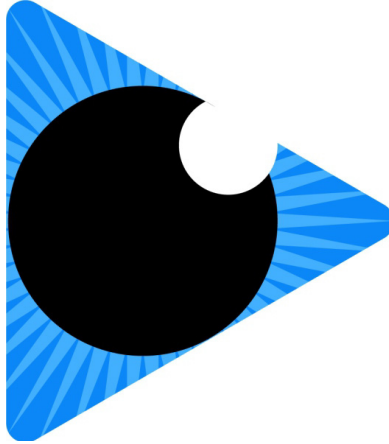




**GLIM**  
User Guide



---

# GLIM 2.2 User Guide

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## Contacting Telestream

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Mostly identical for the entire company. Slight variations can exist (for example Eco apparently uses SPARC trademarks so Louis lists that in his front matter—but I see no reason for all the other units to burden their front matter with it).

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# Introduction

GLIM is a software solution that enables remote viewing and inspection of media files.

## Introducing GLIM

**Figure 1.** Introducing GLIM

Introducing GLIM



GLIM consists of two parts:

- A stateless server component that encodes broadcast media files for delivery over the Internet. The server component employs standard protocols to encode the media files.
- A web client application that enables remote viewing of video. The GLIM server component delivers the web client to the user's Internet-connected browser.

The GLIM engine runs on Windows Server 2016 or Windows Server 2019. You can install the GLIM engine on a Windows computer that meets the minimum system requirements. You can view media files on the GLIM server via the GLIM web client on any Windows or Mac computer with a browser.

GLIM is different from other remote viewing platforms because it does not require the creation of proxy video files and does not consume storage on the server. Instead, GLIM employs HTTP-based protocols and stateless design. Therefore, GLIM uses readily-available components--such as gateways, caches and load balancers--to enhance its performance. Additionally, you can use the server component by itself, to stream video sources to existing customer web apps for remote file viewing. GLIM plays any media file, from anywhere, in a browser.

GLIM offers the following features:

- Enables Web browsers to remotely playback and inspect video. The video can be created from any container, codec, type of audio channel, or color space; at any resolution or frame rate
- Supports playback from NAS, SAN, or LOCAL storage, as well as from BLOB or GCS cloud-object storage. GLIM is compatible with AWS S3 and S3.
- Offers the broadest format support of any media player, including support for audio-only and image-only files
- Supports audio channel routing and automatic mix-down for multi-channel (5.1) sources
- Supports captions and subtitles: both embedded and sidecar subtitle files
- Supports native frame-rate playback with up to 80-90% bit-rate reduction

GLIM reduces the many rough edges often seen when playing mezzanine media remotely, with the following advantages:

- A vastly superior alternative to the remote desktop/virtual desktop playback experience
- High resolution/high bit-rate playback over bandwidth-constrained (<5mbps) connections
- Visual audio meters and waveform monitors with frame-based metadata display
- Quick inspection of technical properties of any media file
- Playback of Open and closed files for video QC
- Review and approval with in/out-point link sharing
- Front end for Vantage and other third-party systems via an open and innovative plug-in architecture
- Imports growing files (MXF growing files fully supported)

## TIFO

Telestream Intermediary Format (TIFO) is an intermediate media wrapper format designed by Telestream as a uniform, interchangeable file format to ensure interoperability among Telestream media processing solutions, including Vantage, FlipFactory, Episode, and Pipeline. TIFO provides a lightweight, low-overhead wrapper that is essence-agnostic, with metadata, timecode, and closed caption support. TIFO improves the ability to move media files between Telestream products with all media essence elements & metadata intact, preserving the widest range of transcoding options.

## Understanding the GLIM User Interface

For a basic understanding of GLIM windows, controls, and menus, see [The GLIM Layout](#).

# Installation

The GLIM engine runs on Windows Server 2016 or Windows Server 2019. You can install the GLIM engine on a Windows computer that meets the minimum system requirements. You can view media files on the GLIM server via the GLIM web client on any Windows or Mac computer with a browser.

## Topics

- [Installing GLIM](#)
- [Installing Your Own Certificate](#)
- [Activating GLIM Via the User Interface](#)
- [Console Mode](#)

## System Requirements

### GLIM Engine Requirements

- Windows installer issued, licensed via annual subscription by serial number
- Windows Server 2016/Windows Server 2019
- Minimum of 12 core CPU/16 GB RAM required (AMD or INTEL)  
24+ core CPU/32 GB RAM recommended
- High performance access to storage required (1+Gbps)
- HTTP or HTTPS ingress traffic

## GLIM Engine Setup

- External access requires TCP 5000/5001 ingress to GLIM Engine
  - Ports are administrator-configurable
- User Account Control should be disabled (never notify)
- GLIM user must be local administrator
- NAS/SAN/Local Storage access is passed through GLIM service via logged on user
  - Passed through actively logged on user if running in console
- S3 storage access requires AK/SAK to be provided in settings user interface

## GLIM Client Requirements

- HTTP/HTTPS connectivity (route-ability) to GLIM engine (Locally, or via VPN)
- MacOS Catalina or later (OSx Monterey 12.5.1 recommended)  
Safari not officially supported
- Windows 10/Windows Server 2016/Windows Server 2019
- Chrome version 80 or later, (Windows build 105.0.5195.10, Official Build 64-bit; or Mac build 105.0.5195.102 recommended)  
Internet Explorer not supported
- iOS 14/iPadOS 14 (third-generation iPad Air with iOS 15.4.1 recommended)

---

**Note:** Mobile devices do not support file browsing or audio-channel selection. Mobile devices support only playback from links generated by GLIM.

---

## Hardware Specification Tested

### 15-session subscription

Running a GLIM appliance (Gen2)

For specifications, see the [Product Sheet](#).

### 5-session subscription

- Server Spec= Dual 12 Core 421R Intel Scalable processors
- 96GB Ram
- Windows Server 2016 Standard

## GLIM Server Performance

The number of concurrent sessions a GLIM server can sustain is dependent upon the server specification, the resolution at which GLIM encodes, and the type of input source that is consumed. You can purchase GLIM Subscriptions with up to:

- 5 sessions (CPU servers)
- 15 Session (GPU Accelerated GLIM Appliance)

Telestream has qualified GLIM processing up to the number of concurrent streams using a 640x360 @ 2500kbps profile in GLIM, using the following source content:

- XDCAMHD 50mbps, 1080i60
- AVCi 100mbps 1080i60

# Installing GLIM

---

**Note:** GLIM is currently available only for Windows operating systems. GLIM is provided in the form of a Windows installer.

---

After you accept the license agreement, the installer places the GLIM application in the c:\Program Files\Telestream\Glim\ directory. This directory contains a plugins directory with example plugins, and a certificate directory with a self-signed certificate. You can use the sample plugins and certificate to demonstrate GLIM HTTPS capability.

When you uninstall GLIM, all files are removed with the exception of the JSON files and log files, including appSettings.json configuration file, located in these directories:

C:\ProgramData\Telestream\GLIM\  
C:\Program Files\Telestream\GLIM\

When you reinstall GLIM, delete the appSettings.json configuration file. Then you can reset GLIM to its defaults, or create new settings.

To install GLIM, follow these steps:

1. Double-click the GLIM installer application. Check the acceptance box and click *Install*.  
GLIM displays a progress bar, and then a completion dialog.
2. Click *Finish*.

## Installing Your Own Certificate

1. Drop the PFX file into the certificate folder (C:\Program Files\Telestream\Glim\certificate\).
2. Open the webserver JSON file:  
(C:\ProgramData\Telestream\Glim\appsettings.webserver.json).
3. In the webserver JSON file, after “*Path*”: alter the PFX path and filename (if different from the default path and filename), and enter the correct password.
4. Close your browser. Then, relaunch your browser.
5. Navigate to https://[machine name]:[port].
6. Verify that the lock icon appears next to the URL bar in your browser.

See [Authentication and Credentials Sections](#).

---

**Note:** You can find further information about the REST API here:  
[http://\[machine name\]:5000/swagger/index.html](http://[machine name]:5000/swagger/index.html)

---

## Activating GLIM Via the User Interface

1. Click the red-and-white license key button toward the top-right of the screen, near the *License Status*.
2. Enter the license serial number Telestream sent you when you accepted the license agreement.
3. Click *Activate*.
4. Open <http://localhost:5000> in your Web browser.  
After GLIM is activated, GLIM displays the *Deactivate* window with all license statuses.
5. You can deactivate GLIM from this window when you want to move your license to another computer.

See [Installing Your Own Certificate](#).

## Activating GLIM Offline with a Second Computer

If the computer running GLIM isn't on the Internet, you can activate GLIM from a second computer that is online.

To activate GLIM offline, do the following:

1. Launch GLIM on the offline computer.
2. Click the red-and-white license key button toward the top-right of the screen, near the *License Status*.
3. Enter the license serial number Telestream sent you when you accepted the license agreement.
4. Click the box for *Activate Offline*.  
GLIM displays your activation key.
5. Copy your activation key.
6. Launch a browser on the second computer, which is online.
7. On the second computer, point the browser to the following location:  
<https://cws.telestream.net/offlineactivation.aspx>
8. Enter your activation key.  
GLIM returns a license file.
9. Copy the license file.
10. On your offline GLIM machine, in the offline activation field, enter the license file into the GLIM server key field.
11. On your offline GLIM machine, click *Activate*.  
When GLIM is activated, the color of the key icon changes to green and white.
12. Refresh or navigate again to <http://localhost:5000>. The license icon at the top right should now be green.  
Telestream has licensed and activated your system.

## De-activating GLIM Online

---

**Caution:** Be sure to deactivate your GLIM license before terminating a GLIM AMI instance. Terminating a GLIM AMI instance cancels any GLIM license active at the time of termination.

---

To deactivate GLIM online, do the following:

1. Click the *License Status* button.

See [License Status Button](#).

2. Click *DEACTIVATE*.

## De-activating GLIM Offline

---

**Caution:** Be sure to deactivate your GLIM license before terminating a GLIM AMI instance. Terminating a GLIM AMI instance cancels any GLIM license active at the time of termination.

---

To deactivate GLIM offline, do the following:

1. Remove the JSON files from these locations:

C:\programdata\Telestream\Licenses\GLIM.json

C:\Windows\System32\config\systemprofile\AppData\Local\Telestream\License\GLIM.json.

2. Before terminating the GLIM AMI instance, ask Telestream Technical Services to deactivate the license.

## Console Mode

GLIM is installed as a Windows service which can be started and stopped from the Windows *Services* control panel. In some cases, you might prefer, instead, to run GLIM as a Console application. To do this, disable the GLIM service and run GlimService.exe directly from the installation directory.

---

**Note:** If the GLIM service automatically restarts after getting installed, or by a machine restart, manually stop the service before attempting to run in console mode. In this case, open Windows *Services* controls via Run > Services, rather than from the *Task Manager*; then manually stop the service.

---





# Configuration

You can configure GLIM for your particular set of hardware, assets, and plugins, through GLIM Settings.

---

**Note:** The *Settings* option always is visible on the GLIM menu to administrators, both on the GLIM server and on the GLIM client.

---

## Topics

- [Network File Locations](#)
- [Choosing Directories and Files for the File Browser](#)
- [Copying a Backend Path](#)
- [Uploading Plugins](#)
- [Quality Settings](#)
- [Choosing Tabs for the Inspection Panes](#)
- [Setting Inactivity Time for File Closing](#)
- [Enabling Image Sequences](#)
- [Enabling Watermark Analysis](#)
- [Setting the GPU Preset Level](#)
- [Defining Overlay Positions](#)
- [Defining Cache Parameters](#)
- [Enabling Experimental Features](#)
- [Setting the Type of Authentication](#)
- [Sidecar Files](#)
- [Adding Surround-Sound Audio Channel Mappings](#)
- [Machine Groupings](#)

## GLIM Settings

You can customize many GLIM features via GLIM settings.

## Opening GLIM Settings

---

**Note:** The *Settings* option is visible on the GLIM menu for the GLIM engine server. The *Settings* option also is visible on the GLIM menu for the GLIM Web client, but only for users logged in as administrators. If you use <http://localhost:5000> GLIM displays the *Settings* menu.

---

To open the GLIM *Settings* menu, do the following:

1. Click the three-dot *GLIM Menu Button* to the upper-right.  
See the three-dot *GLIM Menu Button* on the screenshot in [The GLIM Layout](#).  
GLIM opens the GLIM drop-down menu.
2. Select *Settings*.
3. To close the *Settings* window, click the GLIM Home button.  
See the GLIM Home button on the screenshot in [The GLIM Layout](#).

