FlowCaster v8

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1 Introduction

This manual is for FlowCaster 8.x software from Drastic Technologies, Ltd.

1.1 Conventions

This manual assumes the following:

That the user knows how to operate a mouse and keyboard and perform the basic functions of Microsoft Windows, macOS or Linux operating system.

That the user is familiar with the creative software in use.

That the user has access to technicians capable of placing the device on the network and setting up any SAN systems if necessary.

The name of a control or display present on the interface will be displayed in **bold** text.

Where a portion of the manual is referred to the name of section mentioned will be displayed in *italics*.

Certain images in this document may have been grayed out where it is useful or necessary to place indicator marks to show specific controls or displays above a darker background.

1.2 About FlowCaster

FlowCaster software provides a secure connection from your creative software to a local monitor, no matter where the software or the monitor is. FlowCaster lets you keep your creative software and media in your facility or cloud, while allowing your editors and artists working remotely to get the pixel perfect display they need to create their magic. FlowCaster provides direct plugins for most creative software, and convenient tools to share any other software they need.

Video may be transported via the Secure Reliable Transport (SRT) protocol, with full end to end encryption, low latency and excellent error recovery. FlowCaster also supports UDP, RTP, RTMP and WebRTC for alternate workflow sharing. Inside the secure pipe are up to 32 channels of high quality audio and your choice of lightly compressed video, using h.264, h.264/HEVC or JPEG-2000 up to 16 bits per pixel component. SDR and HDR/HLG signals are supported, as well as alternate color spaces like Rec 709, BT 2020 and P3. Any video resolution and frame rate is supported, and quality settings allow for even low bandwidth connections to take advantage of FlowCaster.

1.3 System Requirements

1.3.1 Recommended Environment

FlowCaster software must be installed on a system at least as powerful as the configurations listed below.

HD 1080p60
- A recent Intel, AMD or NVidia with at least 1G memory card is fine for the GPU
- A recent Quad Core i5/i7/AMD processor with at least 8G of ram

4K/QHD
- A gaming level NVidia or AMD (NVidia 1080 or better/AMD Vega 2 or better)
- Minimum 8 cores [16 virtual] Intel/AMD, recommended 8~12 cores with at least 8G ram

FlowCaster supports a wide variety of input devices. Here is a list:

- AJA: KONA 5, KONA HDMI, KONA IP, KONA IP25, KONA 4, KONA 1, KONA X, KONA Lhe Plus, T-TAP Pro, Corvid 88, Corvid 44, Io4K Plus, Io X3
    - Current release driver for version 7 Drastic software: 16.2
    - Current release driver for version 8 Drastic software: 18.x
- Blackmagic (version 15.x drivers required): DeckLink series, Intensity Pro series.
- Bluefish444: Epoch Supernova, Epoch Neutron, KRONOS
    - Current release driver for Drastic software: 6.3.2.x
- DekTec - SDI boards: DTU-351 (use latest drivers)
- Deltacast – SDI board (use latest drivers)
- Digitnow: HDMI USB Capture
- Elgato: Game device capture devices
- Epiphan: AV.io HDMI/SDI/4K
- Inogeni: 4K, 3G, DVI, VGA/CVBS
- Logitech: HDMI Screen Share
- Magewell: HDMI and SDI USB-3 devices
- Matrox: DSX series (use latest drivers)
- Microsoft: USB Cameras
- Mokose: HDMI/SDI USB-3
- NDI: NDI®
- Rybozen: HDMI USB Capture
- UVC: Most (USB Video Class) compliant video devices

To support ST-2110 input or output, specific hardware and software are required:

Mellanox NVIDIA Bluefield-2/3 (requires a separate Rivermax software license plus one year of support)
Mellanox NVIDIA Connect-X 6/7 (requires a separate Rivermax software license plus one year of support)
Temporary (duration limited) Rivermax licenses for testing can be made available on request
Details on setting up Rivermax can be found here.

2 Getting Set Up

2.1 Installation

Here is how to install FlowCaster. Attach a standard keyboard, mouse and VGA monitor to the system. Plug the system in and turn it on.

IMPORTANT! Log on as Administrator. If the user name and password entered do not extend Administrator privileges, FlowCaster will not install properly. If unsure as to what level of privilege the log-on provides, consult a System Administrator.

Confirm that any other programs are closed before starting this installation.

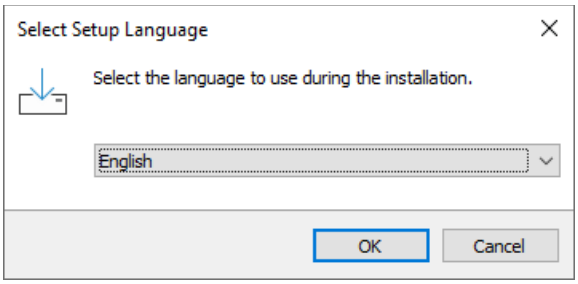
Make sure the system clock is properly set. Open the Control Panel, go to Date/Time. If the time is reset while running a duration-limited license, it may destroy the license.

2.1.1 Install for Windows

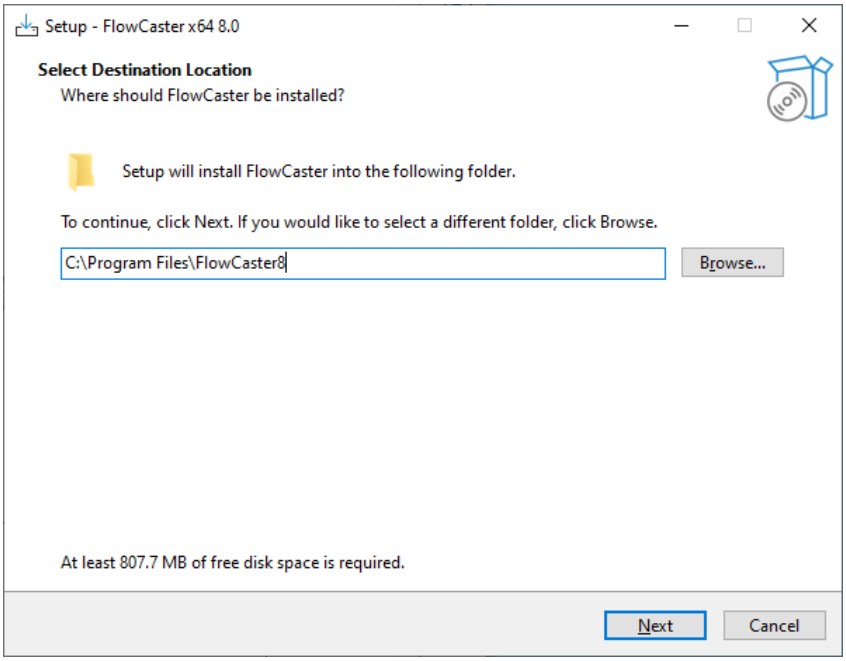
For Windows: Double-click or run the executable FlowCaster installation file.

SetupFlowCaster_x64_8_0.exe

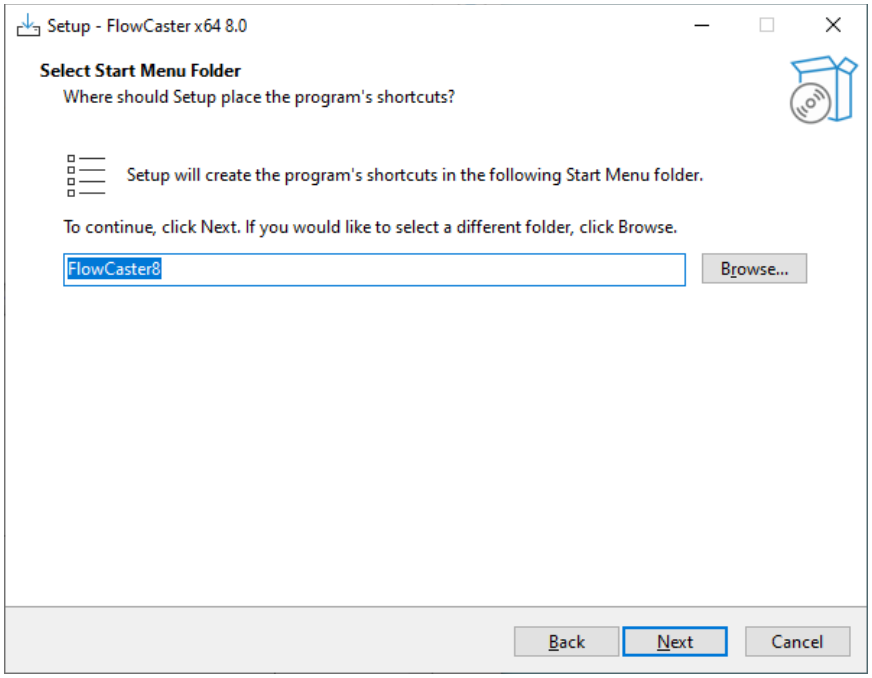
Depending on your OS setup, you may need to allow the installer to run. Once you have done this, you will see a dialog similar to this:



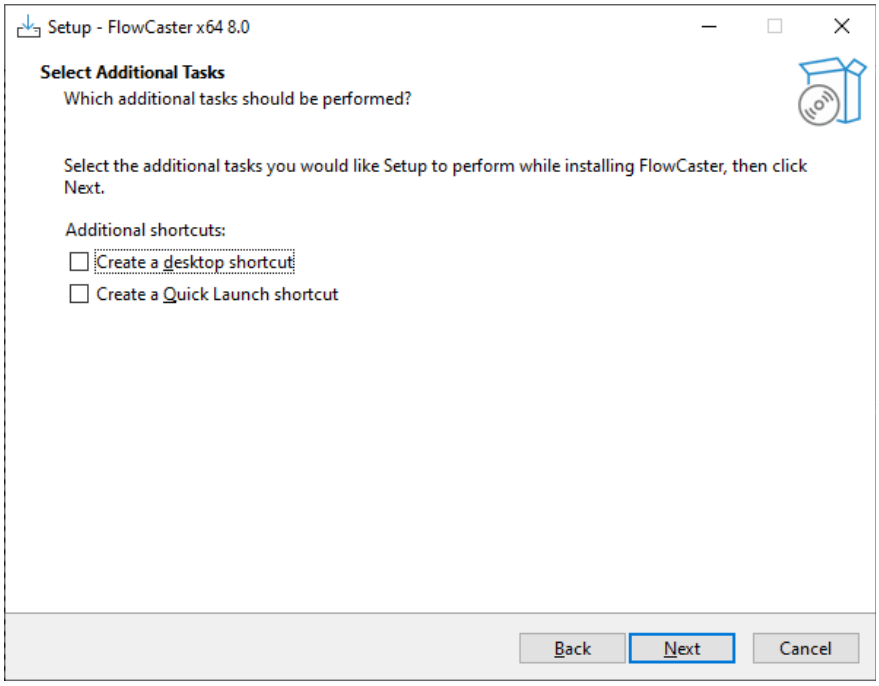
Click OK, and then confirm the install location:



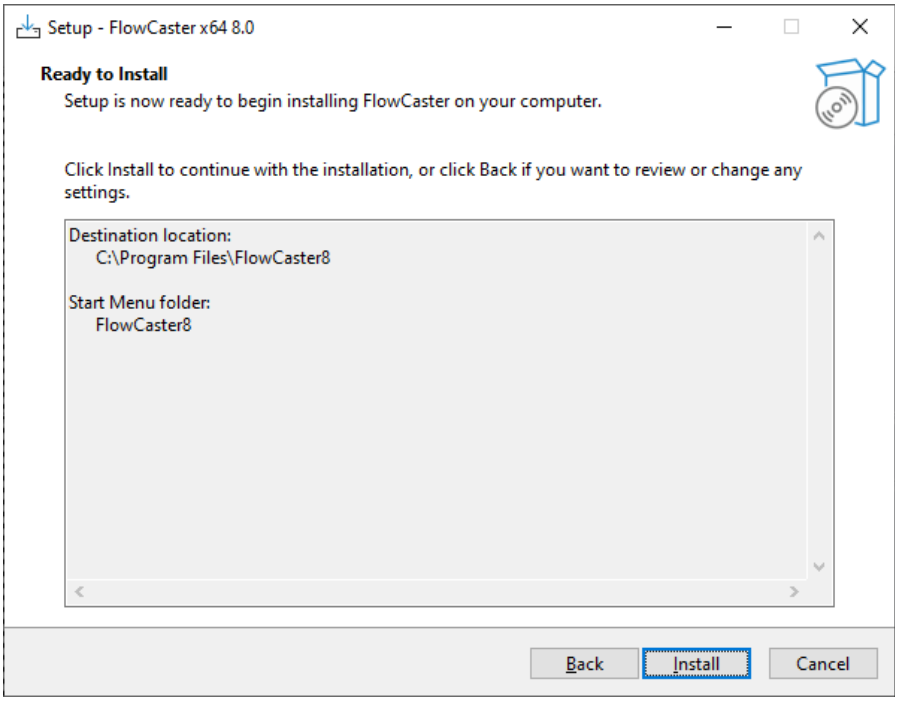
In most cases the default install location is recommended. Create a shortcut in the Start menu:



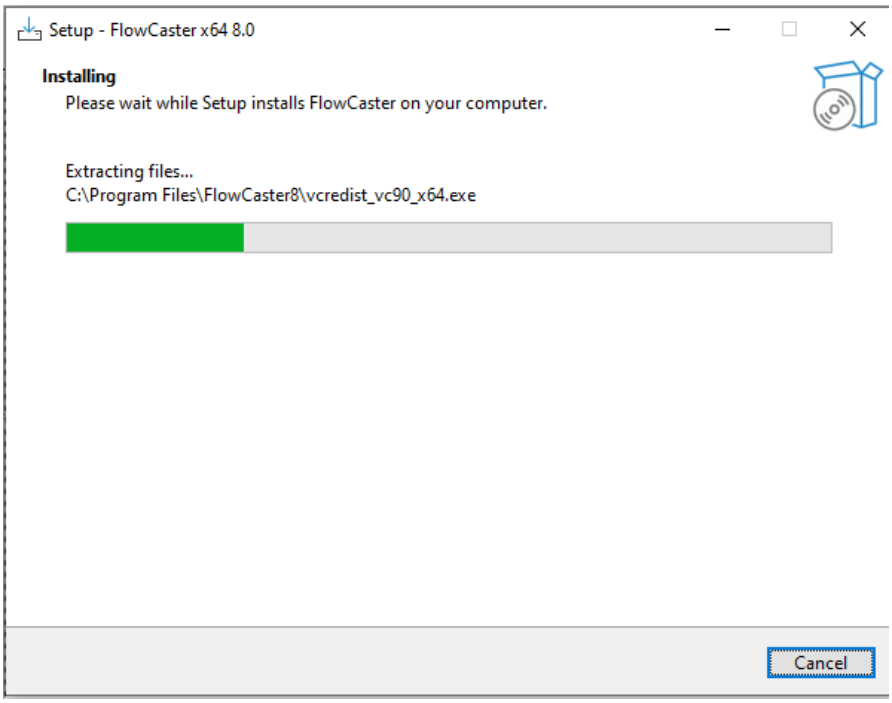
Decide if you want desktop or Quick Launch shortcuts:



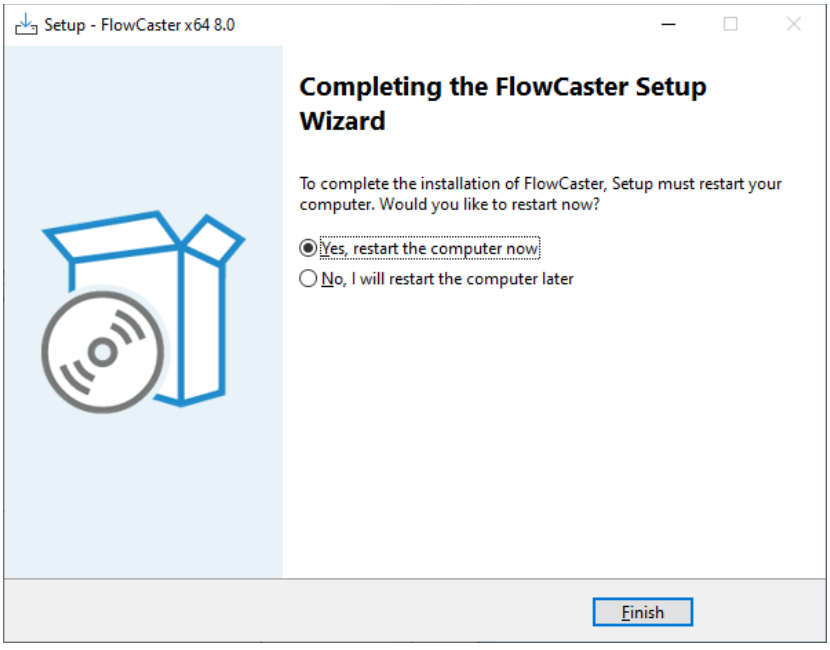
Your choices will be displayed, and pressing the Install button will begin installing FlowCaster software.



The install progress will be displayed.



On completion of the install, you will be prompted to restart the system. Agree to restart.



2.1.2 Install for macOS

Drag the PKG into your applications folder.

Apple Pro hardware accelerated codec support is available for macOS installs.

> Pro Video Formats 3.1 (HW accelerated h.264/265/ProRes)
> https://support.apple.com/en-ca/106396
>
> Rosetta 2 (for AVCi-100)
> https://support.apple.com/en-us/102527

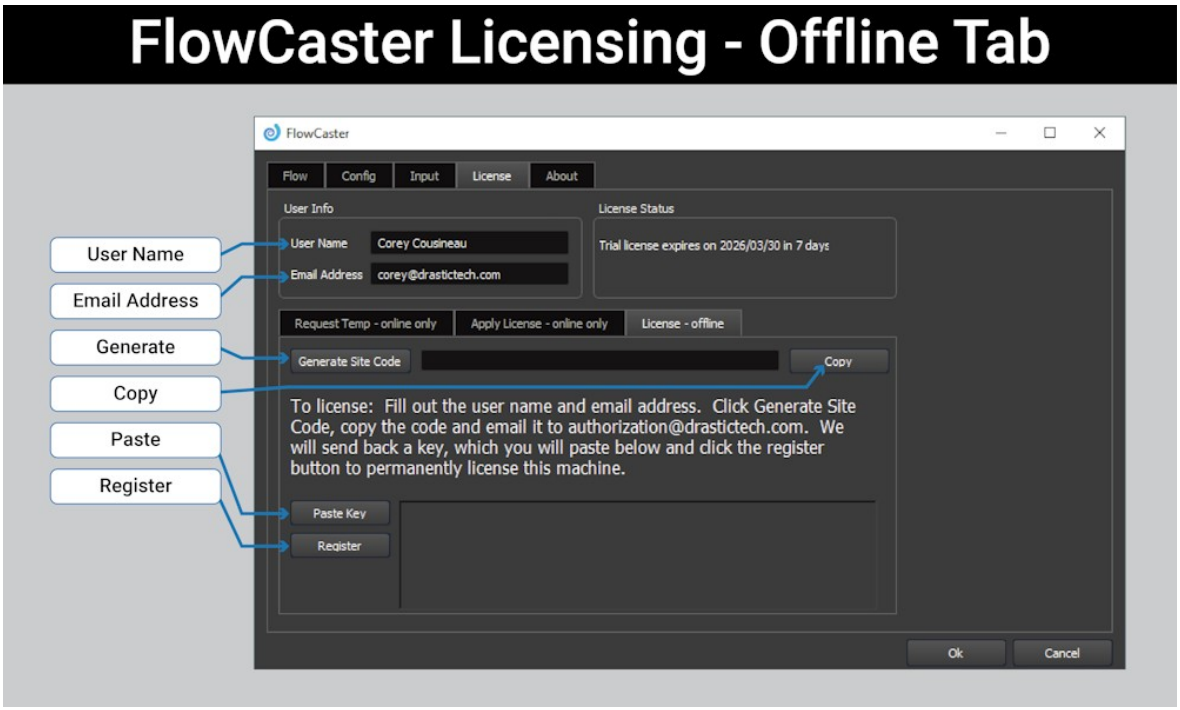
2.2 License the Software

When **FlowCaster** is run without a license, it will place a watermark over the video, and it there will be other (auto shut off, nag screen, etc.) limitations. You will need to request a license to remove these limitations.

2.2.1 Offline tab

Run the software, and select the **License** tab to access the licensing dialog built into the application.

Here is the licensing dialog in FlowCaster, set to the **Offline** tab.



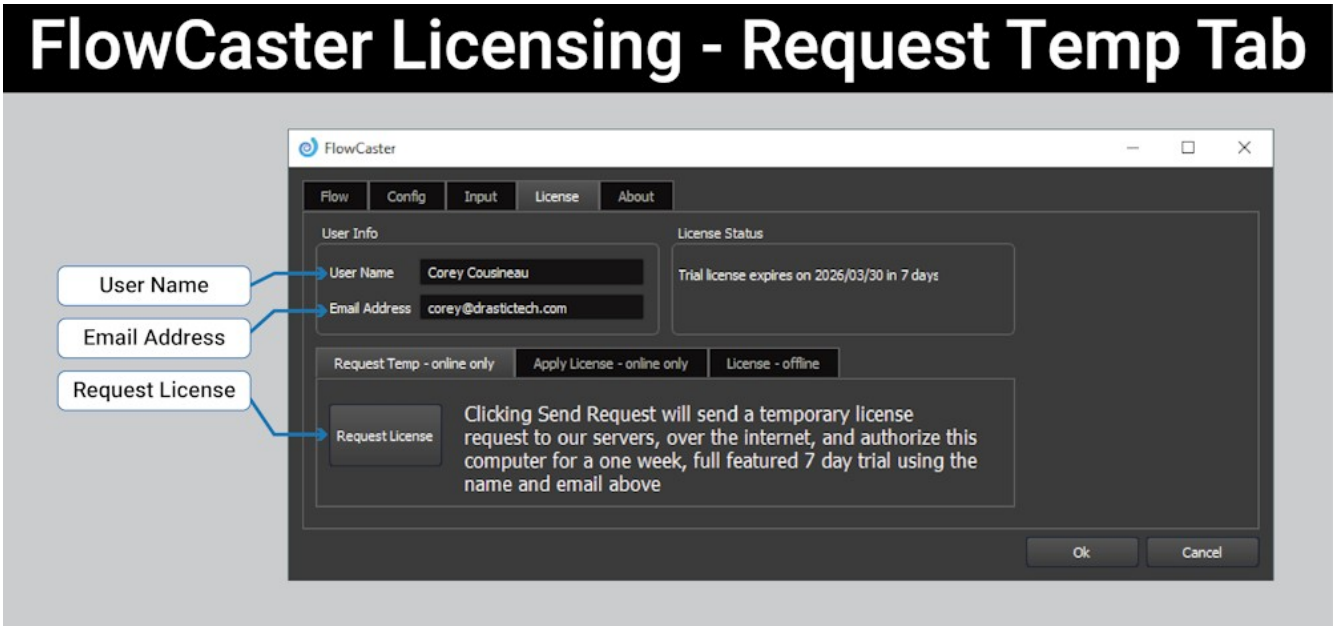
In the offline tab, here is how to license FlowCaster.

Enter a first and last name into the **User Name** field
Enter a valid email address into the **Email Address** field
Click the **Generate Site Code** button. This populates the site code field with a string of alphanumeric characters, which we call the site code.
Press **Copy** to copy the site code to the clipboard.
Paste the site code into an email and send it to us at authorization@drastictech.com.
We will reply with an email containing a site key - copy this key.
Paste the key into the site key field and press **Register**.

Restart FlowCaster to enable the license.

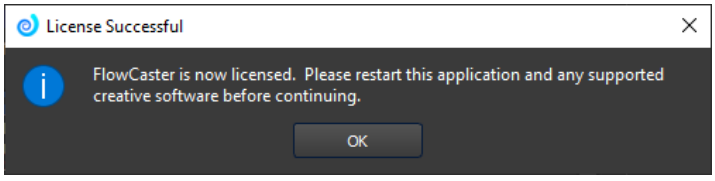
2.2.2 Request Temp tab

To quickly get a 7 day key using our online server, click the Request Temp tab.



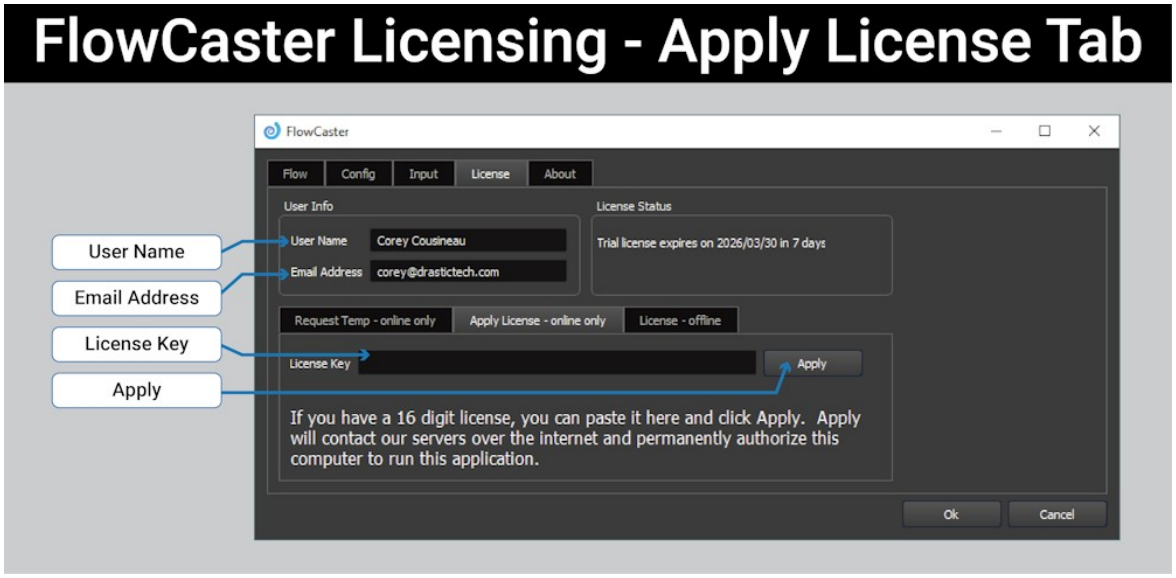
The request temp tab uses our online server to generate a site key without human intervention.

Enter a first and last name into the **User Name** field
Enter a valid email address into the **Email Address** field
Click the **Request License** button. This sends your details to our online server, which is set to reply with an email containing a full featured 7 day key. Copy the key.
Click the **Offline** tab, and paste the key into the **Site Key** field.
Press **Register**.
A successful licensing will produce a success message.



