FlowCaster v8



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1 Copyrights and Trademark Notices	5
1.1 General	5
1.2 GNU LESSER GENERAL PUBLIC LICENSE	14
1.2.1.1 0. Additional Definitions	14
1.2.1.2 1. Exception to Section 3 of the GNU GPL	14
1.2.1.3 2. Conveying Modified Versions	14
3. Object Code Incorporating Material from Library Header Files	15
4. Combined Works	15
5. Combined Libraries	16
6. Revised Versions of the GNU Lesser General Public License	16
1.3 MPEG Disclaimers	17
1.3.1 MPEGLA MPEG2 Patent	17
1.3.2 MPEGLA MPEG4 VISUAL	17
1.3.3 MPEGLA AVC	17
1.3.4 MPEG4 SYSTEMS	17
1.4 Drastic Technologies Limited Warranty and Disclaimers	
1.4.1 Warranty Remedies	
1.4.2 Software Updates	
1.4.3 Restrictions and Conditions of Limited Warranty	
1.4.4 Limitations of Warranties	
1.4.5 Damages	
1.5 GNU LESSER GENERAL PUBLIC LICENSE	20
1.5.1.1 0. Additional Definitions	20
1.5.1.2 1. Exception to Section 3 of the GNU GPL	20
1.5.1.3 2. Conveying Modified Versions	20
3. Object Code Incorporating Material from Library Header Files	21
4. Combined Works	21
5. Combined Libraries	21
6. Revised Versions of the GNU Lesser General Public License	22
1.6 MPEG Disclaimers	23
1.6.1 MPEGLA MPEG2 Patent	23
1.6.2 MPEGLA MPEG4 VISUAL	23
1.6.3 MPEGLA AVC	23
1.6.4 MPEG4 SYSTEMS	23
1.7 Drastic Technologies Limited Warranty and Disclaimers	24
1.7.1 Warranty Remedies	24
1.7.2 Software Updates	
1.7.3 Restrictions and Conditions of Limited Warranty	
1.7.4 Limitations of Warranties	24
1.7.5 Damages	
3 USING IP VIDEO STREAMING	27
	<i>L</i>
3.1 Basic IP Video URLs	
3.1 Basic IP Video URLs 3.2 UDP and RTP	27
3.1 Basic IP Video URLs 3.2 UDP and RTP 3.3 SRT	
3.1 Basic IP Video URLs 3.2 UDP and RTP 3.3 SRT 3.4 RIST	
3.1 Basic IP Video URLs 3.2 UDP and RTP 3.3 SRT 3.4 RIST 3.5 RTSP	

