

MainConcept MPEG Encoder - The Advanced Interface

This document will give an overview of the MainConcept MPEG Encoder's advanced settings. It includes the paragraphs you also find in the manual which comes with the MPEG encoder as well as some additional paragraphs for the advanced settings tree in the **Advanced Video Settings** pane. In the next version of the MPEG Encoder these paragraphs will be included in the regular manual. The software as well as the manual are in a state of constant growth so it might be possible that some aspects or parameters are not described in full detail or the complete satisfaction of the user. However, it is difficult to mention and describe every tiny setting in detail. But we try to do so as far as possible. Several options are highly dependent on the source material and this is always different. We don't want to offer a complete guideline for the best possible settings, because this is not possible in such a manual. We restrict ourselves to describing the important functions and tasks of the corresponding settings. But it is enough for now, let's start...!

The advanced interface offers even more settings, primarily for professional users in highly specialized environments. Advanced settings can be saved and loaded using the buttons at the bottom left of the window.

To reach this interface, click the **Advanced...** button in the detailed settings window.

The advanced window includes four panes: **Video Settings**, **Advanced Video Settings**, **Audio Settings** and **Multiplexer Settings**. Some options are only available when certain parameters are in effect.

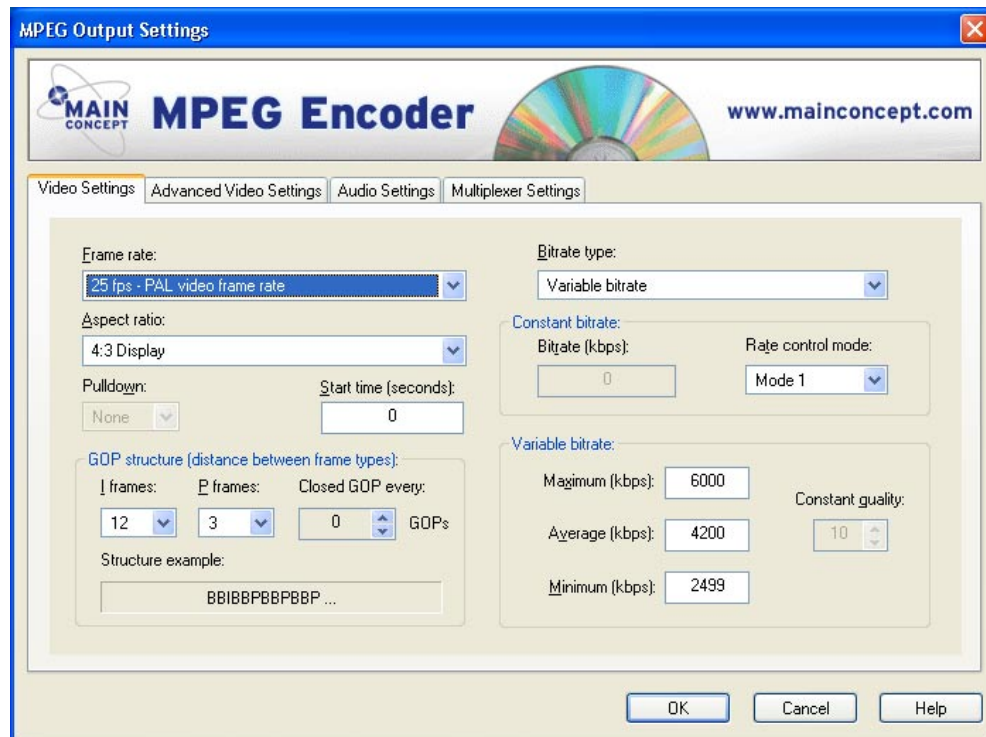


NOTE: The default settings in the main window generally offer the correct settings for high-quality results. We recommend that you only change the advanced settings if you are familiar with them and have a specific need to do so. Incorrect adjustments of these parameters can result in non-compliant MPEG files.

Before we explain the most important **Advanced Settings** in detail here some general remarks before. As mentioned above we recommend that only experienced users should modify these settings. Some of the **Advanced Settings** may be restricted by the settings selected in previous dialogs. When encoding in the VCD, SVCD or DVD formats, it is possible to make changes to these settings such that the resulting file is not compliant for the chosen format.

The Video Settings Pane

In this window you can change the settings for **Frame rate**, **Aspect ratio** and **GOP** (Group of Pictures) **structure**. You can also make various adjustments to the bitrate.



Under **Aspect ratio** you have different options:

Square Pels: Square resolution (used for PC monitors)

4:3: Standard format (TV)

16:9: Widescreen format (16:9 TV, cinema)

2.21:1: Aspect ratio

Pulldown:

The parameters under **Pulldown** convert 23.976 fps (frames per second) to 29.97 fps, or 24 fps to 30 fps, and it is supposed to be done only on progressive frame video (like film). The movie studios slow their films from 24 fps to 23.987 and then encode using pulldown to display at 29.97 fps. The video encoder manipulates the *Top Field First* (tff) and *Repeat First Field* (rff) flags to convert 4 frames (8 fields) to 5 frames (10 fields) like this:

(T = top field, B = bottom field)

frame 1: tff = 1, rff = 0 fields displayed: TB
frame 2: tff = 1, rff = 1 fields displayed: TBT
frame 3: tff = 0, rff = 0 fields displayed: BT
frame 4: tff = 0, rff = 1 fields displayed: BTB

So you get the sequence of fields: TB TBT BT BTB or grouped as frames: TB TB TB TB. The above would be considered **2:3** pulldown as it is 2 fields, 3 fields, 2 fields etc.