2.2.3 Apply License

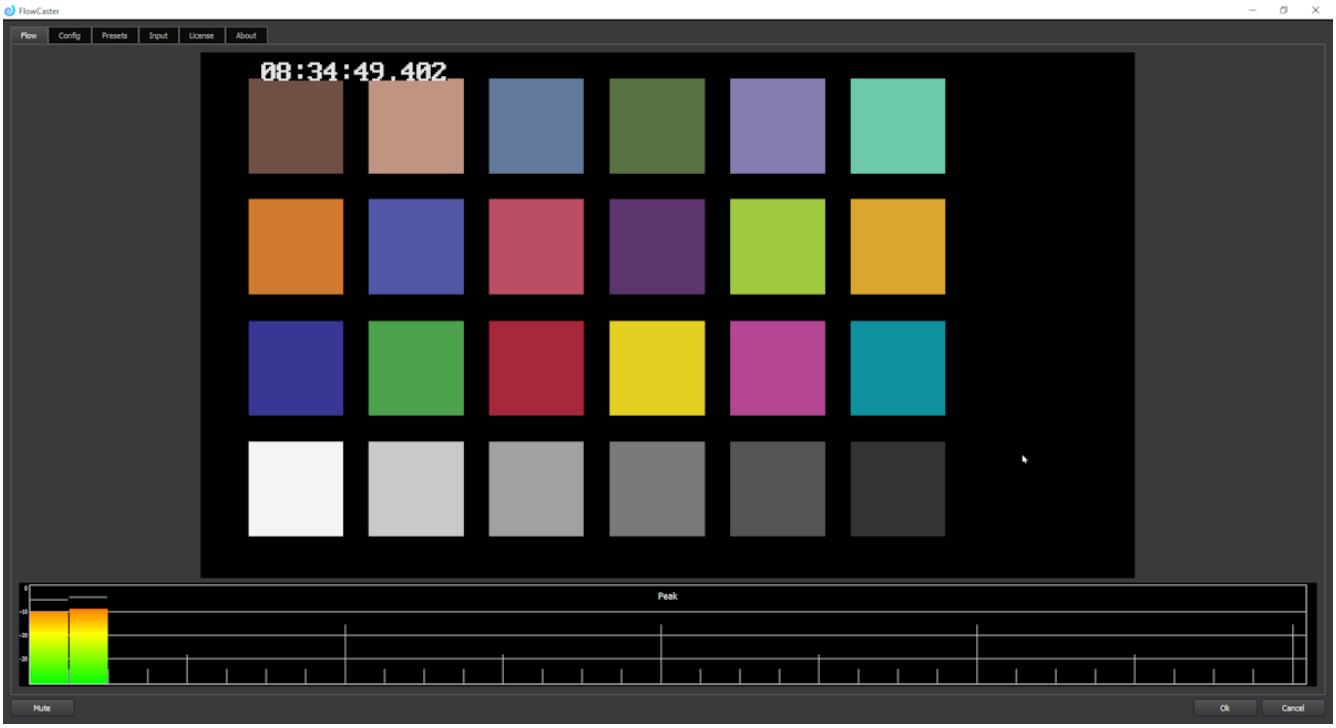
The **Apply License** tab assumes you have received a 16 digit key to use FlowCaster.live online, and need to sign in with the key to use the software.



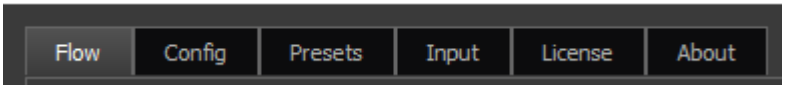
Here is how to apply the FlowCaster online license:

Enter a first and last name into the **User Name** field
Enter a valid email address into the **Email Address** field
Paste the 16 digit key into the **License key** field
Press the **Apply** button

3 Controls and Displays



The FlowCaster UI has 6 tabs.

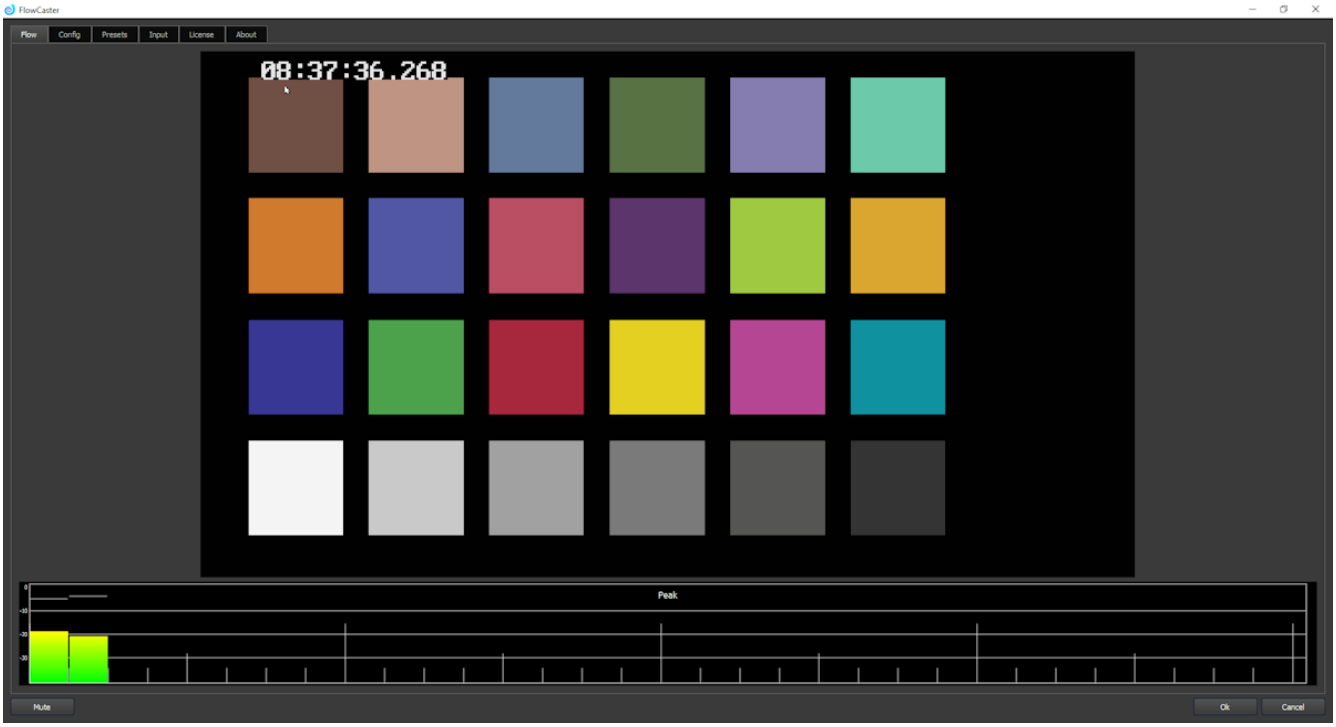


- **Flow** Tab – shows the current input stream and provides meters for audio levels.
- **Config** Tab – provides controls and displays to set up the output source parameters.
- **Presets** tab – shows any presets that have been saved, and allows the user to click to load a preset, to delete a preset, and to search through the presets.
- **Input** Tab – provides controls and displays to select the input source and set up its parameters.
- **License** Tab – displays the current license status, and provides controls to generate a new site code, and to apply a new site key.
- **About** Tab – displays the version number, license status, and trademark details. Offers a link to check for updates, and a link to open the FlowCaster web page.

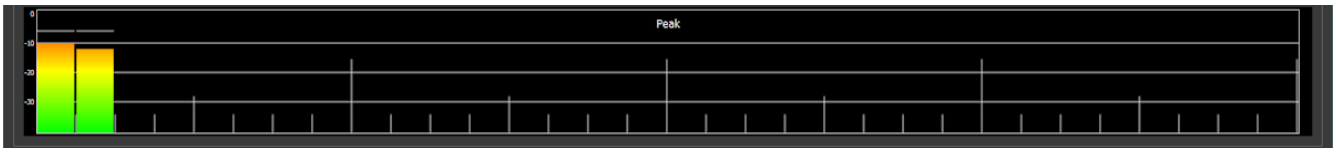
Top Bar – shows the application name and ico, and provides **Minimize**, **Maximize**, and **Close** controls.

3.1 Flow Tab

The **Flow** tab shows the input signal to confirm a valid signal is being captured.



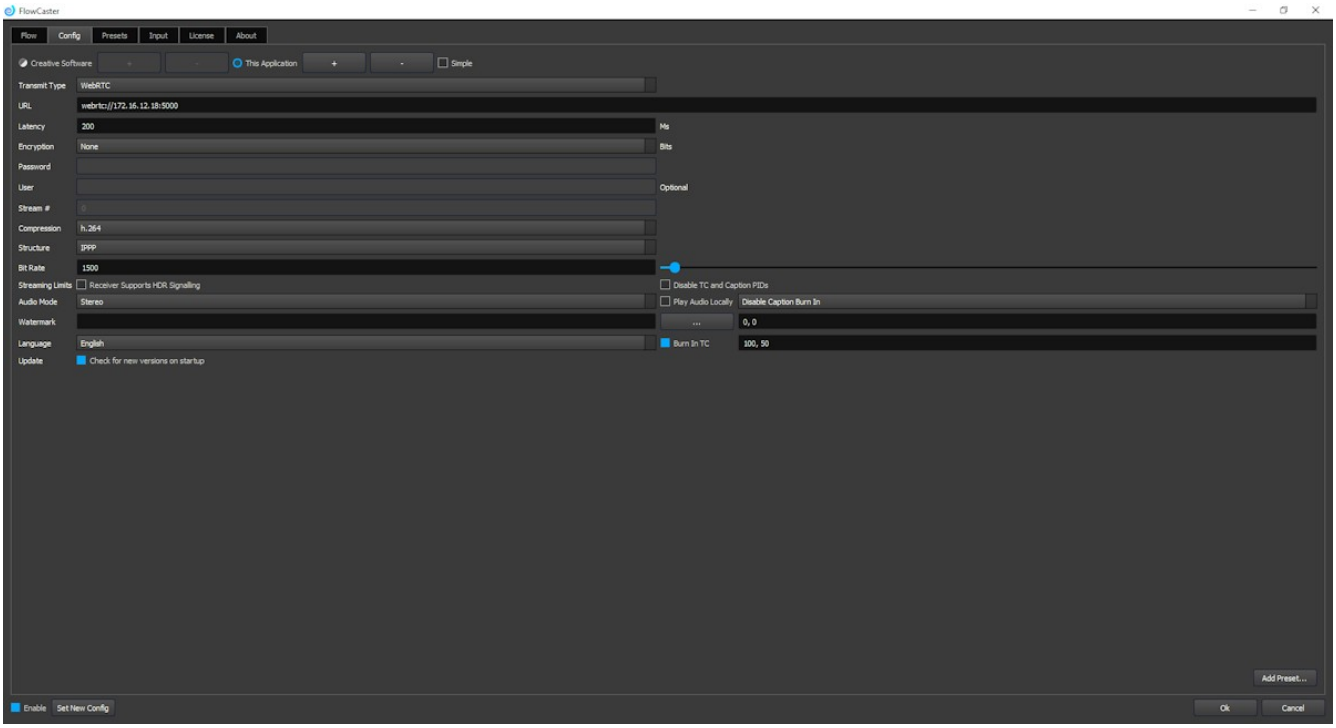
Main Area – provides the signal display.
Audio meters – shows real time audio levels in RMS.
Mute button – offers to mute the audio on the output stream.
OK button – accept any settings changes, and close the application.
Close button – close the application.



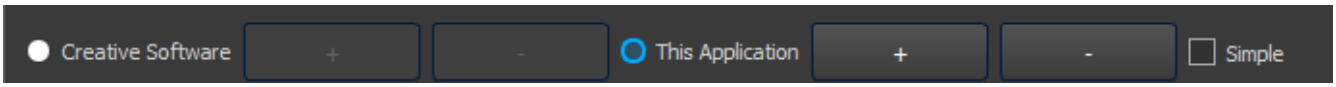
Audio meters display real time audio levels in RMS. Up to 16 channels of audio are supported (hardware- and format- dependent).

3.2 Config Tab

The **Config** tab provides controls and displays to set up the output type.



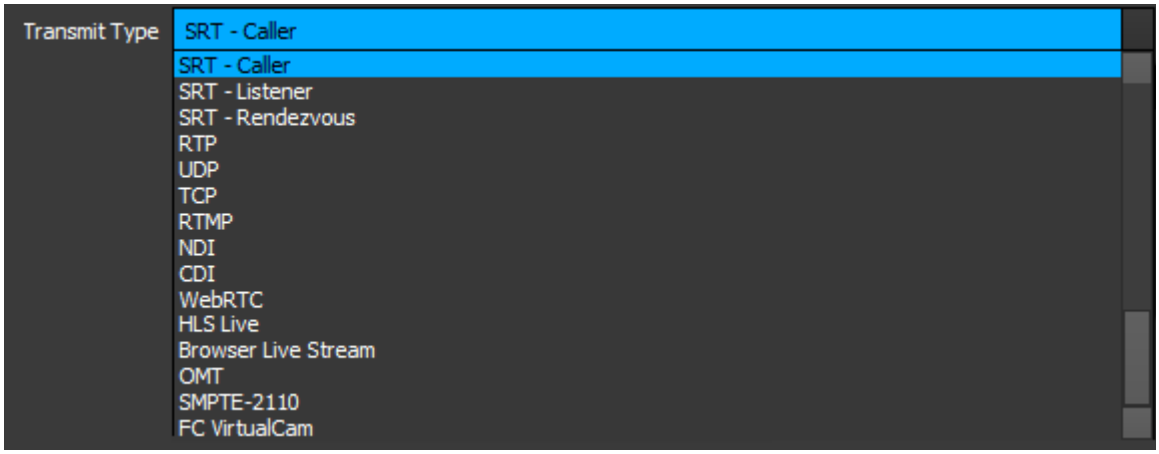
3.2.1 Select the application



FlowCaster can set up streams using the input from Creative Software such as Avid or Adobe. In these cases the user will select **Creative Software**, set the output details for the editor output, and its timeline will be sent, often via WebRTC to the FlowCaster.live site. Otherwise, setting it to **This Application** sets up FlowCaster's output for other sources.

Creative Software button – select to set up the output of the creative software being used. Adobe or Avid will use the supplied configuration to send its timeline out via IP stream.
Plus/Minus buttons – add another creative software setup or remove extras.
This Application button – select to set up the output of FlowCaster, where it is used for an input source other than Adobe or Avid.
Plus/Minus buttons – add another application setup or remove extras.
Simple checkbox – removes most of the lower controls from the tab, designed for WebRTC

output to FlowCaster.live, which does not use these controls.



Transmit Type pulldown menu – displays all the output types supported by FlowCaster. Use the pulldown menu to select the type you want to use. Currently, FlowCaster supports the following:

BLS - (Browser Live Stream) Drastic's lightweight high quality protocol
Compression supported: AVC1 h.264

CAST – CAST (Google Cast) is designed to send signals directly to TVs or TV Boxes (Roku, Google, LG, etc.).

CDI - (AWS Cloud Digital Interface) high-quality uncompressed video for the AWS Cloud

HLS Live - (HTTPS Live Stream) sends audio and video over HTTP for playback on iOS-based devices
Compression supported: h.264

NDI - (Network Device Interface) Any NDI audio/video source

OMT - (Open Media Transport) an open-source network protocol for high performance, low latency video over a local area network. It has been designed to support multiple high-definition A/V feeds on a standard gigabit network without any specialised hardware
Compression supported: YCbCr 8 bit

RIST - (Reliable Internet Stream Transport) - an open-source, open-specification transport protocol designed for reliable transmission of video over lossy networks with low latency and high quality
Compression supported:
H-264 4:2:0/4:2:2 Transport
HEVC 8/10 bit 4:2:0
MPEG 2 Transport 4:2:0/4:2:2
JPEG XS Light 8 bit 4:2:2
JPEG XS Main 10 bit 4:2:2

RTMP - (Real-Time Messaging Protocol). See the FlowCaster Quick Start guide for RTMP. Supported by youtube.com, facebook.com, twitch.com etc.

Compression supported: H-264 RTMP

RTP - (Real-time Transport Protocol) - provides end-to-end, real-time transfer of streaming media, with jitter compensation, detection of packet loss, and reordering for out-of-order delivery

Compression supported:

h.264
HEVC 4:2:0 10 bit
ProRes HQ 10
ProRes XQ 10

SRT - (Secure Reliable Transport). Caller, Listener, and Rendezvous modes supported. See the FlowCaster Quick Start guide for SRT.

Compression supported:

H-264 4:2:0/4:2:2 Transport
HEVC 8/10 bit
MPEG 2 Transport 4:2:0/4:2:2
JPEG XS YCbCr 10 Light
JPEG XS YCbCr 10 Main

ST 2110/2022 - requires an optional license for Rivermax and Mellanox NIC.

TCP - (Transmission Control Protocol) - TCP provides reliable, ordered, and error-checked delivery of a stream of octets (bytes) between applications running on hosts communicating via an IP network. Major internet applications such as the World Wide Web, email, remote administration, file transfer and streaming media rely on TCP, which is part of the transport layer of the TCP/IP suite.

Compression supported:

Uncomp YCbCr 10/8
JPEG XS YCbCr 10 Light/Main
ProRes HQ 10
ProRes XQ 10

UDP - (User Datagram Protocol) UDP is one of the core communication protocols of the Internet protocol suite used to send messages (transported as datagrams in packets) to other hosts on an IP network.

Compression supported:

H-264 4:2:0/4:2:2 Transport
HEVC 8/10 bit 4:2:0
MPEG 2 Transport 4:2:0/4:2:2
JPEG XS YCbCr 10 Light/Main

WebRTC - (Web Real-Time Communication). Supported in flowcaster.live, direct browser, millicast.com, etc.

Compression supported: H-264

WHIP - (WebRTC-HTTP ingestion protocol). Supported in flowcaster.live, direct browser, millicast.com, etc.

Compression supported: H-264

URL field – use the field to enter the URL details that will be used to send the stream. Displays the current setting.

Latency field – specify the latency setting in milliseconds (Ms.).

Encryption pulldown menu – select between **None** (do not apply encryption), **128** (use 128 bit encryption), or **256** (use 256 bit encryption).

Password field – a password (and a user name) can be set to limit access to people who are provided with the password and user name details.

User field – a user name can be set, so anyone trying to access the stream must enter the user name and password before being granted access.

Stream # field – specify which stream number you are sending, where there are multiple streams.

Compression pulldown menu – use to select between available compression types for the output stream. Available types vary depending on which stream protocol is being used.

Structure pulldown menu – provides a choice between IPPP, IBBP, and IIII GOP structures for the stream output.

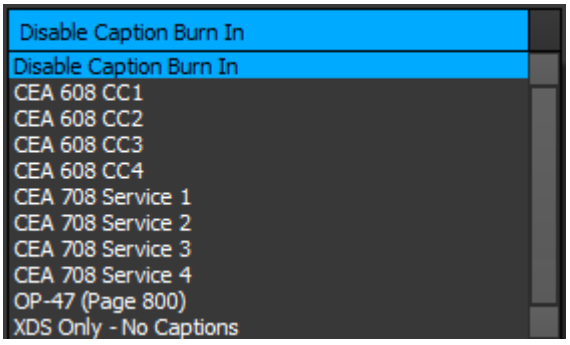
Bit Rate field and slider – enter the preferred data rate in the field, and/or use the slider to set a bit rate for the output stream. Displays the current bit rate setting.

Streaming Limits checkbox – Used where the source media provides HDR signalling. Check this box if you are sending HDR source media to a capable receiver.

Disable TC and PIDs checkbox – check to specify that time code and captions will not be included in the output stream.

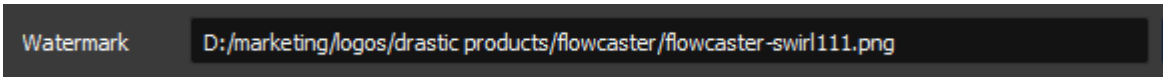
Audio Mode pulldown menu – select between stereo, stereo mix, 4 channels, 8 channels, or 16 channels.

Play Audio Locally checkbox – select to also play the audio associated with the output stream through your local audio output device, for confidence monitoring.



Closed Caption Burn In pulldown menu – select between available closed caption types if you want to “burn” captions into the output stream, or select **Disable Caption Stream Burn** In to specify no captions will be burned into the output stream. Once captions are burned in, they cannot be turned on and off by the user, and have become subtitles, or “open” captions.

Watermark specify and locate controls – to overlay a watermark on the output stream, the middle button (…) opens a browser where you can locate and select a watermark to overlay.



The watermark field will display the location of the watermark where one has been selected. The location field can be used to set the position of the watermark. The default setting is 0,0, which means 0 pixels from the top, and 0 pixels from the left edge. To move the watermark from the adjust the numbers upward (but do not locate the watermark outside the confines of the screen).

Language pulldown menu – shows the current language, and allows the user to select between:

Chinese
English
French
German
Italian
Japanese
Korean
Portuguese
Russian
Spanish
Turkish

Burn In TC section – check this box to burn time code into the output stream. The two numbers to the right allow the user to adjust the location of the burned in time code.

Check for new versions on startup checkbox – check to specify that FlowCaster should check the Drastic website to see if any newer versions are available for download when it starts up.

Enable checkbox – check to enable a new configuration.

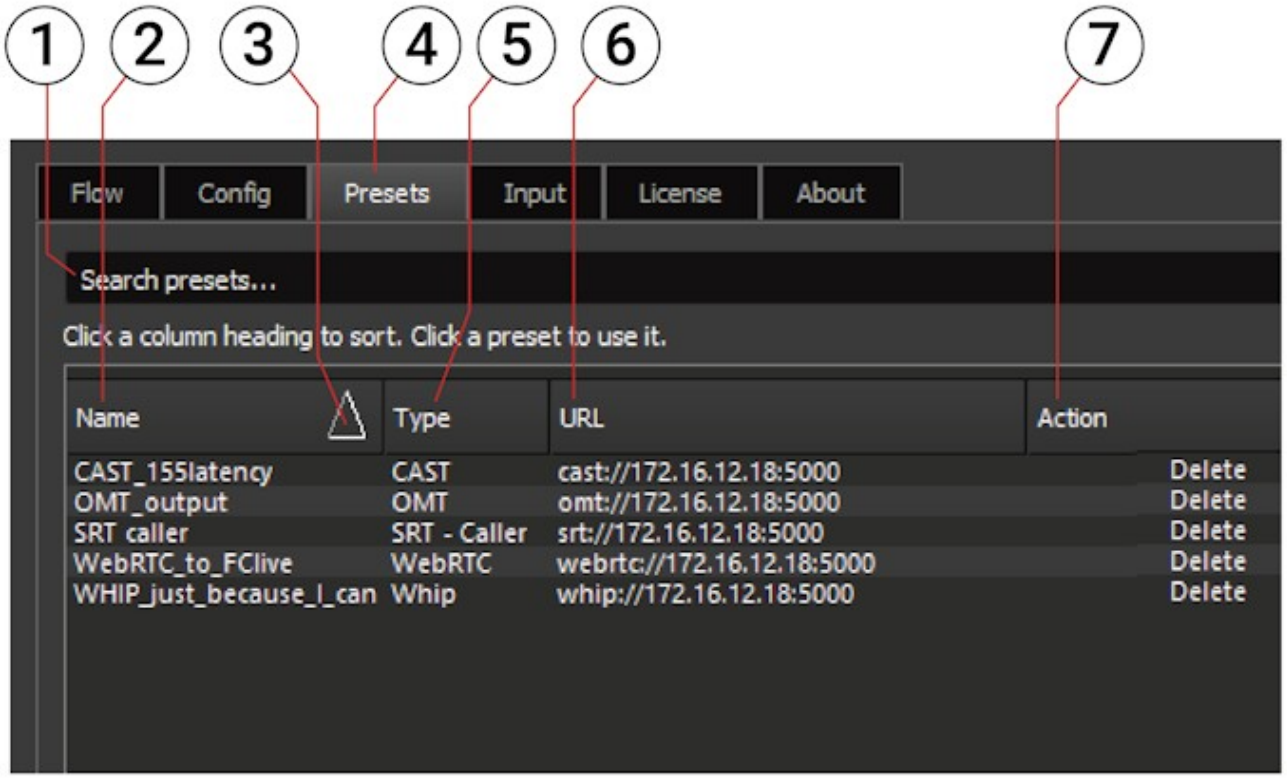
Set New Config button – where a configuration has been changed, this button turns purple. In this state, pressing the button will activate the new settings, and return to the Flow tab to monitor output progress.

OK button – accept any settings changes, and close the application.

Close button – close the application.

3.3 Presets Tab

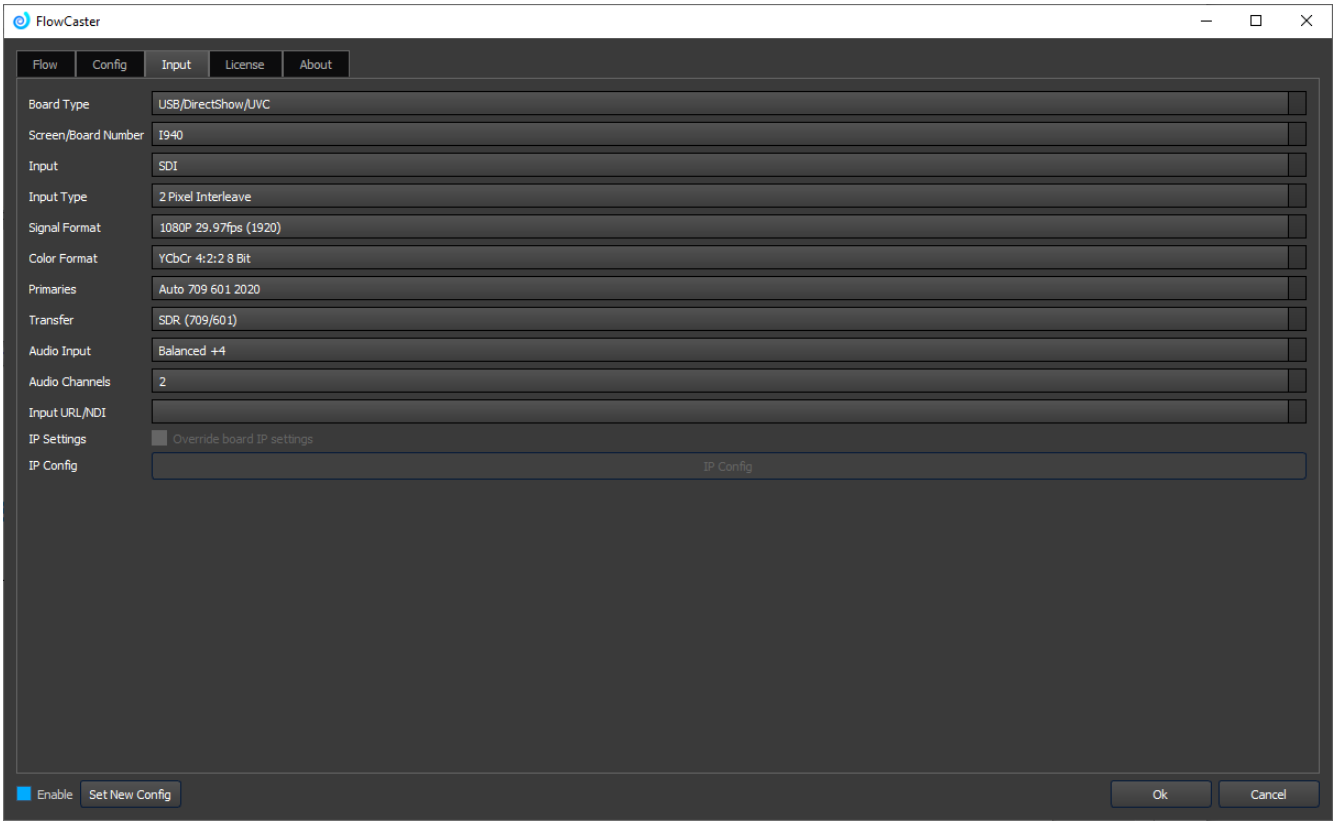
The Presets tab provides controls and displays to load saved configuration presets, and to search through the presets.



