source filter. In the following chapters we give you an overview of the interface and its numerous functions.

The Menus

In the top part of the window are the **File**, **Options**, **Preview** and **Help** menus.

The File Menu

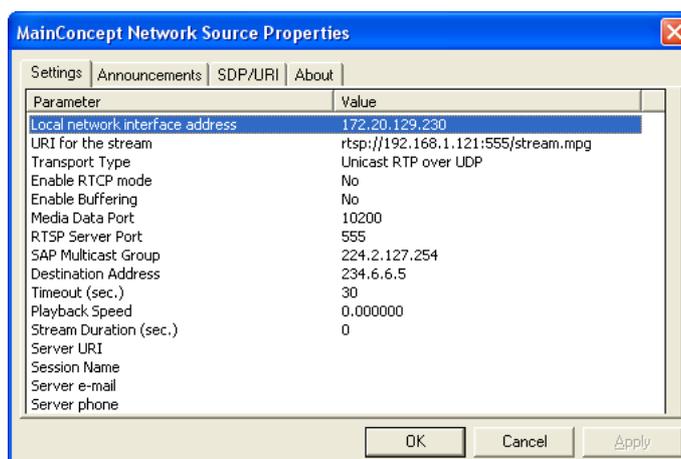


File Mode enables you to play back a stream from your hard drive. You can select the desired clip by choosing the **Select Source...** option.

Streaming Mode plays back a video which is streamed over the network. When you select the option, the **MainConcept Network Source**

Properties page appears on the screen where you can choose the adequate source for preview. If the dialog does not appear automatically you can also choose the **Select Source...** option.

Due to the selected mode, the **Select Source...** option shows a different dialog. When **File Mode** is selected, the **Load Playback File** window appears where you can search for the desired stream on your system. Choosing the **Streaming Mode** option, opens the **MainConcept Network Source Properties** page which enables you to adjust several options for streaming the videos over a network, such as server address, UDP port etc.



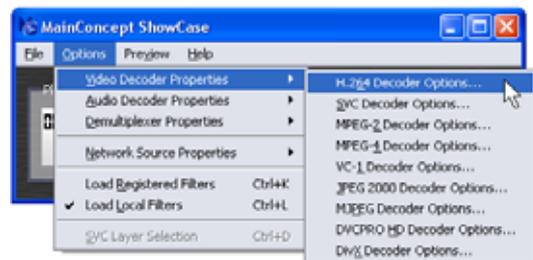
You find some detailed information on the MainConcept Network Source Properties page in the chapter **The MainConcept Network Source** among **The DirectShow Filters' Property Pages**.

Quit closes MainConcept ShowCase.

The Options Menu

Under **Video Decoder Properties...** you get access to the included video decoders and their property pages where you find additional decoder settings to optimize the playback process:

H.264 Decoder Options... opens the **MainConcept H.264/AVC Video Decoder Properties** page which enables you to optimize the decoding quality and performance if necessary. You find some detailed information on the H.264 decoder settings in the chapter **The MainConcept H.264/AVC Decoder** among **The DirectShow Filters' Property Pages**.



SVC Decoder Options... opens the **MainConcept SVC Video Decoder Properties** page which enables you to optimize the decoding quality and performance of H.264/AVC as well as SVC streams if necessary. You find some detailed information on the H.264/AVC and SVC decoder settings in the chapter **The MainConcept SVC Decoder** among **The DirectShow Filters' Property Pages**.

MPEG-2 Decoder Options... opens the **MainConcept MPEG-2 Video Decoder Properties** page which enables you to optimize the decoding quality and performance if necessary. You find some detailed information on the MPEG-2 decoder settings in the chapter **The MainConcept MPEG-2 Video Decoder** among **The DirectShow Filters' Property Pages**.

MPEG-4 Decoder Options... opens the **MainConcept MPEG-4 Video Decoder Properties** page which enables you to optimize the decoding quality and performance if necessary. You find some detailed information on the MPEG-4 Part 2 decoder settings in the chapter **The MainConcept MPEG-4 Video Decoder** among **The DirectShow Filters' Property Pages**.

VC-1 Decoder Options... opens the **MainConcept VC-1 Video Decoder Properties** page which enables you to optimize the decoding quality and performance if necessary. You find some detailed information on the VC-1 decoder settings in the chapter **The MainConcept VC-1 Video Decoder** among **The DirectShow Filters' Property Pages**.

VC-3 Decoder Options... opens the **MainConcept VC-3 Video Decoder Properties** page which enables you to optimize the decoding quality and performance if necessary. You find some detailed information on the VC-3 decoder settings in the chapter **The MainConcept VC-3 Video Decoder** among **The DirectShow Filters' Property Pages**.

JPEG2000 Decoder Options... opens the **MainConcept JPEG2000 Video Decoder Properties** page which enables you to optimize the decoding quality and performance if necessary. You find some detailed information on the JPEG2000 decoder settings in the chapter **The MainConcept JPEG2000 Video Decoder** among **The DirectShow Filters' Property Pages**.

MJPEG Decoder Options... opens the **MainConcept Motion JPEG Video Decoder Properties** page which enables you to optimize the decoding quality and performance if necessary. You find some detailed information on the Motion JPEG decoder settings in the chapter **The MainConcept Motion JPEG Video Decoder** among **The DirectShow Filters' Property Pages**.

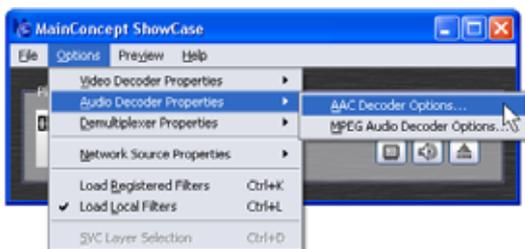
DV/DVCPRO 25/50/HD Decoder Options... opens the **MainConcept DV/DVCPRO Video Decoder Properties** page for DV, DVCPRO 25/50 and DVCPRO HD which enables you to optimize the decoding quality and performance if necessary. You find some detailed information on the DV/DVCPRO decoder settings in the chapter **The Main-Concept DV/DVCPRO 25/50/HD Video Decoder** among **The DirectShow Filters' Property Pages**.



All video decoders currently in active playback use, are marked with a tick in the **Options** menu. Changing some options might have no effect as long as the filter is still in use. You have to stop the playback to configure the settings, in order to obtain the desired effect.

The **DivX Decoder Options...** are only available when the corresponding decoder filter is registered on your system. For detailed information on the DivX Decoder, please refer to the documentation that comes with it.

Under **Audio Decoder Properties...** you get access to the included audio decoders and their property pages where you find additional decoder settings to optimize the playback process:



AAC Decoder Options... opens the **MainConcept AAC Decoder Properties** page which enables you to improve the audio decoding quality of the stream if necessary. You find some detailed information on the AAC decoder settings in the chapter **The MainConcept AAC Decoder** among **The DirectShow Filters' Property Pages**.

Layer 2 Decoder Options... opens the **MainConcept MPEG Layer 2 Audio Decoder Properties** page which enables you to improve the audio decoding quality of the stream if necessary. You find some detailed information on the MPEG Layer 2 audio decoder set-

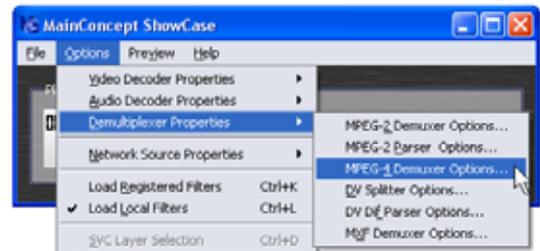
tings in the chapter **The MainConcept Layer 2 Audio Decoder** among **The DirectShow Filters' Property Pages**.



All audio decoders currently in active playback use, are marked with a tick in the **Options** menu. Changing some options might have no effect as long as the filter is still in use. You have to stop the playback to configure the settings, in order to obtain the desired effect.

Under **Demultiplexer Properties...** you get access to the included demultiplexers and their property pages where you find additional settings:

MPEG-2 Demuxer Options... opens the corresponding property page which enables you to adjust some settings of the MainConcept MPEG Pull Demultiplexer filter if necessary. You find some detailed information on **The MainConcept MPEG Pull Demultiplexer** among **The DirectShow Filters' Property Pages**.



MPEG-2 Parser Options... opens the **MainConcept Stream Parser** property page. The filter is part of the MainConcept MPEG Pull Demultiplexer, but it does not offer any additional settings. The **Stream Parser** is used for audio elementary streams.

MPEG-4 Demuxer Options... opens the corresponding property page which enables you to adjust some settings of the MainConcept MP4 Demuxer filter if necessary. You find some detailed information on **The MainConcept MP4 Demultiplexer** among **The DirectShow Filters' Property Pages**.

DV Splitter Options... opens the corresponding property page which enables you to adjust some settings of the MainConcept DV Splitter filter if necessary. You find some detailed information on **The MainConcept DV Splitter** among **The DirectShow Filters' Property Pages**.

DV DIF Parser Options... is needed to play back DV and DVCPRO 25/50/100 frames. However, the parser offers no property page.

MXF Demuxer Options... is needed to play back streams in an MXF container, such as Sony XDCAM HD, Panasonic P2 DVCPRO etc. However, it offers no property page.



All demultiplexers currently in active playback use, are marked with a tick in the **Options** menu. Changing some options might have no effect as long as the filter is still in use. You have to stop the playback to configure the settings, in order to obtain the desired effect.

