

Codian IP VCR

IP VCR 2200 Series

Getting Started: MPEG Converter



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About the MPEG Converter

The MPEG Converter converts Codian IP VCR recordings from their native '.codian' format into an MPEG-1 format. The recording can contain one or two video streams and a content channel (all known as 'streams' in this document). The MPEG Converter enables you to control how the streams appear in the resulting MPEG file (known as the encoded MPEG in this document):

- ▶ you can control the size and resolution of the encoded MPEG
- ▶ you can control the position and size of the streams in the encoded MPEG
- ▶ you can choose to disable a stream
- ▶ you can set a bitmap as a background image
- ▶ you can choose to encode only the audio or the video from a stream
- ▶ you can export the content channel as JPEG slides



The IP VCR provides an option to download a recording as an MPEG file. However, using that feature, the MPEG file will not include the content channel, nor can you control the look of the resulting MPEG file. To include a content channel in an MPEG file and to control the final look of the file, you must download the recording to a PC in the '.codian' format and use the MPEG Converter as described in this document.



The only '.codian' files that contain two video streams are recordings of point-to-point calls.

Installing the MPEG Converter

The MPEG Converter is available for download from www.codian.com. The installation program is called **Codian MPEG Converter.msi**. To install the MPEG Converter:

- 1 Download **Codian MPEG Converter.msi** to your PC and run it. The Codian MPEG Converter Setup Wizard displays.
- 2 Follow the instructions to install the program (accept the End-user License Agreement and select a location in which to install the program).

Running the MPEG Converter

To run the MPEG Converter:

- ▶ In a Command Prompt window, type
codian_to_mpg
followed by the command-line options that you require and press Enter.



You can use the MPEG Converter from any directory at the command prompt. By default, the MPEG Converter will place any encoded MPEGs and JPEGs into the directory from which you run the program.

Quick start: Creating an MPEG video

You can easily convert a '.codian' file into an encoded MPEG by using the default settings of the MPEG Converter:

- 1 Download a recording from an IP VCR and save it to your PC. As an example, you save the file as `myvideo.codian` in the 'Test' directory of your C: drive.
- 2 In a Command Prompt window, go to the directory where you have saved your '.codian' file. For example:

```
C:\Test>
```

- 3 Type:
codian_to_mpg <your_filename>.codian

For example:

```
C:\Test>codian_to_mpg myvideo.codian
```

In this example, the MPEG Converter creates an encoded MPEG from the 'myvideo.codian' file using the default settings. That is in the example, the encoded

MPEG will be called 'myvideo.mpg'. It will be in the same directory as the original '.codian' file, and will be of size 352 x 288 pixels. The video stream will be positioned in the top left corner (if there is a second video stream, it will be below the first), and the content channel will be on the right.

Figures 1 and 2 show how the streams will be arranged in the encoded MPEG when using the default settings of the MPEG Converter. The default settings will allow the content channel two-thirds of the overall size of the encoded MPEG and the video stream one-third.

Figure 1: Default stream settings for one video stream and a content channel

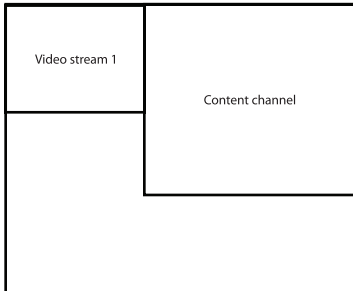
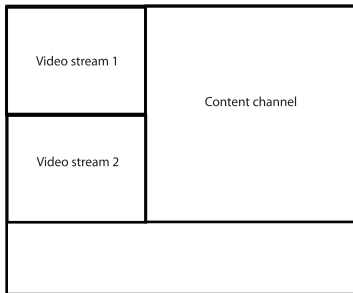


Figure 2: Default stream settings for two video streams and a content channel



Advanced options

The MPEG Converter enables you to control the content and look of the resulting MPEG video. You can use further command-line options to achieve different layouts. You can also use a number of batch files to achieve some standard layouts and resolutions. For more information about batch files, refer to [Using batch files](#). For more information about advanced command-line options, read the following sections.

