# Using TriCaster with YouTube Live

v.20140305

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YouTube Live is an increasingly popular web streaming provider. TriCaster works well with this service; in fact there are several different workflows available to TriCaster users for interfacing with YouTube Live for live stream broadcasting.

This paper is designed to provide users with information they need to decide which method will work best for them. YouTube Live, like many Content Delivery Networks (CDNs), has some specific requirements and recommended streaming configurations that a user should adhere to in order to achieve the highest quality streaming broadcast and take advantage of all of the capabilities that YouTube Live has to offer.

The following settings are recommended by YouTube Live for any encoder:

### Video resolution

Based on your available outbound bandwidth, choose the *one* highest quality from below that you can reliably stream. YouTube will automatically create all of the lower qualities. Remember to account for your backup stream.

*Example: If you have 10M dedicated bandwidth for your encoder, you could safely choose to stream 720p quality. 4M for primary encoder, 4M for backup encoder, with room for overhead.*

### Resolutions

**240p:** 426 x 240, **360p:** 640 x 360, **480p:** 854x480,
**720p:** 1280x720, **1080p:** 1920x1080

### Video Bitrates

**Maximum:** 700 Kbps 1000 Kbps 2000 Kbps 4000 Kbps 6000 Kbps
**Recommended:** 400 Kbps 750 Kbps 1000 Kbps 2500 Kbps 4500 Kbps
**Minimum:** 300 Kbps 400 Kbps 500 Kbps 1500 Kbps 3000 Kbps
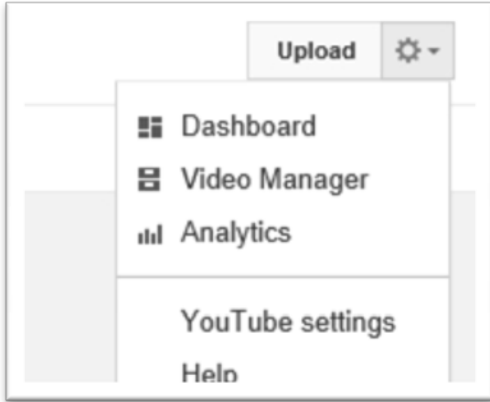
### Encoder settings

Protocol: RTMP Flash Streaming
Video codec: H.264, Main 4.1
Frame rate: 30 fps
Keyframe frequency: 2 seconds
Audio codec: AAC-LC (Audio required)
Audio sample rate: 44.1 KHz
Audio bitrate: 128 Kbps stereo
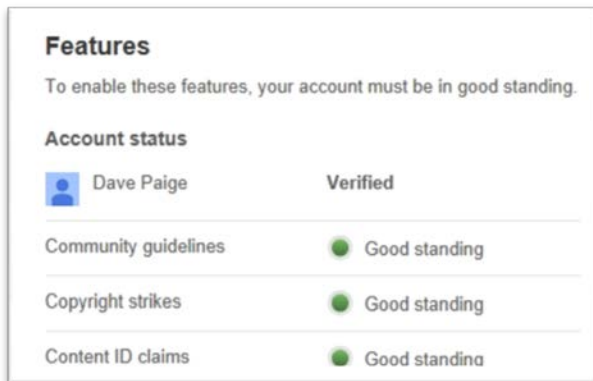
### Recommended advanced settings

Pixel aspect ratio: Square
Frame types: Progressive Scan, 2 B-Frames, 1 Reference Frame
Entropy coding: CABAC

## Setting up your live event at YouTube Live

An active YouTube account, in good standing, is required and once logged in, the status can be checked by selecting "YouTube settings" from account dropdown menu.
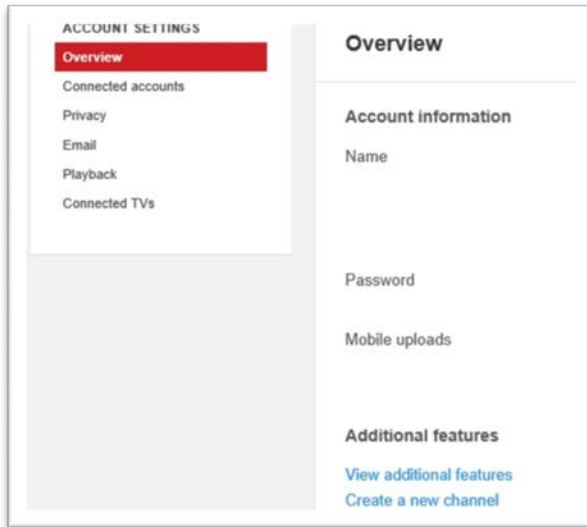


This will take you to the account status page.