3:2 is the reverse:

frame 1: tff = 1, rff = 1 fields displayed: TBT
frame 2: tff = 0, rff = 0 fields displayed: BT
frame 3: tff = 0, rff = 1 fields displayed: BTB
frame 4: tff = 1, rff = 0 fields displayed: TB

In this case you get the sequence of fields: TBT BT BTB TB or grouped as frames: TB TB TB TB.

Start Time (seconds):

This option specifies the starting value of the timecode in the video stream. It is completely arbitrary; as an example one could encode 1 hour of video with the start time set to zero, then encode another hour of video with the start time set to 3600 seconds. Then when the two videos are played one after the other the timecode will be continuous between the two files.

GOP (Group of Pictures) structure:

I frames: These frames are also called Key Frames. All GOPs start with an I frame. I frames contain information for a complete picture, and can be decoded independent of any other frame. I frames are the largest (and least compressed) frames.

P frames: P frames are encoded using information from the previous I or P frame, and can only be decoded correctly if the previous I / P frame is available. P frames are smaller than I frames.

B frames: B frames are usually encoded using information from the previous I or P frame and the next I or P frame. In this case, B frames can only be decoded correctly if the previous and the next I / P frames are available. B frames are smaller than P frames. In addition, B frames can be encoded using only information from the next I / P frame but then they are larger than if they were encoded using both the previous and next frame information.

As a general rule for practical settings: The GOP size (in frames) is specified with the I frame setting and it must be a multiple of the P frame setting. When I frame is set to 1, all frames in the video will be I frames. When I frame is larger than 1, it specifies the size of the GOP, and the P frame setting specifies how often P frames occur in the GOP. If P frame is set to 1, the video will consist of only I and P frames. If P frame is larger than 1, B frames are placed between the P frames and the video will consist of I, P and B frames. Larger GOPs will yield greater compression but will possibly cause a loss of quality. We recommend using the default settings.

Closed GOP every: This value specifies how often the GOPs should be closed and is only of importance if there are B frames present in the GOPs. A value of 0 means do not close any of the GOPs, a value of 1 means close every GOP and a value of 2 means close every other GOP etc. If a GOP is closed, it can be decoded by itself. If a GOP is not closed, the first few B frames of the GOP will be dependent on the last P frame of the previous GOP and cannot be decoded correctly without decoding the previous GOP first. When a GOP is closed, the first few frames of a GOP are encoded so they only depend on the I frame in the GOP (the previous GOP is not required). This can be useful for setting “chapter” points so a player can jump to these GOPs and can start decoding immediately without having to read the previous GOP (or discarding the first few B frames).

Bitrate type:

Constant: Fixed bitrate (the relevant input prompt will be enabled if selected)

Variable: The minimum and maximum values define the bitrate range the encoder should stay within while encoding. The average value is the desired average bitrate of the video stream. The relevant input prompts will be enabled if selected.

Rate Control Mode:

Fast: An older mode, not normally used anymore.

Mode 1: Standard mode (recommended)