About audio

The MPEG Converter mixes the audio stream into the encoded MPEG. You can adjust the quality (see [Setting the audio quality](#)). You can also choose to disable the audio. For '.codian' files that contain two audio streams (those created from point-to-point calls), the MPEG Converter mixes the two audio streams together, unless you disable one of the audio streams (see [Enabling or disabling a stream](#)).

About streams

The MPEG Converter expects up to three streams:

- ▶ Stream 1 is the first video stream
- ▶ Stream 2 is the second video stream
- ▶ Stream 3 is the content channel

When you use advanced options on the command line incorrectly, you might see error messages referring to Streams 1, 2, or 3. Usually, these error messages are as a result of setting the size of one of the streams without specifying the size of the other stream(s).

Command-line options

The following is a summary of the command line options:

```
codian_to_mpg.exe [/S:videosize][W:videowidth]
[/H:videoheight][/C:contentlocation]
[/P:preview][/V:<s>[<p>]:streamconfig][/A:audioquality]
[/R:videobitrate][/B:filename][/p:pixeldifference]
[/a:areathreshold][/q:jpegquality][/L:[loglevel]
infilename.codian [outfilefilename.mpg]
```

You do not have to be in a particular directory location to use the MPEG Converter. Go to the directory where you have the ‘.codian’ files; the MPEG Converter will place encoded MPEG files in the same directory.

You do not need to specify a name for the output encoded MPEG file. If you do not specify a name, the MPEG Converter will give the encoded MPEG the same name as the original ‘.codian’ file.

Table 1: Command-line options

Command	Description	Options
/S:	Set overall video size of resulting MPEG video Default is CIF	Q [cif] (176 x 144) C [cif] (352 x 288) 4 [cif] (704 x 576) V [ga] (640 x 480) D [vd] (720 x 576) X [ga] (1024 x 768) S [xga] (1280 x 1024)
/W:	Set overall width of resulting MPEG video Default is 352 pixels	Value in pixels for width
/H:	Set overall height of resulting MPEG video Default is 288 pixels	Value in pixels for height

Table 1: Command-line options

Command	Description	Options
/C:	Set position of the content channel	L[eft] R[ight] T[op] B[ottom] P[icture-in-Picture] J[peg]
/P:	Generate preview of encoded MPEG	Length in seconds of preview
/V:<s>[<p>]:	Set size and position of streams The position options are values in pixels. That is for Left provide the distance in pixels from the left of the video screen and for Top , provide the distance in pixels from the top of the video. For Width and Height , provide the width and height in pixels for each video stream and the content channel	Stream: 1 2 C[ontent] Position: L[eft] T[op] W[idth] H[eight]
/V:<s>:	Enable or disable a stream	Stream: 1 2 C[ontent] Options: E[nable] D[isable] A[udio-only] V[ideo-only] J[peg]

Table 1: Command-line options

Command	Description	Options
/B:	Set background (24-bit bitmap file)	Filename of bitmap
/A:	Set the audio quality Default is low	H[igh] (128kbps) L[ow] (64kbps)
/R:	Set bitrate for encoded MPEG in bits per second Default is 1000000	Value in bits per second
/p:	Set slide-detection pixel-difference threshold Default is 16	Value for pixel difference
/a:	Set slide-detection area-threshold percentage Default is 10	Value for area-threshold percentage
/q:	Set JPEG slide-quality percentage Default is 75)	Value for slide quality
/L:	Set the logging level	E[rror] W[arning] I[nfo] T[race] D[ebug]

Further details of advanced settings

Setting the overall size of the encoded MPEG

The default size for the encoded MPEG is CIF size (352 x 288 pixels). To alter this, you can use either:

/S

or a combination of:

/W and **/H**

You cannot use **/S** together with **/W** and **/H**.



If you set the size and positions of the streams (that is, using **/V:<s><p>**;) you must set the overall size of the encoded MPEG to accommodate the layout you have specified.