3.7 WebRTC	
3.8 WHIP (WebRTC – Millicast)	
3.9 BLS (Bliss Protocol)	
3.10 NDI.	
3.11 CDI	
3.12 ST-2110 and ST-2011-6	
3.12.1 2110 Video Setup	
3.12.2 ST-2110 Audio Setup	
3.12.3 ST-2110 Anc Setup.	
3.13 videoOC URL/URI From Browser	
3.14 Application Specific Notes	
3.14.1 VLC (version 3.0.8 and greater).	
3.14.2 OBS – Open Broadcast System	
3.14.3 Marshall and other Cameras.	
4 Workflows	
4.1 Work from home/cloud/remote monitoring	/12
4.1 Work norm charing (collaboration	
4.2 Production reduction or conture food	
4.3 Cloud production of capture reed	
4.4 IP IOIMal conversion	
5 QUICK START – SRT/RTP/0DP	
6 Quick Start – RTMP	51
7 FlowCaster Configuration	58
8 Adobe	59
8.1 Adobe Premiere	
8.2 FlowCaster Configuration Dialog	61
8.2 FlowCaster Configuration Dialog 8.2.1 Transmit Type	61 61
8.2 FlowCaster Configuration Dialog 8.2.1 Transmit Type 8.2.2 URI	61 61 62
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency 	61
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency. 8.2.4 Encryption 	
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency. 8.2.4 Encryption. 8.2 5 Password 	
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User 	
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User. 8.2.7 Stream # 	61 61 62 62 62 62 62 62 63 63
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User. 8.2.7 Stream #	61 61 62 62 62 62 62 62 63 63 63
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User. 8.2.7 Stream #. 8.2.8 Compression. 8.2.9 Structure 	61 61 62 62 62 62 62 62 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User. 8.2.7 Stream #. 8.2.8 Compression. 8.2.9 Structure. 8.2.10 Bit Rate 	61 61 62 62 62 62 62 62 63 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User. 8.2.7 Stream #. 8.2.8 Compression. 8.2.9 Structure. 8.2.10 Bit Rate. 8.2.11 Receiver Supports HDR Signaling 	
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User. 8.2.7 Stream #. 8.2.8 Compression. 8.2.9 Structure. 8.2.10 Bit Rate. 8.2.11 Receiver Supports HDR Signaling. 8.2.12 Audio Mode 	61 61 62 62 62 62 62 63 63 63 63 63 63 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User. 8.2.7 Stream #. 8.2.8 Compression. 8.2.9 Structure. 8.2.10 Bit Rate. 8.2.11 Receiver Supports HDR Signaling. 8.2.12 Audio Mode. 8.2.13 Watermark 	61 61 62 62 62 62 63 63 63 63 63 63 63 63 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User. 8.2.6 User. 8.2.7 Stream #. 8.2.8 Compression. 8.2.9 Structure. 8.2.10 Bit Rate. 8.2.11 Receiver Supports HDR Signaling. 8.2.12 Audio Mode. 8.2.13 Watermark. 	61 61 62 62 62 62 62 63 63 63 63 63 63 63 63 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User. 8.2.6 User. 8.2.7 Stream #. 8.2.8 Compression. 8.2.9 Structure. 8.2.10 Bit Rate. 8.2.10 Bit Rate. 8.2.11 Receiver Supports HDR Signaling. 8.2.12 Audio Mode. 8.2.13 Watermark. 	61 62 62 62 62 62 63 63 63 63 63 63 63 63 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL. 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User. 8.2.7 Stream #. 8.2.8 Compression. 8.2.9 Structure. 8.2.10 Bit Rate. 8.2.11 Receiver Supports HDR Signaling. 8.2.12 Audio Mode. 8.2.13 Watermark. 9 Avid.	61 62 62 62 62 62 63 63 63 63 63 63 63 63 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User. 8.2.7 Stream #. 8.2.8 Compression. 8.2.9 Structure. 8.2.10 Bit Rate. 8.2.11 Receiver Supports HDR Signaling. 8.2.12 Audio Mode. 8.2.13 Watermark. 9 Avid. 9.1 Using FlowCaster with Avid Media Composer. 9.2 Avid Media Composer. 9.2 FlowCester Configuration Dialog. 	61 61 62 62 62 62 63 63 63 63 63 63 63 63 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog	61 62 62 62 62 62 63 63 63 63 63 63 63 63 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User. 8.2.7 Stream #. 8.2.8 Compression. 8.2.9 Structure. 8.2.10 Bit Rate. 8.2.11 Receiver Supports HDR Signaling. 8.2.12 Audio Mode. 8.2.13 Watermark. 9 Avid. 9.1 Using FlowCaster with Avid Media Composer. 9.2 Avid Media Composer. 9.3 FlowCaster Configuration Dialog. 9.3.1 Transmit Type. 9.3.1 Transmit Type. 	61 62 62 62 62 62 63 63 63 63 63 63 63 63 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog. 8.2.1 Transmit Type. 8.2.2 URL 8.2.3 Latency. 8.2.4 Encryption. 8.2.5 Password. 8.2.6 User. 8.2.7 Stream #. 8.2.8 Compression. 8.2.9 Structure. 8.2.10 Bit Rate. 8.2.11 Receiver Supports HDR Signaling. 8.2.12 Audio Mode. 8.2.13 Watermark. 9 Avid. 9.1 Using FlowCaster with Avid Media Composer. 9.2 Avid Media Composer. 9.3 FlowCaster Configuration Dialog. 9.3.1 Transmit Type. 9.3.2 URL. 9.2 A target 	61 62 62 62 62 62 63 63 63 63 63 63 63 63 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog	61 62 62 62 62 63 63 63 63 63 63 63 63 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog	61 62 62 62 62 62 63 63 63 63 63 63 63 63 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog	61 61 62 62 62 62 63 63 63 63 63 63 63 63 63 63 63 63 63
 8.2 FlowCaster Configuration Dialog	61 62 62 62 62 62 63 63 63 63 63 63 63 63 63 63 63 63 63

9.3.8 Compression	68
9.3.9 Structure	68
9.3.10 Bit Rate	68
9.3.11 Receiver Supports HDR Signaling	68
9.3.12 Audio Mode	69
9.3.13 Watermark	69
10 Assimilate SCRATCH	70
11 DaVinci Resolve	71
12 OpenFX Compatible Software	72
12 OpenFX Compatible Software 13 SDI/HDMI/NDI/Desktop Input	72 73
12 OpenFX Compatible Software 13 SDI/HDMI/NDI/Desktop Input 13.1 SDI/HDMI	72 73 75
12 OpenFX Compatible Software 13 SDI/HDMI/NDI/Desktop Input 13.1 SDI/HDMI 13.2 NDI	72 73 75 75
12 OpenFX Compatible Software 13 SDI/HDMI/NDI/Desktop Input 13.1 SDI/HDMI 13.2 NDI 13.3 Desktop	72 73 75 75 75
12 OpenFX Compatible Software 13 SDI/HDMI/NDI/Desktop Input 13.1 SDI/HDMI 13.2 NDI 13.3 Desktop 14 Controlling/Configuring	
12 OpenFX Compatible Software 13 SDI/HDMI/NDI/Desktop Input 13.1 SDI/HDMI 13.2 NDI 13.3 Desktop 14 Controlling/Configuring 14.1 Command Line Parameters	

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2 Introduction

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.

3 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.

3.1 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.

3.2 UDP and RTP

UDP [User Datagram Protocol] and **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 UDP and 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 a few examples:

- udp://239.254.40.40:5004
- rtp://239.100.20.20:50004
- rtp://239.100.30:31:1234

3.3 SRT

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=#

3.4 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

3.5 RTSP

RTSP [Real Time Streaming Protocol] streams require not only the device address, but also the description of the source of the stream you are accessing on that device. RTSP streams are also often user/password protected, so you may have to send a user/password in the form "<user>:<pass>@" just before the device identifier. Here are a few examples, and their sources:

- rtsp://192.168.100.10/axis-media/media.amp (an Axis camera)
- rtsp://192.168.199.11/user:pass@/video1+audio1 (a Marshall camera, with password)
- rtsp://192.168.160.20:/onvif/media.amp (an OnVIF source)
- rtps://192.168.150:11/video1?videocodec=h264 (a Marshall camera, video only, force h.264)

3.6 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 rewrapped 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

3.7 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.chat?meetingid=asre-dsec-asds-seff&name=flowcaster

3.8 WHIP (WebRTC – Millicast)

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

3.9 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

3.10 NDI

NDI [Network Device Interface] is a video over IP protocol from NewTek[®]. 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.