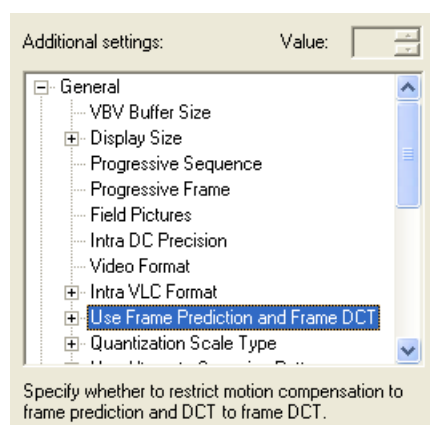
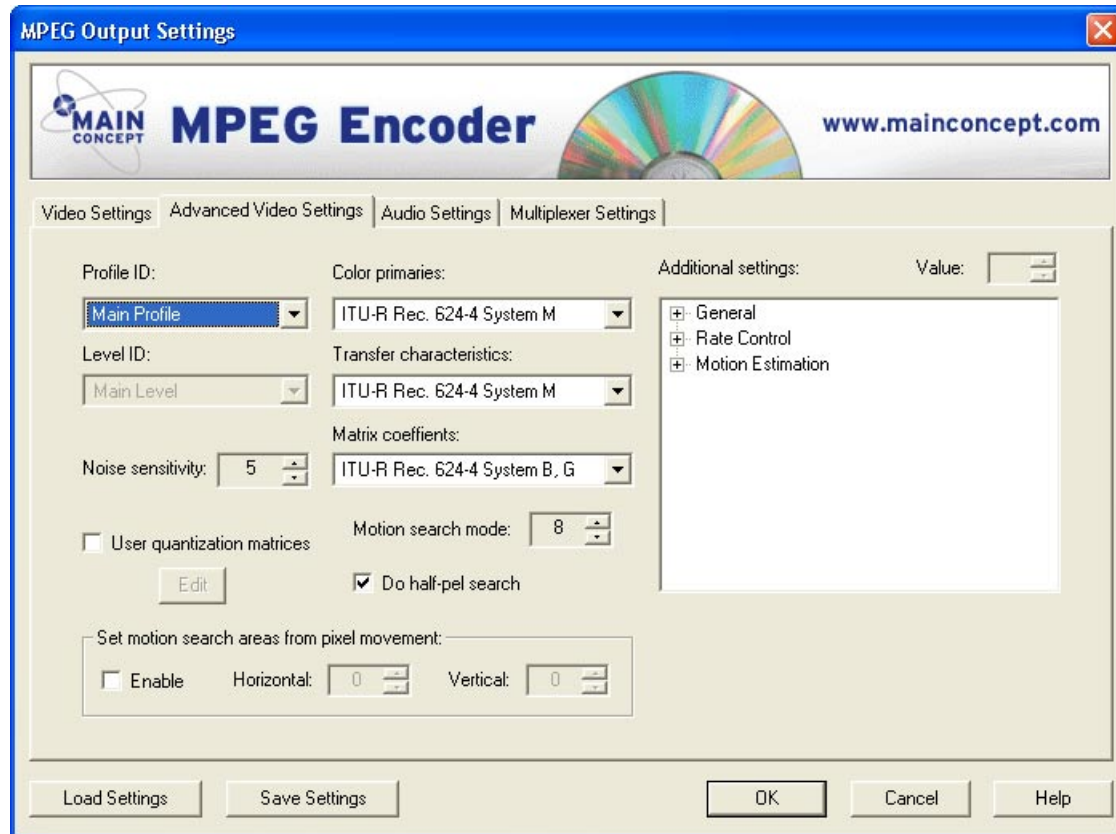
Mode 128: Experimental (will probably cause problems; it should only be used for testing)

Variable Bitrate:

The **Constant quality** affects the macroblock quantization value, sort of the “compression” of the macroblocks. Lower numbers yield better quality and larger files (larger bitrate results in less compression). The range is 1 ... 31; 1 is probably excessive in that the quality does not improve much but the file size increases quite a bit. A range is probably 3 ... 15 for constant quality operation. In normal VBR/CBR modes, the encoder changes the macroblock quantization value to adjust the bitrate; in constant quality mode it does not. You have to set the average bitrate to zero in order to make the **Constant quality** option active.

The Advanced Video Settings Pane

This pane offers professional settings which should not be changed if you are creating MPEG streams for VCD, SVCD or DVD. These adjustments are designed for specific, highly technical environments.



The box on the right side of this pane contains many more parameters for professional users. If you click on an option, details are listed under the box.

NOTE: We highly recommend that these changes are only performed by professional users.

Here are the **Advanced Video Settings** in detail now:

Profile ID:

You have three different options here: **High Profile**, **Main Profile** (standard setting) and **Simple Profile**.

Level ID:

You can choose between **High Level**, **High 1440 Level**, **Main Level** (standard setting) and **Low Level**.

The MPEG-2 spec (specification) allows for a large number of variations in the settings, e.g. the frame resolution can theoretically be as large as $2^{14} \times 2^{14}$. The **Profiles** and **Levels** just set limits on what the values of some of the other settings can be; so if a specification (like the DVD spec) says only *Main Profile/Main* or *Low Level* is allowed, the decoders can safely assume what the bounds of some settings are going to be. A DVD player does not have to account for the resolution being $2^{14} \times 2^{14}$ because the DVD spec only allows a maximum of *Main Profile/Main Level* which only enables for a maximum frame resolution of 720x576.

Noise Sensitivity:

This option specifies how sensitive the video encoder is to noise in the source video; it does not reduce the noise in the source video at all. It sets a motion search threshold at which point the encoder will stop the search for matching blocks of pixels from one frame to another. Higher values mean low sensitivity (faster search times, less quality), while lower values mean higher sensitivity (longer search times, better quality). Typically this option is set in the 1 ... 14 range as follows:

1 ... 5 - Computer animation, VCD from DV-Source, after a line-filter or noise reducing filter (virtually no noise in the source video)

3 ... 7 - Digital video, DV-quality, Hi8-quality etc.