Under **Network Source Properties...** you get access to the included network components and their property pages where you find additional network reception settings to optimize the playback over the network process:

Network Source Options... opens the corresponding property page which enables you to adjust several options for streaming the videos over a network, e.g. server address, UDP port etc. You find some detailed information on demultiplexer **The MainConcept Network Source** among **The DirectShow Filters' Property Pages**.

Push Demuxer Options... opens the corresponding property page which enables you to adjust some settings of the MainConcept MPEG Push Demultiplexer filter if necessary. It is used for network streaming. You find some detailed information on **The MainConcept MPEG Push Demultiplexer** among **The DirectShow Filters' Property Pages**.

Use Registered Filters uses any MainConcept DirectShow filter registered on your system for decoding when it is supported by ShowCase.

Use Local Filters uses the MainConcept DirectShow Decoder filters that come with the currently installed ShowCase version.

SVC Layer selection is only enabled when an SVC stream is added to ShowCase. Then a small window appears that offers several SVC settings:

[svc] dependency_id max specifies the maximum number of layers that should be decoded.

[svc] quality_id max specifies the maximum 'quality_id' value of layer which must be decoded.

[svc] temporal_id max specifies the maximum 'temporal_id' value of layer which must be decoded.

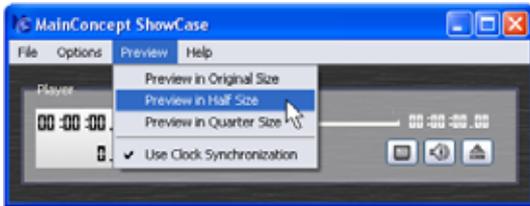
Show base layers indicates whether base layers should be decoded or not.

View them all allows you to display all layers at the same time.



The Preview Menu

The **Preview** menu offers several options for working with the size of the window which is used for playback the video streams.



Preview in Original Size displays the source video in its original size.

Preview in Half Size shows the source video in half the original size.

Preview in Quarter Size displays the source video in a quarter of the original size.

When the **Use Clock Synchronization** option is disabled, the graph is played back non-synchronously, i.e. the video streams are decoded as fast as possible. Please note that you have to stop the decoding process before changing the option.

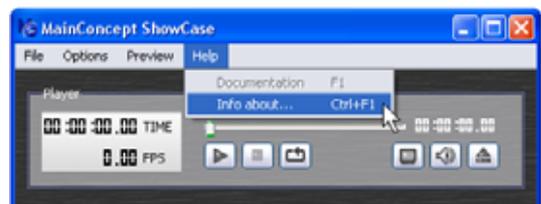


Please note that when you want to evaluate the decoder speed appropriately, you have to mute the audio first. Otherwise, the results are distorted.

The Help Menu

Documentation... opens this manual as PDF file.

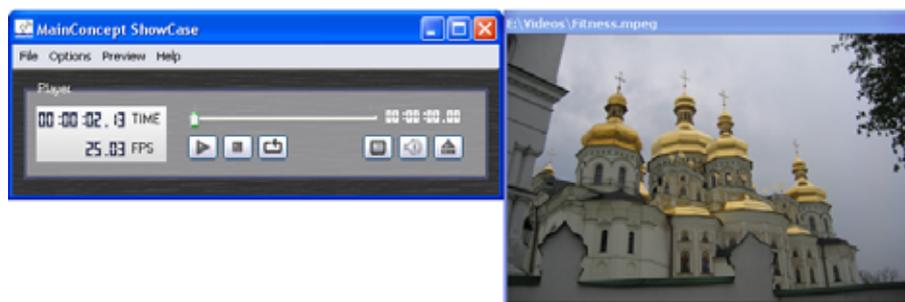
Info about... opens a window showing the current version of MainConcept ShowCase and some copyright information. Click **OK** to close it.



The ShowCase Player Application Interface

In the following chapter we want to introduce the main window of the ShowCase player software in more detail. The interface offers lots of useful controls and information for the playback process.

On the left side of the interface, you see a display that shows the current timecode (**TIME**) and frame rate (**FPS**). The last two digits in the timecode show the current frame number during playback.



Next to the display, you see a slider and various buttons that perform the following functions:

The slider allows you to scrub to the video. Using the arrow keys allows you to step backward and forward framewise.

The **Play** button  starts the decoding of the stream. During playback it turns into a **Pause** button , so that you can pause the decoding process any time, and resuming it by clicking it again.

The **Stop** button  terminates the playback and finishes the graph.

When using the **Loop Playback** option , the video is played back over and over again.

Click the **Switch to Fullscreen Preview** button  to enable fullscreen preview. To return to the normal preview mode, simply press the *Esc* key on your keyboard.

The **Mute Audio** button  disables audio, so that only the video stream is played back. Press this button  a second time to enable audio again.



In the current version of ShowCase, audio cannot be muted directly during playback. You must first **Stop** the decoding process, then mute the playback and **Start** it again.

Depending on the currently used mode, the **Select the network stream or playback file** button  enables you to specify a stream for playback that is received over a network or to open a stream for file playback that is located on your system.

Attached to the main dialog, you have the preview window, where you watch the playback of the video footage.

The DirectShow Filters

To get an idea what happens inside the MainConcept ShowCase player application, we want to give you a short introduction on the DirectShow filter, which is used for decoding video and audio streams on your PC. In the software called *GraphEdit - DirectShow Graph Tool* which is part of the DirectX SDK from Microsoft®, you can create graphs with the filters installed and registered on your system. The following chapter provides a brief overview of the DirectShow components.

What are DirectShow Filters?

As nucleus of DirectShow® there is a modular system of connectable components, the so called *Filters*. These filters are arranged in a composition called a Filter Graph. The Filter Graph Manager component monitors the connection of these filters and controls the data flow stream. Applications that use the DirectShow architecture, control the activities of the Filter Graph by communicating with the Filter Graph Manager.

Most filters included in Microsoft® DirectShow® runtime reside in quartz.dll, while others are standalone *.ax files. The DirectShow filters are *.dll files. Many of them are installed to *Windows\system* directory and others are installed in the product's directory or in specific folders (e.g. some MainConcept filters are installed in the *Program Files\Common Files>MainConcept* folder on the system drive).

Here are some useful information which might be important to know about filter data streaming, connections and pins:

- Data streams in packets (called *MediaSample*) from Source to Renderer through Transform filters.
- The connection from one filter to another is realized with the help of a Pin. A pin is an object that belongs to the filter. It offers a connection to other filter pins.
- The Input Pin receives the MediaSamples from an upstream filter, and the Output Pin sends the MediaSamples to a downstream filter.
- The Source filter has at least one output pin, the Renderer filter has at least one input pin, and the Transform filter has both input and output pins.

DirectShow Filter Types

The DirectShow filters can be divided into the following three main classes:

- Source Filter – provides the multimedia stream. It ranges from the File Source Filter to the MPEG encoding device source or Network source.
- Renderer Filter – finishes a graph. The most common Renderer filters are Video Renderer and Audio Renderer, which play video and audio streams. A Renderer filter can also be a File Dump or File Writer filter and a Network Render filter.
- Transform Filter – are the widest range of filters. All transformations on DirectShow® streams are made in transform filters. This type of filter is divided into Transform and TransInPlace filters. The TransInPlace filter differs from the Transform filter in memory allocation. It does not provide its own allocators, but uses ones from the upstream or downstream filter. It sends the same MediaSample that it received from the upstream to downstream filter and makes all data transformations in the MediaSample data buffer without changing its size.

The DirectShow Filters' Property Pages

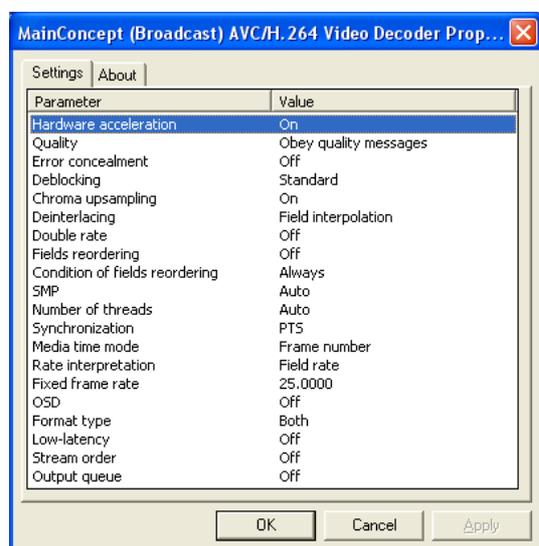
All DirectShow filters included in MainConcept ShowCase have additional settings which can be modified on the property pages if necessary. In the following, we want to describe the option of the filters in more detail. The MainConcept ShowCase player includes an H.264/AVC, SVC, MPEG-2, VC-1, DVCPRO HD, JPEG2000, Motion JPEG and MPEG-4 Part 2 Video Decoder as well as AAC and MPEG Audio Decoder. Moreover, the player contains MPEG-2 Push and Pull Demultiplexer, MP4 Demuxer, MXF Demuxer and a network stream receiver. The various options on the property pages enable you to optimize the decoding of your streams.

