MediaFirst Video Processing

Encoding On-Demand Version 4.2

CONFIGURATION GUIDE

P/N 10-00353-01 Rev00

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Contents

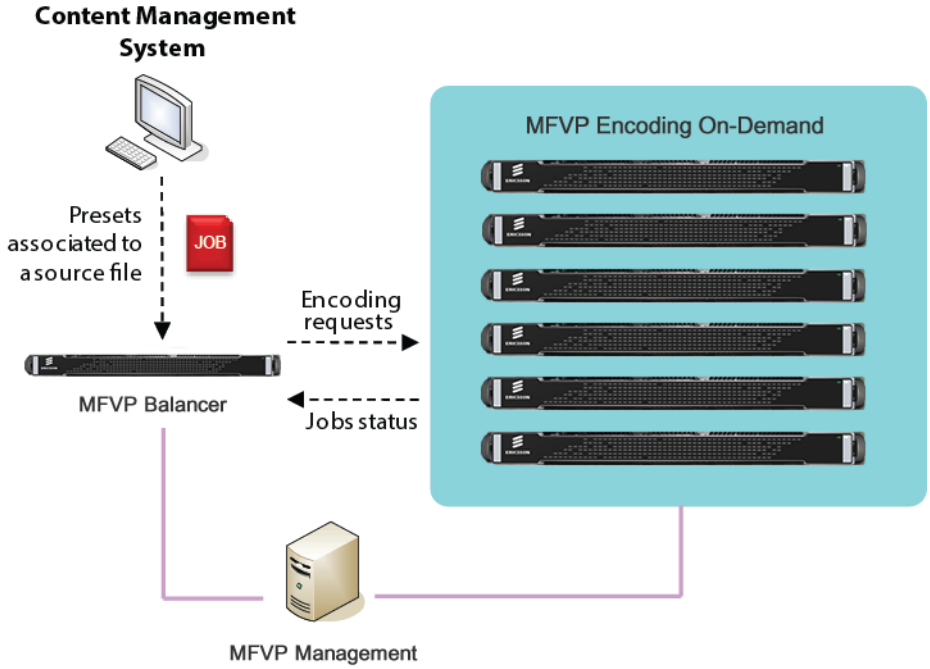
Chapter 1

Introduction

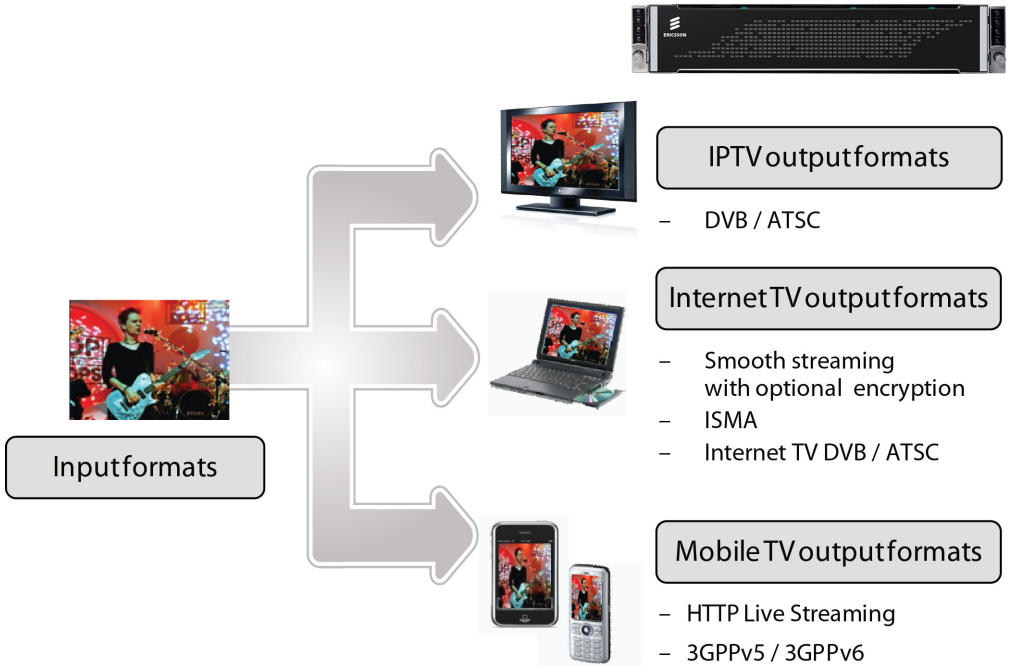
Ericsson on-demand solution

Solution components

- A grid of encoders with MFVP Encoding On-Demand capability enabling:
  - File input with continuous reading
  - Faster than real-time encoding
  - Task management module
  - Interface to communicate with load balancing module
- An MFVP Load Balancer module (optional)
  - Distributes jobs between several encoders
- An MFVP Management system for encoders monitoring (optional)



MFVP Encoding On-Demand inputs/outputs



Support information

CAUTION It is not allowed to perform installation or modification of any software on the appliance as it could impact its proper functioning and could limit the warranty.

You may contact us for specific projects requiring customized options or specific development, available through our service organization. For contact information, see the Ericsson website at http://www.ericsson.com.

If you have support questions, contact Ericsson Customer Services (former Envivio Customer Services: support@envivio.com) or send an email to your Sales contact.

Chapter 1

Quick start

This chapter explains how to quickly set parameters for encoding and viewing a stream.

Step 1: Accessing the web interface

If you are using MFVP Encoding On-Demand on G4

By default, the network management interface (Ethernet 6) is set with a static address: **10.0.0.1XX** (where **XX** are the two last digits of the serial number located on the sticker at the rear of the node.

NOTE You can configure the network interfaces (Ethernet 1 to Ethernet 6) via the web interface (see page 30).

If you are using MFVP Encoding On-Demand on G6

Please refer to the corresponding Installation Guide.

If you are using the software edition

Open a web browser and enter the local IP address of the host where MFVP Encoding On-Demand is installed.

NOTE You can configure the other network interfaces (Ethernet 1 to 5) via the web interface (see page 23).

Step 2: Setting the input

1. From any computer that has a network access to MFVP Encoding On-Demand, open a web browser and enter the following address: **`http://IP_address/`**

   …where *`IP_address`* is the IP address of MFVP Encoding On-Demand (connected to the management network).

   The MFVP Encoding On-Demand web interface is displayed.

1. Configure the file input (see "Configuring the input" on page 34).
2. Select the video and audio sources (see "Configuring the video input settings" on page 37 and "Configuring the audio input settings" on page 41).

Step 3: Setting the encoding profile parameters

3. Create one or more profile(s) and set parameters (see Chapter 5, Chapter 4 or Chapter 5 depending on the export types).
4. Click the  button at the service level to start encoding *(see page 30)*.

Chapter 2

Web interface basics

Accessing the web interface

From any computer that has a network access to MFVP Encoding On-Demand, open a web browser and enter the following address:

`http://IP_address/` or **`https://IP_address/`**

where *`IP_address`* is the IP address of MFVP Encoding On-Demand.

NOTES

The web browser must support HTML 4.0. We recommend Firefox 1.5 or later and Internet Explorer 6.0 or later.

The web interface is automatically refreshed every 3 seconds to maintain consistency between the web interface and MFVP Encoding On-Demand.

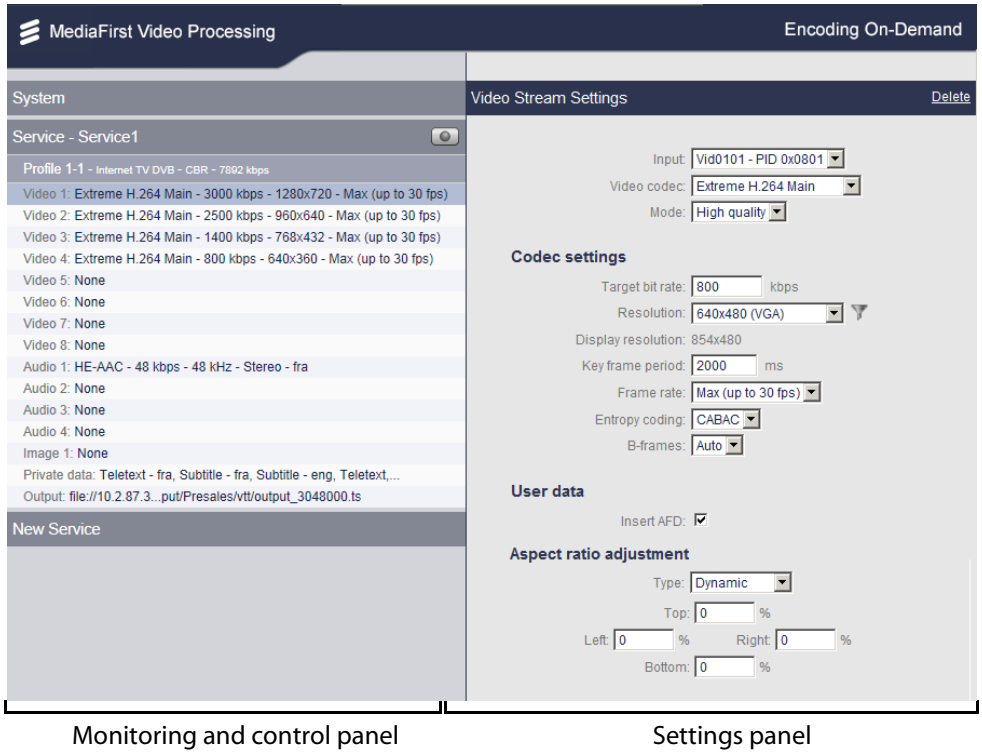
You can restrict the access to the remote configuration web interface by creating a user/password (*see* "Adding or changing the password" on page 154), or by limiting access via the recommended network interface, Ethernet 6 (*see"Restricting the access to the web interface" on page 155*).

Web interface overview

The MFVP Encoding On-Demand web interface is divided in two panels:

- The **monitoring and control panel**, on the left side. From this panel, you can view the current configuration of MFVP Encoding On-Demand and perform some actions such as start/stop a profile.
- The **settings panel**, on the right side. From this panel, you can display the settings of the selected tab and change the parameters.
  An error message may be displayed in the top black banner.

Figure 1. MFVP Encoding On-Demand web interface



Monitoring and control panel | Settings panel

The monitoring and control panel is divided in 3 main sub-panels:

- **System**: This panel lets you configure system settings such as access control, view alarms and logs, import/export configuration parameters, configure credentials and mount points, update MFVP Encoding On-Demand, configure encryption parameters, shut

down or restart MFVP Encoding On-Demand, or view MFVP Encoding On-Demand version information.

- **Service**: Each service includes one or more profiles. A service corresponds to an audio/video input with a logical name. The number of managed services depends on the license. This panel lets you set the file input, and the audio/video input parameters.
- **Profile**: A profile corresponds to particular encoding settings of one channel. This panel lets you configure the encoding parameters for a profile. The number of managed profiles depends on the license.

Applying modifications

- In popup menus and combo boxes, modifications are applied immediately.
- In alphanumerical fields, modifications are applied:
  - when you move to another parameter field, or
  - when you press the ENTER key.
- In the **System** menus, some modifications are applied when you press the **Apply** button.

Accents and special characters

CAUTION When naming an element, you should avoid using accents and special characters, as they may not be recognized by our system.

Configuring the ethernet connectors

NOTE This section is not relevant for MFVP Encoding On-Demand software version on G6 and on HP blade.

By default, the network management interface (Ethernet 6) is set with a static address: **10.0.0.1XX** (where **XX** are the two last digits of the serial number located on the sticker at the rear of the node.

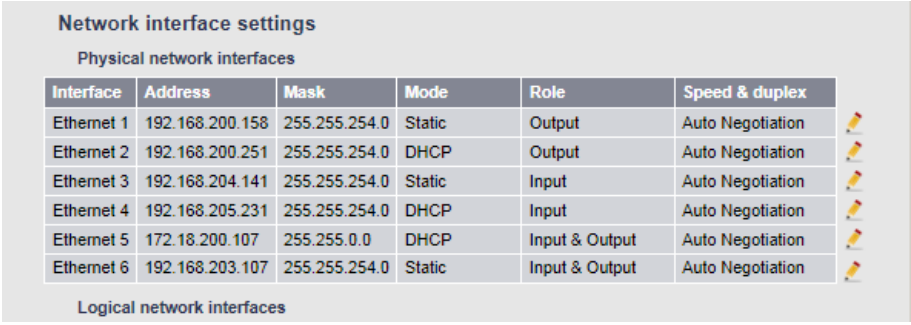
To configure the other network interfaces (Ethernet 1 to 5), see below.

Configuring the physical network interface

To configure the Ethernet connectors, follow these steps:

1. Click the **System** tab, then click the **Configuration** subtab.

Figure 2. Configuration panel



Network interface settings

Physical network interfaces

Interface	Address	Mask	Mode	Role	Speed & duplex
Ethernet 1	192.168.200.158	255.255.254.0	Static	Output	Auto Negotiation
Ethernet 2	192.168.200.251	255.255.254.0	DHCP	Output	Auto Negotiation
Ethernet 3	192.168.204.141	255.255.254.0	Static	Input	Auto Negotiation
Ethernet 4	192.168.205.231	255.255.254.0	DHCP	Input	Auto Negotiation
Ethernet 5	172.18.200.107	255.255.0.0	DHCP	Input & Output	Auto Negotiation
Ethernet 6	192.168.203.107	255.255.254.0	Static	Input & Output	Auto Negotiation

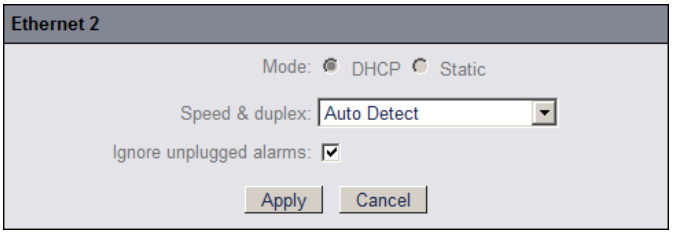
Logical network interfaces

2. In the **Network interfaces settings** panel, click the pencil button, next to the interface to be configured. A new panel is displayed, depending on the current configuration, DHCP or Static.

Configuring an Ethernet connector with DHCP

1. If you select **DHCP**, the following panel is displayed:

Figure 3. Configuring the Ethernet interface with DHCP



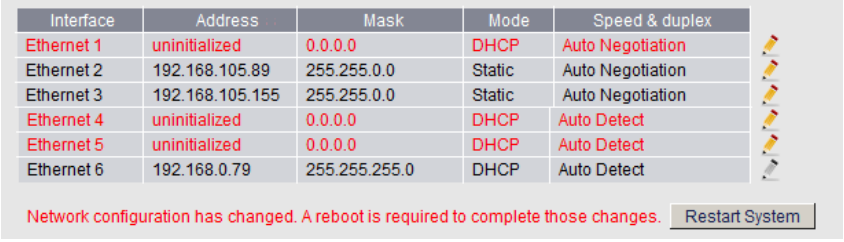
Select **Speed & Duplex**. Possible values are:

- Auto Negotiation
- 10 Mbps Half duplex
- 10 Mbps Full duplex
- 100 Mbps Half duplex
- 100 Mbps Full duplex
- 1.0 Gbps Full Duplex

NOTE Auto-negotiation allows MFVP Encoding On-Demand and a peer ethernet entity to share their network capabilities. Then the fastest common transmission mode is used by the two entities. To optimize the connections between two appliances, we recommend selecting another value.

Select the **Ignore unplugged alarms** checkbox if you want the alarms to be ignored when a physical cable is unplugged.

CAUTION If you modify the **Speed & Duplex** value, a warning message will ask you to restart MFVP Encoding On-Demand to apply the modifications. Click the **Restart System** button *(see graphic below)*.



Interface	Address	Mask	Mode	Speed & duplex
Ethernet 1	uninitialized	0.0.0.0	DHCP	Auto Negotiation
Ethernet 2	192.168.105.89	255.255.0.0	Static	Auto Negotiation
Ethernet 3	192.168.105.155	255.255.0.0	Static	Auto Negotiation
Ethernet 4	uninitialized	0.0.0.0	DHCP	Auto Detect
Ethernet 5	uninitialized	0.0.0.0	DHCP	Auto Detect
Ethernet 6	192.168.0.79	255.255.255.0	DHCP	Auto Detect

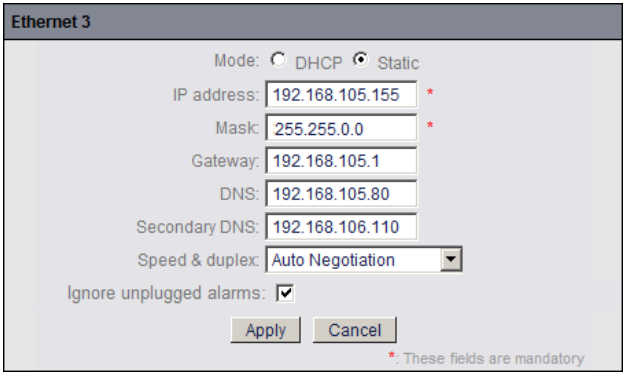
Network configuration has changed. A reboot is required to complete those changes. Restart System

2. Click the **Apply** button to validate your modifications.

Configuring an Ethernet connector with a static IP address

1. If you select **DHCP**, the following panel is displayed:

Figure 4. Configuring the Ethernet interface with static address



2. Enter the IP address, the network mask, the gateway, and the DNS address.

NOTES IP address and Mask are mandatory.

The gateway must be configured on ONLY one interface.

Configuring the logical network interface

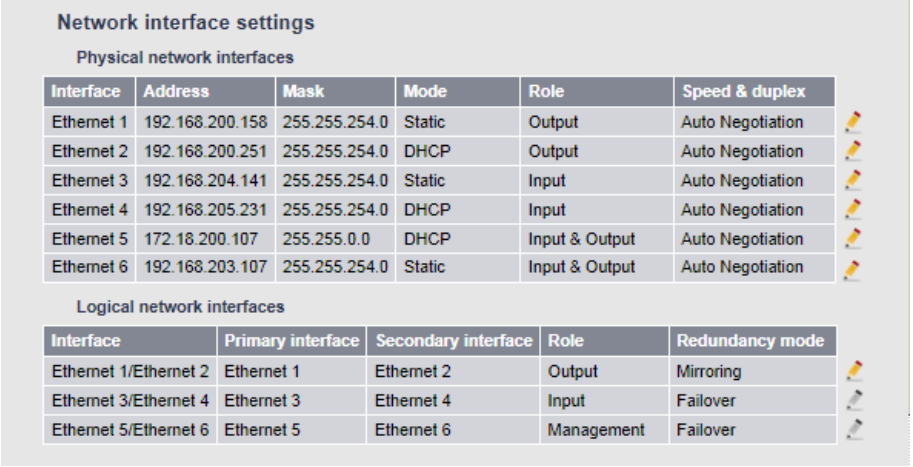
MFVP Encoding On-Demand can output identical streams on two different interfaces, one interface being on the primary distribution network, the second interface being on the backup distribution network.

The streams are strictly identical: same source IP, same source port, same destination multicast address, same destination port and identical data. The only difference is the source MAC address (in the Ethernet II layer) of packets from Ethernet 1 and packets from Ethernet 2.

To configure the logical Ethernet connectors, follow these steps:

1. From the **Network interface settings** section, go to the **Logical network interfaces** subsection.
2. Only Ethernet 1 and Ethernet 2 can be configured.

Figure 5. Logical network interfaces



Network interface settings

Physical network interfaces

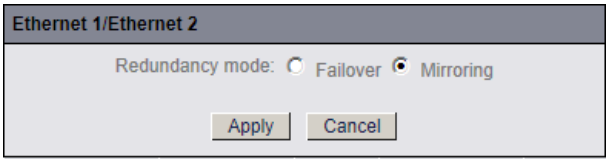
Interface	Address	Mask	Mode	Role	Speed & duplex
Ethernet 1	192.168.200.158	255.255.254.0	Static	Output	Auto Negotiation
Ethernet 2	192.168.200.251	255.255.254.0	DHCP	Output	Auto Negotiation
Ethernet 3	192.168.204.141	255.255.254.0	Static	Input	Auto Negotiation
Ethernet 4	192.168.205.231	255.255.254.0	DHCP	Input	Auto Negotiation
Ethernet 5	172.18.200.107	255.255.0.0	DHCP	Input & Output	Auto Negotiation
Ethernet 6	192.168.203.107	255.255.254.0	Static	Input & Output	Auto Negotiation

Logical network interfaces

Interface	Primary interface	Secondary interface	Role	Redundancy mode
Ethernet 1/Ethernet 2	Ethernet 1	Ethernet 2	Output	Mirroring
Ethernet 3/Ethernet 4	Ethernet 3	Ethernet 4	Input	Failover
Ethernet 5/Ethernet 6	Ethernet 5	Ethernet 6	Management	Failover

3. Click the pencil button,  next to the interface to be configured. A new panel is displayed.

Figure 6. Logical network interfaces



You can select **Failover** or **Mirroring**.

- If you select **Failover**, either the primary interface or the secondary interface streams. It automatically switches from one to the other in case of network issues.
- If you select **Mirroring,** both primary interface and secondary interface stream.

NOTES

Mirroring is only available with IPTV DVB and ATSC Extreme export types, a swell as Internet TV (DVB/ATSC) MPEG-2 TS over UDP and MPEG-2 TS over RTP outputs.

These two modes are exclusive: on a single MFVP Encoding On-Demand, it is not possible to use the same logical interface for mirroring and for backup.

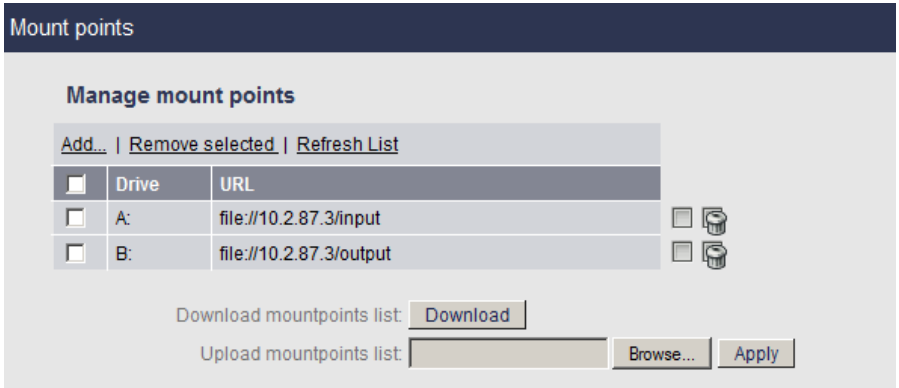
Managing mount points

To define path to input files, subtitles or output files and make them accessible when using the **Browse** button, you must first define the mount points.

To add a mount point, follow these steps:

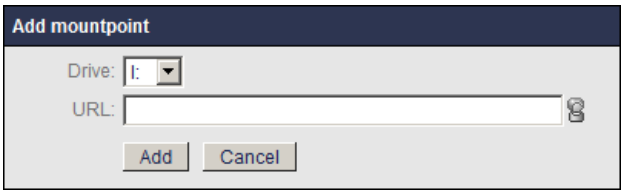
1. Click the **System** tab, then click the **Mount points** subtab.

Figure 7. Mount point management



2. In the **Manage mount points** panel, click the **Add** button. A new panel is displayed.

Figure 8. Adding a mount point



3. Select the drive then enter the URL.

   You can download or upload the mount points list.

CAUTION If the mounted drive is not reachable after a reboot of MFVP Encoding On-Demand or MFVP Load Balancer, the mounting point is no more available in the user interface.

Starting/Stopping encoding

The start/stop button, at each service level, lets you respectively start and stop the current encoding.

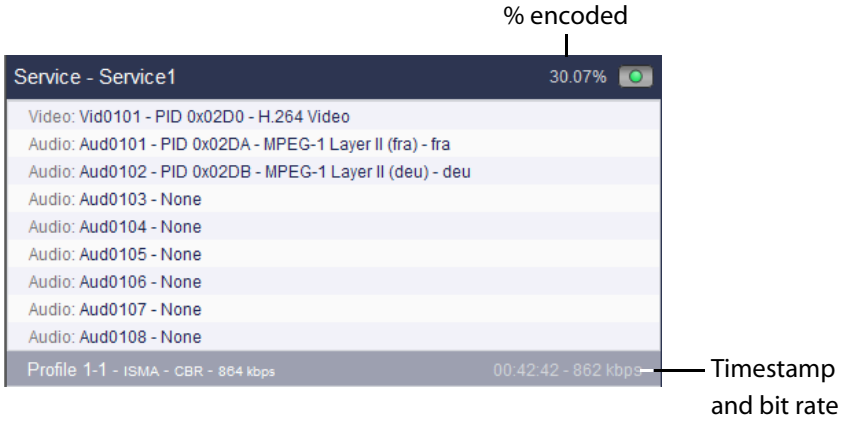
- To start encoding, click the button.
- To stop encoding, click the button.

When you start encoding the following information is displayed in the left panel.

The following parameters are regularly updated:

- At **Service** level, percentage encoded,
- At **Profile** level, timestamp and total bit rate (in kbps) of the content being encoded,

Figure 9. Encoding information



Video quality monitoring

When encoding a profile, you can display a graphical representation of the video quality. To display the video quality monitor, follow these steps:

1. From the **Profile** menu, go to the **Video quality monitoring** section then select the **video quality monitor** link.
2. A new window is displayed showing two independent metrics:

- the video quality of the input video[1] (named Source quality)
- the encoding video quality (named Stream complexity). T

These indicators display the encoder proper performance over the time.

The Source quality metric indicates the video quality measured at the IP input of the encoder.
The score range is [0,10]. A score of 5 means a very bad video quality, a score of 8-10 means a very good one.

The Stream complexity metric measures the encoding performance of the video codec itself. The score range is [40,100]. A score of 70 means a very bad encoding quality, a score above 90 means a very good encoding quality.

NOTE Remember that a low encoding video quality can be due to difficult encoding settings such as low bit rate or high resolution.

1. Only available with IP input & for MPEG-2 & H264 video codecs.

Chapter 3

Web interface Input configuration

Managing the services

Adding a service

By default only one service is already activated and configured.

To add a service, click the **New Service** tab in the left panel, then click the **Add service** button in the right panel.
MFVP Encoding On-Demand creates a new service using default parameters.

Deleting a service

To delete a service, click the **Service** tab corresponding to the service you want to delete, then click the **Delete** link in the top right corner.

A message informs you that all profiles will be deleted. Click **Ok** to validate.

Configuring the input

NOTES

Supported input file formats are MPEG-2-TS, MPEG-2 PS, MPEG-4, MXF OP-1a, Quicktime.