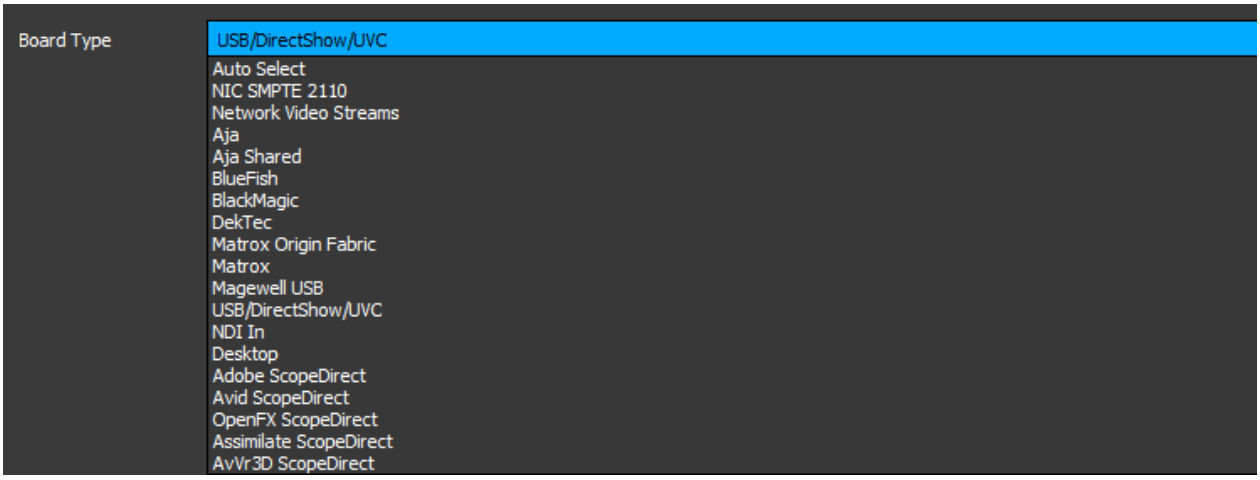
1. **Search presets** field – provides a search function for any presets, allowing the user to quickly narrow down large lists to a specific preset.
2. **Name** column – displays the preset name as the user typed it in.
3. **Ascending/descending** button – click to re-order the list alphabetically, A-Z, or Z-A.
4. **Presets** tab – with the **Presets** tab selected the presets controls and displays are available.
5. **Type** column – displays the IP format type used in the preset.
6. **URL** column – displays the output Url for the preset.
7. **Action** column – for each preset, a **Delete** button is provided so the user can remove any presets they will no longer use.

3.4 Input Tab

The Input tab provides controls and displays to set up the input source.



Board Type



Board Type pulldown menu – select between available “board” types to use for the input.

Currently supported types include:

Adobe ScopeDirect – After Effects, Premiere Pro

AJA – AJA board installed in the system

AJA Shared – share an AJA board with a creative application

Assimilate ScopeDirect – SCRATCH family

Auto Select – look for a valid input type and try to use it. Not recommended.

Avid ScopeDirect – Media Composer, NewsCutter

AvVr3D ScopeDirect – UnReal Engine

Blackmagic – Blackmagic board installed in the system

Bluefish – Bluefish444 board installed in the system

Desktop – Select a desktop to send, works well in a two monitor setup.

Matrox – Matrox board installed in the system

NDI – Any NDI Source

NIC SMPTE 2110 – output via ST-2110 streams (3rd party hardware and software required)

OpenFX ScopeDirect – Windows/macOS/Linux, supports DaVinci

Screen/Board Number

Screen/Board Number pulldown menu – Drastic software maintains a list of devices that have

been used in the application. Depending on how many workflows have been set up, there may be quite a list of recently used boards. Sometimes the user may need to cycle through available boards until the “right” one is found.

Input pulldown menu – select between SDI and HDMI (hardware dependent).

Input Type pulldown menu – select between 2 Pixel Interleave, and Square Pixel input types (hardware dependent).

Signal Format pulldown menu – choose the video standard to send. FlowCaster supports a wide range of standards from SD to 8K, depending on the workflow and system capabilities.

Color Format pulldown menu – choose between available color formats, including YCbCr 4:2:2 8 bit and 4:2:2 10 bit.

Primaries pulldown menu – choices include:

Auto 709 601 2020 – try to detect the primaries setting from the input signal
CCIR 601
CCIR 601 Full
Rec.709
Rec.709 Full
BT.2020
BT.2020 Full

Transfer pulldown menu – choices include:

SDR (709/601) – standard dynamic range
PQ/HDR10
HLG

Audio Input pulldown menu – balanced, unbalanced, etc. (hardware dependent)

Audio Channels pulldown menu – number of audio channels (2, 8, 16, 32).

Input URL/NDI pulldown menu – for IP streams like NDI or ST-2110, specify the URL or stream name.

IP Settings checkbox – check to Override any board IP settings with the new configuration

IP Config button – for ST-2110 input, opens the Config setup dialog.

Enable button – check to enable any changes.

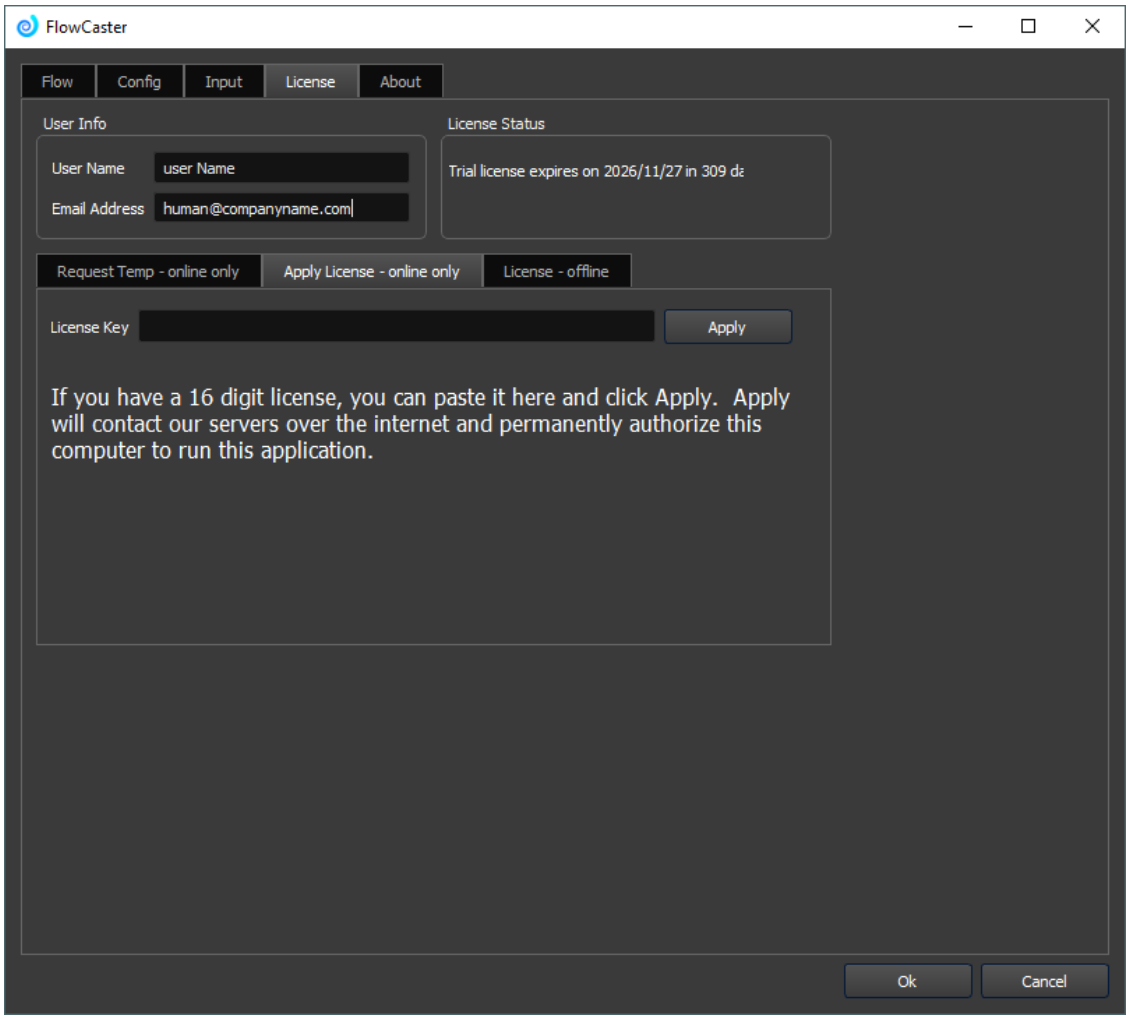
Set New Config button – click to set the new configuration into the Config file.

OK button – accept any settings changes, and close the application.

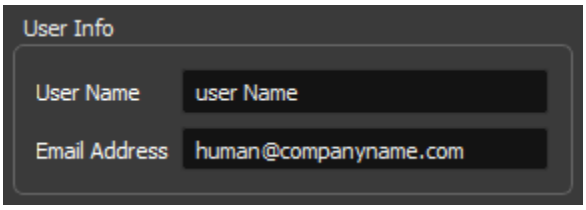
Close button – close the application.

3.5 License Tab

The license tab shows user details, license status, and provides controls to license the system.



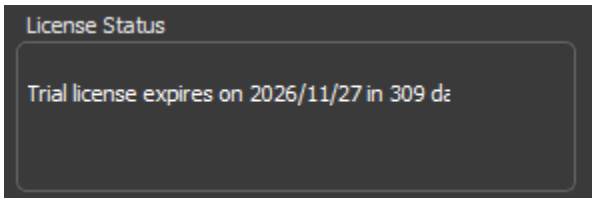
3.5.1 User Info Section



User Name field – Displays the user name. Currently this must be a first and last name.

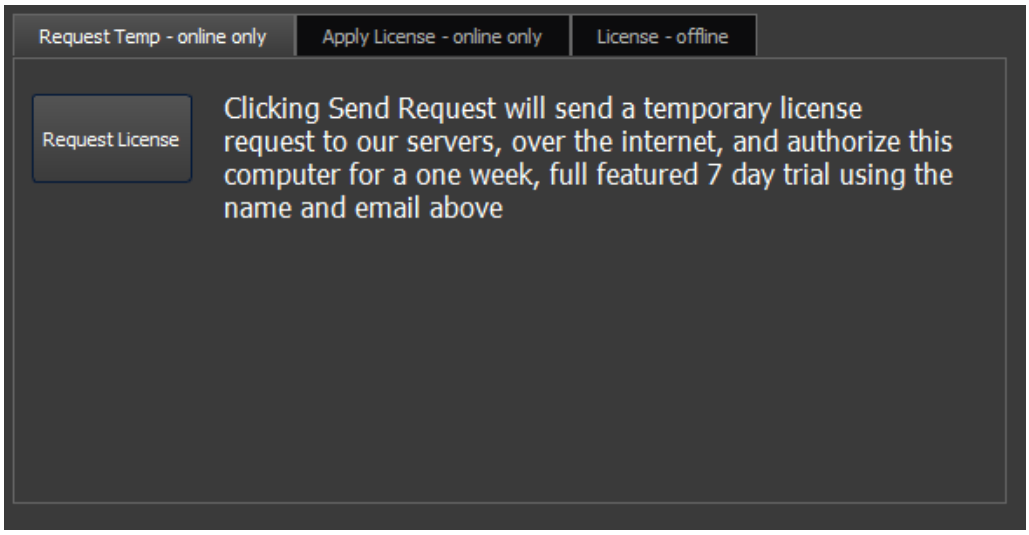
Email Address field – Displays the email address. Note: if you have a relatively new extension like .movie or .stream, our licensing application may not recognize it. This is the email address your online requests will be sent to, so make sure it is a valid address if you want to receive your keys.

3.5.2 License Status Section

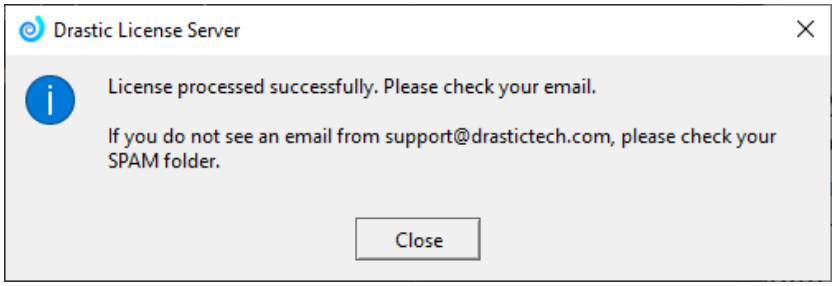


Displays the current license status, i.e. whether permanent, or temporary for x number of days.

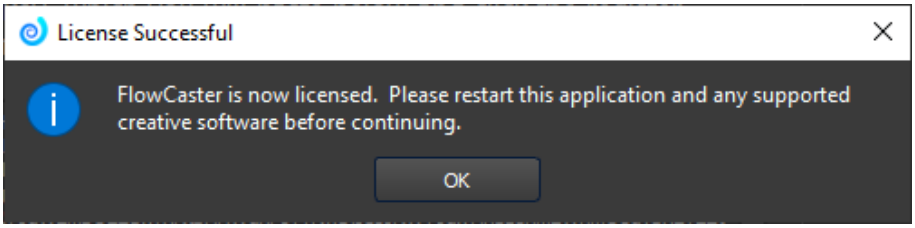
3.5.3 Request Temp Online Tab



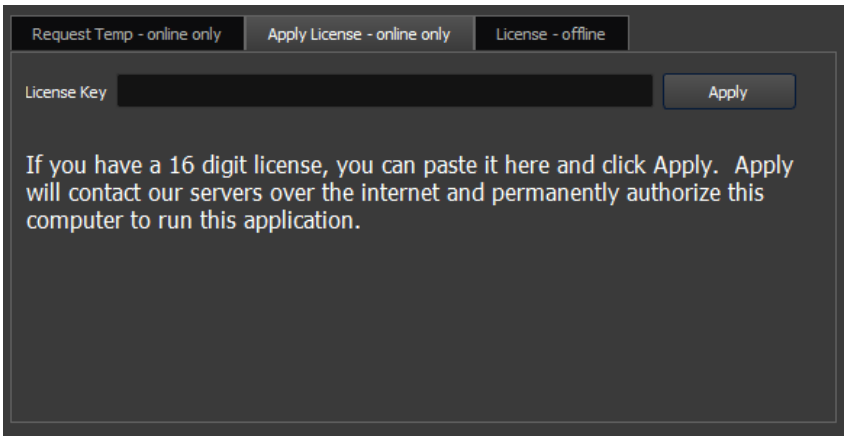
The **Request Temp** tab provides a **Request License** button. Pressing this button will send a request to our online server, and display the following message:



When you see this screen, check your inbox for a message from Drastic support. In the message will be a site code – copy the site code to the clipboard and go back to the licensing tab. Click the Offline tab, and paste the key into the site key field, and press the **Register** button. A successful licensing procedure will display the following message:



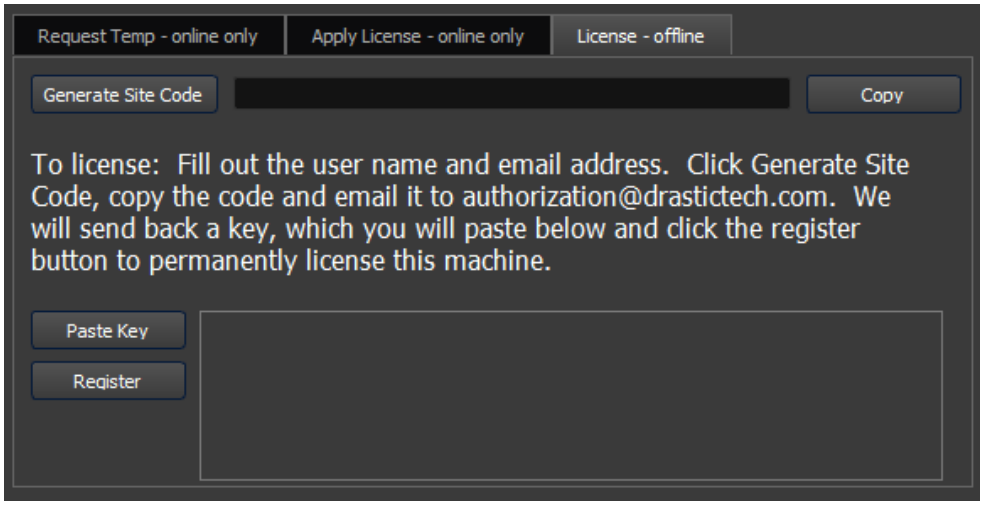
3.5.4 Apply License Online Tab



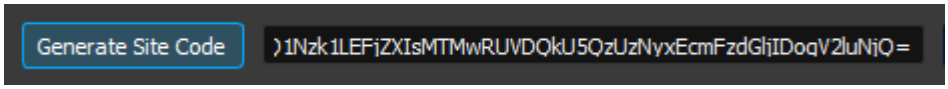
For some workflows a special 16 digit license will be provided. This key requires online access. It needs to be validated each time the software starts up, but instead of looking at a license file on the system, it confirms the license status from an online database.

3.5.5 License Offline Tab

This section lets you generate a site code to send to Drastic, and apply a site key to enable the license.



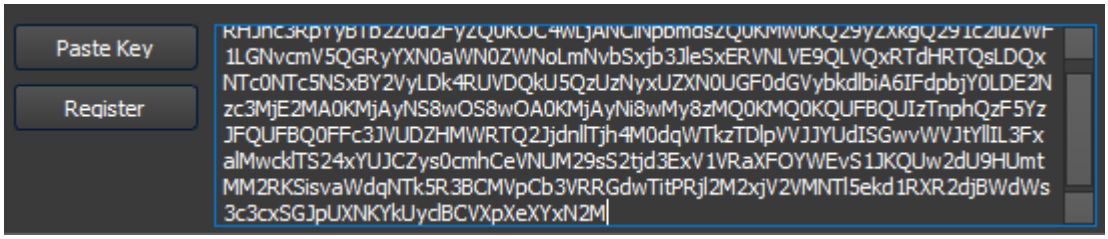
Generate Site Code button – pressing this button will take the User Info and system details to generate a site code. Drastic licenses are currently locked to the system they are installed on.



Site Code field – when the **Generate Site Code** button is pressed, a site code is pushed into the **Site Code** field.

Copy button – with a site code in the **Site Code** field, press the **Copy** button to copy this code to the clipboard. You can also select the code and use CTRL+C. To license the software for use, **send us an email** with the site code in the body of the email. Make sure to confirm which Drastic software you need to license in the request.

Paste Key button – when you receive the email reply from Drastic with the site key in it, copy the key, and press this button to paste the key into the **Key** field. You can also use CTRL+V.



Key field – this field displays the site key you have pasted. They are quite a long string of alphanumeric characters. We do not provide these over the phone.

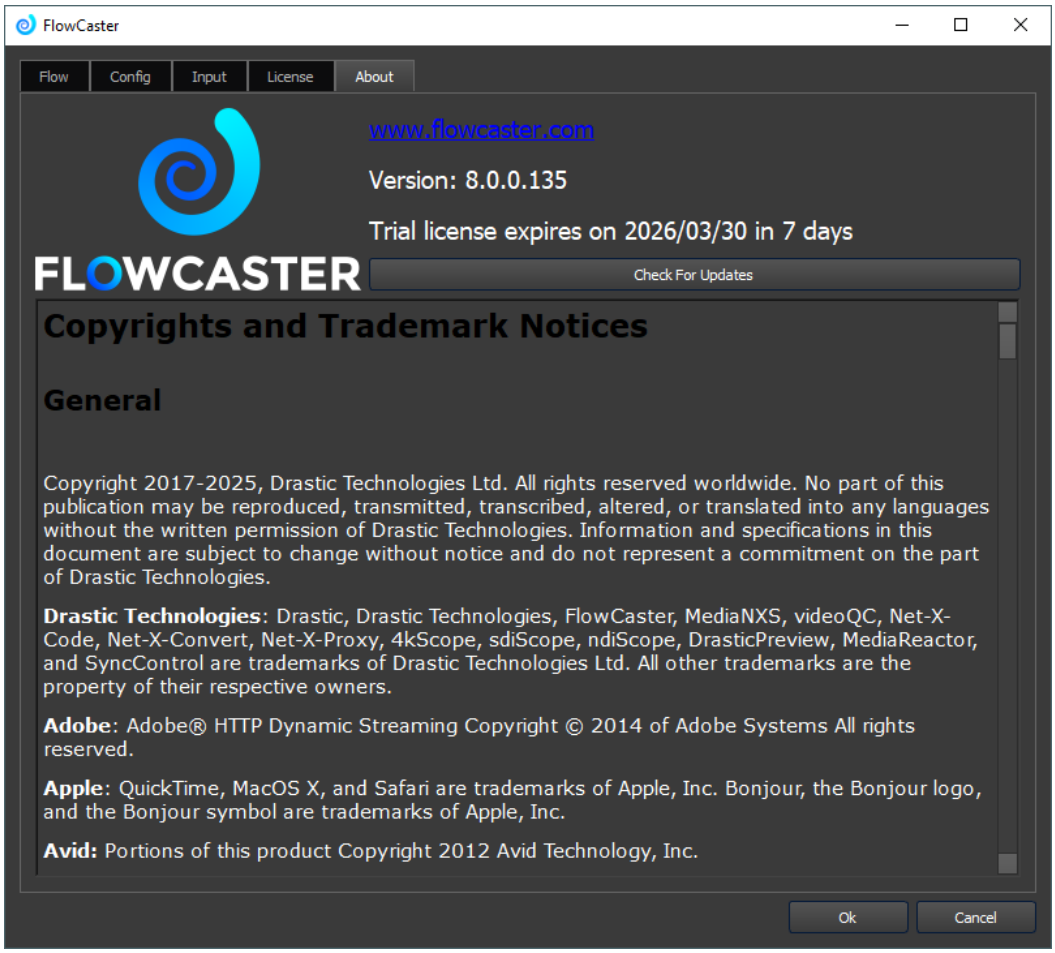
Register button – once the site key has been entered into the **Key** field, pressing the **Register** button sets the key into the licensing application. Drastic software will need to be restarted for the license to be fully enabled.

OK button – accept any settings changes, and close the application.

Close button – close the application.

3.6 About Tab

The About tab provides product and trademark details for Drastic software and the install.

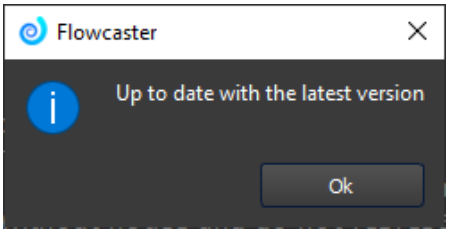


FlowCaster Logo – since the ico in the top left corner is so small, you might want a look at a larger version of the FlowCaster product logo.

www.flowcaster.com link – if you need details on the software, you can always go to the web page and view technical specifications, related articles, etc.

Version Number – displays the version number of the current install.

License Status display – shows whether the license is permanent, or temporary for x number of days.



Check For Updates button – press to confirm whether there is a more recent version available for download. An up to date install would produce the above up to date message.

If a newer version is available, a message would appear and indicate the download's build number, and offer the opportunity to download the latest install.

OK button – accept any settings changes, and close the application.

Close button – close the application.

4 Using IP Video Streaming

Drastic software supports a number of IP video standards in FlowCaster and other Drastic products such as videoQC, Net-X-Code Server, NETXROUTER, and DrasticScope. To access these streams, a URL style string is used to describe them. For some sources, like RTSP, this string is fairly standard. For others, like NDI, a URL style has been developed to allow those streams to be specified. Currently, udp://, rtp://, srt://, rtsp://, ndi://, s2022:// and s2110:// are supported. This document describes the URLs' format in more detail. We have also added some application specific notes for connecting our software to other applications.

4.1 Basic IP Video URLs

An IP video URL will always start with the type of stream you are expecting. Some of the types include udp://, rtp://, rtsp://, ndi://, s2022:// and s2110://. This will be followed by an IP address or resolvable name for the address of the stream. For some streams there will be a port value, and then a description of the stream on that device. For videoQC, there is also a special form that can be used to launch videoQC, FlowCaster iOS Player or FlowCaster Android Player automatically from a browser link. For these, simply preface the link you want with videoqc:// and remove the extra colon from the link.

4.2 BLS (Bliss Protocol)

BLS [Browser Live Stream] is a protocol developed by Drastic to send live video, via an encrypted channel directly to a user's browser. It allows for much higher quality video than WebRTC, while still not requiring any plugins or special setup to present audio and video directly in a modern, HTML5 browser. Here are a couple examples:

- bls://10.0.0.234:5000
- blss://192.168.202.200:3000?password=kfiwgt84jsd&remoteip=120.32.54.6

Compression supported: AVC1 h.264

4.3 Google CAST

CAST is designed to send signals directly to TVs or TV Boxes (Roku, Google, LG, etc). Google Cast is a proprietary protocol developed by Google for playing locally stored or Internet-streamed audiovisual content on a compatible consumer device. The protocol is used to initiate and control playback of content on digital media players, high-definition televisions, and home audio systems using a mobile device, personal computer, or smart speaker.

URL	→ host	→ type
cast://192.168.0.159:8009?type=cast	192.168.0.159	cast
cast://192.168.0.147:8060/	192.168.0.147	roku
cast://192.168.0.161:1622/	192.168.0.160	dlna
cast://192.168.0.159:8008/ssdp/device-desc.xml (auto-discovery form)	192.168.0.159	cast

This covers most smart TVs except Apple TV. For Apple TVs, use our FlowCaster Player.

Note: Roku devices will need to load our streaming app to make it work.

Compression supported: h.264

4.4 CDI

CDI [AWS Cloud Digital Interface] is an advanced, fully uncompressed, protocol for use within Amazon VMs. It transports video in a number of formats, as well as audio, time code and other metadata. While it is possible to use CDI with Amazon's enhanced network backbone, it is safest and most efficient, within their network stacks. The URL will include a local IP and port, with an optional remote IP, adapter and ID. Here are some examples:

- cdi://10.0.0.2:6000
- cdi://10.0.0.1:6000?remoteip=10.0.0.200&adapter=EFA&id=2

Possible parameters include:

- remoteip: a remote computer to connect to exclusively
- adapter: the transport, EFA (Elastic Fabric Adapter) or socket. EFA is the default.
- id: a numeric value to specify the stream

Format is uncompressed.

4.5 HLS

HLS [HTTP Live Streaming] is an HTTP-based adaptive bitrate streaming communications protocol developed by Apple Inc. HLS resembles MPEG-DASH in that it works by breaking the overall stream into a sequence of small HTTP-based file downloads, each downloading one short chunk of an overall potentially unbounded transport stream. A list of available streams, encoded at different bit rates, is sent to the client using an extended M3U playlist.

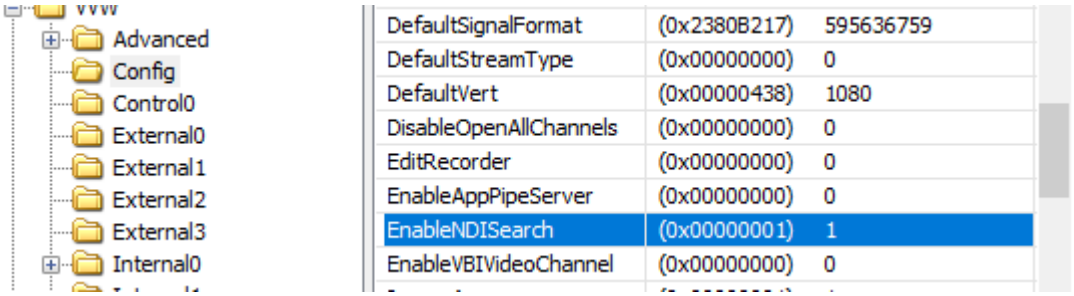
The standard also includes a standard encryption mechanism and secure-key distribution using HTTPS, which together provide a simple DRM system. Later versions of the protocol also provide for trick-mode fast-forward and rewind, and for integration of subtitles.
HLS Encoder: codify video files in H.264 format and audio in AAC, MP3, AC-3 or EC-3. This is encapsulated by MPEG-2 Transport Stream or MPEG-4_Part_14 to carry it.

HLS Segmenter: divides the stream into fragments of equal length. It also creates an index file that contains references of the fragmented files, saved as .m3u8.

Compression supported: h.264

4.6 NDI

NDI [Network Device Interface] is a video over IP protocol. It requires a device name and a source name to access NDI sources. NDI sources may also be searched on the local network. To enable the search, run DDRConfig and select the Advanced tab. Go to /VVW/Config and change EnableNDISearch = 1. If it does not exist, then create a new Numeric value for it.



To specify an NDI stream, use the device name, followed by a space, and then the source name within brackets. Here are some examples:

- ndi://USER-PC (Desktop [2])
- ndi://TestCameraSource (ISO_1)
- ndi://PC2 (Google Chrome [1])

4.7 OMT

OMT - [Open Media Transport)] an open-source network protocol for high performance, low latency video over a local area network. It has been designed to support multiple high-definition A/V feeds on a standard gigabit network without any specialised hardware

Compression supported: YCbCr 8 bit

4.8 RIST

RIST [Reliable Internet Stream Transport] streams are UDP based self correcting connections. RIST supports three profiles: Simple, Main, and Advanced. Both the sender and the receiver must be in the same mode. The receiver will be the server and listen for a connection. The sender will be the client and connect to the receiver to send the data. The protocol will use two ports, the lower of which is specified in the URL and the higher which is the lower plus one. The lower port must be even.