The Video Decoder Properties

The MainConcept H.264/AVC Decoder

The **MainConcept H.264/AVC Video Decoder** filter as standard version is a software-only decoding solution for ISO/IEC 14496 part 10 AVC / ITU-T Recommendation H.264 video streams. The Decoder is implemented as a DirectShow® filter. The filter can process AVC/H.264 video streams produced by the MainConcept MPEG Demultiplexer, MP4 Demuxer or any other compliant filter, such as Microsoft® MPEG-2 Demultiplexer. The filter can process Closed Captions (CC) and has a CC output pin. The CC data output is executed in a way suitable for decoding by the software Line 21 decoder filter which comes with DirectShow®. The Broadcast version of the decoder additionally supports AVC-Intra Class 50 and Class 100.

The H.264/AVC Decoder offers two panes: **About** and **Settings**. We will describe the various settings in more details now.



Hardware acceleration enables hardware acceleration via the DirectX Video Acceleration interfaces (if supported). It is available for both DXVA 1.0 and 2.0.

The **Quality** option specifies the types of frames that the decoder will skip. In case of field pictures the frame type is determined by the first coded slice type of complimentary field pairs. **Skip PB** decodes I frames only, skips P and B frames. The frame type is determined by the type of first slice of the first coded picture of a frame or complimentary field pair. The parameter **Skip B** will decode I and P frames only, skips B frames, even if they are used for reference. When choosing **Skip none** all frames are decoded without regard to

quality messages from a downstream filter. **Obey quality messages** responds to quality messages from a downstream filter by skipping frames.

The **Error Concealment** drop-down menu specifies how the decoder should handle frames with mistakes or errors. **Off** means that all frames are decoded and shown. When choosing **Don't show frames with errors**, the decoder does not display frames, in which mistakes or errors are detected.

The **Deblocking** drop-down menu controls in-loop filter operation. It offers three options. **Standard** respects the stream settings. The **Only reference** option runs the in-loop filter for reference pictures only. Disabling the option with **Off** skips the in-loop filter for all pictures. The latter may produce artifacts in some cases.

The **Chroma Upsample** option can improve the visual quality of the decoded video (chrominance component). **On** enables the option and **Off** disables it again.

The **Deinterlacing** option specifies the deinterlacing mode which should be used. **Auto** enables an automatic deinterlacing if the picture type is field or MBAFF. If **Weave** is selected the decoder will not deinterlace and it will output interleaved fields. The option **Vertical filter deinterlace** selects the vertical deinterlace function. **Field interpolation** will do deinterlace by interpolation. **VMR Deinterlacing** will put the correct interlacing flags on output samples and let VMR (Video Mixing Renderer) decide on deinterlacing.

The **Double Rate** option enables (**On**) and disables (**Off**) the generation of one progressive frame from every field.

The **Fields Reordering** option changes the order of fields by changing the specific media sample flags. **Off** disables the feature. When using the **Invert flags** option the fields are reordered by inverting the specific media sample flags. **Invert fields** reorders the fields by exchanging the fields in a picture.

Condition of Fields Reordering specifies the condition when fields must be reordered. **Always** enables permanent reordering. **Top field is first** is specified if the TopFirst flag is TRUE. **Bottom field is first** is set if TopFirst flag is FALSE.

SMP offers various Hyper-Threading options if they are available. **Auto** checks for multi-threading and using "by picture" mode it is available. The option **By pictures** offers parallel decoding by pictures. **By slices** allows parallel decoding by slices. Finally, the option **Off** allows serial decoding.

Number of threads specifies the number of threads that should be used for decoding.

Synchronization specifies the PTS (*Presentation Time Stamp*) usage for calculating the output time. **PTS** transfers the incoming PTS from input bit stream to output frames. **PTS (reference only)** allows to transfer PTS only for reference frames, interpolate PTS for non-reference frames based on frame rate. **Direct timestamps** uses direct timestamps for calculating the output time. Finally, the option **Off** interpolates all output PTS based on frame count and frame rate.

Rate interpretation specifies the way of interpretation of the frame rate value. In accordance with the standard this value should correspond to the field rate. The available options are **Field rate**, **Frame rate** and **Fixed rate**.

Fixed frame rate specifies the value of frame rate.

Enabling (**On**) the **OSD** (*On-Screen Display*) option shows some decoding/stream statistics (picture type, frame-rate etc.). It is only available in software mode (i.e. it is not available for DXVA). It can be disabled by setting it to **Off**.

Format type sets video format structure for the output Media Type. It offers the following options: **Only VIDEOINFO** connections are allowed. **Only VIDEOINFO2** connections are allowed. The option **Both** means that VIDEOINFO and VIDEOINFO2 connections are allowed.

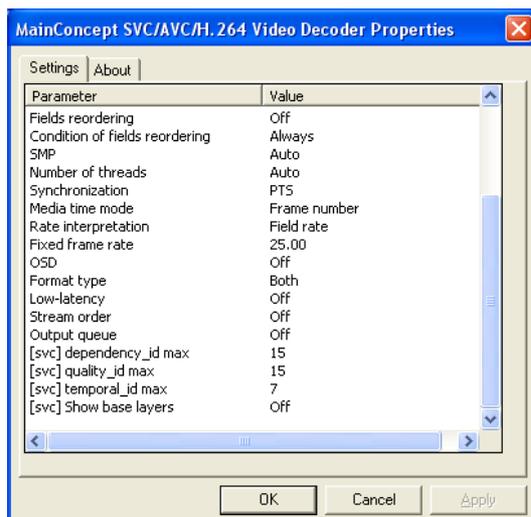
Low Latency allows you to enable and disables the minimal output delay.

Stream Order enables/disables the output of frames in stream order.

The MainConcept SVC Decoder

The **MainConcept SVC Video Decoder** filter is a software-only decoding solution for ISO/IEC 14496 part 10 AVC / ITU-T Recommendation H.264 and SVC video streams. The Decoder is implemented as a DirectShow® filter. The filter can process SVC (Scalable Video Coding) Baseline/Main Profile as well as AVC/H.264 video streams.

The SVC Decoder offers two panes: **About** and **Settings**. It offers the same settings as the H.264/AVC Decoder from the previous chapter, but additionally offers some specific SVC options. We will describe the various settings in more details now.



Hardware acceleration enables hardware acceleration via the DirectX Video Acceleration interfaces (if available).

The **Quality** option specifies the types of frames that the decoder will skip. In case of field pictures the frame type is determined by the first coded slice type of complimentary field pairs. **Skip PB** decodes I frames only, skips P and B frames. The frame type is determined by the type of first slice of the first coded picture of a frame or complimentary field pair. The parameter **Skip B** will decode I and P frames only, skips B frames, even if they are used for reference. When choosing **Skip none** all frames are decoded without regard to quality messages from a downstream filter. **Obey**

quality messages responds to quality messages from a downstream filter by skipping frames.

The **Error Concealment** drop-down menu specifies how the decoder should handle frames with mistakes or errors. **Off** means that all frames are decoded and shown. When choosing **Don't show frames with errors**, the decoder does not display frames, in which mistakes or errors are detected.

The **Deblocking** drop-down menu controls in-loop filter operation. It offers three options. **Standard** respects the stream settings. The **Only reference** option runs the in-loop filter for reference pictures only. Disabling the option with **Off** skips the in-loop filter for all pictures. The latter may produce artifacts in some cases.

The **Chroma Upsample** option can improve the visual quality of the decoded video (chrominance component). **On** enables the option and **Off** disables it again.

The **Deinterlacing** option specifies the deinterlacing mode which should be used. **Auto** enables an automatic deinterlacing if the picture type is field or MBAFF. If **Weave** is selected the decoder will not deinterlace and it will output interleaved fields. The option **Vertical filter deinterlace** selects the vertical deinterlace function. **Field interpolation** will do deinterlace by interpolation. **VMR Deinterlacing** will put the correct interlacing flags on output samples and let VMR (Video Mixing Renderer) decide on deinterlacing.

The **Double Rate** option enables (**On**) and disables (**Off**) the generation of one progressive frame from every field.

The **Fields Reordering** option changes the order of fields by changing the specific media sample flags. **Off** disables the feature. When using the **Invert flags** option the fields are reordered by inverting the specific media sample flags. **Invert fields** reorders the fields by exchanging the fields in a picture.

Condition of Fields Reordering specifies the condition when fields must be reordered. **Always** enables permanent reordering. **Top field is first** is specified if the TopFirst flag is TRUE. **Bottom field is first** is set if TopFirst flag is FALSE.

SMP offers various Hyper-Threading options if they are available. **Auto** checks for multi-threading and using "by picture" mode it is available. The option **By pictures** offers parallel decoding by pictures. **By slices** allows parallel decoding by slices. Finally, the option **Off** allows serial decoding.

Number of threads specifies the number of threads that should be used for decoding.

Synchronization specifies the PTS (*Presentation Time Stamp*) usage for calculating the output time. **PTS** transfers the incoming PTS from input bit stream to output frames. **PTS (reference only)** allows to transfer PTS only for reference frames, interpolate PTS for non-reference frames based on frame rate. **Direct timestamps** uses direct timestamps for calculating the output time. Finally, the option **Off** interpolates all output PTS based on frame count and frame rate.

Rate interpretation specifies the way of interpretation of the frame rate value. In accordance with the standard this value should correspond to the field rate. The available options are **Field rate**, **Frame rate** and **Fixed rate**.

Fixed frame rate specifies the value of frame rate.

Enabling (**On**) the **OSD** (*On-Screen Display*) option shows some decoding/stream statistics (picture type, frame-rate etc.). It is only available in software mode (i.e. it is not available for DXVA). It can be disabled by setting it to **Off**.