Click on "View additional features" and the account status will be shown and the top of the next page.

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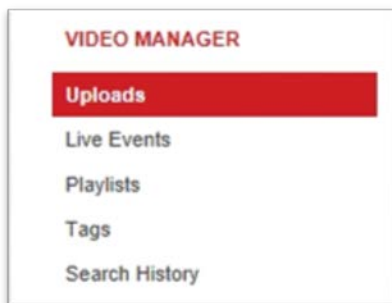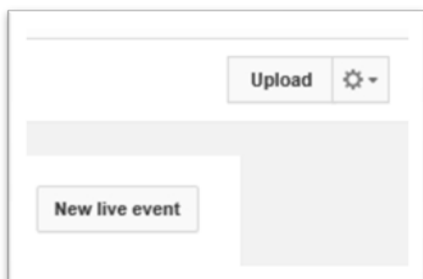


At the bottom of the same page make sure that "Live events" is enabled.



Now selecting "Video Manager" from the account drop down menu will take you to your YouTube channel page and "Live Events" will be available in the channel dashboard on the left.



Click on "Live Events" to go the live event page and click on the "New Live event" button at the upper left.

Now the basic and advanced settings need to be configured for this event. The "Type" will need to be set to "custom" in order to use Tricaster as the encoder. Private should be selected for testing the stream. The advanced settings can be left at the defaults or set as preferred.



Now click the "Create event" button.

## Streaming to YouTube Live directly from the TriCaster

TriCaster has been designed from its inception to live stream to the internet. And all TriCaster models are capable of streaming to YouTube Live. However the FMLE streaming profiles included with the Tricaster are not configured the way that YouTube Live suggests. Based on the information provided by YouTube above, a custom profile will need to be created to meet those requirements.

As indicated as well by YouTube Live, the TriCaster must be set to 2-second keyframes rather than 3-second, the TriCaster default. While YouTube Live suggests using their Flash Media Encoder XML File as the basis for your streaming, this is in fact incompatible with TriCaster. Accordingly, YouTube Live recommends having two separate encoders running as primary and backup; TriCaster is a single encoder so an additional TriCaster or other system running FMLE would need to be employed downstream of the first TriCaster to provide the backup stream from the TriCaster's video feed.

*"When using a TriCaster encoder, please be sure to update the XML file with the 2 second keyframe setting. In the Ingestion Settings tab, download the "Flash Media Encoder XML*

*File" to your desktop. Open the XML file in notepad or text editor. Look for and change the value to 2 seconds. Save the file and confirm the TriCaster has the latest XML file."*

As an example, the following steps would be used to prepare Tricaster to stream to YouTube Live at 1280 x 720 and 2048 Kbps.

YouTube's provided TriCaster settings are incorrect as the XML profile you downloaded from 'Ingestion Settings' when you created your live event cannot be used for TriCaster's Streaming Settings. The XML profile however can be used to auto-populate the Flash Server Address and Stream ID by simply clicking the button labeled **Import Settings** in the Configure Stream Connection panel, navigating to and selecting the XML file.

*Note: Because TriCaster only encodes a single stream, the primary XML profile must be used. For redundancy, YouTube recommends you should have two separate machines running; one streaming to the primary and another streaming to the backup. This can be done by using another TriCaster or a separate computer running Adobe FMLE and taking the video feed from the TriCaster.*

Once you've configured TriCaster's Flash Server settings, you then need to select the appropriate Streaming Settings. Again YouTube provides recommended encoder settings but these are not supported by TriCaster and will cause performance and stability problems due to significant system resources being redirected to the encoder. It is, therefore, recommended that TriCaster's own Streaming Settings are used.

*Note: It's important that your chosen Streaming Settings resolution and bitrate are within range of the Ingestion Settings chosen when you created your live event otherwise the 'Live Control Room's' stream status will show degraded health*

Please follow these steps to enable a 720p stream at 2048k.