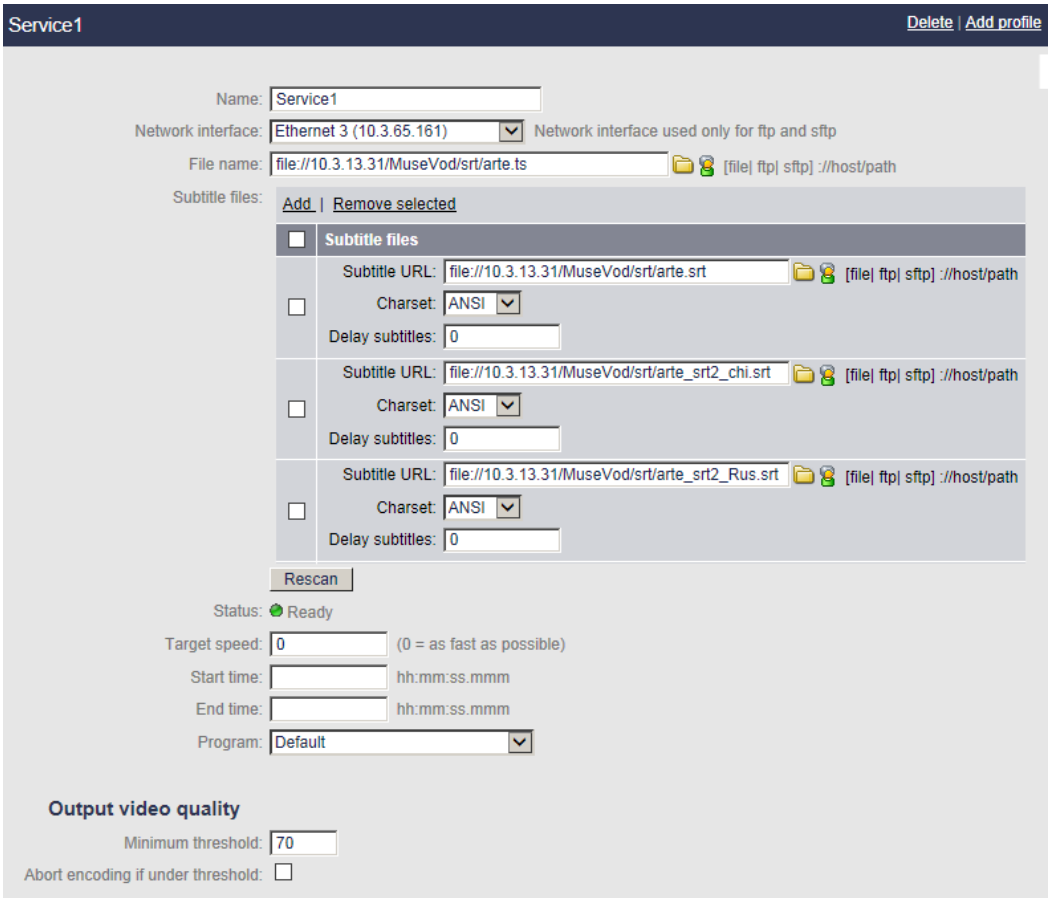
The supported input video codecs are MPEG-2 and H.264. resolutions up to 1920x1080 are supported.

The supported input audio codecs are MPEG-1 Layer II, MPEG-2 Layer II, AC-3, Enhanced AC-3, MPEG-4 AAC/HE-AAC/HE-AAC v2.

To configure the video capture input, follow these steps:

1. Click a **Service** tab. The **Service** parameters are displayed in the right panel.

Figure 1. Configuring the source



2. Select the appropriate value for each parameter.

Name Enter the name of the service

Network interface Select the appropriate network interface.

Possible values: **Ethernet 3, Ethernet 4, ethernet 5, Ethernet 6, Ethernet 3 (backup: Ethernet 4), Ethernet 6 (backup: Ethernet 5)**

File name Enter the URL of the input file (file://ip/path/name; ftp://ip/path/name or sftp://ip/path/name) or click the Browse icon, to select the path, then click the **Scan**/**Rescan** button if you change this URL.

NOTE: You must have first defined credentials to access this URL (*see* "Adding a credential" on page 156). If the credentials are ok, the user icon, should appear in color.

Subtitle files You can add as many subtitles as you need by clicking the **Add** link.

Subtitle URL: Enter the URL of the SRT file (file://ip/path/name; ftp://ip/path/name or sftp://ip/path/name) or click the Browse icon, to select the path.

Charset: Select the character encoding.

Possible values: **ANSI** or **UTF-8** [1]

Delay Subtitles: Enter the delay in msec.

Click the **Remove** selected link to remove a subtitle.

Status Displays the status of the service.

The service status can be Inactive, initializing, Ready, Starting, Encoding, Stopping, Done, Failed or Stopped.

NOTE: A status icon lets you know the service status (grey: capture not configured, orange: checking the capture, or green: capture OK).

Target speed Enter the target average speed of the encoding (relative to real-time), or zero to encode as fast as possible.

Note that the actual encoding speed may be slower depending on the complexity of the encoding configuration.

Start time / End time Enter the start and end time (hh:mm:ss.mmm)

1. Note that if an incorrect charset is selected (ANSI or UTF-8), subtitles encoding may not be performed correctly.

Program Program number and name. Once you have clicked the **Scan** or **Rescan** button to display or refresh the program list, you can select the desired program in the drop-down list.

Auto selects the first available program.

To select the program:

1. Click the **Scan** or **Rescan** button. The list of available programs associated to the input file is displayed.
2. Select the appropriate program in the drop-down list.

Minimum threshold Set the minimum threshold for the output video quality.

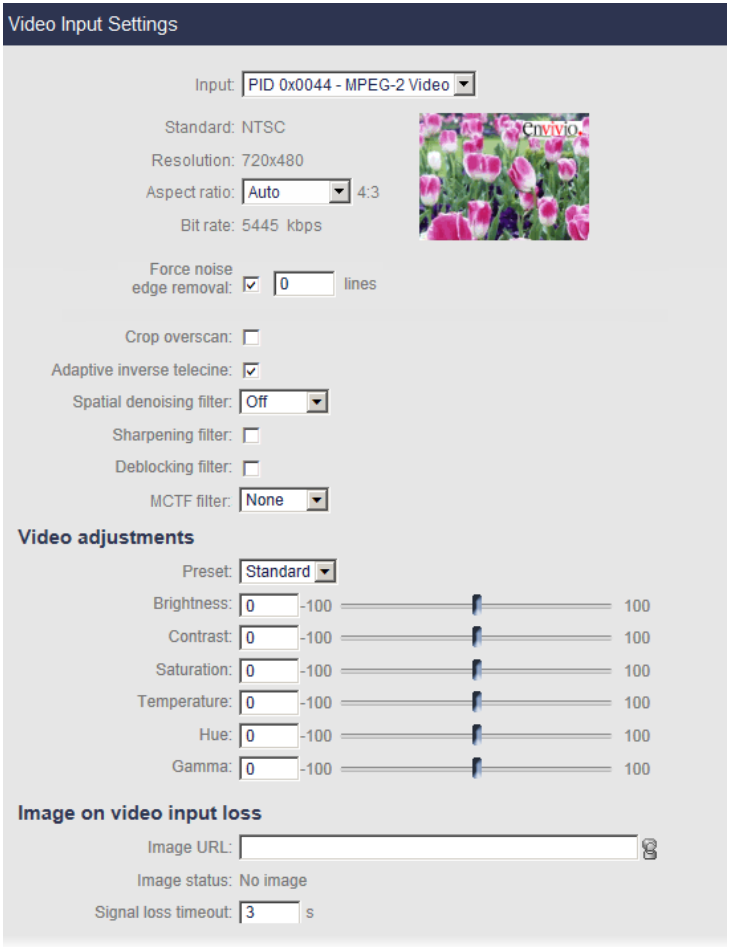
Abort encoding if under threshold If you check this option, encoding will be aborted if the output video quality goes beyond the minimum threshold.

Configuring the video input settings

To configure the video capture input, follow these steps:

1. Click the **Service** tab, then click the **Video input** subtab. The video input parameters are displayed in the right panel.

Figure 2. Input video settings



NOTE When encoding, a preview shows the pre-filtered active video. Changing the value of the parameters has a direct effect on the preview.

2. Select the appropriate value for each parameter.

Input Select the video PID you will use as input source.
None means audio only input.
PID Ghost or scrambled means non-standard input.

Standard Informative field.

Resolution Informative field.

Aspect ratio You can define the process that will be applied on the video input signal to fit in the video output format. *(See Appendix B for more details)*.

Possible values: **Auto**, **Force 4:3** or **Force 16:9**.

- If you select **Auto**, MFVP Encoding On-Demand will take into account the WSS or the AFD information embedded in the video input signal during the encoding process and transform the input video as described in Appendix B.
- If you select **Force to 4:3**, no transformation is necessary. The output maintains the same aspect ratio as the video input and black borders may be added to fit in the video output format.
- If you select **Force to 16:9**, the pixel aspect ratio will be restored and black borders may be added to fit in the video output format. Use this option in case of 16:9 anamorphosed video input format.

Bit rate Informative field.

Force noise edge removal Specify the number of lines to be removed.

Possible values: from **0** to **6** in SD or from **0** to **14** in HD

This filter blanks out video noise around the edges of the screen that would not be seen on a television, but can appear in a web video window. It should only be used if the source has noisy edges.

Crop overscan Check this option, to remove the overscan area from each edge (left, top, right and bottom) of the input video.

Adaptive inverse telecine *NTSC only*. Uncheck this option if you want to deactivate the adaptive inverse telecine pre-processing filter.

Deactivating this filter can be useful when a content must be encoded at 30 fps for interoperability with player device or content distribution solution (ad-insertion).

Prefiltering

These parameters are optional.

Spatial denoising filter
Set the threshold for Spatial denoising filter
Possible values: **Off, Low, Medium, High**

Diamond denoising filter
This filter lets you remove artefacts on progressive contents.
Set the threshold for Diamond denoising filter
Possible values: **Off, Medium, High, Adaptive**

Sharpening filter
Use this filter to increase the contrast and enhance the enhance the edges of text.
When you check this option, you have to define the **Maximum resolution** for which the filter will be applied.
If the profile resolution is lower or equal to the max resolution defined the sharpening filter is activated, otherwise if the profile resolution is bigger, the filter is not activated.

Deblocking filter
This filter lets you enhance the quality of an MPEG-2 encoded video by reducing the blocking and ringing effects.

MCTF filter
This filter lets you reduce the transmission noise (mainly Gaussian noise). You can select the strength of the filter.
Possible values **Off, Low, Medium**, **High** or **Adaptive**

Video adjustments

Preset
You can select a preset from the drop-down list that automatically adjust the video settings depending on predefined color settings.
Possible values: **Custom** (see below)**, Standard** (no color change)**, Vivid** (intense colors)**, Movie** (suitable for watching movies in a dark room)**, Sport** (Suitable for watching sport)**, Bright** (increased luminosity)

Brightness
Contrast
Saturation
Temperature
Hue
Gamma

If you select **Custom**, you can adjust these video input parameters by dragging the sliders back and forth.

All parameters have a value range of between -100 to +100 in whole digit increments. A value of 0 has no effect.

Image on video input loss

In case of input signal loss or unsupported format, you can select a default image (PNG or JPEG file) that will be displayed in the output.

Enter the path to your custom image (http://<spath>/filename.png) then click outside the URL field.

You can modify the default **signal loss timeout**.

CAUTION You must have first defined credentials to access this URL (*see* "Adding a credential" on page 156). If the credentials are ok, the user icon, should appear in color. You can click this icon to display the credentials page.

Configuring the audio input settings

To configure the audio capture input, follow these steps:

1. Click the **Service** tab, then click the first **Audio input** subtab. The audio capture parameters are displayed in the right panel.

Figure 3. Audio settings

2. Select the appropriate value for each parameter.

Input Select the audio PID you will use as input source.

Information on the audio input is displayed below.

Language You can set the language by entering an identifier corresponding to the audio channel language (ISO 639-2 three-letter code).

Examples: **eng, fra, deu, spa**. You can also use **qaa** for original language.

Codec
Sampling rate
Bit rate Informative fields.

Left Right Display the left and right audio volume level (between -60 and 0 dB) for the audio input.

NOTE: The volume indicators show the audio level after adjusting the volume with the **Gain** slider.

Audio adjustment

Automatic level adjustment Select this checkbox if you wish to maintain the level at the level defined by the **Target loudness** parameter.

NOTE: This parameter has no effect if the audio stream is passed-through.

Gain Use the slider or enter a value to amplify or attenuate the volume level of the source audio before encoding.

Possible values: from -100 to +20 dB in whole digit increments, where 0 is the default gain.

NOTE: This parameter has no effect if the audio stream is passed-through.

Mute Check this option to mute the audio input volume.

NOTE: This parameter cannot be applied if the audio stream is passed-through.

Audio delay Use the slider or enter a value to adjust the audio/video synchronization.

Possible values: from -300 to +300 ms.

Downmixed channels compression mode In case of Dolby input stream, select how the downmix from 5.1 to stereo is done. Both 5.1 and stereo outputs can be managed separately in terms of audio levels.

Possible values: **Line mode** or **RF mode**

- **Line mode** enables a greater dynamic range and reproduces dialogue at –31 dBFS
- **RF mode** compresses the dynamic range and reproduces dialogue at –20 dBFS

Audio channels configuration

Figure 4. Setting audio channels

If the audio input is an MXF or a MOV file, MFVP Encoding On-Demand automatically detects the left and right tracks, but you can set them by clicking the **Edit** link.

NOTE You should only select one audio track for left, right, center, LFE (Low-Frequency Effects), RL (Rear Left), RR (Rear Right), other tracks should be set to **undefined**.

NOTE If you want to use a configuration set from a previous version of MediaFirst Video Processing - Encoding On-Demand with an MXF or a MOV file as audio input, we recommend rescanning the input (*see* "File name" on page 36) before configuring audio channels.

3. Repeat these steps to configure all the audio streams.

Chapter 4

Configuring an Internet TV profile

Basic workflow

Below is the basic workflow for generating a PC stream.

Step #1: Configure the Ethernet connectors

Step #2: Set the service parameters

- Enter a service name,
- Specify the input file and program.

Step #3: Set the profile parameters

- Enter a profile name
- Select the export type and the bit rate

Step #4: Set the profile video and audio parameters

- Select the audio and video input
- Select the audio and video codecs

Step #5: Set the profile output parameters

- Select the profile output type, then set the output parameters

Step #6: Start encoding

Step #7: Display logs and alarms (optional)

CAUTION When you modify a parameter and you press ENTER, the modification is automatically saved in the current configuration.

Setting up the encoding profiles

Four services are displayed, each service includes one or two profiles that can be configured and started independently from the other profiles.

Creating a profile

By default only one profile by service is already activated and configured. To create a new profile, you can either add a new profile or duplicate an existing one.

Adding a new profile

To add a profile, click the **Service** tab, then select the **Add profile** link in the top right panel. MFVP Encoding On-Demand creates a new profile using default parameters.

Duplicating a profile

To duplicate a profile, follow these steps:

1. Click the **Profile** tab of the profile you want to duplicate, then select the **Duplicate** link in the top right panel.

MFVP Encoding On-Demand creates a new profile using the selected profile parameters.

Deleting a profile

To delete a profile, click the **Profile** tab, then click the **Delete** link in the right panel. Note that all the profile parameters will be lost.

Setting the profile general parameters

NOTES

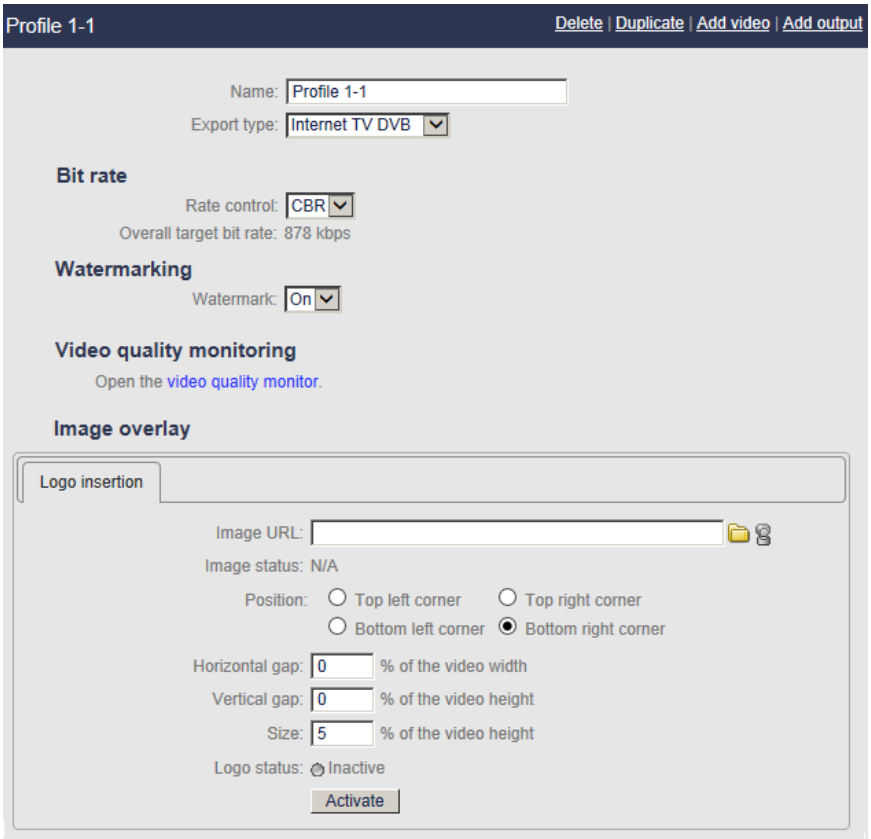
You can refer to "HTTP Streaming" on page 168 and to "Internet TV adaptive streaming" on page 170 for typical encoding settings.

During encoding, all the parameters are greyed and cannot be modified.

To set the profile general parameters, follow these steps:

1. Click a **Profile** tab. The profile general parameters are displayed in the right panel.

Figure 1. Profile general parameters: Internet TV ATSC export type



2. Select the appropriate value for each parameter.

Name Enter a profile name. We recommend using a name that clearly identifies the channel.

Export type Select an export type.

Possible values: **Internet TV ATSC, Internet TV DVB** or **ISMA**

NOTE: If a codec-linked restriction is not respected, an error message is displayed when you start encoding.

Bit rate control

NOTE For more information on bit rate control, see Section 7 on page 136.

Rate control Possible values: **CBR**, **VBR**, or **ABR** (see Table 1 on page 50)

NOTE: In case of H.264, the stream remains compliant with the normative HRD.

- With **CBR** (Constant bit rate), you can stream content over a limited bit rate channel such as a network. The output stream fits in one bit rate, which you specify as a parameter.

NOTE: In **ISMA** export type, **CBR** is equivalent to **ABR** due to the MPEG-4 standard that forbids to add stuffing in ISMA output file (mp4 file).

NOTE: With **VBR** (Variable bit rate), the output stream will never exceed the Overall max bit rate, and will try to reach the Target network bit rate. This is usually used to save bandwidth. This model is also called "Capped VBR".

- With **ABR** (Available Bit Rate), MFVP Encoding On-Demand will never exceed the maximum bit rate, but may go lower than the Target network bit rate if no more bit rate is needed for encoding.

Overall target bit rate Set the overall bandwidth target (in kbps) used by the stream.

Instead of configuring the video and audio bandwidth separately, which, added to the network overhead, constitute the overall bandwidth, you only have to specify the overall bandwidth and the audio bit rate.

Table 1. Rate control depending on export type

Export type	Rate control
Internet TV ATSC **Internet TV DVB**	CBR, VBR, ABR
ISMA	CBR, VBR, ABR

Watermarking

To activate the Civolution watermarking, set the **Watermark** parameter to **On**.

NOTE The Civolution watermarking information (Host ID and License key) are available from the **About** menu (*See*"Civolution watermarking" on page 148).

Video quality monitoring

See "Video quality monitoring" on page 31.

Logo insertion

Complete this section if you want to insert a picture (PNG or JPEG file) in the video output stream. To insert a logo, follow these steps:

1. You can either enter the path to the file (http://Webserver/directory/filename.png or filename.jpg), then click outside the URL field, or click the Browse icon, to select the path.

   NOTE You must have first defined credentials to access this URL (*see* "Adding a credential" on page 156). If the credentials are ok, the user icon, should appear in color.

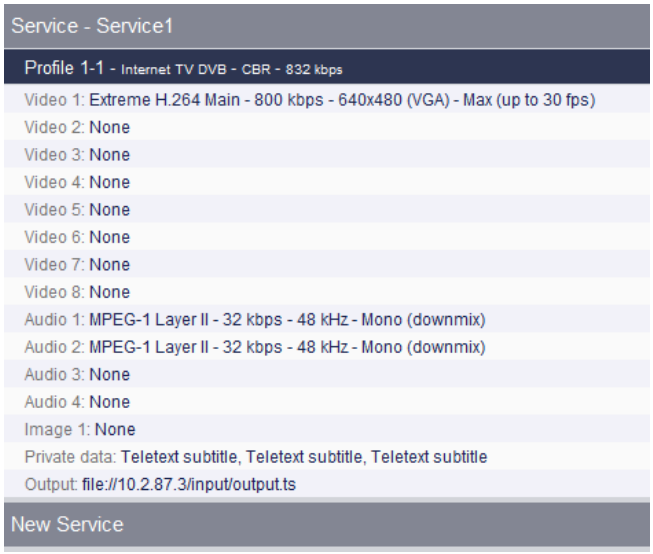
2. Select the position of the logo to be inserted (Top left corner, Top right corner, Bottom left corner, or Bottom right corner), the **horizontal/Vertical gap** (percentage of the image width and height), and the **Size** (percentage of the image height

Click the **Activate/Deactivate** button to respectively display/remove the logo in the output stream.

Displaying the audio, video, and output parameters

To display the video, audio, and output parameters of a profile, click the **Profile #** tab. The selected profile subtabs are displayed below.

Figure 2. Profile subtabs: Internet TV DVB export type



Setting the video stream parameters

NOTE Depending on license and export type, up to twelve video streams are allowed per profile.

Adding or removing a video stream

To add a video stream, click the **Profile #** tab in the left panel, then click the **Add video** link in the top right corner of the panel. A new video stream is added.

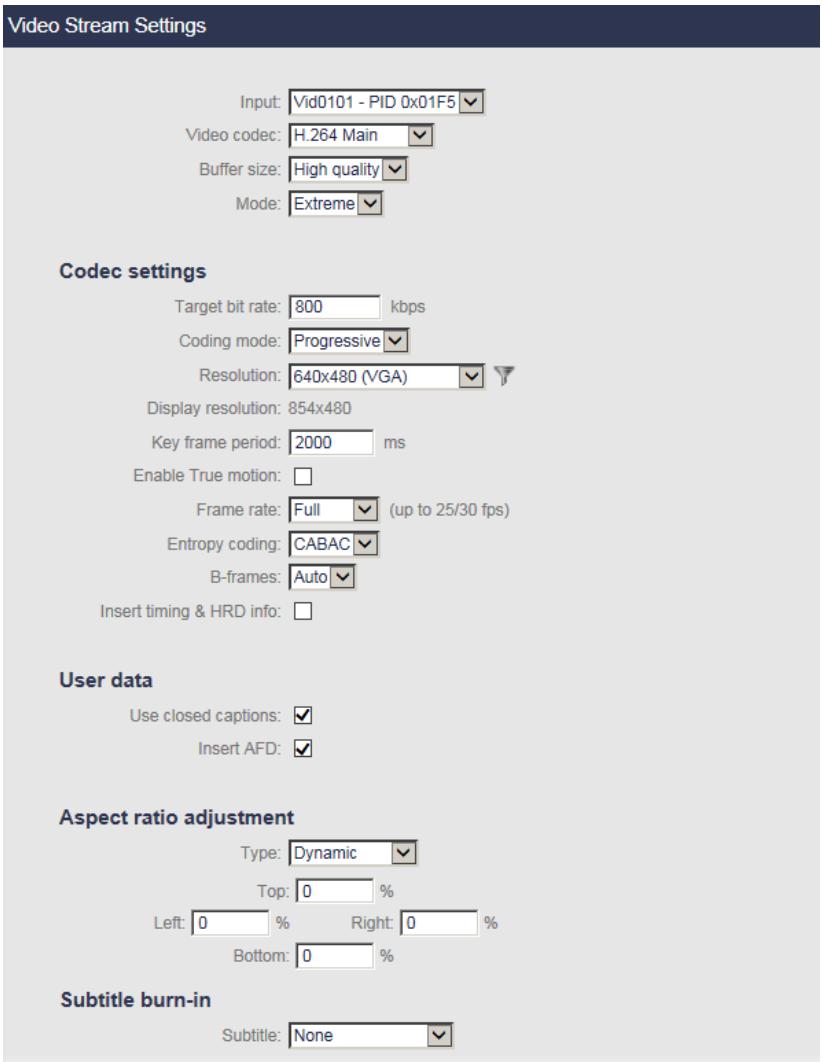
To delete a video stream, select a video stream then click the **Delete** the top right corner of the panel. The video stream is deleted.

Displaying video stream parameters

To display the video parameters, follow these steps:

1. Click the **Video** stream subtab, the video parameters are displayed in the right panel.

Figure 3. Profile video parameters: H.264 Main video codec



2. Select the appropriate value for each parameter.

Input Select the appropriate video input channel
None means audio-only mode.

Video codec Select the video codec.

Possible values: depends on the Export type.
See Table 2 on page 54.

Table 2. Available video codecs per export type

Export type	Video codec
Internet TV ATSC	Extreme H.264 Baseline, Extreme H.264 Main, Extreme H.264 High, HEVC
Internet TV DVB	Extreme H.264 Baseline, Extreme H.264 Main, Extreme H.264 High, HEVC
ISMA	Extreme H.264 Baseline, Extreme H.264 Main, Extreme H.264 High

Buffer size Possible values: **Standard, High quality** or **Custom**.

- **Standard**: VBV size = 2 000 ms
- **High quality**: VBV size = 5 000 ms
- **Custom**: enter a value between 500 and 10 000 ms

Defines the size of the VBV (Video Buffering Verifier). If the set-top box is not performing correctly (desynchronization), you can adjust the delay settings.

NOTE: If you select **Custom** for other video streams, the GOP alignment is not guaranteed.

Mode Possible values: **Extreme** or **UP!**

You can adjust the encoding quality of the service (from Extreme to high video quality).

NOTE: **UP!** mode requires a high level of processing resources.

Codec settings

Target bit rate Informative field (except in **Internet TV ATSC** and **Internet TV DVB** where you define the target video bit rate for each video).

Instead of configuring the video and audio bandwidth separately, which, added to the network overhead, constitute the overall bandwidth, you only have to specify the overall bandwidth and the audio bit rate. The video bit rate is computed from these two values.

Table 3. Target bit rate per video codec

Video codec	Video bit rate
Extreme H.264 Baseline	From 20 to 10 000 kbps.
Extreme H.264 Main	From 20 to 20 000 kbps
Extreme H.264 High	From 20 to 20 000 kbps

Coding mode Select the output coding mode.

Possible values: **Progressive**, **Interlace** or

Resolution You can either select a resolution value from a list of predefined values or enter a custom resolution by specifying the **width** and **height** in pixels).

Possible values: *see Table 4 on page 57*.

NOTES: Resolutions are sorted by the total number of pixels per frame.

With Baseline profile, the list of available resolutions is limited.

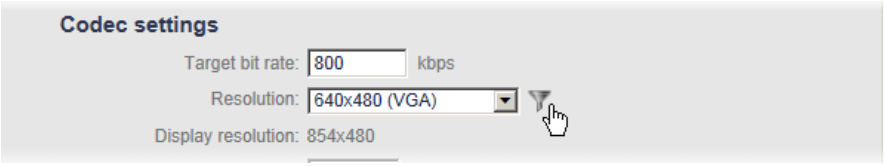
Filtering the resolutions

You can use a resolution filter based on specific parameters (category, aspect ratio) to shorten the resolution list.