	DefaultSignalFormat	(0x2380B217)	595636759
	DefaultStreamType	(0x0000000)	0
Control0	DefaultVert	(0x00000438)	1080
External0	DisableOpenAllChannels	(0x0000000)	0
	EditRecorder	(0x0000000)	0
External2	EnableAppPipeServer	(0x0000000)	0
External3	EnableNDISearch	(0x00000001)	1
🗄 🔂 Internal0	EnableVBIVideoChannel	(0x0000000)	0
1 1 <u>Carr</u> 12		/ ·>	

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])

3.11CDI

CDI [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

3.12 ST-2110 and ST-2011-6

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: <u>Bluefield-2</u> or <u>Connect-X 6</u> (requires Rivermax license) View the <u>Video Overview</u> Here is a page with some <u>Great ST-2110 Links</u> Here is our <u>Rivermax Setup page</u>

SMPTE 2110 hardware

Matrox: <u>ST 2110 Network Adapters</u> AJA: <u>Kona IP</u>

3.12.1 2110 Video Setup

Here is the ST-2110 setup dialog from NetXScope.

When set to ST-2110 or ST-2022 sources, the IP Setup button opens the **IP Video Setup** window, which allows the user to set up how IP 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.

🦂 IP Video Setup			– 🗆 X
Channel	char	inel-0	<u>_</u>
Override NMOS Settings	NMOS Log to file		NMOS Config
Туре	SMPTE-2110	•	
Video Format	1080i 59.94fps (1920)	•	Video
Audio Channels / µs	8	•	125 • C Audio
Receive	IPv4	Ψ.	C Anc
Source Address	239 . 200 . 100	. 20	□ lock
Source port	50002		🗖 lock
✓ Destination Address	239 . 200 . 100	. 20	🗆 lock
Destination Port	50002		🗖 lock
🗔 Interface	192 . 168 . 100	. 166	Iv lock
Send / µs	IPv4	v	125 💌
Source Address	1 . 0 . 0	. 0	🗖 lock
Source Port	5000		🗖 lock
Destination Address	239 . 200 . 100	. 10	🗖 lock
Destination Port	5000		🗖 lock
🗔 Interface	192 . 168 . 100	. 166	lock □
Clock Source	Internal	•	
Clock Info	GMT Time		
Clock Time	2025-03-04 T 13:57:23.267		,
Clock Mac Address / ID		0	Save Video SDP
Load File	Save File	Accept	Cancel

Channel pulldown – select between channels.

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

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.
- **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.

× Save Current Element	i		×
← → · ↑ 🔒 «	Program Files > NetworkVideoAnalyzer >	✓ Ö 🔎 Sear	h NetworkVideoAnalyzer
Organize 🔻 New f	older		::: • ?
💻 This PC	^ Name	Date modified	Type S
3D Objects	arriimagesdk_plugins	2022-12-16 11:17 AM	File folder
Desktop	imageformats	2022-12-16 11:17 AM	File folder
Documents	platforms	2022-12-16 11:17 AM	File folder
👆 Downloads			
k sa s	* <		· · · · · · · · · · · · · · · · · · ·
File <u>n</u> ame:			~
Save as <u>t</u> ype: Se	ssion File(*.sdp)		~
∧ Hide Folders		<u>S</u> ave	Cancel

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.
- Accept button press to accept all changes and close the IP Video Setup window.

Cancel button – press to close the IP Video Setup window without making any changes.
3.12.2 ST-2110 Audio Setup

🦂 IP Video Setup				- 🗆 X
Channel		channel-0		T
✓ Override NMOS Settings	NMOS Log to file		NMOS	Config
Туре	SMPTE-2110	-	[
Video Format	1080i 59.94fps (1920)	•		C Video
Audio Channels / µs	8	•	125 💌	Audio
Receive	IPv4	*	lock all	C Anc
Source Address	239 . 200 .	100 . 21	🗆 lock	
C Source port	50004	4	Iock	
✓ Destination Address	239 . 200 .	100 . 21	lock	
✓ Destination Port	50004	4	lock	
Interface	192 . 168 .	100 . 166	✓ lock	
Send / µs	IPv4	*	125 💌	
Source Address	1.0.	0.0	lock	Audio Channel
Source Port	5001		lock	
✓ Destination Address	239 . 200 .	100 . 10	lock	
✓ Destination Port	5001		lock	03 04
Interface	192 . 168 .	100 . 166	✓ lock	0506
Clock Source	Internal	-	[0708
Clock Info	GMT Time			
Clock Time	2025-03-04 T13:58:34.947			
Clock Mac Address / ID		0		Save Audio SDP
Load File	Save File	Accept		Cancel

Channel pulldown – select between channels.