5 - 14 - Analog captured video, Video 8, Hi8, broadcast TV

The parameters under **Color Primaries**, **Transfer Characteristics** and **Matric coefficients** are the same in the three drop-down menus:

ITU-R Rec. 709 (1990)

Unspecified

ITU-R Rec. 624-4 System M

ITU-R Rec. 624-4 System B, G

SMPTE 170M

SMPTE 240M (1987)

The above settings are pure information fields present in the MPEG headers. It is recommended that these settings be left at their defaults, especially for DVD encoding. These settings, along with *Video format*, *Display horizontal size* and *Display vertical size* are part of the sequence display extension MPEG header. The *Sequence Display Extension* (SDE) is entirely optional in MPEG-2, SVCD and DVD. The information in this extension does not affect the decoding process and may be ignored by decoders.



The DVD specification does specify the values to use for the **Color primaries**, **Transfer characteristics**, *Display horizontal size* and *Display vertical size* settings, if the SDE is present.

Motion Search Mode:

The **Motion Search Mode** defines which method is used to search for pixel movement in the video stream. A higher value specifies a better method and will normally yield better quality. The practical range is 3 to 11.

User Quantization Matrices:

When you activate the checkbox you can click the **Edit** button in order to adjust the parameters for **Matrix for Intra Block** and **Matrix for non-Intra Block**. In the following window you can change these settings.

These values must be in the range 16 ... 256, with the exception that the first entry in the intra block matrix must be 8. Intra blocks are macroblocks coded using only information from the current picture (I frames), non-intra blocks are macroblocks coded using information from the current picture and other pictures (B and P frames). If the bitrate is high you should not change the parameters. Ultimately, these values depend on the source material. If the bitrate is low you can change the parameters to get better results.

Matrix for intra block								Matrix for non-intra block							
8	16	19	22	26	27	29	34	16	16	17	19	20	21	22	23
16	16	22	24	27	29	34	37	16	16	18	20	21	22	23	24
19	22	26	27	29	34	34	38	17	18	19	21	22	23	24	25
22	22	26	27	29	34	37	40	19	20	21	22	23	24	25	27
22	26	27	29	32	35	40	48	20	21	22	23	24	25	27	29
26	27	29	32	35	40	48	58	21	22	23	24	25	27	29	31
26	27	29	34	38	46	56	69	22	23	24	25	27	29	31	33
27	29	35	38	46	56	69	83	23	24	25	27	29	31	33	35

Do half-pel Search:

When this option is activated the **Motion Search** operation also looks for pixels that move only 1/2 of a pixel from one frame to the next (a subpixel search). This should usually be enabled and should only be disabled if speed is desired above quality.

Set motion search areas from pixel movement:

These settings specify the maximum movement of a pixel from one frame to the next. They are used to calculate the *Motion Search Areas*, the maximum area the encoder will search in an attempt to find a match for a block of pixels from one frame to the next. If the video has quite a bit of movement, it is useful to raise these values. Unfortunately, this also extends the encoding time.

These settings are an easy way to manipulate the *Motion Search vectors*. The motion search vectors can also be manually manipulated in the *Motion Estimation* section of the **Additional Settings** tree. The motion search vectors are different and optimized for the different frames and frame types.

Additional Settings Tree:

Now we want to introduce the different parameters in the **Additional Settings** tree. The different options are displayed in the tree. You can change the settings by using the **Value** parameter box. Depending on the setting you have to adjust the appropriate option in the corresponding tree. A short definition of the selected option is offered under the display.

Under **General** you find the following options:

VBV Buffer size: This value specifies the size of the *Video Buffering Verifier* (VBV) buffer in KB (1024 bytes). Decoders can use this value to determine the largest buffer needed to decode the video stream. Set it to zero to have the encoder compute a value based on the video bitrate. VCD specifies 40 KB, SVCD and DVD specify 224 KB. Use the **Value** prompt in order to change the parameters. See ISO/IEC 13818-2 section 6.3.3 or ISO/IEC 11171-2 section 2.4.3.2 for more information.

Display Size: These values specify a rectangle which may be used by decoders as their active display area. MPEG itself does not define what these values are actually used for, so it is up to the decoders to handle as they see fit. DVD does define uses for these values, and the values should be 720x480 (NTSC) or 720x576 (PAL). These settings are part of the sequence display extension and are only used when the Sequence display extension setting is 1. Use the options **Horizontal** and **Vertical** to specify the exact value. See ISO/IEC 13818-2 section 6.3.6 for more information. This option is only valid for MPEG-2.

Progressive Sequence: If set to 1 all frames in the video are progressive, if set to 0 both progressive and interlaced frames can appear in the video. See ISO/IEC 13818-2 section 6.3.5 for more information. This option is only valid for MPEG-2.

Progressive Frame: If set to 1 the frames are progressive, if set to 0 the frames are interlaced. This setting does not change the input frame's progressive/interlaced state before encoding, it just sets the progressive frame flag in each picture coding extension.

It is more a flag to the decoder than a setting for the encoder. This option is only valid for MPEG-2.

Field Pictures: Unsupported, this setting will be removed in the next version. It is ignored by the encoder right now.

Intra DC Precision: Specifies the effective precision of the DC coefficients in intra coded macroblocks. 10-bits usually achieves quality saturation, 11-bits can be used if the quantization is very low (the bitrate is quite high compared to the frame size/rate). See ISO/IEC 13818-2 section 6.3.10 for more information. This option is only valid for MPEG-2.