Format type sets video format structure for the output Media Type. It offers the following options: **Only VIDEOINFO** connections are allowed. **Only VIDEOINFO2** connections are allowed. The option **Both** means that VIDEOINFO and VIDEOINFO2 connections are allowed.

Low Latency allows you to enable and disables the minimal output delay.

Stream Order enables/disables the output of frames in stream order.

[svc] dependency_id max specifies the maximum number of layers that should be decoded.

[svc] quality_id max specifies the maximum 'quality_id' value of layer which must be decoded.

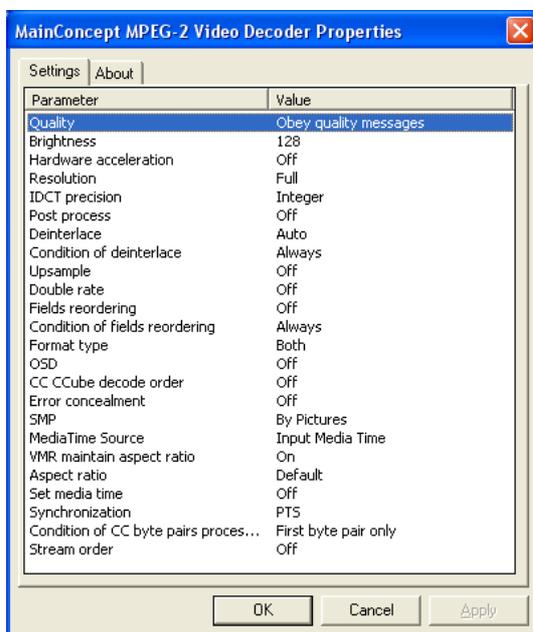
[svc] temporal_id max specifies the maximum 'temporal_id' value of layer which must be decoded.

[svc] Show base layer indicates whether base layers should be decoded or not.

The MainConcept MPEG-2 Video Decoder

The MainConcept **MPEG-1/2 Video Decoder** filter is a software-only decoding solution for MPEG-2 video (ISO/IEC 13818-2) and MPEG-1 video (ISO/IEC 11172-2) streams. The Decoder is implemented as a DirectShow® filter. The filter can process MPEG video streams produced by the MainConcept MPEG2 Demultiplexer filter or by any other compliant filter, such as Microsoft® MPEG-2 Splitter, MPEG-2 Demultiplexer or MPEG-1 Stream Splitter. DirectShow® filters provide additional stream handling, such as reading from a file or network source and rendering it to a window or DirectDraw® surface. The filter can process Closed Captions (CC) and has a CC output pin. The CC data output is executed in a way suitable for decoding by the software Line 21 decoder filter which comes with DirectShow®.

The MPEG-2 Video Decoder offers two panes: **About** and **Settings**. We will describe the various settings in more details now.



Quality sets the decoding quality of the stream. The option offers four settings: **Decode I frames only** decodes I frames only, but skips P and B frames. For field pictures, decodes second field of I frame, which comes as a P picture. **Decode I, P frames only** decodes I and P frames only, but skips B frames. **Decode all frames (I, P, B)** decodes all frames without regard to quality messages from the upstream filter. **Obey quality messages** responds to quality messages from the downstream filter by skipping frames.

Brightness sets the brightness level.

Hardware acceleration enables hardware acceleration via the DirectX Video Acceleration interfaces (if available).



The **Hardware acceleration** feature is enabled by default. If you encounter some picture errors during playback, we recommend to disable the hardware acceleration and try again if the problems disappear. Some graphics cards cause problems with hardware acceleration turned on.

Resolution specifies the output resolution mode. The option offers four parameters **Full**, **Half horizontal** (output video becomes $\frac{1}{2}$ of original frame width), **Half vertical** (output video becomes $\frac{1}{2}$ of original frame height), and **Quarter** (output video becomes $\frac{1}{2}$ of original frame width and height).

IDCT precision specifies the precision of IDCT procedure. The option offers two settings **Integer** (IEEE-1180 integer precision IDCT), and **Float** (IEEE-1180 reference double precision floating point IDCT).

Post process removes the MPEG compression artifacts using deblocking and deringing filters.

Deinterlace sets the deinterlacing mode. There are four modes available: **Weave** does not deinterlace, but output interleaved fields. **Vertical filter deinterlace** selects vertical deinterlace function). **Field interpolation** does deinterlacing by interpolation. **VMR Deinterlacing** puts correct interlacing flags on output samples and lets VMR (Video Mixing Renderer) decide on deinterlacing.

Condition of deinterlace specifies the condition when the decoder must deinterlace output frames. Here you find the following options: **Always**, **Interlaced frames**, and **Progressive frames**.

Upsample improves visual quality of decoded video (chrominance component).

Double rate generates one progressive frame from every field.

Fields reordering changes the order of fields by changing the specific media sample flags.

Condition of fields reordering specifies the condition when fields must be reordered: **Always**, **If TopFirst flag is true**, or **If TopFirst flag is false**.

Format type sets video format structure for the output Media Type. The option offers three parameters: only **VIDEOINFO** connections are allowed, only **VIDEOINFO2** connections are allowed, and **Both** VIDEOINFO and VIDEOINFO2 connections are allowed.

OSD enables the 'On screen display' feature (displaying of the decoding statistical information).

CC CCube decode order parses several different Closed Caption formats.

Error concealment sets the error concealment mode. When set to **Off**, the error concealment is disabled. **Not show frames with errors** enables error concealment is enabled (frames with errors are not shown).

SMP enables Hyper-Threading if it is available.

Media Time Source displays the source (input/GOP time code) of media times.

Enable **VMR maintain aspect ratio** to preserve the aspect ratio of the source video when the output video pin is connected to the VMR.

Aspect Ratio forces the picture aspect ratio. Available options are Default, 1x1, 4x3 and 16x9.

Set media time allows you to set media times on output media samples, which are delivered from the «VideoOut» pin.

Synchronization specifies the PTS (*Presentation Time Stamp*) usage for calculating the output time. **PTS** transfers the incoming PTS from input bit stream to output frames. **PTS (reference only)** allows to transfer **PTS only for reference frames**, interpolate PTS for non-reference frames based on frame rate. **Direct timestamps** uses direct timestamps for calculating the output time. Finally, the option **Off** interpolates all output PTS based on frame count and frame rate.

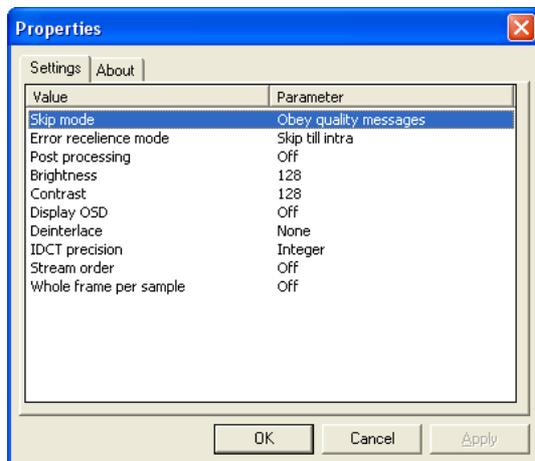
The option **Condition of CC byte pairs processing** sets the condition of CC byte pairs processing.

Stream order specifies whether the decoder should display the output frames in stream order or not.

The MainConcept MPEG-4 Part 2 Video Decoder

The **MainConcept MPEG-4 Video Decoder** filter is a software-only decoding solution for MPEG-4 (ISO/IEC 14496-2) streams. The decoder is implemented as a DirectShow® filter. The filter can process ISO/IEC 14496-2 video streams produced by the MainConcept MPEG Demultiplexer filter, MainConcept MP4 Demultiplexer filter or by any other compliant filter, such as DivX, Xvid Video Encoders etc.

The MPEG-4 Part 2 Video Decoder offers two panes: **About** and **Settings**. We will describe the various settings in more details now.



Skip mode sets the decoding quality of the stream. The option offers four settings: **Decode I frames only** decodes I frames only, but skips P and B frames. For field pictures, decodes second field of I frame, which comes as a P picture. **Decode I, P frames only** decodes I and P frames only, but skips B frames. **Decode all frames (I, P, B)** decodes all frames without regard to quality messages from the upstream filter. **Obey quality messages** responds to quality messages from the downstream filter by skipping frames.

The **Error Resilience mode** drop-down menu specifies the way the H.264/AVC decoder recovers from bit stream errors. The option **Skip till Intra** is useful in case of bit stream errors. Then all slices until the next intra slice are skipped. It may produce artifacts if pictures before an intra slice are used as a reference for pictures after an intra slice. **Decode anyway** ignores bit stream errors.

Post processing allows performing a computationally intensive post process procedure that causes smoothing edges of highly quantized blocks.

Deblock strength (%) specifies the percentage rate of the deblocking filter's usage.

Brightness sets the brightness level.

Contrast sets the contrast level.

The **Display OSD** option enables/disables 'On screen display' feature (displaying of the decoding statistical information such as current frame type, number of decoded frames, number of skipped frames).

Deinterlace sets the deinterlacing mode. There are four modes available: **Weave** does not deinterlace, but output interleaved fields. **Vertical filter deinterlace** selects vertical deinterlace function). **Field interpolation** deinterlaces by interpolation. **VMR Deinterlacing** puts correct interlacing flags on output samples and lets VMR (Video Mixing Renderer) decide on deinterlacing.