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

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 Channel 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 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.
- Accept button press to accept all changes and close the IP Video Setup window.
- Cancel button press to close the IP Video Setup window without making any changes.

3.12.3 ST-2110 Anc Setup

🦂 IP Video Setup			-	- 🗆 X
Channel		channel-0		Ŧ
✓ Override NMOS Settings	NMOS Log to file		NMOS	Config
Туре	SMPTE-2110		-	
Video Format	1080i 59.94fps (1920)			C Video
Audio Channels / µs	8	-	- - 125	
Receive	IPv4	-		
Source Address	239 200	- 100 . 22		(• Anc
	500	006		
Destination Address	239 200	. 100 . 22		
Destination Port	500	006		
	192 168	100 166		
Send / µs	TPv4	. 100 . 100	125	-
	1 0	-		_
	50	02		
	239 200	100 10		
	50 50	02		
	102 169	100 166		
	[192 . 100 .	. 100 . 166		
Clock Info	Jinternai	1	-	
Clock Time	GMT Time	_		
	J2025-03-04 T14:01:54.987		_	1
Clock Mac Address / ID	J	ļo		Save Anc SDP
Load File	Save File	Accept		Cancel

Channel pulldown – select between channels.

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

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- μ s
- **Clock Mac Address / ID** checkbox click to activate the Mac Address boxes to the right, so you can enter the clock's Mac 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.
- **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.
- Accept button press to accept all changes and close the IP Video Setup window.
- **Cancel** button press to close the IP Video Setup window without making any changes.

3.13 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

3.14 Application Specific Notes

3.14.1 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.

3.14.2 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.

3.14.3 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

4 Workflows

4.1 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.

4.2 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

4.3 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).

4.4 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.

4.5 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.

5 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: <u>http://license.drastictech.com</u>

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.

Pr	eferences							:	×
	General Appearance Al Models Audio	Preroll: Postroll: Step forward/back many:	3 2 5	seconds seconds frames					
	Audio Hardware Auto Save Collaboration Color Control Surface	 Pause Media Encoder Enable Mercury Trans Primary Audio Device: Fransmit Device Playback: 	queue durin, mit FlowCaster Ti	g playback ransmitter 🗸 🗸	Offset: 0 ms				
	Graphics Labels	Device Name	Vid	leo Stream	Video Offset	Audio Stream	Settings		
	Media	Adobe Monitor 1: 1920 x	1080		0 ms				
	Media Analysis & Transcription	Adobe SRT		0	0 ms	0	*		
	Media Cache	Drastic Scope Transmitte	r	0	0 ms				
	Playback	FlowCaster Transmitter			0 ms	🗹 Primary	¢		
	Timeline	NDI output			<mark>0</mark> ms		\$		
	Trim Help Reset	Disable video output v	when in the b	vackground				OK Cancel	

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.

Labers	Adobe Monitor 1: 1920 x 1080	<mark>0</mark> ms			
Media	Adobe Monitor 2: 1920 x 1080	0 ms			A
Media Cache	Adobe SRT	0 ms	D	* /	
Memory	Drastic Scope Transmitter	0 ms			
Plavback	FlowCaster Transmitter	0 ms	🗹 Primary	*	<u> </u>
Timeline	NDI output	0 ms		¢	

This brings up the FlowCaster configuration dialog.

O FlowCaster				_		×
Flow Confi	g Input License About					
O Creative Soft	ware + - 🥥 This Ap	plication +		Simple		
Transmit Type	SRT - Listener]				
URL	srt://192.168.100.166:5000					
Latency	120	Ms				
Encryption	None	Bits				
Password						
User		Optional				
Stream #	0	ĺ				
Compression	H-264 4:2:0 Transport]				
Structure	Ibbb]				
Bit Rate	2500					-
Streaming Limits	Receiver Supports HDR Signalling	Disable TC and Capt	ion PIDs			
Audio Mode	Stereo	Play Audio Locally	Disable Caption Bur	n In	_	
Watermark			0,0			
Language	English	📕 Burn In TC	100, 50			
Update	Check for new versions on startup					
				Ok	Cance	

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

📥 Open Media	—		×
Eile Spisc Vetwork Capture Device			
Network Protocol			
Please enter a network URL:			
http://www.example.com/stream.avi rtp://e11234 mms://mms.examples.com/stream.asx rtsp://server.examples.com/othest.sdp http://www.yourtube.com/watch?v=gg64x			<u> </u>
Show more options			
	<u>P</u> lay ▼	Can	cel

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

6 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.

Live str	earning - YouTube Studio 🗙 🔎 Stream Manager - Twitch 🛛 🗙 📔 🕂		– 🗆 X
$\leftarrow \rightarrow$	C 🔒 studio.youtube.com/video/KDZJVj1CAko/livestreaming		🖈 🤤 🕫 🇯 🕄
= (> Studio		* * 🧿
((=))			Live chat :
0 :	Connect streaming software to go live Viewers will be able to find your stream once you go live	Title FlowCaster Live Stream Category People & Blogs Privacy	EDIT Welcome to live chall Remember to guard your privacy and abide by our community guidelines. LEARN MORE
		© Public Viewers waiting Likes 0 0	
	 Start sending us your video from your streaming so 	ftware to go live	
	STREAM SETTINGS ANALYTICS STREAM HEALTH		
	Stream key Select stream key Default stream key (RTMP Variable)	Additional settings Enable DVR	•
	Stream key (paste in encoder)	COPY Added delay	•
	Stream URL Trmp://a.rtmp.youtube.com/live2	COPY None -	
	Backup server URL	COPY Closed captions	
	YouTube also supports RTMPS for secure connections. Learn more	Unlist live replay once stream ends	
	Stream latency 🧑		
	O Normal latency		
	Low-latency		FlowCaster Say something
F			€ 0/200 >

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).