For descriptions of the various settings options, see [Settings](#).

## Configuring GLIM with Settings

You can configure GLIM for your specific hardware and workflow through GLIM *Settings*. From the GLIM *Settings* menu, you can customize GLIM features, from media file locations to quality levels, to surround channel mappings, and much more.

---

**Note:** The *Settings* option is visible on the GLIM menu for the GLIM engine server. The *Settings* option also is visible on the GLIM menu for the GLIM Web client, but only for users logged in as administrators. If you use <http://localhost:5000> GLIM displays the *Settings* menu.

---

1. Open GLIM *Settings*.  
See [GLIM Settings](#).
2. Select options as desired.  
For definitions of the various settings options, see [Settings](#).
3. To close the *Settings* window, click the *GLIM Home* button.  
See [Settings](#).

See also [Appendix: Configuring GLIM with JSON Files](#).

## Importing or Exporting GLIM Settings

To expedite configuration of GLIM on a new machine, administrators can export the GLIM settings from one machine, and import the settings into another.

To export or import GLIM settings, do the following:

1. Log in as an administrator.

2. Open GLIM Settings.  
See [GLIM Settings](#).
3. Scroll to the bottom of *Settings*, and do one of the following:
  - To export settings, click the *Export Settings* button.
  - To import settings, click the *Import Settings* button.
4. To close the *Settings* window, click the *GLIM Home* button.  
See [Settings](#).

## Network File Locations

You can add locations on your network that contain media files by entering location aliases.

See [Location aliases](#).

### Adding Your Network Locations With Location Aliases

---

**Caution:** By default, when a location alias is configured in GLIM, the list of locations in the file browser no longer lists available drives that have no aliases. If you'd like GLIM to continue listing available drives after you've defined location aliases, go to *Settings*. From the *Settings* page, select *File Browser*, and check the box for *Allow all local drives and network authentication*.

---

To add location aliases, do the following:

1. Log into GLIM as an administrator.
2. To open the GLIM menu, click the GLIM three-dot menu button.  
See the GLIM three-dot menu button on the screenshot in [The GLIM Layout](#).
3. From the GLIM drop-down menu, select *Settings*. From the *Settings* page, select *Location Aliases*.
4. Click the *Add Location Alias* button.  
GLIM opens the *New Location* dialog box.
5. Select the option for *Type of location* from the drop-down menu that describes the location you are adding.

---

**Note:** If you are adding a cloud-based storage location, for *Type of location*, choose one of the cloud-based storage options, such as Generic S3, S3 Bucket, Web Dav, Google Cloud Bucket, or Azure Container. For Wasabi, choose Generic S3.

---

6. Enter a name and path for the alias.
7. From the *Delimiter* drop-down menu, select the correct delimiter for the path: typically forward-slash for local files or back-slash for files stored on the cloud.

8. Enter the specific information for your storage location into the open fields, such as *Hidden*, *Bucket*, or *Path*. Open mode doesn't apply to cloud storage locations.

For information about getting keys for Telestream Cloud, see [User Guides - Stores Management](#).

9. (Optional) To enable GLIM to import live growing MXF files, scroll down to *Location Aliases* and double-click a path to a media file. Open the drop-down menu for *Open/Growing File Playback*, and select *true*.

---

**Note:** GLIM fully supports import of growing files in MXF format. Import of growing TIFO files is not recommended. GLIM fully supports import of closed TIFO files, however.

---

See [TIFO](#).

10. (Optional) To test the connection to the alias, click *Test Connection*.

11. Click *Add Location*.

GLIM adds the new location alias to the list of location aliases.

---

**Note:** If Cloud-based storage locations are used and the server is on-premise, Egress charges are charged to your cloud account when you play back content in GLIM.

---

---

**Note:** You may want to use a user group to define which users have access to particular location aliases.

---

## Adding a Google Cloud Bucket or Azure Network Location Via Service Accounts IAM

As a simpler alternative to using a location alias, you can add a Google Cloud Bucket (GCB) network location or Azure network location with Service Accounts IAM. To add Google Cloud Bucket or Azure via Service Accounts IAM, do the following:

1. In the *Cloud Console* for Azure or GCS, navigate to the *Service Accounts IAM & Admin* > *Service accounts*.
2. Select a project.
3. Click the email address of the service account for which you want to create a key.
4. Click the *Keys* tab.
5. For Azure, enter the following information:
  - Container Enter the name of the container you wish to access.
  - Connection string Select the container you want access to, select access key, click show keys, and then copy the connection string.
  - Path You can leave this field empty unless you want to specify only the sub-folder within the selected container.

6. Click the *Add key* drop-down menu, and select *Create new key*.
7. Select JSON as the *Key type* and click *Create*.

This is the JSON file GLIM uses when you create a Google storage location via the GLIM user interface.

## Adding an Amazon Web Services (AWS) Location

As a simpler alternative to using a location alias, you can add an Amazon Web Services (AWS) location. To add AWS IAM, do the following:

1. Acquire Amazon S3 Access Keys.

For information about getting Amazon S3 Access Keys, see <https://objectivefs.com/howto/how-to-get-amazon-s3-keys>.

2. Click the *Add key* drop-down menu, and add the Amazon S3 Access Key.
3. Select JSON as the *Key type* and click *Create*.

This is the JSON file GLIM uses when you create a Google storage location via the GLIM user interface.

## Accelerate Search Results from Amazon Web Services (AWS)

To speed search results from sources in S3 buckets on AWS, limit searches to the first 1,000 results.

---

**Note:** When *Limit object storage results* is enabled, GLIM searches for file names that *start with* your search phrase. When *Limit object storage results* is not enabled, GLIM searches for file names that *contain* your search phrase.

---

To limit searches in S3 buckets to the first 1,000 results, do the following:

1. Open GLIM Settings.  
See [GLIM Settings](#).
2. Under the *File browser* heading, check the box for *Limit object storage results*.

## Choosing Directories and Files for the File Browser

To choose the directories and files that the GLIM file browser can and can't access, do the following:

1. Open GLIM Settings.  
See [GLIM Settings](#).
2. Scroll down to the *File browser* heading.
3. To specify the files and directories excluded from GLIM, open the *Excluded files and directories* drop-down menu, and make the selections desired.

4. To allow GLIM access to all local drives, even after location aliases have been defined, check the box for *Allow all local drives*.
5. To allow GLIM access to UNC locations, check the box for *Allow UNC locations*.

---

**Note:** This allows external applications, such as Vidchecker, access to UNC locations.

---

6. To increase the speed of searches, check the box for *Limit object storage results*.

## Copying a Backend Path

To define a Backend Path, do the following:

1. Click the *Plugins* tab, select *Backend Path*.
2. Click the copy icon to copy the Backend Path to your clipboard.

See [Backend Path](#).

---

**Note:** GLIM includes a collection of stock plugins, including Backend Path, Clip Link, Clip List, Image Link, Luma Scope, and Unload. Also, you can build your own plugins to define ways for GLIM to interact with RESTful APIs of external systems. For example, you can build a plugin to perform simple file system manipulations, or to email a Clip Link or Image link to users.

---

See [Adding a Sidecar Audio File](#).

## Uploading Plugins

To upload plugins into GLIM, do the following:

1. Open GLIM Settings.  
See [Opening GLIM Settings](#).
2. Scroll down to the *Plugins* heading.
3. Click *UPLOAD PLUGIN*.  
GLIM opens a file browser.
4. Browse to the plugin desired, select it, and click *Open*.

There is no need to restart GLIM. GLIM makes the plugin available immediately through the *Plugins* tab.

## Quality Settings

You can determine GLIM encoder and display qualities, to optimize system performance.

## Setting Encoder Quality Levels

To set the quality levels for GLIM output encoding, do the following:

1. Open GLIM Settings.  
See [GLIM Settings](#).
2. Scroll down to the *Quality levels* heading.
3. To add a quality level, click *Add Quality Level*.
4. Entered the settings desired for *Width* and *Bitrate*.

## Setting Displayed Qualities

To set the quality levels for GLIM output encoding, do the following:

1. Open GLIM Settings.  
See [GLIM Settings](#).
2. Scroll down to the *Displayed qualities* heading.
3. Check the boxes to enable either *Allow advanced interlace modes*, *Allow best quality modes*, or both.

## Setting Media Player Window Video Quality

To choose the video quality of the Media Player Window, do the following:

1. Click *Browse*, navigate to the desired media file, and select the file desired.
2. Click the *Media Player Display Controls* (gear) button to open the menu of *Media Player* control options, and select *Quality*.  
See the Media Player Display Controls button on the screenshot in [Media Player Display Controls](#)
3. When GLIM displays the *Video Quality* menu, select a video quality setting.

---

**Note:** The *Best Quality* settings are dynamic. They adjust the encoding parameters based on the source media, the client display size, or the windowed video player size, respectively. You can apply the selections below the divider line only if the content is interlaced and if it provides different methods of displaying that interlaced content. Available bandwidth limits real-time playback speed. If there are caching issues disrupting real time playback, try reducing the resolution/bitrate quality setting.

---

## Setting the Interpolation Method for Resizing

To set the interpolation method for resizing, do the following:

1. Open GLIM Settings.  
See [GLIM Settings](#).
2. Scroll down to the *Resizing* heading.

3. Select an option for the *Interpolation method* drop-down menu. The default is NearestNeighbor.

See also [Encode Section](#).

## Choosing Tabs for the Inspection Panes

GLIM can display each of the inspection tabs in either the *Audio/Frame/Scopes/Inspection Pane* or in the *File Inspection Pane*, not in both. To choose the tabs GLIM displays in either the *Audio/Frame/Scopes/Inspection Pane*, or the *File Inspection Pane*, do the following:

1. In the *Audio/Frame/Scopes/Inspection Pane*, click the *Tab Selection* button. In the menu of tabs, check the names of the tabs GLIM displays in the *Audio/Frame/Scopes Inspection Pane*.

Alternatively, drag a tab from the tab bar in the *File Inspection Pane* to the tab bar in the *Audio/Frame/Scopes Inspection Pane*

---

**Note:** To select a tab for the *Audio/Frame/Scopes/Clips Inspection Pane*, make sure the name of that tab is unchecked in the tab selection menu for the *File Inspection Pane*.

---

2. In the *File Inspection Pane*, click the *Tab Selection* button. In the menu of tabs, check the names of the tabs GLIM displays in the *File Inspection Pane*.

Alternatively, drag a tab from the tab bar in the *Audio/Frame/Scopes/Clips Inspection Pane* to the tab bar in the *File Inspection Pane*.

---

**Note:** To select a tab for the *File Inspection Pane*, make sure the name of that tab is unchecked in the tab selection menu for the *Audio/Frame/Scopes/Clips Inspection Pane*.

---

See the *Tab Selection* buttons on the screenshot in [The GLIM Layout](#).

## Setting Inactivity Time for File Closing

To set the time GLIM remains inactive before closing a file, do the following:

1. Open GLIM Settings.  
See [GLIM Settings](#).
2. Scroll down to the *File closing* heading.
3. In the *Seconds of inactivity* field, enter the desired length in seconds. The default is 180 seconds.

## Enabling Image Sequences

To enable GLIM to process image sequences, do the following:



1. Open GLIM Settings.  
See [GLIM Settings](#).
2. Scroll down to the *Image sequences* heading.
3. To enable GLIM for image sequences, check the box for *Enable image sequences*.

## Enabling Watermark Analysis

To enable watermark analysis, do the following:

1. Open GLIM Settings.  
See [GLIM Settings](#).
2. Scroll down to the *Watermark Analysis* heading.
3. Check the box for *Watermark Analysis*.

## Setting the GPU Preset Level

---

**Note:** This option is available only for licenses that include GPU entitlement. These licenses enable GPU acceleration using either the GLIM Appliance or Cloud Compute using Nvidia GPU Compute.

---

To set the GPU use level, do the following:

1. From the GLIM drop-down menu, select *Settings*.
2. Select a level setting from the *Gpu Preset* drop-down menu. The default is *High*.

See [Gpu Preset](#).

## Defining Overlay Positions

To define the two locations for overlays, do the following:

1. Open GLIM Settings.  
See [GLIM Settings](#).
2. Scroll down to the *Overlay* heading.
3. Enter a value for *Top overlay position*. The default is 0.
4. Enter a value for the *Left overlay position*. The default is 0.

See also [Overlay Section](#).