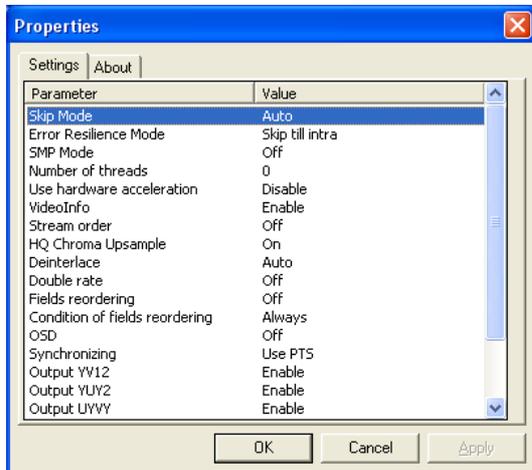
IDCT precision forces the decoder to use the double precision reference IDCT algorithm. By default, the decoder uses the optimized CPU-specific IEEE-1180 compliant **Integer** IDCT. As a reference, the double precision IDCT algorithm from the IEEE 1180-test was used (**Float**). This algorithm is useful for editing applications due to the high precision, though it is quite slow regarding the order of magnitude.

Stream order specifies whether the decoder should display the output frames in stream order or not.

Whole frame per sample forces decoder to assume that every sample buffer contains complete frame to process it and send ready frames to renderer immediately.

The MainConcept VC-1 Video Decoder

The **MainConcept VC-1 Decoder** filter is a software-only decoding solution for SMPTE 421M-2006 (VC-1) video streams. The Decoder is implemented as a DirectShow® filter and can be used by any DirectShow® application (e.g. Windows® Media Player). The filter can process VC-1 video streams produced by the MainConcept MPEG Demultiplexer or any other compliant filter, such as Microsoft® ASF Reader.



Skip Mode specifies types of frames that decoder will skip. In case of field pictures frame type is determined by the type of first coded slice of complimentary field pair. **None** decodes all frames without regard to quality messages from a downstream filter. **Decode reference only** decodes all reference frames, skips non-reference frames. **Decode intra only** decodes I frames only, skips P and B frames. In case of field coding, frame type is determined by the type of first coded picture of a complimentary field pair. **Auto** responds to quality messages from a downstream filter by skipping frames.

Error Resilience Mode specifies the way decoder recovers from bit stream errors. Skip till Intra skips all slices till next intra slice in case of bit stream errors. Decode anyway ignores bit stream errors.

SMP mode offers various Hyper-Threading options if they are available. **Auto** checks for multi-threading and using "by picture" mode it is available. The option **By pictures** offers parallel decoding by pictures. **By slices** allows parallel decoding by slices. Finally, the option **Off** allows serial decoding.

Number of threads specifies the number of threads that should be used for decoding.

Use hardware acceleration enables hardware acceleration via the DirectX Video Acceleration interfaces (if available).

VideoInfo enables or disables the usage of the VIDEOINFOHEADER format structure along with VIDEOINFOHEADER2.

Stream order specifies whether the decoder should display the output frames in stream order or not.

HQ Chroma Upsample improves the visual quality of decoded video (chrominance component).

Deinterlace sets the deinterlacing mode. When choosing **Weave** no deinterlace is done and the decoder outputs interleaved fields. **Vertical filter deinterlace** applies a vertical deinterlace function. **Field interpolation** enables deinterlace by interpolation. **VMR Deinterlacing** puts correct interlacing flags on the output samples and let the VMR (Video Mixing Renderer) decide on deinterlacing.

Double rate generates one progressive frame from every field.

Fields reordering changes the order of fields by changing the specific media sample flags.

Condition of fields reordering specifies the condition when fields must be reordered. There are three options: **Always**, **Top field is first** and **Bottom field is first**.

OSD enables or disables the displaying of frame statistical information on output images. Useful for debugging.

Synchronizing sets the synchronization mode used by decoder. **Use PTS** transfers the incoming PTS from the input bit stream to the output frames. **Ignore PTS on non-reference frames** transfers the PTS only for reference frames, interpolates the PTS for non-reference frames based on the frame rate. **Ignore all PTS** interpolates all output PTS based on frame count and frame rate.

Output YV12 enables or disables YV12 color space (native VC-1 format) output.

Output YUY2 enables or disables YUY2 color space output.

Output UYVY enables or disables UYVY color space output.

Output RGB32 enables or disables RGB32 color space output.

Output RGB24 enables or disables RGB24 color space output.

Output RGB565 enables or disables RGB565 color space output.

Output RGB555 enables or disables RGB555 color space output.

The MainConcept DV/DVCPRO 25/50/HD Video Decoder

The **MainConcept DVCPRO HD** video decoder DirectShow filter allows decoding of consumer DV 25 Mbit (IEC-61834), DVCPRO 25/50 Mbit (SMPTE 314M), and DVCPRO HD in 720 50/60p and 1080 50/60i (SMPTE 370M).



The **Fast decoding** checkbox enables the usage of fast decoding method. This will result in slightly lower quality.

Change field order allows you to invert the upper and lower field.

Decode to CIF size play back the video streams in CIF format.

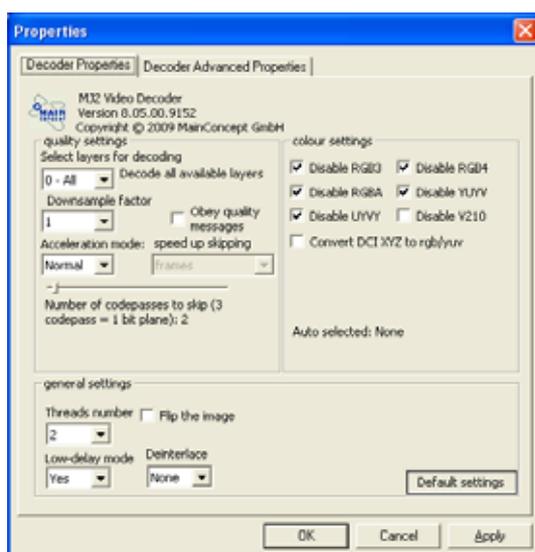
RGB 16..235 specifies the usage of the RGB format as clamped format: (16,16,16) is black, (235,235,235) is white.

Clamp YUV to ITU-610r allows clamping YUV values to ITU601R legal values.

Disable 16x9 ignores the 16x9 flag in DV (CIF only).

The MainConcept JPEG2000 Video Decoder

The **MainConcept JPEG2000** (also known as J2k) Video Decoder filter allows software-only decoding of JPEG2000 video (ISO/IEC 15444-1) streams. It is fully DCI compliant.



The **Decoder Properties** tab offers the following options under **quality settings**:

Select layers for decoding allows you to specify the max. number of layers for decoding. **0** decodes all layers, **1** decodes layer 1 only, **2** decodes layer 1 through 2 only, **3** decodes layer 1 through 3 only, etc.

Downsample factor defines the downsampling factor exponent.

Acceleration mode sets the appropriate acceleration mode.

When **Obey quality messages** is selected, the filter handles the quality messages generated with the video renderer.

Number of codepasses to skip adjusts the level of quality degradation in favor of faster playback. The parameter sets the number of codepasses to skip at bit level decoding of the bitstream. Accepted values are from 0 to 31. But, if the value will be more than 23, the user will not be able to see the image. Therefore, the real maximal value is limited to 23.

Under **colour settings** you find the following options:

Disable RGB3 disables the RGB3 output.

Disable RGB4 disables the RGB4 output.

Disable RGBA disables the RGBA output.

Disable UYVY disables the UYVY output.

Convert DCI XYZ to rgb/yuv enables transform from DCI's xyz format.

Under **general settings** you find the following options:

Number of threads specifies the number of threads that should be used for decoding.

Low-delay mode enables inter (**No**) or intra (**Yes**) frame multithreading.

Flip the image turns the picture upside down.

Deinterlace sets the deinterlace mode. **None** disables the option, so decoder uses interlace. If you select **Weave** no deinterlace is done, i.e. the decoder outputs interleaved fields. **VMR** puts correct interlacing flags on output samples and lets VMR (*Video Mixing Renderer*) decide on deinterlacing.

Default settings restores the J2k decoder to its default settings.

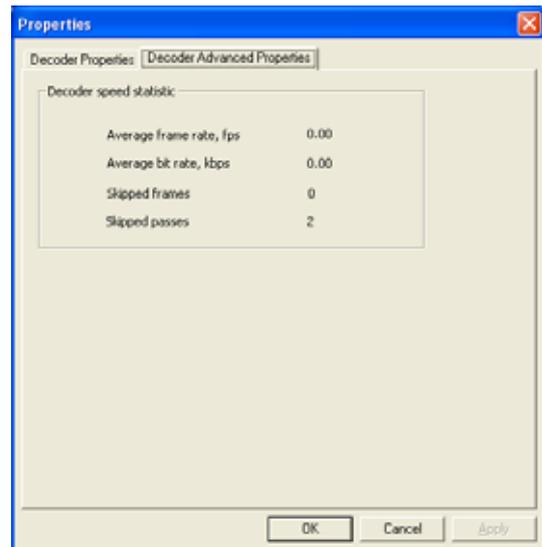
The **Decoder Advanced Properties** tab provides information about the following parameters:

Average frame rate, fps indicates the average frame rate (read-only).

Average bit rate, kbps displays the average bitrate (read-only).

