Nero Digital™ Plug-in for Adobe® Premiere® Manual

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REV 1.0

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1 General information

1.1 About the manual

This manual is intended for all users who want to find out about how to use Nero Digital™ plug-in for Adobe® Premiere®. It is process-based and explains how to reach a particular objective on a step-by-basis.

In order to make best use of this manual, please note the following conventions:

Symbol	Meaning
	Indicates warnings, preconditions or instructions that have to be followed strictly.
	Indicates additional information or advice.
1. Start …	A number at the beginning of a line indicates a request for action. Carry out these actions in the order specified.
→	Indicates an intermediate result.
➜	Indicates a result.
OK	Indicates text passages or buttons that appear in the program interface. They are shown in bold face.
Chapter	Indicates references to other chapters. They are executed as links and are shown in red and underlined.
[…]	Indicates keyboard shortcuts for entering commands.

1.2 About the Nero Digital™ plug-in for Adobe® Premiere®

The Nero Digital™ plug-in for Adobe® Premiere® allows you to convert video files edited in Adobe® Premiere® into Nero Digital™ files (MPEG-4).

Additional setting options are available during encoding.

The Nero Digital™ plug-in for Adobe® Premiere® is available both in Adobe® Premiere® Pro and in Adobe® Premiere® Elements.
For simplicity's sake the different versions are referred to generically as Adobe® Premiere® in this manual.

2 Technical information

2.1 System requirements

In addition to the general system requirements for the Nero suite, it is also necessary to install Adobe® Premiere® to enable the Nero Digital™ plug-in for Adobe® Premiere® to be installed

2.1.1 Operating systems

The Nero Digital™ plug-in for Adobe® Premiere® supports the same operating systems as the Nero suite

Information about the system requirements for Adobe® Premiere®, such as supported operating systems and formats, can be found in the Adobe® Premiere® documentation.

3   Installing the Nero Digital™ plug-in for Adobe® Premiere®

> Please note that it is important that Adobe® Premiere® has been installed on your system **before** you install Nero, as otherwise the plug-in will not be activated.

To install the Nero Digital™ plug-in for Adobe® Premiere®, proceed as follows:

1. Install Nero. To do this, follow the instructions in the QuickStart Guide.

→ Nero has been installed.

2. Open Adobe® Premiere®.

→ The Nero Digital™ plug-in for Adobe® Premiere® installed itself automatically the first time Adobe® Premiere® was opened after installing Nero.

4   Setting chapter and subtitle markers

You can set subtitle and chapter markers in the Adobe® Premiere® project which will then be transferred to the MPEG-4 output file.

To do this, proceed as follows:

1. Open Adobe® Premiere®.

2. Create a new project.

3. Import a video file you want to convert with Nero Digital™ into the Adobe® Premiere® project.

4. Insert the video in the timeline.

5. If you want to set chapter markers:
    1. Set a marker at the required point in the timeline.
    2. Repeat this step until you have set all the required markers.
    3. Double-click on a marker.
       → The **Marker** window is opened.
    4. Enter the name of the chapter in the **Chapter** box in the **Marker** window. You can also make an entry under **Comments** however this is optional.
    5. Repeat the last two steps for all markers in the timeline that you want to convert into chapter markers.
       → You have now set chapter markers.
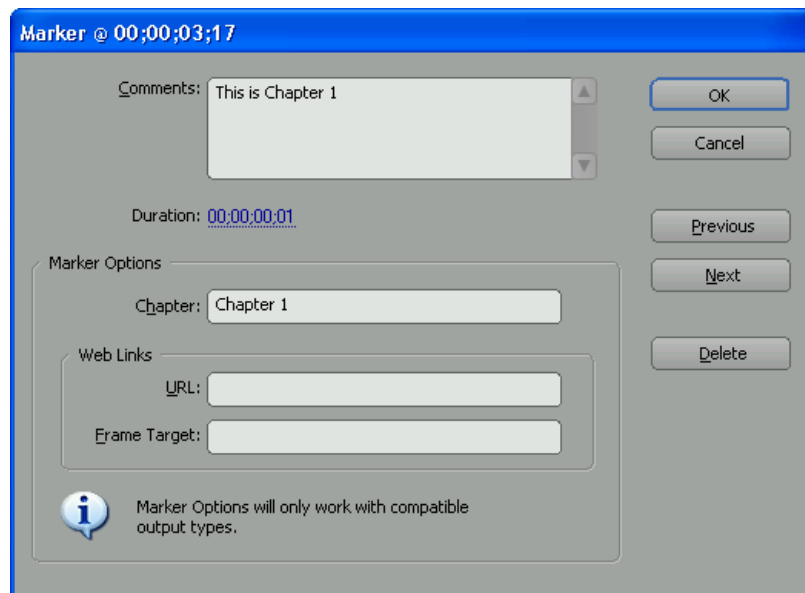
Fig. 1: **Marker** window for chapters