## Defining Cache Parameters

To define the number of threads, and to set the sizes of chunks and caches, do the following:

1. Open GLIM Settings.  
See [GLIM Settings](#).
2. Scroll down to the *Cache* heading.
3. Enter a value for *Max concurrent download threads*. The default is 12.
4. Enter a value for *Download chunk size*. The default is 16 MB.
5. Enter a value for *Memory cache size limit*. The default is 10,240 MB.
6. Enter a value for *Memory cache recycling percentage*. The default is 5%.
7. To enable disk caching, check the box for *Disk cache enabled*.
8. Enter the location for the disk cache into *Disk cache path*. The default is `./cache/`.
9. Enter a value into *Disk cache size limit*. The default is 10 GB.
10. Enter a value into *Disk cache recycling percentage*. The default is 25%.

## Enabling Experimental Features

To enable experimental features, do the following:

1. Open GLIM settings.  
See [GLIM Settings](#).
2. Scroll down to the *Experimental features* heading, and check the box for any experimental feature listed to enable it.

## Setting the Type of Authentication

GLIM ships with authentication disabled: a user is not required to log into the system before remotely viewing media files. If user authentication is required, you can set `Authentication` to `Windows`. GLIM then uses the Windows-native users. Alternatively, use `BuiltIn` to specify users directly in the configuration file, via the `UserName` and `Password` keys.

---

**Caution:** To minimize your security risk, change the password for the `BuiltIn` user the first time you log in.

---

---

**Note:** When changing the authentication method between `BuiltIn` and `Windows` settings, you must reconfigure the user group settings.

---

To log in the first time as the `BuiltIn` user, enter *admin* as the user name, and *admin* as the password.

See also [Authentication and Credentials Sections](#).

## Sidecar Files

Occasionally, a media file has associated metadata files that contains captions or subtitles for the media file. This metadata file is referred to as a sidecar subtitle or caption file. GLIM supports the following types of sidecar files: .scc, .srt, .stl, .mcc, TTML, .vtt, and .pac.

### Adding a Sidecar Audio File

You can add audio files to a video file by supplying the backend path to the audio file via the file browser.

To add a sidecar audio file to a video file, do the following:

1. Open a video file.  
See [Opening Files](#).
2. In the file browser, browse to an audio file you want to add to the video file, and click the three dots next to the filename.  
The file browser opens a menu.
3. Select *Add to audio paths configuration*.
4. Click the *Audio file paths configuration* button.  
See the *Audio file paths configuration* on the screenshot in [File Browser Window](#).  
GLIM opens a dialog box.
5. In the dialog box, select the audio file path you added, and click *Load Audio*.
6. (Optional) To add another audio file to the video file, repeat steps 3 - 6.

See also [Selecting an Audio Track to Display in the Mini Timeline](#).

### Adding a Subtitle or Caption Sidecar File

You can add sidecar subtitles or caption files associated to a video file by supplying the backend path to the sidecar file.

To add a sidecar subtitle or caption file to a video file, do the following:

1. Open a video file.  
See [Opening Files](#).
2. In the *Mini Timeline*, click the *Marker Menu* button. Check the boxes for the types of subtitles or captions you want to view, if they aren't already checked.  
See the *Marker Menu* button on the screenshot in [Media Player Window](#)
3. In the file browser, browse to a sidecar subtitle or caption file you want to add to the video file, and click the three dots next to the filename.  
The file browser opens a menu.
4. Select *Load as sidecar subtitles*.

5. (Optional) To add another subtitle or caption sidecar file to the video file, repeat steps 3 - 4.

See [Viewing Captions and Subtitles](#).

## Adding Surround-Sound Audio Channel Mappings

To add custom surround-sound audio channel mappings, do the following:

1. From the GLIM drop-down menu, select *Settings*.
2. Click the *Add Surround Channel Mappings* button.

GLIM opens the *Channel Mappings* dialog box.

3. Enter the channel mappings desired.
4. Click *Add*.

GLIM adds the new channel mappings to the list of channel mappings.

See [SurroundChannelMappings Section](#).

## Machine Groupings

You can increase the number of available sessions by grouping machines into a single session.

See [Grouping Machines with JSON Appsettings.other](#).

# Media Playback and Inspection

Using GLIM, you can inspect all the important elements and attributes of your media files.

## Topics

- [Video Playback](#)
- [Audio Playback](#)
- [Metadata and Properties](#)
- [Scopes](#)
- [Annotations](#)
- [Media Links](#)
- [Clip Lists](#)

## Navigation

You can control most of the features in GLIM through the user interface.

## Understanding the GLIM Layout

For a basic understanding of the GLIM user interface, including windows, controls, and menus, see [The GLIM Layout](#).

## Viewing the Keyboard Shortcut List

GLIM comes with a set of preset keyboard shortcuts for the most-used commands. To view the complete list of GLIM keyboard shortcuts, do the following:

1. Click the GLIM Menu button.

See the GLIM menu button on the screenshot in [The GLIM Layout](#).

2. Click *Keyboard Shortcuts*.

See [Keyboard Shortcuts](#).

## Resizing the GLIM Panes

To resize a pane in the GLIM layout, drag the hatch marks to the right of the Media Player, or the one above the File Inspection pane.

See [The GLIM Layout](#).

## Restoring the GLIM Default Layout

To restore the GLIM layout to its default settings, do the following:

1. Select *GLIM Menu* button > *Restore Default Spacing*.

See [GLIM Menu \(Three-Dot\) Button](#).

## Finding Media Files

To find a media file to inspect in GLIM, do the following:

1. Click *Browse*, and select a folder.
2. In the *Search* field, enter the name of the file desired, and press *Enter*.

GLIM searches the folder selected.

---

**Note:** You can't use wildcard characters in searches of Amazon Web Services (AWS) S3 locations.

---

See [File Browser Window](#).

## Refreshing the List of Media Files

To update the list of media files available to GLIM, do the following:

1. Click *Browse*, and select a folder.
2. Click the *Refresh folder* button.

GLIM refreshes the folder selected.

See [File Browser Window](#).

## Opening Files

To select a media file for inspection, do the following:

1. Click *Browse*.

GLIM opens a file browser.

See [Browse Button](#).

2. Do one of the following:
  - Browse and select a media location, then click on a file to open it.
  - Enter the name of the file into the *Search* field, and press *Enter*.
  - Click the *File History* button. In the file history list, double-click the name of the file desired.
3. To close the file browser, press *Esc*.

---

**Note:** Once GLIM displays the file in the *Media Player Window*, you can use the control panel to play and navigate through the file.

---

See [Media Player Window](#) and .

## Opening a Growing File

To open a growing MXF file, do the following:

1. Open a media file.  
See [Opening Files](#).
2. Click the *Reload file as Growing File* button.  
See the *Reload file as Growing File* button on the screenshot in [The GLIM Layout](#).

---

**Note:** GLIM fully supports import of growing files in MXF format. Import of growing TIFO files is not recommended. GLIM fully supports import of closed TIFO files, however.

---

---

**Note:** The *Reload file as Growing File* button is available only for .tifo and .mxf files.

---

See [TIFO](#).

## Closing Files

To close the file currently open, click the *Close File* button.

See the *Close File* button on the screenshot in [The GLIM Layout](#).

## Video Playback

You can determine how GLIM plays video through the *Media Player Window Controls*.

## Changing the Playback Speed

To change the playback speed of the file displayed in the *Media Player*, do either of the following:

- Click the *Playback Speed* button in the *Media Player Window Controls*. See the *Playback Speed* button on the screenshot in .
- To increase the rewind speed, press “j” multiple times. Rewind speed increases each time you press “j,” up to 16x.
- To increase the play-forward speed, press “l” multiple times. Play-forward speed increases each time you press “l,” up to 16x.

## Looping the Playback

To enable GLIM to automatically continue playing a clip from the beginning after reaching the end, click the *Repeat* button in the *Media Player Window Controls*.

Keyboard shortcut: r.

See the *Repeat* button on the screenshot in .

## Playing Video Fullscreen

1. To play the video in the *Media Player* fullscreen, click the *Fullscreen* button. See the *Fullscreen* button on the screenshot in .
2. To stop playing the video in the *Media Player* fullscreen, click the *Close Fullscreen* button, or press *Esc*.

Keyboard shortcut: f.

See the *Fullscreen* button on the screenshot in .

## Viewing Captions and Subtitles

To display subtitles or captions, do the following:

1. Make sure the selected video file has one or more subtitle or caption sidecar files associated with it.  
See [Adding a Subtitle or Caption Sidecar File](#).
2. Click the *Show Captions* button.  
See the *Show Captions* button on the screenshot in .  
GLIM displays a menu of associated subtitle and caption sources.
3. (Optional) Toggle between caption sources with the keyboard shortcut, “c.”  
See [Viewing the Keyboard Shortcut List](#).
4. Choose the caption source desired.  
GLIM superimposes the selected subtitles or captions over the video in the *Media Player*.

See [Show Captions](#), and [Subtitles](#).



## Viewing the Timecode Overlay

To display the timecode over the video in the *Media Player*, click the *Timecode Overlay* button in the Media Player controls.

Keyboard shortcut: t.

See the *Timecode Overlay* button on the screenshot in .

## Jumping to the Beginning or End of a Clip

To jump to the first or last frame of a clip in the *Media Player*, do either of the following:

- Click the *Jump to Beginning* button.

Keyboard shortcut: Home.

See the *Jump to Beginning* button on the screenshot in .

- Click the *Jump to End* button.

See the *Jump to End* button on the screenshot in .

Keyboard shortcut: End.

## Jumping Back or Forward One Frame

To jump to the previous or next frame of a clip in the *Media Player*, do either of the following:

- Click the *Jump Back One Frame* button.

Keyboard shortcut: left arrow

See the *Jump Back One Frame* button on the screenshot in .

- Click the *Jump Forward One Frame* button.

Keyboard shortcut: right arrow.

See the *Jump Forward One Frame* button on the screenshot in .

## Viewing the Action Safe and Title Safe Areas

The Action Safe area is the central area of the video where actions are not cut off at the edges, due to screen masking or overscan. The Title Safe area is the central area of the video where you can place a title without losing parts of the title at the edges, due to screen masking or overscan.

You can view the Safe Title area, the Safe Action area, or both, as borders superimposed over the video in the media file selected.

To view the Action Safe and Title Safe areas, do the following:

1. To open the *Media Player Display* menu, click the *Media Player Display Controls* gear button.

See the *Media Player Display Controls* gear button on the screenshot in .

2. Select *Overlays*, and check the box for each type of safe area desired.
3. To close the *Media Player Display Controls* menu, click outside the menu.

See [Overlay](#).

## Viewing a Live File

While capturing live video, GLIM displays the Live Source Indicator in the *Media Player Window Controls*. To jump to the last frame captured from the live source, click the *Live Source Indicator*.

Keyboard shortcut: G (jumps to current live portion of the open media file).

GLIM takes you to the latest frame already captured from the live video stream.

See this button on the screenshot in .

## Defining a Sub-clip with In and Out Points

To define a sub-clip in the *Media Player*, do the following:

1. Scrub the playhead to the desired in point, and click the *Mark In* button.  
Keyboard shortcut: i.  
See the *Mark In* button on the screenshot in .  
GLIM marks the in point with a yellow marker in the *Media Player* timeline.
2. Scrub the playhead to the desired out point, and click the *Mark Out* button.  
Keyboard shortcut: o.  
See the *Mark Out* button on the screenshot in .  
GLIM marks the out point with a yellow marker in the *Media Player* timeline.

## Selecting Timecode Type

To select the type of timecode GLIM displays in the *Mini Timeline*, open the *Timecode* drop-down menu, and select the type of timecode desired.

See the Timecode Menu on the screenshot of .

See [Overlay Timecode](#).

## Jumping to a Timecode Location

To make the playhead jump to a specific timecode location, do the following:

1. In the *Timecode Display* of the *Mini Timeline*, click a time increment (hours, minutes, seconds, or frames).  
See the *Timecode Display* on the screenshot of .
2. Do one of the following:
  - Type the timecode for the desired location, and press Enter.

- Copy the timecode for the desired location from a source. Paste the timecode into the *Timecode Display*, and press Enter.

See [Timecode Display](#).

## Jumping to an Annotation

Make sure the annotations feature is enabled.

See [Enabling Experimental Features](#).

Make sure *Annotations* is checked in the *Mini Timeline Marker Menu*.

See the marker menu in [Marker Menu Button](#).

Make sure *Annotations* is checked in either the *Audio/Frame/Clips/Scopes/Annotations Inspection* pane, or the *File Inspection* pane.

See the tab selection buttons in [The GLIM Layout](#).

To make the playhead jump to a specific annotation, double-click the Annotations flag in the *Mini Timeline*.