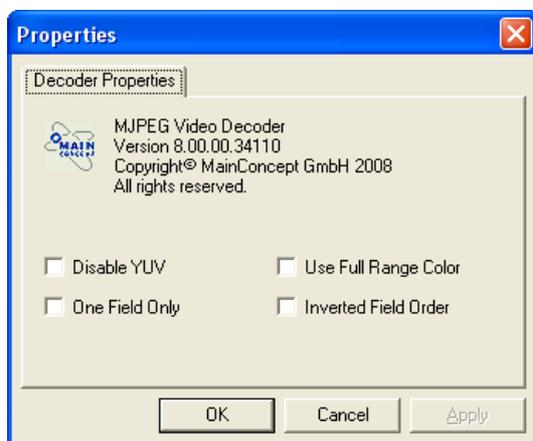
Skipped frames indicates the number of skipped frames during decoding (read-only).

Skipped passes indicates the number of code-passes to skip at bit level decoding of the bit-stream (read-only).



The MainConcept Motion JPEG Video Decoder

The **MainConcept MJPEG** allows you to read analog video footage on your computer. It is optimized for MMX technology. The filter should be able to decode PAL/NTSC coded AVIs in near realtime. It can decode Motion-JPEG (Movie-JPEG, MJPEG, MJPG) AVIs, created with Miro (DC10, DC20 and DC30), FAST, Matrox and similar cards.



The decoder currently supports RGB16, RGB24, YUY2 and UYVY color spaces as input formats. It is possible to disable the YUY2 and UYUY color spaces by activating the **Disable YUV** checkbox.

One Field Only decodes only one field of interlaced MJPEG AVIs, which is much faster than encoding both fields.

Use Full Range Color specifies whether the ITU601 recommendations should be ignored or not.

Inverted Field Order simply reverses the field order.

The MainConcept VC-3 Video Decoder

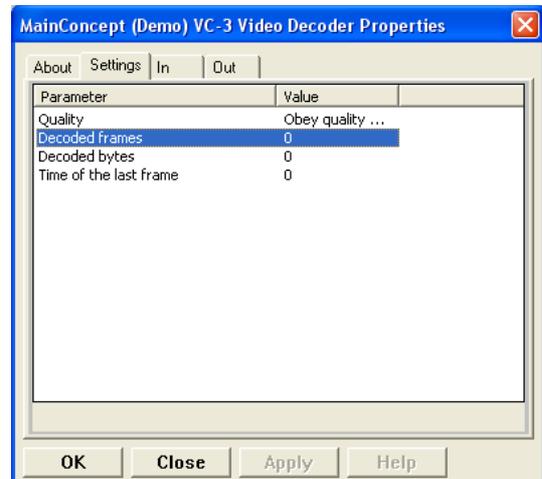
The **MainConcept VC-3 Decoder** filter is a software-only decoding solution for SMPTE 2019-2006 (VC-3) video streams. It allows the decoding of DNxHD compliant streams.

Quality specifies the decoding quality. **Decode all frames** allows you decoding all frames without regard to quality messages from the downstream filter. **Obey quality messages** responds to quality messages from the downstream filter by skipping frames.

Decoded frames displays the number of decoded frames.

Decoded bytes displays the number of decoded bytes.

Time of the last frame displays the time of the last decoded frame.



The Audio Decoder Properties

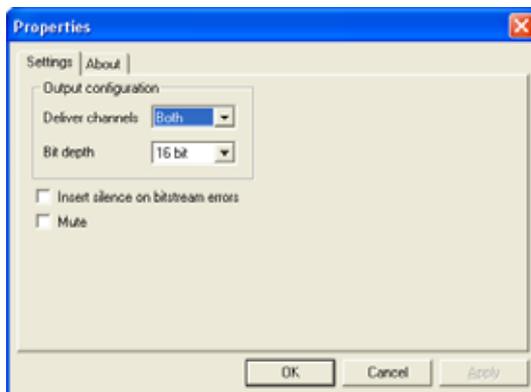
The MainConcept AAC Decoder

The MainConcept **AAC Decoder** filter enables the software-only decoding of MPEG-2 (ISO/IEC 13818-7) and MPEG-4 (ISO/IEC 14496-3) AAC audio streams.



The demo version of the AAC Decoder DirectShow filter has an decoding limitation of 30 seconds for files which include AAC audio, i.e. after this period of time audio is muted and only video is played back correctly.

The AAC Decoder offers two panes: **About** and **Settings**. It only has two settings right now.



Deliver channels specifies the output channels configuration: **Both**, **First** and **Second**.

Bit depth specifies the output bit depth.

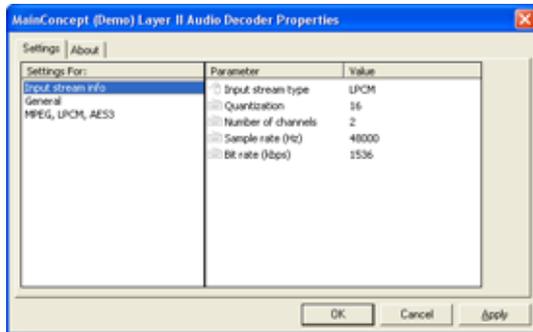
Insert silence on bitstream errors specifies whether silence should be added on bitstream errors or not.

The **Mute** option allows you to mute the audio during playback.

The MainConcept MPEG Audio Layer 1&2 Decoder

The **MainConcept MPEG Audio Decoder** filter enables the software-only decoding of MPEG-1, MPEG-2, MPEG-2.5, LPCM audio streams.

Here are the MPEG Layer II Audio Decoder filter's **Input Stream Info** options. They are all read-only items:



Input stream type indicates type of the input audio. The possible values are: MPEG-1, MPEG-2, MPEG-2.5, and LPCM.

Mode shows the MPEG audio layer of the stream according to ISO/IEC 11172-3 and 13818-3.

Channels config shows the channel configuration for MPEG and AC-3 streams.

Bit stream ID indicates the bit stream ID.

Quantisation shows the quantization value for LPCM streams.

Number of channels displays the number of channels in LPCM streams.

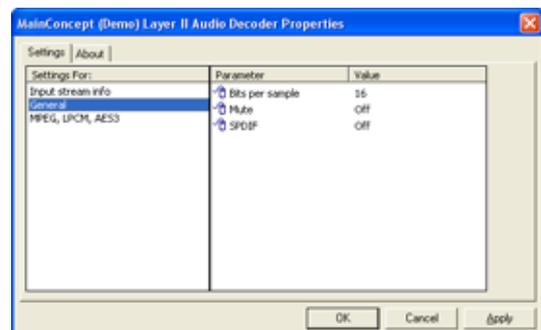
Sample rate (Hz) shows the sample rate value.

Bit rate (kbps) displays the bitrate value.

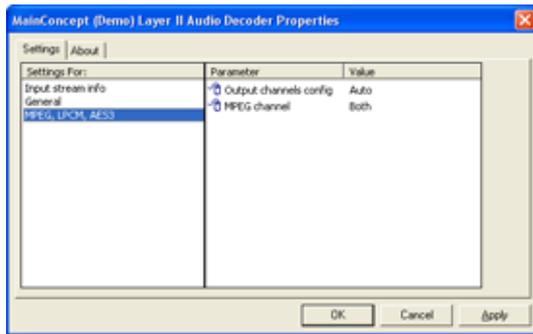
Here are the MPEG Layer II Audio Decoder filter's **General** settings. It includes some general settings for all decoders: MPEG, AC-3, AAC, LPCM, ProLogic II.

Bit per sample specifies output sample quantization. The available parameters are **16** and **32**.

The **Mute** option mutes (**On**) the output.



When enabling **MPEG, LPCM, AES3** you find two more options among the MPEG Layer II Audio Decoder filter settings. It includes some general settings for MPEG, AES3 and LPCM decoders.



Output channels config specifies the configuration of output channels. Available values are: **Auto**, **Stereo** and **Mono**.

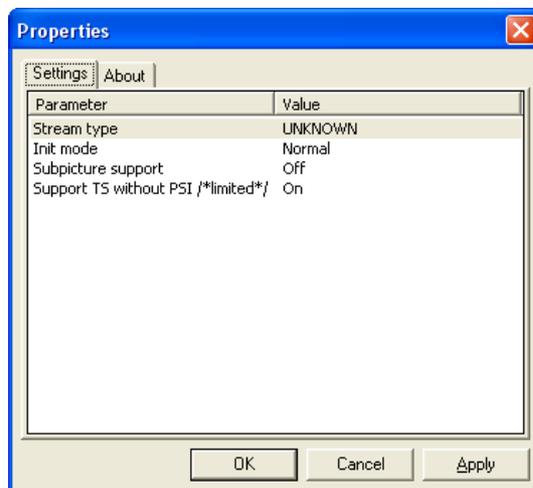
MPEG channel configures the MPEG channels for reproduction. Available values are: **Both**, **First** and **Second**.

The Demultiplexer Properties

The MainConcept MPEG Pull Demultiplexer

The **MainConcept MPEG Pull Demultiplexer** filter is a DirectShow® filter designed for the software-only splitting of MPEG-1 System Streams, MPEG-2 Program Streams and MPEG-2 Transport Streams into video and audio streams. The Pull Demultiplexer operates with subpicture streams and allows for the parsing of MPEG-1 and MPEG-2 video-only streams and H.264 video streams. The MainConcept MPEG Pull Demultiplexer filter performs seek operations in a media file by using Presentation Time Stamps (PTS), bitrate or MainConcept indexing technology. It is fully compatible with the MainConcept MPEG-2 Video Decoder and the MainConcept MPEG Audio Decoder.