Here are a few examples:

- rist://10.0.0.123:5000?mode=listener&profile=main
- rist://192.168.1.22?mode=caller&profile=simple

Possible parameters include:

- mode: listener (for server/receiver), caller (for client/sender) - Required
- profile: simple. main or advanced
- password: encryption key

- buffering: amount of buffer in milliseconds

Compression supported:

H-264 4:2:0/4:2:2 Transport
HEVC 8/10 bit 4:2:0
MPEG 2 Transport 4:2:0/4:2:2
JPEG XS Light 8 bit 4:2:2
JPEG XS Main 10 bit 4:2:2

4.9 RTMP

RTMP [Real-Time Messaging Protocol] is normally used to stream one video and one stereo audio channel to a website for distribution to multiple watchers. In modern sites, the RTMP is actually re-wrapped into HLS, which is then viewed by the end user. To connect to an RTMP site, like flowcaster.live, youtube.com, and twitch.com, you will need the URL/Link and the key/secret. For YouTube, they are available after you 'go live' as the Stream URL and the Stream Key. Once you have them, you simply add a slash and the Stream Key to the Stream URL. For example:

Stream URL: rtmp://a.rtmp.youtube.com/live2
Stream Key: j2bg-a6ck-8t48-w2y2-aaaa
Final URL: rtmp://a.rtmp.youtube.com/live2/j2bg-a6ck-8t48-w2y2-aaaa

Compression supported: H-264 RTMP

4.10 RTP

RTP [Real-time Transport Protocol] streams can be elementary video or audio streams, or more commonly a transport stream with PMT/PAT (Program Association Table/Program Mapping Table) and a number of streams within it. For RTP, you can specify a TCP (direct) address, but normally it will be a multicast group address, and also a port is normally specified. Here are examples:

- rtp://239.100.20.20:50004
- rtp://239.100.30:31:1234

Compression supported:

h.264
HEVC 4:2:0 10 bit
ProRes HQ 10
ProRes XQ 10

4.11SRT

SRT [Secure Reliable Transport] streams contain a transport stream with PMT/PAT and a number of streams within it. For SRT you can specify an address and a port. There are three modes for SRT: listener, caller and rendezvous. If you are a listener, you can only connect with a caller and vice versa. For Rendezvous, both the sender and receiver must be in rendezvous mode. A password for encrypted service can also be set. Here is some information on the modes:

- **listener** - this has to be one of your local IP addresses, and acts as a server waiting for a connection, so it must be directly visible to the caller (not behind a firewall)

- **caller** - this calls out to a remote IP that is running as a listener. You must be able to reach the IP directly (e.g. no firewall)
- **rendezvous** - this connects bidirectionally, allowing it to connect through firewalls without extra configuration. Each side of the rendezvous uses the external (internet facing) IP address of their internet connection. This allows the signals to connect and pass through the firewall

Here are a few examples:

- srt://239.254.40.40:5004?mode=listener
- srt://172.12.25.20:5006?mode=caller
- srt://239.100.30:31:1234?mode=caller&password=thisisapassword&user=thisisauser

Possible parameters include:

- mode=
    - caller
    - listener
    - rendezvous
- password=<string>
- keylen=16|24|32
- username=<string>
- streamid=#
- latency=#
- buffering=#
- maxbw=#

Compression supported:

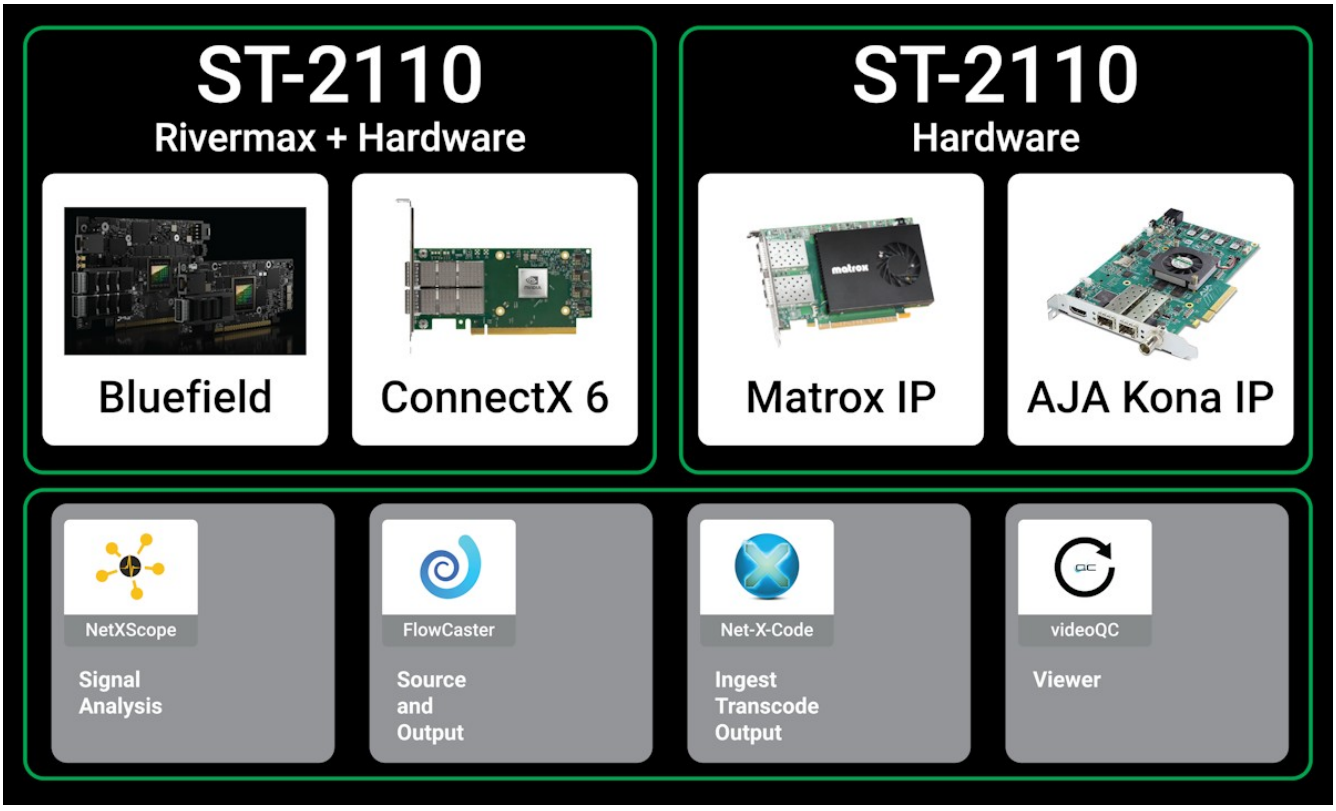
H-264 4:2:0/4:2:2 Transport
HEVC 8/10 bit
MPEG 2 Transport 4:2:0/4:2:2
JPEG XS YCbCr 10 Light
JPEG XS YCbCr 10 Main

4.12 ST-2110 and ST-2022-6

The SMPTE 2022-6 and SMPTE 2110 protocols can be accessed via SDP (Session Description Protocol) or manual setup. To access an SDP source:

- s2202://192.168.101.200/channel1.sdp
- s2110://mainsources.drastic.ca/crosspoint10.sdp

For some Drastic software, the source can be set up manually. For S2022, this is a single set of Source IP, Source Port, Destination IP, Destination Port and Interface address. One or any combination of these can be used to describe the source of the SMPTE 2022-6 stream, which contains all the video, audio and HANC/VANC channels. For SMPTE 2110, up to three sets of the same information are required to describe the video, audio and anc streams, which are all separate. A PTP (Precision Time Protocol) grandmaster may also be specified.



ST-2110 and ST-2022 require one of the following environments:

NVidia Hardware + Rivermax: Bluefield-2 or Connect-X 6 (requires Rivermax license)
View the Video Overview

Here is a page with some Great ST-2110 Links
Here is our Rivermax Setup page

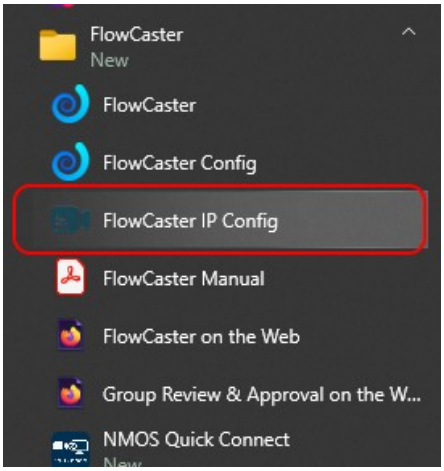
SMPTE 2110 hardware

Matrox: ST 2110 Network Adapters
AJA: Kona IP

4.12.1 2110 Video Setup

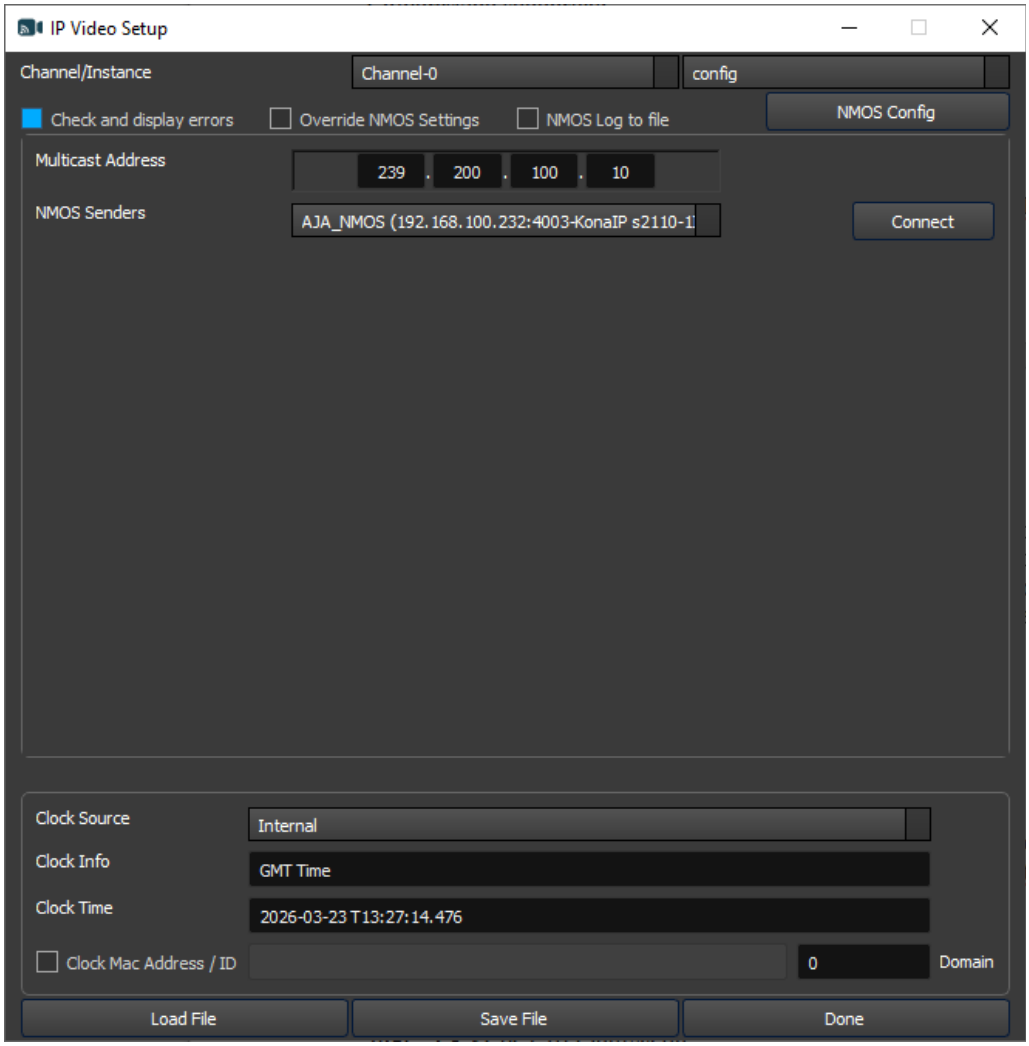
When set to ST-2110 or ST-2022 sources, the URL field is replaced by an **IP Config** button. This button opens the **IP Config** window.

The user can also open the **IP Video Setup** window from the start menu.

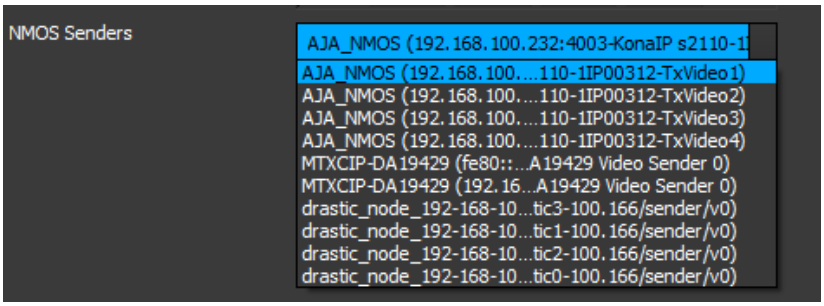


This application allows the user to set up how ST-2110 video is handled, and to specify the source, destination, and interface addresses for the Receiver, and the Sender. Clock source, master, and domain settings are present. Settings are maintained separately for video, audio, and ancillary data.

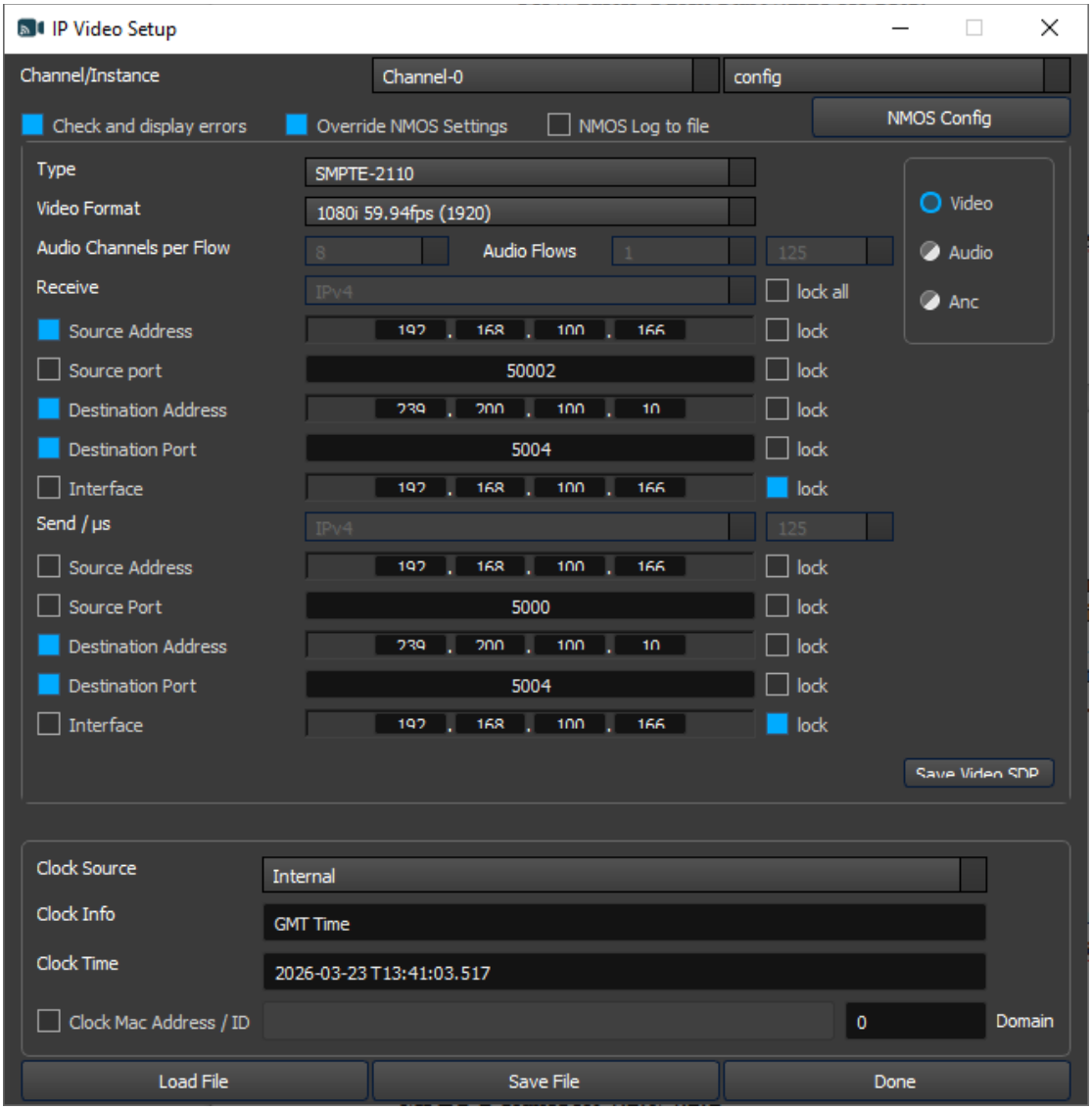
In many cases, ST-2110 flows will be handled by NMOS. Minimal controls are provided, since all the details are taken care of.



The selected NMOS source's settings are used to control 2110 flows. FlowCaster will try to locate and display all accessible NMOS sources, so make sure to select the right one.



To set up the ST-2110 flow manually, select the **Override NMOS Settings** checkbox.

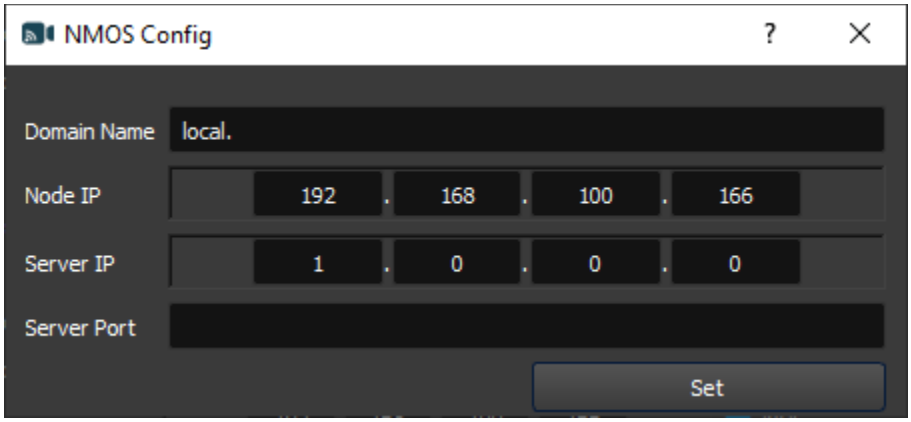


Channel pulldown – select between channels.

Check and display errors checkbox – monitor for errors, and display error message if they occur.

Override NMOS Settings checkbox – select to automatically set up the configuration according to the source signal parameters.

NMOS Log to file checkbox – check to specify an NMOS log should be saved to file.



NMOS Config button – opens the **NMOS Config** window, where the user can specify the **Domain Name**, the **Node IP**, the **Server IP**, and the **Server Port**.

Type pulldown menu - select between SMPTE-2110, SMPTE-2022, or TR-01.

Video Format pulldown menu - select between available video standards.

Video/Audio/Ancillary selector – select between settings for either video, audio, or ancillary streams.

AUDIO SETTINGS (grayed out in the video section)

Audio Channels per flow pulldown menu – allows the user to select the number of audio channels

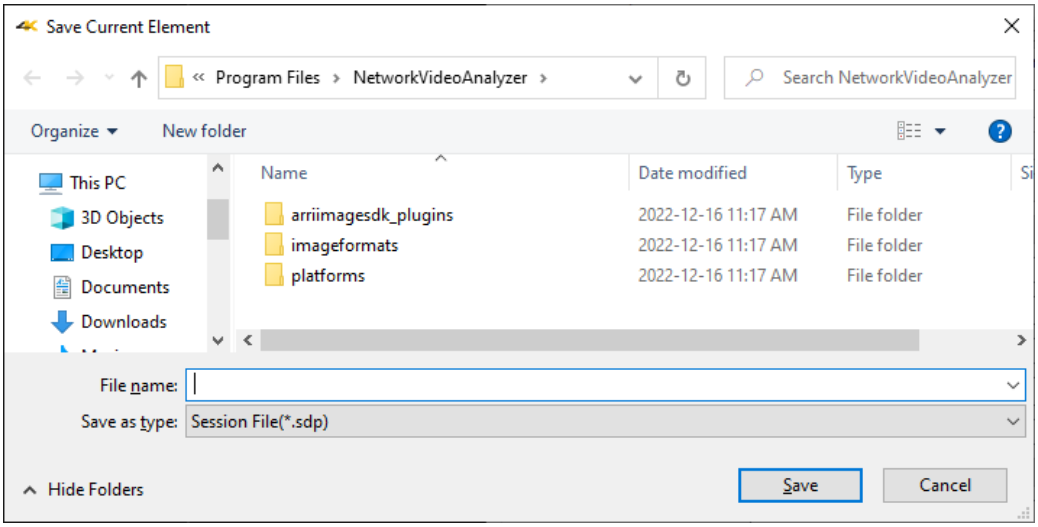
Audio Flows pulldown menu – flows per channel

Audio Packet Size pulldown menu – microseconds setting for audio packets. Audio in 2110/2022 is commonly split into packets of 125 microseconds or 1 millisecond, and this pulldown allows the user to set which one is used.

Receive pulldown menu / section – lets the user select the type of IP version used to receive IP video. Provides IP Address Settings for the Source Address, Source Port, Destination Address, Destination Port, and Interface are available. There is a Lock available for each setting, and a Lock All checkbox to set all the Receive addresses to the same address.

Send / µs pulldown menu / section – lets the user select the type of IP version used to send IP video, and adjust the setting for packet size in microseconds. Provides IP Address Settings for the Source Address, Source Port, Destination Address, Destination Port, and Interface are available. There is a Lock available for each setting, and a Lock All checkbox to set all the Receive addresses to the same address.

Save Video SDP button – opens the Save Current Element window, which allows the user to save all of the settings as a Session File (*sdp) for later retrieval.



Clock Source pulldown menu – select the clock source. Choices include Internal, H/W SMPTE 2059/PTP, S/W SMPTE 2059/PTP, or Free Run.

Clock Info field – displays information about the clock setting.

Clock Time field – displays the current time in YYYY-MM-DD-THH-MM-SS-µs

Clock Mac Address / ID checkbox – click to activate the Mac Address boxes to the right, so you can enter the clock's Mac Address.

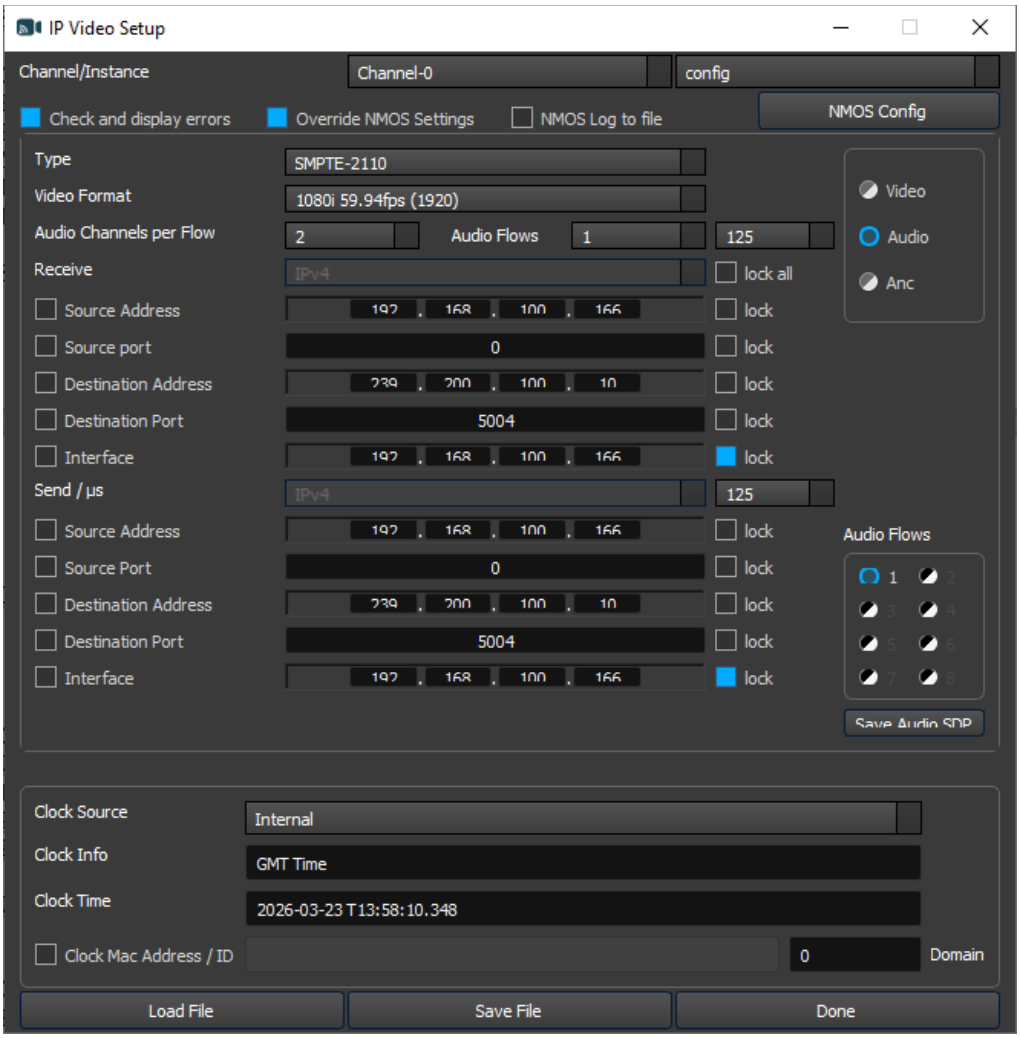
Domain field – displays the current domain setting.

Load File button – opens the Ini File browser, which allows the user to open an existing Ini File (*ini) to use the settings for the session.

Save File button – opens the save Ini File window, which allows the user to save all of the settings as an Ini File (*ini) for later retrieval.

Done button – press to accept all changes and close the IP Video Setup window.

4.12.2 ST-2110 Audio Setup

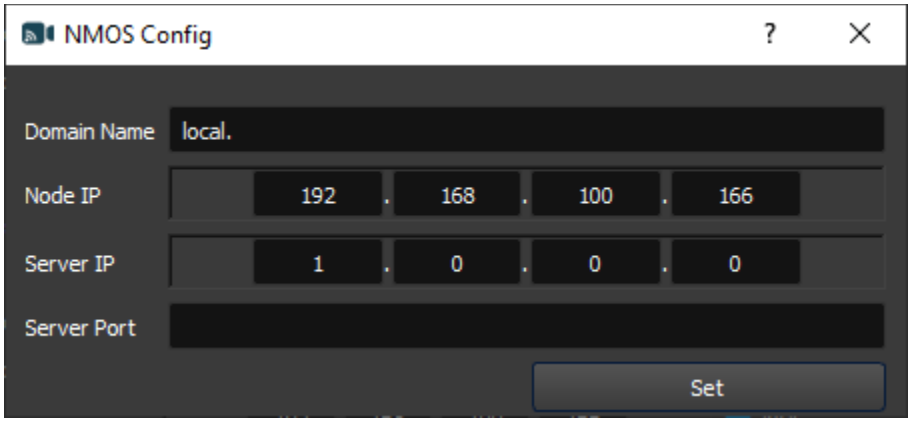


Channel pulldown – select between channels.

Check and display errors checkbox – monitor for errors, and display error message if they occur.

Override NMOS Settings checkbox – select to automatically set up the configuration according to the source signal parameters.

NMOS Log to file checkbox – check to specify an NMOS log should be saved to file.