To open the filtering options, follow these steps:

1. Click the filter icon next to the resolution list:

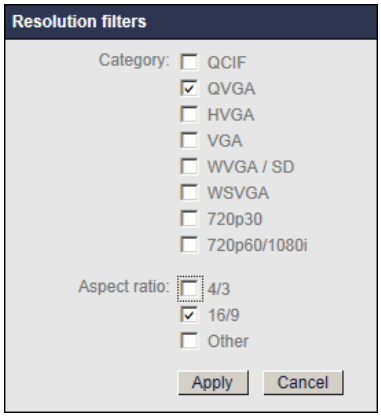
Figure 4. Filtering resolutions



2. Select category or/and aspect ratio filters to be applied on the list.

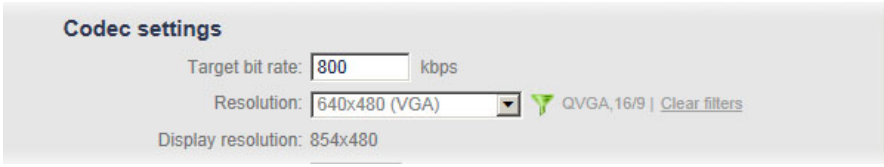
- Filter by category: **QCIF, QVGA, HVGA, VGA, WVGA/SD, WSVGA, 720p30, 720p60/1080i**
- Filter by aspect ratio: **4/3, 16/9, Other**

Figure 5. Filters



3. Click the **Apply** button to display the filtered resolutions.

Figure 6. Filtering resolutions



When one or several filters are applied:

- The filter icon turns to green: you can still click the filter icon to open the filtering window.
- The active filter(s) is(are) displayed.

NOTE If the current resolution does not belong to the filtered list, the value will still be in the list, but appears in grey. You cannot select it

4. You can click the **Clear filters** link to delete the filter.

Custom resolutions

When you specify custom resolutions, you must follow these rules:

- **Width** value must be in range from 80 to 1920.
- **Height** value must be in range from 64 to 1080.
- **Width** and height values must be even numbers.

CAUTION If the constraints are not respected, an error message is displayed.

Table 4. Possible resolutions per export type

Resolution Width	x Height	Internet TV DVB	Internet TV ATSC	ISMA
1920	1080	x	x	x
1440	1080	x	x	x
1280	1080	x	x	x
960	1080	x	x	x
1280	720	x	x	x
960	720	x	x	x
854	720	x	x	x
960	640	x	x	x
848	720	x	x	x
1024	576	x	x	x
960	544	x	x	x
960	540	x	x	x
784	592	x	x	x
640	720	x	x	x
768	576	x	x	x

Resolution Width x Height		Internet TV DVB	Internet TV ATSC	ISMA
720	576	x	x	x
854	480	x	x	x
848	480	x	x	x
704	576	x	x	x
832	480	x	x	x
800	480	x	x	x
720	480	x	x	x
480	720	x	x	x
704	480	x	x	x
768	432	x	x	x
544	576	x	x	x
640	480	x	x	x
528	576	x	x	x
720	404	x	x	x
624	464	x	x	x
704	396	x	x	x
480	576	x	x	x
544	480	x	x	x
528	480	x	x	x
640	360	x	x	x
480	480	x	x	x
624	360	x	x	x
624	352	x	x	x
352	576	x	x	x
512	384	x	x	x
480	360	x	x	x
480	352	x	x	x
352	480	x	x	x
480	320	x	x	x
512	288	x	x	x
480	272	x	x	x
480	270	x	x	x
400	304	x	x	x
400	300	x	x	x
384	288	x	x	x
432	240	x	x	x
320	320	x	x	x
352	288	x	x	x
416	240	x	x	x

Resolution Width x Height		Internet TV DVB	Internet TV ATSC	ISMA
416	234	x	x	x
400	240	x	x	x
400	224	x	x	x
360	240	x	x	x
352	240	x	x	x
384	216	x	x	x
320	240	x	x	x
368	208	x	x	x
304	224	x	x	x
320	192	x	x	x
320	180	x	x	x
240	240	x	x	x
320	176	x	x	x
304	168	x	x	x
256	192	x	x	x
240	192	x	x	x
240	180	x	x	x
240	176	x	x	x
220	176	x	x	x
240	160	x	x	x
192	192	x	x	x
176	144	x	x	x
176	128	x	x	x
176	120	x	x	x
144	140	x	x	x
160	120	x	x	x
160	90	x	x	x
128	96	x	x	x
144	80	x	x	x
96	96	x	x	x
80	64	x	x	x

Display resolution
Information field. Depends on the aspect ratio management and on the encoding resolution.

Key frame period
Possible values: from **1 000** to **10 000**

Enter the maximum time (in ms) between two key frames. You can specify how often you want key frames to be inserted into the video stream. Key frames are inserted into the stream periodically to synchronize the decoder and enable it to recover from errors.

Refreshing the image more often (by setting a shorter key frame period) reduces the recovery time but requires a higher bit rate to maintain encoding quality.

Enable true motion
Select this checkbox if you want to increase the frame rate (up to 50/60 fps). See **Frame rate** parameter below.

This option enhances the visual quality, especially with fast-moving sport contents or with scrolling text. It increases the sharpness of the images and the smoothness of the motion.

NOTES: For optimal quality with telecine contents, we recommend not selecting the **Adaptive Inverse Telecine** option (see page 39). If the Adaptive Inverse Telecine is selected, frame rate may vary from 59.94 fps to 23.98 fps.

Frame rate [1]
Possible values: **Full (up to 60 fps)**, **Max (up to 30 fps)**, **Half**, **Quarter** or **Custom**

If you select **Custom,** enter a specific value from **5** to **25** fps (PAL) or from **5** to **29.97** fps (NTSC)

---

1. When setting the **Frame rate** to **Custom** in **Smooth Streaming** output type, the GOPs are not synchronized and the IDR is not aligned between streams; preventing the player from switching from one stream to another one.

Entropy coding Possible values: **CABAC or CAVLC**.

CABAC means Context Adaptative Binary Arithmetic Coding. This is an entropy lossless compression algorithm, but very time-consuming, especially at the decoder side.

CAVLC means Context Adaptative Variable Length Coding. This is the other entropy lossless compression algorithm used in the H.264 format. It is less efficient than CABAC, but faster (especially at the decoder side).

B-Frames *Not available with Extreme H.264 Baseline video codecs.*

Possible values: **Off**, **Auto** (2 B-frames).

B-frames are used to increase quality. It indicates whether bidirectional encoded pictures (B-frames) are used. A B-frame can be considered as an interpolated frame between reference frames (I or P), interpolation is done using forward and backward motion vectors used to select pieces of pictures in reference frames.

Specific Internet TV DVB and Internet TV ATSC parameters

Use hierarchical P *Only available with Extreme H.264 Baseline video codec.*

This feature improves the video quality of terminal devices especially for half to full frame rate and from medium to high bit rate. Outside these settings quality remains unchanged.

This uses a new GOP structure with several temporal levels which has a better coding efficiency than a classical P structure.

NOTE: This option may not be supported by the device player and must be deactivated in case of non fluent video.

User data

Use closed captions

Only available is export type is Internet TV ATSC.

Check this option if you want to extract and embed the closed caption information in the output stream.

NOTE: Compliant with the EIA-608 and EIA-708 standards.

Insert AFD

Only available with Internet TV DVB and Internet TV ATSC export types.

Check this option if you want to take into account the display aspect ratio of the source and provide this information to the output.

Aspect ratio management

See Appendix B for more details.

Type

Select the aspect ratio adaptation type.

Possible values: **Dynamic**[1], **Letter Boxing** or **Stretching**.

NOTE: We recommend launching the encoding, and modify the **Aspect ratio adjustment** value to adjust it with accuracy.

Output aspect ratio

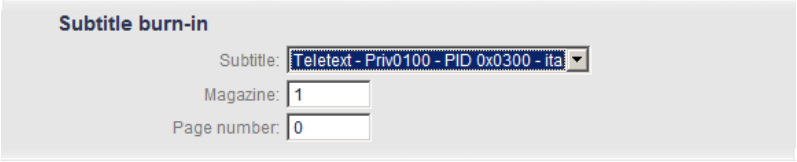
- If you select **Dynamic**, you can define the Top, Bottom, Right and Left values (in%).
- If you select **Letter boxing**, you can define **Output aspect ratio** (square pixel, 4/3 or 16/9) and the **Zoom level** (in%). Possible values for **Zoom level**: 0 (no zoom, black stripes on the top and bottom), 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 (the video is zoomed, and black stripes are removed).
- If you select **Stretching**, you can define the **Output aspect ratio** (square pixel, 4/3 or 16/9) and the stretching values (in%) for Top, Bottom, Right and Left.

1. Internet TV DVB and Internet TV ATSC export types only.

Subtitle burn-in

The subtitle burn-in feature enables burn-in DVB teletext subtitle, DVB subtitle or Closed Caption streams in the video.

Figure 7. Subtitle burn-in: Teletext



1. Select the stream you want to burn.

NOTE By default the **Subtitle** parameter is set to **None**.

2. In case of Teletext, specify the Magazine and the page number.

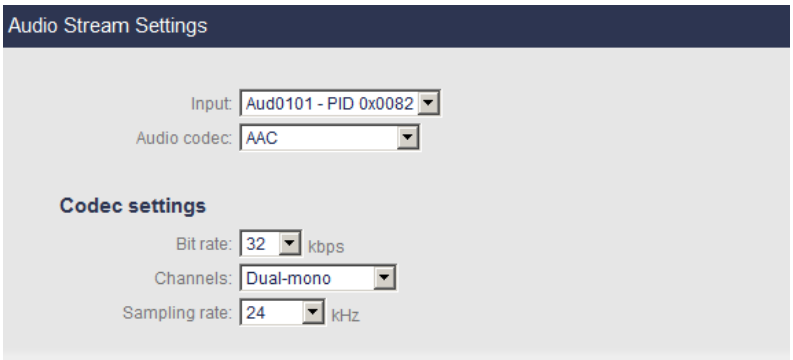
Setting the audio stream parameters

NOTE Depending on license and export type, up to four audio streams are allowed per profile.

To display the audio parameters, follow these steps:

1. Click the **Audio** stream subtab, the audio parameters are displayed in the right panel.

Figure 8. ProfileAudio parameters: MPEG-4 AAC audio codec



2. Select the appropriate value for each parameter.

Input Select the appropriate audio input channel.
None means video-only mode.

Audio codec Specify the audio codec.
Possible values: *see Table 5 below*.

Table 5. Available audio codecs per export type

Export type	Audio codecs
Internet TV ATSC **Internet TV DVB**	MPEG-1 Layer II, AAC, HE-AAC, HE-AAC v2, Pass-through[1],or Dolby Digital Plus
ISMA	MPEG-4 AAC, MPEG-4 HE-AAC, MPEG-4 HE-AAC v2

1. **Pass-through** lets you receive an already encoded Dolby 5.1 or AC-3 stream and forward it to the output. Supported format for Pass-through are MPEG-1 /MPEG-2 Layer II, AC-3 Audio and Enhanced AC-3.

Codec settings

NOTE These parameters are not available with **Pass-through**.
For Dolby Digital Plus parameters, see "Dolby specific parameters" on page 67.

Bit rate Specify the audio bit rate value in kilobits per second.
See Table 6 below.

NOTE: The specified value does not include the packet overhead.

Channels Possible values: *see Table 7 on page 65.*

Sampling rate Specify the sampling rate in kilohertz (kHz).
See Table 7 on page 65.

Table 6. Bit rates depending on codec

Codec type	Bit rate
MPEG-2 AAC **MPEG-4 AAC**	8, 10, 12, 16, 20, 24, 28, 32, 40, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320
MPEG-2 HE-AAC **MPEG-4 HE-AAC**	8, 10, 12, 16, 20, 24, 28, 32, 40, 48, 56, 64, 80, 96, 112, 128
MPEG-2 HE-AAC v2 **MPEG-4 HE-AAC v2**	20, 24, 28, 32, 40, 48

Table 7. Sampling rate depending on codec and bit rate

Codec	Bitrate (kbps)	Channel mode	Sampling rates (kHz)
MPEG-2 AAC **MPEG-4 AAC**	8, 10	Mono Mono left Mono right	8, 11.025, 12
	12	Mono Mono left Mono right	8, 11.025, 12, 16

Codec	Bitrate (kbps)	Channel mode	Sampling rates (kHz)
MPEG-2 AAC **MPEG-4 AAC**	16	Mono Mono left Mono right	8, 11.025, 12, 16, 22.05, 24
		Dual mono Stereo	8, 11.025, 12
	20, 24, 28, 32	Mono Mono left Mono right	8, 11.025, 12, 16, 22.05, 24, 32, 44.1, 48
		Dual mono Stereo	11.025, 12, 16, 22.05, 24
MPEG-2 AAC **MPEG-4 AAC**	40	Mono	16, 22.05, 24, 32, 44.1, 48
		Dual-mono, Stereo	16, 22.05, 24, 32
	48	Mono	22.05, 24, 32, 44.1, 48
		Dual-mono, Stereo	22.05, 24, 32
	56	All channel modes	22.05, 24, 32, 44.1, 48
	64 and over	All channel modes	32, 44.1, 48
MPEG-2 HE-AAC **MPEG-4 HE-AAC**	All bit rates	All channel modes	32, 44.1, 48
MPEG-2 HE-AAC v2 **MPEG-4 HE-AAC v2**	All bit rates	Stereo	32, 44.1, 48

Dolby specific parameters

Bit rate Specify the audio bit rate value in kilobits per second.
Possible values: from **96** to **640 kbps**

NOTE: Minimum bitrate for surround is **160 kbps**

Channels Select the number of output channels.

Possible values: **2/0** (stereo) or **3/2** (surround)

Check the **Follow input** option to maintain the number of channels.

Sampling rate Specify the sampling rate in kilohertz (kHz).

NOTE: Only 48kHz is supported.

Dialog Normalization Possible values: **Auto** or, from **-1 dB** to **-31 dB**

Auto means that no processing will be done on the input.

Informational metadata for stereo (2/0) channels

Dolby Surround Mode Possible values: **Not Indicated, NOT Dolby Surround Encoded**, or **Dolby Surround Encoded**

Preprocessing for stereo (2/0) channels

NOTE **Auto** means that no processing will be done on the input.

DC Highpass Filter Check this option to activate a DC highpass filter.

DRC Line Mode Profile Possible values: **None**, **Film: Standard, Film: Light, Music: Standard, Music: Light, Speech**

Enables Dynamic Range Control that restricts the absolute peak level for a signal.

DRC RF Mode Profile Possible values: **None, Film: Standard, Film: Light, Music: Standard, Music: Light, Speech**

Enables heavy Dynamic Range Control, ensures that the instantaneous signal peaks do not exceed specified levels.

Informational metadata for surround (3/2) channels

Dolby Surround EX Mode Possible values: **Not Indicated, NOT Dolby Surround EX Encoded**, or **Dolby Surround EX Encoded**

Preprocessing for surround (3/2) channels

DC Highpass Filter Check this option to activate a DC highpass filter.

LFE Lowpass Filter Applies a 120Hz lowpass filter to the LFE (Low Frequency Effects) channel prior to encoding.

90 Degree Phase Shift Applies a 90-degree phase shift to the surround channels.

3 dB Attenuation Applies a 3 dB attenuation to the surround channels.

DRC Line Mode Profile Possible values: **Film: Standard, Film: Light, Music: Standard, Music: Light, Speech**

Enables Dynamic Range Compression that restricts the absolute peak level for a signal.

DRC RF Mode Profile Possible values: **Film: Standard, Film: Light, Music: Standard, Music: Light, Speech**

Enables heavy Dynamic Range Compression, ensures that the instantaneous signal peaks do not exceed specified levels.

Downmix Metadata for surround (3/2) channels

NOTE **Auto** means that no processing will be done on the input.

Lo/Ro Center Mix Level This parameter indicates the level shift applied to the center channel as a result of downmixing to an Lo/Ro output.

Lo/Ro Surround Mix Level This parameter indicates the level shift applied to the surround channels when downmixing to an Lo/Ro output.

Lt/Rt Center Mix Level This parameter indicates the level shift applied to the center channel as a result of downmixing to an Lt/Rt output.

Lt/Rt Surround Mix Level
This parameter indicates the level shift applied to the surround channels when downmixing to an Lt/Rt output.

Stereo Downmix Preference
Select the stereo downmix preference.

Possible values: **Not Indicated**, **Lt/Rt Downmix preferred**, **Lo/Ro Downmix preferred** or **Dolby Prologic II downmix preferred**

Setting the private stream parameters

NOTE private data is only available if **Export type** is **Internet TV DVB, Internet TV** or **ATSC**.

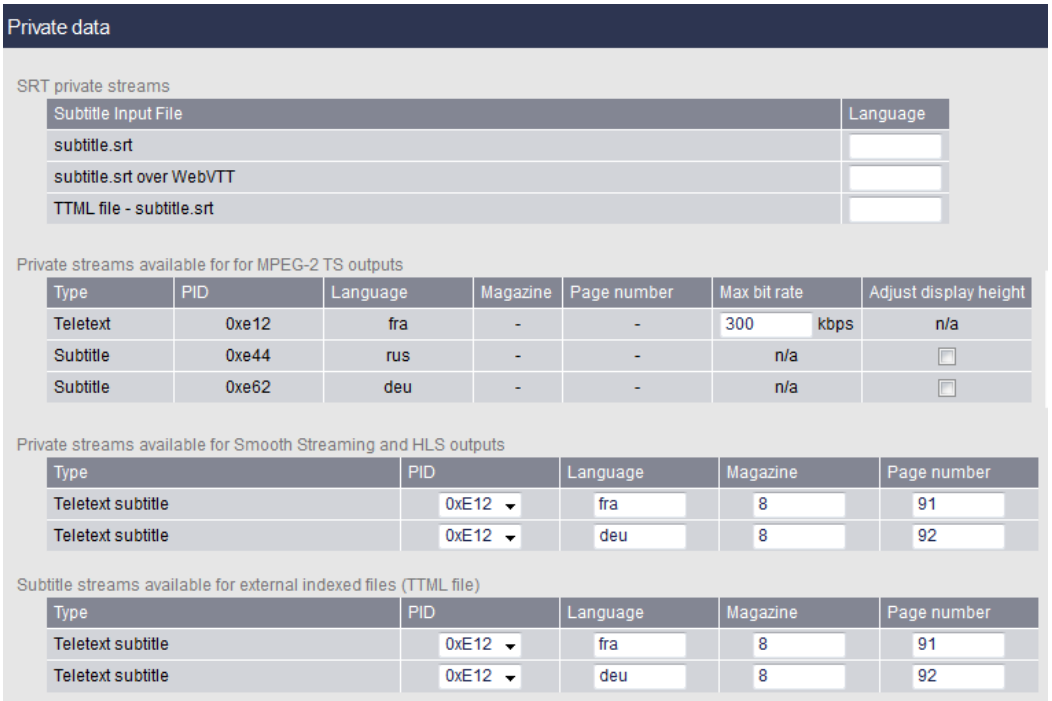
To display the private stream parameters, follow these steps:

1. Set the **Export type** to **Internet TV DVB**. The **private data** subtab is added to the profile subtabs.

Figure 9. Private data subtab: Internet TV DVB

2. Click the **private data** subtab, the private stream parameters for subtitles (SRT, MPEG-2 TS, Smooth Streaming & HLS outputs, and TTML files are displayed in the right panel.

Figure 10. Private data: Internet TV DVB



3. The following information is displayed for each private stream:

Type Possible values: **Teletext**, **Subtitle**, **VBI data**, **VBI teletext, SCTE 35, Closed captions**(1)

PID PID of the input private stream.

Language In **Ethernet** mode, the input language is displayed as information.
With **Smooth Streaming** output type, you can change the Language for Subtitles and Closed captions.

Magazine
Page number Magazine/page number.
For example, for DVB teletext 777, magazine number is 7 and page number is 77.

Max bit rate *Only available with teletext*.

You can define the bandwidth reserved for the teletext DVB data.

Possible values: from **30** to **600** kbps

Adjust display height Check this option to adjust the DVB subtitle display height.

1. Only available with **Smooth Streaming** output type. Uses DFXP, an XML format for subtitling used for Smooth Streaming output.

Specific parameters for SRT private streams

Subtitle input file Possible values: **SRT, SRT over WebVTT**

Language In **Ethernet** mode, the input language is displayed as information.
With **Smooth Streaming** output type, you can change the Language for Subtitles and Closed captions.

Specific parameters for TTML subtitle streams

Type **Teletext subtitle**

PID PID of the input subtitle stream.

Language Language of the subtitle.

Magazine Magazine/page number.

Page number For example, for DVB teletext 777, magazine number is 7 and page number is 77.

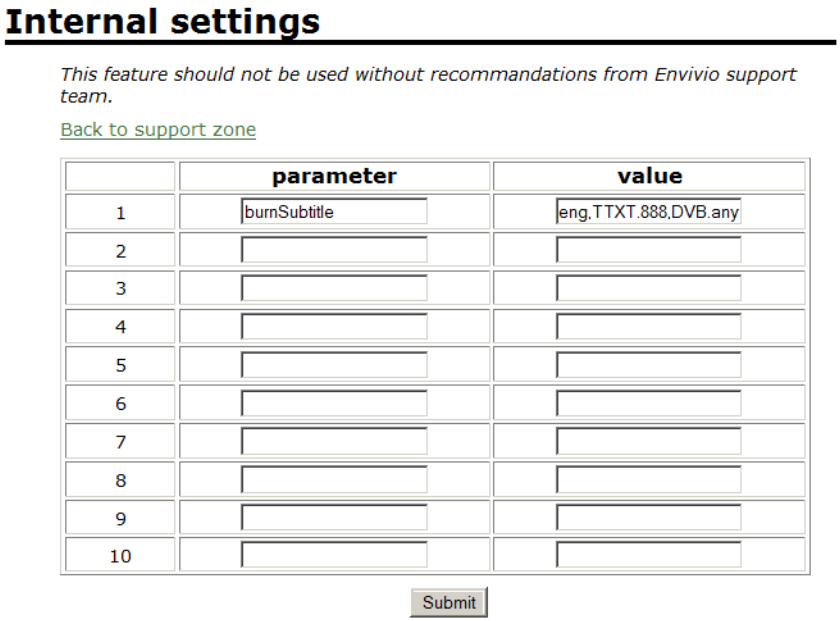
DVB and Teletext burn-in

The subtitle burn-in feature enables burning DVB teletext or DVB subtitle streams in the video. The feature is configurable using advanced configuration settings.

Using subtitle burn-in feature:

1. Open a browser and enter the following address:
   http://<MFVP-OD_IP_Address>/Support.html

2. Click the **Advanced configurations** green link at the bottom of the page.
3. Enter the following parameter: **burnSubtitle**



Internal settings

This feature should not be used without recommandations from Envivio support team.

Back to support zone

	parameter	value
1	burnSubtitle	eng,TTXT.888,DVB.any
2		
3		
4		
5		
6		
7		
8		
9		
10		

Submit

4. Enter the parameter value: the value is a list of DVB bitmap or teletext subtitles that the encoder must look for in the input stream and burn.

   burnSubtitle=TTXT.fra,DVB.fra,TTXT.deu,DVB.eng,TTXT.888,DVB.any

   In our example, MFVP Encoding On-Demand will first look for the French teletext, then he French DVB, the German teletext, and finally, the English teletext.

   - `TTXT.pageNumber` (for example, `TTXT.888`): if a teletext stream is available, MFVP Encoding On-Demand burns the indicated page of the first teletext stream.
   - `DVB.any`: If a DVB bitmap stream is available MFVP Encoding On-Demand burns it.
5. Click the **Submit** button.

CAUTION This list applies to all profiles activated on the encoder. If a profile does not require subtitle burn in, the profile name must start with **noSub** (example: **noSub_Profile 1-1**).

NOTES

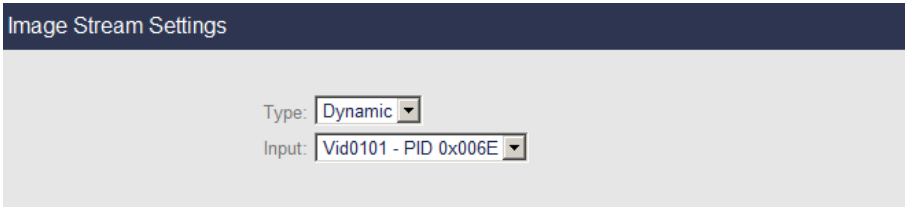
To configure a back-up encoder, follow the procedure indicated above and indicate all subtitles that can be used in the value field, and check that **noSub** is part of the name of the profile on primary encoders.

To configure a back-up encoder, the following use case cannot be performed: a source has 2 subtitle tracks in the same format, one per language. The scenario is to use the encoder to generate 2 video streams with subtitle burn-in, one per language. The encoder will burn-in the same language in the 2 output streams.

Setting the image stream parameters

You can select the image source that will be displayed in case of audio only input.

Figure 11. Image stream settings



This image can be either **static** or **dynamic**.

If you select **static**, you must enter the path to the image. Path can be:

- `file://<spath>/filename.png`
- `ftp://<spath>/filename.png`
- `ftps://<spath>/filename.png`
- `http://<spath>/filename.png`
- `https://<spath>/filename.png`

Then click outside the URL field.

NOTE If you defined credentials to access this URL (*see* "Adding a credential" on page 263), the user icon, should appear in color.

If you select **dynamic**, you must select the appropriate video input channel. An image will be regularly extracted from the video input.

Setting the output parameters

Adding or removing an output

With **Internet TV DVB** and **Internet TV ATSC** export types, you can add and remove the network outputs.

To add a network output, click the **Profile #** tab in the left panel, then click the **Add output** link in the top right corner of the panel. A network output is added.

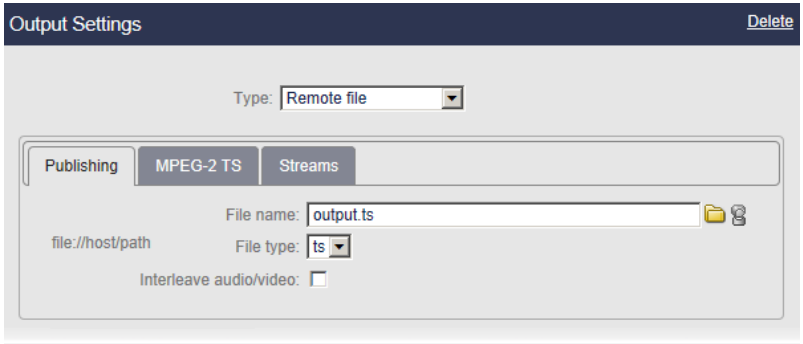
To delete a network output, select the network output then click the **Delete** the top right corner of the panel. The network output is deleted.

Configuring the output parameters

To display the output parameters, follow these steps:

1. Click the **Output** subtab, the output parameters are displayed in the right panel.

Figure 12. Output parameters: Remote file



2. Select the appropriate value for each parameter.

NOTE Depending on the export type, you can configure one or two outputs independently.

Type Select the broadcast type.

Possible values: *see Table 8 below*.

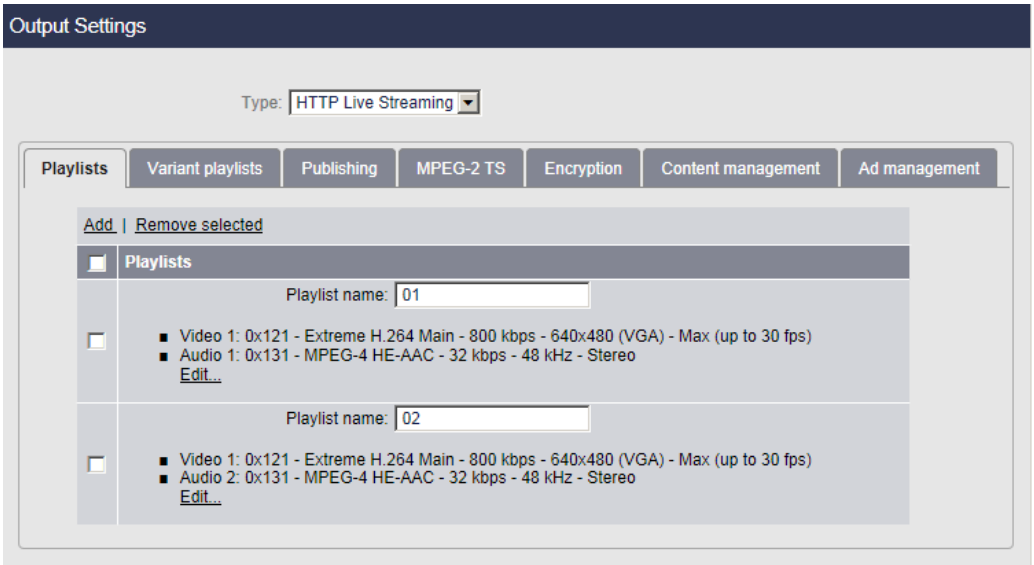
Depending on the selected output type, specific parameters are displayed.