Go to you YouTube Live account and schedule an Event.
Under Ingestion Setting -> Main Camera, Change the Name to **TriCaster**. You will need to choose the maximum bitrate for your encoder. 720p is the highest offered by TriCaster at this time.

*Note: It's important that your chosen Streaming Settings resolution and bitrate are within range of the Ingestion Settings chosen when you created your live event otherwise the 'Live Control Room's' stream status will show degraded health*

2. Select Your Encoder as Flash Media Live Encoder (FMLE)

3. Export settings for the Primary Profile (see graphic below) and move this file to the TriCaster.

4. On TriCaster, go to the Windows Desktop and browse to the folder **C:\TriCaster\Streaming Profiles\FlashProfiles\NTSC\HD** and open '*1280x720 2048k*' in Notepad.

5. On line 38 change the keyframe frequency from 3 seconds to 2 seconds; Use *Save As* and name this file as **YouTube 720 2048k**; placing it in a folder other than the TriCaster

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directory

6. Go to TriCaster Live Production. Set up your show and open the streaming configuration panel.

7. Select New Connection in the box and choose Adobe Flash as the Connection Type

8. Rename the Unnamed Connection 'YouTube Live'

9. Type http://www.youtube.com in the URL bar and click Go

10. Under Home, click the return arrow to make YouTube the Home page for this connection

11. Under Streaming Profile select Browse and use the explorer window to find the file that was saved in step 5.

12. Under Flash Server – Click the '**Import Settings'** button and select the xml file that was downloaded in step 3

13. You should now be able to test the connection to YouTube by turning the streaming encoder on and also hitting "test connection" in the stream config window on the TriCaster

14. On the YouTube Live Control Room page, you should get a preview and status of the stream.

## Using an intermediate encoder

Since TriCaster can stream directly to YouTube Live, why use an intermediate encoder? As you can see from the YouTube Live settings above, resolutions up to 1080p are supported by YouTube Live. Currently the TriCaster encoder profiles only support up to 720p. YouTube Live also expects to receive both a primary and a backup stream. The TriCaster currently supports one stream while performing all of its other powerful live production features. So the use of an intermediate encoder allows for these additional capabilities and, with the ability to provide a network (IP) stream output from the TriCaster, using other encoders is now much easier as no additional video/audio capture hardware is required. So what stream encoding products are out there to provide this functionality?
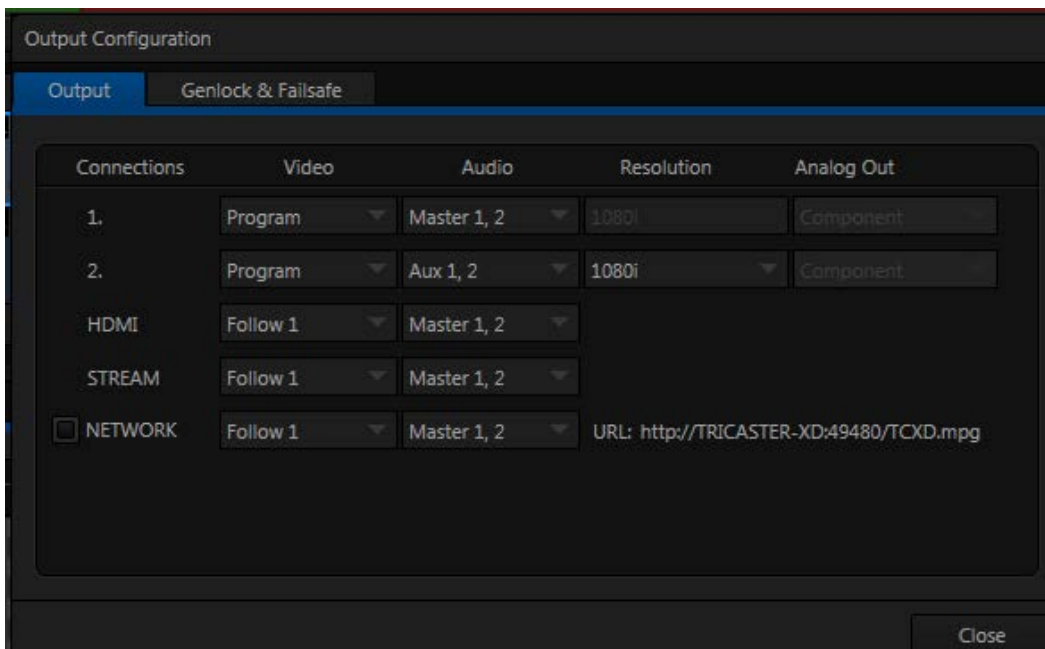
## Using Wirecast from Telestream as an intermediate encoder