File	<u>E</u> dit	<u>B</u> in	<u>C</u> lip	Tim	eline	Compo	ser	Tools	Windows	Script	Avid Link
0	Sł	iow Al		•	=			Tir	neline		Ctrl+0
					Ω			Co	mpose <u>r</u>		Ctrl+4
8	-	Flow	Caster	Bin	120K	Color		So	urce Brows	er	
								Ins	spector Too		
							œ₿	Au	dio Mixer		
.S							œ₿	Au	dio E <u>Q</u>		
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							⊞ß	Au	dio Track E	ffect	
							_0	A <u>u</u>	dio Tool		Ctrl+1
								Au	dio <u>P</u> unch-l	n	
								Co	lor Info		
								<u>E</u> ff	ect Editor		
								Mg	tion Effect	Editor	
								E <u>f</u> f	ect Palette		Ctrl+8
								<u>T</u> it	le Tool App	lication	
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e								Tir	necode <u>W</u> in	ndow	
inelin								Ne	w Deck <u>C</u> or	ntroller	
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								<u>V</u> ic	leo Output	Tool	

This will bring up the FlowCaster configuration dialog.

Flow Config Tiput License About • Creative Software + • • • • • This Application + • • • • • • This Application + • • • • • • • • • • • • • •	OF FlowCaster				_		×
Creative Software + Transmit Type This Application Transmit Type ThiP URL Transmit Type ThiP This Application Ms This Application Ms Transmit Type ThiP URL Transmit Type ThiP This Application Transmit Type ThiP This Application Ms Transmit Type ThiP This Application Dopologication Ms Transmit Type ThiP This Application Thin This ThiP This Application Thin This This Application	Flow Confi	g Input License About					
Transmit Type RTMP URL rtmp://artmp.youtube.com/live/jhdfshowhefwensjchigoonfe/fwfnf7867cefiksfo Latency 120 Ms Bits Password Bits Password Optional Stream # Occupression Compression h.264 Structure IPPP Bit Rate 2500 Streaming Limits Receiver Supports HDR Signaling Audio Mode Stereo Play Audio Locally Disable Caption Burn In Watermark 0, 0 Language English Burn In TC 100, 50 Update Check for new versions on startup Ok Cancel	Creative Soft						
Transmit Type RTMP URL rtmp://a.rtmp.youtube.com//we/jhdfshowhefwensjdnjgoonfejfwfnf78672efiksfo Latency 120 Ms Bits Password							
URL rtmp://a.rtmp.youtube.com/live/jhdfshowhefwenginjgoonfejfwfnf78676efiksfo Latency 120 Bits Bits Password Optional User Optional Stream # 0 Compression h.264 Structure IPPP Bit Rate 2500 Streaming Limits Receiver Supports HOR Signalling Audio Mode Stereo Play Audio Locally Disable TC and Caption PIDs Audio Mode Stereo Update Check for new versions on startup	Transmit Type	RTMP					
Latency 120 Ms Encryption None Bits Password	URL	rtmp://a.rtmp.youtube.com/live/jhdfshowhefwensjdnjgg	osnfejfwfnf78676eflksfo				_
Encryption None Bits Password User Optional Stream # O Compression h.264 Structure IPPP Bit Rate 2500 Streaming Limits Receiver Supports HDR Signalling Disable TC and Caption PIDs Audio Mode Stereo Play Audio Locally Disable Caption Burn In Watermark 0, 0 Language English Update Check for new versions on startup OK Cancel	Latency	120	Ms				
Password User Optional Stream # Compression h.264 Structure IPPP Bit Rate 2500 Streaming Limits Receiver Supports HDR Signalling Disable TC and Caption PIDs Audio Mode Stereo Play Audio Locally Disable Caption Burn In Watermark 0, 0 Language English Update Check for new versions on startup	Encryption	None	Bits				
User Optional Stream # 0 Compression h.264 Structure IPPP Bit Rate 2500 Streaming Limits Receiver Supports HDR Signalling Disable TC and Caption PIDs Audio Mode Stereo Play Audio Locally Disable Caption Burn In Watermark 0, 0 Language English Burn In TC 100, 50 Update Check for new versions on startup Enable Set New Config OK Cancel	Password						
Stream # • Compression h.264 Structure IPPP Bit Rate 2500 Streaming Limits Receiver Supports HDR Signalling Audio Mode Stereo Play Audio Locally Disable Caption Burn In Watermark 0, 0 Language English Burn In TC 100, 50 Update Check for new versions on startup Ok Cancel	User		Optional				
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Structure IPPP Bit Rate 2500 Streaming Limits Receiver Supports HDR Signalling Audio Mode Stereo Play Audio Locally Disable Caption PIDs Audio Mode Stereo Watermark Language English Update Check for new versions on startup	Compression	h.264]				
Bit Rate 2500 Streaming Limits Receiver Supports HDR Signalling Disable TC and Caption PIDs Audio Mode Stereo Play Audio Locally Disable Caption Burn In Watermark Understand Check for new versions on startup	Structure	Ibbb]				
Streaming Limits Receiver Supports HDR Signalling Audio Mode Stereo Play Audio Locally Disable Caption Burn In Watermark Language English Update Check for new versions on startup Enable Set New Config Ok Cancel	Bit Rate	2500					—
Audio Mode Stereo Watermark Language English Update Check for new versions on startup Enable Set New Config Ok Cancel	Streaming Limits	Receiver Supports HDR Signalling	Disable TC and Cap	otion PIDs			
Watermark 0, 0 Language English Burn In TC 100, 50 Update Check for new versions on startup Enable Set New Config Ok Cancel	Audio Mode	Stereo	Play Audio Locally	Disable Caption Bu	rn In	_	
Language English Burn In TC 100, 50 Update Check for new versions on startup Image: English Image: English Image: English Image: English Ima	Watermark			0, 0			
Update Check for new versions on startup Enable Set New Config Ok Cancel	Language	English	📕 Burn In TC	100, 50			
Enable Set New Config Ok Cancel	Update	Check for new versions on startup					
Enable Set New Config Ok Cancel							
Enable Set New Config Ok Cancel							
Enable Set New Config Ok Cancel							
Enable Set New Config Ok Cancel							
Enable Set New Config Ok Cancel							
	Enable Set N	ew Config			Ok	Cance	1