6. If you want to set the subtitle markers:
    1. Set a marker at the required point in the timeline.
    2. Repeat this step until you have set all the required markers
    3. Double-click on a marker.
       → The **Marker** window is opened.

4. Enter the required subtitle text in the **Comments** box in the **Marker** window. An entry is required in the **Comments** box in order to create a subtitle.

5. In the **Duration** box enter the length of time for which the subtitle is to be displayed.

The length of time for which a subtitle is displayed must be at least one second. If the duration is too short or not specified at all, the subtitle will not be displayed in the video.

6. Repeat the last three steps for all markers in the timeline that you want to convert into subtitles.

→   You have now set subtitle markers.
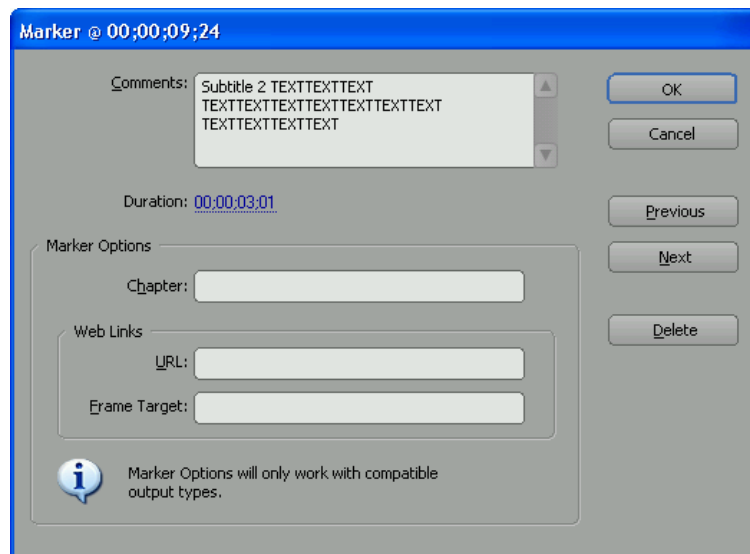

Fig. 2: **Marker** window for subtitles

➔   The video now has markers for chapters and subtitles. You can now proceed to convert the processed video to MPEG-4 format. The set markers are transferred to the MPEG-4 version.

4.1   Exporting to Nero Digital™

To encode a video in Nero Digital™ format, proceed as follows:

1. Select **File > Export > Nero Digital**.

➔ The **Nero Digital** window is opened.

2. Specify where the output file is stored.

3. If you then want to make the expert settings for Nero Digital™, check the **Advanced** box in the bottom right-hand corner.

You should only change the expert settings if you are sufficiently familiar with the area of video encoding, in particular MPEG-4 encoding.

Poorly selected settings can have a significant negative impact on the quality of the output file.

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4. Make the settings in the **Video**, **Audio**, **Subtitle**, **Chapter**, and **Muxer** areas as required (see Nero Digital™ settings).

5. Click on the **Next** button.

➔ If you have checked the **Advanced** box, a window will open showing the Nero Digital™ expert settings.

