

Using Timed Text Flip in Vantage

This App Note applies to Vantage version 7.0 and later

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Overview

Timed Text Flip is a sophisticated subtitle and captioning component that runs on the Telestream Media Framework in Vantage, providing an easy-to-use interface to read, write, and adjust subtitle and caption data; automating common captioning and subtitling conversion processes.

Any Vantage customer who requires automated caption and subtitle file conversions and timing adjustments for TV broadcast and IP workflows should consider the Timed Text Flip service. Telestream CaptionMaker Enterprise customers who rely on automation, but also need a platform to transcode a variety of video files, should consider Vantage with Timed Text Flip.

Caption data can be extracted from video files that have embedded caption data as well as from common caption and subtitle file formats such as SRT and EBU-STL, in addition to SCC which was already supported in other Vantage actions. Outputs include Internet caption files, such as TTML, as well as SCC, MCC, and "Same as Source" caption insertion into media files such as MXF and MOV.

Timed Text Flip also gives users the ability to create subtitle overlay graphic files for Vantage workflows that require burn-in subtitles. These graphic files can be customized in Timed Text Flip and are able to be used with Vantage actions that support graphic overlay burn-in filters. You can change the subtitle font, set text and background colors, and customize other settings.

Timing adjustments are also a feature of the Timed Text Flip action. Users can quickly adjust timecode parameters of source files such as drop frame to non-drop frame changes, frame rate conversions, and speed timing adjustments to fix drifting synchronicity of caption and subtitles within media files. This is critical for media transcoding workflows that require a frame rate conversion of a video file that is not in the proper format for delivery.

SCC files and subtitle overlay graphic files that Timed Text Flip generates are able to be used with other Vantage actions such as IPTV VOD and Multiscreen. All other generated files, including TTML and WebVTT, can be attached to media in a Vantage workflow that require a side-car captioning file for delivery.

Licensing

Timed Text Flip is available starting in Vantage 6.3 with Update Pack 5, and later. To enable full operation of Timed Text Flip you can download the latest version from www.telestream.net and obtain a license from Telestream that includes Vantage Timed Text Flip.

Demo Mode

The Timed Text Flip service is available and fully functional, with watermark, for Vantage users who do not have a license for it. The limitation for a non-licensed user is that the letters "DEMO" replace existing characters in each caption or subtitle.

Installing the Timed Text Flip ComponentPac

ComponentPac 7.0.3 is a maintenance update for the Timed Text Flip action in Vantage 7.0. It includes these new outputs and inputs:

- Teletext OP-42 SD VBI Overlay output
- Teletext OP-47 MXF output
- EBU-STL output
- 890 Subtitles input

To complete the ComponentPac installation users will need to install the following:

1. Vantage 7.0
2. Timed Text Flip ComponentPac for Vantage (Version 7.0.3), available at:
<http://www.telestream.net/telestream-support/timed-text/support.htm>
3. IPTV ComponentPac for Vantage (Version 7.0.3), available at:
<http://www.telestream.net/telestream-support/iptv-vod/support.htm>

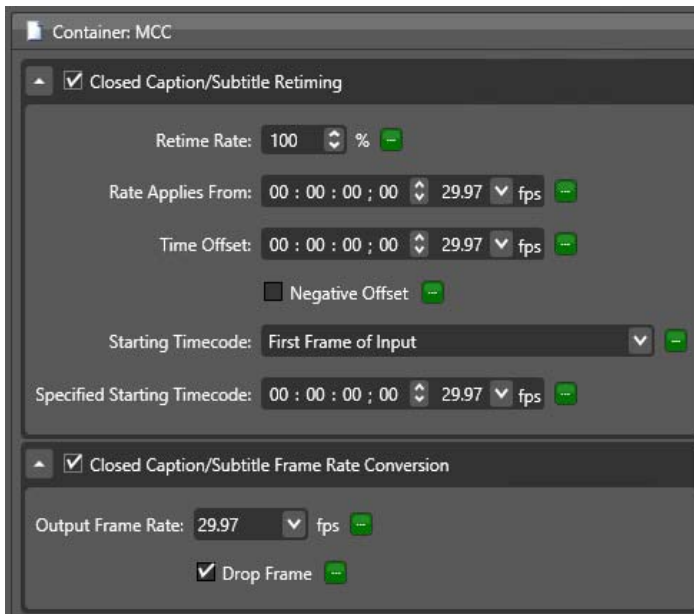
For instructions on installing a ComponentPac, please see:

<http://www.telestream.net/pdfs/app-notes/app-Secured-Version-Control.pdf>

Adjusting Frame Rates and Time Codes

Although frame rate conversion of video files is a common workflow for Vantage users, adding captioning and subtitling to an automated workflow can present challenges. For example, a media source file may be at a different frame rate than a subtitle source file which is used to add a caption track to the output. As a result, the captions and video will be out of synchronization. With the Timed Text Flip action this situation is easily corrected using the output filter options for retiming and frame rate conversion.

The following from the Timed Text Flip action's inspector shows the retiming and frame rate setting options available:



Closed Caption/Subtitle Retiming Options

To fix problems related to synchronicity, Timed Text Flip has output setting parameters called Closed Caption/Subtitle Retiming. The following options are included:

Retime Rate

The rate factor to apply to caption/subtitle event times to realign or change synchronization. 100% matches the original speed. Use greater than 100% to make captions/subtitles slower than the original speed (appear later). Use less than 100% to make captions/subtitles faster than the original speed (appear sooner).

One example of when to use Retime Rate is when captions or subtitles are drifting out of sync as the video program length increases. Often, this drift of captions and subtitles is caused by drop frame to non-drop frame video conversion, which results in 3.6 seconds of captioning text timing change per hour (3.6 seconds early or late at the one-hour mark). This is caused by the difference between 30.0fps and 29.97fps, or 24.0fps and 23.976fps. To fix this problem, add or subtract 0.1% from 100%, depending on the timing of the text being early or late as it corresponds to the video.

(In the Telestream CaptionMaker and MacCaption applications this feature is called "stretch or shrink timecode".)

Retime Rate example settings:

- Subtitles are appearing too early: Increase the time code by 0.1% (1.001/1.000). Enter 100.1% for the Retime Rate.
- Subtitles are appearing too late: Decrease the time code by 0.1% (1.000/1.001). Enter 99.9% for the Retime Rate.

Another example is for a video conversion of PAL 25fps to Film 24fps. This conversion is a 4% speed-up. Enter 104% for the Retime Rate, to do a conversion of the Timed Text source.

A third example is for media that was processed through Vantage Tempo, which can speed up or slow down a clip by plus or minus 10%. When adding captions or subtitles to that processed media, Timed Text Flip can adjust caption or subtitle sources to match that type of media manipulation, by adding or subtracting the proper percentage in Retime Rate.

Rate Applies From

This option only works if the Retime Rate is set to something other than 100%. The Retime Rate applies starting from the time set in the Rate Applies From field. Also, if a program starts at a non-zero time, such as 1 hour (01:00:00;00), and you want to preserve this start time even after caption retiming, set this field to the program start time.

For example, if your media has a tape-based start time of 01:00:00:00 and you want to apply a retime rate (speed up or slow down) but you want the starting time code to remain pinned at 01:00:00:00 even after retiming, set this field to 01:00:00:00.

Time Offset

Time code value to add to, or subtract from, each caption or subtitle time code. This feature is sometimes also called "ripple time code". To subtract, enable the Negative Offset option.

For example, if an SCC file starts at 01:00:00;00 and you want to adjust the start time to 00:00:00;00 for Internet delivery, set this Time Offset to 01:00:00;00, and select the Negative Offset checkbox.

Negative Offset

When checked, the specified Time Offset is subtracted from each of the caption/subtitle time codes, instead of added.

Starting Timecode

Modifies the starting timecode of the output. Use when the starting timecode of the input timed text does not begin at 0 (zero). The options are:

- *First Frame of Input*. This will generate an output file that starts at the same frame as the input caption/subtitle file. This option is useful when creating a subtitle overlay from a caption or media file that already has the correct starting time code.