Table 8. Available outputs per export type

Export type	Network output type
Internet TV ATSC **Internet TV DVB**	None, HTTP Live Streaming, Smooth Streaming, Remote file
ISMA	None, Remote file

Specific HTTP Live Streaming parameters

Figure 13. Output parameters: HTTP Live Streaming



Media playlists

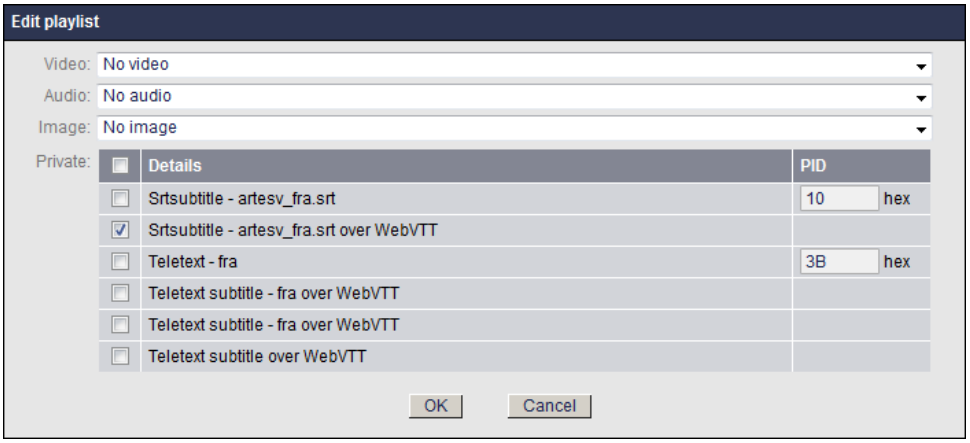
You can add or remove media playlists and define the composition of the media playlist by selecting the video stream, the audio stream, the image and the private data that will be sent to the selected output. You can define up to 16 playlists.

To define a media playlist, follow these steps:

1. Click the **Add** button, a default playlist is created.
2. Click the **Edit** button.

NOTE We recommend changing the playlist name.

Figure 14. Media playlist definition



3. In the drop-down lists, select the video, audio and image streams to be added then select the private data by ticking the corresponding checkbox.
4. Click the **OK** button.
5. The playlist is updated.

CAUTION SRT over WebVTT playlists must not include audio nor video streams.

NOTES Once selected, private data streams (teletext, subtitle, SCTE-35) are passed through.

You can delete an existing media playlist by checking the playlist to be removed and clicking the **Remove selected** button.

Master playlists

Once you have defined playlists, you can define master playlists.

You can define up to 5 master playlists.

To define a master playlist, follow these steps:

1. In the master playlist table, click the **Add** link to create a new master playlist, then click the **Edit** link.
2. Tick the checkbox next to the playlists to be added then click the **OK** button.
3. The playlist is added to the list of master playlists.

NOTE You can delete an existing master playlist by checking the master playlist to be removed and clicking the **Remove selected** button.

iOS 5 related features: Alternative audio group

Alternative groups

This feature lets you package each media stream (audio or video stream) in a flexible manner.

An audio group (*rendering group* in Apple specifications) aggregates several audio playlists to propose an alternative rendition of the audio for a given video stream. For instance, an English audio playlist can be replaced by a French or a Spanish audio playlist. Inside a group, a default playlist can be set.

To use this feature, you must first create audio-only and video-only playlists, then you will associate the audio and video streams into one or more master playlist(s).

Creating an alternative group

If you want to define an alternative audio group, follow these steps:

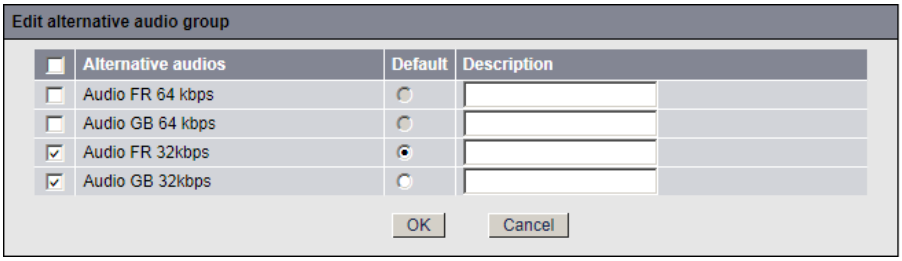
1. Create audio-only and video-only playlists (*see* "Media playlists" on page 78)
2. From the **Master Playlist** tab, tick the **Use alternative audio groups** checkbox. A new table is displayed.
3. In the alternative audio group table, you can either:

- click the **Auto-configure** link to automatically create alternative audio groups based on the audio-only playlists you created,

- or click the **Add** link to create a new group then click the **Edit** link to define the composition of your alternative audio group. Select the default audio stream and add a description.

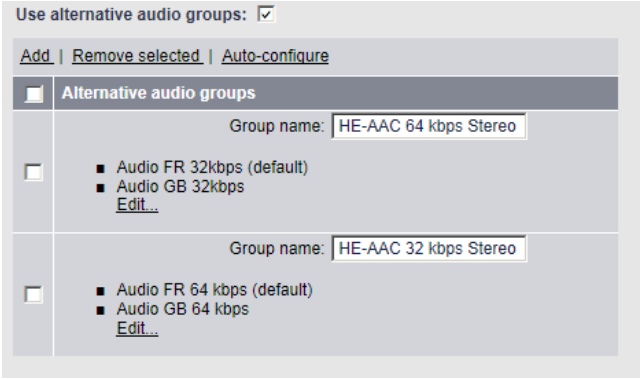
NOTE Only audio streams with identical codec/bitrate/channels/sampling rate can be associated in a same group.

Figure 15. Editing alternative audio groups



4. The alternative audio group is added to the table:

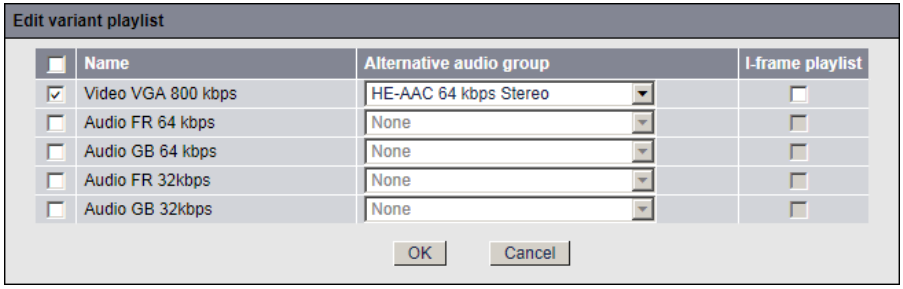
Figure 16. Alternative audio groups table



5. In the master playlist table, click the **Add** link to create a new master playlist, then click the **Edit** link.

6. Select the alternative audio group you want to associate to the video stream then click the **OK** button.

Figure 17. Editing master playlists

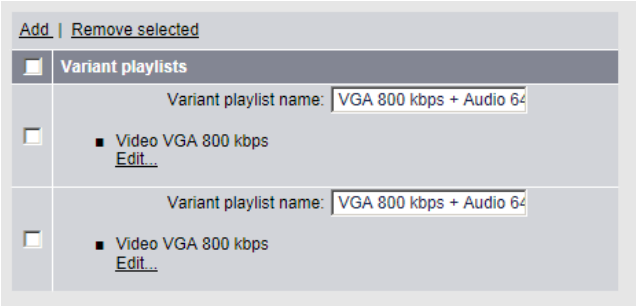


7. You can check the **I-frame playlist** option to reference I-frames in the stream.

NOTE To optimize rapid forward and reverse playback, Apple introduced the notion of I-Frame playlist in iOS5.

8. The master playlist is added to the table:

Figure 18. Master playlists table



Publishing

Network interface Select the appropriate network interface.

Possible values: **Ethernet 1, Ethernet 2, ethernet 5, Ethernet 6, Ethernet 1 (backup: Ethernet 2), Ethernet 6 (backup: Ethernet 5)**

Select **Ethernet 1 (backup: Ethernet 2)** –or Ethernet 6 (backup: Ethernet 5)– if you want redundant Ethernet interfaces. In this case, Ethernet 1 will be used to stream by default, but if Ethernet 1 fails, then Ethernet 2 will be used instead.

The **Ethernet 1 (backup: Ethernet 2)** is a logical interface. The same physical Ethernet interface will be used by all profiles which have selected this interface. For example, if a profile 1 uses Ethernet 2 after a backup, all profiles that have selected **Ethernet 1 (backup: Ethernet 2)** will use the same Ethernet interface after stop/start.

If you want to force MFVP Encoding On-Demand to switch back to Ethernet 1, you will have to either stop/start all the profiles that have selected **Ethernet 1 (backup: Ethernet 2)** or to unplug Ethernet 2.

Publishing point

Specify the location where fragments and playlist/index files will be published.

file://<IP Address>/path
file://<DNS host name >/path

NOTE: If you defined credentials to access this URL (*see "Adding a credential" on page 175*), the user icon, should appear in color. You can click this icon to display the credentials page.

Distribution point

Enter the URL where fragments and playlist files can be retrieved.

Secondary publishing point

Enter the URL of the secondary publishing point for redundancy purpose.

Secondary distribution point

Enter the URL of the secondary distribution point where fragments and playlist files can be retrieved.

Separate playlists

Check this option if you want to upload/download playlists to/from a different location.

If you check this option, new parameters are displayed. Specify the main/backup publishing and distribution points for the playlists.

Separate segments

Check this option if you want to upload/download segments to/from a different location.

If you check this option, new parameters are displayed. Specify the main/backup publishing and distribution points for the segments.

Use thumbnails

If you check this option, JPEG thumbnail images will be generated every 3 seconds. These JPEG files will be uploaded in the same location as fragments and playlist/index files. Thumbnails can be used to create a dynamic EPG for instance.

Separate thumbnails

Only visible if you checked the **Use Thumbnails** *option.*

Click this checkbox if you want the thumbnails to be published in another location than the fragments and playlist/index files, then fill in the different parameters.

Network interface: select which network interface is used to publish thumbnails.

Publishing point: specify the location where thumbnails will be published.

Secondary publishing point: for redundancy aspects, a secondary publishing point can be configured.

NOTE: If you defined credentials to access this URL (*see "Adding a credential" on page 175*), the user icon, should appear in color. You can click this icon to display the credentials page.

Use subdirectories

If you check this option, you can define the maximum number of files per upload directory.

NOTE: Deleted fragments are part of the overall count.

MPEG-2 TS settings

Video stream PID

MPEG-2 TS parameter. PID of the video stream.

Possible values: from **0x0010** to **0x1FFE** *(see "PIDs consistency rules" on page 94).*

CAUTION: If the **Network output type** is **HTTP Live Streaming**, all the video streams will have the same PID as the first video stream.

Audio stream PID

MPEG-2 TS parameter. PID of the audio stream.

Possible values: from **0x0010** to **0x1FFE**

See "PIDs consistency rules" on page 94.

Image stream PID

MPEG-2 TS parameter. PID of the image stream.

Possible values: from **0x0010** to **0x1FFE**

See "PIDs consistency rules" on page 94.

PMT PID

PID (Packet IDentifier) of the PMT (Program Map Table) stream.

Possible values: from **0x0010** and **0x1ffe** (hexadecimal) or from 16 to 8190 (decimal).

PCR PID

PID of the PCR, Program Clock Reference used to synchronize the video and audio packets.

Possible values: from **0x0010** and **0x1ffe** (hexadecimal) or from 16 to 8190 (decimal).

Target PCR Period

PCR period (in milliseconds)

Possible values: from **20** to **1000** ms.

Target PSI Period

PSI period (in milliseconds)

Possible values: from **20** to **1000** ms.

Program number

Program identifier.

Possible values: from **0x0001** to **0xffff** (hexadecimal) or from 1 to 65 535 (decimal).

Use LATM encapsulation for AAC

By default, AAC audio is MPEG-2. Check this option if you want AAC audio to be MPEG-4.

Encryption

Encryption type

Possible values: **None**, **Internal key generation**, **External key generation** or **HTTP ECMG and TS packet encryption**

By default, the protection is not activated.

If you enable the encryption, specific parameters are displayed *(see "Encryption for HTTP Live Streaming" on page 163)*.

Content management

GOPs per segment

You can define the number of GOPs per segment.

Possible values: from 1 to 120

Recommended value: from 1 to 10

The estimated segment size is automatically updated.

NOTE: The segment size is computed from the Number of GOP(s) and the Key frame period.

Concatenate segments (byte range)

Check this option to enable segments concatenation.

Cross reference

The cross reference enables redundancy at player level. It is used when playlists are published on both primary and backup publishing points. If you check this option, master playlists reference both the primary and the backup publishing points.

Example of a master playlist using cross reference:

```
#EXTM3U
#EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=500832
http://myPrimaryServer/france5/01.m3u8
#EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=500832
http://myBackupServer/france5/01.m3u8
```

Custom naming

Use custom naming

CAUTION: Reserved for advanced users.

Check this option if you want to customize the playlist name, the master playlist name, the segment name and the thumbnail name.

Five parameters are used to customize the output file names: **Segment pattern**, **Master playlist pattern**, **Media playlist pattern**, **I-frame playlist pattern,** and **thumbnail pattern**

These five patterns support the following keys (these keys will be replaced at encoding time with the appropriate value):

Key	Description
${starttime}	Time at session start
${bitrate}	Bitrate (in kbps) associated to the file
${id}	Session identifier
${seq}	Sequence number associated to the file
${curtime}	Time at file creation
${lang}	Language associated to the file
${variantid}	Name of the master playlist

NOTE **${id}** must be before **${seq},** and **${seq}** must be before **${curtime}**.

Below are the rules to follow for an Apple HTTP output:

Table 9. File naming rules

Parameter name	Default value	Supported keys	Required keys	Specific rules
Segment	${starttime}-${id}-${seq}.ts	${starttime} ${bitrate} ${id} ${seq} ${curtime} ${lang}	${id} ${seq}	If subdirectories are used: - ${id} must be before ${seq} - ${seq} must be before ${curtime}

Parameter name	Default value	Supported keys	Required keys	Specific rules
Master playlist	index.m3u8	${lang} ${variantid}	${variantid}(1)	
Media playlist	${id}.m3u8	${id} ${bitrate} ${lang}	${id}	
iFrame playlist	${id}-iframe.m3u8	${id} ${bitrate} ${lang}	${id}	
Thumbnail	thumb.jpg	${starttime} ${seq} ${curtime}		

1. Required in case of multi audio session.

Example for file naming:

pattern=${id}_${seq}_${bitrate}_${curtime}.ts

The created files will have these names:

- 01_341_750_20100101T010101.ts
- 01_342_750_20100101T010103.ts
- 01_343_750_20100101T010105.ts

Subdirectory for naming rules:

If subdirectories are used, the segment pattern is divided in two parts:

- the first one is used for the subdirectory name
- the second one is used for the segment name

To separate this pattern and provide the subdirectory and segment names, the **`${seq}`** token is divided by the **`maxSegmentPerDir`** value.
The *Quotient* is kept for the directory name, the *Rest* for the segment name.

Examples:

Let's consider that the output is **`maxSegmentPerDir = 100`** and the segment pattern is set to **`iPad_${seq}_hq.ts`**.

Let's find the directory and segment names during runTime:

If `${seq}`=**`341`**
341 / 100 = 3*100 + 41 (Q=3 - R=41).
The directory will be `iPad_`**`3`**
The segment name will be **`41`**`_hq.ts`

If `${seq}`=**`399`**
399 / 100 = 3*100 + 99 (Q=3 - R=99)
The directory will be `iPad_`**`3`**
The segment name will be **`99`**`_hq.ts`

If `${seq}`=**`400`**
400 / 100 = 4*100 + 0 (Q=4 - R=0)
The directory will be `iPad_`**`4`**
The segment name will be **`0`**`_hq.ts`

If `${seq}`=**`18539`**
18539 / 100 = 185*100 + 39 (Q=185 - R=39)
The directory will be `iPad_`**`185`**
The segment name will be **`39`**`_hq.ts`

64 kbps stream for iPhone and iPad

Apple requires an alternate stream at 64 kbps or less for slow data connections.

Recommended audio settings:

- **Audio codec**: MPEG-2 HE-AAC
- **Bit rate**: 40 kbps
- **Channels**: Stereo
- **Sampling rate**: 48 kHz

Ad management (content replacement)

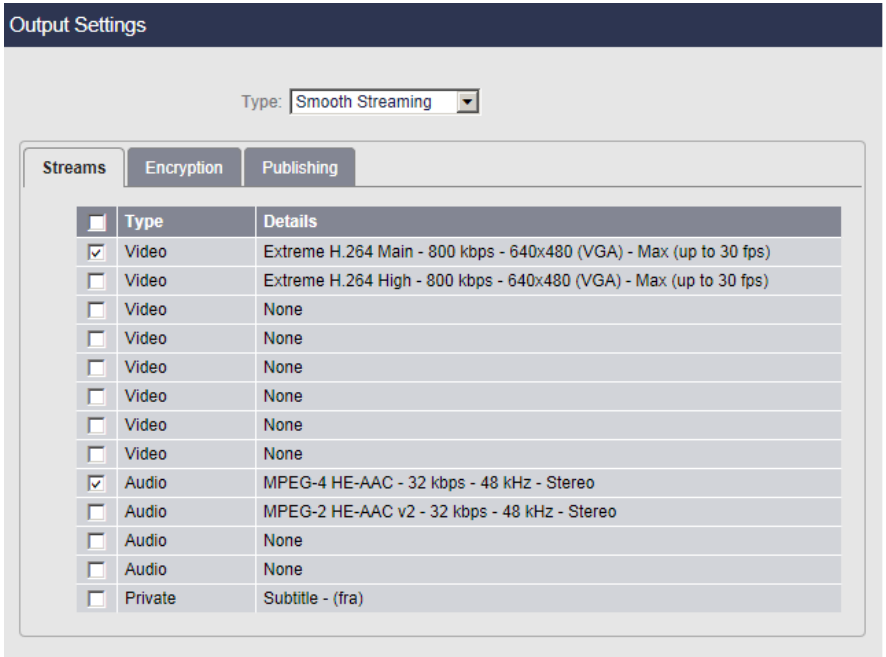
Linear ad insertion in HLS consists in inserting tags within the playlist.

NOTE By default, the replacement type is set to **None** and therefore the content replacement is not activated.

Replacement type	Possible values: **None**, **Playlist markers**
Reference SCTE 35 stream	Select the SCTE 35 PID from which splice-in and splice-out information will be derived.

Specific Smooth Streaming parameters

Figure 19. Smooth Streaming output parameters: Streams tab



	Type	Details
☑	Video	Extreme H.264 Main - 800 kbps - 640x480 (VGA) - Max (up to 30 fps)
☐	Video	Extreme H.264 High - 800 kbps - 640x480 (VGA) - Max (up to 30 fps)
☐	Video	None
☐	Video	None
☐	Video	None
☐	Video	None
☐	Video	None
☐	Video	None
☑	Audio	MPEG-4 HE-AAC - 32 kbps - 48 kHz - Stereo
☐	Audio	MPEG-2 HE-AAC v2 - 32 kbps - 48 kHz - Stereo
☐	Audio	None
☐	Audio	None
☐	Private	Subtitle - (fra)

Streams

You can specify the composition of the output stream by selecting the streams that will be sent to the selected output.

NOTE The number of audio streams depends on the license.

Encryption

By default, the protection is not activated. If you set the **Fixed key, Fixed key seed, Fixed protected key seed,** or **External key generation**, specific parameters are displayed *(see "Encryption for Smooth Streaming profile" on page 160)*.

Publishing

Network interface

Select the appropriate network interface.

Possible values: **Ethernet 1 (backup: Ethernet 2), Ethernet 1, Ethernet 2, ethernet 5** or **Ethernet 6.**

Select **Ethernet 1 (backup: Ethernet 2)** if you want redundant Ethernet interfaces. In this case, Ethernet 1 will be used to stream by default, but if Ethernet 1 fails, then Ethernet 2 will be used instead.

The **Ethernet 1 (backup: Ethernet 2)** is a logical interface. The same physical Ethernet interface will be used by all profiles which have selected this interface. For example, if a profile 1 uses Ethernet 2 after a backup, all profiles that have selected **Ethernet 1 (backup: Ethernet 2)** will use the same Ethernet interface after stop/start.

If you want to force MFVP Encoding On-Demand to switch back to Ethernet 1, you will have to either stop/start all the profiles that have selected **Ethernet 1 (backup: Ethernet 2)** or to unplug Ethernet 2.

Publishing point

Enter the IP address of your IIS server. MFVP Encoding On-Demand will remotely create a new publishing point.

URL: file://<server address>/

NOTE: If you defined credentials to access this URL (*see "Adding a credential" on page 175*), the user icon, should appear in color. You can click this icon to display the credentials page.

Secondary publishing point

Enter the IP address of the secondary server.

URL: file://<backup server address>/

NOTE: If you defined credentials to access this URL (*see "Adding a credential" on page 175*), the user icon, should appear in color. You can click this icon to display the credentials page.

GOPs per fragment

You can define the number of GOP(s) per fragment.

Possible values: from 1 to 40
Recommended value: from 1 to 10

The estimated fragment size is automatically updated.

NOTE: The fragment size is computed from the Number of GOP(s) and the Key frame period.
The maximum fragment duration is 20 seconds.

Estimated fragment duration

Informative field.

NOTE: This value is computed by multiplying the number of GOPs per fragment by the video frame rate. It cannot exceed 20 seconds.

Specific parameters for remote file

Publishing

Publishing point

Network share name.

Enter the URL of the publishing point (file://ip/path/name) or click the Browse icon, to select the path to the publishing point.

NOTE: If you defined credentials to access this URL (*see* "Adding a credential" on page 156), the user icon, should appear in color.

File type

Select the file extension
Possible value: **ts** or **mp4**

Specific TS parameters

Interleave audio/video

Check this option to synchronize audio and video before ad insertion.

Generate manifest

Check this option if you want to be compliant with CableLabs and Halo "Just in time packaging" feature.

GOP Signaling Specify the method used to signal the boundary of the fragments (GOPs). Following methods are available:

- **IDR-based**: use this mode to detect GOP boundaries, using IDR frames.
- **RAP-based**: GOP is signaled using Random Access Point of the MPEG-TS standard.
- **ALD-based**: GOP is signaled using Adaptation Data field layer from the MPEG-TS source (deprecated CableLabs specification)
- **EBP-based**: GOP is signaled using Adaptation Data field layer from the MPEG-TS source (up-to-date with CableLabs specification).
  When you select this method, you can tick the **Add EBP on audio tracks** option.

Configure for ATS If you click this link, PIDs will be automatically configured to be compatible with the ATS (Adaptive TS) standard.

Specific MP4 parameters

Prepare for streaming Check this option to include hint tracks that tell the server how to send the streams and what to set as the maximum bit rate for the presentation.

Optimized for download Check this option to format the file to be compliant with progressive download.

MPEG-2 TS settings

PMT PID PID (Packet IDentifier) of the PMT (Program Map Table) stream.

Possible values: from **0x0010** and **0x1ffe** (hexadecimal) or from 16 to 8190 (decimal).

PCR PID PID of the PCR, Program Clock Reference used to synchronize the video and audio packets.

Possible values: from **0x0010** and **0x1ffe** (hexadecimal) or from 16 to 8190 (decimal).

Target PCR Period
Internet TV DVB export type only.
PCR period (in milliseconds)
Possible values: from **20** to **1000** ms.

Target PSI Period
Internet TV DVB export type only.
PSI period (in milliseconds)
Possible values: from **20** to **1000** ms.*
NOTE: In **HTTP Live Streaming**, the PSI period size is the same as the segment size.

Program number
Program identifier.
Possible values: from **0x0001** to **0x1fff**.

Service name
Internet TV DVB export type only.
Service name in SDT.

Service provider
Provider of the program stream.

Use LATM encapsulation for AAC
By default, AAC audio is MPEG-2. Check this option if you want AAC audio to be MPEG-4.

PIDs consistency rules

- PID must be between **0x0010** and **0x1ffe**.
- PMT PID must be different from video and audio PIDs.
- Video PID must be different from audio PID.
- PCR PID can be equal to PMT PID or to Video/Audio PIDs.

Transport streams

You can specify the composition of the output stream by selecting the streams (video, audio or private) that will be sent to the selected output.

NOTE The number of audio streams depends on the license.

Chapter 5

Configuring a TV profile

Basic workflow

Below is the basic workflow for generating an IPTV stream.

Step #1: Set the service parameters

- Enter a service name,
- Specify the input file and program.
- Set the video and audio inputs

Step #2: Set the profile parameters

- Enter a profile name
- Select the export type and the bit rate

Step #3: Set the profile video and audio parameters

- Select the audio and video input
- Select the audio and video codecs

Step #4: Set the private data

Step #5: Set the output parameters

- Select the profile output type, then set the output parameters

Step #6: Start the encoding

Step #7: Display alarms (optional)

CAUTION When you modify a parameter and you press ENTER, the modification is automatically saved in the current configuration.

Setting up the encoding profiles

Depending on license, up to four services are displayed, and each service may include one or two profiles that can be configured and started independently from the other profiles.

Creating a profile

By default only one profile by service is already activated and configured. To create a new profile, you can duplicate an existing one.

Adding a new profile

To add a profile, click the **Service** tab, then select the **Add profile** link in the top right panel. MFVP Encoding On-Demand creates a new profile using default parameters.

Duplicating a profile

To duplicate a profile, follow these steps:

1. Click the **Profile** tab of the profile you want to duplicate, then select the **Duplicate** link in the top right panel.

MFVP Encoding On-Demand creates a new profile using the selected profile parameters.

Deleting a profile

To delete a profile, click the **Profile** tab, then click the **Delete** link in the right panel. Note that all the profile parameters will be lost.

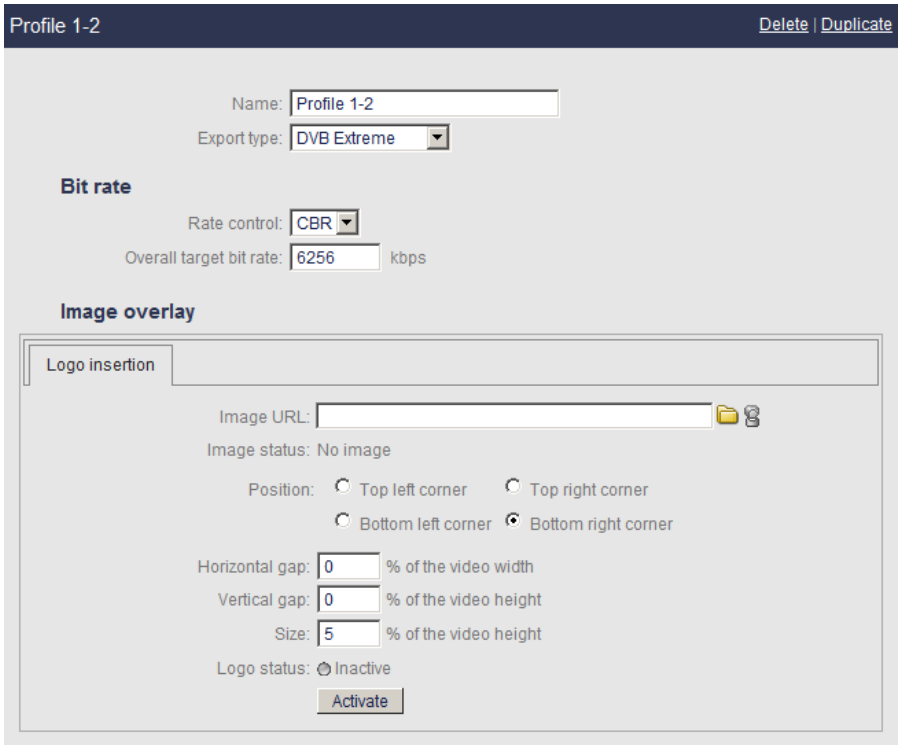
Setting the profile general parameters

NOTE During encoding, all the parameters are greyed and cannot be modified, except the **Overall target bit rate**.