NMOS Config button – opens the **NMOS Config** window, where the user can specify the **Domain Name**, the **Node IP**, the **Server IP**, and the **Server Port**.

Video/Audio/Ancillary selector – select between settings for either video, audio, or ancillary streams.

Type pulldown menu - select between SMPTE-2110, SMPTE-2022, or TR-01.

Video Format pulldown menu - select between available video standards.

Audio Channels / µs pulldown menu – allows the user to select the number of audio channels, and microseconds setting for audio packets. Audio in 2110/2022 is commonly split into packets of 125 microseconds or 1 millisecond, and this pulldown allows the user to set which one is used.

Receive pulldown menu / section – lets the user select the type of IP version used to receive IP video. Provides IP Address Settings for the Source Address, Source Port, Destination Address, Destination Port, and Interface are available. There is a Lock available for each setting, and a Lock All checkbox to set all the Receive addresses to the same address.

Send / µs pulldown menu / section – lets the user select the type of IP version used to send IP video, and adjust the setting for packet size in microseconds. Provides IP Address Settings for the Source Address, Source Port, Destination Address, Destination Port, and Interface are available. There is a Lock available for each setting, and a Lock All checkbox to set all the Receive addresses to the same address.

Clock Source pulldown menu – select the clock source. Choices include Internal, H/W SMPTE 2059/PTP, S/W SMPTE 2059/PTP, or Free Run.

Clock Info field – displays information about the clock setting.

Clock Time field – displays the current time in YYYY-MM-DD-THH-MM-SS-µs

Clock Mac Address / ID checkbox – click to activate the Mac Address boxes to the right, so you can enter the clock's Mac Address.

Audio Flows buttons – select specific channels, or Use Single Flow.

Save Audio SDP button – opens the Save Current Element window, which allows the user to save all of audio the settings as a Session File (*sdp) for later retrieval.

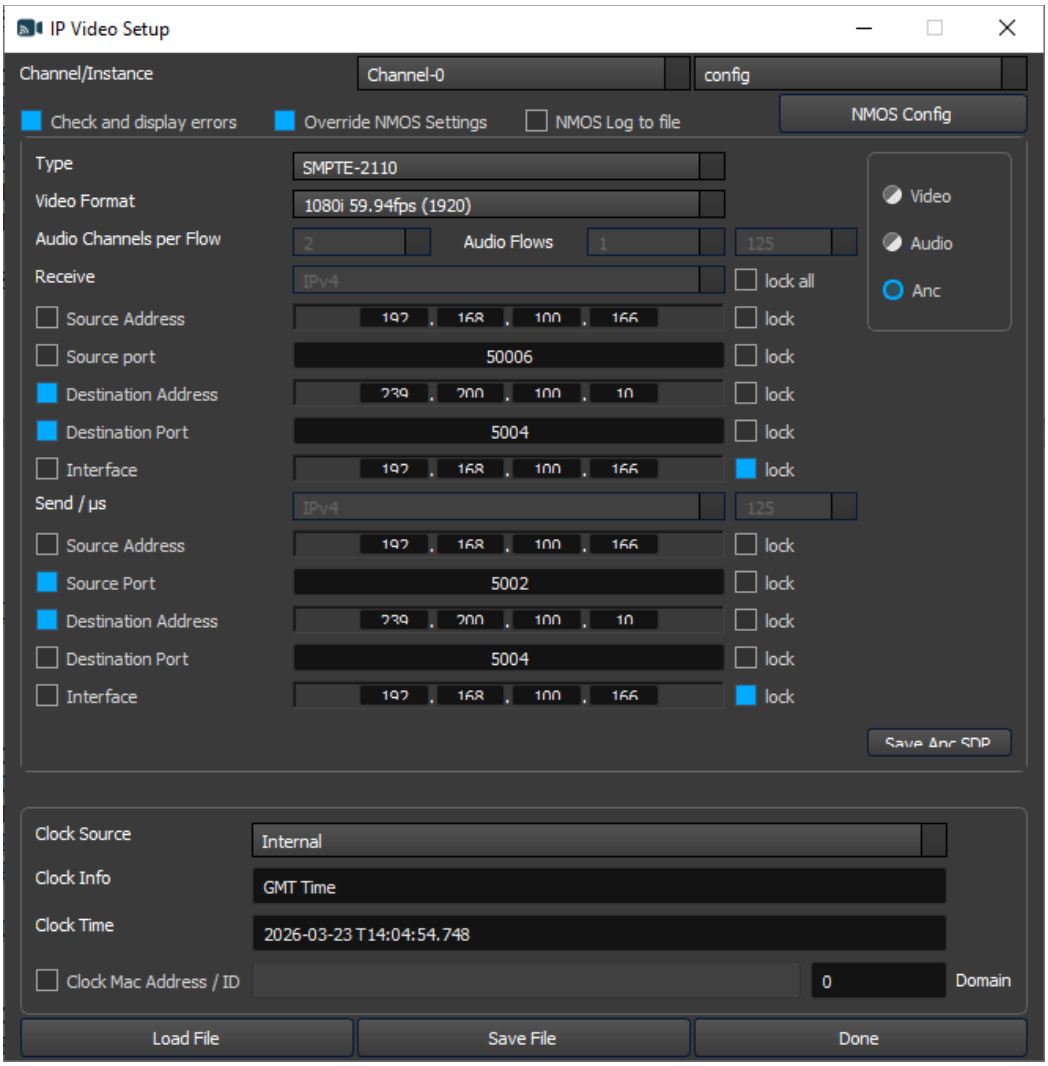
Load File button – opens the Ini File window, which allows the user to open an existing Ini File

(*ini) to use the settings again.

Save File button – opens the Ini File window, which allows the user to save all of the settings as an Ini File (*ini) for later retrieval.

Done button – press to accept all changes and close the IP Video Setup window.

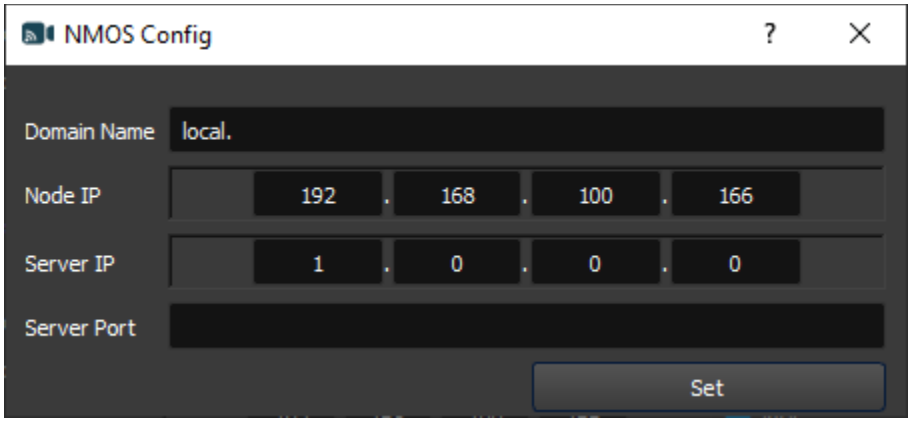
4.12.3 ST-2110 Anc Setup



Check and display errors checkbox – monitor for errors, and display error message if they occur.

Override NMOS Settings checkbox – select to automatically set up the configuration according to the source signal parameters.

NMOS Log to file checkbox – check to specify an NMOS log should be saved to file.



NMOS Config button – opens the **NMOS Config** window, where the user can specify the **Domain Name**, the **Node IP**, the **Server IP**, and the **Server Port**.

Video/Audio/Ancillary selector – select between settings for either video, audio, or ancillary streams.

Type pulldown menu - select between SMPTE-2110, SMPTE-2022, or TR-01.

Video Format pulldown menu - select between available video standards.

Audio Channels / µs pulldown menu – allows the user to select the number of audio channels, and microseconds setting for audio packets. Audio in 2110/2022 is commonly split into packets of 125 microseconds or 1 millisecond, and this pulldown allows the user to set which one is used.

Receive pulldown menu / section – lets the user select the type of IP version used to receive IP video. Provides IP Address Settings for the Source Address, Source Port, Destination Address, Destination Port, and Interface are available. There is a Lock available for each setting, and a Lock All checkbox to set all the Receive addresses to the same address.

Send / µs pulldown menu / section – lets the user select the type of IP version used to send IP video, and adjust the setting for packet size in microseconds. Provides IP Address Settings for the Source Address, Source Port, Destination Address, Destination Port, and Interface are available. There is a Lock available for each setting, and a Lock All checkbox to set all the Receive addresses to the same address.

Save Anc SDP button – **opens the Save Current Element** window, which allows the user to save all of the Anc settings as a Session File (*sdp) for later retrieval.

Clock Source pulldown menu – select the clock source. Choices include Internal, H/W SMPTE 2059/PTP, S/W SMPTE 2059/PTP, or Free Run.

Clock Info field – displays information about the clock setting.

Clock Time field – displays the current time in YYYY-MM-DD-THH-MM-SS-µs

Clock Mac Address / ID checkbox – click to activate the Mac Address boxes to the right, so you can enter the clock's Mac Address.

Load File button – opens the Ini File window, which allows the user to save all of the settings as an Ini File (*ini) for later retrieval.

Save File button – opens the Ini File window, which allows the user to open an existing Ini File (*ini) to use the settings again.

Done button – press to accept all changes and close the IP Video Setup window.

4.13 TCP

TCP (Transmission Control Protocol) provides reliable, ordered, and error-checked delivery of a stream of octets (bytes) between applications running on hosts communicating via an IP network.Three way handshake (active open), retransmission, and error detection adds to the reliability. Major internet applications such as the World Wide Web, email, remote administration, file transfer and streaming media rely on TCP, which is part of the transport layer of the TCP/IP suite.

Compression supported:

- Uncomp YCbCr 10/8
- JPEG XS YCbCr 10 Light/Main
- ProRes HQ 10
- ProRes XQ 10

4.14 UDP

UDP [User Datagram Protocol] UDP is one of the core communication protocols of the Internet protocol suite used to send messages (transported as datagrams in packets) to other hosts on an Internet Protocol (IP) network. Within an IP network, UDP does not require prior communication to set up communication channels or data paths.

UDP is a connectionless protocol, meaning that messages are sent without negotiating a connection and that UDP does not keep track of what it has sent. UDP provides checksums for data integrity, and

port numbers for addressing different functions at the source and destination of the datagram. It has no handshaking dialogues and thus exposes the user's program to any unreliability of the underlying network; there is no guarantee of delivery, ordering, or duplicate protection

For UDP, you can specify a TCP (direct) address, but normally it will be a multicast group address, and also a port is normally specified. Here is an example:

- udp://239.254.40.40:5004

Compression supported:
H-264 4:2:0/4:2:2 Transport
HEVC 8/10 bit 4:2:0
MPEG 2 Transport 4:2:0/4:2:2
JPEG XS YCbCr 10 Light/Main

4.15 WebRTC

WebRTC [Web Real-Time Communication] is a browser native method of sharing video, audio and data. It is primarily used in chat programs, like Google Meet. When sending via WebRTC, FlowCaster appears as a person in the chat, with whatever video and audio it is receiving being sent to the chat. Here is an example:

- webrtc://flowcaster.live?meetingid=asre-dsec-asds-seff&name=flowcaster

WebRTC uses a bunch of standard ports:

- Access to ports TCP + UDP 4443, 3478, 443 for www.flowcaster.live
- Access to video streaming services in VPN and Firewall settings
- Ports used: 80, 443, 4443, 3478 (TCP and UDP), 5349 TCP, 40000:65535 UDP

Compression supported: H-264

4.16 WHIP

WHIP [WebRTC-HTTP ingestion protocol] is a simpler negotiation system for WebRTC. Currently in use by Millicast to receive streams for worldwide, low latency transmission, FlowCaster and Net-X-Code support sending video signals via WHIP. WHIP requires an authorization code (available from the Millicast config pages) and a stream name. The stream name is added to the end of whip://director.millicast.com/api/whip/ and the auth token is a parameter that starts with auth=. Here is an example

- whip://director.millicast.com/api/whip/kwky3g6g?auth=48ce3daa09cd8355f80fc0d37005f9422a62bebf9b6411b61cfb1cfb2fa

Compression supported: H-264

4.17 videoQC URL/URI From Browser

videoQC supports being run from a browser, if installed on a Windows or macOS computer, with the special videoqc:// URL/URI. This will also work on Apple and Android devices with our FlowCaster Player apps (available free from the app store). In the case of videoqc://, it is not a protocol itself, but rather it loads the player and passes the rest of the protocol to it. So if you wanted an automatic link to bring up the srt stream:

srt://239.100.30:31:1234?mode=caller&password=thisisapassword&user=thisisauser

you would add this to the videoqc:// start and remove its colon, as below:

videoqc://srt//239.100.30:31:1234?mode=caller&password=thisisapassword&user=thisisauser

4.18 Application Specific Notes

4.18.1 VLC (version 3.0.8 and greater)

VLC supports a number of streaming formats from the menu Media | Open Network Stream. Here you can read our UDP://, RTP:// and SRT://. If you are using multicast IP addresses (eg. 239.#.#.#), VLC prefers that you add an at sign (@) before the ip, like:

rtp://@239.240.30.30:5004

You can also use the @ sign to receive on any address using just the port:
udp://@:5004

For SRT, VLC only supports the being a 'caller', so our software needs to be set up as a listener. A typical setup would be

SMPTE2NET: srt://172.16.12.25:5000?mode=listener
VLC: srt://172.16.12.25:5000

Assuming the IP 172.16.12.25 was the IP of the machine SMPTE2NET is running on.

4.18.2 OBS – Open Broadcast System

OBS supports UDP, RTP and SRT using its FFMPEG media reader. It will support both listener and

caller modes in the latest versions (26.0.2 or greater). The reconnect is not 100% reliable, so if connection is lost, then you may have to open the source again to have it set up. To add a UDP, RTP or SRT source, click the + button in the Source panel and select MediaSource. In the Properties, unclick Local File, add the standard srt string, for listener or caller:

srt://172.16.12.25:5000?mode=listener

Set the input format to "mpegts" without the quotes, and set up the buffering and reconnect to taste.

4.18.3 Marshall and other Cameras

Most cameras we have tested operate as callers, so our software will have to be set up as a listener on the local IP the SRT stream is coming in on. Alternately, you can use the all addresses mode by using the 0.0.0.0 IP

srt://0.0.0.0:5000?mode=listener

5 Workflows

5.1 Work from home/cloud/remote monitoring

The main problem with using creative software remotely is the poor quality of the compressed/low bit rate/random frame rate output signal from shared desktop software. While FlowCaster uses desktop sharing for control of the software, the audio/video signal is transported separately, using low latency/high quality compression and matching frame rate to your project. This gives you the ability to monitor your work as if you were using a hardware output to an independent monitor. FlowCaster also supports HDR/HLG/WCG, any video resolution, up to 32 channels of high quality audio, and ancillary data including closed captions, active format description and v-chip information.

5.2 Production team sharing/collaboration

There are a number of ways FlowCaster's audio/video and desktops can be shared to a group for collaboration:

- SRT Multicast or Haivision Gateway - maintain direct control of encrypted feeds by using SRT to all the collaborators. With the gateway, different users can be given different passwords and address/ports that can be fixed to a user’s IP address for further security
- RTMP - send your output and desktops to the **www.flowcaster.live** server, or any other RTMP

compatible server like twitch/youtube/facebook, and use the server’s tools to share live audio/video, host chats and handle authentication

- WebRTC – use **www.flowcaster.live**'s WebRTC compatible meeting rooms, or any other WebRTC compatible server, to support live A/V chat, authentication and text chat for one on one or multiuser collaboration

5.3 Cloud production or capture feed

Using SRT, signals from your creative software (Adobe/Avid/Assimilate/DaVinci/etc.) or from baseband feeds (SDI, HDMI, NDI, IP) can be sent directly to the cloud and captured to MXF, MOV, AVI, MP4 or others by the FlowCaster server. Optionally, a proxy file can also be generated.

All FlowCaster Server capture files support edit while record and playback while record, for local clipping or editing in Adobe Premiere. Signals can also be sent from the cloud, from Adobe/Avid/DaVInci/FlowCaster Server via SRT to be played locally as SDI or HDMI using a supported A/V device (AJA, Bluefish444, Blackmagic, Matrox).

5.4 IP format conversion

The FlowCaster Server can also be used to convert UDP, RTP, NDI, and SRT to a new UDP, RTP, NDI, or SRT stream. The server supports both re-wrapping of the compressed data and transcoding of the signal to a new compression type. As well as IP to IP, both baseband (SDI/HDMI) to IP, and IP to baseband are also supported.

5.5 Cloud to cloud

FlowCaster supports cloud to cloud transmission. Both compressed, via RTP, UDP and SRT, and uncompressed, via Amazon CDI, transports are supported. FlowCaster also has the ability to read and write directly from cloud object storage, like Amazon's S3 storage. File mode may also be used for guaranteed copies of media to be moved from one point to another.

6 Quick Start – SRT/RTP/UDP

Here is a quick start on demoing FlowCaster's SRT output:

Download and install FlowCaster

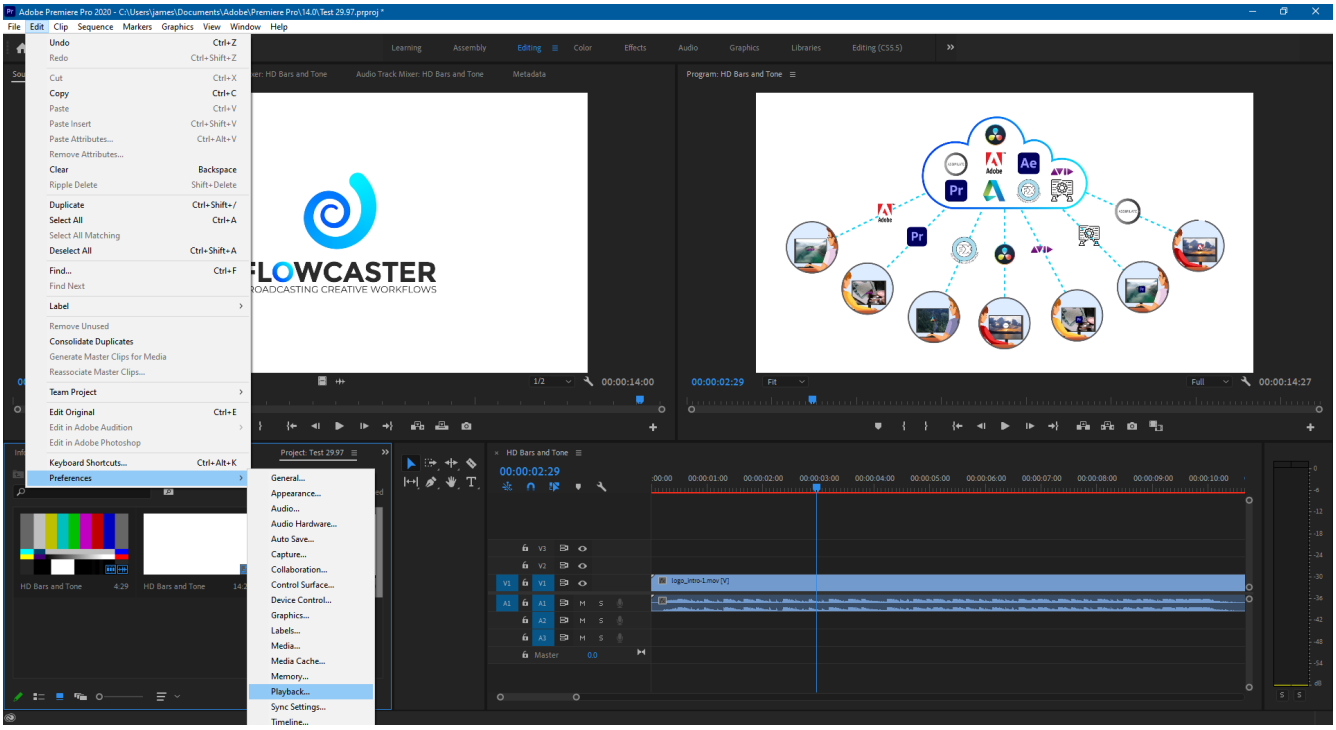
You will need at least a temp license to use all the features of FlowCaster. Please refer to the following page for info on how to license: http://license.drastictech.com

Download and install VLC (on the same machine to start with)
Optional: Install the Haivision Play Pro app on your phone

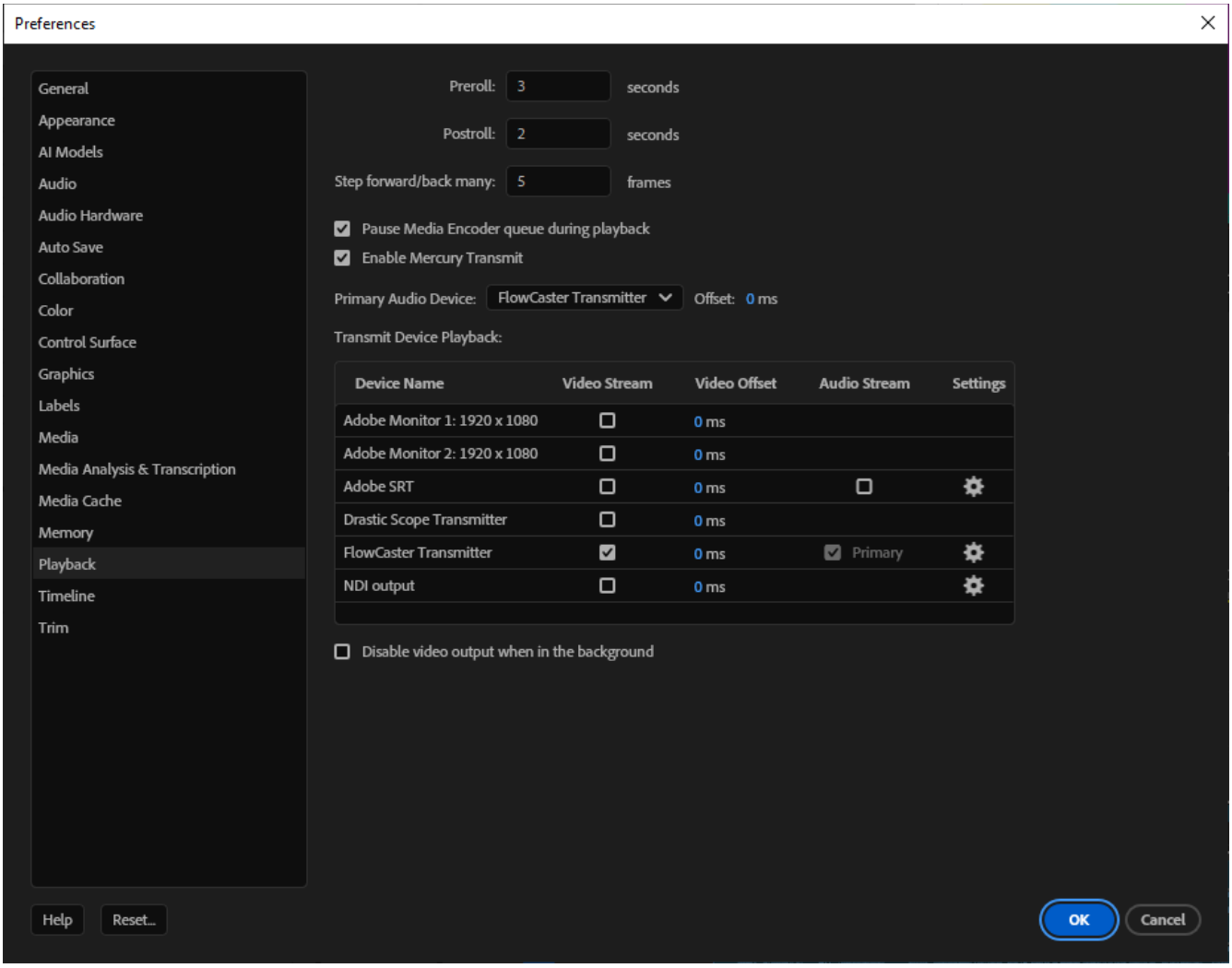
Determine your computer's IP address (ipconfig or ifconfig or control panel)

Run your creative software (Premiere in this example)

Open the FlowCaster configuration dialog. For Premiere, the menu Preferences | Playback. For Media Composer, the menu Tools | Video Output Tool, when enabled.

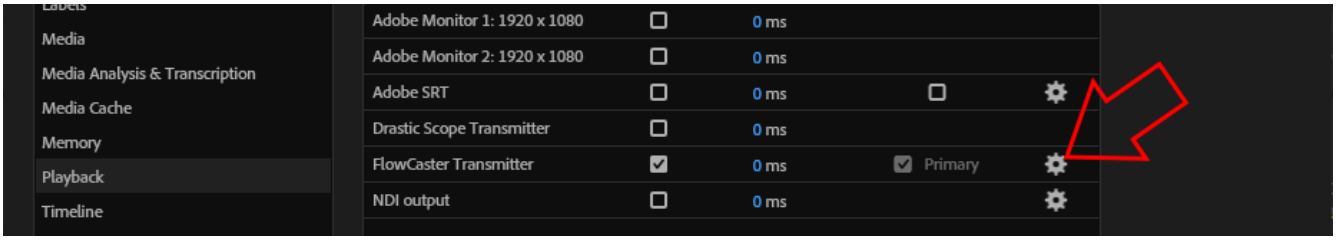


Click on the **Preferences | Playback** menu.

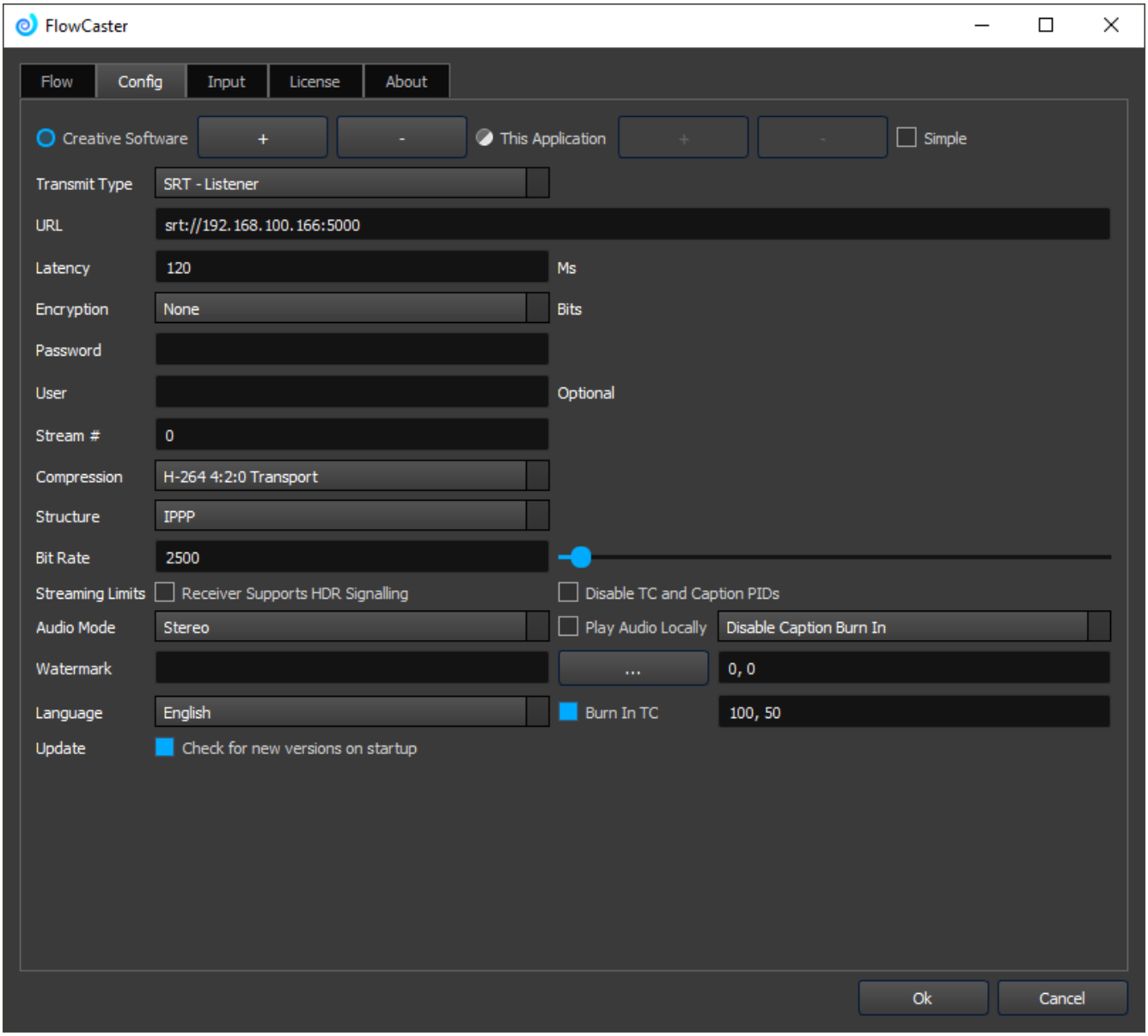


Click the checkbox next to FlowCaster Transmitter to enable output via FlowCaster.
Select FlowCaster Transmitter as the Audio Device.