Video Format: This setting is just a flag in the bitstream to inform the decoder how the pictures were represented before encoding. If the sequence display header is not present, the decoder will assume "*Unspecified video format*". This setting does not affect the encoding process at all. It is part of the sequence display extension and is only used when the Sequence display extension setting is 1. See ISO/IEC 13818-2 section 6.3.6 for more information. This option is only valid for MPEG-2.

Intra VLC Format: VLC is the acronym for *Variable Length Coding*. This option specifies one of two MPEG defined variable length coding tables used for intra coded blocks. Table 1 is considered to be statistically optimized for Intra coded pictures coded within the sweet spot range (e.g. 0.3 to 0.6 bit/pixel) of MPEG-2. Normally set to 1 for MPEG-2 video, this setting can be specified independently for each frame type (I, B and P). See ISO/IEC 13818-2 section 6.3.10 for more information. This option is only valid for MPEG-2.

Use Frame Prediction and Frame DCT: Set to 1 to have the motion estimation and DCT (*Discrete Cosine Transformation*) computations done on both fields of a frame in the same pass, set to 0 to have them done on each field independently. Normally this should be 0 for interlaced frames and 1 for progressive frames. Setting this field to 1 will result in slight faster encoding but will yield less quality in interlaced frames. This setting can be specified independently for each frame type (I, B and P). See ISO/IEC 13818-2 section 6.3.10 for more information. This option is only valid for MPEG-2.

Quantization Scale Type: Specifies which mapping to use between the encoded quantization scale factor and the quantizer scale applied in the inverse quantization arithmetic. Set to 0 to specify a linear mapping or 1 to specify a non-linear mapping. This setting can be specified independently for each frame type (I, B and P). See ISO/IEC 13818-2 section 6.3.10 for more information. This option is only valid for MPEG-2.

Use Alternate Scanning Pattern: Specify one of two entropy scanning patterns which define the order in which quantized DCT coefficients are run-length coded. Set to 1 for the alternate scanning pattern or 0 for the zig-zag scanning pattern. The alternate scanning pattern is considered to be better suited for interlaced video where sophisticated forward quantization is not enabled. This setting can be specified independently for each frame type (I, B and P). See ISO/IEC 13818-2 section 6.3.10 for more information. This option is only valid for MPEG-2.

Sequence Display Extension: If set to 1, sequence display extension headers are placed in the video stream after the sequence extension headers. If set to 0, the *Video format*, *Color Primaries*, *Transfer characteristics*, *Matrix coefficients* and *Display Size* settings are not used or present in the video stream. Some SVCD players can have problems if sequence display extensions are present, for DVD the sequence display extension may or may not be present. This option is only valid for MPEG-2.

Sequence End Code: If set to 1 a sequence end code is written at the end of the video stream (it terminates the stream). Normally this is set to 1, set to 0 if you intend to concatenate video streams together after encoding. See ISO/IEC 13818-2 section 6.3.2 or ISO/IEC 11172-2 section 2.4.3.1 for more information.

Embed SVCD User Blocks: If set to 1, user data blocks are placed in the bitstream to reserve space for the SVCD scan information data. The multiplexer then fills in the correct values when the video stream is muxed. Should only be enabled for SVCD video, disable for non-standard SVCD video.

Ignore Frame Interval: Set to some non zero value (n) to ignore every n'th frame. For example, if set to 1000, every 1000th frame is ignored and not encoded. This can be used to convert frame rates.

Under **Rate Control** you find the following options:

The options **Reaction Parameter**, **Initial Average Activity**, **Initial Global Complexity Measure** and **Initial Virtual Buffer Fullness** are very complex as well as highly mathematical. These values are default to 0 and should not be changed unless advised to do so by MainConcept support.

Minimum Frame Percentage: Unused, this setting will be removed in the next version.

Pad Frame Percentage: Unused, this setting will be removed in the next version.

Motion Estimation offers the following options:

- P Frame Motion Vector
 - Forward Search Width
 - Forward Search Height
- B Frame Motion Vectors
 - Forward Search Width
 - Forward Search Height
 - Backward Search Width
 - Backward Search Height

The search width and height settings set the (half) width of the windows used for motion estimation. Here is an example of how to set these values, assuming a maximum motion of 10 pixels per frame in horizontal direction and 5 pixels per frame in the vertical direction and $M = 3$ (I B1 B2 P).