    1. Define the Nero Digital™ expert settings (see Nero Digital™ settings).

      ➔   You have now defined the Nero Digital™ expert settings.

6. Click on the **Export** button to start the export process.

➔   The export process is started. The **Encoding to Nero Digital in progress…** window is displayed. The progress bar shows the progress of the encoding process in graphical form.

5 Nero Digital™ settings

5.1 Nero Digital™ profiles

You can select the required profile in the **Profile** drop-down menu.

Here is a brief overview of the profiles:

MPEG-4 SP/ASP	
Nero Digital™ Mobile	Output file for cell phones and handheld devices; resolution 176x144 @ 15 fps; MPEG-4 SP AAC
Nero Digital™ Portable	Output file for PDAs and personal video players; resolution 352x288 @ 30 fps; MPEG-4 SP AAC
Nero Digital™ Standard	Output file for home players and set-top boxes (STB); resolution 720x576 @ 25 fps/720x480 @ 30 fps; MPEG-4 ASP AAC
Nero Digital™ Cinema	Output file for high-end home players and set-top boxes (STB); resolution 1280x720 @ 30 fps; MPEG-4 ASP AAC
Nero Digital™ HDTV	Output file for HDTV content; resolution 1920x1080 @ 30 fps; MPEG-4 ASP AAC
MPEG-4 AVC	
Nero Digital™ Mobile AVC	Output file for cell phones and hand-held devices; resolution 176x144 @ 15 fps; MPEG-4 AVC HE-AAC (2.0)
Nero Digital™ Portable AVC	Output file for PDAs and personal video players; resolution 352x288 @ 30 fps; MPEG-4 AVC HE-AAC (2.0)
Nero Digital™ Standard AVC	Output file for home players and set-top boxes (STB); resolution 720x576 @ 25 fps/720x480 @ 30 fps; MPEG-4 AVC HE-AAC (5.1)
Nero Digital™ Cinema AVC	Output file for high-end home players and set-top boxes (STB); resolution 1280x720 @ 30 fps; MPEG-4 AVC HE-AAC (5.1)
Nero Digital™ HDTV AVC	Output file for HDTV content; resolution 1920x1080 @ 30 fps; MPEG-4 AVC HE-AAC/ACC (5.1)
iPod outputs	
Nero Digital™ iPod Video	Output file for iPod video and car entertainment; resolution 480x480 @ 30 fps; MPEG-4 LC-AAC
Nero Digital™ iPod Video AVC	Output file for iPod video and car entertainment; resolution 320x240 @ 30 fps; MPEG-4 AVC LC-AAC

5.1.1 Creating a copy of a Nero Digital™ profile

You can copy or rename an existing Nero Digital™ profile and change the settings described below.

To copy a Nero Digital™ profile, proceed as follows:

1. Click on the **+** button.

   → The Create copy of the profile window is opened.

2. Enter the name of the new profile in the **Name** text box.

3. Enter a short description of the profile in the **Description** text box.

4. Click **OK**.

   → You have now copied an existing Nero Digital™ profile.

5.2 Nero Digital

You can use the [...] button in the **Nero Digital** entry to select the folder on your hard drive where the output file is to be stored.

The settings you can make in the subentries of the **Nero Digital** entry are described below.

5.2.1 Video

You can change the video track settings in the **Video** area.

5.2.1.1 Bit Rate/Size

You can use the slider to set the bit rate. The precise numerical value of the bit rate is displayed in the **Bit Rate** box. The value here can also be increased or decreased using the arrow buttons.
The bit rate changes proportionately to the change in file size in the **Size** box.

You can use the arrow buttons to increase or decrease the file size in the **Size** field. The file size is proportionate to the bit rate setting.

5.2.1.2 Quality

You can define the method to be used to resize the output file with the **Resize method** drop-down menu.

If the **Auto resize** box is not checked, you can specify the resolution in two text boxes in pixels. You can now enter the aspect ratio in the **Aspect ratio** boxes.