Click the Setup link next to FlowCaster Transmitter.



This brings up the FlowCaster configuration dialog.

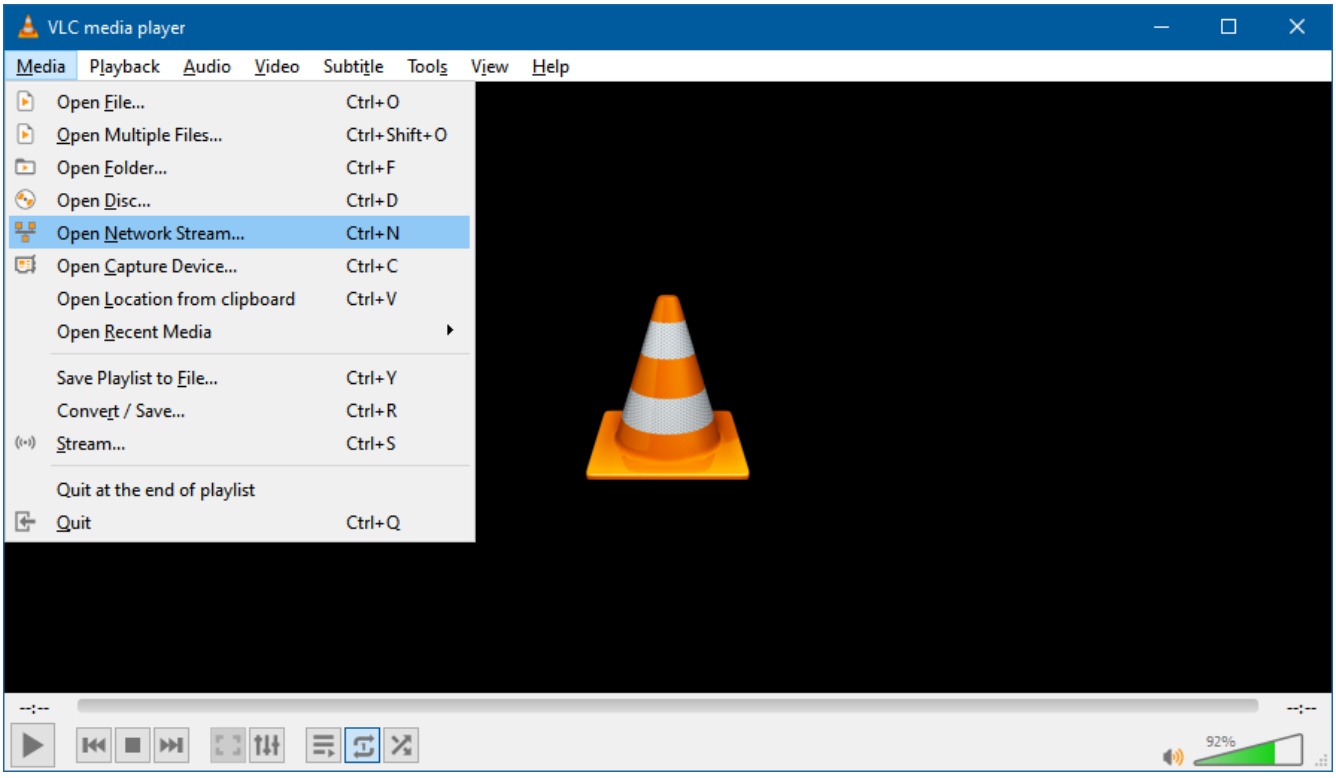


Set up the dialog as shown above

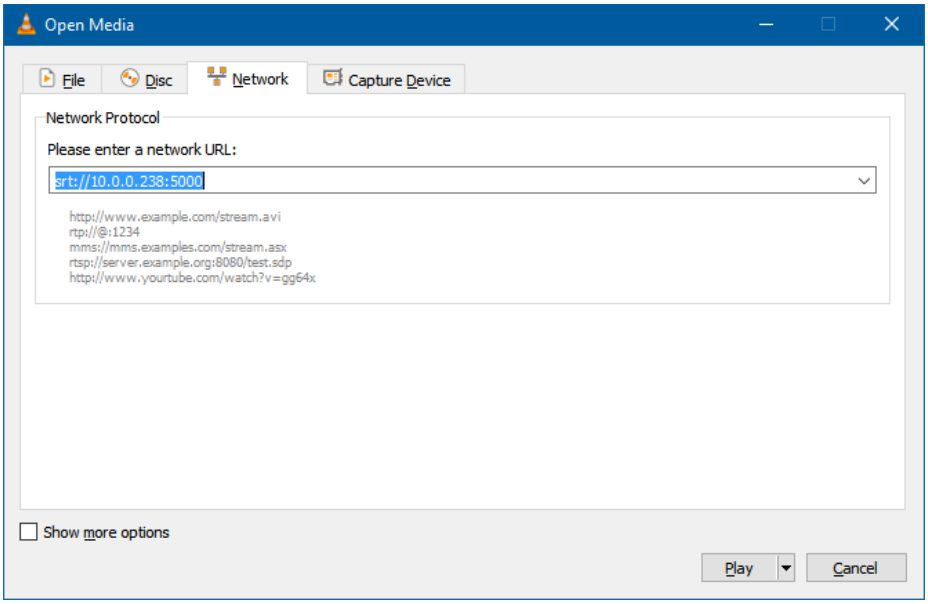
- Transmit Type: SRT Listener
- URL: srt://<your ip>:5000
- Latency: 90
- Encryption: None
- Password: Empty
- User: Empty
- Stream: 0
- Compression: h.264 4:2:0 Transport
- Structure: IPPP
- Bit Rate: 2500
- Audio Mode: Stereo

Click Ok on the FlowCaster Config and Adobe Preferences and you will be transmitting Premiere's output.

To receive the signal, run VLC and select the menu **Media | Open Network Stream**.

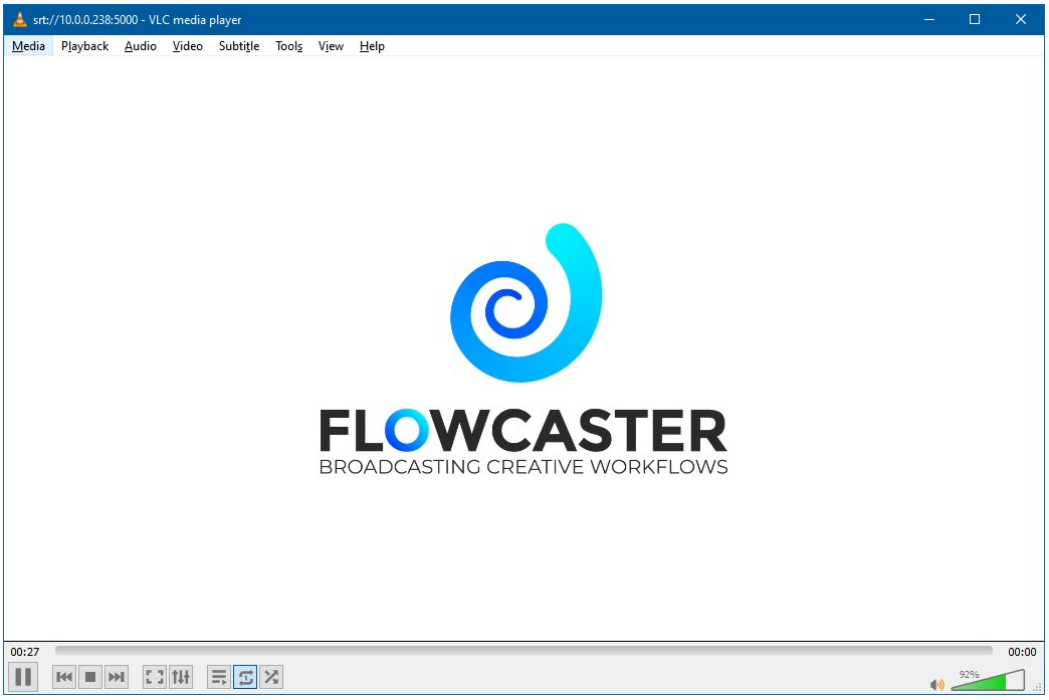


This will bring up the Network Open Media dialog



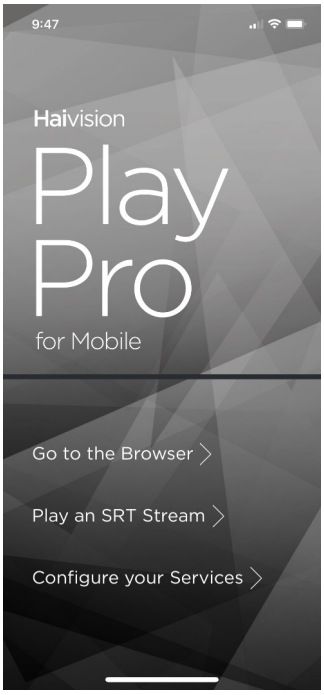
Enter

srt://<your ip>:5000

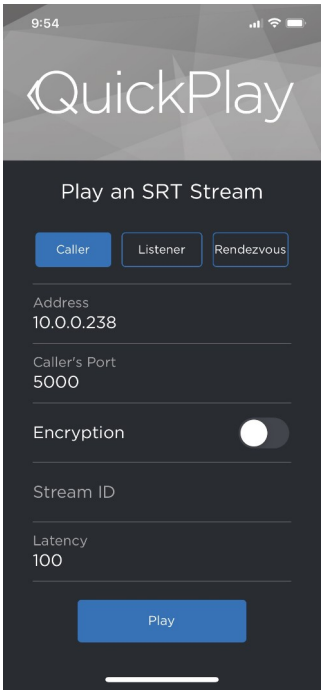


in the network URL text box and click Play and VLC will start receiving the SRT stream from Premiere.

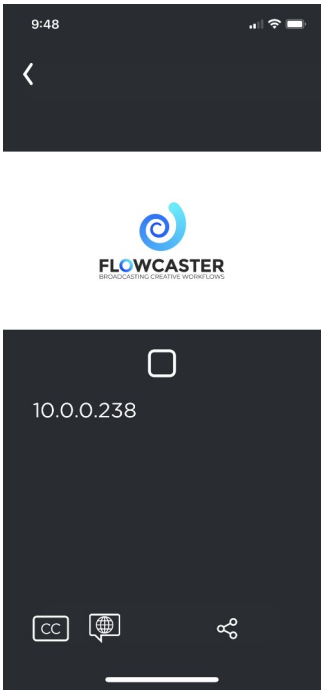
If you have the Haivision Play Pro app installed on your phone you can receive the SRT there as well. Close VLC and open Play Pro on your phone. After logging in, select Play an SRT Stream.



This will bring up the configuration screen.



Select Caller and set the Address to <your ip> and the Caller's Port to 5000. Click Play to start receiving the SRT stream



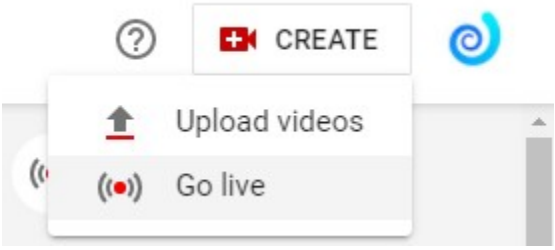
Once you have FlowCaster set up, configuring it for various scenarios will be a combination of transmission type, address and port, to match the sender and receiver. Here are some of the basic rules to follow:

- If FlowCaster is a Listener, then the receiver must be a Caller
- If FlowCaster is a Caller, then the receiver must be a Listener
- If FlowCaster is in Rendezvous mode, the receiver must also be in Rendezvous mode
- VLC only supports Caller mode (so FlowCaster must be a receiver)
- Whoever is the Listener must use a local address on the machine to listen on
- The Caller's address and port should match the Listener's address and port
- The Rendezvous addresses will be the ones outside your firewall, on the actual network/internet

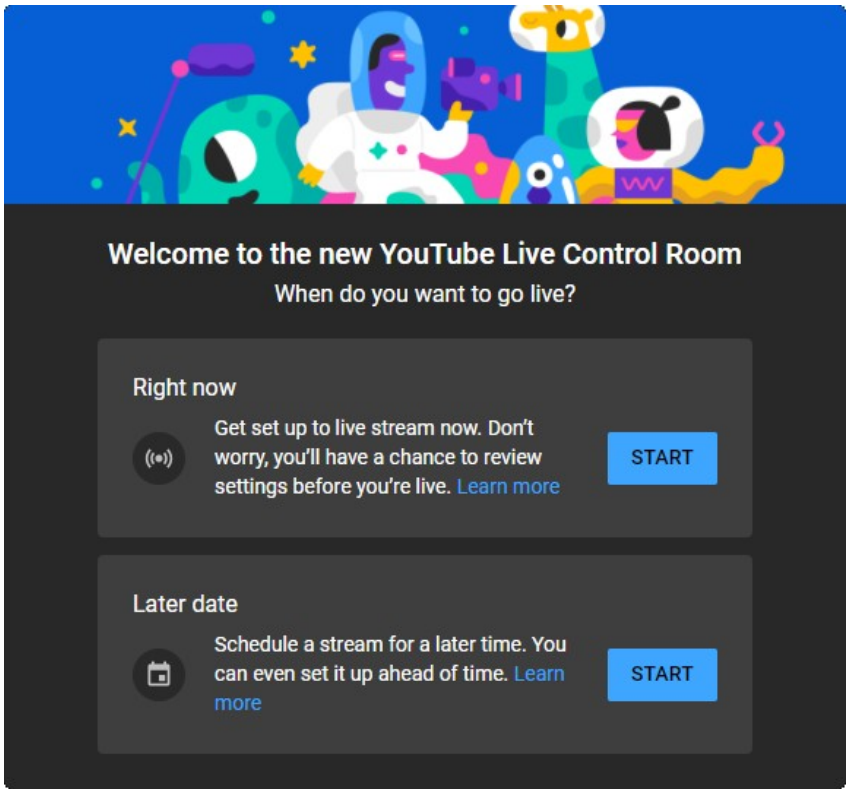
7 Quick Start – RTMP

FlowCaster supports local and internet based RTMP sharing sites like flowcaster.live, youtube.com, twitch.tv and many others. This quick start will connect Avid Media Composer's output to youtube.com.

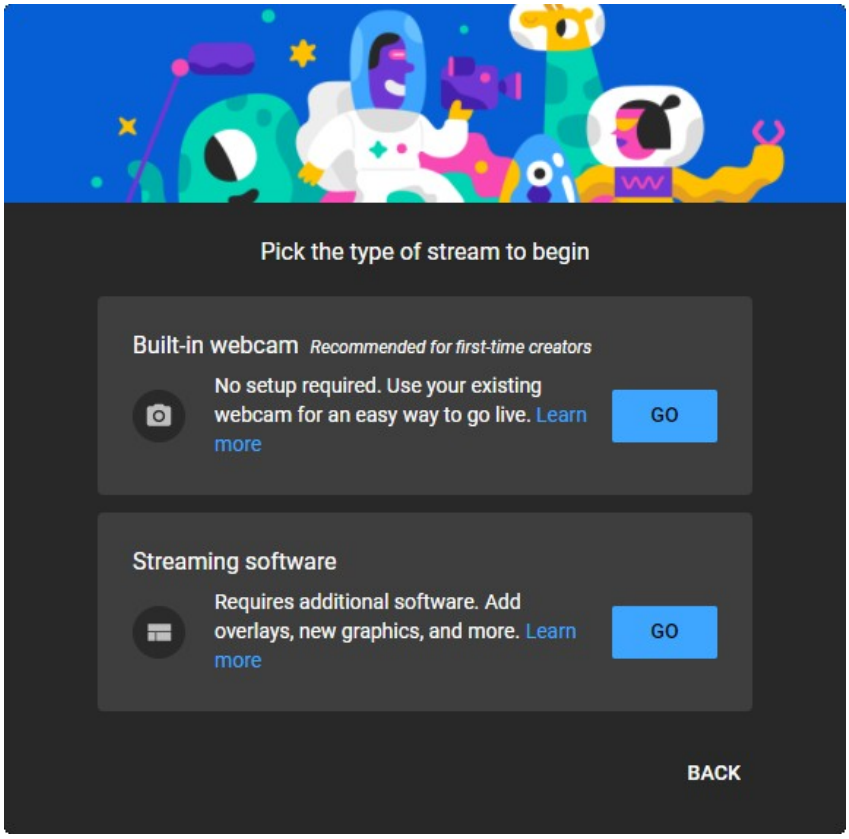
Start by logging into YouTube and selecting **Go Live** from the upper right



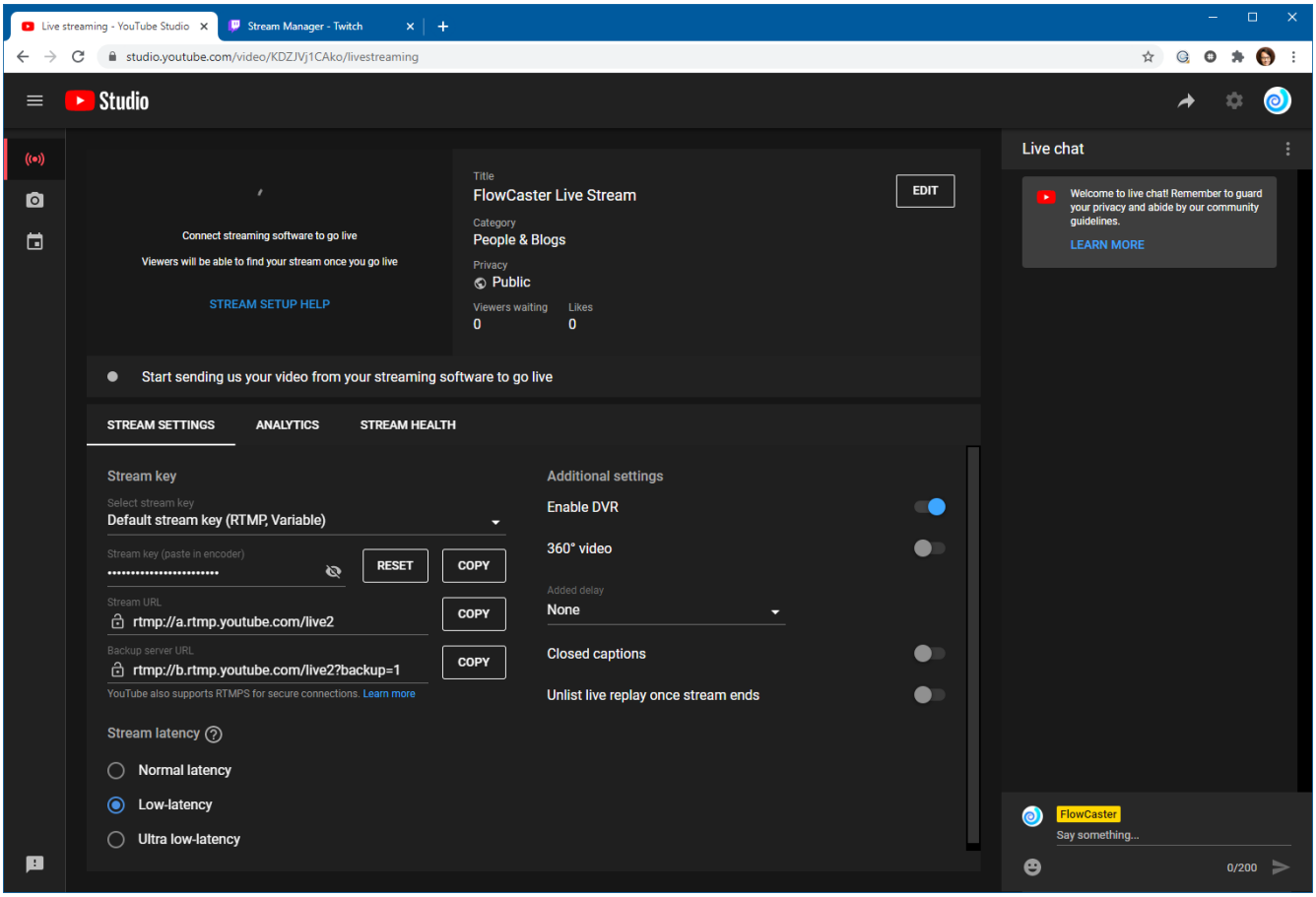
That will bring up the time to stream dialog



Select Right now's START button. That will bring up the source selection dialog.



Select Streaming software and click GO. This will bring up the live streaming page.



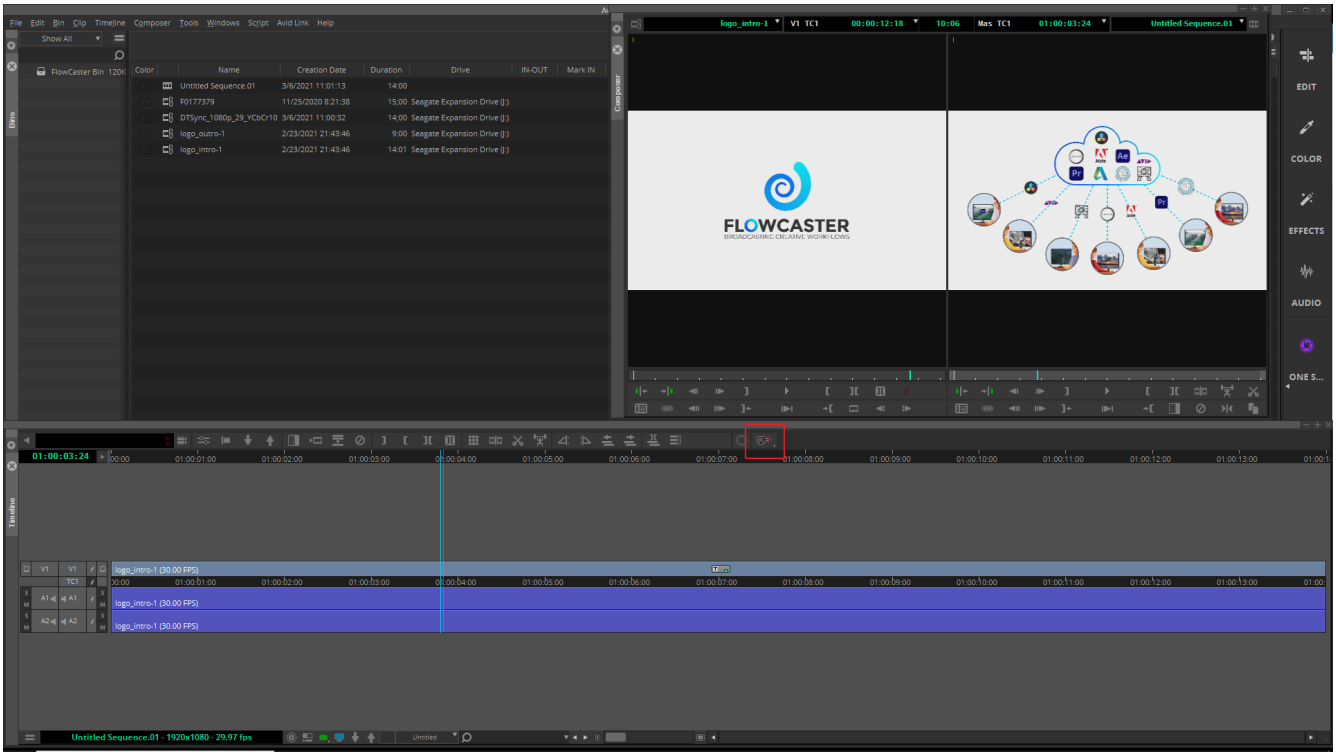
To connect your stream, you will need two things

1. The server URL (rtmp://a.rtmp.youtube.com/live2)
2. The secret Stream Key (hidden under the dots)

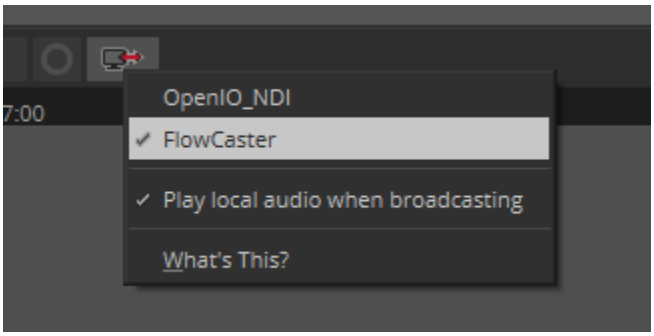
To create the URL for FlowCaster, take the server URL, add a / to it and append the stream key, for something like this:

rtmp://a.rtmp.youtube.com/live2/z746-80k2-2vxd-vcv8-0pzx

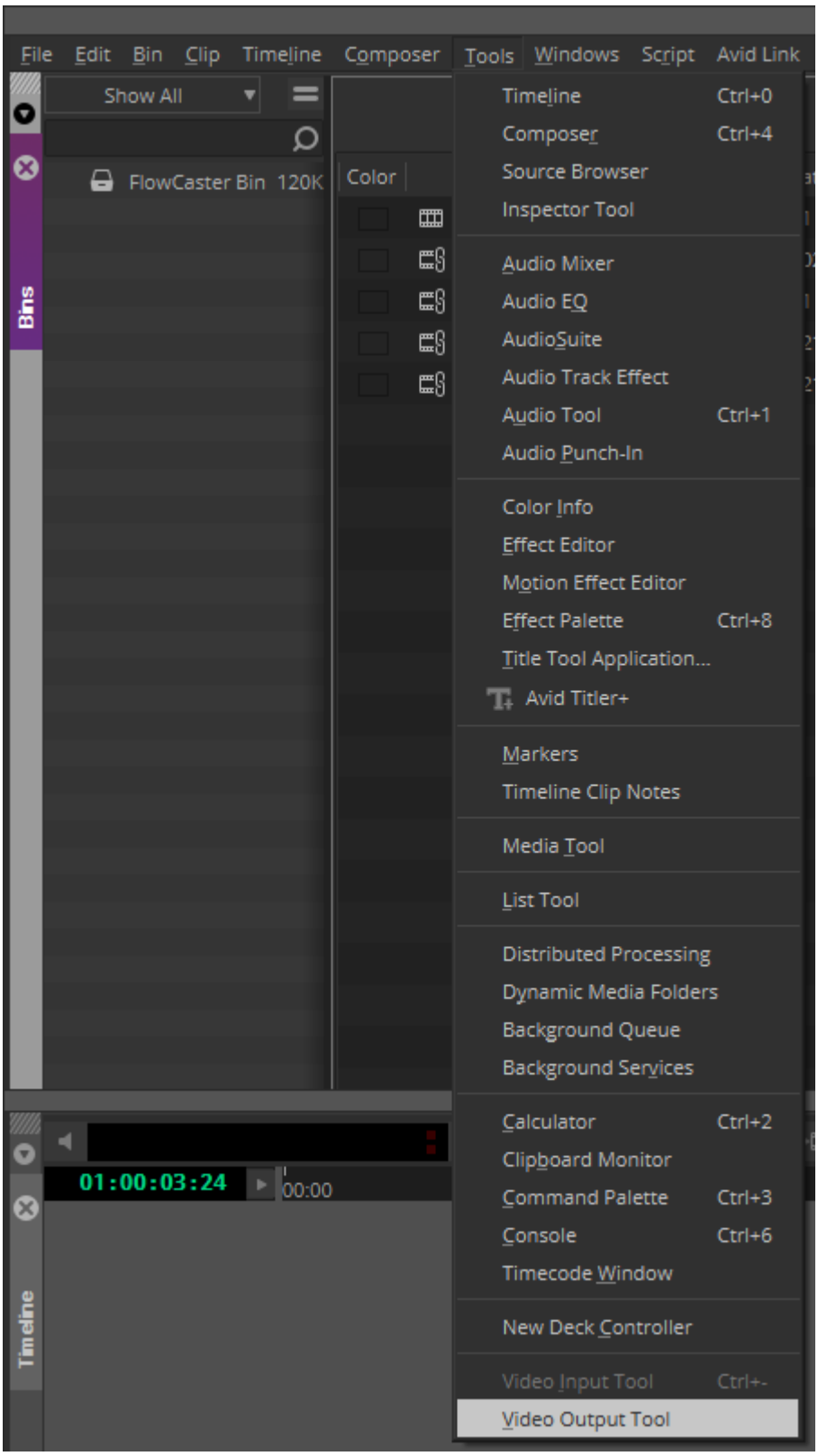
To start streaming, run Media Composer and load your project. To enable digital outputs, click on the button in the red box, so that it flashes red.