The playhead jumps to the desired annotation, and the *Annotations* tab displays the annotation.

## Zooming In or Out in the Mini Timeline

By default, the *Mini Timeline* displays 10 seconds of the clip selected.

1. To zoom in or out, do one of the following:

- To zoom in, click the *Zoom In* button.

See the *Zoom In* button on the screenshot of .

- To zoom out, click the *Zoom Out* button.

See the *Zoom Out* button on the screenshot of .

- To view the entire clip in the *Mini Timeline*, click the *View Entire Timeline* button.

See the *View Entire Timeline* button on the screenshot of .

## Inspecting Audio, Ad Markers, and Annotation Markers

You can inspect SCTE ad-insertion markers, Nielsen markers, I, P, and B-frame markers, the audio waveform, and annotations in the *Mini Timeline*. To inspect the markers in a media file, do the following:

1. Click the *Marker Menu* eyeball button in the *Mini Timeline*

See the *Marker Menu* eyeball button on the screenshot in [The GLIM Layout](#).

GLIM opens the *Marker Menu*.

2. Check the box for audio waveform, any type of marker, any type of frame, or annotations you want to view.

3. To close the menu, click outside the menu.

## Viewing the History of Inspected Files

If no media file is open, GLIM displays the history of the last three files opened. To view the history of the last 10 files opened, do the following:

1. Open a media file.  
See [Opening Files](#).
2. Click the *History* tab, then click on any media file in the list to re-open it.
3. Use the controls at the bottom of the window to select rows of files per page.

## Audio Playback

You can determine how GLIM plays audio.

## Muting or Unmuting Audio Playback

To mute or unmute a clip in the *Media Player*, do either of the following:

- Click the *Mute/Unmute* button.  
Keyboard shortcut: n (toggle)  
See the *Mute* button on the screenshot in .
- Click the *Mute/Unmute* button.  
Keyboard shortcut: n (toggle)

## Mapping Audio Channels to Outputs

To map audio channels to audio outputs, do the following:

1. To open the *Media Player Display* menu, click the *Media Player Display Controls* gear button.  
See the *Media Player Display Controls* gear button on the screenshot in .
2. Select *Audio Channels*, and select radio buttons to map channels to outputs as desired.
3. To close the *Media Player Display Controls* menu, click outside the menu.

---

**Note:** A single audio track can contain numerous audio channels. For example, an audio track could contain one or more L/R stereo pairs of channels, or it could contain five channels for surround sound. The *Audio* pane displays both the individual channels in an audio track and the single composite audio track that contains all the audio channels.

---

## Selecting an Audio Track to Display in the Mini Timeline

To select the audio track to display in the *Mini Timeline*, do the following:

1. Make sure the selected video file has one or more audio tracks associated with it.  
See [Adding a Sidecar Audio File](#).
2. In the *Mini Timeline*, click the *Marker Menu* button. Check the box for *Waveform*, if it isn't already checked.  
See the *Marker Menu* button on the screenshot in [Media Player Window](#)
3. To open the *Media Player Display* menu, click the *Media Player Display Controls* gear button.  
See the *Media Player Display Controls* gear button on the screenshot in .
4. Select *Audio Tracks*, and select the audio track desired.
5. To close the *Media Player Display Controls* menu, click outside the menu.

## Metadata and Properties

You can view metadata and other properties of an open video file, through GLIM data tabs.

### Viewing Frame Metadata

The frame metadata windows give the user access to technical metadata about each frame. This can include various data such as Timecode, Closed Caption, and SCTE markers.

To view the frame metadata for a media file, do the following:

1. Open a media file.  
See [Opening Files](#).
2. In the *Audio/Frame/Scopes/Inspection Pane*, click *Frame*.  
See the *Frame* tab on the screenshot in [The GLIM Layout](#).

### Viewing Properties of a Media File

To view the container, video, audio, or metadata properties, click the *Inspector* tab, then click one of the sub-tabs to display the settings.

See the *Inspector* tab on the screenshot in [The GLIM Layout](#).

---

**Note:** You can hover over the “?” to see the definition for each field.

---

## Exporting Inspector Video Data

To export the data shown in the Inspector Video tab to a JSON file, do the following:

1. Open a media file.

See [Opening Files](#).

2. Click *Inspector > Video*.

GLIM displays data about the media clip in the *Video* tab.

3. Click the Export Inspector Data (square with right-pointing arrow) button to the lower-right of the *Video* tab.

GLIM exports the Inspector data into a JSON file to the downloads folder, with the filename taken from the filename of the source media file.

See [Video Sub-tab](#).

## Scopes

The *Scopes* tab is an experimental feature available for technical preview only.

See [Enabling Experimental Features](#).

When you open a scope, GLIM automatically starts an additional session for the transmission of data between the server and the scope. GLIM uses additional bandwidth when opening scopes. This can impact overall performance.

## Viewing the Luma Scope, Vector Scope, or RGB Parade

To inspect a clip via lumascope, vectorscope, or RGB parade, do the following:

1. Make sure the experimental *Scopes* feature is enabled.

See [Enabling Experimental Features](#).

2. Open a media file in the Media Player.

See [Viewing Properties of a Media File](#).

3. Click the *Scopes* tab.

See the *Scopes* tab on the screenshot in [The GLIM Layout](#).

4. Click the *Scope Selection* button, and select the desired scope from the menu.

See the *Scope Selection* button on the screenshot in [The GLIM Layout](#).

GLIM displays the selected scope for the frame of video under the playhead in the *Media Player*.

---

**Note:** If you move the playhead to a frame that GLIM has not yet buffered, it might take GLIM a few seconds to display the luma waveform for the frame. You can see which frames are buffered by looking at the progress bar below the scope.

---

See [Audio/Frame/Clips/Scopes/Annotations Inspection Pane](#).

## Taking a Screenshot of a Scope

---

**Note:** The *Scopes* tab is available for technical preview only.

---

You can take a screenshot of the *Scope* view of any selected frame. To take a screenshot of a *Scope*, do the following:

1. Make sure the experimental *Scopes* feature is enabled.  
See [Enabling Experimental Features](#).
2. Select the desired scope from the *Scopes Selection* button.  
See the *Scopes Selection* button on the screenshot in [The GLIM Layout](#).
3. In the *Media Player* window, scrub the playhead to the frame desired.
4. Click the *Save Scope Image* button.  
See the *Save Scope Image* button on the screenshot in [The GLIM Layout](#).  
GLIM saves a screenshot of the scope to your Downloads folder.

See [Scopes Tab](#) and [Plugins Tab](#).

## Taking a Screenshot of the Luma Scope with the VideoScope Link Plugin

---

**Note:** The *Scopes* tab is available for technical preview only.

---

With the *VideoScope Link* plugin, you can take a screenshot of the *Luma Scope* view of any selected frame. To take a screenshot of the *Luma Scope*, do the following:

1. Make sure the experimental *Scopes* feature is enabled.  
See [Enabling Experimental Features](#).
2. Select the *Luma* scope from the *Scopes* tab.
3. To view the *VideoScope Link* options, click *Plugins* > *VideoScope Link*.
4. In the *Media Player* window, scrub the playhead to the frame desired.
5. In the *VideoScope Link* pane, click the *Start Frame* clock icon.  
GLIM records the timecode for the selected frame in the *Start Frame* field.
6. Click *Submit*.  
GLIM takes a screenshot of the scope, records a URL for the screenshot in the *Image Link* field, and downloads the screenshot to your downloads folder.
7. To view the screenshot, click *Open file* for the screenshot listed in the *Downloads* menu.

---

**Note:** You can take a screenshot only of the *Luma Scope* with the *VideoScope Link* Plugin. To take screenshots of other scopes, see [Taking a Screenshot of a Scope](#).

---

See [Scopes Tab](#) and [Plugins Tab](#).

## Annotations

You can add comments to a frame of video and draw shapes on the frame via the *Annotations* tab.

To use the annotations feature, make sure:

- You have a license with the annotation entitlement, and the *Annotations* experimental feature enabled.

See [Enabling Experimental Features](#).

- *Annotations* is checked in the *Mini Timeline Marker Menu*.

See the marker menu in [Marker Menu Button](#).

- *Annotations* is checked in either the *Audio/Frame/Clips/Scopes/Annotations Inspection* pane, or the *File Inspection* pane.

See the tab selection buttons in [The GLIM Layout](#).

- The *Annotations Drawing Control Panel* is open.

See [Show Tools button](#), and [Annotations Tab](#).

## Annotating a Frame

To annotate a frame, do the following:

1. In the *Media Player*, pause a video clip on a frame you want to annotate.

See [Media Player Window](#).

2. To open an empty annotations field for the frame, click the *Add Annotation* button.

See [Annotations Tab](#).

GLIM opens an empty annotations field in the *Annotations* tab.

3. (Optional) To enable drawing, click the *Show Tools* button.

See [Annotations Tab](#).

4. (Optional) To draw a shape onto the frame, choose a shape on the drawing tools control panel. Click and drag on the *Media Player* window to draw the shape.

See [Annotations Drawing Tools Control Panel](#).

GLIM opens an empty annotations field in the *Annotations* tab.

5. Enter your comment into the annotations field.

GLIM displays your drawing on the frame in the *Media Player*. GLIM also displays your comment in the list of annotations in the *Annotations* tab, along with the annotations of other users.

## Moving an Annotation Shape

To move an annotation shape on a frame, do the following:



1. Select the *Moving* tool from the *Annotations Drawing Control Panel*.  
See [Moving Tool](#).
2. Drag and drop the desired shape to its new position in the frame.

## Replying to an Annotation

You can reply to comments in the *Annotations* tab.

See [Annotations Tab](#).

To reply to a comment on a frame, do the following:

1. On the *Annotations* tab, click the *Reply* button under the comment to which you want to reply.  
GLIM opens an empty field for your reply.
2. Enter your reply into the reply field.

## Deleting an Annotation

You can delete any annotation you made on a frame.

See [Annotations Tab](#).

To delete an annotation on a frame, do the following:

1. Make sure you have the *Annotations* feature experimental feature enabled.  
See [Enabling Experimental Features](#).
2. Make sure the *Annotations* tab is open in either the *Audio/Frame/Clips/Scopes/Annotations Inspection Pane* or in the *File Inspection Pane*.  
See [Choosing Tabs for the Inspection Panes](#).
3. On the *Annotations* tab, click the *Delete Annotation* button next to the comment you want to delete.  
See [Annotations Tab](#).  
GLIM opens the *Remove Annotation?* dialog box.
4. Click *REMOVE ANNOTATION*.

## Deleting All Your Annotations

You can delete the annotations you made on a video file, all at once.

See [Annotations Tab](#).

To delete all the annotations you made on a video file, do the following:

1. Make sure you have the *Annotations* feature experimental feature enabled.  
See [Enabling Experimental Features](#).
2. Make sure the *Annotations* tab is open in either the *Audio/Frame/Clips/Scopes/Annotations Inspection Pane* or in the *File Inspection Pane*.  
See [Choosing Tabs for the Inspection Panes](#).

3. On the *Annotations* tab, click the *Clear Annotations* button.

See [Annotations Tab](#)

GLIM deletes the comment.

## Deleting a Shape from an Annotation

You can delete any shape you added to an annotation.

See [Annotations Tab](#).

To delete a shape from an annotation, do the following:

1. Make sure you have the *Annotations* feature experimental feature enabled.  
See [Enabling Experimental Features](#).
2. Make sure the *Annotations* tab is open in either the *Audio/Frame/Clips/Scopes/Annotations Inspection Pane* or in the *File Inspection Pane*.  
See [Choosing Tabs for the Inspection Panes](#).
3. On the *Annotations* tab, click the annotation containing the shape you want to delete.  
See [Annotations Tab](#).
4. In the Media Player Window, right-click the shape you want to delete.  
GLIM displays a Remove button.
5. Click the *Remove* button.  
GLIM removes the selected shape.

## Importing Annotations

To import annotations from a JSON file, do the following:

1. Click the *Import Annotations* button.  
See the *Import Annotations* button in [Annotations Tab](#).
2. Click *Open*.  
The *Annotations* tab displays the annotations in the selected JSON file.

## Exporting Annotations

To export annotations to a JSON file, click the *Export Annotations* button.

See the *Export Annotations* button in [Annotations Tab](#).

GLIM exports the annotations for the selected clip to a JSON file in your Downloads folder.

## Media Links

You can create and copy links to clips and images.

## Copying a Clip Link

To copy a link to a video clip that others can use, do the following:

1. Open a media file.

See [Opening Files](#).