5.2.1.3 Name&Language

You can enter the name of the video track in the **Name** entry. The name of the Adobe® Premiere® project is referenced in the **Name** text box by default.

You can use the **Language** drop-down list to choose the language in which the video track is to be recorded.

5.2.2 Audio

You can change the audio track settings in the **Audio** area.

Select an entry from the drop-down menu that defines the specifications you want, such as the sampling rate, number of channels, codec, and bit rate.

5.2.2.1 Name&Language

You can enter the name of the audio track in the **Name** entry. The name of the Adobe® Premiere® project is referenced in the **Name** text box by default.

You can use the **Language** drop-down list to choose the language in which the audio track is to be recorded.

5.2.3 Subtitle

The subtitles you have created are displayed in the **Subtitle** area (see Setting chapter and subtitle markers).

You can set the frame rate of the subtitles in the **Frame Rate** text box.

The [...] button is used to export subtitle files.

The [S] button is used to import subtitle files.

Subtitle files that you import must be in SRT or SUB format.

5.2.3.1 Subpicture

The following setting options are available in the **Subpicture** area:

Font drop-down menu	Changes the font for all inserted subtitles.
Font size drop-down menu	Changes the font size for all inserted subtitles.
B button	Changes all inserted subtitles to bold.
I button	Changes all inserted subtitles to italics.
U button	Underscores all inserted subtitles.
S button	Strikes through all inserted subtitles.
Preview window	Shows how the subtitles are formatted.

Convert subtitles as subpictures check box	Converts all subtitles into subpictures when the box is checked.
Color button	Changes the font color for all inserted subtitles.

Subpictures are image files that are placed over the background. They can be used to create buttons, for example.

5.2.3.2 Name&Language

You can give all subtitles a name in the **Name** entry. The name of the Adobe® Premiere® project is referenced in the **Name** text box by default.

You can use the **Language** drop-down list to choose the language for the subtitles.

5.2.4 Chapters

The **Chapter** area displays the chapters you have created.

5.2.5 Muxer

The **Muxer** entry is used to make more settings for the encoding process.

The following setting options are available:

Interleave audio and video in packets with duration of check box	This synchronizes the audio and video tracks at the intervals specified in the relevant text box.
Auto-split file if bigger than check box	This automatically splits the output file after a particular file size and creates a second file. The file size at which the output file is split is entered in the text box.

6 Nero Digital™ expert settings

> You should only change the expert settings if you are sufficiently familiar with the area of video encoding, in particular MPEG-4 encoding.
>
> Poorly selected settings can have a significant negative impact on the quality of the output file.

6.1 MPEG-4 glossary

A number of terms are defined here to clarify the explanations of the options available in expert mode:

AVC	Advanced Video Coding. Corresponds to the H264 standard. See H264.
ASP	Advanced Simple Profile. Corresponds to the H263 standard. See H263.
B-Frame	Bidirectional coded Frame. Uses only the difference information relative to the previous and subsequent keyframes (I-frames). Because the complete image information is not used, the degree of compression is greater.
B-VOP	Bidirectional coded Video Object Plane (see B-Frame). VOP is only referred to in the context of coding in the H263 standard.
CABAC	Context Adaptive Binary Arithmetic Coding. Refers to a process for arithmetically coding digital video data as part of coding standard MPEG-4 AVC or H264.
Data Compression	Process whereby data is compressed so as to require less storage space and shorter transmission times in data networks.
EPZS	Enhanced Predictive Zonal Search. An algorithm for motion searching in video sequences.
GOP	Group Of Pictures. Interval from one I-frame to the next.
H264	ITU standard for video encoding and compression.
H263	Standard for video compression that takes a similar approach to MPEG-2, but is much more efficient.
I-Frame	Intra-coded Frame. Contains the complete integral image information for a frame.
I-VOP	Intra-coded Video Object Plane. See I-Frame. VOP is only referred to in the context of coding in the H263 standard.
Interlace	Horizontal skip process. Used when recording, processing, and displaying images. Mainly used for displaying television signals on receivers based on the CRT principle.
ISO	International Organization for Standardization.
ITU	International Telecommunication Union.
Keyframe	See I-Frame.