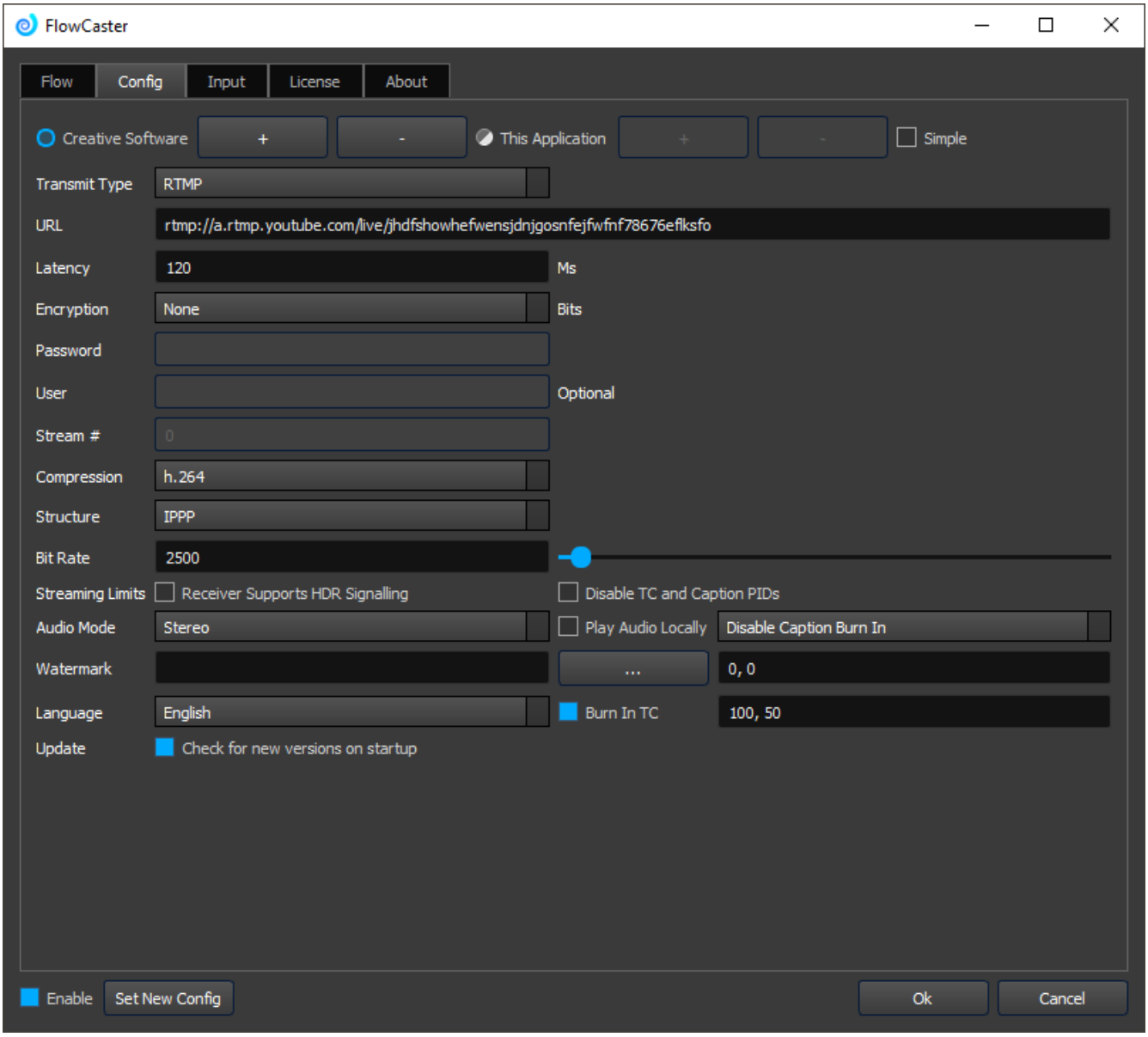
To make sure you are transmitting using FlowCaster, left click on that same button and make sure FlowCaster is selected in the popup menu.



To configure FlowCaster, select the menu Tools | Video Output Tool (please note, this menu is only present when the video output is enabled with the button above).



This will bring up the FlowCaster configuration dialog.



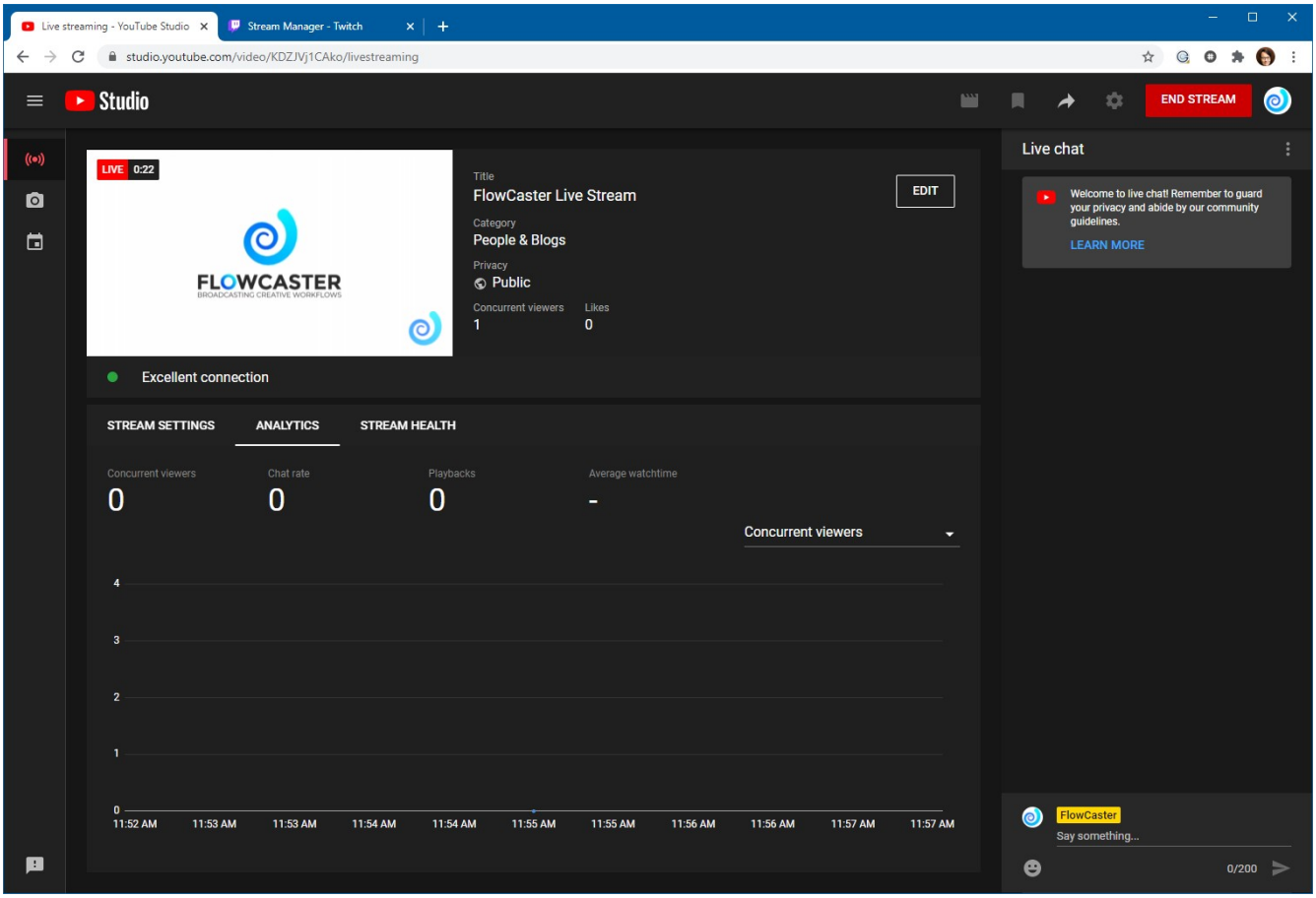
Enable the following settings:

Transmit Type: RTMP
URL: rtmp://a.rtmp.youtube.com/live2/<your secret key>
Compression: h.264/AVC1
Structure: IPPP
Bit Rate: 2500
Audio Mode: Stereo

Click Ok to close the configuration dialog, and then click the record button twice (off and then back on)

to pick up the new configuration.

After a short while, the stream should appear on YouTube.



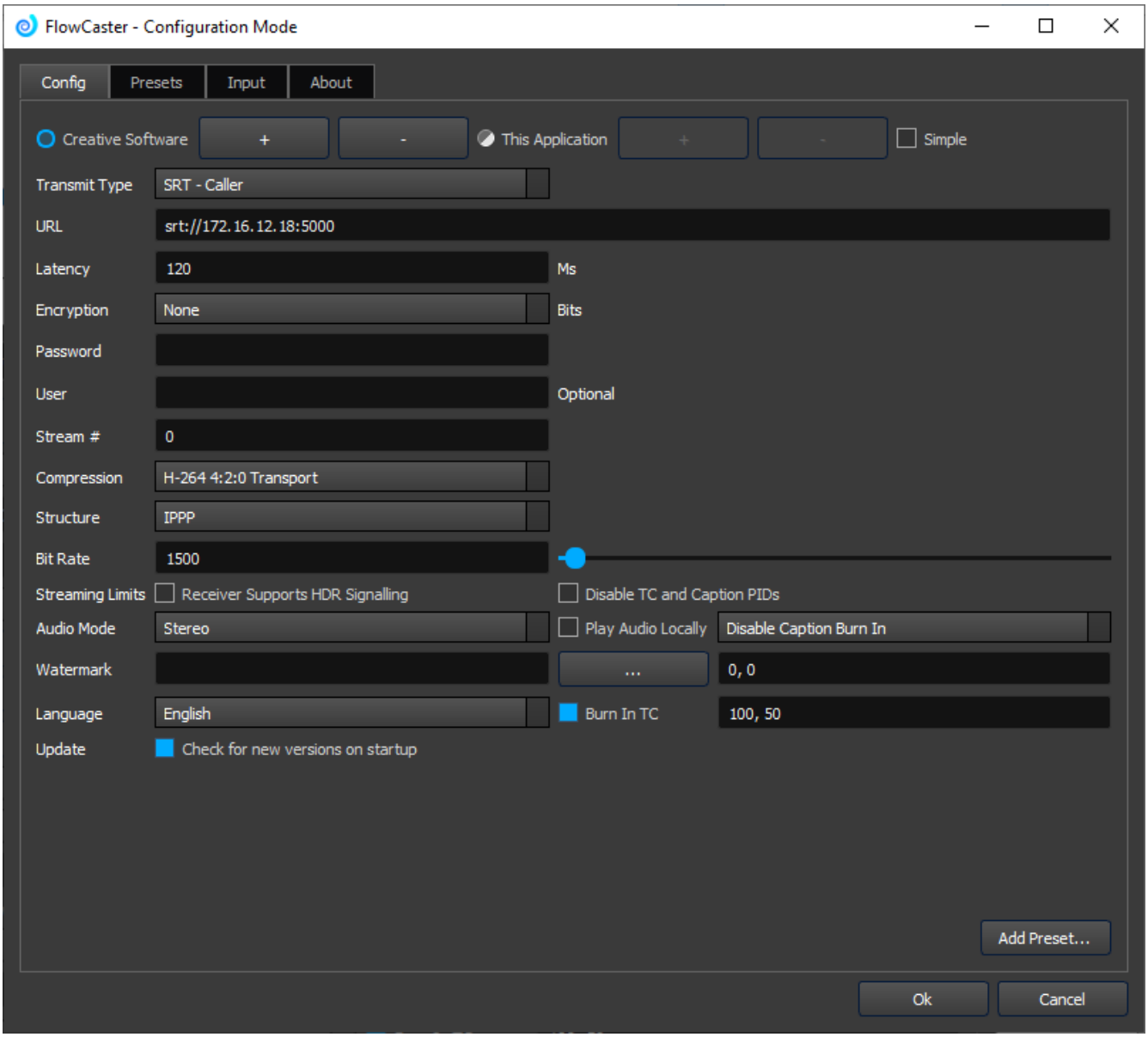
The stream can now be shared publicly or privately to as many people as you wish.

To transmit to Twitch.tv is similar, except they have dedicated servers for each region that you can find here:

https://stream.twitch.tv/ingests/

to be combined with your secret twitch key as described above.

8 FlowCaster Configuration



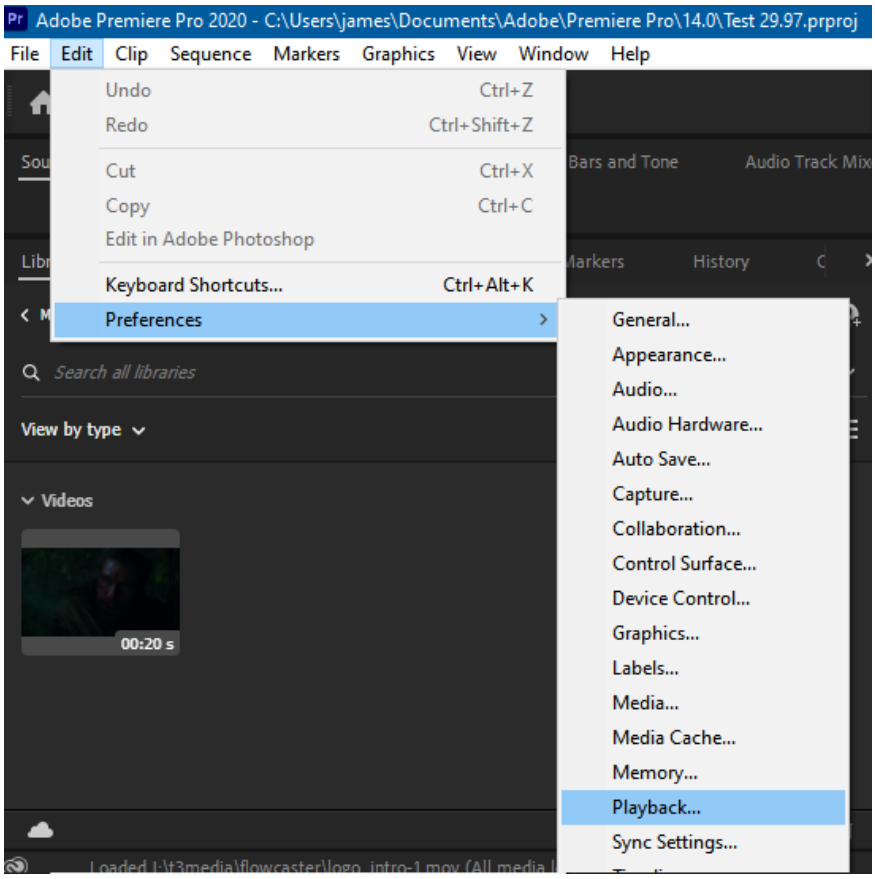
The FlowCaster config dialog is used to configure the output of your creative software (Adobe, Avid, Assimilate, DaVinci, etc) as well as any secondary output from SDI, HDMI, NDI or your desktop.

9 Adobe

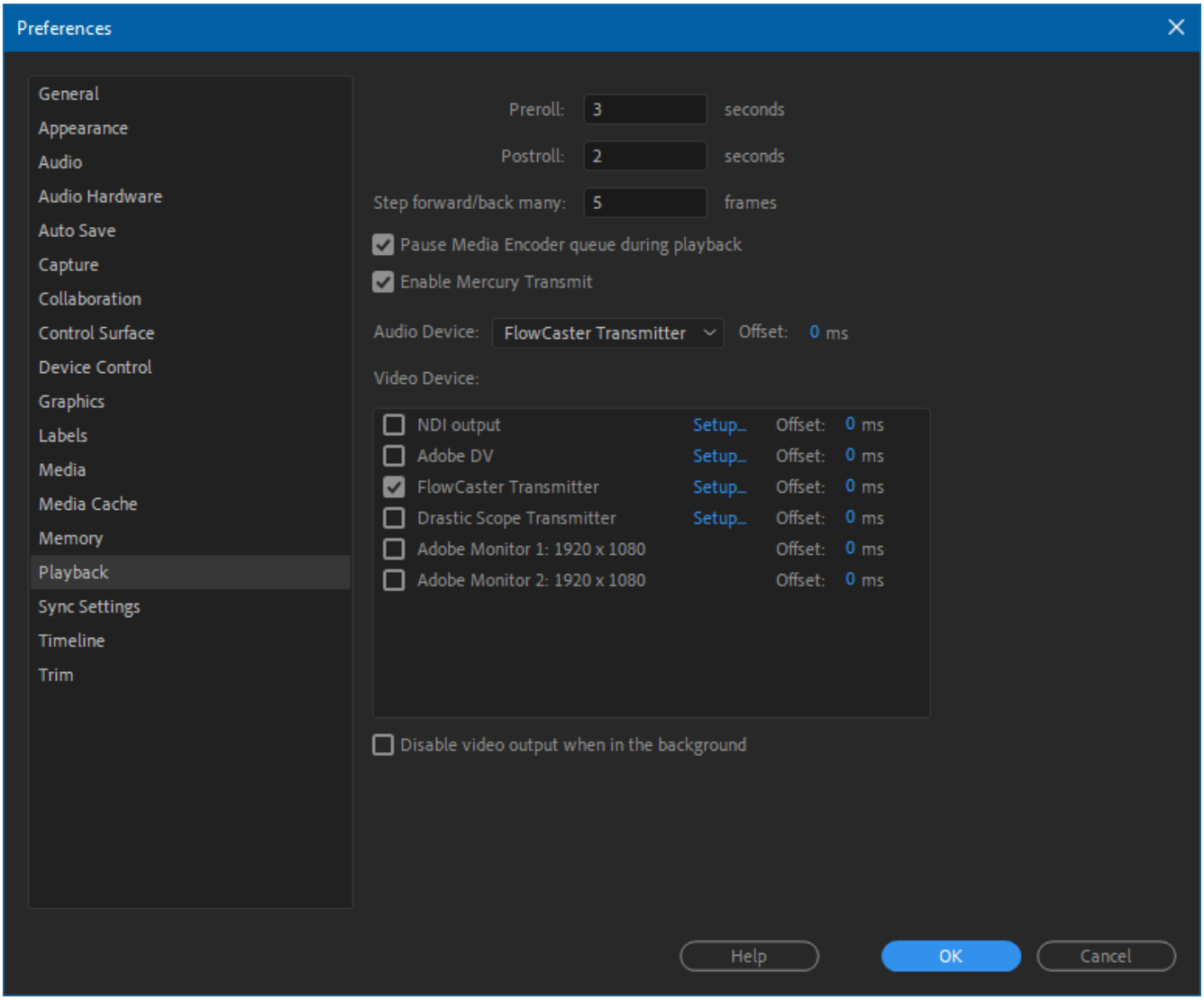
FlowCaster creates a virtual I/O board as a transmitter for Adobe creative software like Premiere and After Effects. As a virtual video board, it can send the same high quality audio, video and captions from a real or virtual machine to wherever you are doing your creative work for output on a 'third monitor'. This signal can be received by free software, like VLC and the Haivision Pro Player, or by dedicated Drastic receivers for more features, like FlowCaster for IOS and Android, videoQC for Windows, macOS and Linux or even a variety of hardware decoders from AJA, Haivision and others. This article demonstrates configuring FlowCaster in Adobe creative software.

9.1 Adobe Premiere

To configure FlowCaster in Adobe Premiere, access the Playback area or Preferences. On Windows, it is the **Edit | Preferences | Playback** menu. For macOS, it is the **Main | Preferences | Playback** menu.

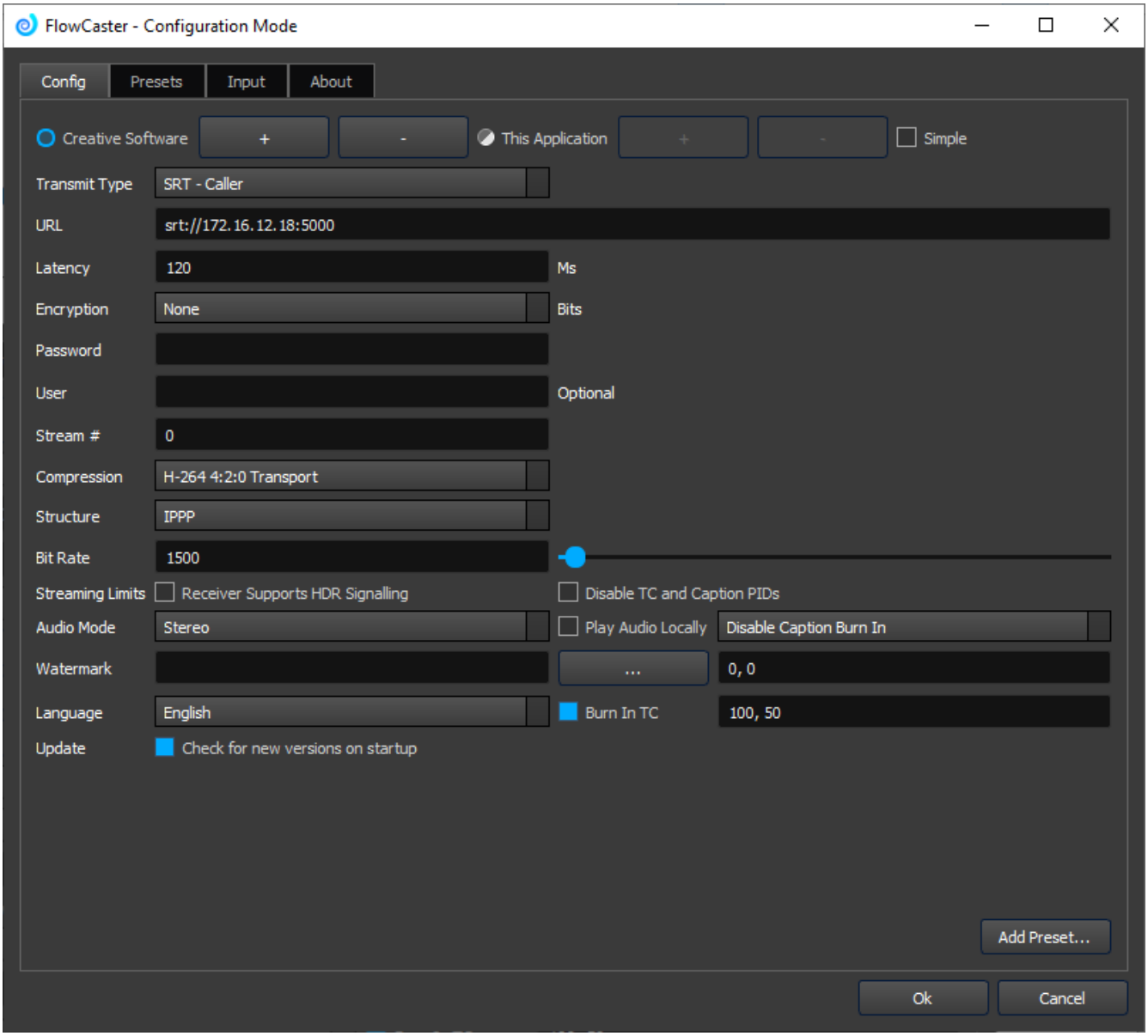


This will bring up the Playback settings in the Preferences panel. To use FlowCaster, you will want to set the Audio Device to FlowCaster Transmitter, as well as checking the checkbox next to FlowCaster Transmitter in the Video Device list.



This will cause Adobe to use FlowCaster as its video board. To configure FlowCaster, click on the Setup link in the Video Device list next to the FlowCaster Transmitter entry. That will bring up the FlowCaster Configuration dialog

9.2 FlowCaster Configuration Dialog



9.2.1 Transmit Type

SRT Caller - this uses SRT to call out to a remote device. The IP and port for this protocol in URL should be the remote device's IP address and selected port

SRT Listener - this uses SRT to listen on your local machine. The IP must be one of the IPs on your machine, and you must select a port to receive on

SRT Rendezvous - this mode uses the external, internet IP to connect through local NAT

routers. Here it should be the internet facing IP of the remote device. On that device's config, it should be your internet facing remote IP. To get those IPs from each network, use **https://whatismyipaddress.com/**

RTP - the IP and Port for this mode can be the remote device, or a multicast address (239.x.x.x) that both the sender and receiver are set to

UDP - the IP and Port for this mode can be the remote device, or a multicast address (239.x.x.x) that both the sender and receiver are set to

RTMP - the URL for this mode will consist of the remote server, followed by the remote key. For instance, with YouTube.com, the address would be rtmp://a.rtmp.youtube.com/live2, and the key would be provided by YouTube and look something like this j2br-3t45-b6ck-s9h9-5dcy, so the URL would be rtmp://a.rtmp.youtube.com/live2/j2br-3t45-b6ck-s9h9-5dcy

NDI - for NDI, the URL would be a unique name, that NDI will combine with the computer name, to create a fully qualified name you can use to connect to the stream

9.2.2 URL

Normally the IP and Port or a fully qualified URL, depending on the Transmit Type setting. Below are some typical examples

SRT Caller: 10.0.0.60:5000
SRT Listener: 10.0.0.238:5000
SRT Rendezvous: 108.174.19.198:5000
RTP : 239.254.30.30:1234
UDP: 10.0.0.60:5004
RTMP: rtmp://a.rtmp.youtube.com/live2/j2br-3t45-b6ck-s9h9-5dcy
NDI: FlowCaster1Out

9.2.3 Latency

Latency is the number of milliseconds to give the signal to recover packets. This is for SRT. The lower this number, the closer to real time the monitor will be. The larger, the more room it will have to recover any lost packets. It is recommended this be the RTT (round trip time) between the two devices plus 20 milliseconds

9.2.4 Encryption

SRT supports end to end encryption. Setting this to 128 or 256 will cause all the data to be encrypted, use the Password below.

9.2.5 Password

If encryption above is set to 128 or 256, then this password will be used to encrypt the signal, and it must be used on the receiving device for it to be able to decrypt the signal

9.2.6 User

If your protocol/transmit type requires authentication, this is the user name that will be used in that authentication

9.2.7 Stream

If your protocol/transmit type supports multiple stream sets, this will specify which one you are sending

9.2.8 Compression

What compression to use to send the stream. FlowCaster supports h.264, h.265/HEVC and JPEG 2000, but the receiver must also support them for the monitor to work. If you are unable to see the signal in the receiver, start with h.264 8 bit 4:2:0 and then work up from there to see what the receiver supports. videoQC supports all the codecs.