2. In the *Mini Timeline*, scrub the playhead to the frame desired for the clip in point. Click the *Mark In* button or press "i."

See the *Mark In* button on the screenshot in .

GLIM places yellow markers at the in point in the *Media Player* time bar and in the *Mini Timeline*.

3. In the *Mini Timeline*, scrub the playhead to the frame desired for the clip out point. Click the *Mark Out* button or press "o."

See the *Mark Out* button on the screenshot in .

GLIM places yellow markers at the out point in the *Media Player* time bar and in the *Mini Timeline*.

4. Click the *Copy Clip Link* button.

See the *Copy Clip Link* button on the screenshot in [The GLIM Layout](#).

GLIM copies the sub-clip between the in and out points to the clipboard.

5. You can send the link to the sub-clip by pasting the clip link from the clipboard into an email, or you can view the sub-clip by pasting the clip link into a browser address field.

---

**Note:** When you open a clip link GLIM displays the timecodes for the sub-clip in and out points above the *Media Player* window.

---

See [Clip Link](#).

## Creating an Image Link

To create a link to a still image that can be copied and used by others, do the following:

1. Select a media file, click the *Plugins* tab and select *Image Link*.

2. In the *Media Player* window, click the time bar at the frame desired for the still image. Click the time icon for the *Start Frame* field.

3. Click *Submit*.

GLIM displays the image link and downloads the image to your download folder.

4. Click the copy icon for the *Image link* field to copy the *Image Link* to your clipboard.

See [Image Link](#).

## Clip Lists

In the course of a broadcast, you may want to extract an edit from a live video feed or closed file. For example, you may want to extract a highlight from a live sports event. You can use GLIM to extract the edit desired into a sub-clip, and you can save a set of such sub-clips into a *Clip List*. You can create sub-clips from live and growing MXF files, or from closed files in any format.

GLIM saves a *Clip List* as a Composition Markup Language (CML) file. Vantage workflows, for example, can stitch, conform, or transcode media files defined in CML files.

See [TIFO](#).

## Creating a Clip List

---

**Note:** A clip list may contain no more than 150 clips.

---

To extract edits and add them to a *Clip List*, do the following:

1. Make sure you have configured a location alias for the open or growing clip from which you want to extract sub-clips.  
See [Adding Your Network Locations With Location Aliases](#).
2. Open a live and growing MXF clip, or a closed clip, in the *Media Player*.  
See [Opening Files](#).  
GLIM displays the red *Live Source Indicator* in the *Media Player Window Controls* under the video in the *Media Player*.  
See the *Live Source Indicator* on the screenshot in .
3. Click the *Clips* tab.  
See [Clips Tab](#).
4. Move the playhead in the *Media Player* to the first frame of the edit you want to extract, and click the *Mark In* button (keyboard shortcut: I).  
See the *Mark In* button on the screenshot in .
5. Move the playhead in the *Media Player* to the last frame of the edit you want to extract, and click the *Mark Out* button (keyboard shortcut: O).  
See the *Mark Out* button on the screenshot in .
6. In the *Clips* panel, click the *Log Clip* button (keyboard shortcut: P).  
GLIM adds the sub-clip between the In and Out points to the *Clip List*. The *Clips* tab displays the Filename, Path, In Point, and Out Point of the extracted sub-clip.
7. Repeat this procedure to add more sub-clips to the *Clip List*, either from the same file, or from different files.
8. (Optional) If desired, export the clip list.  
See [Exporting a Clip List as a CML File](#).

## Creating a Clip List with the Clip List Plugin

In the course of a broadcast, you may want to extract an edit from a live video feed or closed file. For example, you may want to extract a highlight from a live sports event. You can use GLIM to extract the edit desired into a sub-clip, and you can save a set of such sub-clips into a *Clip List*. You can create sub-clips from live and growing files, or from closed files. Further, you can send a *Clip List* to Vantage, Post Producer, Flip 64, Multiscreen, or IPTV, as a CML (Composition Markup Language) file, for further processing.

For information about using clip lists and EDLs in Vantage see [Vantage Documentation](#).

---

**Note:** Composition Markup Language (CML) is an XML-based media descriptor language designed by Telestream. Vantage uses CML files for conforming media, stitching multiple separate media files and more.

---

To extract edits and add them to a *Clip List*, do the following:

1. Make sure you have configured a location alias for the open or growing clip from which you want to extract sub-clips.  
See [Adding Your Network Locations With Location Aliases](#).
2. Open a live and growing clip, or a closed clip, in the *Media Player*.  
See [Opening Files](#).  
GLIM displays the red *Live Source Indicator* in the *Media Player Window Controls* under the video in the *Media Player*.  
See the *Live Source Indicator* on the screenshot in .
3. Click the *Plugins* tab, and select *Clip List*.
4. Move the playhead in the *Media Player* to the first frame of the edit you want to extract, and click the *Mark In* button.  
See the *Mark In* button on the screenshot in .
5. Move the playhead in the *Media Player* to the last frame of the edit you want to extract, and click the *Mark Out* button.  
See the *Mark Out* button on the screenshot in .
6. In the *Clip List* or *Clip List CML to Vantage* control panel, click the "+" button.  
GLIM adds the sub-clip between the In and Out points to the *Clip List*. The *Clip List* or *Clip List CML to Vantage* control panel displays the Path, Duration, In Point, and Out Point of the extracted sub-clip.
7. Repeat this procedure to add more sub-clips to the *Clip List*, either from the same file, or from different ones.
8. (Optional) To change the destination of the *Clip List* CML file from the default location, enter the desired path and filename in the *Output Name* field of the *Clip List* control panel.

---

**Note:** There is no filename collision avoidance with the example *Clip List* plugin.

---

GLIM saves the *Clip List* as a CML file consumable by Vantage, Post Producer, Flip 64, Multiscreen, or IPTV.

For information about ingesting CML files into Vantage, see the *Vantage User Guide*.

See also [Customizing the Clip List Plugin Via JSON](#).

## Importing a Clip List into GLIM

To import a Clip List JSON file, do the following:

1. Click the *Clips* tab.  
See the *Clips* tab on the screenshot in [Clips Tab](#).
2. Click the *Import Clip List* button.
3. Browse to the desired *Clip List* JSON file, select it, and click *Open*.

## Deleting All Clips from a Clip List

To delete all clips from a Clip List, do the following:

1. Click the *Clips* tab.  
See the *Clips* tab on the screenshot in [Clips Tab](#).
2. Click the *Clear All Clips* button.

## Exporting a Clip List as a CML File

---

**Note:** Composition Markup Language (CML) is an XML-based media descriptor language designed by Telestream. Vantage uses CML files for conforming media, stitching multiple separate media files and more.

---

To export the clip list as a CML file, do the following:

1. In the *Clips* tab, click the *Destination* button.  
See the *Destination* button on the screenshot in [Clips Tab](#).  
GLIM opens the destination drop-down menu.
2. Select *Write CML to File*.
3. Click the *Enter Path (Gear)* button.  
GLIM opens the *Write CML to File* dialog.

4. Enter the desired path into the *Output directory* field, and click *Save*.

Specify the location and file name for the CML file. Do not use any of the following characters in the file name: \*, \, |, ", <, >, ?, or /.

If you try to assign a name that already has been used, GLIM automatically adds a version number to the file name. This prevents overwriting the file that already has that name.

GLIM saves the CML file containing the clip list to the location specified.





# Windows, Controls, and Menus

You can inspect media files and control the functions of GLIM through the windows, controls, and menus in the GLIM user interface.

## Topics

### The GLIM Layout

- [The GLIM Layout](#)
- [Sessions](#)
- [License Status Button](#)
- [GLIM Menu \(Three-Dot\) Button](#)
- [Current User Icon](#)
- [Reload file as Growing File](#)
- [Copy Clip Link](#)
- [Close File](#)
- [Browse Button](#)
- [File History Button](#)
- [Media Player Window](#)
- [Mini Timeline Window](#)
- [Audio/Frame/Clips/Scopes/Annotations Inspection Pane](#)
- [File Inspection Pane](#)
- [Media Player Window Controls](#)

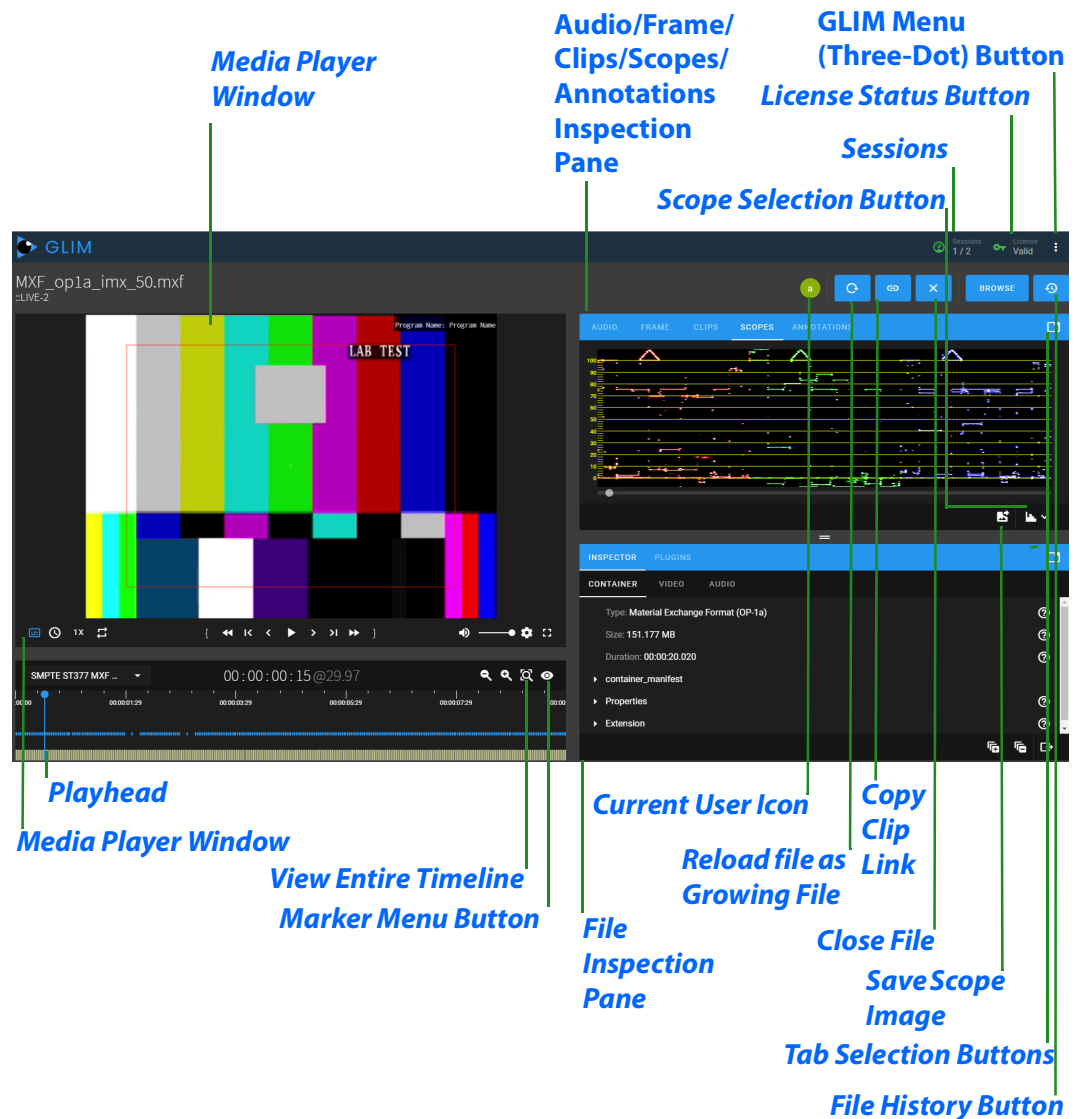
The GLIM layout includes windows, buttons, controls, and menus for inspecting media.

---

**Note:** The GLIM layout is optimized for 16:9 displays at 1920 x 1080 ppi. However, when running with non-standard aspect ratio screens, for example Ultra-wide screens, we pillar-box content in full screen mode.

---

**Figure 1.** The GLIM Layout



## Sessions

See this button on the screenshot in [The GLIM Layout](#).

Displays the number of active sessions.

The *Sessions* indicator shows the number of playback sessions being consumed in your GLIM server pool. For example, if using a GLIM Appliance with a 15-session license and GPU acceleration, GLIM shows the number of sessions as 15. If using, instead, a CPU-only server with a maximum of five sessions, GLIM shows the number of sessions as 5. If you have more than one server in the GLIM array, GLIM shows the total number of

available sessions here. For example, if you have two GLIM appliances, GLIM shows the total session count as 30.