Macroblock	A macroblock describes 16x16 pixels and is the elementary unit in the MPEG standard on which motion coding is also based.
Matrix	A matrix is a rectangular pattern whose elements are usually numbers, although they can be other mathematical elements such as variables of functions. It consists of m lines and n columns. In relation to quantization: the values in the matrix are factors that control the value of the compression. The higher the number the greater the compression.
Motion Estimation	Motion estimation/search.
MPEG-4	An MPEG standard (ISO/IEC-14496) that describes the procedure for video and audio compression, among other things. Video compression is divided into MPEG-4 AVC (see H264) and MPEG-4 SP/ASP (see H263).
NC	Not Coded.
P-Frame	Predictive Frame. Uses only the difference information relative to the previous and subsequent keyframes (I-frames). Because only the difference information is used, not the complete image information, the degree of compression is greater.
P-VOP	Predicted Video Object Plane. See P-Frame. VOP is only referred to in the context of coding in the H263 standard.
Prediction	Prediction/estimation.
Quantization	In general: The creation of a digital signal from an analog signal. During video compression: Quantization controls the degree of compression. It involves the reduction of the value range through a division-type operation.
Interference	Interference in image or sound. Generally a disturbance with a broad, unspecified frequency spectrum. It can thus be interpreted as the superimposition of numerous oscillations or waves of varying amplitude and frequency or wave length.
RVLC	Reversible Variable Length Coding.
Keyframe	See I-Frame.
VOP	A video picture in the MPEG-4 SP/ASP context.

6.2 MPEG-4 profiles

MPEG-4 SP/ASP is mainly available in two different profiles, Simple Profile (SP) and Advanced Simple Profile (ASP).

The functions are supported by the various profiles as follows:

Function	Profile	
	Simple	Advanced Simple
I-frame	x	x
P-frame	x	x
B-frame	–	x
AC/DC prediction	x	x
4 motion vectors per macroblock / unlimited motion vectors	x	x
H.263 / MPEG quantization	–	x
Global motion compensation	–	x
Interlace process	–	x

Various entries are available for selection in the **Profile** area in the navigation tree. The entries under the MPEG-4 encoder main point are explained below (see MPEG-4 Encoder).

The option for changing settings depends on the selection made in the **Nero Digital Profile** drop-down menu (see Nero Digital™ profiles). Unavailable selection options are grayed out.

6.3 Creating a new default profile for expert settings

To create a new default profile for the Nero Digital™ expert settings, proceed as follows:

1. Enter a name in the **Name** box.

2. Enter a description in the **Description** box.

3. Click on the **Default** button.

➔ You have now created a new default profile for the Nero Digital™ expert settings. You can now define the Nero Digital™ expert settings for your new default profile.

6.4 MPEG-4 Encoder

You can make the Nero Digital™ expert settings in the **MPEG-4 Encoder** entry.

6.4.1 Encoding Method

The **Encoding Method** entry allows you to choose between the **Real-time encoding (1 pass)** and **High quality encoding (2 pass)** settings.

Coding in a single pass may take less time, but it does not offer the same quality as coding in two passes.

If coding in a single pass is selected, two fields are available, **Min. quant.** and **Max. quant.**. You can use these to set the range for the permitted quantization factor. This determines the degree of compression for the output file.

Remember that while greater compression reduces the output, it also involves a loss of quality.
For this reason you should never exceed a quantization factor of 31.

This setting option is only available if you have selected an MPEG-4 SP/ASP profile in the Nero Digital™ profile.

6.4.2 Quality/Speed

The **Quality/Speed** entry allows you to make settings in relation to the quality and speed of the coding process.

The **Performance/Quality** drop-down menu can be used to select defaults for the best possible configuration of the options. When you choose **Custom** you can select the options yourself. These options are explained below.

This setting option is only available if you have selected an MPEG-4 SP/ASP profile in the Nero Digital™ profile.