Note: Most subtitle sidecar file formats consider their first frame to be the starting time of the first subtitle, which could be several seconds or more after the start of the media file. If you want to make a subtitle overlay file from a sidecar subtitle file, so that the overlay starts at the same frame as an associated media file, you should use the "Specified Timecode" option.

- *Nearest Hour to Zero*. This option will round the starting time of the caption/subtitle source file to the nearest hour, and then subtract all of the hours portion, so that the output file starts at

00:00:00:00, to align with the first frame of the program media (ignoring any pre-roll). This option is useful if your source caption/subtitle files have a mix of inconsistent or unknown starting time codes, and you want them all to be output with a consistent starting time code that is likely to match with the program start time of the associated media file.

Note: If you want your output time to consistently start at 01:00:00:00 instead of zero, you can combine the "Nearest Hour to Zero" option with the "Time Offset" option, and have the Time Offset set to add a 01:00:00:00 offset.

- *Specified Timecode.* Select this option to use the values set in the Specified Starting Timecode fields. This option is useful when processing a sidecar file that already has correct timecode overall, but you want to add to or trim from the start time, such as when adding or removing a pre-roll segment.

Specified Starting Timecode

The output media will start with the timecode values specified in these fields, when "Specified Timecode" is selected for the Starting Timecode option.

Closed Caption/Subtitle Frame Rate Conversion Options

Check to enable this filter and use these options to modify the frame rate of the captions/subtitles without changing the relative timing.

Output Frame Rate

Select the output frame rate for the caption/subtitle.

Drop Frame

When checked, Drop Frame time code mode is used when the output is 29.97 or 59.94 fps. Drop Frame mode is not used for any other frame rate, even if checked.

Note: If the video frame rate is also being changed, that change must happen in a separate action.

Converting To/From Captions and Subtitles

Converting a TV captioning file such as SCC to subtitles is a simple process with Timed Text Flip. However, converting captioning files that contain CEA-608 data to a subtitle overlay will, by default, have the look of TV closed captioning. The default TV look is monospaced text with a black background box. In addition, positioning and formatting of text will follow the caption data settings, such as paint-on, pop-on, and roll-up captioning.

In Timed Text Flip, the Subtitle Overlay options allow users to change the look of the text with font, color, and background opacity parameters. These can be used to output a subtitle overlay file that has a custom subtitle look. For example, the source file can be caption CEA-608 data extracted from a video media file. This caption data can be converted to a subtitle overlay graphic that has, for example, a yellow Arial font with a translucent grey box around the text for legibility. Once the subtitle overlay graphic has been created, a Vantage service such as Multiscreen or IPTV VOD can be used to burn-in the graphic to a media file.

Another important aspect of creating a subtitle overlay file from a TV caption file is setting the resolution. Captioning for TV is resolution independent, meaning that the same text data can be rendered on top of an SD, 720p, or 1080i image. Therefore, when extracting caption data from a media file the Subtitle Overlay output can be set to various user selectable resolutions, up to UHD and 4K. The font size will be automatically adjusted based on the resolution selected.

Note: The Subtitle Overlay resolution always exports square pixel graphics and should only be used with corresponding square pixel video media to avoid text width distortion.

Source files that are considered TV caption files containing CEA-608 are:

- MCC
- SCC
- Media (video files containing CEA-608 data)

Source files that do not contain CEA-608 data are:

- STL-EBU (Teletext subtitle format)
- TTML
- SRT (subtitle file format)
- WebVTT
- PAC Subtitles
- Lambda CAP
- 890 Subtitles

Note: Telestream recommends to set your font, background, and color parameters for all subtitle overlay output files. If you don't choose settings, then by default the subtitle overlay feature will choose a generic font for source files that do not contain CEA-608 data.

CEA-608 Only Supports the Latin Character Set

Converting from subtitle formats, or non-TV captioning files, to TV caption files containing CEA-608 data, such as SCC, can also be done with Timed Text Flip. However, an important consideration is that CEA-608 supports a limited set of characters.

With very few exceptions, TV caption data supports Latin character alphabets such as English, Spanish, French, Portuguese, and Italian. Subtitle files containing non-Latin languages such as Russian, Chinese, Hebrew, and Arabic cannot be translated to CEA-608 or used with the CEA-608 insertion output, called Same as Source in Timed Text Flip.

Therefore, an SRT or EBU-STL subtitle file can be converted to SCC provided that the character set inside the file is part of a Latin language alphabet. The same is true for TTML and WebVTT file types.

PAC Subtitles

PAC Subtitles (.PAC) is a subtitle data exchange format widely used in Europe. The format contains subtitle information which can be used by Timed Text Flip to create subtitle overlays as well as caption and subtitle files, such as MCC, SRT, WebVTT, and so on.

Note: Depending on the subtitle language character set found in the PAC input files, some conversions to TV closed captioning are not possible if the output caption file only supports Latin characters. See more detail below in *Selecting the PAC Character Set*.

Selecting the PAC Character Set

The Character Set language must be selected to properly decode a PAC format file. The Character Set (alphabet) must be selected in the input configuration, or by using a variable. If the PAC file contains only Latin characters it can be converted to CEA-608/708 formats, such as SCC, by the Timed Text Flip action. If non-Latin characters are present, the action will indicate an error during conversion to a CEA-608/708 format.

Select the character set used by PAC files that will be processed by the Timed Text Flip action. The character set can not be automatically determined from the source PAC file. The default setting is Latin and supports PAC files containing English, Spanish, French, German, Portuguese, and other languages that can be written with the "Latin 1" character set.

If using PAC files containing another language, such as Japanese, select the matching character set from this menu. This setting can be bound to a variable.

The Character Set options are:

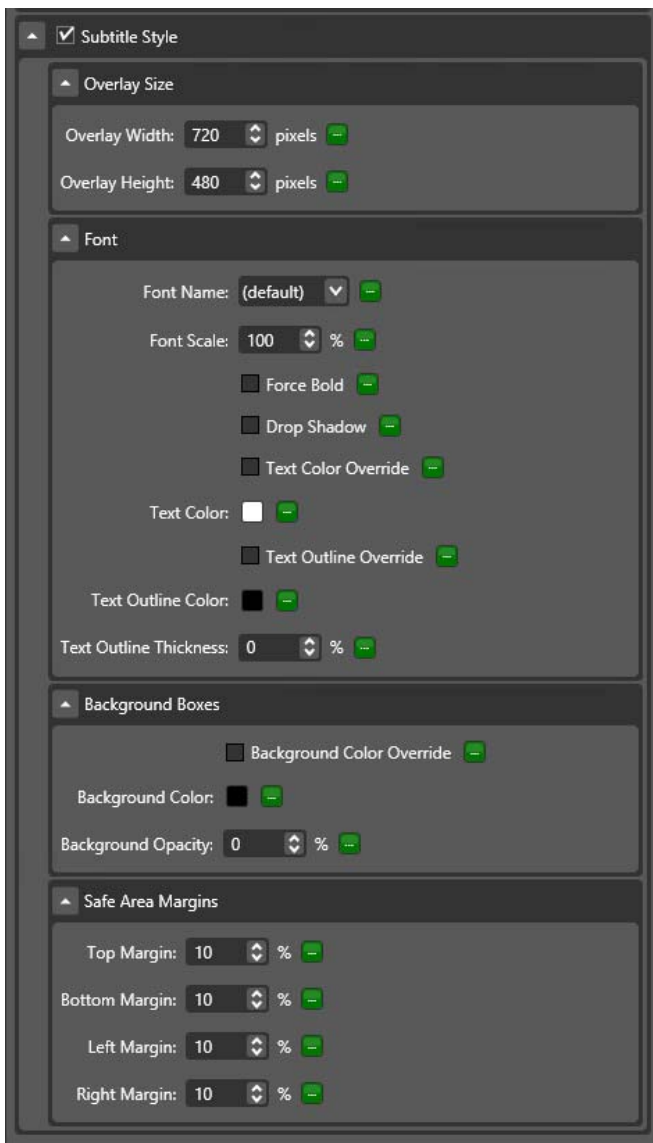
- Arabic
- Chinese Simplified
- Chinese Traditional
- Cyrillic
- Greek
- Hebrew
- Japanese
- Korean
- Latin
- Latin Czech
- Thai

Creating or Adjusting a Subtitle Overlay

The Subtitle Overlay is a very powerful feature of Timed Text Flip. The Subtitle Overlay output generates an MOV video file that contains subtitle graphics with an alpha channel for overlay purposes. This MOV file does not contain any video picture, but only the subtitle graphics generated by the Timed Text Flip action.