To set the profile general parameters, follow these steps:

1. Click a **Profile** tab. The profile general parameters are displayed in the right panel.

Figure 1. Profile general parameters: DVB Extreme export type



2. Select the appropriate value for each parameter.

Name Enter a profile name. We recommend using a name that clearly identifies the channel.

Export type Select an export type.

Possible values: **DVB Extreme** or **ATSC Extreme**

If a codec-linked restriction is not respected, an error message is displayed when you start encoding.

Bit rate control

NOTE For more information on bit rate control, see Section 7 on page 136.

Rate control Possible values: **CBR**, **VBR**, or **ABR**

NOTE: In case of H.264, the stream remains compliant with the normative HRD.

- With **CBR** (Constant bit rate), you can stream content over a limited bit rate channel such as a network. The output stream fits in one bit rate, which you specify as a parameter.
- With **VBR** (Variable bit rate), the output stream will never exceed the Overall max bit rate, and will try to reach the Target network bit rate. This is usually used to save bandwidth. This model is also called "Capped VBR".
- With **ABR** (Available Bit Rate), MFVP Encoding On-Demand will never exceed the maximum bit rate, but may go lower than the Target network bit rate if no more bit rate is needed for encoding.

Overall target bit rate Set the overall bandwidth target (in kbps) used by the stream.

Instead of configuring the video and audio bandwidth separately, which, added to the network overhead, constitute the overall bandwidth, you only have to specify the overall bandwidth and the audio bit rate.

Video quality monitoring

See "Video quality monitoring" on page 31.

Logo insertion

Complete this section if you want to insert a picture (PNG or JPEG file) in the video output stream.

To insert a logo, follow these steps:

1. You can either enter the path to the file (http://Webserver/directory/filename.png or filename.jpg), then click outside the URL field, or click the Browse icon, to select the path.

NOTE You must have first defined credentials to access this URL (*see* "Adding a credential" on page 156). If the credentials are ok, the user icon, should appear in color.

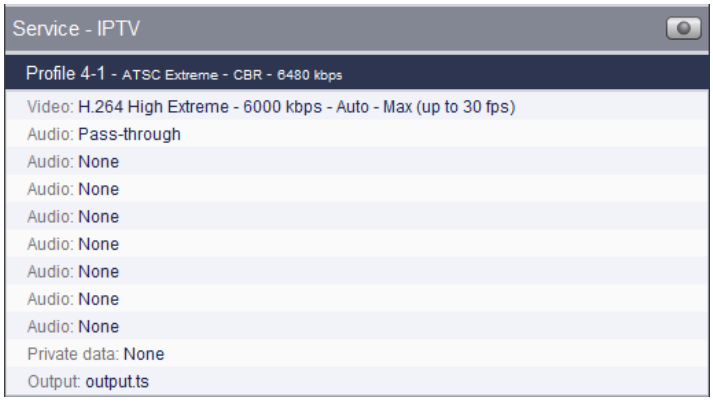
2. Select the position of the logo to be inserted (Top left corner, Top right corner, Bottom left corner, or Bottom right corner), the **horizontal/Vertical gap** (percentage of the image width and height), and the **Size** (percentage of the image height

Click the **Activate/Deactivate** button to respectively display/remove the logo in the output stream.

Displaying the video, audio, and output parameters

To display the video, audio, and output parameters of a profile, click the **Profile #** tab. The selected profile subtabs are displayed below.

Figure 2. Profile subtabs: DVB export type

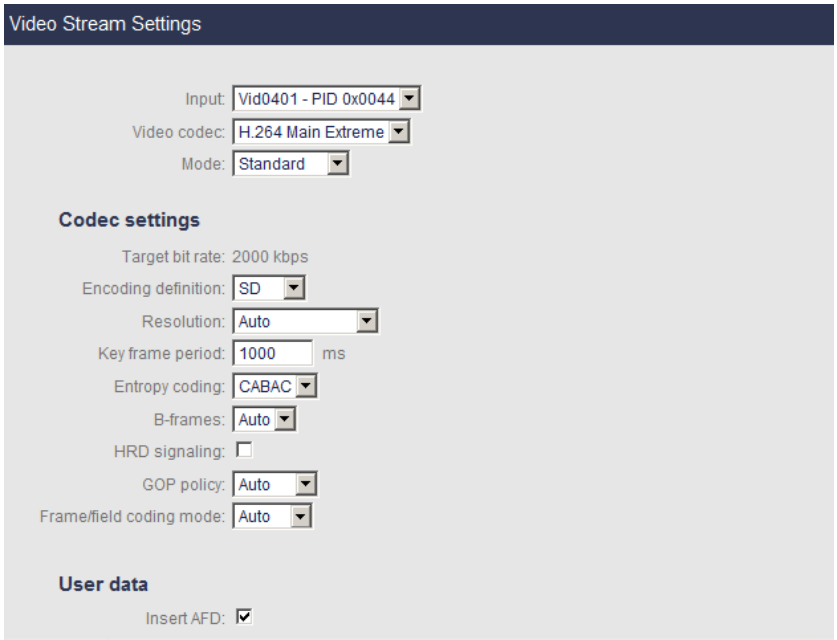


Setting the video stream parameters

To display the video parameters, follow these steps:

1. Click the **Video** stream subtab, the video parameters are displayed in the right panel.

Figure 3. Profile video parameters: Extreme H.264 Main video codec



2. Select the appropriate value for each parameter.

Input Select the appropriate video input channel.
None means audio-only mode.

Video codec Select the video codec.
Possible values: **Extreme H.264 Main,** or **Extreme H.264 High, MPEG-2 main** depending on your license and the export type (*see Table 1*).

Table 1. Available video codecs per export type

Export type	Video codec
DVB Extreme	Extreme H.264 Main, Extreme H.264 High
ATSC Extreme	Extreme H.264 Main, Extreme H.264 High

Buffer size Possible values: **Low delay**, **Standard**, **High quality**, or **Custom**.

- **Low delay**: VBV size = 0.500 seconds
- **Standard**: VBV size = 1.000 seconds
- **High quality**: VBV size = 2.000 seconds
- **Custom**: Specify the VBV size in milliseconds

The latency modifies the video buffer size. The video buffer is the standard MPEG-4 VBV (Video Buffering Verifier). It is the instantaneous bit rate smoother (transmission buffer) that guarantees that the instantaneous bit rate never exceeds the target bit rate.

Mode Possible values: **Extreme**, or **UP!**

You can adjust the encoding quality of the service (from Extreme to high video quality)

NOTE: UP! mode requires a high level of processing resources.

Codec settings

Target bit rate Informative field. The value is automatically computed.

Possible values: **Extreme video codec**: (SD) from 128 kbps to 4 Mbps, (HD) from 2 Mbps to 20 Mbps

Encoding definition Possible values: 1080i, 720p, SD.

Depending on the selected Encoding definition, a list of resolutions is displayed.

Resolution Select a resolution value. Values depend on the selected **Encoding definition**.

Possible values: *see Table 2 on page 104 below*.

NOTE: For low bit rates, it is recommended to use a low resolution to improve encoding quality.

Table 2. Possible resolutions per encoding definition

Resolution Width	x Height	1080i	720p	SD (NTSC source)	SD (PAL source)
1920	1080	x			
1440	1080	x			
1280	1080	x			
960	1080	x			
1280	720		x		
960	720		x		
854	720		x		
848	720		x		
640	720		x		
720	576				x
704	576				x
720	480			x	
480	720		x		
704	480			x	
544	576				x
640	480			x	
528	576				x
480	576				x
544	480			x	
528	480			x	
480	480			x	
352	576				x
352	480			x	
432	240			x	x
352	288				x
352	240			x	

Resolution Width x Height		1080i	720p	SD (NTSC source)	SD (PAL source)
176	144				x
176	120			x	

Resolution

With **Extreme H.264 Main,** and **Extreme H.264 High** video codecs, the following resolution is applied when you select **Auto**:

	Video bit rate (kbit/s)	Resolution
1080i	7000 and above	1/1
	5000 to 6999	3/4
	3500 to 4999	2/3
	2000 to 3499	1/2
720p	5500 and above	1/1
	4000 to 5499	3/4
	2000 to 3999	1/2
SD	2000 to 4000	1/1
	1500 to 1999	3/4
	1100 to 1499	2/3
	800 to 1099	1/2
	Below 800	1/4

Key frame period

Possible values: from **500** to **3000** ms

Enter the maximum time between two key frames. You can specify how often you want key frames to be inserted into the video stream. Key frames are inserted into the stream periodically to synchronize the decoder and enable it to recover from errors.

Refreshing the image more often (by setting a shorter key frame period) reduces the recovery time but requires a higher bit rate to maintain encoding quality.

Enable True motion

Select this checkbox if you want to increase the frame rate (up to 50/60 fps). See **Frame rate** parameter below.

This option enhances the visual quality, especially with fast-moving sport contents or with scrolling text. It increases the sharpness of the images and the smoothness of the motion.

NOTES: For optimal quality with telecine contents, we recommend not selecting the **Adaptive Inverse Telecine** option (see page 39). If the Adaptive Inverse Telecine is selected, frame rate may vary from 59.94 fps to 23.98 fps.

Entropy coding

Possible values: **CABAC or CAVLC**.

CABAC means Context Adaptative Binary Arithmetic Coding. This is an entropy lossless compression algorithm, but very time-consuming, especially at the decoder side.

CAVLC means Context Adaptative Variable Length Coding. This is the other entropy lossless compression algorithm used in the H.264 format. It is less efficient than CABAC, but faster (especially at the decoder side).

B-Frames

Possible values: **Off**, **Auto** (2 B-frames), **2** or **3**

B-frames are used to increase quality. It indicates whether bidirectional encoded pictures (B-frames) are used. A B-frame can be considered as an interpolated frame between reference frames (I or P), interpolation is done using forward and backward motion vectors used to select pieces of pictures in reference frames.

HRD signaling

The H.64/AVC standard specifies the Hypothetical Reference Decoder (HRD). By activating HRD signaling, additional syntax parameters are generated in the coded bitstream that enable to check bitstream and decoding buffer conformance.

GOP policy

The GOP policy allows to support any STB for interoperability. Open GOP is the best solution to optimize VQ but may be not supported by STB.

Possible Values: **Auto** (open gop), **Open** (frames may have reference frames from outside the GOP), or **Closed** (each frame of the GOP is independent from the frames outside of the GOP).

Frame/field coding mode

A picture to be encoded may have interlaced structure (2 fields) or progressive structure. Even though a picture may be interlaced, video quality may be improved with frame coding when the correlation between odd and even fields is very strong.

- In H.264 and MPEG-2, **PAFF** coding is the best option as it dynamically chooses either frame or field coding.
- In HEVC, **SAFF** (Sequence Adaptive Frame Field) coding is the best option as it dynamically chooses either frame or field coding.

Possible values for H.264 and MPEG-2 video codecs: **Auto** (PAFF), **Frame** (frame coding) or **PAFF** (picture adaptive frame field).

Possible values for HEVC video codec: **Auto** (SAFF), **Frame** (frame coding) or **Field** (field coding).

Use MBAFF

Only available with Extreme video codecs.

When **Frame** or **PAFF** modes are selected, you can check the **MBAFF** option (macroblock-adaptive frame-field) to encode the macroblock pairs of a single frame either in field mode or in frame mode.

User data

Use closed captions

Only available if Export type is ATSC.

Check this option if you want to extract and embed the closed caption information in the output stream.

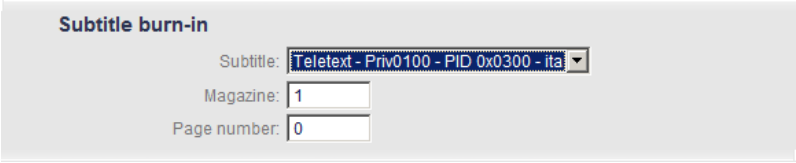
NOTE: Compliant with the EIA-608 standard.

Insert AFD Check this option if you want to take into account the display aspect ratio of the source and provide this information to the output.

Subtitle burn-in

The subtitle burn-in feature enables burn-in DVB teletext, DVB subtitle or Closed Caption streams in the video.

Figure 4. Subtitle burn-in: Teletext



1. Select the stream you want to burn.

NOTE By default the **Subtitle** parameter is set to **None**.

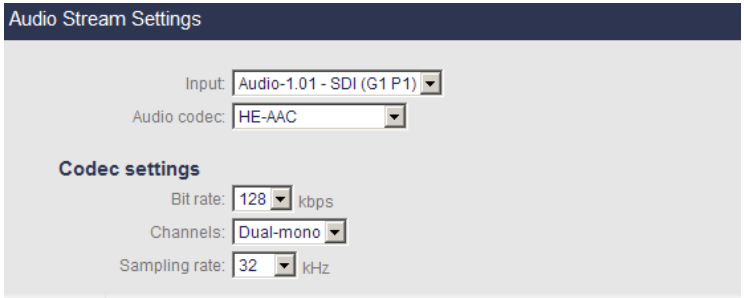
2. In case of Teletext, specify the Magazine and the page number.

Setting the audio stream parameters

NOTE Depending on license and export type, up to eight audio streams are allowed per profile.

To display the audio parameters, follow these steps:

1. Click the **Audio** stream subtab, the audio parameters are displayed in the right panel.



2. Select the appropriate value for each parameter.

Input Select the appropriate audio input channel.

None means video-only mode.

Audio codec Specify the audio codec.

Possible values: **AAC, HE-AAC, HE-AAC v2, MPEG 1 Layer II, MPEG 2 Layer II**, **Dolby Digital**, **Dolby Digital Plus** or **Pass-through**.

Pass-through lets you receive an already encoded Dolby 5.1 or AC-3 stream and forward it to the output. Supported format for **Pass-through** are:

- MPEG-1 Layer II
- MPEG-2 Layer II
- AC-3 Audio
- Enhanced AC-3

Codec settings

NOTES These parameters are not available with **Pass-through**, except **Audio PID**.

For Dolby Digital and Dolby Digital Plus parameters, see "Dolby specific parameters" on page 67.

Bit rate Specify the audio bit rate value in kilobits per second.
The specified value does not include the packet overhead.
Possible values: See table below

Channels Possible values: See Table 4 below.

Sampling rate Specify the sampling rate in kilohertz (kHz).
See Table 4 below.

Depending on the selected codec, the channel mode or the sampling rate can be disabled because they are not applicable. The following tables summarize this behavior.

Table 3. Channel modes depending on bit rate and codec

Codec type	Bit rate (kbps)
AAC	8, 10, 12, 16, 20, 24, 28, 32, 40, 48, 56, 64, 80, 96, 112, 128, 160
	192, 224, 256, 320
HE AAC	8, 10, 12, 16, 20, 24, 28, 32, 40, 48, 56, 64
	80, 96, 112, 128
HE AAC v2	20, 24, 28,32, 40, 48
MPEG 1 Layer II	32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384
MPEG 2 Layer II	32, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320, 384

Table 4. Sampling rate depending on codec, on bit rate and on channel

Codec type	Bit rate (kbps)	Channel	Sampling rates (kHz)
AAC	8, 10	Mono Mono left Mono right	8, 11.025, 12
	12	Mono Mono left Mono right	8, 11.025, 12, 16
	16	Mono Mono left Mono right	8, 11.025, 12, 16, 22.05, 24
		Dual mono Stereo	8, 11.025, 12
	20, 24, 28, 32	Mono Mono left Mono right	8, 11.025, 12, 16, 22.05, 24, 32, 44.1, 48
		Dual mono Stereo	11.025, 12, 16, 22.05, 24
	40	Mono	16, 22.05, 24, 32, 44.1, 48
		Dual-mono, Stereo	16, 22.05, 24, 32
	48	Mono	22.05, 24, 32, 44.1, 48
		Dual-mono, Stereo	22.05, 24, 32
	56	All channel modes	22.05, 24, 32, 44.1, 48
	64 and over	All channel modes	32, 44.1, 48
HE AAC	All	All	32, 44.1, 48
HE AAC v2	All	All	32, 44.1, 48
MPEG-1 Layer II	All	All	32, 44.1, 48

Dolby specific parameters

See "Dolby specific parameters" on page 67.

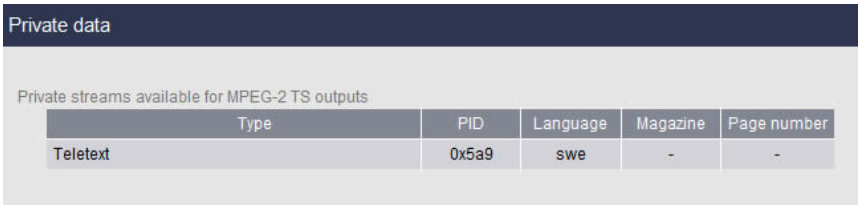
Setting the private stream parameters

NOTE private data is only available if **Export type** is **ATSC Extreme**.

To display the private stream parameters, follow these steps:

1. Set the **Export type** to **ATSC Extreme**. The **private data** subtab is added to the profile subtabs.

2. Click the **private data** subtab, the private stream parameters are displayed in the right panel.



3. The following information is displayed for each private stream:

Type	Possible values: **Teletext**, **Subtitle, SCTE-35**
PID	PID of the input private stream.
Language	Input language.
Magazine	Magazine/page number.
Page number	For example, for DVB teletext 777, magazine number is 7 and page number is 77.

Max bit rate	*Only available with teletext*. You can define the bandwidth reserved for the teletext data. Possible values: from **30** to **600** kbps
Adjust display height	Check this option to adjust the DVB subtitle display height.

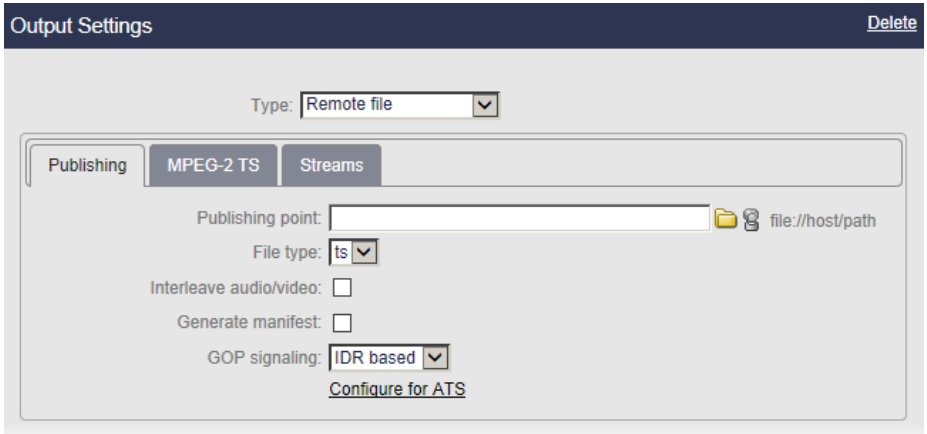
4. Check the private streams that will be sent to the network output(s).

Setting the output parameters

To display the output parameters, follow these steps:

1. Click the **Output** subtab, the network output parameters are displayed in the right panel.

Figure 5. Output parameters: Remote file



2. Select the appropriate value for each parameter.

NOTE Depending on the export type, you4 can configure one or two network outputs independently.

Type Select the output type.
Possible values: **None** or **Remote file**

Specific parameters for remote file

Publishing

Publishing point
Network share name.
Enter the URL of the input file (file://ip/path/name) or click the Browse icon, to select the path

NOTE: You must have first defined credentials to access this URL (*see* "Adding a credential" on page 156). If the credentials are ok, the user icon, should appear in color.

File type
Select the file extension.
Possible value: **ts**

Interleave audio/video
Check this option to synchronize audio and video before ad insertion.

Generate manifest
Check this option if you want to be compliant with CableLabs and Halo "Just in time packaging" feature.

GOP Signaling
Specify the method used to signal the boundary of the fragments (GOPs). Following methods are available:

- **IDR-based**: use this mode to detect GOP boundaries, using IDR frames.
- **ALD-based**: GOP is signaled using Adaptation Data field layer from the MPEG-TS source

Configure for ATS
If you check this box, this will automatically configure output streams with the required parameters to be compliant with ATS.

MPEG-2 TS settings

PMT PID
PID (Packet IDentifier) of the PMT (Program Map Table) stream.

Possible values: from **0x0010** and **0x1ffe** (hexadecimal) or from 16 to 8190 (decimal).

PCR PID PID of the PCR, Program Clock Reference used to synchronize the video and audio packets.

Possible values: from **0x0010** and **0x1ffe** (hexadecimal) or from 16 to 8190 (decimal).

Target PCR Period *Internet TV DVB export type only.*

PCR period (in milliseconds)

Possible values: from **20** to **1000** ms.

Target PSI Period *Internet TV DVB export type only.*

PSI period (in milliseconds)

Possible values: from **20** to **1000** ms.*

NOTE: In **HTTP Live Streaming**, the PSI period size is the same as the segment size.

Program number Program identifier.

Possible values: from **0x0001** to **0x1fff**.

Service name Service name in SDT.

Service provider Provider of the program stream.

Use LATM encapsulation for AAC By default, AAC audio is MPEG-2.
Check this option if you want AAC audio to be MPEG-4.

Transport streams

You can specify the composition of the output stream by selecting the streams that will be sent to the selected output.

NOTE The number of audio streams depends on the license.

Audio PID MPEG-2 TS parameter. PID of the audio stream.

Possible values: from **0x0010** and **0x1ffe** (hexadecimal)
See "PIDs consistency rules" on page 94.

NOTES: The audio PID defined is for the first audio. The second is increased by +1 and so on.

Video PID *MPEG-2 TS parameter*. PID of the video stream.
Possible values: from **0x0010** and **0x1ffe** (hexadecimal)

private PID *MPEG-2 TS parameter*. PID of the private stream.
Possible values: from **0x0010** and **0x1ffe** (hexadecimal)

Chapter 6

Configuring a Mobile Streaming profile

Basic workflow

Below is the basic workflow for generating a mobile streaming stream.

Step #1: Configure the Ethernet connectors

Step #2: Set the service parameters

- Enter a service name
- Specify the input file and program.

Step #3: Set the profile parameters

- Enter a profile name
- Select the export type and the bit rate

Step #4: Set the profile video and audio parameters

- Select the audio and video input
- Select the audio and video codecs

Step #5: Set the output parameters

- Select the profile output type, then set the output parameters

Step #6: Start encoding

Step #7: Display logs and alarms (optional)

CAUTION When you modify a parameter and you press ENTER, the modification is automatically saved in the current configuration.

Setting up the encoding profiles

Up to four services and a total of 31 profiles can be configured and started independently one from the other profiles.

Creating a profile

By default only one profile by service is already activated and configured. To create a new profile, you can either add a new profile or duplicate an existing one.

Adding a new profile

To add a profile, click the **Service** tab, then select the **Add profile** link in the top right panel. MFVP Encoding On-Demand creates a new profile using default parameters.

Duplicating a profile

To duplicate a profile, follow these steps:

1. Click the **Profile** tab of the profile you want to duplicate, then select the **Duplicate** link in the top right panel.

MFVP Encoding On-Demand creates a new profile using the selected profile parameters.

Deleting a profile

To delete a profile, click the **Profile** tab, then click the **Delete** link in the right panel. Note that all the profile parameters will be lost.

Setting the profile general parameters

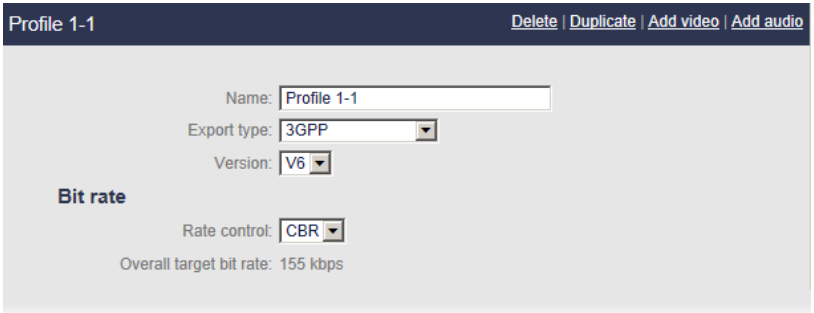
NOTES You can refer to "HTTP Streaming" on page 168 for typical encoding settings.

During encoding, all the parameters are greyed and cannot be modified.

To set the profile general parameters, follow these steps:

1. Click a **Profile** tab. The profile general parameters are displayed in the right panel.

Figure 1. Profile general parameters: 3GPPv6 export typel



2. Select the appropriate value for each parameter.

Name Enter a profile name. We recommend using a name that clearly identifies the channel.

Export type Select an export type.

Possible value: **3GPP**

If a codec-linked restriction is not respected, an error message is displayed when you start encoding.

Export type Version Select the 3GPP version.

Possible values: **V6** [1] or **V5**

1. If you select 3GPPv6, you can have up to four video streams and two audio streams per multirate profile.

Bit rate control

For more information, see "Advanced Rate Control" on page 136.

Rate control

Possible values: **CBR**, **VBR**, or **ABR**.

NOTES: In case of H.264, the stream remains compliant with the normative HRD.

- With **CBR** (Constant bit rate), you can stream content over a limited bit rate channel such as a network. The output stream fits in one bit rate, which you specify as a parameter.
- With **VBR** (Variable bit rate), the output stream will never exceed the Overall max bit rate, and will try to reach the Target network bit rate. This is usually used to save bandwidth. This model is also called "Capped VBR".
- With **ABR** (Available Bit Rate), MFVP Encoding On-Demand will never exceed the maximum bit rate, but may go lower than the Target network bit rate if no more bit rate is needed for encoding.

Overall target bit rate

Set the overall bandwidth target (in kbps) used by the stream.

Instead of configuring the video and audio bandwidth separately, which, added to the network overhead, constitute the overall bandwidth, you only have to specify the overall bandwidth and the audio bit rate. The video bit rate is computed from these two values.

Overall max bit rate

VBR mode only.

Enter the maximum overall bit rate (in kbps).

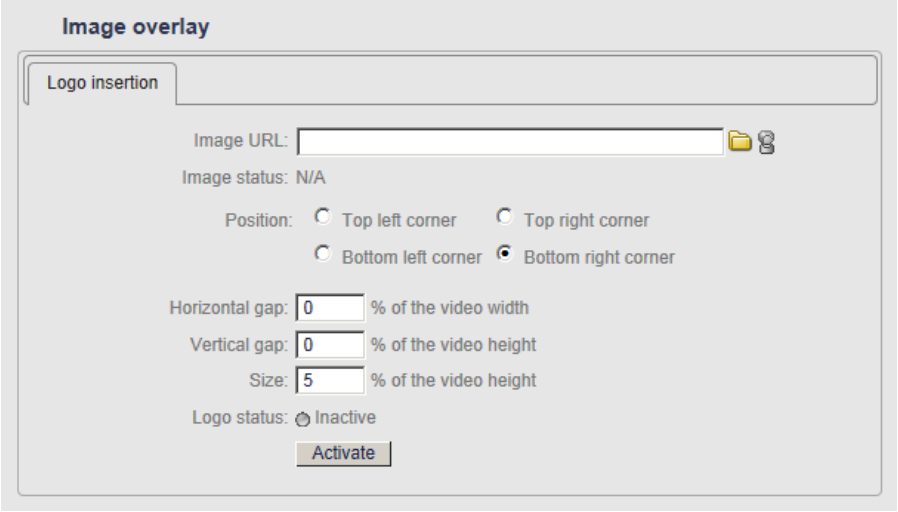
Video quality monitoring

See "Video quality monitoring" on page 31.