6.4.2.1 Motion search

In the **Motion search** drop-down menu you can choose between **None**, **EPZS** (**E**nhanced **P**redictive **Z**onal **S**earch), and **EPZS²**. These are algorithms for reducing image information in P- and B-VOPs.

EPZS² produces the best results in this setting, but requires more time for encoding.
The **None** setting produces the lowest coding efficiency. For this reason it is not recommended.

6.4.2.2 NC Prediction

You can use the **NC Prediction** drop-down menu to set the speed of the prediction of non-coded macroblocks.

If you choose **Fast**, an attempt will be made to use a fast process to extrapolate the current macroblock from neighboring, non-coded macroblocks. However, the quality of the output file is poorer.
The **None** setting delays the coding process because the non-coded blocks are not

predicted but are rather analyzed in detail. This produces the best possible quality.
The **Normal** setting is recommended as it is the middle ground.

6.4.2.3 Scene cut

If you check the **Scene cut** box, you can use the slider to set the sensitivity with which the encoder detects scene changes. For efficiency, it inserts keyframes at these points whose information is used by the P- and B-VOPs. This is necessary in scenes involving a lot of fast movement in order to reproduce the details of the picture accurately.
We advise a central slider setting because inserting too many keyframes is inefficient.

6.4.2.4 Fast ME

Fast ME speeds up encoding by accelerating the estimation of motion.

6.4.2.5 Low/High noise

The **Low/High noise** setting requires you to judge for yourself whether your source features minor or major interference. If your source does have such interference, you should check the corresponding box. The encoder will then try to resolve the problems during encoding.

6.4.2.6 High B-VOP quantization

If you check the **High B-VOP quantization** box, you will increase the quantization of the B-VOPs.
The increase in quantization will improve the compression of the output file, making it smaller. However, this also means a reduction in quality.

This option is only relevant if B-VOPs are permitted in the **Advanced** entry (see Advanced).

6.4.2.7 Rate distortion optimization

The **Rate distortion optimization** setting enables the encoder to guarantee the ratio between quality and targeted compression level with automatic decisions.

6.4.2.8 Maximum MV range

The **Maximum MV range** drop-down menu allows you to use predefined values to set the maximum range for motion vectors.

6.4.2.9 Psycho-visual quality level

The **Psycho-visual quality level** setting uses human perception patterns to achieve better overall quality.

This means, for example, that the quality is better in the middle of the picture than at the outer edges because the eyes tend to focus on the middle and do not notice slight blurring at the edge. Because quality is "saved" at the edge, you can either improve overall quality or achieve greater compression.

6.4.3 Advanced

You can make further settings relating to various areas of encoding in the **Advanced** entry. These are explained below.

This setting option is only available if you have selected an MPEG-4 SP/ASP profile in the Nero Digital™ profile.

6.4.3.1 Simple profile (QuickTime™ compatibility)

If you check the **Simple profile** box, a number of options in expert mode are grayed out and cannot be changed. The output file is thus encoded in the MPEG-4 simple profile (see MPEG-4 Encoder).

6.4.3.2 Quantization

The **Quantization** drop-down menu allows you to choose between **H236 quantization** and **MPEG quantization**.

Select **MPEG** if you want to use your own quantization matrix or change the existing one. If you do not want to do this, leave the setting at **H263 quantization**.

6.4.3.3 Pixel

You can choose between **Half** and **Quarter Pixel** in the **Pixel** drop-down menu.

Motion is then sought in quarter or half pixel steps (see Motion search). If estimation is in quarter pixels, the coding process takes longer, but the quality is better.

6.4.3.4 Spatial Prediction

The **Spatial Prediction** setting is used to encode macroblocks in correlation with neighboring macroblocks. In other words, they are coded with difference information relating to these neighboring macroblocks and on the basis of the probability of similarity. The information from several intra-coded neighboring macroblocks is used to be able to predict a macroblock more accurately.

6.4.3.5 Predicted VOP

The **Predicted VOP** setting enables encoding using P-VOPs.