All supported video, caption, and subtitle files in Timed Text Flip can be converted to subtitle graphics using the Subtitle Overlay option. The resulting MOV file can be used with a Vantage transcode action, such as Multiscreen or IPTV Flip, that have an Overlay Video Filter. The MOV file can also be used with any video editing system that supports an alpha channel overlay such as Autodesk Smoke, Avid Media Composer, Apple Final Cut Pro, and Adobe Premiere Pro.

The following image shows the Subtitle Style adjustment options available in Timed Text Flip. To see information about the Subtitle Style filter options when in Vantage, click the 'M' icon in the upper right of the Timed Text Flip inspector. This opens a window that provides help information for each Input or Output component you select.



When choosing Subtitle Overlay as an output in Timed Text Flip, the Subtitle Style Filter option can be enabled to configure the resolution and appearance of the subtitle graphics. These parameters include resolution, font style, font scale, force bold, drop shadow, color, outline, background color, and opacity.

The resolution parameter should be set to the video resolution size desired for delivery, or in the case of using a Vantage transcode action, the resolution should be set based on the requirement of the Overlay Video Filter. This is because the video may be resized prior to applying an Overlay Video Filter in a Vantage action. The font size is automatically adjusted based on the resolution parameter entered in Timed Text Flip, or can be changed with the Font Scale parameter.

All text formatting and positioning is preserved from caption and subtitle data source files. The Subtitle Overlay output in Timed Text Flip also preserves animated CEA-608 caption formatting, such as paint-on or roll-up captions, from input CEA-608 source files such as SCC and video files.

Example Timed Text Flip Workflows

The following example workflows describe how to use Timed Text Flip with other Vantage actions, and how to convert captions or subtitles to different format types.

Note: This app note assumes you know how to create and configure Vantage workflows and how to submit jobs. See the Vantage User's Guide for details.

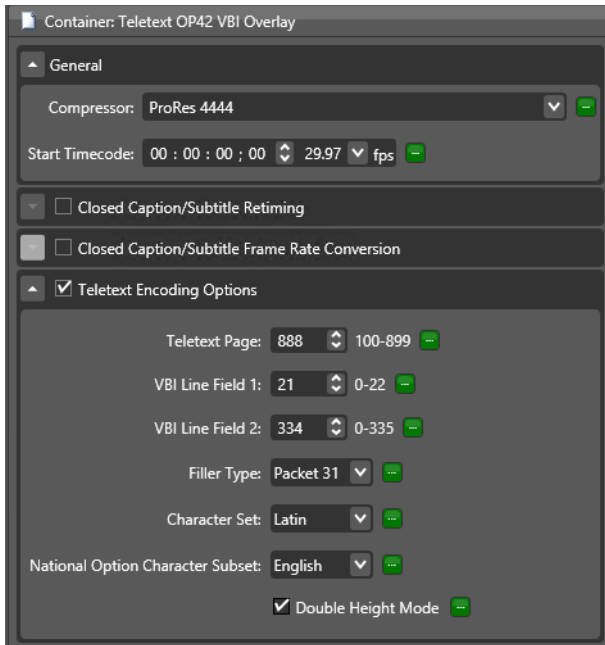
Creating Teletext OP-42 for SD MXF Workflows

The Teletext OP42 VBI Overlay output is specific for Standard Definition PAL video delivery in MXF. Timed Text Flip will only export the Teletext OP-42 VBI line graphics from the Timed Text Flip action. The graphics will be exported as a QuickTime .mov with alpha channel transparency. Therefore, it is necessary to have a Transcode > Flip action in the same workflow in order to combine the VBI graphics with an SD MXF PAL video.



Because the VBI line graphics must be rendered onto an SD video, delivering Teletext OP-42 SD with Vantage always requires a transcode action that is specific for this purpose.

The Compressor setting in the General parameters allows you to select either ProRes 4444 or QuickTime Animation output with the alpha respecting the VBI Teletext lines. It is recommended to use the ProRes 4444 option (default) whenever possible. Timed Text Flip will then create a PAL 720x608 .mov file with alpha channel for downstream processing.



When setting up the Flip action to combine the OP-42 Teletext VBI graphics (.mov file) with video, a Movie Overlay filter must be applied to process the .mov file that is created with Timed Text Flip.

The Movie Overlay filter in the Flip action should be set to the following parameters:

- Filename: This should be bindable to a variable created with an Identify action to avoid manually selecting the output OP-42 VBI graphics .mov on each job submission.
- Overlay Left: 0
- Overlay Top: 0
- Width: 720
- Height: 608
- Opacity: 100
- Looping: not selected

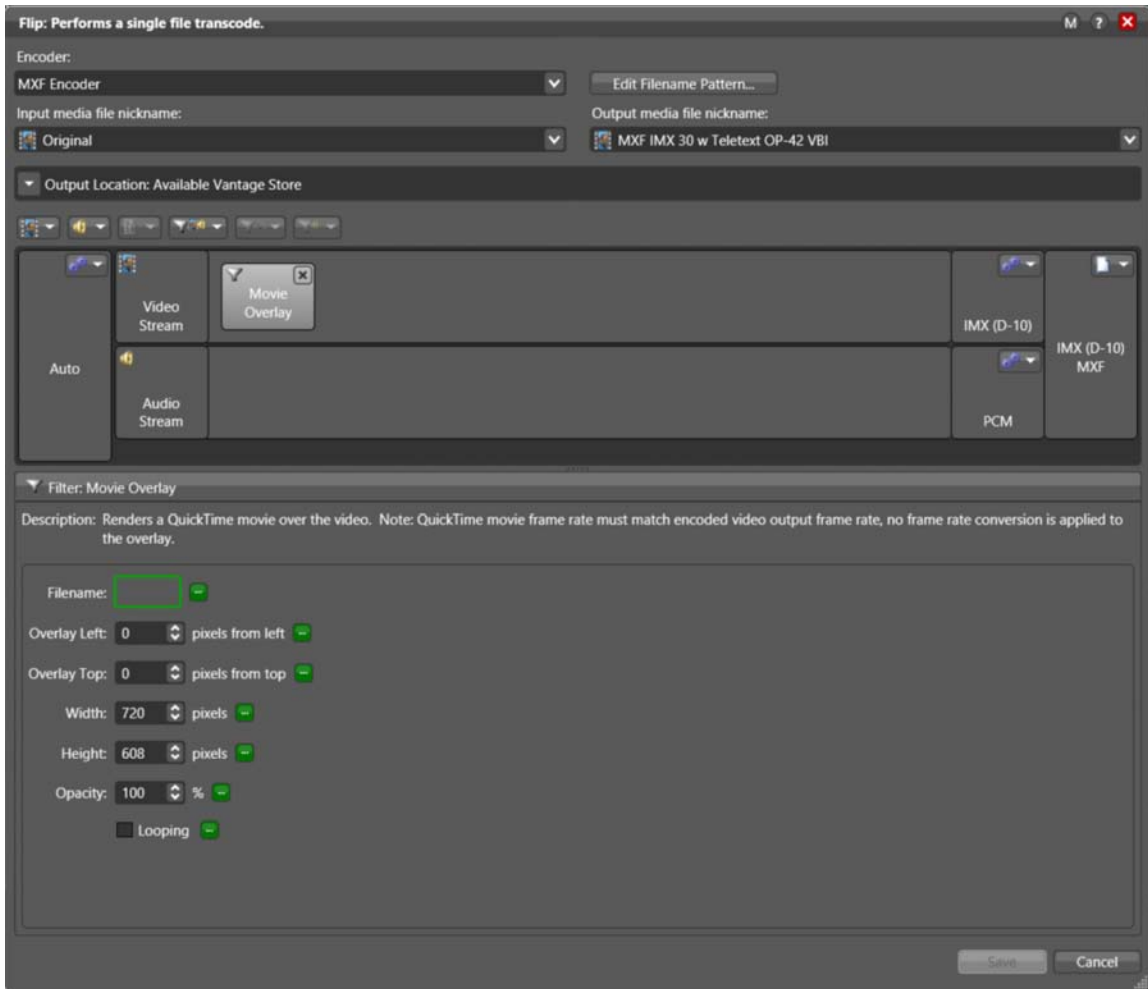
In the Flip action use the following transcode settings:

- Encoder: MXF Encoder
- Video Stream: IMX (D-10) MXF

In the codec settings for IMX (D10) set the following parameters:

- In General
 - Video Bit Rate: All settings will work
 - Aspect Ratio: 4:3
 - MPEG 2 Encoder Version: Default
- In Video Profile: PAL 720x608

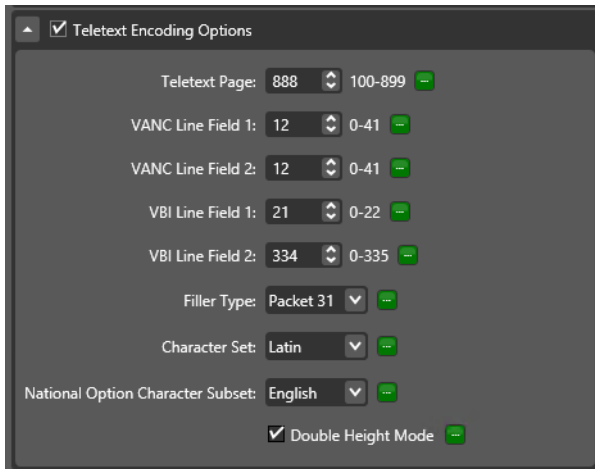
The following shows the Flip action inspector with the settings described above:



Creating Teletext OP-47 for HD MXF Workflows

The Teletext OP47 MXF output is very similar to the Same as Source output in that an input source media video file is used to create an output video file with embedded subtitle data. However, the OP47 output is designed to only work with MXF HD OP1a video media files. It is recommended to use MXF files with XDCAM HD and AVC-Intra HD video essence.

The OP47 export will add a SMPTE 436M data track containing Subtitle Data Packets (SDP) that include Teletext style subtitling. Because a SMPTE 436M track also contains timecode information, a Start Timecode parameter is provided in the General output settings. The Start Timecode parameter should be set to correspond with the timecode track that is in the input MXF media.



Naturally, the Teletext OP47 MXF output parameters include Teletext Encoding Options. These options allow you to configure the Teletext encoding settings. Please refer to your TV station's or video programming distributor's delivery requirements to select the appropriate Teletext settings.

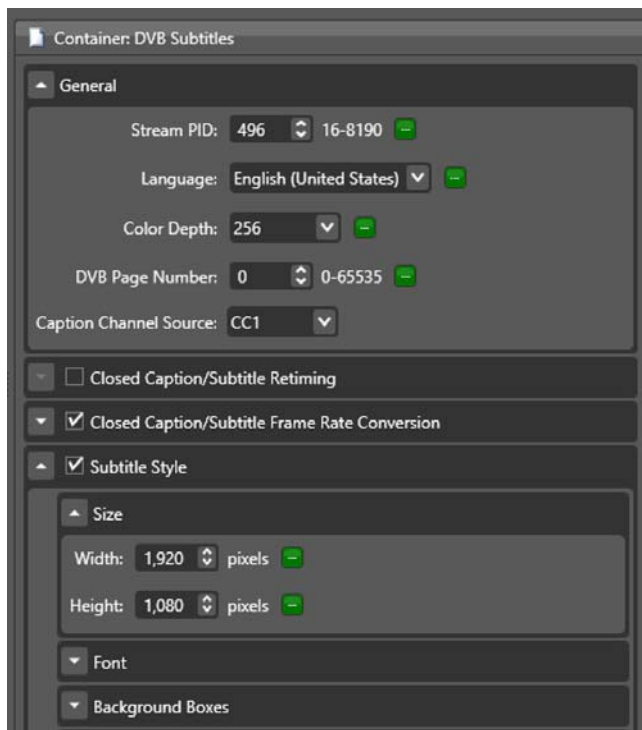
There are several Teletext settings that must be set correctly in order for Teletext subtitling to work properly. The most critical setting is the Teletext Page number. It is typical for Teletext in Australia to be set to page 801. U.K. Teletext programming may use page 888. For a complete description of all the settings in the Teletext Encoding Options please refer to the Vantage help page for this output.

Creating DVB Subtitles for IPTV Flip

Timed Text Flip can create Transport Streams containing specific DVB Subtitle graphics. These graphics can then be used by the IPTV Flip action to multiplex with Audio and Video into a final Transport Stream.

Designing the DVB Subtitle Workflow

DVB Subtitle graphics can be made from any input file that is supported by Timed Text Flip. These include standard caption and subtitle files, OTT caption files, and media with embedded caption data.



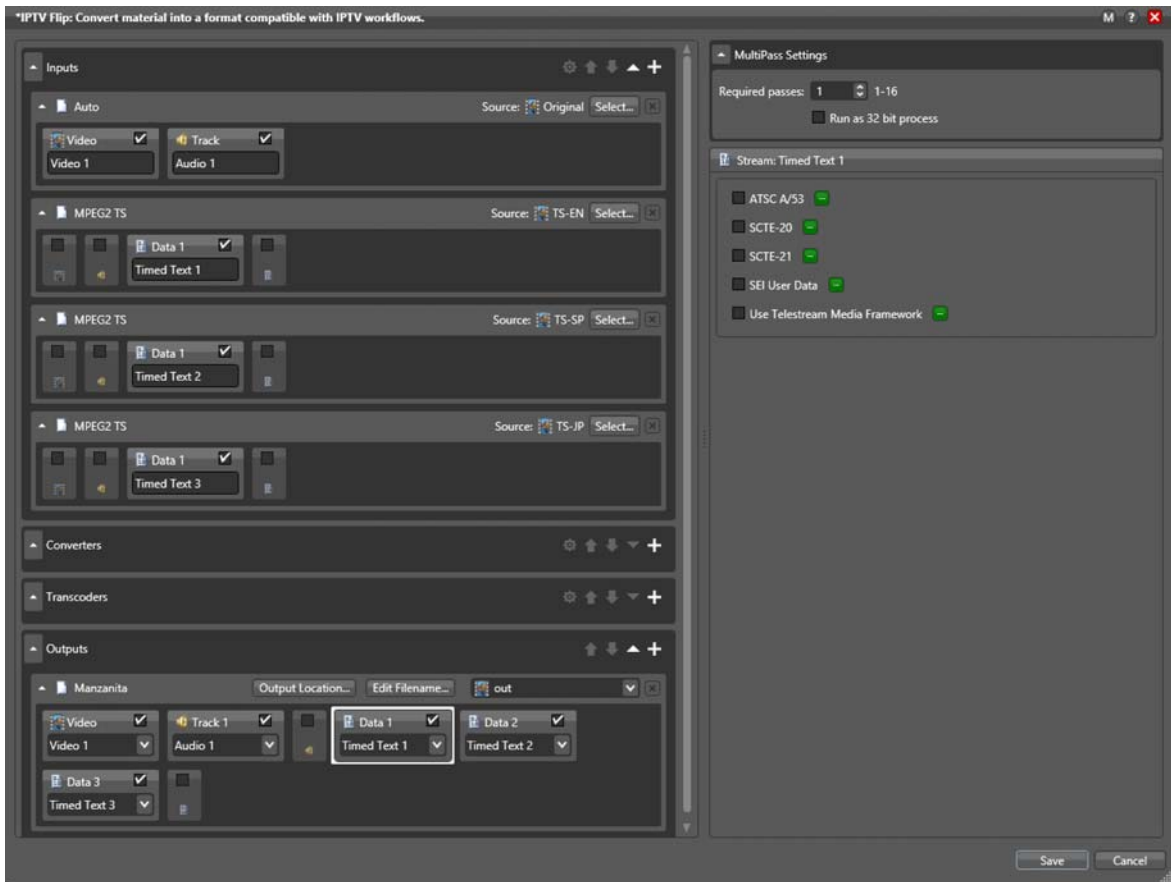
Similar to the Subtitle Overlay output, a resolution must be specified for the DVB Subtitles output. This resolution should be limited to the specifications of DVB Subtitling which include SD, 720, and 1080. In addition, DVB also requires you to specify the PID number, color depth, and language tag for each language in a Transport Stream.