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)

F

to pick up the new configuration.

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

D Live	stream	ning - YouTube Studio	🗙 🔛 St	ream Manager - Tv	vitch ×	+										-	□ ×
\leftrightarrow \rightarrow	C	â studio.youtu	ube.com/vide	o/KDZJVj1CAko	/livestreaming										☆	G 0 #	• 🚯 E
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		0 — 11:52 AM	11:53 AM	11:53 AM	11:54 AM	11:54 AM	11:55 AM	11:55 AM	11:56 AM	11:56 AM	11:57 AM	11:57 AM	0	FlowCaster Say somethi	ng		
P													θ			0/	200 ≽

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.

7 FlowCaster Configuration

O FlowCaster				_		×
Flow Confi	ig Input License About					
O Creative Soft	ware + - 🥥 This Ap	oplication +		Simple		
Transmit Type	RTMP]				
URL	rtmp://a.rtmp.youtube.com/live/jhdfshowhefwensjdnjg	osnfejfwfnf78676eflksfo				
Latency	120	Ms				
Encryption	None	Bits				
Password						
User		Optional				
Stream #						
Compression	h.264]				
Structure	Іррр]				
Bit Rate	2500					-
Streaming Limits	Receiver Supports HDR Signalling	Disable TC and Cap	tion PIDs			_
Audio Mode	Stereo	Play Audio Locally	Disable Caption Burr	1 In		
Watermark			0, 0			_
Language	English	📕 Burn In TC	100, 50			
Update	Check for new versions on startup					
Enable Set N	ew Config			Ok	Cance	ł

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.

8 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.

8.1 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.

Preferences		×
Vertice General Appearance Audio Audio Hardware Auto Save Capture Collaboration Control Surface Device Control Graphics Labels Media Media Media Sync Settings Timeline Trim	Preroll: 3 seconds Postroll: 2 seconds Step forward/back many: 5 frames ✓ Pause Media Encoder queue during playback Fnable Mercury Transmit ✓ Enable Mercury Transmit ✓ Offset: 0 ms ✓ Inable Mercury Transmitter ✓ Offset: 0 ms ✓ Video Device: ✓ Setup. Offset: 0 ms ✓ Adobe DV Setup. Offset: 0 ms ✓ FlowCaster Transmitter Setup. Offset: 0 ms ✓ Adobe Monitor 1: 1920 x 1080 Offset: 0 ms ✓ Adobe Monitor 2: 1920 x 1080 Offset: 0 ms	×
Trim	Disable video output when in the background Help OK Cancel	

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

O FlowCaster				_		×
Flow Confi	g Input License About					
O Creative Soft	ware + - 🥥 This Ap	oplication +		Simple		
Transmit Type	SRT - Listener]				
URL	srt://192.168.100.166:5000					
Latency	120	Ms				
Encryption	None	Bits				
Password						
User		Optional				
Stream #	0					
Compression	H-264 4:2:0 Transport]				
Structure	Ibbb]				
Bit Rate	2500					_
Streaming Limits	Receiver Supports HDR Signalling	Disable TC and Cap	otion PIDs			
Audio Mode	Stereo	Play Audio Locally	Disable Caption Bur	rn In	_	
Watermark			0, 0			
Language	English	📕 Burn In TC	100, 50			
Update	Check for new versions on startup					
				Ok	Cance	el

8.2 FlowCaster Configuration Dialog

8.2.1 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

8.2.2 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

8.2.3 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

8.2.4 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.

8.2.5 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

8.2.6 User

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

8.2.7 Stream

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

8.2.8 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.

8.2.9 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)

8.2.10 Bit Rate

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

8.2.11 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

8.2.12 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

8.2.13 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.

9 Avid

9.1 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.