If you want a standard size (QCIF, CIF, 4CIF, VGA, DVD, XGA, or SXGA), use **/S**. Otherwise, explicitly set the width and height using **/W** and **/H**.

Example 1:

```
codian_to_mpg /S:X mystream.codian myfile.mpeg
```

Example 1 converts the '.codian' file to an MPEG with XGA resolution (1024 x 768).

Using **/W:** and **/H:**

Note that the width and height must be a multiples of 16.

To set the overall width of the encoded MPEG, use:

/W

The default width is 352 pixels.

To set the overall height of the encoded MPEG, use:

/H

The default height is 288 pixels.

Example:

```
codian_to_mpg /W:480 /H:176 mystream.codian myfile.mpg
```

The example converts 'mystream.codian' into an encoded MPEG called 'myfile.mpg' with size 480 x 176 pixels.

Setting the content channel location

The default location for the content channel in the encoded MPEG is on the right. To set the content channel location, use:

`/c`

Location options:

`[L]eft, [R]ight, [T]op, [B]ottom, [P]icture-in-Picture, [J]peg`

The 'Jpeg' option means that the content channel will be output as a series of JPEG files. For more information, refer to [Creating JPEG slides from the content channel](#).

The 'Picture-in-picture' option means that the content channel will be sized to fit the overall size of the encoded MPEG, and the video stream will appear as a small picture in the bottom right of the encoded MPEG.

Figure 3: Picture-in-picture option with one video stream

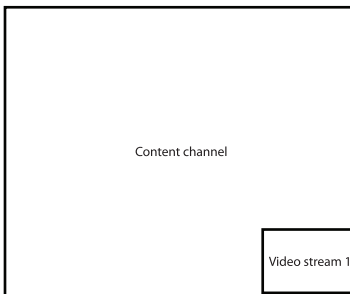
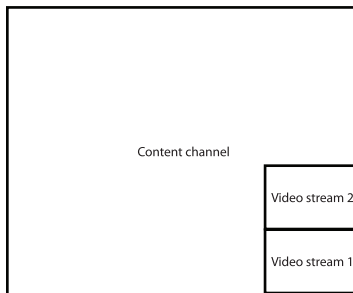


Figure 4: Picture-in-picture option with two video streams



Setting the position and size of a video stream

You can set the size and position of the video stream(s) and the content channel within the encoded MPEG. To do this, use:

`/V:<s><p>:`

Stream options:

`[1], [2], [C]ontent`

Position and size options:

`[L]eft, [T]op, [W]idth, [H]eight`



If you use the `/V:<s><p>:` option, set the size for each stream, otherwise you will see an error message; also, set a position for each stream, otherwise all streams will overlay each other in the top left corner of the encoded MPEG.



`/v` options override any `/c` options. Do not use both `/v` and `/c` together.

You set the position of a stream by specifying the distance in pixels from the upper left corner of the encoded MPEG. These values must be multiples of 8. If you do not specify a position for the stream, it will be placed in the top left corner.

You set the size of a stream by specifying the height and width that you want. These values must be multiples of 16.

If you use this feature, you will find it useful to know the resolutions of the streams inside the '.codian' file. To find these out:

- 1 On the IP VCR, go to **Recordings**.
- 2 Click on the name of the recording that you have downloaded as a '.codian' file.
- 3 Write down the resolutions from the **Recorded media** section.

When you are considering altering the size of a stream, be aware of the following:

- ▶ The positions and sizes you specify must fit within the overall dimensions of the encoded MPEG. That is, the size you have specified using `/S`, or with `/W` and `/H`
- ▶ If you specify a size or position for any stream, you must specify a size and position for each stream in the '.codian' file or disable those streams that you do not specify

- ▶ When you specify a size for a stream, you will get the best results if you keep the original resolution (especially for the content channel)
- ▶ If you reduce the resolution of a video stream, keep the ratio of the original resolution, otherwise the stream will appear distorted. For example, if the original resolution was 1280 x 1024 pixels, you could reduce the resolution to 640 x 512 pixels
- ▶ Increasing the resolution to higher than the original resolution will not improve the quality
- ▶ You might find it worthwhile to make a drawing of what you are trying to achieve, with pixel measurements, before entering the command

Examples:

The following two examples are for a '.codian' file containing only one stream. Remember, where there is more than one stream, you must specify sizes for each stream or disable the streams you do not require.