When designing a workflow that requires multiple languages, users should set each output to a different Stream PID number, DVB Page Number, and language tag. For example, English could be set to Stream PID 496/DVB page 1, Spanish to PID 497/DVB page 2, and French to PID 498/DVB page 3.

The Caption Channel Source parameter only applies to a Timed Text Flip action that is converting a CEA-608 caption file, or video containing CEA-608, to DVB-Subtitling.

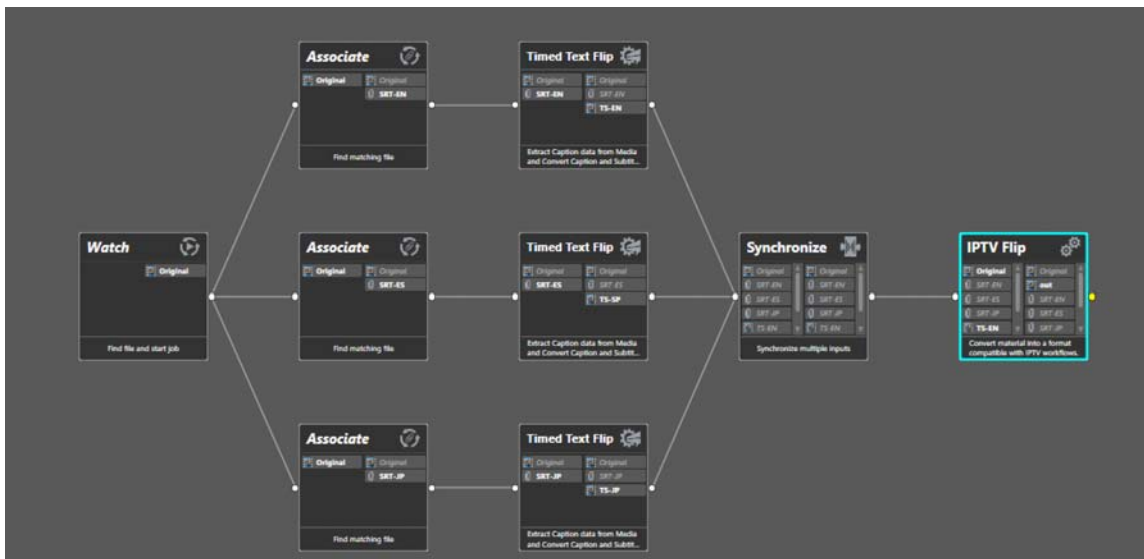
The IPTV Flip action can multiplex up to 16 languages of subtitles per Transport Stream. To create a workflow to multiplex DVB subtitles with audio and video, add an IPTV Flip action in Vantage Workflow Designer along with the Timed Text Flip action.

In IPTV Flip, you select multiple input parameters. One for each of the DVB languages and one for the input video file. The input video file input parameter can be set to Auto or any of the video files supported. However, the input DVB Subtitle files which are Transport Streams should be set to the "MPEG2 TS" input parameter as show in the screenshot below:



Include a Synchronize Action for Multiple DVB Subtitle Languages

When adding multiple DVB Subtitle languages to the IPTV Flip action, users should add a Synchronize Action to their workflow in order to have all of the subtitle files ready to process by IPTV Flip.



Use Telestream Switch to Verify DVB Subtitles

Once a Transport Stream has been created by the IPTV Flip action that contains audio, video, and subtitles, a user can verify that the subtitles are present by using the Telestream Switch Player. Each DVB subtitle language is tagged and can be selected from the drop-down menu in Switch under View > Subtitle/ Closed Caption Source.

Compressor Settings for Subtitle Overlay

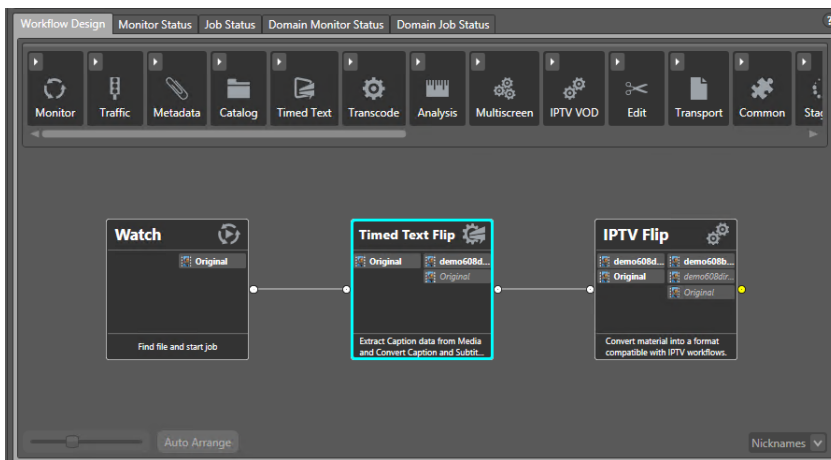
In the General tab of the Subtitle Overlay output option, under the Compressor settings, select the video codec to use to compress the subtitle overlay movie. The options are QuickTime Animation or ProRes 4444:

- Use the ProRes 4444 setting to create a burn-in overlay for use in the Flip transcode action.
- Use the QuickTime Animation setting to use the output in the IPTV or Multiscreen actions.

Extract Timed Text and Convert to Subtitle Overlay for IPTV Flip Transcode

A simple way to work with the Timed Text Flip action is to create subtitle overlay graphics for burn-in subtitles. While Timed Text Flip can extract caption data from source video media files and create a QuickTime MOV with subtitle graphics, another service such as IPTV Flip must be used to burn-in the subtitle graphics into output media files.

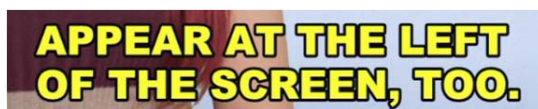
The following workflow depicts a Watch action set up to initiate a subtitle overlay job using Timed Text Flip and the IPTV Flip action, in Vantage Workflow Designer:



Configuring the Timed Text Flip Action to Create a Subtitle Overlay

In the following example steps, the source media is an MOV file containing CEA-608 caption data. CEA-608 media is rendered, by default, with a mono-spaced font and a black background. To obtain the desired look, specific parameters must be set. In this example, the subtitle graphics have an Arial Black font, colored yellow, with a 10% black outline around each letter.