The MPEG Pull Demultiplexer offers two panes: **About** and **Settings**. We will describe the various settings in more details now.



The **Stream Type** parameter shows the type of the detected stream after connecting to the source.

The **Init Mode** option specifies an algorithm of the initial stream duration calculation. **Normal** initialization mode, scans the stream and checks the monotony of the PTS (*Presentation Time Stamp*) increment. If PTS is incremented monotonically, the duration is calculated by PTS. If there is a gap or reset of PTS, the duration is calculated by bitrate. The **Simple** initialization mode, does not perform the stream scanning to check monotony of the PTS increment. The duration is always calculated by PTS.

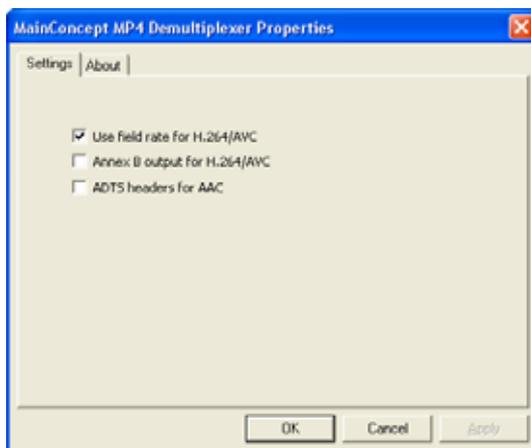
Subpicture Support enables (**On**) and disables (**Off**) the subpicture streams support.

Support TS without PSI /*limited/ specifies whether the first video PID belongs to the first audio PID or not (if there is no PAT/PMT present).

The MainConcept MP4 Demuxer

MainConcept MP4 Demuxer is a DirectShow® filter that provides demultiplexing of MPEG-4 (Intermedia Format (MP4)), 3GPP System streams into a MPEG-4, H.263, AVC/H.264 video streams and AAC, MPEG-1/2 Audio Layer 3 audio streams. MainConcept MP4 Demultiplexer is fully compatible with MainConcept MPEG-4 Video Decoder, MainConcept AVC/H.264 Video Decoder, ffdshow MPEG-4 Video Decoder, 3ivx D4 Video Decoder, MainConcept Audio Decoder, ffdshow Audio Decoder and 3ivx D4 Audio Decoder.

The MP4 Demuxer offers two panes: **About** and **Settings**. We will describe the few settings in more details now.



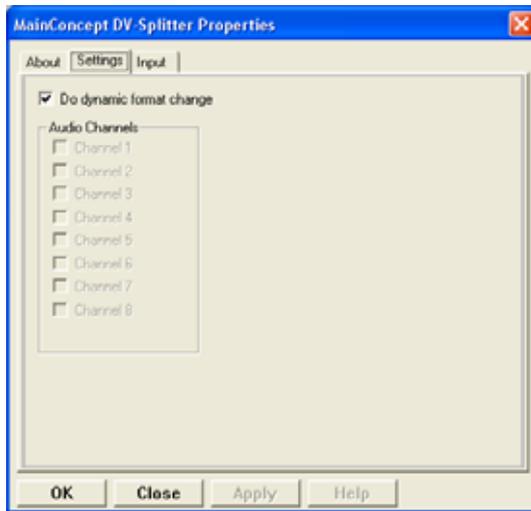
Ticking the checkbox **Use field rate for H.264/AVC** activates the correct time stamps calculation for H.264/AVC, when the field rate is used in the sequence header instead of the frame rate.

Ticking the checkbox **Annex B output for H.264/AVC** produces H.264/AVC output in conformity with ISO/IEC 14496-10 Annex B.

Ticking the checkbox **ADTS headers for AAC** adds an ADTS header to each AAC sample.

The MainConcept DV Splitter

The **MainConcept DV Splitter** filter splits an interleaved digital video (DV) stream into its component video and audio streams.

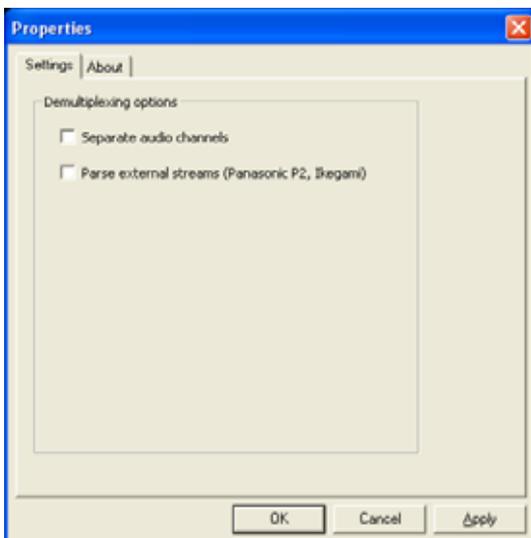


Do dynamic format change enables and disables the dynamic format change during streaming.

The **Audio channels** checkboxes specify the fit channels. Channels that are lacking an input stream are grayed. The marked ones will be included in the output audio stream.

The MainConcept MXF Demuxer

The **MainConcept MXF Demuxer** filter provides demultiplexing of MXF (Material eXchange Format) streams, such as XDCAM HD, XDCAM IMX, P2 DVCPRO HD, P2 AVC-Intra, JPEG2000, etc.



Separate audio channels allows that the demuxer creates one output pin for each audio channel.

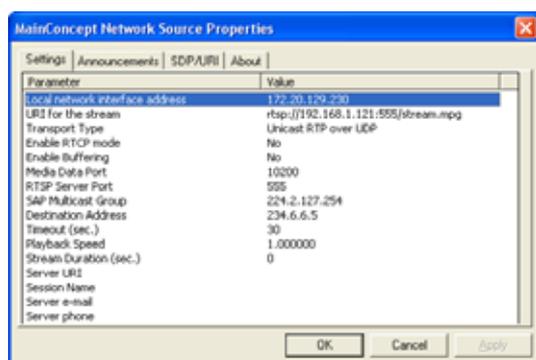
Parse external streams allows to parse external streams (for Panasonic P2, Ikegami).

The Network Source Properties

The MainConcept Network Source

The DirectShow filter **Network Source** supports two protocols: RTP (connecting to broadcast servers) and RTSP (video on demand). The filter can receive media streams from the network: AVC/H.264 Video, MPEG-4 Video, AAC Audio, MPEG-1 System Stream, MPEG-2 Transport Stream, MPEG-2 Program Stream, Audio, MPEG-1 Video, MPEG-1 Audio (including MPA-Robust for MPEG-1 Layer-3 Audio according to RFC-3119), MPEG-2 Video, MPEG-2 Audio, and AC-3 Audio.

The Network Source Settings pane



The **Settings** pane offers various general options for the filter:

Local Network interface address defines the interface address of the local network.

URI for the stream specifies the URI path for the stream.

Transport Type specifies the transport type of received data. The available options are **Unicast RtpAvpUdpMode**, **InterleavingMode**, **Multicast**

RtpAvpMod, **UnicastRawUdpMode**, **MulticastRawMode**, **UnicastRawTcpMode**.

Enable RTCP mode enables (**Yes**) or disables (**No**) the RTCP mode.

Enable buffering allows you enable (**Yes**) and disable (**No**) the stream buffer.

Source port displays the source port from which the data is received

Server connection port specifies the connection server port.

SAP Multicast Port declares the multicast group for the announces (from which address SDP should be received, i.e. RFC2974 or any user defined address).

Destination Address specifies the main connection address (multicast group under RTSP, and indicates media data supplier address under RTP mode).

RTSP Server Address specifies the RTSP server address.

Timeout (sec.) specifies the time out value in seconds.

Playback Speed it is a scale value, which is actual only for RTSP mode to change the playback rate.

Stream duration (sec.) retrieves the duration stream from SDP in seconds.

Server URI retrieves the server URI from SDP.

Session name retrieves the session name from SDP.

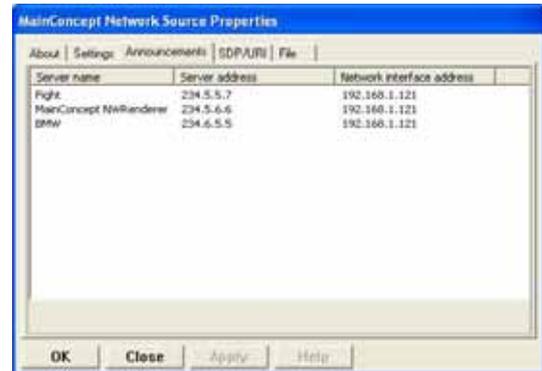
Server e-mail retrieves the server e-mail from SDP.

Server phone retrieves the server phone from SDP.

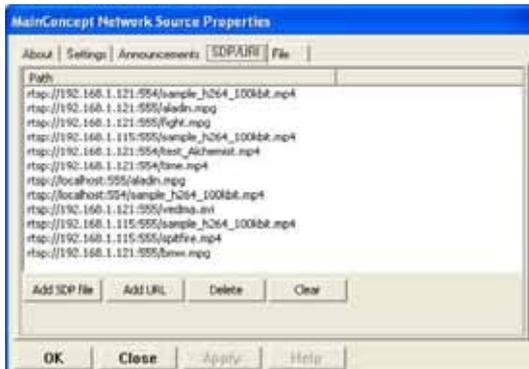
Session Info is a description field that displays values from SDP (RFC2327).

The Network Source Announcements pane

The **Announcements** pane displays some information on the current session, such as **Server name**, **Server address** and **Network interface address**.