- ▶ To place the first stream in the upper-left corner at CIF resolution, use
`/V:1L:0 /V1T:0 /V1W:352 /V1H:288`
- ▶ To place the content channel in the lower-right corner at VGA resolution in an XGA MPEG, use
`/V:CL:344 /V:CT:288 /V:CW:640 /V:CH:480`

Enabling or disabling a stream

You can disable a stream so that it will not appear in the encoded MPEG. To do this, use:

`/V:<s>:`

Stream options:

`[1], [2], [C]ontent`

Disabling options:

`[E]nable, [D]isable, [A]udio-only, [V]ideo-only, [J]peg`

Examples:

To disable the second video stream, use `/V:2:D`

To encode only the audio from the first stream, use `/V:1:A`

To encode the content channel as JPEG slides, use `/V:C:J`

Note that if the second video stream or content channel is not present, it is implicitly disabled and this option has no effect.

Creating a preview

If you have lengthy streams, you might find it useful to use the preview option. In this way you can specify the length of preview and quickly check that other settings are correct before using the MPEG converter to convert the entirety of the streams. The default preview is the first 10 seconds of the streams. To create a preview use:

```
/P:<seconds>
```

Example:

```
codian_to_mpg /W:480 /H:176 /P:20 mystream.codian  
myfile.mpg
```

This example creates a 20 second preview of the encoded MPEG with the configured width and height settings.

Setting the bitrate

You can set the bitrate for the encoded MPEG in bits per second. The default is 1000000. Usually, you will not alter the bitrate from its default value. However, in some circumstances, raising the bitrate can improve the resolution of the resulting MPEG file (it does not affect the audio quality). For example, if you are trying to produce a high-resolution MPEG and your material has lots of color and motion, you could experiment with raising the bitrate value. To set the bitrate, use:

```
/R
```

Example:

```
codian_to_mpg /R:2000000 mystream.codian myfile.mpeg
```

Setting the audio quality

If necessary, you can improve the quality of the audio by setting audio quality to high. This will increase the size of the encoded MPEG and might not be necessary. The default audio quality is low (64kbps). To set the audio quality, use:

/A

Audio quality options:

H[igh] (128kbps), **L[ow]** (64kbps)



Note that you can also disable the audio of individual streams. For more information, refer to [Enabling or disabling a stream](#).

Creating JPEG slides from the content channel

You can use the MPEG converter to produce a series of JPEGs from the content channel in a '.codian' file. When you choose to create JPEGs from the content channel, that channel will not appear in the resulting MPEG file. To encode the content channel as JPEG slides, use:

/C:J or **/V:C:J**

Example:

```
codian_to_mpg /C:J /V:CJ mystream.codian myfile.mpeg
```

This creates an MPEG file of the video stream(s) using the default settings. It also creates a series of numbered JPEG files in the same directory. A JPEG file is created every time the MPEG converter considers the content channel to have changed. The MPEG converter use a pixel-difference threshold is judge whether the content channel has changed and makes a new JPEG file every time the pixel difference threshold is reached.

The default slide-quality percentage is 75. To set the JPEG slide-quality percentage, use:

/q

You can alter the threshold for the detection of difference in the content channel which controls how often a new slide is created. The two settings listed below are used in combination to establish whether the content channel is considered to have changed sufficiently to merit creating a new JPEG file:

-
- ▶ Slide-detection area threshold: the percentage of pixels that need to have changed before a new slide is created. To set the slide-detection area-threshold percentage (default 10), use:

/a

- ▶ Slide-detection pixel difference: the amount by which the pixels need to have changed before a new slide is created. Pixel difference is measured in units (range 0 to 255). To set the slide-detection pixel-difference threshold (default 16), use:

/p

The MPEG converter measures the difference in pixels. When:

area threshold % of pixels have changed by **pixel difference**
a new slide is created.