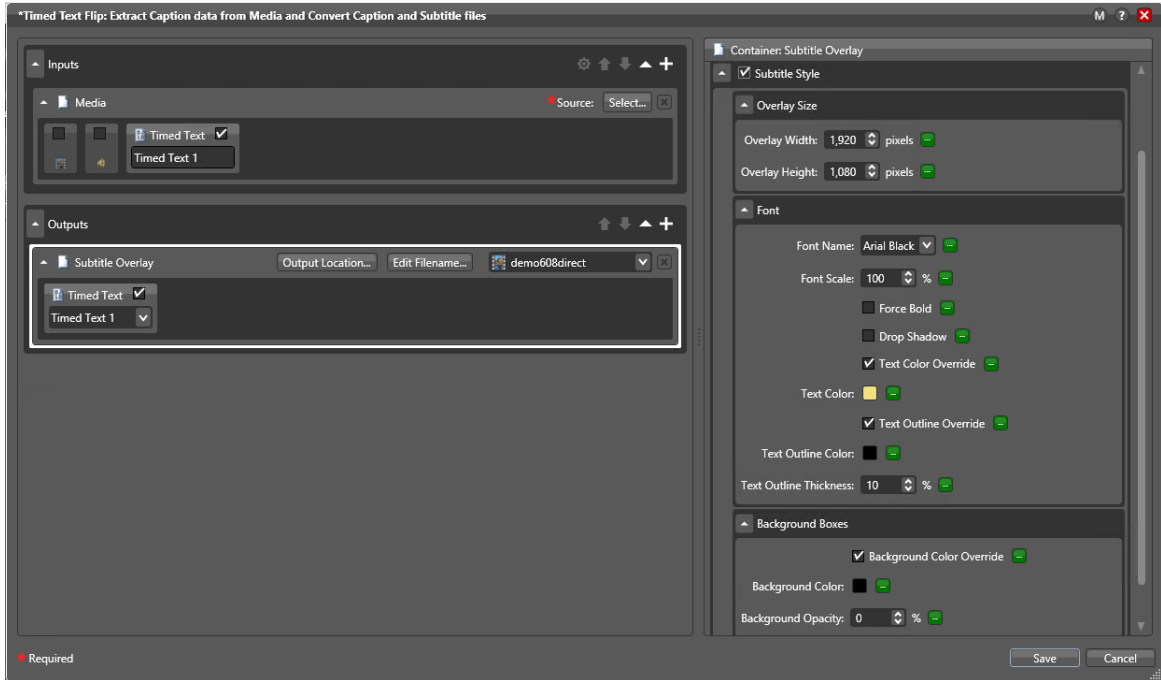
The final font and style for the subtitle overlay burn-in example should look like this:



Follow these steps to create a workflow, configure the Timed Text Flip action to extract CEA-608 from an incoming file, and output a Subtitle Overlay:

- 1.** Create a new workflow in Workflow Designer.
- 2.** Add a Watch action and configure it to monitor a folder to receive source files.
- 3.** Add a Timed Text Flip action to the workflow, and connect it to the Watch action.
- 4.** Double-click the Timed Text Flip action to open its inspector and configure it.
- 5.** Add a Media source to the Inputs panel.
- 6.** Select an Input Source for the Media component, to get media from the Watch action.
- 7.** Uncheck the Video and Audio streams in the Media component to deactivate them. (The source video and audio are not used in this action. Only extraction of timed text data is performed.)
- 8.** Add a Subtitle Overlay output to the Outputs panel.
- 9.** Select the Timed Text stream name so it is the same name as the Timed Text stream in the Media component. This connects the two components together.
- 10.** Select the Subtitle Overlay component and enable the General checkbox. In the General parameters, specify the following:
 - a.** For the Caption Channel Source, select CC1 (this is the default setting).
 - b.** For the Compressor, select QuickTime Animation.
- 11.** Select the Subtitle Overlay component and enable the Subtitle Style checkbox.
- 12.** In the Subtitle Style parameters, specify the following:
 - a.** Set the Overlay Width to 1,920 and the Height to 1,080 pixels resolution for the subtitle overlay graphic.
 - b.** Set the Font Name to Arial Black.
 - c.** Enable Text Color Override and set the color to yellow.
 - d.** Enable Text Outline Override and set the Text Outline Color to black.
 - e.** Set the Text Outline Thickness to 10%.
 - f.** To eliminate the default black background text box, enable Background Color Override.
 - g.** Set the Background Color to black and set the Background Opacity to 0%. This will override the default and make the background transparent.
- 13.** Create a media nickname for Subtitle Overlay so the output can be picked up from other actions. In this case we'll name it "demo608direct". (You can name it anything you like.)
- 14.** Click Save to save your changes and close the Timed Text Flip inspector.

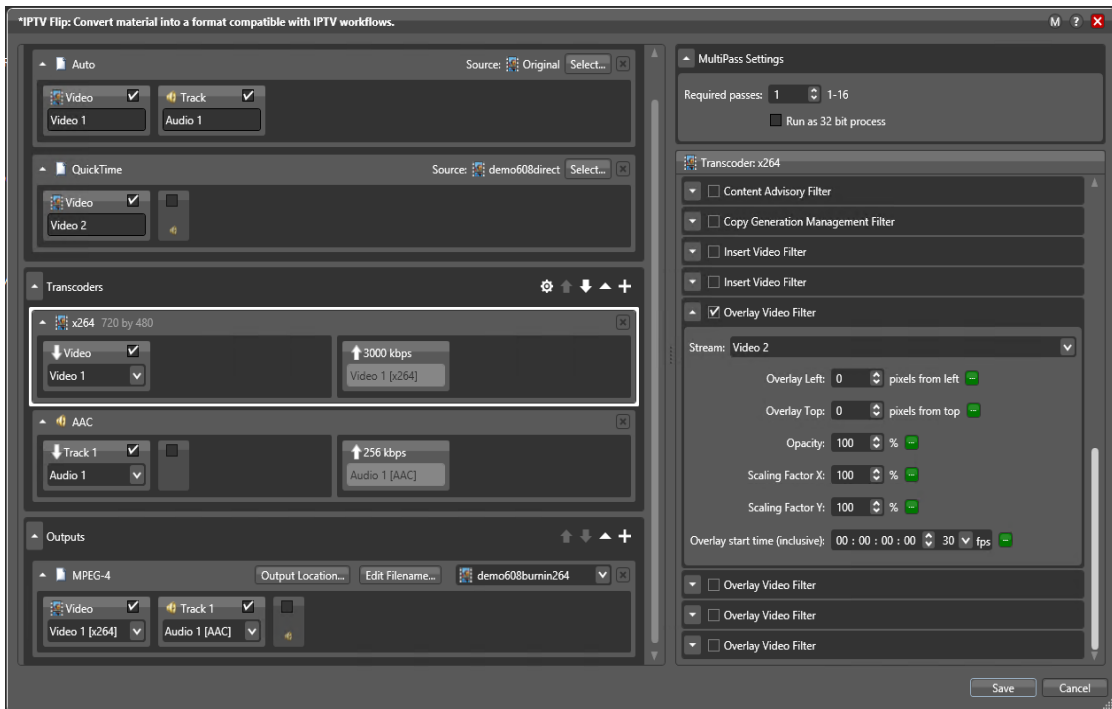
The following shows the Timed Text Flip inspector with the settings described above:



Configuring the IPTV Flip Action to Create an MP4 with Subtitles

IPTV Flip can utilize the QuickTime MOV subtitle graphic file from Timed Text Flip by using the Overlay Video Filter to create the final output deliverable of an H.264 MP4 file for Internet usage and desktop playback.

The following shows the settings in the IPTV Flip action that are used in this workflow example, to create an MP4 with subtitles:



In IPTV Flip, two input files are used to execute the subtitle overlay burn-in into an MP4 media file. The first input is Auto, which incorporates the original media file that contains the video program (named Auto for automatic decoding of any supported format). The second input type is QuickTime, which uses the QuickTime MOV subtitle overlay file exported from Timed Text Flip.