Logo insertion

Complete these parameters if you want to insert a picture (PNG or JPEG file) in the video output stream.

Figure 2. Profile subtabs



To insert a logo, follow these steps:

1. You can either enter the path to the file (http://Webserver/directory/filename.png or filename.jpg), then click outside the URL field, or click the Browse icon, to select the path.

NOTE You must have first defined credentials to access this URL (*see* "Adding a credential" on page 156). If the credentials are ok, the user icon, should appear in color.

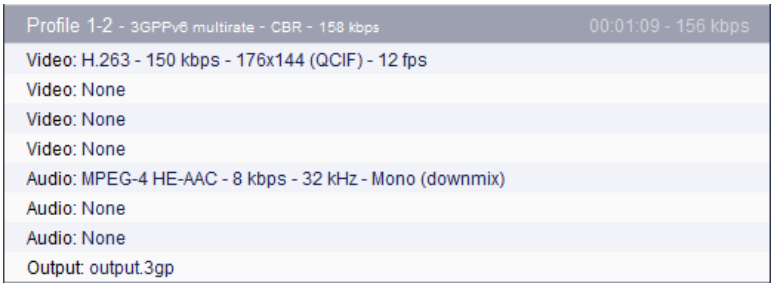
2. Select the position of the logo to be inserted (Top left corner, Top right corner, Bottom left corner, or Bottom right corner), the **horizontal/Vertical gap** (percentage of the image width and height), and the **Size** (percentage of the image height
3. Click the **Activate/Deactivate** button to respectively display/remove the logo in the output stream.

NOTE To remove the logo, delete the URL, then click outside the URL field. Note that you can only add or remove a logo when the profile is not encoding.

Displaying the video, audio, and output parameters

You can quickly check the video, audio, and output parameters of a profile, by clicking the **Profile #** tab. The selected profile subtabs are displayed below.

Figure 3. Profile subtabs



Setting the video stream parameters

Adding or removing a video stream

To add a video stream, click the **Profile #** tab in the left panel, then click the **Add video** link in the top right corner of the panel. A new video stream is added.

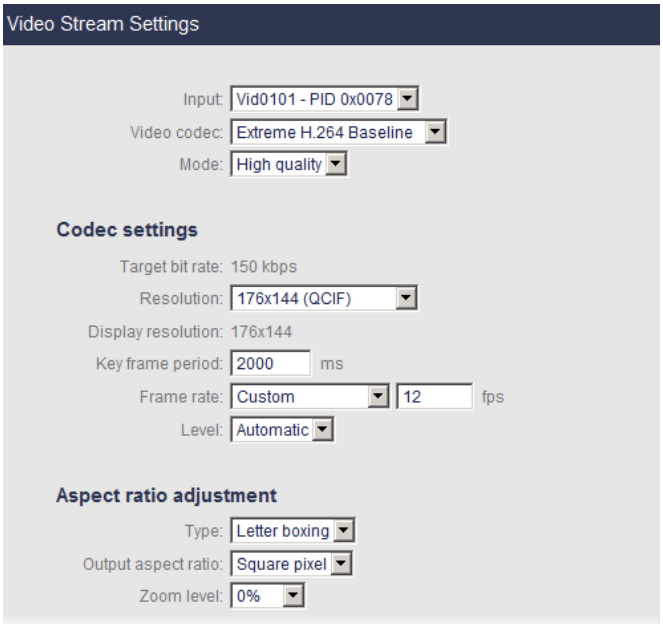
To delete a video stream, select a video stream then click the **Delete** the top right corner of the panel. The video stream is deleted.

Displaying video stream parameters

To display the video parameters, follow these steps:

1. Click the **Video** stream subtab, the video parameters are displayed in the right panel.

Figure 4. Profile video parameters: Extreme H.264 Baseline video codec



2. Select the appropriate value for each parameter.

Input Select the appropriate video input channel

None means audio-only mode.

Video codec Select the video codec.

Possible values: **Elite H.264 Baseline, Extreme H.264 Baseline, MPEG-4 SP, H.263**

Buffer size Only available with H.264 codecs.

Possible values: **Low delay**, **Standard** or **High quality**

Defines the size of the VBV (Video Buffering Verifier). If the mobile device is not performing correctly (desynchronization), you can adjust the delay settings.

Low delay: VBV size = 1 second
Standard: VBV size = 2 seconds
High quality: VBV size = 5 seconds

Mode Possible values: **Extreme**, or **UP!**

You can adjust the encoding quality of the service (from Extreme to high video quality)

NOTE: UP! mode requires a high level of processing resources.

Codec settings

Target bit rate Set the video target bit rate (in kbps).

Possible values: from 20 kbps to 1 Mbps

Resolution Select a resolution value.

Possible values: *see Table 2 below*.

You can use a resolution filter based on specific parameters (category, aspect ratio) to shorten the resolution list (see "Filtering the resolutions" on page 55).

NOTE: resolutions are sorted by the total number of pixels per frame.

Table 1. Possible resolutions per video codec

Resolution Width	x Height	MPEG-4 SP	H.263	Extreme H.264 Baseline	Elite H.264 Baseline
720	576			x	x
854	480			x	x
848	480			x	x
704	576			x	x
832	480			x	x
800	480			x	x
720	480			x	x
480	720			x	x
704	480			x	x
768	432			x	x
544	576			x	x
640	480			x	x
528	576			x	x
720	404			x	x
624	464			x	x
704	396			x	x
480	576			x	x
544	480			x	x
528	480			x	x
640	360			x	x
624	360			x	x
624	352			x	x
480	480			x	x
352	576			x	x
512	384			x	x
576	324			x	x
480	360			x	x
480	352			x	x
352	480			x	x
480	320			x	x
312	480			x	x
512	288			x	x
480	272			x	x
480	270			x	x
400	320			x	x
400	304			x	x

Resolution Width x Height		MPEG-4 SP	H.263	Extreme H.264 Baseline	Elite H.264 Baseline
400	300			x	x
448	252			x	x
384	288			x	x
432	240			x	x
320	320			x	x
352	288	x	x	x	x
416	240			x	x
400	240	x			
416	234			x	x
400	224			x	x
360	240			x	x
352	240	x		x	x
384	216			x	x
320	240	x		x	x
368	208			x	x
304	224			x	x
320	192			x	x
320	180	x		x	x
240	240			x	x
320	176	x		x	x
304	168			x	x
256	192	x		x	x
240	192	x		x	x
240	180	x		x	x
240	176	x		x	x
220	176	x		x	x
240	160			x	x
192	192			x	x
176	144	x	x	x	x
176	128	x		x	x
176	120	x		x	x
144	140	x		x	x
160	120	x		x	x
160	90	x		x	x
128	96	x	x	x	x
144	80	x		x	x
96	96	x		x	x
80	64	x		x	x

Display resolution Information field. Depends on the aspect ratio management and on the encoding resolution.

Key frame period Possible values: **1 000** to **10 000** ms

Enter the maximum time between two key frames. You can specify how often you want key frames to be inserted into the video stream. Key frames are inserted into the stream periodically to synchronize the decoder and enable it to recover from errors.

Refreshing the image more often (by setting a shorter key frame period) reduces the recovery time but requires a higher bit rate to maintain encoding quality.

Frame rate Possible values: **Max (up to 30 fps)**, **Half**, **Quarter** or **Custom**

Custom: enter a specific value from **5** to **25** fps (PAL input) or from **5** to **29.97** fps (NTSC input).

Level The level is a measure of the projected decoding complexity of the file or stream. Because video codecs have level definitions with overlapping underline settings, you can create content with the right level of compatibility with your target device.

Possible values for H.263 codec:
Automatic, or **10**, **20**, or **30**

Possible values for MPEG-4 SP codec:
Automatic, or **0**, **0b**, **1**, **2,** or **3**

Possible values for H.264 codec:
Automatic, or **1**, **1b**, **1.2, 1.3, 2, 2.1, 2.2,** or **3**

Aspect ratio adjustment

Select the aspect ratio adaptation type (*see Appendix B for more details*).

NOTE We recommend launching the encoding, and modify the **Aspect ratio adjustment** value to adjust it with accuracy.

Possible values: **Letter boxing** or **Stretching**.

- If you select **Letter boxing**, you can define **Output aspect ratio** (square pixel, 4/3 or 16/9) and the **Zoom level** (in%).
  Possible values for Zoom level: 0 (no zoom, black stripes on the top and bottom), 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 (the video is zoomed, and black stripes are removed).
- If you select **Stretching**, you can define the **Output aspect ratio** (square pixel, 4/3 or 16/9) and the stretching values (in%) for Top, Bottom, Right and Left.

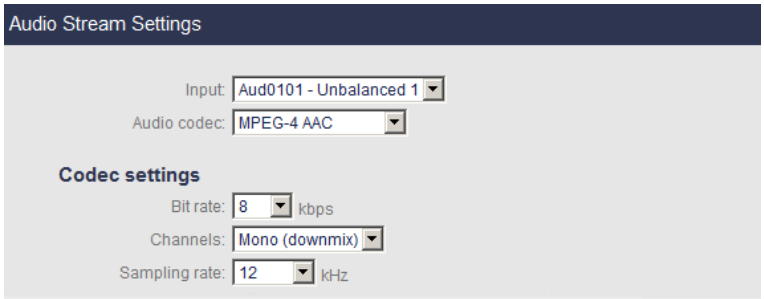
Setting the audio stream parameters

NOTE Depending on license, one or two audio streams are allowed per profile.

To display the audio parameters, follow these steps:

1. Click the **Audio** stream subtab, the audio parameters are displayed in the right panel.

Figure 5. Audio parameters: MPEG-4 AAC codec



2. Select the appropriate value for each parameter.

Input Select the appropriate audio input channel.
None means video-only mode.

Audio codec Specify the audio codec.
Possible values: AMR-NB, AMR-WB, AAC, HE-AAC, or HE-AAC v2

Codec settings

Bit rate Specify the audio bit rate value in kilobits per second.
Possible values: *see Table 2 below*.

NOTE: The specified value does not include the packet overhead.

Table 2. Bit rates depending on codec

Audio codec	Bit rate
AMR-NB	4.75, 5.15, 5.9, 6.7, 7.4, 7.95, 10.2, 12.2
AMR-WB	6.6, 8.85, 12.65,14.25, 15.85, 18.25, 19.85, 23.05, 23.85
AAC	8, 10, 12, 16, 20, 24, 28, 32, 40, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 256, 320
HE-AAC	8, 10, 12, 16, 20, 24, 28, 32, 40, 48, 56, 64, 80, 96, 112, 128
HE-AAC v2	20, 24, 28, 32, 40, 48

Channels Specify the channel mode.
Possible values: *see Table 3 below*.

Sampling rate Specify the sampling rate in kilohertz (kHz).
Possible values: *see Table 3 below*.

Table 3. Channel modes and sampling rate depending on bit rate and codec

Codec type	Bit rate (kbps)	Channel mode	Sampling rate
AMR-NB	All bit rates	Mono downmix Mono left Mono right	8
AMR-WB	All bit rates	Mono downmix Mono left Mono right	16
AAC	8, 10	Mono Mono left Mono right	8, 11.025, 12
	12	Mono Mono left Mono right	8, 11.025, 12, 16

Codec type	Bit rate (kbps)	Channel mode	Sampling rate
AAC	16	Mono Mono left Mono right	8, 11.025, 12, 16, 22.05, 24
	16	Dual mono Stereo	8, 11.025, 12
	20, 24, 28, 32	Mono Mono left Mono right	8, 11.025, 12, 16, 22.05, 24, 32, 44.1, 48
		Dual mono Stereo	11.025, 12, 16, 22.05, 24
	40	Mono Mono left Mono right	16, 22.05, 24, 32, 44.1, 48
		Dual mono Stereo	16, 22.05, 24, 32
	48	Mono Mono left Mono right	22.05, 24, 32, 44.1, 48
		Dual mono Stereo	22.05, 24, 32
	56	Mono Mono left Mono right Dual mono Stereo	22.05, 24, 32, 44.1, 48
	64 and over	Mono Mono left Mono right Dual mono Stereo	32, 44.1, 48
HE-AAC	8 to 20	Mono left Mono right Mono downmix	32, 44.1, 48

Codec type	Bit rate (kbps)	Channel mode	Sampling rate
HE-AAC	24 to 64	Mono left Mono right Mono downmix Dual mono Stereo	32, 44.1, 48
HE-AAC	80 and over	Dual mono Stereo	32, 44.1, 48
HE-AAC v2	All bit rates	Stereo	32, 44.1, 48

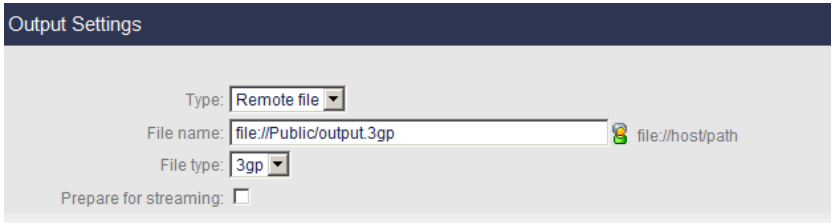
Setting the output parameters

NOTE Two outputs are allowed per profile.

To display the output parameters, follow these steps:

1. Click the **Output** subtab, the output parameters are displayed in the right panel.

Figure 6. Output parameters: Remote file



2. Select the appropriate value for each parameter.

Network parameters

Type Select the output type.
Possible values: **None** or **Remote file**

File name Enter the URL of the network share name (file://host/path) or click the Browse icon, to select the path,

NOTE: You must have first defined credentials to access this URL (*see* "Adding a credential" on page 156). If the credentials are ok, the user icon, should appear in color.

File type Select the file extension
Possible value: **3gp**

Prepare for Streaming Check this option to include hint tracks that tell the server how to send the streams and what to set as the maximum bit rate for the presentation.

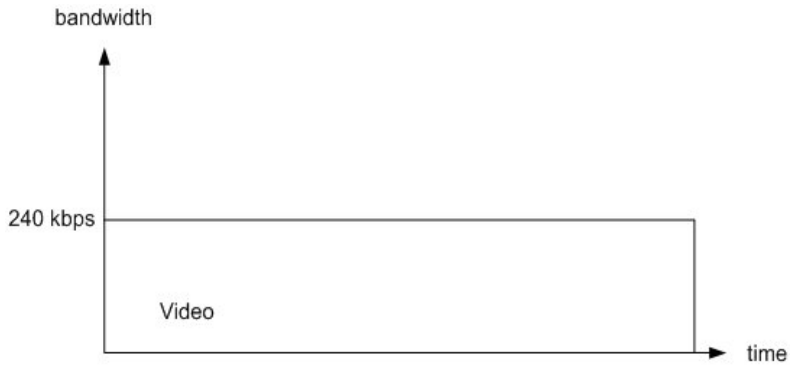
Chapter 7

Advanced Rate Control

CBR mode

In CBR mode, the total rate is set and always maintained.

Figure 1. CBR mode



Example:

Over a Satellite link limited to 1.5 Mbps, the encoder can be set at a target bit rate of 1.4 Mbps. We guarantee that the encoder will never go over or under the expected bit rate.

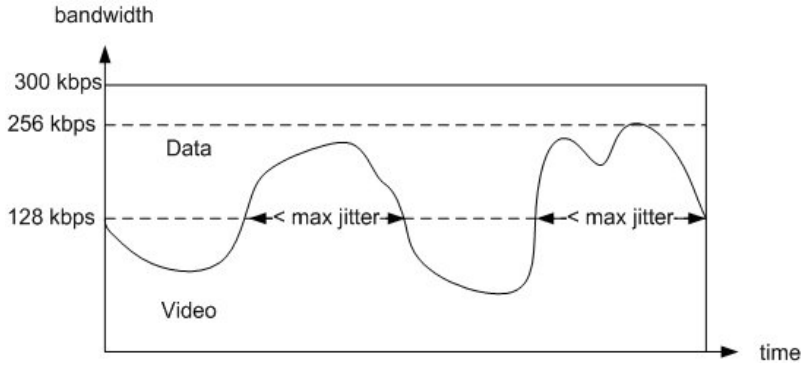
Benefit:

This mode can be used in video contribution or any other application where a limited bandwidth is fully allocated to the video feed. By maintaining the data rate constant, you can easily check that the feed is not dropping. This mode is particularly useful with IP Satellite modems.

Capped VBR mode

The capped VBR bit rate allows a user to set a nominal target bit rate, **Target bit rate** (average bit rate over time) and a maximum instantaneous bit rate, **Max bit rate**. The target bit rate is guaranteed over a configurable time window.

Figure 2. Capped VBR Mode



Example:

Over a DSL line limited to 4 Mbps, MFVP Encoding On-Demand **Target bit rate** can be set at 2 Mbps with a 3.5 Mbps **Max bit rate**. It guarantees that the maximum excursion above the targeted bit rate will not exceed a certain time, called the maximum jitter (usually set around 1 sec.).

The remaining bandwidth available for asynchronous data is equal to 2 Mbps in average, but can be lower. The jitter created by this bandwidth reduction will not exceed the maximum jitter defined above.

Benefit:

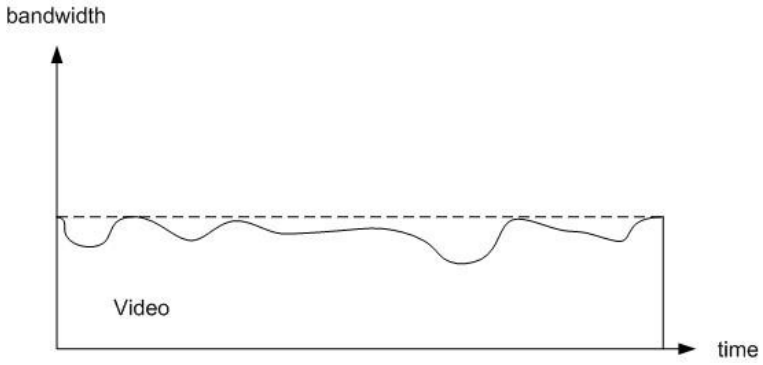
This mode can be used in IPTV deployments or shared bandwidth networks with heterogeneous data. With a slight impact on the data jitter, one can achieve better video quality results while not affecting the overall data transmissions[(1)].

1. Other capped VBR implementations do not guarantee this maximal jitter. The video could take over completely the bandwidth originally set for data.

Available Bit Rate (ABR) mode

This mode is obtained by setting the **Rate control** parameter to **ABR**. In this configuration, MFVP Encoding On-Demand will never exceed the target bit rate, but may go lower than the targeted bit rate.

Figure 3. ABR Mode



Benefits:

This mode can be used in mobile streaming applications or any application not requiring a full bandwidth allocation. This mode uses the necessary amount of bits to transmit video. The savings in bit rate can reduce the communication costs (for example, extended battery life for a cell phone) while always respecting the maximum channel capacity.

Combined with ToS (Type of Service) tagging, this mode can also be used to mix video with asynchronous data over a fixed capacity channel. The asynchronous data is opportunistically sent when the video does not take all the bandwidth.

Chapter 8

Encryption

Encryption for Smooth Streaming profile

Encryption type Possible values: **None**, **Fixed key, External key generation**

Specific Fixed key parameters

Key Key used for encrypted the video content.

16 Byte hexadecimal value.

NOTE: When the video is encoded over different resolutions and bit rates (this is the case for Smooth Streaming), the same key is used

Key ID Unique identifier of the encryption key. This information is embedded into PlayReady header, and passed by the Silverlight client player to PlayReady DRM server.

16 Byte base 64 value.

Domain service ID Unique identifier of PlayReady service provider. This ID is granted by Microsoft to companies willing to license PlayReady technology.

License acquisition URL URL of the PlayReady license server where the Silverlight player will need to connect to get the description key.

Licence UI URL By default, set the same value as License acquisition URL.

Key Key used for encrypting the video content.

16 Byte hexadecimal value.

NOTE: When the video is encoded over different resolutions and bit rates (this is the case for Smooth Streaming), the same key is used

Key seed Key seed used for encrypting the video content.

base64-encoded key seed.

Key ID Unique identifier of the encryption key. This information is embedded into PlayReady header, and passed by the Silverlight client player to PlayReady DRM server.

16 Byte base 64 value.

Click the **Generate key ID** button to generate a random key ID.

Domain service ID Unique identifier of PlayReady service provider. This ID is granted by Microsoft to companies willing to license PlayReady technology.

License acquisition URL URL of the PlayReady license server where the Silverlight player will need to connect to get the description key.

Licence UI URL By default, set the same value as License acquisition URL.

Key Key used for encrypting the video content.

16 Byte hexadecimal value.

NOTE: When the video is encoded over different resolutions and bit rates (this is the case for Smooth Streaming), the same key is used

Protected key seed Key seed used for encrypting the video content.

Click the **Generate protected key seed** button to generate a random key seed for the Smooth Streaming output and protect the key seed by encrypting it.

30-byte hexadecimal value.

Key ID Unique identifier of the encryption key. This information is embedded into PlayReady header, and passed by the Silverlight client player to PlayReady DRM server.

16-byte base 64 value.

Click the **Generate key ID** button to generate a random key ID.

Domain service ID Unique identifier of PlayReady service provider. This ID is granted by Microsoft to companies willing to license PlayReady technology.

License acquisition URL URL of the PlayReady license server where the Silverlight player will need to connect to get the description key.

Licence UI URL By default, set the same value as License acquisition URL.

Specific External key generation parameters

Key server URL URL of the PlayReady license server where the Silverlight player will need to connect to get the description key.

Content ID Unique identifier of the encryption key.

Encryption for HTTP Live Streaming

Encryption type Possible values: **None**, **Segment based, Sample based, TS packet based, Authentec, Conax, Discretix** or **Irdeto**

Key source Possible values: See table below

Table 1. Key source depending on Encryption type

Encryption type	Key source
Segment based **Sample based**	Internal key generation or External key generation
TS packet based	HTTP ECMG or TS packet encryption
Authentec, Discretix, Irdeto	External key generation or Fixed key
Conax	External key generation

Specific internal key generation parameters

Crypto period Defines how long (in seconds) a crypto word will be used.

Content ID Unique identifier of the encryption key.

Separate keys Click this checkbox if you want the key to be published in another location than the streams, then fill in the different parameters.

Network interface: select which network interface is used to publish keys.

Publishing point: specify the location where keys will be published.

Separate keys

Distribution point: specify the URL to which iPhone will connect to retrieve decryption key. This URL will be referenced within the playlist.

Secondary publishing point: for redundancy aspects, a secondary publishing point can be configured.

Secondary distribution point: for redundancy aspects, a secondary distribution point can be configured.

Specific external key generation parameters

Network interface Select which network interface is used to publish keys.

Key server URL Enter the URL of the key server.

Crypto period Defines how long (in seconds) a crypto word will be used.

Content ID Unique identifier of the encryption key.

Specific HTTP ECMG and TS packet encryption parameters

Network interface Select which network interface is used to publish keys.

ECMG URL Enter the URL of the key server.

CA PID Enter the MPEG2-TS PID used for the CA (Conditional Access).

Possible values: from 0x0010 to 0x1FFE

NOTE: The CA PID must be different from the video, audio, private, image, PMT and PCR PIDs declared in the HLS TS settings.

CA system ID Enter the identifier of the Conditional Access system.

Possible values: from 0x000 to 0FFFF

Scrambling algorithm Select a scrambling algorithm.

Possible values: AES-128 ECB (L), AES-128 ECB (R), AES-128 CBC (L), AES-128 CBC (R), or ATIS IDSA

Crypto period Defines how long (in seconds) a crypto word will be used.

Encrypt video **Encrypt video headers** **Encrypt RAP frames** **Encrypt non-RAP frames**	Check this option if you want to encrypt the video stream, then specify if you want to encrypt the video headers, the RAP (Random Access Point) and non-RAP frames.
Encrypt audio **Encrypt audio headers**	Check this option if you want to encrypt the audio stream, then specify if you want to encrypt the audio headers.

Chapter 9

Administration

Getting information about MFVP Encoding On-Demand

System information

To get information on MFVP Encoding On-Demand, follow these steps:

1. Click the **System** tab, then click the **About** link.
2. Information on MFVP Encoding On-Demand is displayed in the right panel, especially:

- Serial number
- Firmware and system versions
- Licensing information
- Upgrade expiration information
- link to the support page

Civolution watermarking

If you have subscribed the Civolution watermarking option, the Host ID and the License key are already filled. If not, please contact Ericsson Customer Services (support@envivio.com).

To activate the Civolution watermarking, please refer to "Watermarking" on page 50.

Figure 1. About panel example

About

System

Platform model: Intel Corporation S2600JF
Serial number: 4S-100000
Part number: 4E-253178
Firmware: Muse
Version: 4.00.00 (002)
ISO version: N/A
Upgrade expiration: 08/12/2016 23:59:59
Date: 2015-12-17 00:54:54 +08:00
Support: Go to support page

Civolution

Host ID: 2602414244
License key: Apply

License

Workflow
VOD

Inputs	MPEG-2 file	MPEG-2 & H.264 file
SD inputs	●	●
HD inputs	●	●
Audio only inputs	●	●
Audios per input	8	8

Decoding / pre-processing	
Max Dolby input channels	192
Max AAC input channels	96
Denoising filter	●
SCTE 27 translation	●
Video Quality Monitoring	●
Sharpening filter	●
Deblocking filter	●
MCTF filter	●
4:2:2 ingest	●
Cross-Talk filter	●

Outputs	Internet and Mobile TV	IPTV Extreme
Audio only profiles	36	36
QCIF profiles	36	-
QVGA profiles	36	-
HVGA profiles	36	-
VGA profiles	36	-
WVGA / SD profiles	36	36
WSVGA profiles	36	-
720p30 profiles	10	-
720p60/1080i profiles	10	8
Audios per profile	4	8
Encryption	●	-
File output	●	●
MPEG-2 encoding	-	●
HEVC encoding	●	-
Dolby encoding stereo	100	
Dolby encoding 5.1	100	
ABR packaging	●	-

Managing the encoder configuration

You can save and restore MFVP Encoding On-Demand encoding settings, that means its services & profiles configurations. The complete system settings are gathered into a single XML file, **config.xml**.

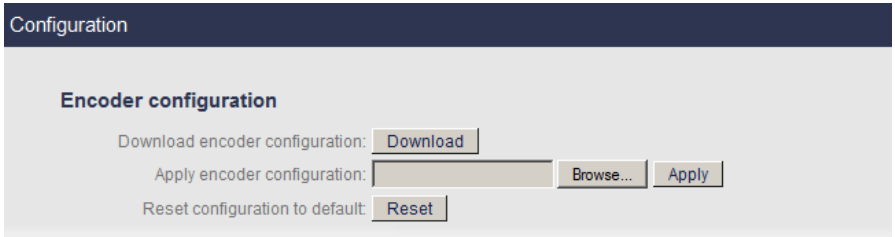
To access the configuration panel, click the **System** tab, then click the **Configuration** subtab. The configuration options are displayed in the right panel.