9.2 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

FlowCaster				_		×	
Flow Config Input License About							
Creative Soft	ware + - 🥥 This Ap	oplication +		Simple			
Transmit Type	SRT - Listener]					
URL	srt://192.168.100.166:5000						
Latency	120	Ms					
Encryption	None	Bits					
Password							
User		Optional					
Stream #	0						
Compression	H-264 4:2:0 Transport]					
Structure	IPPP]					
Bit Rate	2500						
Streaming Limits	Receiver Supports HDR Signalling	Disable TC and Cap	otion PIDs				
Audio Mode	Stereo	Play Audio Locally	Disable Caption Bur	n In	_		
Watermark			0, 0				
Language	English	📕 Burn In TC	100, 50				
Update	Check for new versions on startup						
				Ok	Cance	:	

9.3 FlowCaster Configuration Dialog

9.3.1 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 is should be the internet facing IP of the remove 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

9.3.2 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

9.3.3 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

9.3.4 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.

9.3.5 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

9.3.6 User

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

9.3.7 Stream

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

9.3.8 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.

9.3.9 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)
- III this has the shortest latency, but the worst quality (temporal, or Intraframe only)

9.3.10 Bit Rate

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

9.3.11 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

9.3.12 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

9.3.13 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 Assimilate SCRATCH

All Files.	QNT (.qnt) [P]	OMF (.omf .omfi) [P]	FLM (.flm) [P]
All Formats	YUV (.yuv* .y .v210) [P]	R-G-B (.red .blu .grn) [P]	AvidDS (.gen) [P]
DPX/Cineon (.dpx .cin)	HDR (.hdr) [P]	rtIndex (.rtin) [P]	GXF 360 (.gxf) [P]
Tiff (.tif)	DHDR (.dhdr) [P]	RTV (.rtv) [P]	264 (.264 .h264) [P]
Jpeg (.jpg .jpe .jpeg)	IFX ARC (.arc) [P]	VC1 (.vc1) [P]	HDV (.hdv) [P]
OpenEXR (.exr)	WMV (.asf .wmv) [P]	SIV (.siv) [P]	IHSS (.ihss) [P]
Targa (.tga)	AVI (.avi) [P]	Drastic (Many) [P]	Jaleo (.js) [P]
Windows Bitmap (.bmp)	CINE (.cine) [P]	AVC-HD (.m2ts .mts) [P]	Separate (.luma) [P]
Silicon Graphics (.sgi .rgb)	FLM (.fim) [P]	ARI (.ari) [P]	MPEG (.mpg .vob etc) [P]
Jpeg 2000 (.jp2 .jpc .j2c)	AvidDS (.gen) [P]	DNG (.dng) [P]	MOV (.mov) [P]
QuickTime (.mov .mp4 .avi)	GXF 360 (.gxf) [P]	DPX(C) (.dpx .cin) [P]	MPEG-4 (.mp4) [P]
REDCODE (.r3d)	264 (.264 .h264) [P]	TGA (.tga) [P]	Panasonic MXF (.mxf) [P]
MXF (.mxf)	HDV (.hdv) [P]	TIFF (.tiff .tif) [P]	Sony MXF (.mxf) [P]
ARRI RAW (*.ARI) [P]	IHSS (.ihss) [P]	DVS (.dvs) [P]	Avid MXF (.mxf) [P]
Drastic (Many) [P]	Jaleo (.js) [P]	PSD (.psd) [P]	Omneon MXF (.mxf) [P]
AVC-HD (.m2ts .mts) [P]	Separate (.luma) [P]	VPB (.vpb) [P]	General MXF (.mxf) [P]
ARI (.ari) [P]	MPEG (.mpg .vob etc) [P]	QNT (.qnt) [P]	OMF (.omf .omfi) [P]
DNG (.dng) [P]	MOV (.mov) [P]	YUV (.yuv* .y .v210) [P]	R-G-B (.red .blu .grn) [P]
DPX(C) (.dpx .cin) [P]	MPEG-4 (.mp4) [P]	HDR (.hdr) [P]	rtIndex (.rtin) [P]
TGA (.tga) [P]	Panasonic MXF (.mxf) [P]	DHDR (.dhdr) [P]	RTV (.rtv) [P]
TIFF (.tiff .tif) [P]	Sony MXF (.mxf) [P]	IFX ARC (.arc) [P]	VC1 (.vc1) [P]
DVS (.dvs) [P]	Avid MXF (.mxf) [P]	WMV (.asf .wmv) [P]	SIV (.siv) [P]
PSD (.psd) [P]	Omneon MXF (.mxf) [P]	AVI (.avi) [P]	
VPB (.vpb) [P]	General MXF (.mxf) [P]	CINE (.cine) [P]	

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.

11 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.