To configure the IPTV action to create an MP4 with subtitles:

1. Add an IPTV Flip action to the workflow, and connect it to the Timed Text Flip action.
2. Double-click the IPTV Flip action to open its inspector and configure it.
3. Add an Auto component to the Inputs panel.
4. Select an Input Source that is the same media file used by the Timed Text Flip action to extract the CEA-608 caption data.
5. Add a QuickTime component to the Inputs panel.
6. Select the Input Source with the Nickname "demo608direct" in order to pull in the MOV subtitle overlay file exported from Timed Text Flip.
7. Uncheck the Audio stream in the QuickTime component, to disable it.
8. Notice that the name "Video 2" is associated with the Video parameter in the QuickTime component. The Video 2 name will be referenced in the transcoder filter settings. (You can, optionally, disable the Audio track in the QuickTime component.)
9. Next, Transcoder components are used to create the MP4 file from the two input sources. First add the x264 component. The Video track stream name should be Video 1.
10. Select the x264 component you just added, then look for an Overlay Video Filter and check one of those to activate it.
11. Select Video 2 as the Stream in the Overlay Video Filter. (This corresponds to the QuickTime input stream name and tells the IPTV action to use the MOV subtitle file for overlay purposes.)
12. Add the AAC audio component to the Transcoders panel, and make sure the audio track is set for Audio 1.
13. Finally, add an MPEG-4 container component into the Output panel. Create a new Nickname for this output. For example, you can enter "demo608burnin264", but any user nickname can be used as long as it is different than the output nickname used in the Timed Text Flip action.
14. Make sure the Video Track and Audio Track in the MPEG-4 component are set to connect to the components in the Transcoders panel. Which in this case should be "Video 1 [x264]" and "Audio 1 [AAC]".
15. Click Save to save your changes and close the IPTV Flip inspector.

You can now activate the workflow to accept new jobs. Source files placed in the watched folder will be processed.

The following shows an example of the new MP4 file output from IPTV Flip, created when the workflow is executed using a combination of the original video media file and the QuickTime subtitle overlay.



Selecting an Alternate Caption Language for Output

When selecting WebVTT, TTML, SRT, and Subtitle Overlay output parameters, the General tab provides the setting for the Caption Channel Source.

In Caption Channel Source you can select to decode channels CC1, CC2, CC3, or CC4 from the input Media or CEA-608 caption data file. Once selected, Timed Text Flip will create an output file from the selected CEA-608 language channel.

For media with embedded captions that contain two caption languages, CC1 is typically the primary language and CC3 is the secondary language. Often, CC2 and CC4 are left blank. The Subtitle Overlay output parameters adds CEA-708 Service 1 and 2 options for decoding, this is because CEA-708 may also contain advanced font style data.

To create output in more than one language at the same time, you will need to add multiple output components. For example, two TTML outputs with one set to decode CC1 and the other set to decode CC3.

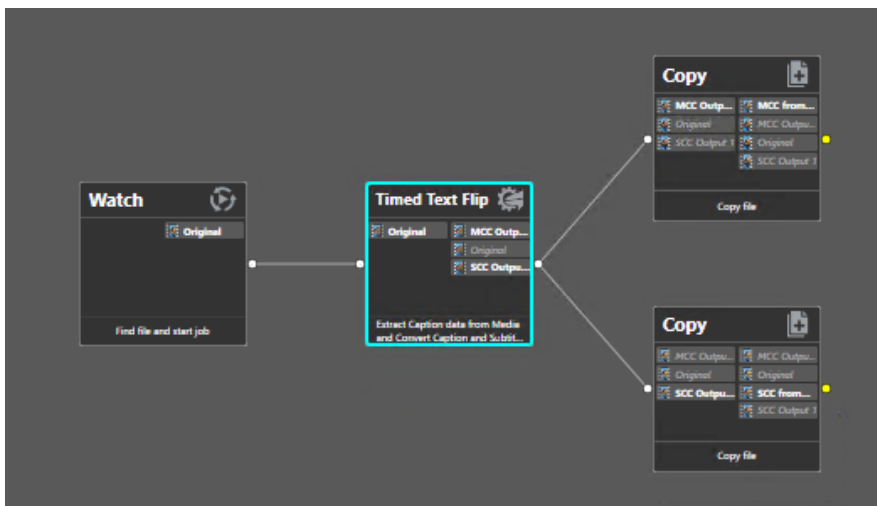
Timed Text Conversion of EBU-STL to MCC and SCC

A simple workflow in Timed Text Flip is the ability to convert one caption or subtitle format to a different one, in order to meet a specific delivery requirement. With Timed Text Flip, you can use a single action to create multiple file types from one source file. In this example we are converting an EBU-STL subtitle file into both an MCC and SCC TV caption file.

Note: When converting EBU-STL to CEA-608 data, the language must use Latin characters since CEA-608 does not support Unicode characters such as Japanese, Hebrew, and Cyrillic.

The EBU-STL Input component is used in Timed Text Flip to accept incoming subtitle files. Although an EBU-STL file does not contain either CEA-608 or CEA-708 caption data, it can contain timing and text information that is used by the Timed Text Flip action to create CEA-608 and CEA-708 output. In this example, an SCC (CEA-608 only) and an MCC (both CEA-608 and 708) output component are needed as delivery formats. In order to distribute the output files to specific storage folders, a Copy action is used for each export.

The following shows a prototype workflow with a Watch action, Timed Text Flip, and two Copy actions set up to convert EBU-STL files into both MCC and SCC output deliverables.



Configuring Timed Text Flip to Convert EBU-STL to MCC and SCC

To configure Timed Text Flip to convert EBU-STL data into both an MCC and SCC file:

1. Create a new workflow in Workflow Designer, named “MCC and SCC from EBU-STL”, for example.
2. Add a Watch action, a Timed Text Flip action, and two Copy actions to the workflow. Connect them together as shown in the above diagram.
3. Configure the Watch action to watch a source folder.
4. Double-click the Timed Text Flip action to open its inspector and configure it.
5. Add an EBU-STL component to the Inputs panel.
6. Select an Input Source for the EBU-STL input to get the file from a Watch action.
7. Add both an MCC and an SCC component to the Outputs panel.
8. Create a unique Nickname for each output so that a separate Copy action can be used for the different file types. Such as “MCC Output 1” and “SCC Output 1”.

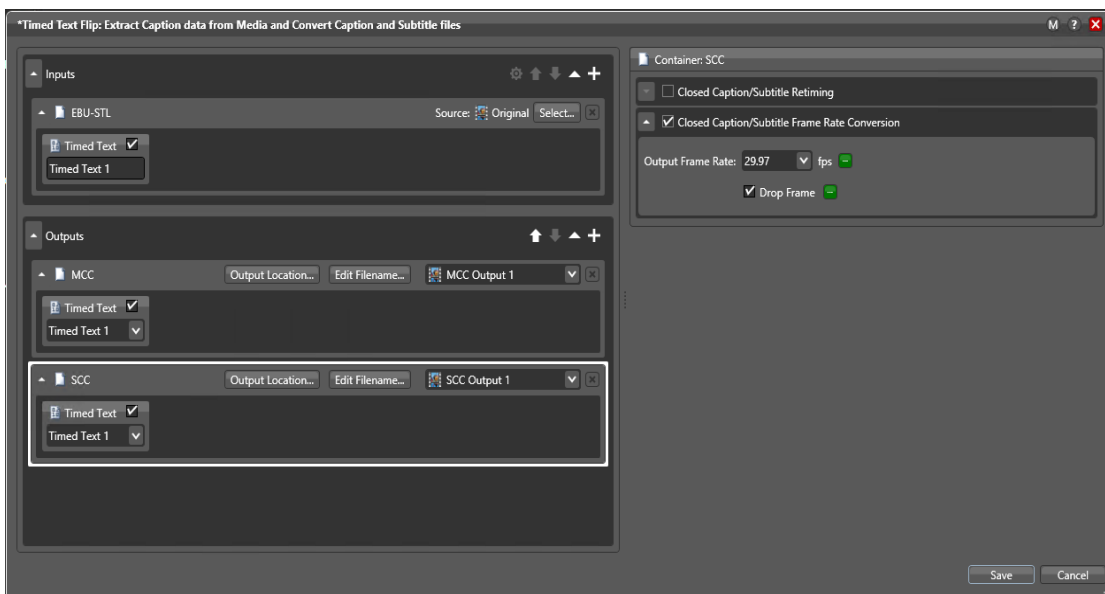
9. Select the MCC output component and check the "Closed Caption/Subtitle Frame Rate Conversion" option to activate it.
10. For Output Frame Rate choose 29.97fps from the menu, and enable Drop Frame.
11. Select the SCC output component, active the "Closed Caption/Subtitle Frame Rate Conversion" option, set 29.97fps for Output Frame Rate and enable Drop Frame.