Saving the current configuration

To get the current configuration and save it on a remote computer, follow these steps:

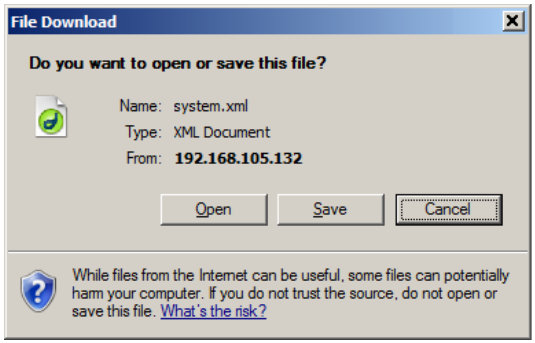
1. Click the **Download encoder configuration** button.

Figure 2. Downloading the configuration



2. A new window is opened.

Figure 3. Saving the configuration



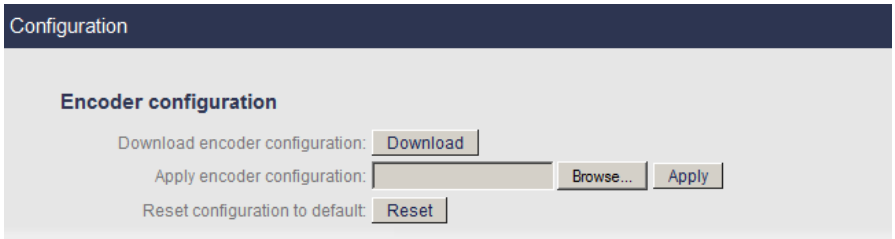
3. Click the **Save** button to save the encoder configuration file then select the destination folder and click **Save**.

Uploading an encoder configuration file

To upload an existing encoder configuration, follow these steps:

1. Next to the Apply encoder configuration parameter, select the appropriate configuration file by clicking the **Browse...** button, then click the **Apply** button.

Figure 4. Uploading a configuration



Resetting the encoder configuration

To reset the encoder to its default configuration, click the **Reset** button next to the Reset configuration to default parameter.

Managing the system configuration

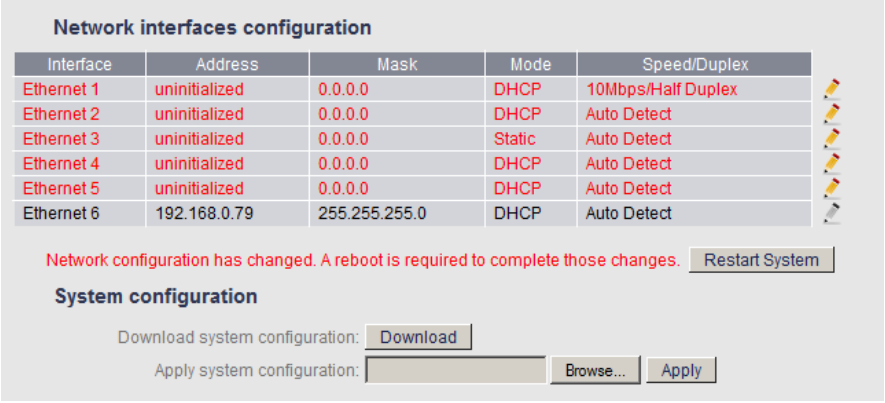
You can save and restore MFVP Encoding On-Demand system settings, that is Ethernet interfaces configuration. The complete system settings are gathered into a single XML file, **system.xml**.

Saving the current configuration

To get the current system configuration and save it on a remote computer, follow these steps:

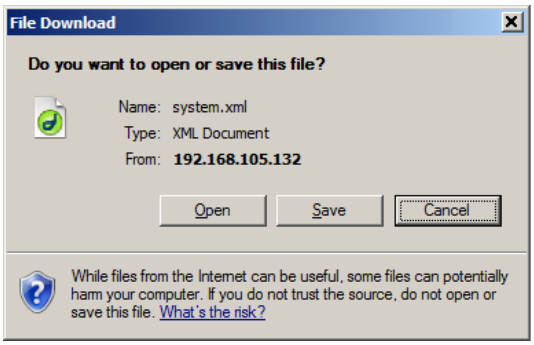
1. Click the **System** tab, then click the **Configuration** subtab. The configuration options are displayed in the right panel.
2. From the **System configuration** part, click the **Download** button next to the **Download system configuration** parameter.

Figure 5. Downloading the configuration



3. A new window is opened.

Figure 6. Saving the configuration



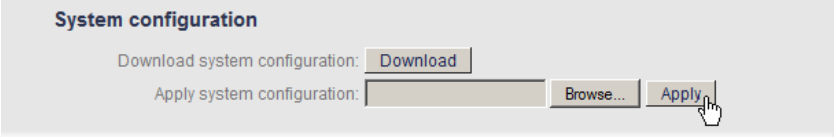
4. Click the **Save** button to save the system configuration file then select the destination folder and click **Save**.

Uploading a system configuration file

To upload an existing system configuration, follow these steps:

1. Select the **System** tab, then click the **Configuration** subtab. The configuration options are displayed in the right panel.
2. Select the appropriate configuration file by clicking the **Browse...** button, then click the **Apply** button next to the Apply encoder configuration parameter.

Figure 7. Uploading a system configuration



Restricting access to the remote configuration

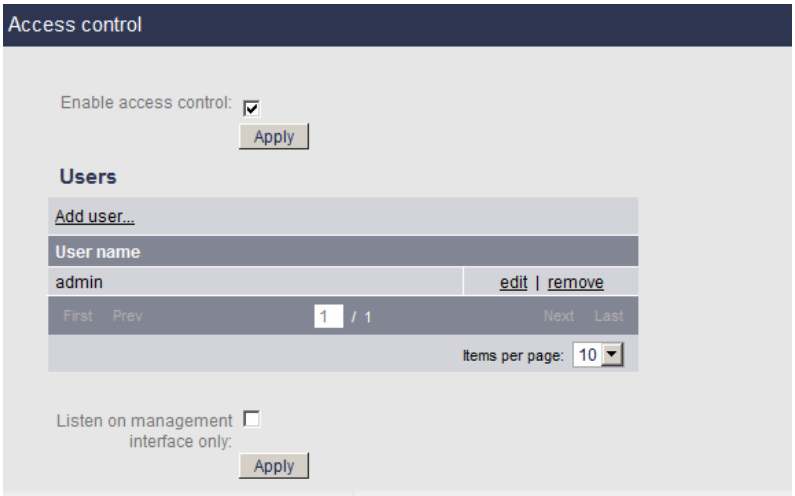
You can restrict the access to the remote configuration web interface by creating a password.

Adding or changing the password

To add or change the password, follow these steps:

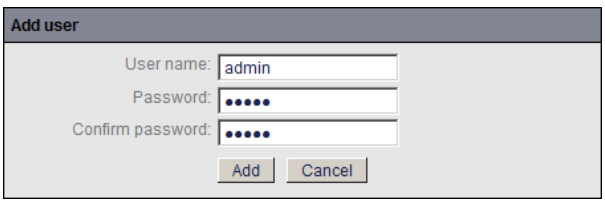
1. From the web interface, click the **System** tab, then select the **Access control** subtab, the access control parameters are displayed in the right panel.

Figure 8. Access control



2. Select the **Enable access control** checkbox, then click the **Add user** link. A new window is displayed.

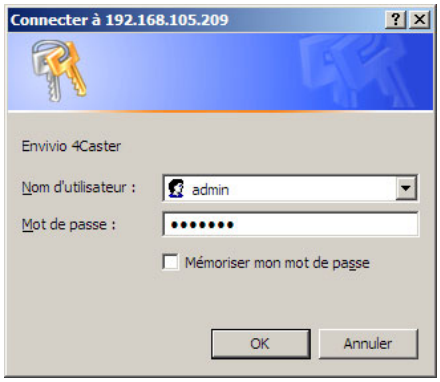
Figure 9. Changing the password



3. Enter the user name and the new password twice, and click the **Apply** button. A message informs you that the password has been changed.

NOTE The user name (***admin***) cannot be modified.

4. When trying to access MFVP Encoding On-Demand web interface, you will now be asked to enter the user name and password.



Removing the password/disabling access control

To remove the password, click the remove link next to the user name, or deselect the **Enable access control** checkbox and click the **Apply** button.

Restricting the access to the web interface

You can select the **Listen on management interface only** checkbox to restrict the web interface access via the recommended network interface, Ethernet 6.

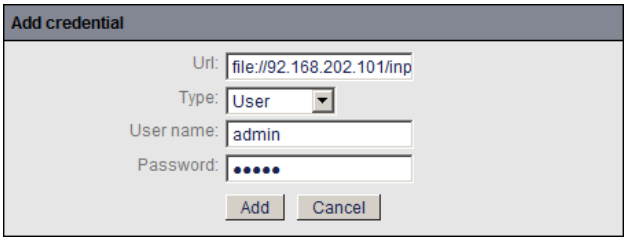
Managing the certificates and credentials

Adding a credential

You can create credentials to access a server for input or output files.
To create a credential, follow these steps:

1. From the web interface, click the **System** tab, then select the **Credentials** subtab.
2. Click the **Add credential** link. A new window is opened.

Figure 10. Adding a credential



3. Select the appropriate value for each parameter.

URL Enter the URL to the server.

Type Possible values: **Token**[1], **User**, or **Certificate**
Depending on the credential type, additional parameters are displayed (see below).

1. Especially for HTTP streaming publishing with CDNs

4. The new credential is added to the list of credentials.

Specific Token authentication parameters

Token seed Enter the Token seed.

Refresh period Specify the Token refresh period.

Specific User authentication parameters

Corresponds to the basic/digest authentication.

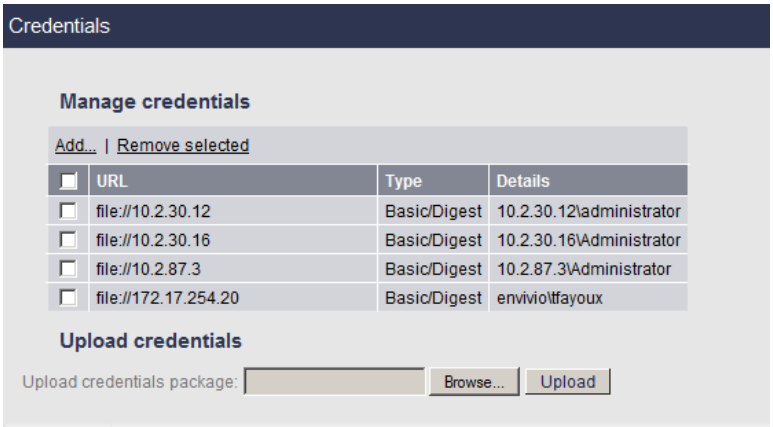
User name Specify the user name (server_ip_address\user_name or domain_name\user_name to access the server.

Password Specify the password to access the server.

Specific Certificate authentication parameters

1. To download a certificate, follow these steps:
2. Click the **Browse** button then select the appropriate certificate file and click the **Add** button.
3. The new certificate is added to the list of credentials.

Figure 11. Credentials



Uploading a credential file

To upload a credential file, click the **Browse** button into the **Upload credentials** section then select the appropriate file and click the **Upload** button. The credentials are added to the list of credentials.

Deleting a credential

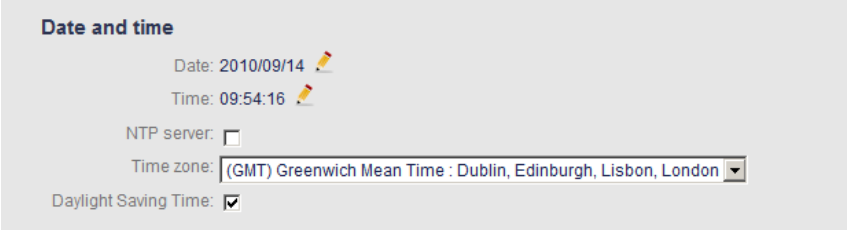
You can delete a credential by selecting its checkbox and clicking the **Remove selected** link.

Setting the date and time

To set the date and time, follow these steps:

1. Click the **System** tab, then click the **Configuration** subtab. The configuration options are displayed in the right panel.
2. The date and time part parameters are displayed in the right panel.

Figure 12. Date and time parameters

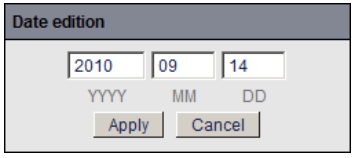


Setting the date

To edit the date, follow these steps:

1. Click the pencil button, next to the date. A new panel is displayed.

Figure 13. Setting the date



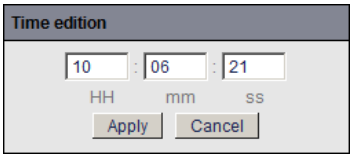
2. Enter the new date then click the **Apply** button.

Setting the time

To edit the time, follow these steps:

1. Click the pencil button, next to the time. A new panel is displayed.

Figure 14. Setting the time



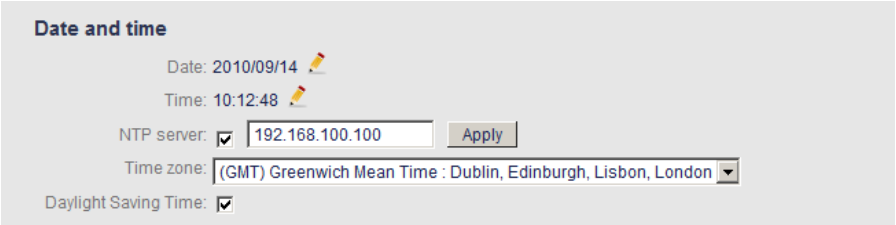
2. Enter the new date then click the **Apply** button.

Enabling the NTP server

If NTP[1] is enabled, the MFVP Encoding On-Demand time will be given by a specific server.

If you check the NTP server option, you will have to specify the NTP server IP address is.

Figure 15. Enabling the NTP server



Setting the time zone

NOTE MFVP Encoding On-Demand uses Windows API for the time zone.

To set the time zone select a value from the drop-down list.

1. See "NTP" in Glossary on page 200.

Enabling the daylight saving time

Check this parameter if you observe the daylight savings time (DST).

Enabling SNMP

The SNMP agent allows users to receive traps when alarms occur.

To enable SNMP, follow these steps

1. Click the **System** tab, then click the **Configuration** subtab. The configuration options are displayed in the right panel.
2. In the **SNMP** section, check the **Enable SNMP** option.

Updating MFVP Encoding On-Demand version

To update MFVP Encoding On-Demand, contact Ericsson Customer Services that will check version upgrade compatibility and supply you with an update package including an update package file (UPD file).

To update your MFVP Encoding On-Demand, follow these steps:

1. Power on the MFVP Encoding On-Demand, then, from any computer that has a network access to the MFVP Encoding On-Demand, copy the update package file to a local temporary directory.
2. Open a web browser to access the MFVP Encoding On-Demand web interface (see "Accessing the web interface" on page 26).
3. From the **System** tab, select the **About** menu to check the **Upgrade expiration**.
4. Save the system and MFVP Encoding On-Demand application configuration (see "Managing the encoder configuration" on page 150).
5. From the **System** tab, select the **Update** menu then click the **License Update** menu item.
6. In the right panel, click the **Browse** button to choose the update package file, then click the **Upload** button.

NOTE The update process may take a few minutes.

7. Just after the update, a status is provided. A result such as `No error` will be displayed if the license was installed successfully.
8. Click the **Back to product** button to go back to the MFVP Encoding On-Demand web interface.
9. You can check that the MFVP Encoding On-Demand has been correctly updated by selecting the **About** tab. The new version number should be displayed.

NOTE The **Licencing** menu item lets you update the MFVP Encoding On-Demand licence (see "Updating MFVP Encoding On-Demand license" on page 164).
The **Platform Identifier** menu item lets you retrieve the platform information for support purpose.

Updating MFVP Encoding On-Demand license

Get the LIF file to generate the license

To generate the license, follow these steps:

1. Open a web browser to access MFVP Encoding On-Demand web interface (see Configuration Guide, Chapter 3, "Accessing the web interface") and enter the following address:

   `http://IP_address/Updater`

   where *`IP_address`* is the IP address of MFVP Encoding On-Demand.
2. Click the **System** tab then select the **Get Platform Identifier** submenu, and save the LIF file on your PC.
3. Send the LIF file to Ericsson Support team to get the license package (ZIP file).

Load the firmware license

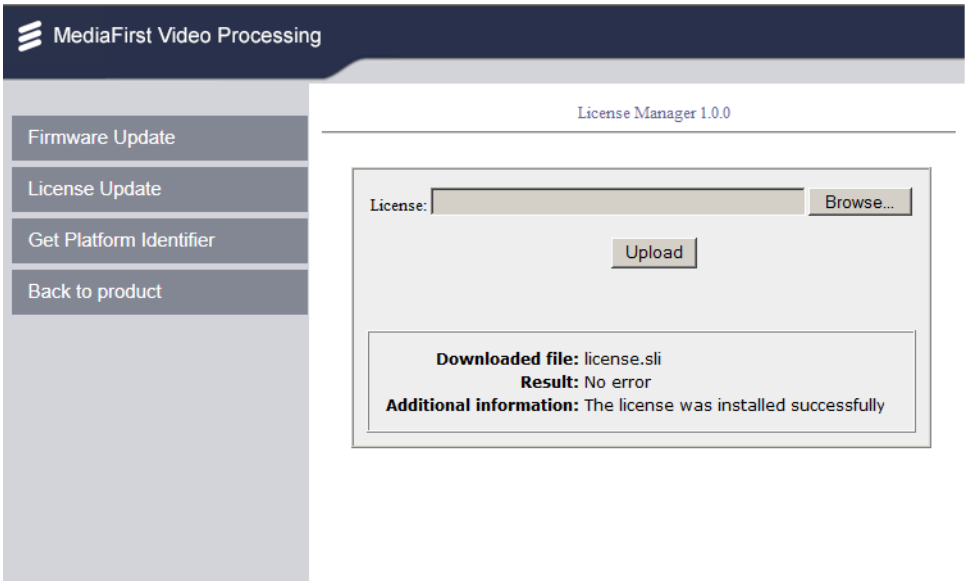
Once you have received the license package (ZIP file) from Ericsson support, follow these steps to load the firmware license:

1. Unzip the package.
2. From the **Updater** page, select the **License Update** submenu.
3. In the right panel, click the **Browse** button to choose the FLI file (license.fli).
4. Click the **Upload** button
5. A message informs you that the installation is successful.

Load the software license

To load the software license, follow these steps:

1. From the **Updater** page, select the **License Update** submenu.
2. In the right panel, click the **Browse** button to choose the SLI file (license.sli)[1].
3. Click the **Upload** button
4. A message informs you that the installation was successful.



MFVP Encoding On-Demand installation verification

You can check that the license has been correctly updated by selecting the **About** menu from the web interface. The new license information should be displayed.

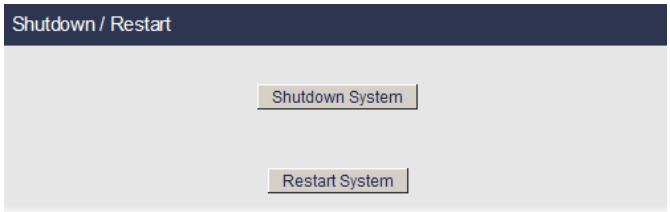
1. The SLI file is part of the zip file received

Shutting down or restarting the system

To restart or shut down MFVP Encoding On-Demand follow these steps:

- From the web interface, click the **System** tab, then click the **Shutdown/restart** subtab.
- Click the **Shutdown system** or the **Restart system** button.

Figure 16. Shutting down or restarting MFVP Encoding On-Demand



NOTE A message will ask you to confirm your action.

Appendix A

Encoding parameters Guidance

HTTP Streaming

Table 1. Typical encoding settings for HTTP Streaming for iPhone

Network	Bit rate (kbps)	Encoding Res.	Rate Control	Codec	Frames (fps)	Audio codec	ES Audio (kbps)	Mode	Sample rate (kHz)
WiFi	600	480x272 (16:9)	CBR	H264 Baseline	30	HE-AAC	64	Stereo	44.1
	300								
3,5G	400	320x240	CBR	H264 Baseline	30	HE-AAC	24	Mono	32
3G	150	320x240	CBR	H264 Baseline	15	HE-AAC	24	Mono	32
EDGE	64	-	-	-	-	HE-AAC	48	Stereo	48

Table 2. Typical encoding settings for HTTP Streaming for iPad

Network	Bit rate (kbps)	Encoding Res.	Rate Control	Codec	Frames (fps)	Audio codec	ES Audio (kbps)	Mode	Sample rate (kHz)
WiFi	3000	960x720	CBR	H264 Main	30	HE-AAC	64	Stereo	44.1
	700	640x360 (16:9)							
	500	480x272(16:9)							
	350	320x160(16:9)							

Table 3. Typical encoding settings for Smooth Streaming

Network	Bit rate (kbps)	Encoding Res.	Rate Control	Codec	Frames (fps)	Audio codec	ES Audio (kbps)	Mode	Sample rate (kHz)
Broadband	3000	960x720	CBR	H264 Main	30	HE-AAC	64	Stereo	48
	2000	854x480							
	1400	640x360							
	1000	640x360							
	700	640x360							
	500	480x272							
	350	320x160							

Internet TV adaptive streaming

Table 4. Typical encoding bit rates

Input	Network output type	Codec	Output Res.	Bit rate	Encryption
HD-SDI	Smooth Streaming HTTP Streaming	H264	720p	3Mbps	Yes
			D1	2 Mbps	
			VGA	1.4Mbps	
			VGA	1Mbps	
			HGA	700kbps	
			QVGA	500kbps	
			QVGA	350kbps	
HD H264 over IP	Smooth Streaming HTTP Streaming	H264	720p	3Mbps	Yes
			D1	2 Mbps	
			VGA	1.4Mbps	
			VGA	900kbps	
			HVGA	500kbps	
			QVGA	350kbps	
SD H264 over IP	Smooth Streaming HTTP Streaming	H264	VGA	1Mbps	Yes
			HVGA	700kbps	
			QVGA	500kbps	

Appendix A

Prerequisites and Standards Compliance

Prerequisites

MFVP Encoding On-Demand supports IP ingest of MPEG-2-TS streams with the following characteristics

TS Stream:

- Up to 40 Mbps

Video:

- Single video track
- Codec:
  - MPEG-2 HP@HL (up to 20Mbps for SD and 30Mbps for HD)
  - H.264 HiP@Level4
- Resolution and frame rate:
  - 576i and 480i @25 / 29.97 / 30fps
  - 1080i@ 25 / 29.97 / 30 fps
  - 1080p@ 23.98/ 24 /25 / 29.97 / 30 fps
  - 720p@ 23.98/ 24 /25 / 29.97 / 30 / 50 / 59.94 / 60 fps

Audio:

- Up to 8 audio tracks
- Codec:
  - AAC (HE-AAC, HE AAC v2)
  - MPEG-1 Layer 2
  - AC-3

Input/Output Standards compliance

Type		Norm Reference	Parameters to measure
TS	SPTS	ETR 101290	Level 1,2 and part of 3 of norm
	MPTS	ETR 101290	Level 1,2 and part of 3 of norm
IP	Transport	IETF RFC 4445 IETF RFC 768 (UDP) IETF RFC 3550 (RTP) IETF RFC 2326 (RTSP) IETF RFC 2429 (RTP Payload Format for H263+)	• Protocol compliance • Off-air period • Number of PIDs per service • Scramble status • Program loss: MLR, MLT-15, MLS-15, MLT24, MLS24 • Program Bit Rate alarms: count of alarms and duration • Program outage alarms • Flow outage alarms • Bit rate statistics for the last 15 minutes (current/min/max/average) • Jitter and Delay factor (MDI – DF)
	MPEG over IP	ISO 14496 part 8 IETF RFC 3267 (AMR-NB & AMR-WB) IETF RFC 2658 (QCELP) IETF RFC 3984 (H264 Video) IETF RFC 3640 (Transport of MPEG-4 ES) IETF RFC 3016 (MPEG-4 AV Streams payload format) IETF RFC 3551 (RTP Profile for Audio and Video Conferences with Minimal control) IETF RFC 4566 (SDP)	• Protocol compliance
ASI		ETSI TR 101 891 BS EN50083-9	• Peak-to-peak signal amplitude • Maximum Rise and fall times • Deterministic Jitter (DJ) and Random Jitter (RJ)

Type		Norm Reference	Parameters to measure
Serial video	SDI	SMPTE 259M ITU-R BT.601/656 SMPTE 272M	• Peak-to-peak signal • Rise and fall times • Signal waveform jitter • No illegal code • Carry supported video formats • Correct values in group format • No EDH group error • No CRC error
	HD-SDI	SMPTE 292M SMPTE 299M SMPTE 291M SMPTE RP 184	• Peak-to-peak signal • Rise and fall times • Signal waveform jitter • No illegal code • Carry supported video formats
Analog	NTSC	ITU BT R 1700/A SMPTE 170M	• Signal amplitude • Time measurement (sync mostly) • Noise level
	PAL	ITU BT R 1700/B	• Signal amplitude • Time measurement (sync mostly) • Noise level
MPEG	Codec	ISO/IEC 11172-3 ISO 13818-2 ISO 13818-3 ISO 14496 part 3/10/14 ITU-T Rec. H.263 Video	• Format/norm compliance

Appendix B

Output aspect ratio and cropping

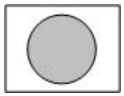
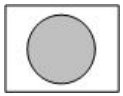
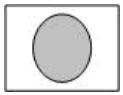
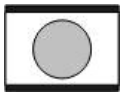
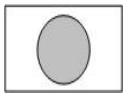
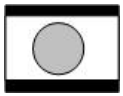
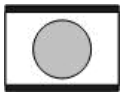
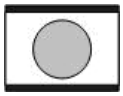
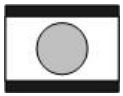
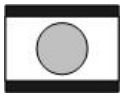
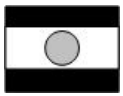
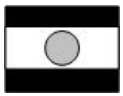
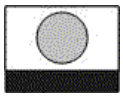
management

Picture aspect ratio handling

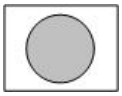
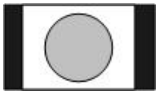
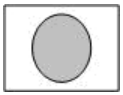
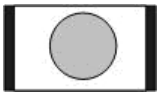
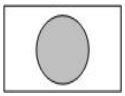
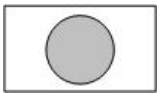
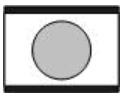
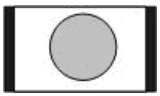
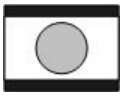
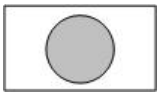
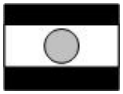
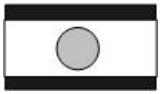
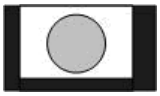
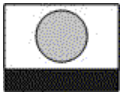
"Auto" aspect ratio handling

If the input video signal embeds WSS information and if the **Aspect ratio** parameter is set to **Auto**, MFVP Encoding On-Demand can extract the picture aspect ratio (PAR) information and transforms the input video as follows.

NOTE The signal always comes as 4:3, but the picture could be 16:9 anamorphic.