Table 1: Search Width and Height values

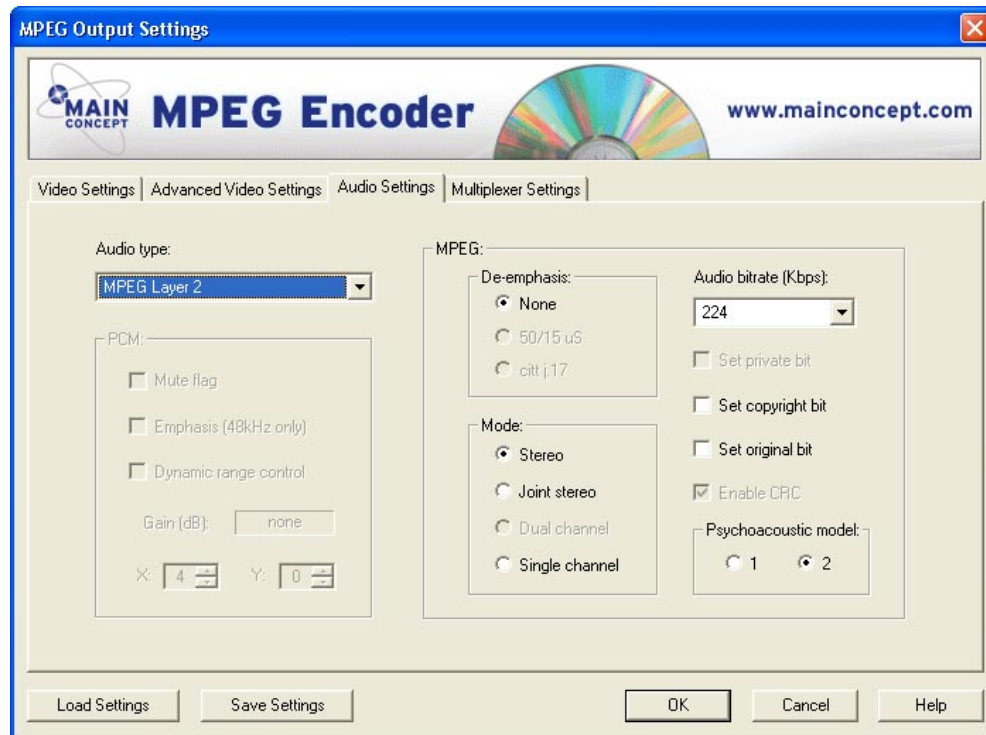
forward	horizontal	vertical	backward	horizontal	vertical
I => B1	10	5	B1 <= P	20	10
I => B2	20	10	B2 <= P	10	5
I => P	30	15			

The search window settings are +/- values, for instance if a search window value is 10, the actual search for a matching pixel is done from $(x + 10, y)$ to $(x - 10, y)$ for each pixel (x, y) .

These values are usually set automatically by either the *Video encoder quality* sliders (**Search method** and **Search range**) or the **Motion search pixel movement** settings but can be set manually here.

The Audio Settings Pane

This pane offers professional adjustments for audio exporting.



The **Audio Settings** include the following options and parameters:

Audio type:

None: If you do not want to encode audio, select none here.

MPEG-1 Layer 1: Normally not used

MPEG-1 Layer 2: Used for VCD, SVCD and PAL DVD

PCM: Used for NTSC DVD

NTSC DVDs use LPCM (Linear PCM) audio (or AC3) as the standard audio type instead of MPEG Layer2. LPCM is an uncompressed audio format, which offers higher quality but it also uses far more of the total bitrate (consequently less bitrate is available for the video stream). PCM is only available for MPEG-2 type streams, and is seldom used for PAL DVDs.

MPEG:

Under **De-Emphasis** you find three options: **None**, **50/15 uS** and **citt. j 17**.

This is a flag to the player specifying what kind of de-emphasis to perform on the audio. DVD and SVCD specify **None**, VCD can be either **None** or **50/15 uS**.

Mode:

Stereo: Standard stereo

Joint Stereo: This option can convert the sound to mono in the lower frequency range (which can hardly be perceived by the human ear). This results in an enhancement of the stereo quality in the median and higher frequency ranges. The setting is useful if the audio bitrate is below 200 Kbps.

Dual Channel: In this case both audio channels are output separately as mono channels; it is normally used for two-channel sound. The compression of the channels takes place separately.

Single Channel: Another expression for mono audio.

Audio Bitrate (Kbps):

32-384: This specifies the bitrate of the audio stream. Depending on the MPEG type selected, some values may not be available. Increasing the bitrate will yield better sound quality and result in larger files, or if the total bitrate is limited it will mean less of the total bitrate is available for the video.

Set private bit: Just a spare bit in the audio headers, which is user defined. DVD specifies it shall be 0.

Set copyright bit: Specifies whether the audio is copyrighted or not, this setting is completely arbitrary; it has no effect whatsoever.

Set original bit: Specifies whether the audio is a copy or an original, this setting is completely arbitrary; it has no effect whatsoever.

Enable CRC: Specifies whether a CRC is embedded in each audio frame, both SVCD and DVD specify enabled.

Psycho-acoustic model:

Two different models (**1** and **2**) specified by MPEG to compute the "just noticeable noise-level".

PCM:

Mute flag: Flag to the player whether to mute or not when all samples in an audio frame are zero.