By default, GLIM releases a session to the session pool if there has been no activity in the session for three minutes (180 seconds). You can change the amount of time GLIM waits before releasing a session, through *Settings*.

See [Setting Inactivity Time for File Closing](#).

---

**Note:** If you enable Scopes, GLIM consumes an additional session.

---

## License Status Button

See this button on the screenshot in [The GLIM Layout](#).

When this indicator is green, this instance of GLIM has a current license. When this indicator is red, this instance of GLIM doesn't have a current license.

---

**Note:** When you log in as an administrator, GLIM alerts you if your license is about to expire; 60 days before, 30 days before, seven days before, and every day for the last seven days.

---

When hovered over, GLIM displays the license status. When clicked, GLIM displays license details.

## GLIM Menu (Three-Dot) Button

See this button on the screenshot in [The GLIM Layout](#).

When clicked, GLIM opens a drop-down menu listing various GLIM resources, settings, and controls, as follows:

### Version

When clicked, *Version* displays the number of the GLIM version you are running.

### Guide

When clicked, *Guide* opens the GLIM User Guide. When clicked again, *Guide* closes the guide. Also, clicking outside the Guides area closes the guide.

### Support

When clicked, *Support* opens the GLIM Support web page in a new browser tab or window.

## Keyboard Shortcuts

When clicked, *System* displays a list of the files selected. The columns in the list show the path and filename of the files selected; and the device, commands, and statistics associated with each file.

See [Viewing the Keyboard Shortcut List](#).

## Restore Default Spacing

When clicked, GLIM restores the GLIM layout to its default settings.

## Settings

*Settings* displays a list of GLIM options. You can edit these options to customize how GLIM works with your equipment and media files.

---

**Note:** The *Settings* option is visible on the GLIM menu for the GLIM engine server. The *Settings* option also is visible on the GLIM menu for the GLIM Web client, but only for users logged in as administrators.

---

The *Settings* menu displays settings as follows:

### Location aliases

Identifies the locations of assets on your network.

Fields:

- *Alias name*
- *Path*
- *Type*

See [Adding Your Network Locations With Location Aliases](#).

### Quality levels

Defines the bitrate for media files at various widths. GLIM re-encodes the source media for transmission over the Internet.

Fields:

- *Bitrate*
- *Width*

See [Quality Settings](#).

### Displayed qualities

Determines the display modes.

Options:

- *Allow advanced interlaced modes*
- *Allow best quality modes*

See [Setting Displayed Qualities](#).

### File browser

Drop-down menu:

- *Excluded files and directories* menu

Option:

- *Allow all local drives* allows the file browser access to local drives.
- *Allow UNC locations* allows the file browser and external applications, such as Vidchecker, to access UNC locations.
- *Limit object storage results* limits search results from object storage, to increase search speed.

See [Choosing Tabs for the Inspection Panes](#).

### File closing

Field:

- *Seconds of inactivity* Default: 180

See [Setting Inactivity Time for File Closing](#).

### Image sequence

Option:

- *Enable image sequences* option

See [Enabling Image Sequences](#).

### Resizing

Drop-down menu:

- *Interpolation method* Default: NearestNeighbor

See [Enabling Watermark Analysis](#).

### Watermark Analysis

Option:

- *Watermark Analysis*

See [Enabling Watermark Analysis](#).

### Gpu Preset

Based on the GPU, this changes the preset used when encoding with the NVENC encoder.

Drop-down menu:

- *Gpu Preset* Default: High

See [Setting the GPU Preset Level](#).

### Surround Channel Mappings

Editable channel count and mapping list

Fields:

- *Channel count*
- *Mapping*

See [Adding Surround-Sound Audio Channel Mappings](#).

### **Overlay**

Fields:

- *Top overlay position* Default: 0
- *Left overlay position* Default: 0

See [Defining Overlay Positions](#) and [Overlay Section](#).

### **Cache**

Field:

- *Max concurrent download threads* Default: 12

The maximum number of concurrent read requests GLIM can issue for each loaded clip accessed from IP storage locations.

---

**Note:** GLIM can access locations such as HTTP and S3 type volumes. GLIM can request up to four simultaneous downloads. Diminishing returns are likely at higher values. You can tune this setting. Four downloads is well tested value for most scenarios.

---

Drop-down menu:

- *Download chunk size* Default: 16 MB

The size of the download portion GLIM caches in memory, using both RAM and hard disk. Select a value from 256KB-32MB.

### **Memory Cache**

Fields:

- *Memory cache size limit* Default: 10240 MB  
The maximum size of the memory cache. The total size of all source clips that could be loaded concurrently is a good guide for administrators to consider when sizing the cache.
- *Memory cache recycling percentage* Default: 5%  
The total size of the oldest chunks GLIM removes from memory when the memory cache size limit is reached.

## Disk Cache

Option:

- *Disk cache enabled*  
GLIM caches download portions to hard disk only when disk cache is enabled.
- *Disk cache path*  
The location of on the hard disk of cached download chunks.
- *Disk cache size limit* Default: 10 GB  
The maximum size, in gigabytes, of the hard disk cache.
- *Disk cache recycling percentage* Default: 25%  
The total size of the oldest chunks GLIM removes from the hard disk when the disk cache size limit is reached.

## Experimental features

*Scopes* option

## System

When clicked, *System* displays a list of the files selected. The columns in the list show the path and filename of the files selected; and the device, commands, and statistics associated with each file.

## Sessions

Displays the number of active sessions.

## Logs

---

**Note:** Logs are available in the *Settings* menu only for administrators logged in to a local server. Logs are not available in the *Settings* menu for administrators logged in to a GLIM client.

---

When clicked, *Logs* downloads a GLIM log to your local hard drive, and also downloads the JSON settings files located in C:\ProgramData\Telestream\Glim\.

## Current User Icon

See the *Current User Icon* on the screenshot in [The GLIM Layout](#).

In this region, GLIM shows icons for all current users. Hover the cursor over a Current User Icon to see the full user name.

## Reload file as Growing File

See the *Reload file as Growing File* button on the screenshot in [The GLIM Layout](#).

---

**Note:** The *Reload file as Growing File* button is available only for .tifo and .mxf files.

---

When clicked, GLIM opens the file in the *Media Player* as a growing file.

---

**Note:** In the GLIM web client, this setting also is available via the [GLIM Menu \(Three-Dot\) Button](#) as well.

---

## Copy Clip Link

See this button on the screenshot in [The GLIM Layout](#).

When clicked, GLIM copies a link to the sub-clip between the marked in and out points. If no in or out points are marked, GLIM copies a link to the whole clip. See [Copying a Clip Link](#).

## Close File

See this button on the screenshot in [The GLIM Layout](#).

When clicked, GLIM closes the open file. See [Closing Files](#).

## Browse Button

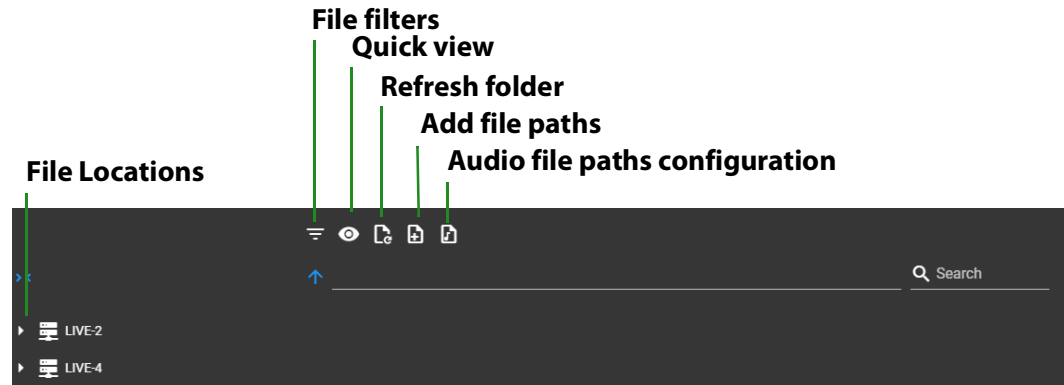
See this button on the screenshot in [The GLIM Layout](#).

When clicked, GLIM opens a file browser.



## File Browser Window

**Figure 2.** File Browser Window



The left-side pane of the *File Browser* window displays links to locations of media files. When clicked, buttons along the top of the window open panes for *File filters*, *Quick view*, *Refresh folder*, *Add file paths*, and *Audio file paths configuration*. The *Search* field allows you to search for files across file locations.

## File History Button

See this button on the screenshot in [The GLIM Layout](#).

When clicked, GLIM displays a list of the 10 last files opened.

## Media Player Window

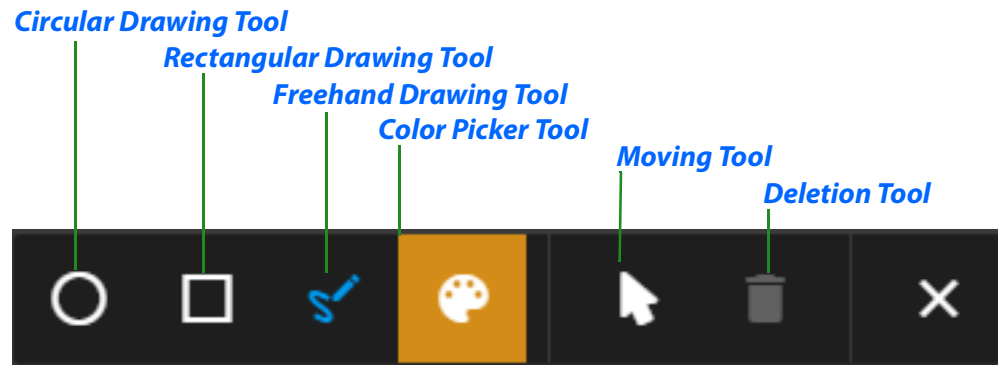
See this window on the screenshot in [The GLIM Layout](#).

Displays the video of the file selected. With a file selected, when the cursor hovers above the *Media Player* window, GLIM displays the *Media Player* controls.

## Annotations Drawing Tools Control Panel

The Annotations Drawing Tools control panel enables you to draw annotation shapes on a frame of video. The tools in the control panel work as described below.

**Figure 3.** The Annotations Drawing Tools Control Panel



### **Circular Drawing Tool**

When selected, GLIM draws circular shapes.

### **Rectangular Drawing Tool**

When selected, GLIM draws rectangular shapes.

### **Freehand Drawing Tool**

When selected, GLIM draws a freehand line.

### **Color Picker Tool**

When selected, GLIM opens a palette for shape color selection.

### **Moving Tool**

When selected, GLIM lets you move annotation shapes by dragging and dropping them.

### **Deletion Tool**

When selected, GLIM deletes the shape selected.

## **Mini Timeline Window**

See this window on the screenshot in .

Displays the audio waveform, SCTE-104 markers, SCTE-35 markers, GOP, In points, Out points, *Clip List* clips, and Nielson watermarks.

## **Playhead**

See the playhead on the screenshot in [The GLIM Layout](#).

The playhead indicates the position, in the *Mini Timeline*, of the frame displayed in the *Media Player*.

## View Entire Timeline

See the *View Entire Timeline* button on the screenshot in [The GLIM Layout](#).

When clicked, GLIM displays the entire length of the selected clip in the Mini Timeline window.

## Audio/Frame/Clips/Scopes/Annotations Inspection Pane

---

**Note:** The *Scopes* tab is available for technical preview only.

---

See this pane on the screenshot in [The GLIM Layout](#).

Displays the *Audio*, *Frame*, and *Scopes* tabs, each showing data for the file selected.

## Tab Selection Buttons

See the tab selection buttons on the screenshot in [The GLIM Layout](#).

When clicked, the tab selection buttons open menus of tabs you can display in the *Audio/Frame/Scopes/Inspection Pane* or in the *File Inspection Pane*.