6.4.3.6 Unrestricted motion vectors

If you check the **Unrestricted motion vectors** box, you allow the motion vectors also to point to spots outside the frame.

This option improves coding efficiency at the edges of the frame.

6.4.3.7 4 motion vectors per macroblock

The **4 motion vectors per macroblock** setting allows the encoder to divide the macroblocks of 16x16 pixels into four 8x8 pixel macroblocks for the motion search. This means that there are now four motion vectors instead of one.
This option improves the quality but slows down the encoding process.

6.4.3.8 Bidirectional VOP

The **Bidirectional VOP** setting enables encoding using B-VOPs.

6.4.3.9 Support of interlaced VOP

The **Support of interlaced VOP** setting is used to support the half frame or horizontal skip process.

This process, which is used to display a TV picture in PAL standard, displays two half frames in succession. As the frame is generated, only the odd lines from the output device are displayed for the first half frame and, once this is complete, the second half frame is generated from the even lines. The two frames are coded separately. The relatively high refresh frequency means that the eye picks this up as a single frame.

This function is not supported by all hardware.

6.4.3.10 Global motion compensation

The **Global motion compensation** setting is an attempt to compensate for camera movement. This is achieved by means of previously generated vector fields for the motion vectors. The vector corrections required when the vector fields do not match are less complex than the complete generation of a new vector field.

This setting requires a lot of time for relatively little increase in quality.

6.4.4 Keyframes

The **Keyframes** entry can be used to make settings for the keyframe intervals.

This setting option is only available if you have selected an MPEG-4 SP/ASP profile in the Nero Digital™ profile.

6.4.4.1 Minimum/Maximum keyframe interval

The **Minimum/Maximum Keyframe interval** setting defines the maximum and minimum limits for the GOP size.

Remember that the value for the largest interval may not be greater than 300, but should not be set too low either because the coding efficiency at other locations can become poorer if there are too many keyframes.

6.4.5 Error resilience

You can make the settings for better transferability in networks in the **Error resilience** entry. Activating all of these tools would create a bitstream overhead, i.e. the video quality is diminished with a fixed bit rate.

This setting option is only available if you have selected an MPEG-4 SP/ASP profile in the Nero Digital™ profile.

6.4.5.1 Resync

In the **Resync** setting, the encoder does not encode a video picture as a whole, but rather breaks it down into several independently decodable parts.

6.4.5.2 Part

The **Part** (Data Partitioning) setting enables the encoder to group the data from several macroblocks according to header and difference information.
The background to this process is that it is assumed that the loss of difference information would cause fewer visible disruptions that the loss of motion vectors, for example.

This is a useful option if you can transmit the video stream over several channels with different error rates.

6.4.5.3 RVLC

The **RVLC** (**R**eversible **V**ariable **L**ength **C**oding) setting enables the encoder to produce compressed frames so that the program skips to the end of the frame and encodes in reverse if an error occurs while transmitting or saving. Reverse coding continues until the encoder encounters the error again. This means that as much intact data as possible can be used.

This setting enables the bitstream to be highly compressed, while the excellent recovery options still allow an excellent quality to be achieved.

6.4.6 Matrices

You can edit the existing quantization matrices or upload your own matrices in the **Matrices** entry.

The matrices define how the various frequencies are displayed in the macroblocks.

This setting option is only available if you have selected an MPEG-4 SP/ASP profile in the Nero Digital™ profile.

6.4.6.1 Intra

The matrix in the **Intra** entry is responsible for the quantization of I-macroblocks because these are intra-coded.

6.4.6.2 Inter

The matrix in the **Inter** entry is responsible for the quantization of P- and B-macroblocks because these are inter-coded.

6.4.7 AVC Encoder

You can make settings for the AVC encoding of your data in the **AVC** (Advanced Video Encoding) entry and its subentries.

6.4.7.1 Thread count

Nero Digital™ supports multi-core processors. If you have one of these, you can distribute the encoding process over the required number of threads.