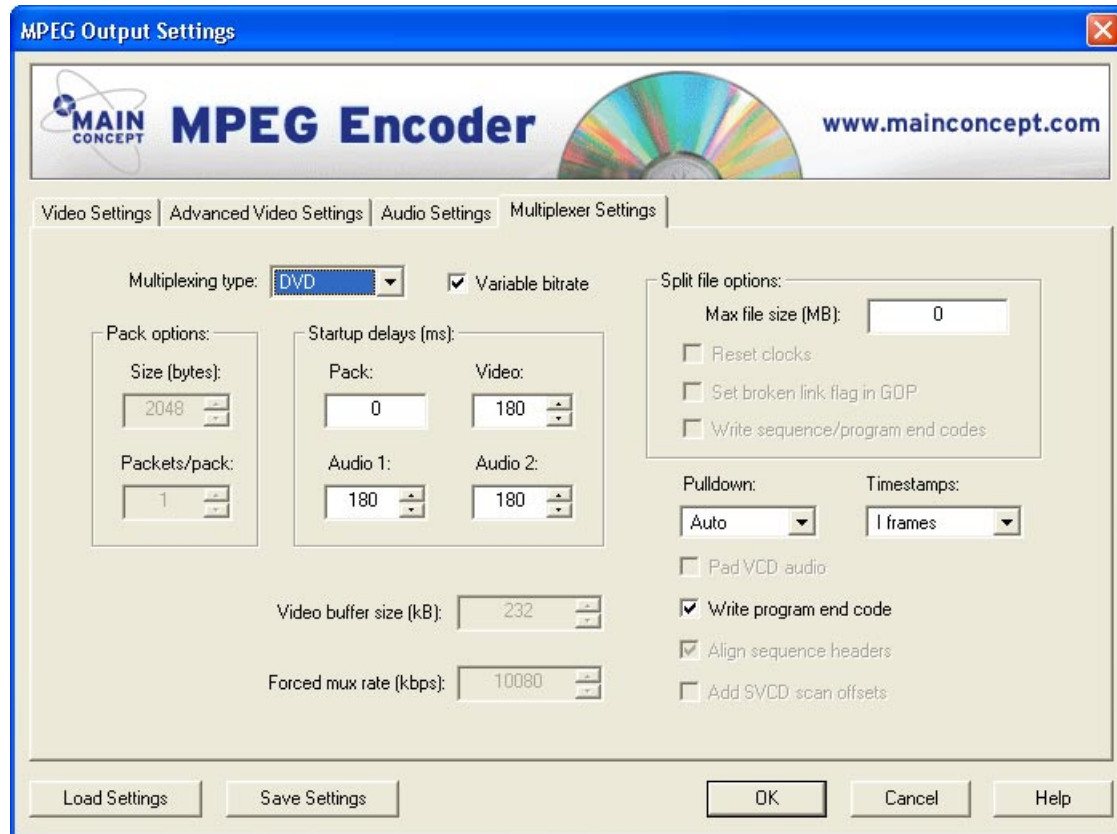
Emphasis (48 KHz only): Flag to the player whether emphasis is to be applied to all audio samples from the start of the audio stream.

Dynamic range control: The option is a recommended gain value which can be applied to all audio samples decoded from the first access unit. Ticking the checkbox enables the **Dynamic range control**. The setting does not affect the encoding of the audio at all. It is simply a value decoders may use when playing the audio.

Gain (dB): The Gain value (**X** and **Y**) is a recommended gain value to be applied to all audio samples by the player, where: $\text{Gain} = 24.082 - 6.0206 * X - 0.2007 * Y$.

The Multiplexer Settings Pane

In this pane you can control whether your exported MPEG files will be multiplexed (also referred to as “muxed”). Multiplexed output means that the video and audio are exported in a single file. This pane also offers several professional settings for muxing.



In general, the basic settings for this pane and the other advanced panes are set by the options in the **Output format** section of the main window.

Here are the **Multiplexer Settings** in detail:

Variable Bitrate:

This option sets the muxing mode to variable or constant bitrate. If it is turned off (constant bitrate), the output data stream will contain padding packets (if needed) to maintain the constant bitrate. In variable bitrate muxing no padding packets are added.

Multiplexing Type:

The drop-down menu offers the options **MPEG-1**, **VCD**, **MPEG-2**, **SVCD**, **DVD**, **TS** (transport stream) and **None**. The settings are usually defined by the parameters of the MPEG Encoder.

Pack Options:

Under this heading you find the options **Size (bytes)** and **Packets/Pack**. **Pack size** is the number of bytes in each pack (or sector); VCD and SVCD use 2324 bytes, DVD uses 2048 and general MPEG-1/2 can use up to 4096 bytes (4096 is our limit, not MPEG's limit). The muxed bitstream is broken up into these 'packs' with a pack header starting each one and they contain 1 or more PES (Program Elementary Stream) packets (chunks of the video or audio stream). The **Packets/Pack** setting specifies the number of PES packets that are placed in each pack. VCD, SVCD and DVD always want 1 PES packet per pack.

Startup delays (ms):

The **Pack** value specifies the starting timecode of the muxed stream (this can be different than the starting timecode of the video stream). It is arbitrary as well.