## Settings (Gear) Button

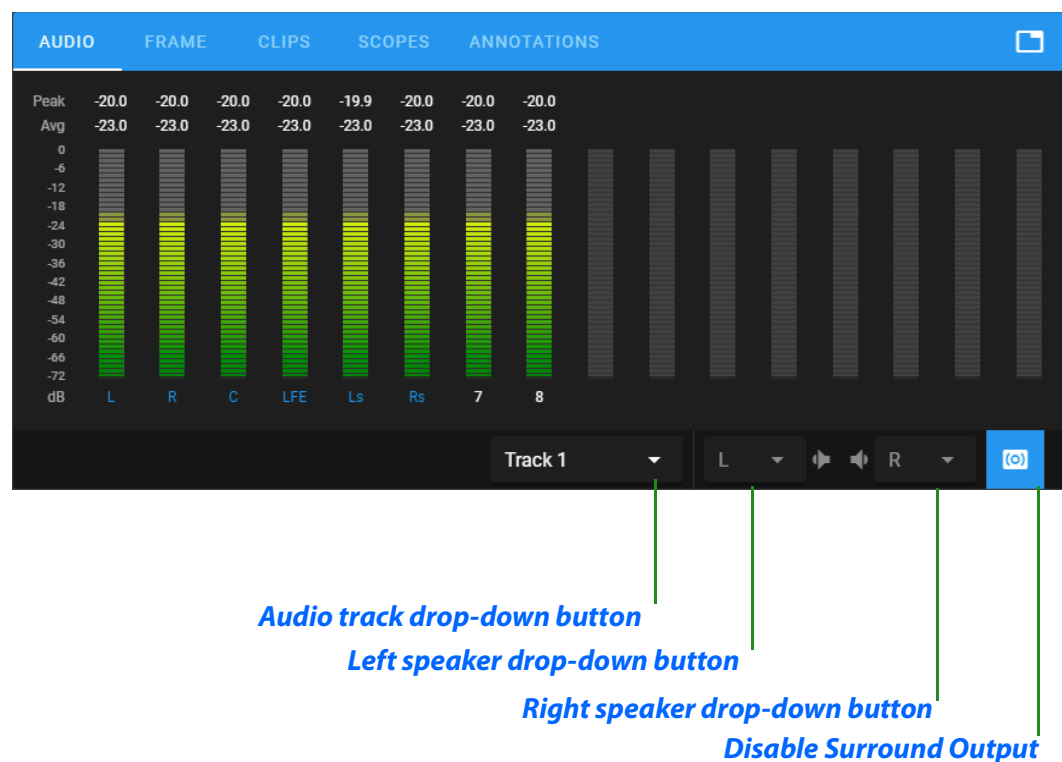
When clicked, GLIM opens a dialog for setting parameters for clip lists.

## Audio Tab

Displays the audio VU meters. The *Audio* tab displays all the channels in the currently-selected track, regardless of the number of channels GLIM renders to the speakers.

**Note:** For PCM audio, the *Audio* tab displays all channels by default, displaying all audio channels in all tracks present. However, you still can select PCM tracks independently. For other audio formats, GLIM displays individual audio tracks without the all-channels option.

**Figure 4.** The *Audio* tab showing a single audio track containing multiple audio channels.



The audio meters work like loudness meters in other media applications. However, GLIM audio meters are optimized to work for quality control and editing applications. The peak and average loudness measurements (displayed in dB) are calculated for the period of time taken by the current frame. For a 60 fps video, GLIM samples the audio over 1/60th of a second, and displays the measurements for the peak and average (RMS) loudness for that frame. If, for example, you advance the player to the next video frame, the audio meters change to display the peak and average loudness measurements for the subsequent 1/60th of a second.

### Audio track drop-down button

When clicked, GLIM opens a drop-down menu listing available audio tracks.

### **Left speaker drop-down button**

When clicked, GLIM opens a drop-down menu listing audio channels available for placement in the left speaker.

### **Right speaker drop-down button**

When clicked, GLIM opens a drop-down menu listing audio channels available for placement in the right speaker.

### **Disable Surround Output**

This button is a toggle. When clicked, GLIM disables or enables audio output to the surround speakers.

## **Frame Tab**

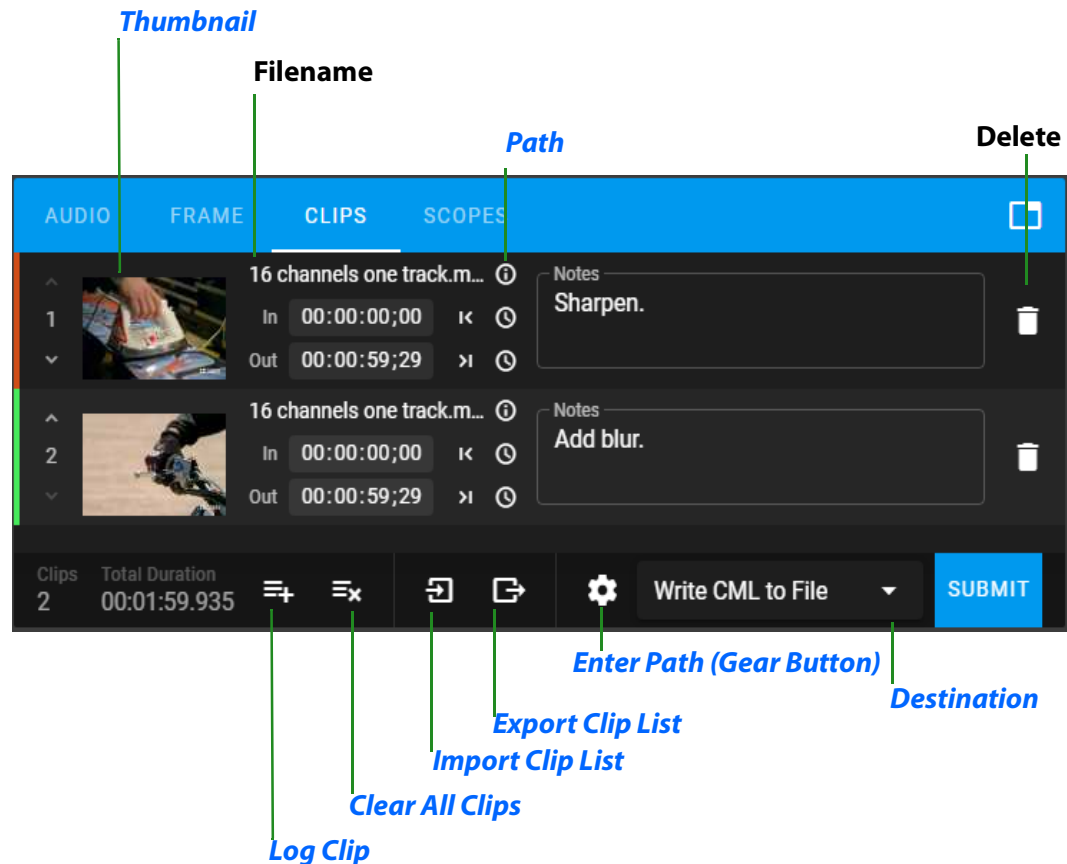
Displays metadata for the frame selected in the *Media Player* window.

## **Clips Tab**

Displays metadata for logged subclips.

See [Creating a Clip List](#).

**Figure 5.** Clips Tab



### Thumbnail

When clicked, GLIM makes the frame at the playhead of the *Media Player* the thumbnail.

### Path

When hovered over, GLIM displays the path to the media file.

### Log Clip

When clicked, GLIM logs the section of video between the In and Out points as a subclip. If you have not set In and Out points, GLIM sets the In point to the current position of the playhead. You must set the Out point manually in that case.

### Clear All Clips

When clicked, GLIM clears all clips from the *Clip List*.

### Import Clip List

When clicked, GLIM opens a file browser for selecting a *Clip List* file to import.

### Export Clip List

When clicked, GLIM exports the *Clip List* to a CML file in your Downloads folder.

### Enter Path (Gear Button)

When clicked, GLIM opens the Write CML To File dialog.

### Destination

When the downward-pointing arrow is clicked, GLIM opens a drop-down menu showing alternative destinations for the exported *Clip List* file, and creates a CML file that works with Vantage Conform, IPTV, MS, and F64 actions.

## Scopes Tab

---

**Note:** The *Scopes* tab is available only in Experimental Mode. To enable *Scopes* or other experimental features, see [Enabling Experimental Features](#).

---

When selected, GLIM displays a window for diagnostic scopes, showing the lumascope by default, and the *Scopes Selection* button. The progress bar along the bottom of the scopes window shows the section of the file that GLIM already has buffered for the scope. When you scrub the playhead to an unbuffered frame, a scope could take up to 15 seconds before showing the graph for the frame.

The GLIM scopes detect whether the source file has narrow-range or full-range video. The scopes automatically set the scope graticules for the range detected.

The *Scopes* tab has a buffer indicator, showing when the scope is buffered.

### Scope Selection Button

See the *Scope Selection* button on the screenshot in [The GLIM Layout](#).

When clicked, the *Scopes Selection* button opens a menu of available scopes, as follows:

- **Luma** Used for plotting histograms of brightness. Analyzes single-pixel horizontal slices of a video frame (ex. 1,920 pixels per slice for HD) and plots each vertical pixel according to its gray level (or luminance value). This allows you to quickly and visually locate bright and dark areas in your video. This scope makes it easier to spot things that might be hard for your eyes to notice especially when using a monitor that may be inaccurate or poorly calibrated.
- **Vector** Used for plotting U-V brightness distribution. Analyzes and displays hue and saturation of colors in your video. the Vector scope graticules are colored squares which represent the locations of the color primaries at 100% for the larger rectangles and at 75% for the smaller rectangles. The colors displayed are red, magenta, blue, cyan green, and yellow. The further away from the center each color is, the more saturated it is. The location of each color on the graph indicates its specific hue and which hues are the most saturated in the image.

- **RGB Parade** Used for plotting three component brightness distributions. Analyzes and displays saturation levels of red, green, and blue in your video.

See [Scopes](#).

---

**Note:** Use of a scope opens a separate session for the scope data. This increases GLIM bandwidth use. Higher resolution videos, such as 4K, or higher frame rates, such as 60fps, require more bandwidth than lower-resolution videos, such as SD, or lower frame rates such as 30fps. To limit bandwidth use, view a scope for a single frame rather than for a continuously-playing media file.

---

### **Save Scope Image**

When clicked, GLIM saves a screenshot of the scope displayed in your Downloads folder.

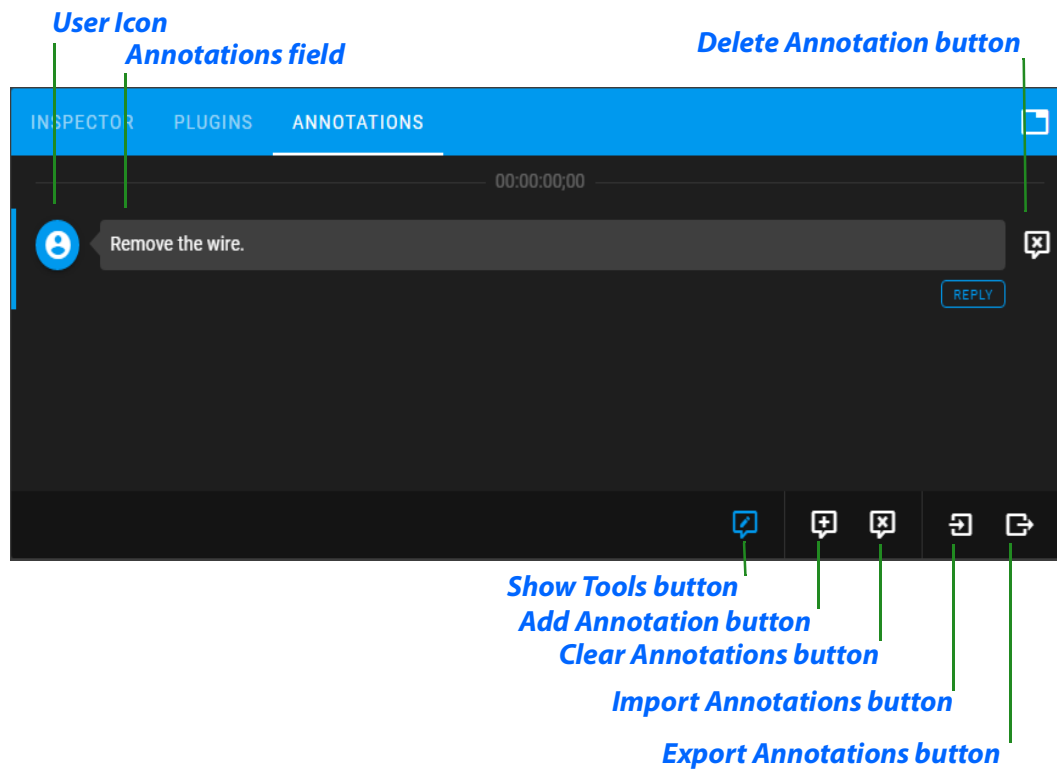
## **Annotations Tab**

When selected, GLIM displays a window for annotations. You can draw on a frame and add notes about the frame using the *Annotations* tab.

