



VSofts H.264/AVC Codec v4
Encoder Settings for
ARIB Compliance

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1. Version History

Version	Date	Comments
1.0	10/2009	Initial version

2. Overview

This document describes *VSofts H.264/AVC Encoder v4* settings for creation of ARIB compliant streams. Refer to *VSofts AVC Advanced Settings* document for the details on the encoder parameters and possible values.

3. Encoder Settings

The following parameters should be changed from their default values:

```
profile_idc  = 100 //or 77 if only Main profile is valid
level_idc    = 40 // level 4.0

input.width  = <width> //Only predefined spatial dimensions allowed
input.height = <height> //See ARIB document

gop.num_units = 1001 //fixed
gop.time_scale = <time_scale> //60000 or 12000 are valid only
//Defines Frames per seconds: fps = time_scale/(2*num_units)
//Only predefined combinations are valid. See below

sei.pic_timing_flag = 1
gop.aud = 1

rc.type      = 2 // CBR
rc.kbps      = <desired_kbps> // target bitrate (kbps)
rc.vbv_length = 2000 // VBV buffer length
```

Make sure that

1. $rc.kbps \leq 20,000$

2. $rc.kbps * rc.vbv_length * 1.5 \leq 20,000,000$

For higher bitrates reduce `rc.vbv_length` accordingly.

```
interlace_mode = 0 // for progressive material
```

or

```
interlace_mode = 3 // for interlace material
```

3.1 Other settings

- It is possible to use VBR coding (`rc.type = 1`) (VBR bitrate) in combination with `rc.max_kbps` setting. In this case, all the restrictions described above for `rc.kbps` parameter will be related to `rc.max_kbps` parameter. `rc.kbps` must be less than `rc.max_kbps` and it will define average resulting bitrate. For HRD buffer parameter in SPS and SEI messages `rc.max_kbps` will be used.
- Don't use more than 1 reference frame and fields coding mode.

Another issue is 1.5 in restriction (2) above. It is redundant and is set due to VSofts internal rate-control buffer model being slightly different from the standard HRD. In forthcoming releases (starting from 4.4) this 1.5 coefficient will be excluded.

There are more constraints in the specification:

- Some of the VUI parameters must be present and have predefined values depending of video material. See details in ARIB documentation. This can be achieved by proper VUI settings
- `gop.keyframes` has limitations – not less than 1 key frame per second and the recommended value is one per ½ second.
- Only predefined combination of frame rate, frame size, `frame_mbs_only` flag and aspect ratio values are allowed. See appropriate ARIB document

The following parameters should be changed, if possible, from their default values for better quality:

```
preproc.intra_precision = 4

gop.idr_period      = 10

frext.transform_8x8 = 1 //For High profile only
frext.scaling_matrix = 1 //For High profile only

speed.i = 0 // highest quality, slowest encoding
speed.p = 0
speed.b = 0
```

For 720P60 it is recommended to set:

```
gop.bframes = 3
```