Video Input	WSS Flag	Processing	4:3 Video Output
	4:3 Full	Nothing	
	14:9 Full [1]	Restore PAR and fit in letterbox	
	16:9 Full	Restore PAR and fit in letterbox	
	14:9 Letterbox (center) [1]	Nothing	
	16:9 Letterbox (center) [1]	Nothing	
	> 16:9 Letterbox (center) [1]	Nothing	
	14:9 Letterbox (top) [1]	Nothing	
	16:9 Letterbox (top) [1]	Nothing	

1. Only available in PAL.

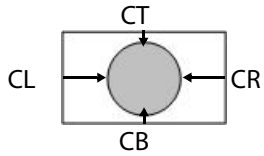
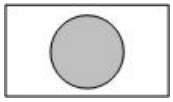
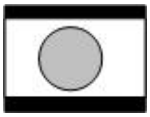
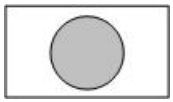
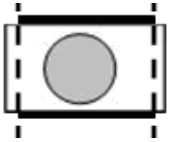
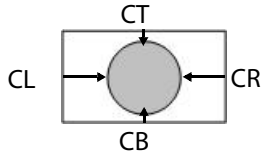
Video Input	WSS Flag	Processing	16:9 Video Output
	4:3 Full	Fit in pillar box	
	14:9 Full [1]	Restore PAR and fit in pillar box	
	16:9 Full	Restore PAR	
	14:9 Letterbox (center) [1]	Remove black stripes and fit in pillar box	
	16:9 Letterbox (center) [1]	Remove black stripes	
	> 16:9 Letterbox (center)	Remove black stripes and fit in letterbox	
	14:9 Letterbox (top) [1]	Fit in pillar box	
	16:9 Letterbox (top) [1]	Fit in pillar box	

1. Only available in PAL.

NOTE Only the aspect ratio part of WSS is supported. Additional information such as enhanced services and subtitles is not used.

Cropping management

Cropping is managed in a different way depending on the output aspect ratio management.

Cropping method	Parameters	Input display	Output display
Dynamic	Crop Left, Right, Top, Bottom and keep Aspect ratio		
Letter Boxing	Adaptation of input 16:9 to output 4:3 zoom level 0%		
	Adaptation of input 16:9 to output 4:3 zoom level 50%		
Stretch to fit	Crop Left, Right, Top, Bottom and Stretch		

Appendix C

H.264 Codecs

Premium, Extreme and Elite video codecs

Premium H.264

- H.264 baseline profile
- Video quality inherits from the previous generation of encoders for backward compatibility purposes

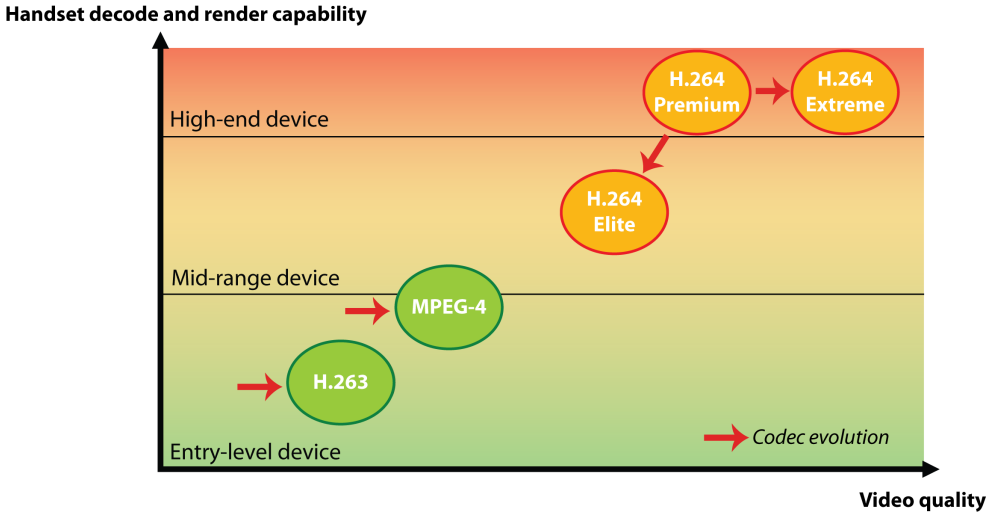
Extreme H.264

- H.264 baseline profile
- Best video quality at mobile bit rates:
  - Spatio-temporal adaptive rate control: provides better trade-off between picture and movement quality on difficult scenes
  - Rate Distortion Optimization (RDO): new advanced heuristics to determine the best coding strategy
  - Motion estimation improvements: additional gain brought by 1/2 PEL and increased number of reference frames
  - Adaptive area-based compression: improvement on edge and text readability

Elite H.264

- H.264 baseline profile and optimized algorithms for mid-range handsets
- Based on H.264 Extreme
- Further optimizes H.264 quality at targeted rates: 200 kbps
- Works on H.264 deployed players
- Cooperation with player manufacturers on simplification study and IOT testing
- Improves the decoding frame rate by 5 to 7 frames compared to Extreme H.264.

Figure 1. Handset versus video quality



Appendix D

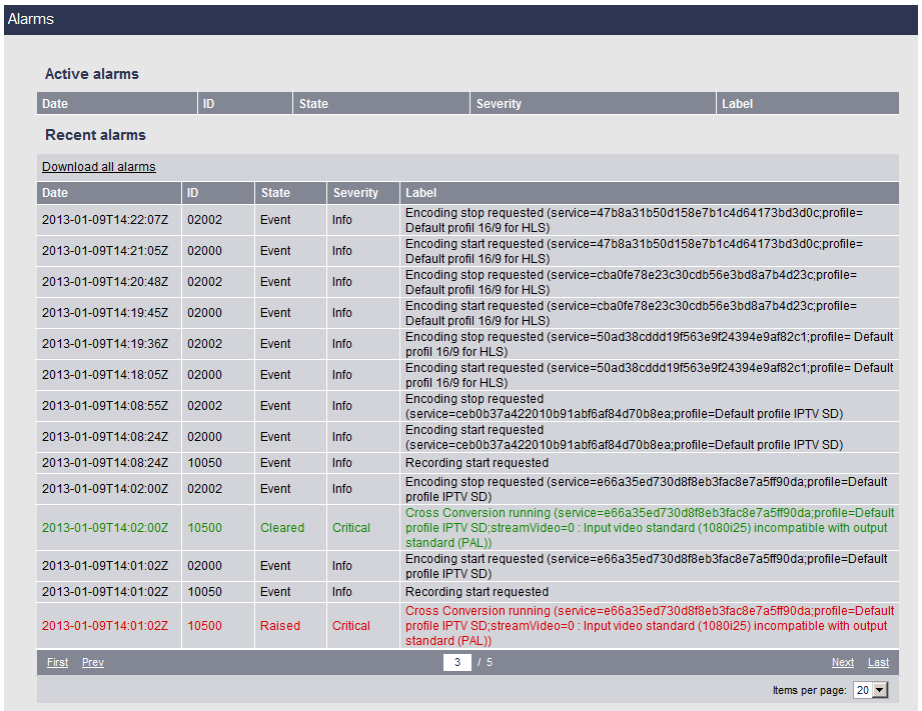
Alarms and Logs

Displaying alarms

To display MFVP Encoding On-Demand alarms, follow these steps:

1. Click the **System** tab, then click the **Alarms** subtab.
2. The list of alarms is displayed in the right panel.
   This list is periodically updated (every 3 seconds).

Figure 1. Alarms panel



Alarms

Active alarms

Date	ID	State	Severity	Label

Recent alarms

Download all alarms

Date	ID	State	Severity	Label
2013-01-09T14:22:07Z	02002	Event	Info	Encoding stop requested (service=47b8a31b50d158e7b1c4d64173bd3d0c;profile= Default profil 16/9 for HLS)
2013-01-09T14:21:05Z	02000	Event	Info	Encoding start requested (service=47b8a31b50d158e7b1c4d64173bd3d0c;profile= Default profil 16/9 for HLS)
2013-01-09T14:20:48Z	02002	Event	Info	Encoding stop requested (service=cba0fe78e23c30cdb56e3bd8a7b4d23c;profile= Default profil 16/9 for HLS)
2013-01-09T14:19:45Z	02000	Event	Info	Encoding start requested (service=cba0fe78e23c30cdb56e3bd8a7b4d23c;profile= Default profil 16/9 for HLS)
2013-01-09T14:19:36Z	02002	Event	Info	Encoding stop requested (service=50ad38cddd19f563e9f24394e9af82c1;profile= Default profil 16/9 for HLS)
2013-01-09T14:18:05Z	02000	Event	Info	Encoding start requested (service=50ad38cddd19f563e9f24394e9af82c1;profile= Default profil 16/9 for HLS)
2013-01-09T14:08:55Z	02002	Event	Info	Encoding stop requested (service=ceb0b37a422010b91abf6af84d70b8ea;profile=Default profile IPTV SD)
2013-01-09T14:08:24Z	02000	Event	Info	Encoding start requested (service=ceb0b37a422010b91abf6af84d70b8ea;profile=Default profile IPTV SD)
2013-01-09T14:08:24Z	10050	Event	Info	Recording start requested
2013-01-09T14:02:00Z	02002	Event	Info	Encoding stop requested (service=e66a35ed730d8f8eb3fac8e7a5ff90da;profile=Default profile IPTV SD)
2013-01-09T14:02:00Z	10500	Cleared	Critical	Cross Conversion running (service=e66a35ed730d8f8eb3fac8e7a5ff90da;profile=Default profile IPTV SD;streamVideo=0 : Input video standard (1080i25) incompatible with output standard (PAL))
2013-01-09T14:01:02Z	02000	Event	Info	Encoding start requested (service=e66a35ed730d8f8eb3fac8e7a5ff90da;profile=Default profile IPTV SD)
2013-01-09T14:01:02Z	10050	Event	Info	Recording start requested
2013-01-09T14:01:02Z	10500	Raised	Critical	Cross Conversion running (service=e66a35ed730d8f8eb3fac8e7a5ff90da;profile=Default profile IPTV SD;streamVideo=0 : Input video standard (1080i25) incompatible with output standard (PAL))

First Prev 3 / 5 Next Last

Items per page: 20

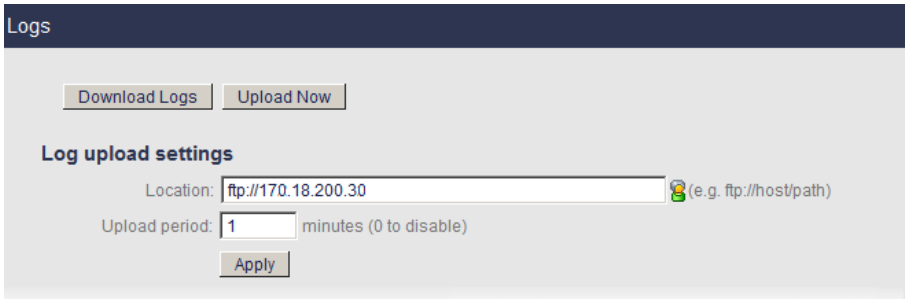
NOTE You can click the **Download all alarms** button to save the alarms file.

Displaying logs

To display MFVP Encoding On-Demand logs, follow these steps:

1. Click the **System** tab, then click the **Logs** subtab.
2. You can either download the logs on your PC or upload the logs to a remote server

Figure 2. Logs panel



Downloading the logs

To download the logs, click the **Download Logs** button.

Uploading the logs

To upload the logs, follow these steps:

1. Configure the remote server by entering the **Location**, and the **Upload period** – from 0 (disabled) to 1440 minutes.
2. Click the **Apply** button.
3. You can click the **Upload Logs** button at any moment to upload the logs to the specified remote server.

Appendix E

Monitoring via SNMP

Using SNMP monitoring

MediaFirst Video Processing - Encoding On-Demand supports SNMP for monitoring purposes.

You can use an SNMP supervisor to remotely monitor several MFVP Encoding On-Demand encoders.

You can retrieve MFVP Encoding On-Demand MIBs (Management Information Base) at:

http://<MFVP-OD_IP>/Snmp/Mibs/

Enabling SNMP trap reception

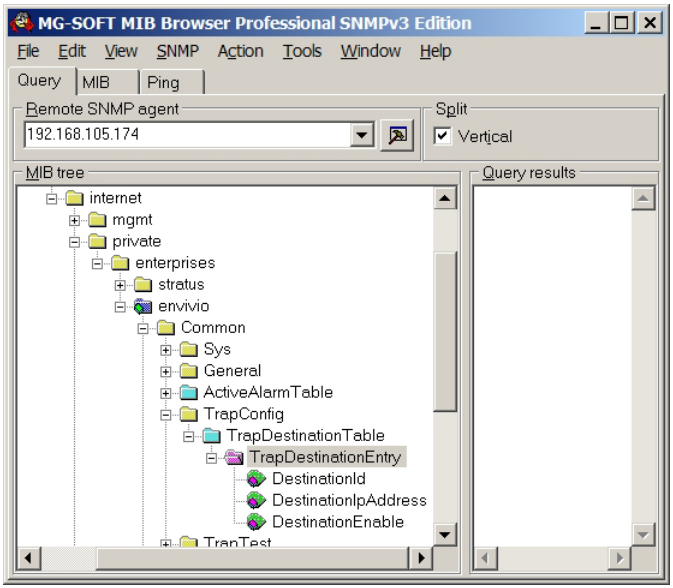
SNMP traps are used to monitor the events and alarms generated by MFVP Encoding On-Demand. To receive SNMP traps, you have to be registered as a trap listener on the MFVP Encoding On-Demand SNMP agent.

NOTE Each MFVP Encoding On-Demand supports up to ten trap listeners.

Registering as a trap listener

To be registered as a trap listener, you must fill the destinations fields in the trap destination entry table.

Figure 1. Example using a MIB browser, MG-SOFT [1]



DestinationIPAddress is the target client IP address.

DestinationEnable must be set to *true* to receive the SNMP trap.

1. http://www.mg-soft.com/mgMibBrowserPE.html

NOTE The default Get SNMP community for the SNMP agent is **public_!envivio!**
The default Set SNMP community for the SNMP agent is **private_!envivio!**

Appendix F

Troubleshooting

Troubleshooting advice

- Make sure that the system is plugged into an electric power outlet and switched on.

I get an error when I start encoding

Problem description

When I start encoding a profile from the web interface, I get an error message.

Tests to perform

1. Open MFVP Encoding On-Demand web interface, then check the error messages in the Alarms section *(see "Alarms and Logs" on page 182)* to identify the alarm.
2. Check your settings, especially the transport settings, check that you are streaming on a valid network interface.

NOTE If you cannot connect to the web interface, please refer to "I cannot access the web interface of MFVP Encoding On-Demand" on page 192.

Solution

This error is usually a configuration issue. Checking the parameters should resolve the problem.

I cannot access the web interface of MFVP Encoding On-Demand

Problem description

I cannot open MediaFirst Video Processing - Encoding On-Demand web interface http://<MFVP-OD_IP>.

Tests to perform

1. Check the IP connectivity, by *pinging* MFVP Encoding On-Demand from another device on the same IP subnet (from this device command prompt):

   ping <MFVP-OD_IP> (where **MFVP-OD_IP** is the IP address of MFVP Encoding On-Demand)

   If MFVP Encoding On-Demand does not reply, refer to the solution explained on page 193, "I cannot ping MFVP Encoding On-Demand".

2. Try to access one of the following pages:

   - The updater web page: **http://<MFVP-OD_IP>/Updater/**
   - The support page: **http://<MFVP-OD_IP>/Support.html**

   If you can access one of these pages but you cannot access MFVP Encoding On-Demand page, see solution below.

Solution

1. Restart MFVP Encoding On-Demand to reset the startup configuration (*see "Shutting down or restarting the system" on page 166*).
2. If the problem still exists after restarting, get the support package and send it to the Ericsson support team (*see "How to report a problem to the support team." on page 195*) who will provide you a way to overcome this issue.

I cannot ping MFVP Encoding On-Demand

Problem description

When I ping MFVP Encoding On-Demand:

`ping <MFVP-OD_IP>` (where **`MFVP-OD`** is the IP address of MFVP Encoding On-Demand),

… I receive no reply from the equipment.

Tests to perform /solution

Usually this problem is related to a network failure, but it can also be due to a bad network configuration.

1. Open a session on the local host and check IP configuration:
   - Connect a KVM to the VGA port.
   - Open a Windows session using the following credentials:

     Login: **`administrator`**
     Password: **`3nvivio_!`**
   - Go to **Control Panel> Network and Internet> Network and Sharing Center** and select the **Change adapter settings link.**
2. Also check at the back of MFVP Encoding On-Demand that the network interface is connected to the network.
3. Check that you can ping another system located on the same network as MFVP Encoding On-Demand.

- If you cannot ping any equipment on the network – your IP switch or router may malfunction, or your console is not connected to the network – you should contact your network administrator.
- If you cannot ping MFVP Encoding On-Demand but you can ping other equipment, check the network connection between MFVP Encoding On-Demand and your network switch.
  On the switch side, check the LED corresponding to the port to which the G4 is connected (refer to the switch's manufacturer documentation for the meaning of the LED status).
  – If the LED status means that the G4 is not connected, check that the cable is properly inserted into the Ethernet ports of both the switch and the G4.

- If the LED status means that the G4 is still not connected, try to connect the G4 to another port in the network switch.
- If the LED status means that the G4 is still not connected, connect the network switch to another of the G4Ethernet ports.
- If the LED status means that the G4 is still not connected, try to use another Ethernet cable.
- If the LED status means that the G4 is still not connected, contact Ericsson support.

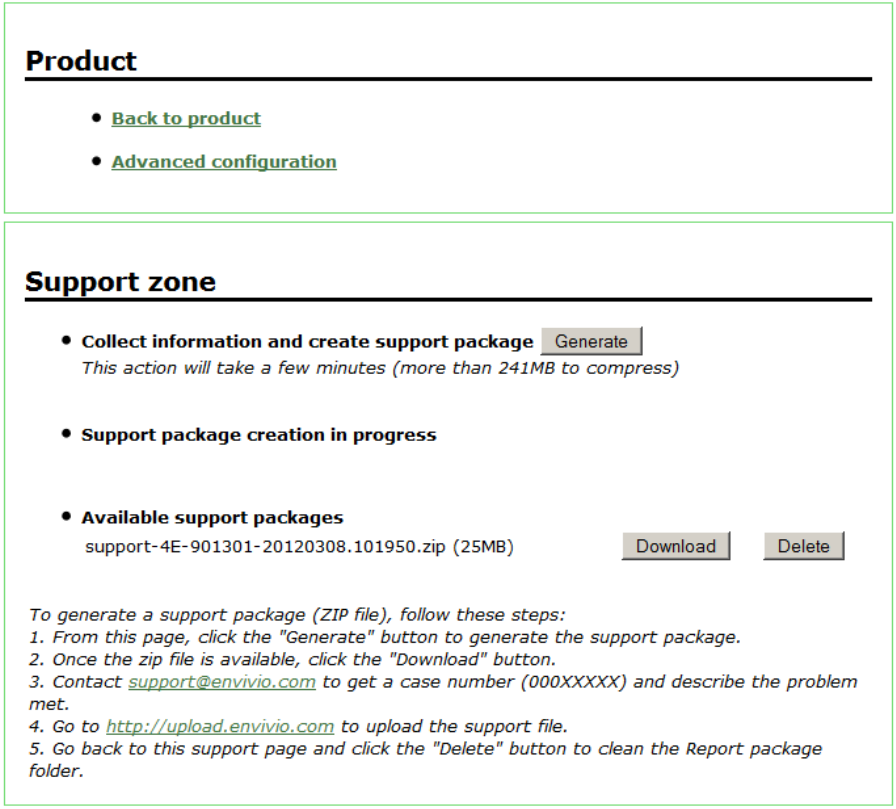
How to report a problem to the support team.

To optimize the support process and bug tracking, a report package should be sent to the Support team.

CAUTION You should only generate a support package when the encoder is stopped or removed from active operation or during a non-critical time.

To generate a report package, follow these steps:

1. Open a browser and enter the following address to connect to the support web page:
   `http://<MFVP-OD_IP_Address>/Support.html`
   The following page is displayed:



2. Click the **Generate** button to generate the support package.

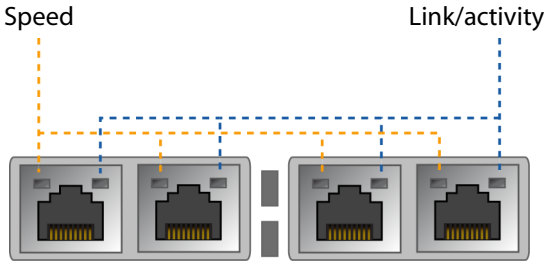
3. Once the zip file is available, click the **Download** button.
4. Contact support@envivio.com to get a case number (`000XXXXX`) and describe the problem met.
5. Go to http://upload.envivio.com to upload the support file.
6. Go back to this support page and click the **Delete** button to clean the Report package folder.

LEDs of the network interface connector

On G4, each network interface controller drives two LEDs located on each network interface connector:

- The link/activity LED to the right of the connector
- The speed LED to the left of the connector

Figure 1. Quad port server adapter Ethernet LEDs (Ethernet 3 to 6)



The table below provides an overview of these LEDs:

LED Color	LED state	Ethernet 1/6 state
Speed LED (Left)	Off	10 Mbps
	Green	100 Mbps
	Amber	1 000 Mbps
Activity LED (Right)	On	Active connection
	Blinking	Data activity

Glossary

AAC

Advanced Audio Coding, MPEG-2 or MPEG-4.

ABR

Available Bit Rate.

AFD

Active Format Descriptor. Standard set of codes that can be sent in the MPEG video stream or in the baseband SDI video signal that carries information about their aspect ratio and active picture characteristics.

artifacts

Flaws in the video encoding such as circles, blemishes, noise or spots.

ATSC

Advanced Television Systems Committee. An international digital television standard adopted by the United States, Canada, South Korea, Taiwan and Argentina. Broadcast over the air (terrestrial), via satellite or cable, ATSC transmits in a 6 MHz channel and uses MPEG-2 video compression and Dolby Digital audio compression.

AVI

Audio Video Interleaved. A container for a video and audio format.

B-frame

Bi-directional MPEG video frames are calculated from the content of the preceding video frame and the following video frame.

bandwidth

Bandwidth has many meanings, depending on context. It started as a radio term and has been expanded to include other kinds of communications. It is the numerical difference between the highest and lowest frequencies of a radio band or channel.

Bandwidth means the same thing in audio, although in most applications, the lowest frequency is sufficiently low enough to be considered equal to zero. Hence, audio bandwidth usually means the highest frequency of an audio signal or the highest frequency that can be carried by an audio system.

Typical examples of bandwidth are 300 - 3,400 Hz for telephone,
20 - 20,000 Hz for Hi-fi, and 20 - 15,000 Hz for fm.

bit rate

The rate (in Mbits per second) for transmitting data over a network. MFVP Encoding On-Demand refers to several bit rates. The target bit rate is the

channel capacity of the network. The maximum bit rate is a limit, less than the target bit rate, that the fitter uses to fit data into the actual bandwidth for a streaming server. The audio encoder uses an average target bit rate and a maximum target bit rate for variable bit rate encoding.

broadband

A general term for DSL lines, cable modem, and t1 lines.

CAPEX

CAPital EXpenditure. Capital expenditures refer to the cost of developing or providing non-consumable parts for the product or system.

CBR

Constant bit rate.

CELP

Code Excited Linear Prediction. Audio encoding scheme used for very low bit rate encoding, mainly for speech.

CIF

Common Interchange Format. A video size (352 x 288) well suited to higher bit rates.

codec

The software that encodes and decodes a file. The word is a shortened form of coder-decoder or compression-decompression. MFVP Encoding On-Demand has an audio codec and a video codec.

contrast

The tonal difference between light, midtone and dark zones of an image.

D1

Video resolution standard. For NTSC, D1 is 720 x 480 pixels, in the PAL and SECAM systems, D1 is 720 x 576.

Fps

Frames per second. Number of video frames displayed within one second.

frame size

Size (in pixels) of a video frame (for example, 640 x 480).

GMT

Greenwich Mean Time.

hinted movies

Movies that can be streamed for broadcast over the Internet. A hint track has information about the media file so that it can be streamed properly.

HRD

Hypothetical Reference Decoder.

I-frames

An MPEG-4 video term for key frames.

image source

Optical device (camera, webcam, TV, or VCR) that can create a digital representation of a view, scene or picture.

ISO

International Standards Organization.

kbps

Kilobits per second.

key frame

A video frame that fully refreshes its contents and can be used as a reference point for other frames in the sequence. In MPEG terms, this is an I-frame.

MPEG

As defined on the MPEG website, MPEG (pronounced M-peg), stands for Moving Picture Experts Group, and is the name given to a family of International Standards used for coding audio-visual information in a digital compressed format. The MPEG family of standards includes MPEG-1, MPEG-2, MPEG-4, MPEG-7, and MPEG-21, which are formally known as iso/iec-11172, iso/iec-13818, iso/iec-14496, iso/iec-15938, and iso/iec-21000.

multicast

Process where a single stream is served from one source to multiple receivers. It is a one-to-many communication. The multicast address range is: 224.0.0.0 - 239.255.255.255.

multimedia

A single presentation with multiple forms of media—text, graphics, sound, video, and animation. Most personal computers can display multimedia, and the source is usually a cd because the files are large and require considerable storage capacity. MPEG-4 gives broadcasters the tools to deliver multimedia presentations over the Web in smaller file size.

noise

Random flaws that appear in audio or video.

NTP

Network Time Protocol. NTP is a protocol designed to synchronize the clocks of computers over a network.

NTSC

National Television Systems Committee. Determines the standards for color picture broadcasting. Used in the USA, Canada and Japan.

OPEX

OPerational EXpenditure. Operating expenditures are the on-going costs for running a product, business, or system.

PAL

Phase Alternating Line. Standard for television broadcast and reception used in Europe.

PCR

Program Reference Clock. MPEG-2 concept. The PCR is usually used for synchronization.

PID

Packet IDentifier. Each packet in the transport stream, whether it contains audio, video, tables or data, is identified by a number called a PID. PIDs enable the decoder to sort through the packets in a transport stream.

pixel

A picture element, which is one point in a graphic image.

PMT

Each PMT, or Program Map Table literally maps out a specific program, listing the PID values for the packets containing the program's video, audio and data components.With this information, the decoder can easily locate, decode and display the program's contents.

POIS

Placement Opportunity Information Service. POIS is a system or a process that identifies and provides descriptions of placement opportunities for media (such as the availability to insert ads). The POIS may contain requirements and attributes that can include which platforms may be used, ownership rights, and policies that are used to coordinate the placement of media. The POIS system is described in SCTE 130-5.

program

For MPEG-2, a program is a collection of video, audio, data elementary streams, and tables carried on a channel that share a common clock reference.

QCIF

Quarter Common Interchange Format. A video size (176 x 144) well suited to lower bit rates.

real-time

Rapid transmission and processing of event-oriented data and transactions as they occur instead of being stored and retransmitted or processed as batches.

resolution

Determined by the number of pixels displayed per line or for a given area. Higher resolution means better picture quality.

sample rate

The speed at which analog audio data is collected.

SD

Standard Definition. A set of digital television (DTV) standards with 480 lines of pixels from top to bottom for NTSC format (or 576 lines for PAL format).

set-top box

A device that provides access to the Broadband broadcast and Internet and displays information on a TV screen.

streaming

Sending media streams from a live encoder or streaming server to a player as a steady, continuous stream.

unicast

Unicast is communication between a single sender and a single receiver over a network.

URL

Uniform Resource Locator. A method of naming documents or places on the Internet.

VBI

Vertical Blanking Interval. The part of a TV signal that is sent between each video frame. Its purpose is to allow the TV time to reposition its electron beam from the bottom of the current frame (screen) to the top of the next one. This non-viewable part of the signal is used to transmit closed-caption content.

VBR

Variable bit rate.

VBV

The Video Buffering Verifier implements the leaky bucket algorithm. Leaky bucket is a flow control mechanism that is designed to reduce the effect of the inevitable variability in the input stream into a node of a communication network. The key concept is that if the encoder receives too much data or very complex data, the bitrate will not be respected and the bucket may overflow.

WSS

Wide Screen Signaling is a digital stream embedded in the TV signal describing qualities of the broadcast, in particular the intended aspect ratio of the image. This can be used by a widescreen TV to switch to the correct display mode.

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