The **Video**, **Audio1** and **Audio2** delays actually specify the starting time of the respective stream (relative to the pack delay). If these settings do not match the streams will start at different times. Normally they are the same, but say you had a video stream and an audio stream where you know the audio actually starts 500ms after the video, you would set the video delay to some value and set the Audio1 delay to video delay + 500, this would then synchronize the two streams when played.

Split File Options:

Max. file size: You enter the value (in MB) here, from which a further file shall be written.

Reset clocks: If Reset clocks is enabled, the SCR, PTS and DTS clocks are reset to the 'startup delay' values (the starting values) when starting a new file. This would make the timecodes in each of the files start with the same values. If disabled, the clocks are not reset and the timecodes would be continuous from one file to the next.

Set broken link flag in GOP: This has to do with the way MPEG compresses frames. Usually a GOP consists of 1 I frame and several B and P frames. I frames are not dependent on any other frames, P frames are normally dependent on the preceding P or I frame, and B frames are normally dependent on the preceding and successive I or P frames.

A standard GOP (the default settings) are 15 (maybe 18) frames long and they look like this (in the order the frames are displayed):

B B I B B P B B P B B P B B P, B B I B B P B B P B B P B B P, ...

Here the first two B frames are dependent on both the I frame after them and the last P frame of the previous GOP. The *Broken link* flag in the GOP header is there to inform decoders that some kind of action was taken such that the preceding P frame is not present and the first 2 B frames cannot be decoded correctly (the decoder may then ignore them). When splitting files, the files are split on a GOP boundary so that the previous P frame of the first few B frames is not present in the new file (it is in the previous file). If the files are played one after another, and the last P frame of the first file is kept by the decoder, the decoder can correctly decode the first few B frames of the second file.

The *Set broken link* setting just allows one to specify whether the *Broken link* flag is set or not, and it depends on whether you intend to play the files one after another or separately.

Write sequence/program end codes: When enabled, sequence and program end codes are written to the old file when switching to a new file. If the files are meant to be played one after another, the streams should not be terminated. This option only applies to the files that are split; it does not apply to the last (or only) file generated.

Pulldown:

This option contains three parameters: **2:3**, **3:2** and **Auto**. When pulldown is present in the video stream, the multiplexer must adjust the PTS/DTS timestamps to account for the extra fields displayed. This option should be set to the same value as the video pulldown setting (or to Auto).

Timestamps:

You find **All frames**, **I & P frames** and **I frames** in this menu. Here you can choose which frames in the stream have a timestamp attached. The timestamps are needed for synchronization of video and audio. In general, it is enough to set this option to I-Frame. For particular formats the values are clearly defined.

Pad VCD Audio: Some VCD burning programs require this flag to be set and some do not. VCD video packs are 2324 bytes long, but the audio packs are only 2304 bytes long. When the data is written to a VCD disk, the audio packs are put in normal 2324 byte sectors. Some VCD burning programs deal with the extra 20 bytes themselves, while others require the extra 20 bytes to be present. When this setting is enabled, the audio packs are padded with 20 zero bytes so they are 2324 bytes long, if not enabled the audio packs are only 2304 bytes long. This setting is only meaningful VCD.

Write program end code: When enabled, a program end code is written at the end of the file. This setting only applies to the last file if the splitting option is enabled, or if there is only one file generated.

Align sequence headers: When enabled, the sequence headers present in the video stream are placed at the beginning of a PES packet, this makes it easier to find the sequence headers and the start of a GOP. When a sequence header is aligned, it is possible that the previous video PES packet will need to be padded to make it the correct size, so this option can consume a little of the total bitrate. This option is required for SVCD and DVD.

Add SVCD scan offset: SVCD defines some navigation information that is put into the video stream to help players jump back and forth or skip ahead easily. The info is called scan offsets, this option is normally required for SVCD. This option also consumes a little of the video bitrate. Note: this option will be ignored if the user mux rate is set higher than allowed for SVCD.

Video Buffer Size and Audio Buffer Size:

These settings specify the size of the buffers needed to decode the video and audio. If it is too low, you will get buffer overflows, which could show up as stuttering video and/or audio. Usually it is set to the same size as the video VBV buffer (although the VBV units are half these units), DVD specifies 232 for the video buffer. Software decoders usually ignore the buffer sizes, but most hardware players will have problems if the buffer size is not correct.

VBV is the abbreviation of *Video Buffering Verifier*. It is a hypothetical decoder with a buffer whose size is specified by the Video Buffer Size. Encoded pictures from the MPEG stream are placed into the buffer (hypothetically) and removed from the buffer at regular intervals. The MPEG video stream is supposed to be constructed by varying the size of the encoded frames such that the buffer does not underflow (i.e. becomes empty where there are no frames in the buffer when it is time to decode one) or overflow (i.e. becomes full where no space is available for more encoded pictures).

Technical Support



MainConcept Support

If you want more information about the MainConcept MPEG Encoder, 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'll assist you as quickly as possible.

Telephone technical support is also available. Check the MainConcept website for details. Charges may apply from some areas.



Additional Information

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



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