The **Thread Count** drop-down menu allows you to choose whether to allow the encoding process to be performed by several threads. This means that you can use a multi-core processor system to optimum effect

The number of processor cores used corresponds to the number of threads you have selected.

6.4.8 Rate control

The **Rate control** entry allows you to make settings in relation to the bit rate mode and quantization (see Encoding Method).

6.4.9 General Settings

The **General Settings** entry allows you to make settings in relation to **Decision quality,** the **Motion vectors**, and the **GOP properties**.

This setting option is only available if you have selected an MPEG-4 SP/ASP profile in the Nero Digital™ profile.

6.4.10 Decision quality

The **Decision quality** slider specifies the quality of the output file in relation to the time expended.
High Quality offers the best quality with the longest encoding period.
High Speed requires the shortest coding time but offers the poorest possible quality.
It is advisable to choose a middle value in the **Best** range.

6.4.10.1 Motion vectors

See Maximum MV range.

6.4.10.2 GOP properties

A GOP (**G**roup **O**f **P**ictures) is an interval from one I-frame to the next.

- Maximum reference frames
  The number in the **Maximum reference frames** text field indicates from how many frames a P- or B-frame may obtain its information.
  If B-frames are permitted, the number must be at least 2.

- Maximum GOP size
  The number in the **Maximum GOP size** text field indicates the number of frames permitted between I-frames.

- Maximum B-frames
  The number in the **Maximum B-frames** text box indicates the maximum number of consecutive B-frames permitted in a GOP.

6.4.11 Encoding Tools

You can make the settings for the encoder process in the **Encoding Tools** entry.

This setting option is only available if you have selected an MPEG-4 AVC profile in the Nero Digital™ profile.

6.4.11.1　CABAC

CABAC (**C**ontext **A**daptive **B**inary **A**rithmetic **C**oding) is a particular coding method. Instead of bit sequences of variable length, it uses more effective arithmetic coding to achieve a 10 to 20% data rate saving.
This is only used with MPEG-4 AVC

6.4.11.2　Bidirectional prediction

The **Bidirectional prediction** setting permits encoding using B-frames.

6.4.11.3　Macroblock partitions

The **Macroblock partitions** setting allows macroblocks to be split (see 4 motion vectors per macroblock).

6.4.11.4　Weighted prediction

The **Weighted prediction** setting allows reference frames to be weighted when predicting motion. This increases coding efficiency, particularly in the case of cross-fading.

6.4.11.5　8x8 Transform

The **8x8 Transform** setting allows the encoder also to use an 8x8 transformation as an alternative to the standard 4x4 transformation (see 4 motion vectors per macroblock).
This setting enables better compression with HD resolutions in particular.

6.4.11.6　Deblocking options

The **Deblocking options** setting operates like a soft focus on the sharp edges of the macroblocks. You can use the slider to change the intensity of this effect.

6.4.12 Visual Enhancement

The settings in the **Psycho visual quality level** entry use human perception patterns to achieve better overall quality.

This means, for example, that the quality is better in the middle of the picture than at the outer edges because the eyes tend to focus on the middle and do not notice slight blurring at the edge. Because quality is "saved" at the edge, you can either improve overall quality or achieve greater compression.
This means that you can achieve greater compression without any appreciable loss of quality.

This setting option is only available if you have selected an MPEG-4 AVC profile in the Nero Digital™ profile.

6.4.12.1 Picture Level

The **Picture Level** setting takes account of human perception so as to achieve better compression for individual video frames at particular points in the video.

6.4.12.2 Macroblock Level

The **Macroblock Level** setting takes account of human perception so as to achieve better compression for individual video frames in particular areas of the picture.

6.4.12.3 Advanced

The **Advanced** setting provides more ways to achieve higher compression, however these may be evaluated by different viewers in different ways.

6.4.12.4 Enhanced Chroma Prediction

Traditionally, only brightness information was used for video compression, enabling compression decisions to be made in the encoder.
The **Enhanced Chroma Prediction** setting includes extensive color information in these decisions, making for better compression.

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