9.2.9 Structure

This is the internal structure of the compression. Three modes are supported

- **IBBP** - this has the highest quality, but the longest latency (Long GOP: I frame, 2 bipredictive frames, predictive frame)
- **IPPP** - this has the best compromise between quality and latency (Long GOP: I frame, 3 predictive frames)
- **IIII** - this has the shortest latency, but the worst quality (Temporal, or Intraframe only)

9.2.10 Bit Rate

The kilobit rate to encode the video within. For instance, 2 mbs (megabits) would be 2000 kbs (kilobits)

9.2.11 Receiver Supports HDR Signaling

If your receiving software supports HDR Signaling, checking the checkbox will enable sending any local HDR signaling to the remote monitor

9.2.12 Audio Mode

FlowCaster supports 5 audio modes

- Stereo - just the first stereo pair
- Stereo Mix - mix all available channels to a stereo pair
- 4 channels - send the first four channels
- 8 channels - send the first eight channels
- 16 channels - send the first sixteen channels

9.2.13 Watermark

A path and filename to a file to place on the output as a watermark. This would normally be a 32 bit PNG file with Alpha. The "..." button will bring up a file browse dialog to allow you to select a file from your local file system. The two numbers separated by a comma and the x and y start position of the watermark on the output signal in pixels.

Once the OK button is clicked, FlowCaster will reset its output to match the new setup. This may take a few seconds before you see the changes on the receiver.

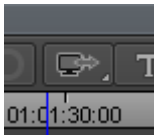
10 Avid

10.1 Using FlowCaster with Avid Media Composer

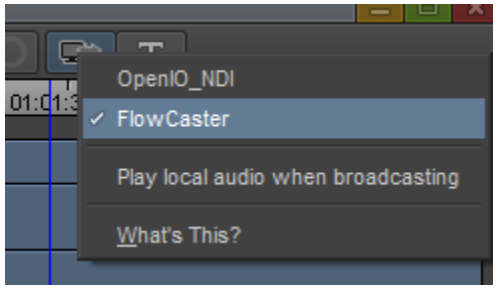
FlowCaster creates an Open I/O board Avid creative software like Media Composer. As a virtual video board, it can send the same high quality audio, video and captions from a real or virtual machine to wherever you are doing your creative work for output on a 'third monitor'. This signal can be received by free software, like VLC and the Haivision Pro Player, or by dedicated Drastic receivers for more features, like FlowCaster for IOS and Android, videoQC for Windows, macOS and Linux or even a variety of hardware decoders from AJA, Haivision and others. This article demonstrates configuring FlowCaster in Avid Media Composer.

10.2 Avid Media Composer

To configure FlowCaster in Avid Media Composer, you first have to enable it on the timeline. Find the Open IO output button just above the timeline



To enable it, right click on it and select FlowCaster. If FlowCaster is already selected, you can just left click on the button.

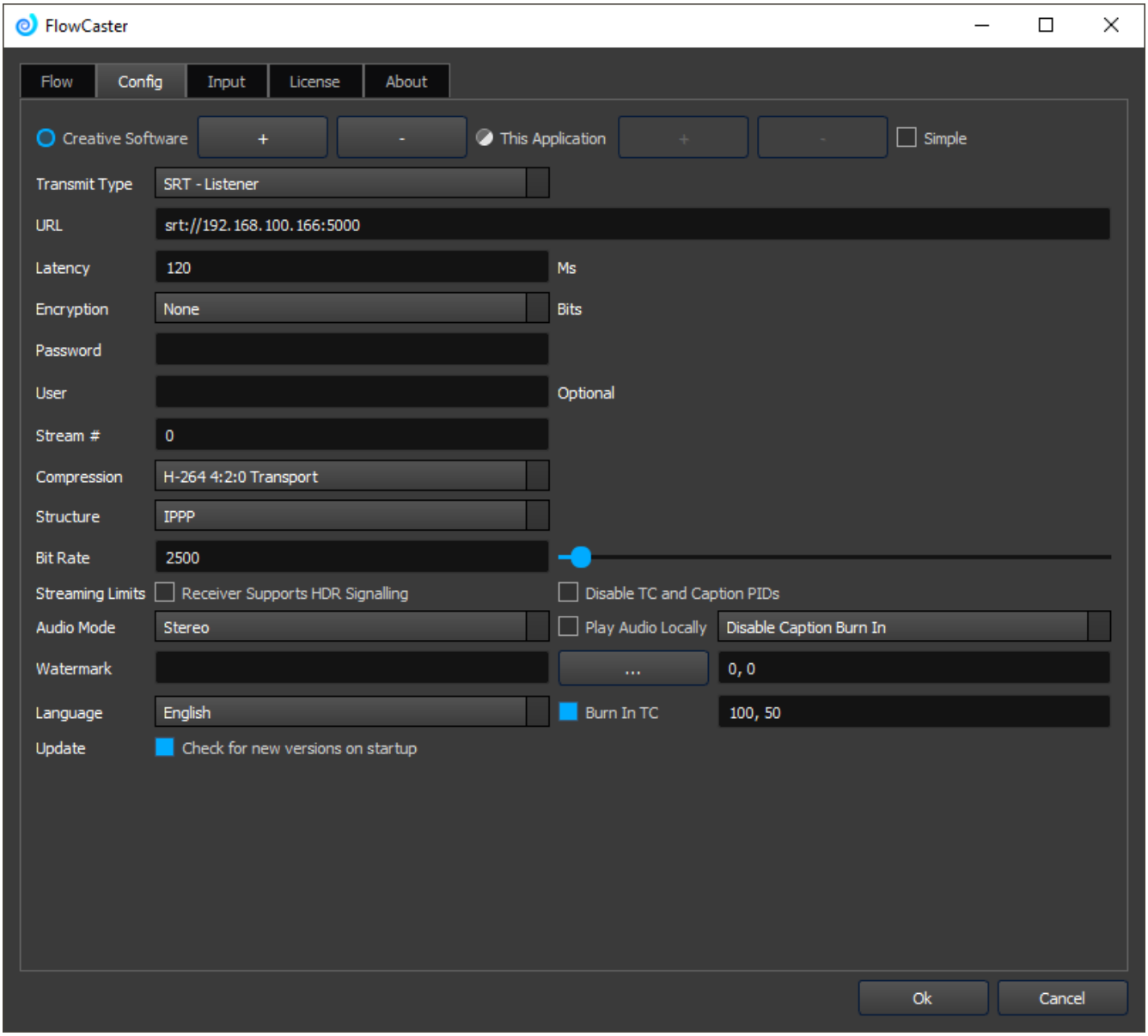


Once enabled, the button will flash a red double arrow to indicate it is sending to FlowCaster.

When enabled, a new menu under Tools will be available called Video Output Tool

Clicking on this will bring up the FlowCaster Configuration Dialog

10.3 FlowCaster Configuration Dialog



10.3.1 Transmit Type

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NDI - for NDI, the URL would be a unique name, that NDI will combine with the computer name, to create a fully qualified name you can use to connect to the stream

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UDP: 10.0.0.60:5004
RTMP: rtmp://a.rtmp.youtube.com/live2/j2br-3t45-b6ck-s9h9-5dcy
NDI: FlowCaster1Out

10.3.3 Latency

Latency is the number of milliseconds to give the signal to recover packets. This is for SRT. The lower this number, the closer to real time the monitor will be. The larger, the more room it will have to recover any lost packets. It is recommended this be the RTT (round trip time) between the two devices plus 20 milliseconds

10.3.4 Encryption

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10.3.6 User

If your protocol/transmit type require authentication, this is the user name that will be used in that authentication

10.3.7 Stream

If your protocol/transmit type supports multiple stream sets, this will specify which one you are sending

10.3.8 Compression

What compression to use to send the stream. FlowCaster supports h.264, h.265/HEVC and JPEG 2000, but the receiver must also support them for the monitor to work. If you are unable to see the signal in the receiver, start with h.264 8 bit 4:2:0 and then work up from there to see what the receiver supports. videoQC supports all the codecs.

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10.3.10 Bit Rate

The kilobit rate to encode the video within. For instance, 2 mbs (megabits) would be 2000 kbs (kilobits)

10.3.11 Receiver Supports HDR Signaling

If your receiving software supports HDR Signaling, checking the checkbox will enable sending any local HDR signaling to the remote monitor

10.3.12 Audio Mode

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- 8 channels - send the first eight channels
- 16 channels - send the first sixteen channels

10.3.13 Watermark

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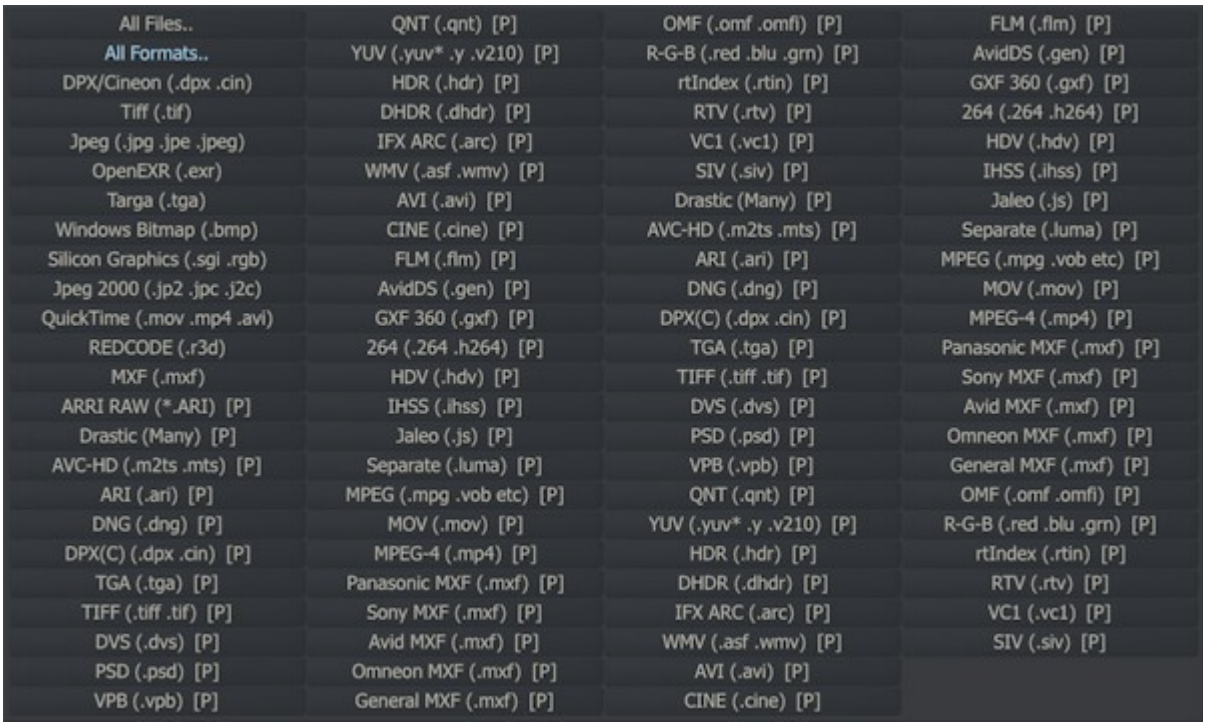
Once the OK button is clicked, FlowCaster will reset its output to match the new setup. This may take a few seconds before you see the changes on the receiver.

11 Assimilate SCRATCH



FlowCaster includes an Assimilate direct and OpenFX monitor plugin, allowing monitoring of any software that supports OpenFX. For Assimilate SCRATCH, high quality audio and video monitoring is supported. For OpenFX software, like DaVinci Resolve, only high quality video monitoring is support, due to the limitations of the OpenFX standard. In both cases, RGB, as well as YCbCr, signals are supported with up to 12 bits per component, using JPEG2000, or 10 bits per component, using HEVC.

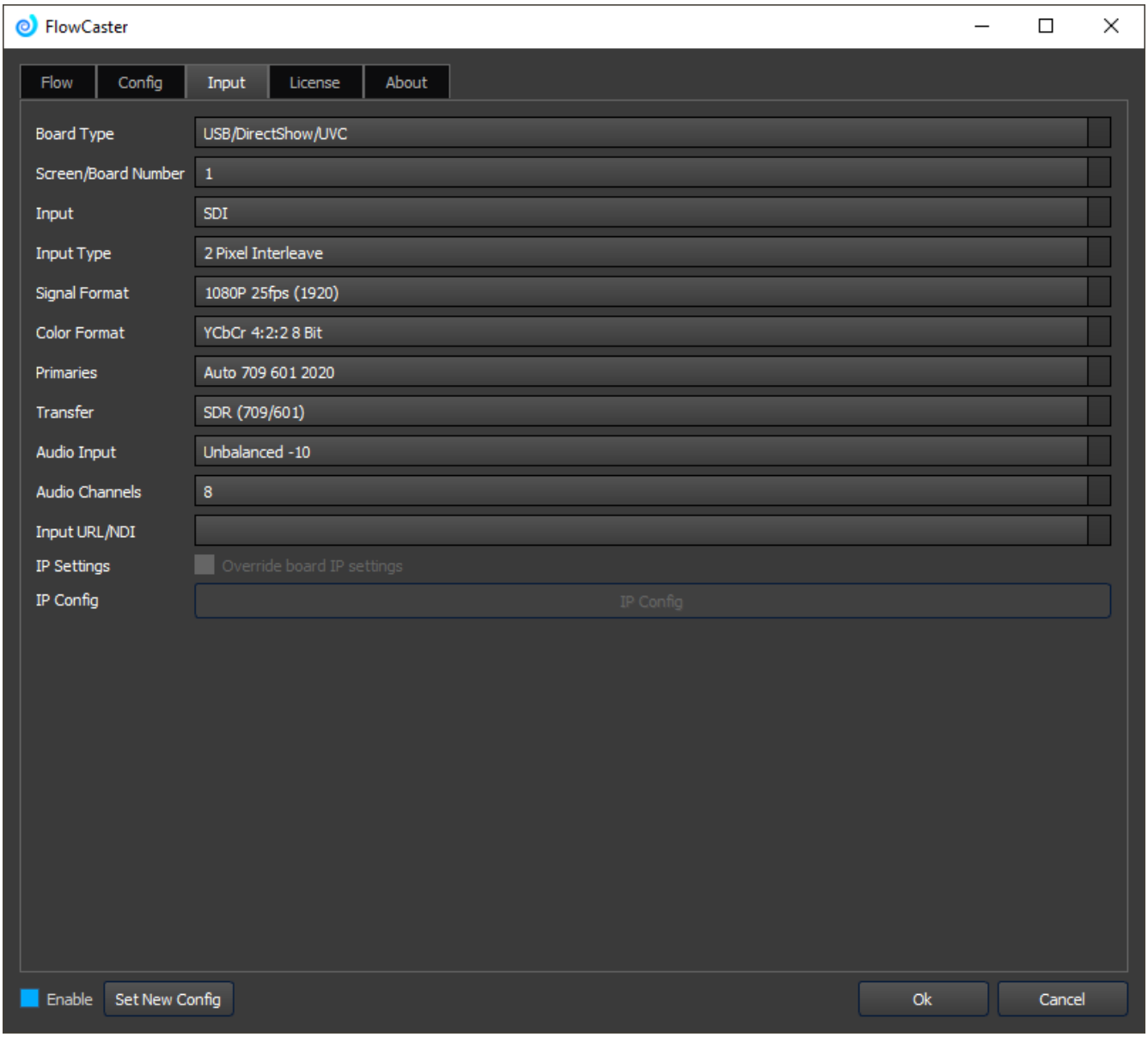
12 DaVinci Resolve

FlowCaster includes an Assimilate direct and OpenFX monitor plugin, allowing monitoring of any software that support OpenFX. For Assimilate SCRATCH, high quality audio and video monitoring is supported. For OpenFX software, like DaVinci Resolve, only high quality video monitoring is support, due to the limitations of the OpenFX standard. In both cases, RGB, as well as YCbCr, signals are supported with up to 12 bits per component, using JPEG2000, or 10 bits per component, using HEVC.

13 OpenFX Compatible Software

FlowCaster includes an Assimilate direct and OpenFX monitor plugin, allowing monitoring of any software that supports OpenFX. For Assimilate SCRATCH, high quality audio and video monitoring is supported. For OpenFX software, like DaVinci Resolve, only high quality video monitoring is support, due to the limitations of the OpenFX standard. In both cases, RGB, as well as YCbCr, signals are supported with up to 12 bits per component, using JPEG2000, or 10 bits per component, using HEVC.

14 SDI/HDMI/NDI/Desktop Input



Board Type – select the type of board that will be used. Choices include:

Auto Select – find the most recent board used, or cycle through options until a likely board is found.

NIC SMPTE 2110 – use an Nvidia board and Rivermax software to enable ST-2110 input.

Network Video Streams – view IP streams on the network.

Aja – use an AJA board installed in the system as the input.

Aja Shared – run at the same time as an AJA board in the system and grab frames in

real time without tying up an input.

Bluefish – use a Bluefish444 board installed in the system as the input.

BlackMagic – use a Blackmagic board installed in the system as the input.

Deltacast – use a Deltacast board installed in the system as the input.

DekTec – use a DekTec board installed in the system as the input.

Matrox Origin Fabric – use Matrox Origin Fabric streams or compatible devices as the input.

Matrox – use a Matrox board installed in the system as the input.

Magewell USB – use a Magewell SDI Pro 4K board installed in the system as the input.

USB/DirectShow/UVC – use a USB/DirectShow/UVC device attached the system as the input.

NDI In – use an NDI stream as the input.

Desktop – use the desktop as an input. This works best when the user has a 2 screen setup, and wants to share an application that is open on screen 1.

Adobe ScopeDirect – use the output of an Adobe editor via the ScopeDirect plugin as the input.

Avid ScopeDirect – use the output of an Avid editor via the ScopeDirect plugin as the input.

OpenFX ScopeDirect – use the output of an OpenFX editor via the ScopeDirect plugin as the input.

Assimilate ScopeDirect – use the output of an Assimilate editor via the ScopeDirect plugin as the input.

AvVr3D ScopeDirect – use the output of UnReal Engine via the ScopeDirect plugin as the input.

Screen/Board Number – select between available boards for the selected board type.

Input pulldown – select between available input types. Choices include:

Composite
S-Video
Composite 2
Component YUV
Component M2
Component SMPTE
Component RGB
SDI
D1 Parallel
SDTI
S-Video 2
SDI 2
Composite (Japan)
S-Video (Japan)
XVid RGB
HDMI
HDMI RGB

HDMI YCbCr
DVI
SDI 3G A
SDI 3G B
SDI 4K 425
SDI 12G/6G A
SDI 12G/6G B

Input Type pulldown – select between Square Pixels and 2 Pixel Interleave.

Signal Format pulldown – select between available signal formats. FlowCaster supports standard broadcast signal formats from NTSC/PAL to 4K 4096x2160 60fps.

Color Format pulldown – select between available color formats (hardware dependent). Choices may include YCbCr 4:2:2 8 bit, YCbCr 4:2:2 10 bit.

Primaries pulldown – select between available primaries. Choices may include: Auto 709 601 2020, CCIR 601, CCIR 601 Full, Rec.709, Rec.709 Full, BT.2020, BT.2020 Full

Transfer pulldown – select between available transfer types. Choices may include: SDR (709/601), PQ/HDR 10, HLG.

Audio Input pulldown – select between available audio inputs. Choices may include: Unbalanced -10, Unbalanced +4, Balanced -10, Balanced +4, SPDIF, AES/EBU, Embedded, AES/EBU Pro, HDMI, Silence.

Audio Channels pulldown – select the number of audio channels. FlowCaster supports 2, 8, 10, and 32 channels of audio.

Input URL/NDI field – displays the current input URL or NDI stream URL, if one is present. The user may need to input a URL specific to their input format in this field.

IP Settings Override checkbox – check to ignore the board's IP input settings, and use the ones being entered here.

IP Config button – opens the IP Configuration dialog.

14.1 SDI/HDMI

14.2 NDI

14.3 Desktop

15 Controlling/Configuring

15.1 Command Line Parameters

Usage: FlowCaster.exe [options]

Options:

-n, --ndisource <NDI Source Name>	NDI Source
-u, --urldestination <Destination URL>	URL to send to
-N, --name <Stream User Name>	User name
-p, --password <Stream Password>	SRT password (min 10 char)
-i, --sourcenumber <Source Stream ID #>	Source ID number
-s, --source <0-12 See Docs>	A/V Source
-t, --transport <srtCaller,1-srtListener,2-srtRendezvous,3-rtp,4-udp,5-rtmp,6-2110,7-2022-8,hls,9-dash,10-cdi,11-webrtc,12-tr01,13-bls,14-rist,15-whip,16-tcp,80-vcam,100-ndi,200-file>	Transport Type
-x, --extrastreams <0-Allow/1-Disable Extra Streams>	Extra Streams
-a, --audchan <Number of channels: 1=St.Mix, 2, 4, Audio 8, 16, 24, 32>	
-c, --codec <0-4: h264,h264_10,HEVC,HEVC_10,J2K>	Codec
-i, --frameorder <0-IBBP, 1-IPP, 2-I>	Frame order
-b, --bitrate < kilobits per second>	Kilobits per second
-l, --latency <# milliseconds>	Latency in milliseconds
-e, --encryption <0-none, 1-128, 2-256>	Encryption level
-B, --board <Source 0-All, 2-AJA, 3-AJA Shared, 4-Screen or BlueFish444, 5-BlackMagic, 6-UltraScope, 7-Matrox, 8-USB, 11-NDI, 12-Screen>	board to use
-f, --format <Signal format>	Signal format
-P, --playaudio <Play audio locally if 1>	Play audio locally
-v, --screen <# kilobits per second>	Screen or board to send to 0..n
-X, --watermarkx <number in pixels>	X position of the watermark
-Y, --watermarky <number in pixels>	Y position of the watermark
-W, --watermark <a png file>	Path and name of the watermark file
-o, --overlaycc <0=disable,1-4=CC1-4,8=708 Service,9=OP-47,10=XDSOnly>	Overlay closed captions/xds data over video
-z, --netx	Parent Net-X-Code
-m, --minimized	Start app minimized
-C, --config <0-All, 1-CS, 2-FCApp>	Just display config page
-S, --saveconfig <0-NC, 1-CS, 2-FCApp>	Save to settings
-r, --virtualsdi <0-Unregister, 1-Register>	Register/unregister
-L, --license	Run for licensing
-?, -h, --help	Displays help on command line options.
--help-all	Displays help including Qt specific options.
-v, --version	Displays version information.

15.2 Configuring

Windows (registry)
Creative Software Settings:

HKEY_CURRENT_USER\Software\Drastic\FlowCaster
Applications (SDI/HDMI/NDI/Desktop) Settings:
HKEY_CURRENT_USER\Software\Drastic\FlowCaster1

macOS (~\Library\Preferences\)
Creative Software Settings:

/Library/Application\ Support/Drastic/com.drastictech.flowcaster.plist
Applications (SDI/HDMI/NDI/Desktop) Settings:
/Library/Application\ Support/Drastic/com.drastictech.flowcaster1.plist

Linux (~\.config\)
Creative Software Settings:

FlowCaster.conf
Applications (SDI/HDMI/NDI/Desktop) Settings:
FlowCaster1.conf

Settings:
- AudioMode - what audio channels to send
  - Stereo - 0
  - Stereo Mix - 1
  - 4 channels - 2
  - 8 channels - 3
  - 16 channels - 4
- ColorSpace
- Compression - compression for stream as a fourcc code
  - h264 - 875967080
  - h264 10 Bit - 1630680628
  - HEVC - 1752589105
  - HEVC 10 Bit - 1752589153
  - JPEG 2000 - 1598501450
- DataRate - in kilobits per second (megabits per second divided by 1000)
- Email - email address for licensing
- Enabled - enable transmission of SDI/HDMI/NDI
- Encryption - type of encryption to use
  - 0 - None

1 - AES 128
2 - AES 256

FPS

IBP - the IBP structure of the compressed stream
IBBP - 0
IPPP - 1
IIII - 2

Latency - the number of milliseconds to use to recover packets

Password - password to use for the encryption (must be at least 10 characters)

SDR_HDR

SendHDRSignals - 1 if it should send HDR signals to the receiver

StreamNo - stream number to set for this send

TransferType

Type - protocol to send the stream as
SRT - Caller
SRT - Listener
SRT - Rendezvous
RTP
UDP
RTMP
NDI
CDI
RIST
WebRTC
SMPTE 2110

URL - the target address (eg. srt://199.0.0.123:5000?mode=caller)

User - the user name to use with the URL you are sending to (optional)

UserName - user name for licensing

Watermark - a path to a watermark file (normally PNG 32 bit)

WatermarkX - the horizontal offset at which to display the watermark image

WatermarkY - the vertical offset at which to display the watermark image

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“The Library” refers to a covered work governed by this License, other than an Application or a Combined Work as defined below.
An “Application” is any work that makes use of an interface provided by the Library, but which is not otherwise based on the Library. Defining a subclass of a class defined by the Library is deemed a mode of using an interface provided by the Library.
A “Combined Work” is a work produced by combining or linking an Application with the Library. The particular version of the Library with which the Combined Work was made is also called the “Linked Version”.
The “Minimal Corresponding Source” for a Combined Work means the Corresponding Source for the Combined Work, excluding any source code for portions of the Combined Work that, considered in isolation, are based on the Application, and not on the Linked Version.
The “Corresponding Application Code” for a Combined Work means the object code and/or source code for the Application, including any data and utility programs needed for reproducing the Combined Work from the Application, but excluding the System Libraries of the Combined Work.

16.2.1.2 1. Exception to Section 3 of the GNU GPL.

You may convey a covered work under sections 3 and 4 of this License without being bound by section 3 of the GNU GPL.

16.2.1.3 2. Conveying Modified Versions.

If you modify a copy of the Library, and, in your modifications, a facility refers to a function or data to be supplied by an Application that uses the facility (other than as an argument passed when the facility is invoked), then you may convey a copy of the modified version:

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- b) under the GNU GPL, with none of the additional permissions of this License applicable to that copy.

3. Object Code Incorporating Material from Library Header Files.

The object code form of an Application may incorporate material from a header file that is part of the Library. You may convey such object code under terms of your choice, provided that, if the incorporated material is not limited to numerical parameters, data structure layouts and accessors, or small macros, inline functions and templates (ten or fewer lines in length), you do both of the following:

- a) Give prominent notice with each copy of the object code that the Library is used in it and that the Library and its use are covered by this License.
- b) Accompany the object code with a copy of the GNU GPL and this license document.

4. Combined Works.

You may convey a Combined Work under terms of your choice that, taken together, effectively do not restrict modification of the portions of the Library contained in the Combined Work and reverse engineering for debugging such modifications, if you also do each of the following:

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- c) For a Combined Work that displays copyright notices during execution, include the copyright notice for the Library among these notices, as well as a reference directing the user to the copies of the GNU GPL and this license document.
- d) Do one of the following:
  - 0) Convey the Minimal Corresponding Source under the terms of this License, and the Corresponding Application Code in a form suitable for, and under terms that permit, the user to recombine or relink the Application with a modified version of the Linked Version to produce a modified Combined Work, in the manner specified by section 6 of the GNU GPL for conveying Corresponding Source.
  - 1) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (a) uses at run time a copy of the Library already present on the user's computer system, and (b) will operate properly with a modified version of the Library

that is interface-compatible with the Linked Version.

- e) Provide Installation Information, but only if you would otherwise be required to provide such information under section 6 of the GNU GPL, and only to the extent that such information is necessary to install and execute a modified version of the Combined Work produced by recombining or relinking the Application with a modified version of the Linked Version. (If you use option 4d0, the Installation Information must accompany the Minimal Corresponding Source and Corresponding Application Code. If you use option 4d1, you must provide the Installation Information in the manner specified by section 6 of the GNU GPL for conveying Corresponding Source.)

5. Combined Libraries.

You may place library facilities that are a work based on the Library side by side in a single library together with other library facilities that are not Applications and are not covered by this License, and convey such a combined library under terms of your choice, if you do both of the following:

- a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities, conveyed under the terms of this License.
- b) Give prominent notice with the combined library that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

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Your sole remedies under this limited warranty are as follows:
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