The Network Source SDP/URL pane



In the field in the middle of the **SDP/URL** pane you see the **Path** information of the streams you find under the corresponding network address.

The four buttons below perform these functions:

Add SDP file allows you to load the necessary SDP file (Session Description Protocol), in which all necessary settings for RTP streaming (simple broadcasting) are present. The client will automatically make a connection.

Add URL can be used for playlist generating. The protocol will be automatically detected, Here are some examples:

rtp://234.5.6.7:1234 - will automatically make a connection on 234.5.6.7 multicast group on port = 1234, via RTP (UDP will be used as lower transport);

udp://234.5.6.7:1234 - will automatically make a connection on 234.5.6.7 multicast group on port = 1234, for simple UDP broadcasting;

tcp://192.157.4.3:1234 - will automatically make a connection on 192.157.4.3 unicast address on port = 1234, for simple TCP streaming;

`rtsp://192.156.5.6:554/stream1.mp4` - will automatically make a connection on 192.156.5.6 unicast address (RTSP server address) on port = 554, for RTSP session. Protocol and other settings are adjusted via "Settings" tab, before URL will be applied.

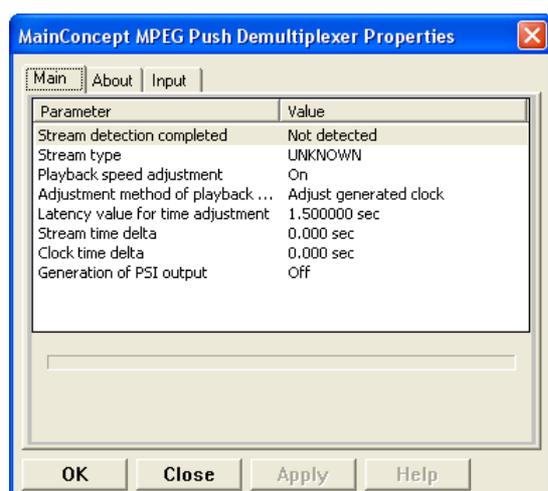
Delete removes the selected connection from the list.

Clear resets the current **Path** display list.

The MainConcept MPEG Push Demultiplexer

The MainConcept **MPEG Push Demultiplexer** filter is a software-only MPEG splitter implemented as a Microsoft® DirectShow® transform filter. The MainConcept MPEG Push Demultiplexer is designed to split MPEG-2 (ISO/IEC 13818-2) and MPEG-1 (ISO/IEC 11172-2) streams provided by source or transform filters in Push (Sync) mode into video and audio streams. It is fully compatible with the MainConcept MPEG-2 Video Decoder and the MainConcept Audio Decoder.

The MPEG Push Demultiplexer offers two panes: **About** and **Settings**. We will describe the various settings in more details now.



Stream detection completed is a read-only option. It indicates the status of the stream detecting process.

Stream type shows the recognized stream type.

Playback speed adjustment enables (**On**) and disables (**Off**) the reference clock generation and adjustment of the playback rate.

The drop-down menu **Adjustment method of playback speed** offers two options: When you select **Adjust generated clock**, the demultiplexer provides the reference clock with the time which is adjusted in accordance with the input data rate. **Adjust time stamps** sets the demulti-

plexer's time stamps on output samples that depend on the input data rate.

Latency value for time adjustment indicates the value that is used for the playback rate adjustment. This parameter specifies the latency between the data reception and playback, that may be needed to avoid the playback jerking.

Stream time delta indicates the maximum time delta inside the stream (read-only).

Clock time delta displays the current difference between the time reported by the reference clock and the outgoing time stamps. It is a read-only parameter as well.

The drop-down menu **Generation of PSI output** turns **On** the demultiplexer to work with manually created output pins. It can be disabled with **Off**.

The MeritMe! Tool

Using the MeritMe! Tool

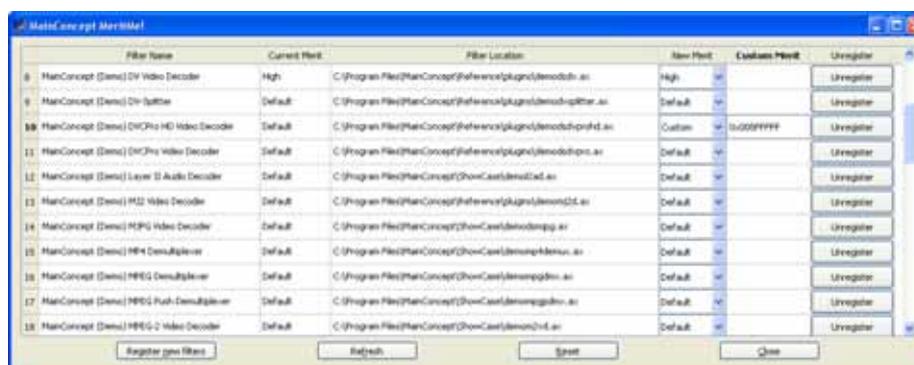
The MeritMe! tool enables you to change the merit of all installed MainConcept Video and Audio Decoder as well as Demultiplexer DirectShow filters. The aim of it is to increase the priorities of the filters that should be used to play back a file in the Media Player.



The MeritMe! tool does not only display the DirectShow filters that come with a MainConcept Decoder Pack or ShowCase. It shows all MainConcept audio/video decoders and demultiplexers that are currently registered on your system. It also informs you whether these filters are installed as demo or as full versions.

Every filter is installed with a specific merit on a system. As already mentioned in the previous chapter, when playing back a clip in the Media Player, you cannot be sure that the MainConcept filters are used. This might cause problems when DirectShow filters from different companies are mixed, in order to decode a stream. Using the MeritMe! tool, you can define a specific priority for the installed MainConcept DirectShow filters, so you can increase and decrease the usage of a decoder or demuxer.

When you start MeritMe! from the Windows **Start** menu, the following dialog appears:



Under **Filter Name** you find the list of registered MainConcept DirectShow audio and video decoder as well as demuxer filters. The list contains demo as well as full versions.

Current Merit displays the current merit of a DirectShow filter.

Filter Location shows the path where the filter is registered on your system. You can select the link and copy it to the Explorer by using **Ctrl+C**.



DirectShow filters that have been registered, but are not in their actual location anymore, are marked with an **<Invalid Path>** extension before the entry.

The **New Merit** drop-down menu enables you to specify the new merit for a filter. It offers the following parameters:

- **Default:** Sets the filter back to its original values when it was registered the first time.
- **Disable:** Disables the DirectShow filter, so that it is not used anymore (MERIT_DO_NOT_USE = 0x00200000).
- **High:** Sets the filter's merit to the maximum (0xFFFFFFFF), so that it should definitely be used when decoding a specific format.
- **Custom:** When choosing this option, an input prompt will be enabled, where you can enter the new merit as a hexadecimal value.

Under **Custom Merit** the value is displayed that you have entered manually.

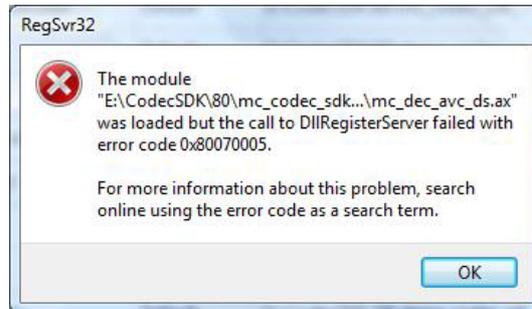
The **Unregister** button in the last column enables you to unregister the selected filter. The filter entry is then removed from the list completely.

At the bottom of the MeritMe! tool are three buttons that perform the following functions:

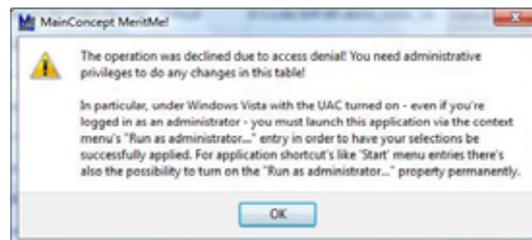
- **Register new filters:** This option opens a new window that enables you to look for DirectShow filters (*.ax) on your system. Select the desired filters you want to register and confirm with **OK**. Now they can also be edited in MeritMe for future use!
- **Refresh:** Clicking the button refreshes the current status and view of the DirectShow filters in the MeritMe! tool.
- **Reset:** Press the button, in order to set all filters back to their original setting, i.e. to the state when they have been registered the first time on your system.
- **Close:** Click this button to leave the MeritMe! tool.

IMPORTANT NOTE:

Under **Microsoft Windows Vista**, you need to run MeritMe! as “**Run as administrator...**”, otherwise you will get an *Access Denied* system error message when registering or unregistering new DirectShow filters. When registering a new filter the following error message might appear:



If this is the case, please start MeritMe! as administrator and repeat the task. The same is valid when you receive the following message.



However, this message box is displayed by the MeritMe! tool, and not by your operating system.

Technical Support

MainConcept Support

If you want more information about MainConcept ShowCase, visit our website at www.mainconcept.com. Visit the **Support** section for a variety of resources.

If you need additional assistance, the MainConcept Technical Support team is standing by to help. Send an e-mail to support@mainconcept.com, and we will assist you as quickly as possible.

Additional Information

Be sure to check the MainConcept website frequently for updated tips, tricks, tutorials and other information on software decoding.

Thank you for choosing MainConcept ShowCase!