For example, using the defaults, when 10% of pixels have changed by 16 units, a new JPEG file is created.

If your content channel is a slide presentation, the MPEG converter will use the pixel-difference threshold to detect each time a new slide occurs, thereby making a JPEG image of each slide in the presentation.

Example:

```
codian_to_mpg /a:50 /p:200 mystream.codian myfile.mpeg
```

This example raises the threshold for detection of difference such that slides will be created less frequently than when using the defaults.

Using a background bitmap

You can specify a bitmap to appear as a background behind your streams in the encoded MPEG. The bitmap must be a 24-bit bitmap file. The MPEG Converter places the bitmap in the center of the screen. The width and height of the bitmap must be multiples of 8 otherwise the file will be cropped. Also, the bitmap must fit within the dimensions of the encoded MPEG.

The easiest way to control how a bitmap appears in the encoded MPEG, is to ensure that the bitmap is the same size as the encoded MPEG. For example, if you are creating an MPEG with VGA resolution, then ensure your bitmap is 640 x 480 pixels.

An example of the use of this feature is the placing of a company logo alongside a video stream and content channel. You can arrange the streams using the size and

position command (`/V:<s><p>`). For more information about sizing and positioning the streams, refer to [Setting the position and size of a video stream](#).

Using the logging feature

The MPEG Converter provides a logging feature. This is only useful for debugging purposes. To set the logging level, use:

```
/L
```

Logging level options:

```
E[rror], W[arning], I[nfo], T[race], D[ebug]
```

Example:

```
codian_to_mpg /L:I mystream.codian myfile.mpeg
```

This example takes the `mystream.codian` file and turns it into an encoded MPEG called 'myfile.mpeg' using default settings. While the conversion is taking place, information about the conversion is displayed in the command prompt window. You can also output logging details to a file by using '>' and a file name as in the following example:

```
codian_to_mpg /L:I mystream.codian myfile.mpeg >mytext.txt
```

Using batch files

The MPEG Converter also provides batch files for some common layouts and resolutions. To use a batch file, type the name of the batch file followed by the name of your '.codian' file. For example:

```
codian_to_mpg_dvd.bat mystreams.codian
```

The above example creates a DVD resolution encoded MPEG called `mystreams.mpg`.

The available batch files are as follows:

- ▶ To convert streams at DVD resolution using a side-by-side layout, use:

```
codian_to_mpg_dvd.bat
```
- ▶ To convert streams at VGA resolution using a side-by-side layout, use:

```
codian_to_mpg_vga.bat
```
- ▶ To convert content channel at VGA resolution and audio from first video stream, use:

```
codian_to_mpg_vga_audio_content.bat
```

-
- ▶ To convert content channel at VGA resolution and video streams at CIF resolution using a side-by-side layout, use:
codian_to_mpg_vga_cif.bat
 - ▶ To convert content channel at iPod resolution and small resolution video streams using picture-in-picture layout, use:
codian_to_mpg_ipod_pip.bat
 - ▶ To convert content channel as JPEG (1024x768) slides and first video stream at 4CIF (704 x 576) resolution, use:
codian_to_mpg_jpg_4cif.bat
 - ▶ To convert streams at XGA resolution using side-by-side layout, use:
codian_to_mpg_xga.bat
 - ▶ To convert content channel at XGA resolution and audio from first video stream, use:
codian_to_mpg_xga_audio_content.bat
 - ▶ To convert content channel at XGA resolution and video streams at CIF resolution using side-by-side layout, use:
codian_to_mpg_xga_cif.bat
 - ▶ To convert content channel at SXGA resolution and small resolution video streams using picture-in-picture layout, use:
codian_to_mpg_sxga_pip.bat

Advanced examples

Creating a bitmap background

To set a bitmap as the background to your streams in the encoded MPEG:

- 1 Decide the overall size your encoded MPEG.
- 2 Make a bitmap the same size as the dimensions of the encoded MPEG.
- 3 Decide the part of the bitmap that you want to be visible in the encoded MPEG.
- 4 Work out where the streams will fit around that part of the bitmap that you want to remain visible.