Note: Frame rate conversion is needed because an EBU-STL file is normally timed at 25fps PAL and an SCC and MCC should be timed to 29.97fps NTSC (drop frame), for this example.

12. Click Save to save your changes and close the Timed Text Flip inspector.
13. Open each Copy action and configure them to distribute the output files from Timed Text Flip into appropriate folders.

You can now activate the workflow to accept new jobs. Source files placed in the watched folder will be processed.

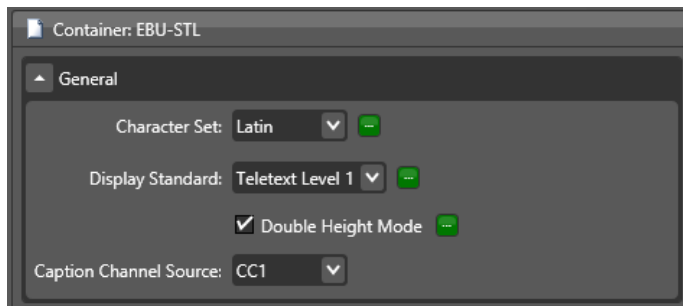
The following shows the Timed Text Flip inspector with the settings described above for one EBU-STL input and two output files, MCC and SCC:



EBU-STL Output

Timed Text Flip can export EBU-STL subtitle files for downstream processing. The EBU-STL subtitle text format is intended for Teletext and Open Subtitling workflows.

Unlike closed captioning (CEA-608/708) used in North America, EBU-STL files do not support paint-on or roll-up animated formatting of text. Therefore, caution is important when converting to EBU-STL from source captioning files such as SCC and MCC that could contain CEA-608 data. In addition, EBU-STL files only support 25 fps and 29.97 fps timing and therefore a conversion may be necessary if the source format is in a different timecode frame rate.



Character Set

Character Set options can be set to support foreign language characters. These include:

- Latin
- Latin/Cyrillic
- Latin/Arabic
- Latin/Greek
- Latin/Hebrew

Note: EBU-STL subtitle files do not support other character sets such as Japanese, Chinese, and Korean.

Display Standard

EBU-STL output files should be tagged for a specific purpose. The two Display Standard options to choose from are:

- *Teletext Level 1*—Subtitling positioning is formatted according to the Teletext standard for broadcast systems.
- *Open Subtitling*—With this option, video text rendering can convert EBU-STL into burn-in subtitling overlay.

Double Height Mode

Double Height Mode affects the size of the Teletext that is visible on a TV monitor. This option is very standard and should typically be selected for accessibility and readability.

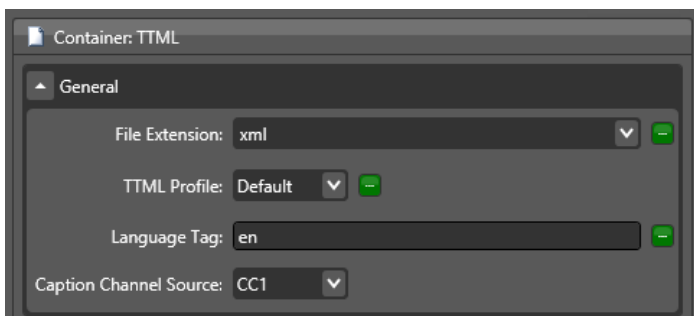
Caption Channel Source

When the source input is a media file with embedded captions (CEA-608/708) or subtitles (Teletext), you should select the option that corresponds with the data that is available. For example, if the original source clip is an MXF HD OP1a and contains Teletext OP-47 in a SMPTE 436M track, you should select the magazine and page number where the subtitling is present. Australian broadcasters often use page 801. While it is more common to use page 888 for Teletext in the U.K., Timed Text Flip will extract the subtitling data (SDP) according to this setting.

If the source clip contains CEA-608/708, then CC1 will extract the CEA-608. A setting of Service 1 will extract the CEA-708. It is typical to set the parameter to CC1 for extraction from North American video content because most programming upconverts the CEA-608 to 708 and therefore the same text data is found in both CC1 and Service 1.

TTML Output Profiles

Timed Text Flip allows you to select from a list of industry standard TTML profiles and file type extensions when using the TTML output.



File Extension

The File Extension parameters are critical for downstream mechanisms to correctly process the resulting TTML file. Essentially, all TTML files are XML's. However, packaging of video programming with side car TTML caption/subtitle files need to meet the required specifications to be accepted by a video programming distributor. Therefore, Timed Text Flip has the following bindable options:

- .XML—Often used for SMPTE TT 2052 captioning file format. This extension is the default setting.
- .dfxp—This is a legacy naming extension used by proprietary video depositories and generic implementation of TTML.
- .ttml—This extension should be used for IMSC 1.0 subtitling TTML profile.
- .itt—This extension should be used for the iTT (iTunes subtitling) profile.

TTML Profile

The TTML Profile parameter is critical to all TTML output workflows. This parameter determines the structure of the TTML. The following profiles are available and are also bindable to a variable:

- *Default*—When selecting this parameter, it is important to note that the input source will be analyzed to determine what is exported. If the source contains CEA-608 data, such as .SCC, .MCC, or video media with embedded CEA-608, then this setting will export a SMPTE 2052 style TTML.
- *Basic Subtitles*—This profile will create a simple TTML document that conforms to the TTML 1.0 specification. This setting will have limited support for positioning and formatting of text on screen and should not be used for advanced conversion of TV broadcast captions or subtitles to TTML.
- *IMSC 1.0 Text Subtitles*—This profile creates a TTML that conforms to the IMSC 1.0 Text profile. This profile has extended support for positioning and formatting attributes. However, it is intended for subtitle delivery workflows and does not support roll-up or paint-on formatting.
- *SMPTE 2052 Captions*—This profile creates a TTML that conforms to the SMPTE 2052 specification which replicates the look and feel of CEA-608 broadcast style closed captions. It is intended to be used when the source contains CEA-608 data, such as .SCC, .MCC, or video media with embedded CEA-608.
- *iTT*—This profile creates a TTML that conforms to the Apple iTunes iTT specification. This is intended for subtitle delivery workflows and should be used with film content. This profile also supports Japanese Ruby and Vertical text pass-through from input Lambda .CAP files. When exporting Japanese .iTT files it is imperative to choose the language tag "ja" to indicate that this TTML file may contain Ruby or vertical text. All other languages should also be set to correspond with the contents of the TTML.

Language Tag

The Language Tag parameter uses ISO 639-2 language codes and is set to "en" (English) as default. This parameter is bindable to a variable and can be automatically set based on analysis of the input format. You should select the corresponding language code for the TTML export. For a complete list of language codes please go to: https://www.w3schools.com/tags/ref_language_codes.asp

Caption Channel Source

The Caption Channel Source parameter is used when extracting caption or subtitle data from an input video media file with embedded captions or subtitles.

More Information

For more information on using Timed Text Flip in Vantage, see the help pages for the Timed Text Flip action by clicking the 'M' icon in the title bar, then select an input/output component to see its help page. Click the '?' icon to open the Vantage User's Guide for general information on using Vantage. Visit the Telestream web site for additional information.



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