12 OpenFX Compatible Software

All Files	QNT (.qnt) [P]	OMF (.omf .omfi) [P]	FLM (.flm) [P]
All Formats	YUV (.yuv* .y .v210) [P]	R-G-B (.red .blu .grn) [P]	AvidDS (.gen) [P]
DPX/Cineon (.dpx .cin)	HDR (.hdr) [P]	rtIndex (.rtin) [P]	GXF 360 (.gxf) [P]
Tiff (.tif)	DHDR (.dhdr) [P]	RTV (.rtv) [P]	264 (.264 .h264) [P]
Jpeg (.jpg .jpe .jpeg)	IFX ARC (.arc) [P]	VC1 (.vc1) [P]	HDV (.hdv) [P]
OpenEXR (.exr)	WMV (.asf .wmv) [P]	SIV (.siv) [P]	IHSS (.ihss) [P]
Targa (.tga)	AVI (.avi) [P]	Drastic (Many) [P]	Jaleo (.js) [P]
Windows Bitmap (.bmp)	CINE (.cine) [P]	AVC-HD (.m2ts .mts) [P]	Separate (.luma) [P]
Silicon Graphics (.sgi .rgb)	FLM (.flm) [P]	ARI (.ari) [P]	MPEG (.mpg .vob etc) [P]
Jpeg 2000 (.jp2 .jpc .j2c)	AvidDS (.gen) [P]	DNG (.dng) [P]	MOV (.mov) [P]
QuickTime (.mov .mp4 .avi)	GXF 360 (.gxf) [P]	DPX(C) (.dpx .cin) [P]	MPEG-4 (.mp4) [P]
REDCODE (.r3d)	264 (.264 .h264) [P]	TGA (.tga) [P]	Panasonic MXF (.mxf) [P]
MXF (.mxf)	HDV (.hdv) [P]	TIFF (.tiff .tif) [P]	Sony MXF (.mxf) [P]
ARRI RAW (*.ARI) [P]	IHSS (.ihss) [P]	DVS (.dvs) [P]	Avid MXF (.mxf) [P]
Drastic (Many) [P]	Jaleo (.js) [P]	PSD (.psd) [P]	Omneon MXF (.mxf) [P]
AVC-HD (.m2ts .mts) [P]	Separate (.luma) [P]	VPB (.vpb) [P]	General MXF (.mxf) [P]
ARI (.ari) [P]	MPEG (.mpg .vob etc) [P]	QNT (.qnt) [P]	OMF (.omf .omfi) [P]
DNG (.dng) [P]	MOV (.mov) [P]	YUV (.yuv* .y .v210) [P]	R-G-B (.red .blu .grn) [P]
DPX(C) (.dpx .cin) [P]	MPEG-4 (.mp4) [P]	HDR (.hdr) [P]	rtIndex (.rtin) [P]
TGA (.tga) [P]	Panasonic MXF (.mxf) [P]	DHDR (.dhdr) [P]	RTV (.rtv) [P]
TIFF (.tiff .tif) [P]	Sony MXF (.mxf) [P]	IFX ARC (.arc) [P]	VC1 (.vc1) [P]
DVS (.dvs) [P]	Avid MXF (.mxf) [P]	WMV (.asf .wmv) [P]	SIV (.siv) [P]
PSD (.psd) [P]	Omneon MXF (.mxf) [P]	AVI (.avi) [P]	
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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.
13 SDI/HDMI/NDI/Desktop Input

O FlowCaster				×
Flow Config	Input License About			
Board Type	USB/DirectShow/UVC		_	пL
Screen/Board Number	1			
Input	SDI			
Input Type	2 Pixel Interleave			
Signal Format	1080P 25fps (1920)			
Color Format	YCbCr 4:2:2 8 Bit			
Primaries	Auto 709 601 2020			
Transfer	SDR (709/601)			
Audio Input	Unbalanced -10			
Audio Channels	8			
Input URL/NDI				
IP Settings				
IP Config				
Enable Set New Co	nfig	Ok	Cance	:

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.

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

Matrox – use a Matrox 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.

13.1 SDI/HDMI

13.2 NDI

13.3 Desktop

14 Controlling/Configuring

14.1 Command Line Parameters

Usage: d:\drastic.trunk\bin64\flowcaster.exe [options]

Options:

- -n, --ndisource NDI Source
- -u, --urldestination URL to send to
- -N, --name User name
- -p, --password SRT password (min 10 char)
- -I, --sourcenumber Source ID number
- -s, --source <0-12 See Docs> A/V Source
- -t, --transport <0-5: NDI,UDP,RTP,TR01,SRT,RTMP> Output Transport Type
- -x, --extrastreams <0-allow, 1-disable> Extra streams that Haivision Player can't handle
- -a, --audchan <1 (st mix), 2, 4, 8, 16, 24, 32> Number of output audio channels
- -c, --codec <0-4: h264,h264_10,HEVC,HEVC_10,J2K> Codec
- -i, --iframeorder <0-IBBP, 1-IPP, 2-III> Frame order
- -b, --bitrate <# kilobits per second> Kilobits per second
- -I, --latency <# milliseconds> Latency in milliseconds
- -e, --encryption <0-none, 1-128, 2-256> Encryption level
- -B, --board <# kilobits per second> Source 0-All, 2-AJA, 3-AJA Shared, 4-Bluefish444, 5-Blackmagic, 6-UltraScope, 7-Matrox, 8-USB, 11-NDI, 12-Screen
- -f, --format Signal format
- -P, --playlocally Play audio locally
- -V, --screen <# kilobits per second> Screen or board to send 0..n
- -X, --watermarkx X position of the watermark
- -Y, --watermarky Y position of the watermark
- -W, --watermark Path and name of the watermark file
- -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
- -L, --license Run for licensing
- -?, -h, --help Displays this help
- -v, --version Displays version

14.2 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 FlowCaster Manual v8

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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This manual has been compiled to assist the user in their experience using **FlowCaster** software. It is believed to be correct at the time of writing, and every effort has been made to provide accurate and useful information. Any errors that may have crept in are unintentional and will hopefully be purged in a future revision of this document. We welcome your feedback.

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