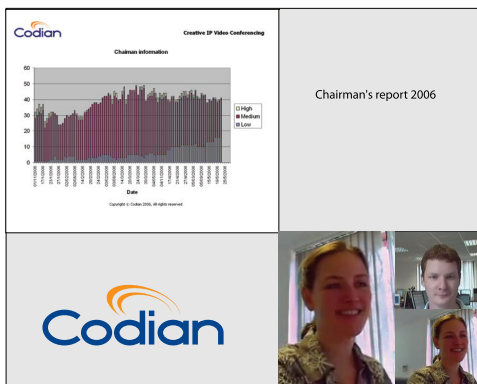
Remember to use resolution information on the IP VCR to help you decide on appropriate resolutions for each stream in the '.codian' file and to work out suitable positions for each stream within the dimensions of the encoded MPEG.

For example, you have a stream containing:

- ▶ video stream 1 at resolution 640 x 480 pixels
- ▶ content channel at resolution 704 x 576 pixels

You want to create an encoded MPEG that displays a company logo and some text alongside the two streams as shown in Figure 5.

Figure 5: Example layout of content stream, video stream, and bitmap background



To do this:

- 1 Decide on the overall size of the encoded MPEG:
 - i Maintain the resolution of the content channel (704 x 576 pixels).
 - ii Decide on a resolution for the video stream that maintains the aspect ratio (4:3 in the example). An appropriate resolution is 576 x 432 pixels.
 - iii With the two streams side-by-side as in Figure 5, the overall width of the encoded MPEG must be 1280 pixels. The combined heights of the streams means the overall height of the encoded MPEG must be 1025 pixels.
Therefore, the required size for the encoded MPEG is 1280 x 1024 pixels.
- 2 Create the 24-bit bitmap with the same dimensions as the encoded MPEG (1280 x 1024), placing the logo and text where required.
- 3 Run the MPEG Converter, entering a command to set the overall size of the encoded MPEG, the sizes and positions of the streams, and the bitmap as follows:

```
codian_to_mpg /W:1280 /H:1024 /V:1L:704 /V:1T:576 /V:1W:576  
/V:1H:432 /V:CL:0 /V:CT:0 /V:CW:704 /V:CH:576 /B:logo.bmp  
mystreams.codian
```

Creating a content channel with voice-over and bitmap background

In this example, you want to create an encoded MPEG that displays the content channel only at its original resolution with a bitmap banner above the stream, border around the content channel, and with the audio from the video stream.

Your '.codian' file contains:

- ▶ video stream 1 at resolution 640 x 480 pixels
- ▶ content channel at resolution 1024 x 768 pixels

To create your encoded MPEG:

- 1 Decide on the overall size of the encoded MPEG, maintaining the resolution of the content channel (1024 x 768 pixels) and leaving space for a bitmap border and banner. An appropriate resolution is 1280 x 1024 pixels.
- 2 Create the 24-bit bitmap with the same dimensions as the encoded MPEG (1280 x 1024), placing the logo and text where required.
- 3 Run the MPEG Converter, entering a command to:
 - set the overall size of the encoded MPEG (1280 x 1024 pixels)

- center the content channel horizontally (it is 1024 pixels wide, therefore to center it within a 1280 pixel wide screen it must be 128 pixels from the left)
- position it vertically, leaving room for banner above the content channel and a border below, choosing values divisible by 8 (144 pixels above leaves 112 pixels below the content channel)
- set audio-only for the video stream
- set the bitmap

as follows:

```
codian_to_mpg /W:1280 /H:1024 /V:1A /V:CL:128 /V:CT:144  
/V:CW:1024 /V:CH:768 /B:logo.bmp mystreams.codian
```

The encoded MPEG will use the layout as shown in Figure 6.

Figure 6: Example content-channel-only layout with voice-over