Telestream produces a software based streaming encoder called Wirecast. On their website they describe the procedure for using their software with the TriCaster.
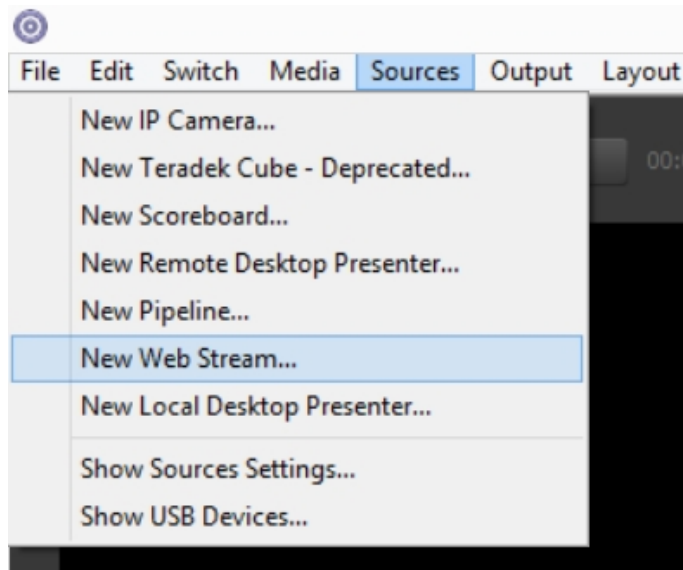
To set up Telestream's Wirecast software to recognize TriCaster's Network output as a source, follow these steps:

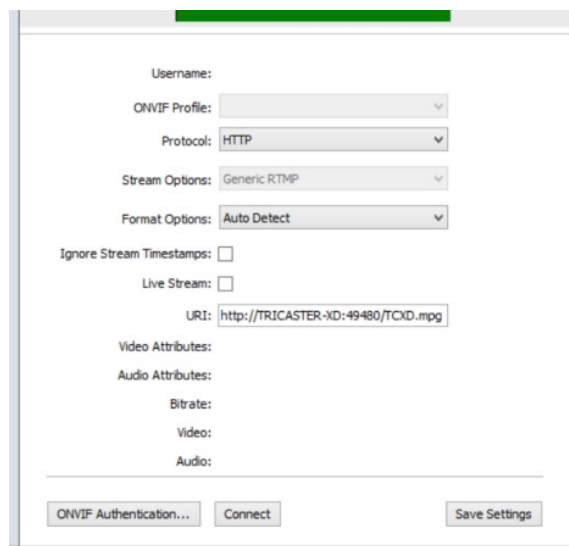1. Double-click the main Program monitor to open TriCaster's Output Configuration panel.



2. Select the desired audio and video sources for Network output, and enable it.

3. At the time of writing, Wirecast does not fully support interlaced video, so you must also checkmark De-Interlace at the bottom of the Network video source



menu.

4. Next, open the Sources menu in the Wirecast interface, and select the "New Web Stream" option. The Source Settings dialog will open.

5. Set Protocol to "HTTP".

6. Type the Network URL from TriCaster's Output Configuration pane into the Wirecast URL field.

7. Click the "Connect" button at the bottom of the "Source Settings" dialog.

8. TriCaster's Network video output should now appear in Wirecast, ready to be added to a shot like any other valid source.

## Final note

More general information about using YouTube Live can be found on Google's support site at…

https://support.google.com/youtube/answer/2474026?hl=en&ref_topic=2853712&rd=1

One of Tricaster's most tremendous advantages is the ease with which a production can be streamed live over the internet, allowing producers to broadcast to a world-wide audience. With YouTube's wide appeal and tremendous viewership, the partnership between Tricaster and YouTube live is a powerful way to reach that audience.