See [Enabling Experimental Features](#) and [Annotations](#).



**Figure 6.** Annotations Tab



**User Icon**

The icon of the user who entered the annotation

**Annotations field**

Field for annotation comments

**Delete Annotation button**

When clicked, GLIM deletes the annotation.

**Show Tools button**

When clicked, GLIM opens a control panel of drawing tools.

**Add Annotation button**

When clicked, GLIM opens an empty annotations field.

**Clear Annotations button**

When clicked, GLIM deletes all the annotations you made on the video file.

### Import Annotations button

When clicked, GLIM opens a file browser for finding the JSON file containing the desired annotations.

### Export Annotations button

When clicked, GLIM exports a JSON file containing the annotations for the selected clip to your Downloads folder.

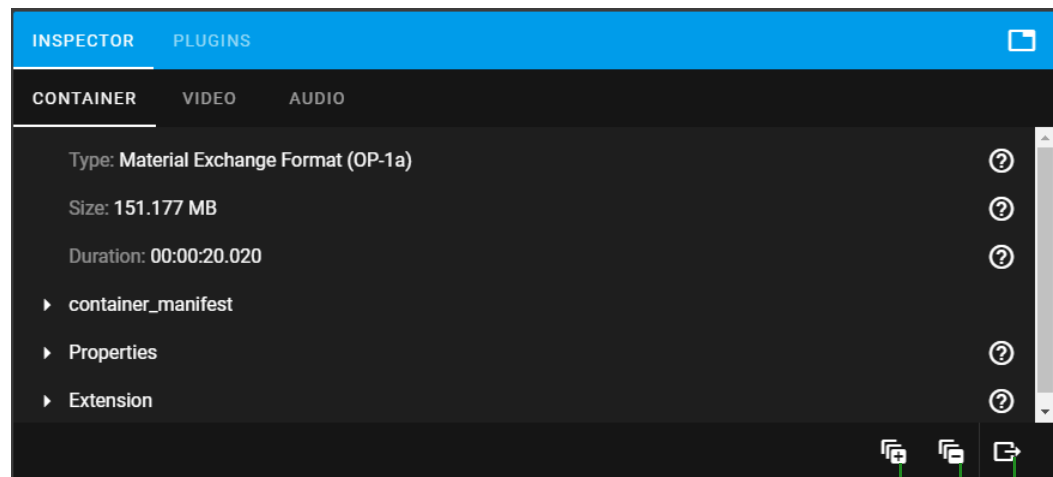
## File Inspection Pane

See this pane on the screenshot in [The GLIM Layout](#).

Displays the *Inspector*, *Plugins*, and *History* tabs, each showing data for the file selected.

## Inspector Tab

**Figure 7.** Inspector Tab



*Expand All Rows Button*

*Collapse All Rows Button*

*Export All Properties Button*

Displays the *Container*, *Video*, *Audio*, and *Metadata* sub-tabs, each showing properties for the file selected.

### Expand All Rows Button

When clicked, GLIM expands all rows in the Inspector tab.

### Collapse All Rows Button

When clicked, GLIM expands all rows in the Inspector tab.

**Export All Properties Button**

When clicked, GLIM exports all properties to a JSON file in your Downloads folder.

**Container Sub-tab**

Displays container data, including data for the container manifest and properties, for the file selected.

**Video Sub-tab**

Displays video data for the file selected.

See [Exporting Inspector Video Data](#).

**Audio Sub-tab**

Displays audio data for the file selected.

## Plugins Tab

Displays data about any plugins associated with the file selected. You can copy some of the data fields, or use controls to create shareable video clips or still images.

---

**Note:** GLIM includes a collection of stock plugins: Clip List, VideoScope Link, Backend Path, Clip Link, Image Link, and Unload. Also, you can build your own plugins to define (or script) a way for GLIM to interact with RESTful APIs of external systems. For example, you can build a plugin that allows for a user to enter in/out point variables and submit the loaded file to another program to subclip and transcode it to a different format. There are also plugins that can be built to perform simple file system manipulations, or to send an email of a clip link or image link to users.

---

The *Plugins* pane contains the following controls:

**Settings (Gear) Button**

When clicked, GLIM opens a dialog for setting plugin parameters.

**Backend Path**

When selected, GLIM displays several controls for copying the backend paths to a clip you specify. See [Copying a Clip Link](#).

**Clip Link**

When selected, GLIM displays several controls for creating a link to a video clip you specify. See [Copying a Clip Link](#).

**Clip List**

When selected, GLIM displays several controls for extracting sub-clips from live, growing files. See [Creating a Clip List](#).

**Clip List CML to Vantage**

When selected, GLIM displays several controls for extracting sub-clips from live, growing files; and for sending the list of sub-clips to Vantage. See [Creating a Clip List](#).

### Image Link

When selected, GLIM displays several controls for creating a link to a still image you specify. See [Creating an Image Link](#).

### Unload

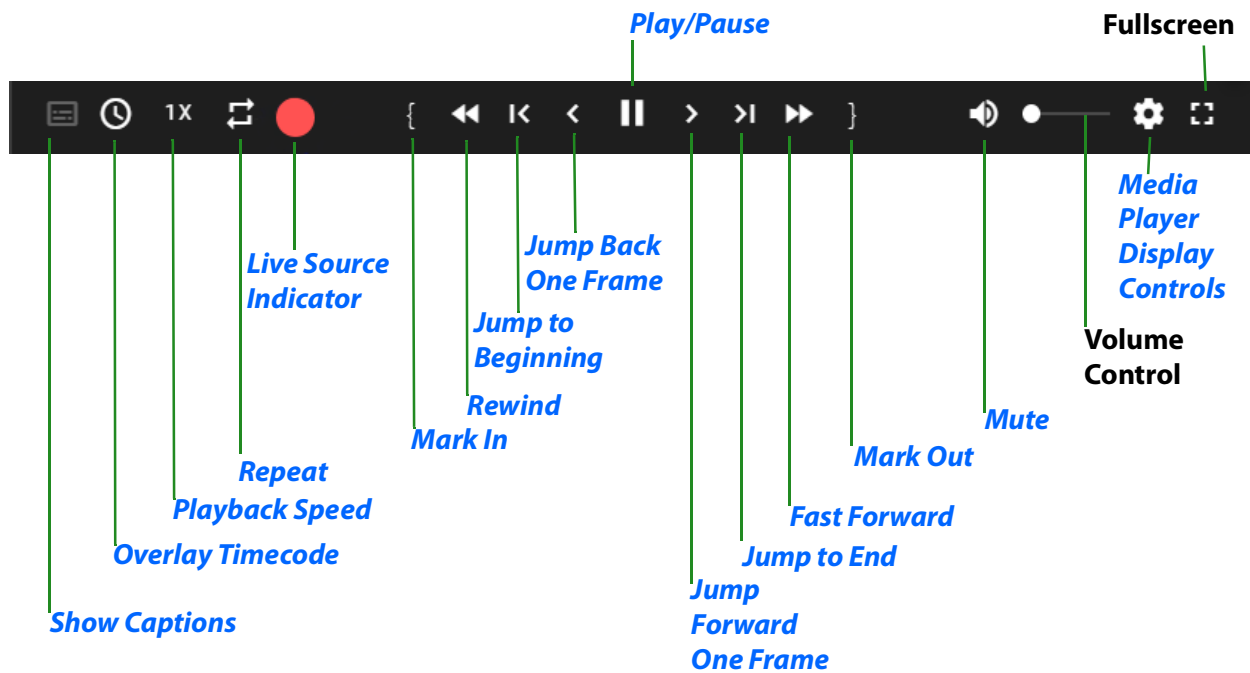
When selected, and Submit is clicked, GLIM unloads the plugin.

### Videoscope Link

When selected, GLIM opens a pane for setting the start frame and image link.

## Media Player Window Controls

**Figure 8.** Media Player Window Controls



With a file selected, when the cursor hovers above the *Media Player* window, GLIM displays the *Media Player* controls.

See [Media Player Window](#).

The *Media Player* window controls playback as indicated in the call-outs shown in the screenshot of the *Media Player* window controls, above.

*Media Player Control* buttons that are not self-explanatory, are described below.

## Show Captions

See this button on the screenshot in .

Enables you to superimpose captions over the video displayed in the *Media Player* window. When clicked, GLIM displays a menu of caption sources.

See [Viewing Captions and Subtitles](#).

## Overlay Timecode

See this button on the screenshot in .

Keyboard shortcut: t.

Enables you to superimpose the timecode over the video displayed in the *Media Player* window.

See [Selecting Timecode Type, Overlay](#), and [Timecode Menu](#).

## Playback Speed

See this button on the screenshot in .

Enables you to determine the playback speed of the *Media Player* window.

See [Media Player Display Controls](#).

## Repeat

See this button on the screenshot in .

Keyboard shortcut: r.

When clicked, Repeat replays the clip in the *Media Player* window.

## Live Source Indicator

See this button on the screenshot in .

GLIM displays the Live Source Indicator when the source is a live growing file. When clicked, GLIM takes you to the latest frame already captured from the live video stream.

See [Viewing a Live File](#).

## Mark In

See this button on the screenshot in .

Keyboard shortcut: i.

When clicked, *Mark In* marks the frame selected as the In point of the clip.

## Rewind

See this button on the screenshot in .

Keyboard shortcut: j.

When clicked, GLIM plays the clip backwards.

## Jump to Beginning

See this button on the screenshot in .

Keyboard shortcut: Home.

When clicked, this button returns the playhead to the beginning of the clip.

## Jump Back One Frame

See this button on the screenshot in .

Keyboard shortcut: Left Arrow.

When clicked, GLIM moves the playhead back one frame.

## Play/Pause

See this button on the screenshot in .

Play keyboard shortcut: spacebar.

Pause keyboard shortcut: k

When clicked, GLIM moves the playhead back one frame.

## Jump Forward One Frame

See this button on the screenshot in .

Keyboard shortcut: Right Arrow.

When clicked, GLIM moves the playhead forward one frame.

## Jump to End

See this button on the screenshot in .

Keyboard shortcut: End.

When clicked, this button advances the playhead to the end of the clip.

## Fast Forward

See this button on the screenshot in .

Keyboard shortcut: l.

When clicked, GLIM plays the clip backwards.

## Mark Out

See this button on the screenshot in .

Keyboard shortcut: o.

When clicked, *Mark Out* marks the frame selected as the *Out* point of the clip.

## Mute

See this button on the screenshot in .  
Keyboard shortcut: n.

When clicked, *Mute* toggles audio playback on and off. When Mute is disabled, GLIM enables the volume-control slider to the right of the Mute button.

## Media Player Display Controls

See this button on the screenshot in .

For the location of the gear button, see the screen-shot for the topic, .

When clicked, the gear button opens a menu of options for the *Media Player* window display, as follows:

### Audio tracks

Displays the names of active audio tracks.

### Audio channels

Displays the audio channel map.

See [Adding Surround-Sound Audio Channel Mappings](#).

---

**Note:** You select an audio track, and then the desired channels for GLIM to render. You can toggle between rendering your selections and rendering a single channel (soloing) by clicking the column header in the channel dialog.

---

### Subtitles

Displays the subtitles as an overlay over the video.

The *Media Player* allows the selection of a subtitle track from which to create caption or subtitle overlays that are rendered in the media player. Glim looks at the content being played back and shows the captions and subtitles tracks that are present.

GLIM displays only the caption tracks present in the source. If only a CEA-608 track is present, GLIM displays only a CEA-608 track. At least one pair of 608/708 tracks is present in most cases.

See [Subtitles](#) and [Viewing Captions and Subtitles](#).

---

**Note:** GLIM can display one subtitle or caption at a time. The subtitle sub-menu allows selection of the desired sidecar file, channel (CEA-608), service (CEA-708), page (teletext), or both CEA-608 and CEA-708.

---

### Quality

Enables you to select the resolution of the *Media Player* window video display.

## Show Alpha

---

**Note:** The *Show Alpha* menu item is visible only when the selected media file contains an alpha channel.

---

Toggles the alpha channel contents, on or off, as an overlay over the video.

## Overlays

When clicked, GLIM opens the *Overlay* menu. The *Overlays* menu enables you to overlay borders for various types of “safe” areas over the *Media Player Window* video display. The menu lists *Action Safe* and *Title Safe* overlays for various aspect ratios. Select the desired overlay with the same aspect ratio as the video in the media file selected.

See [Viewing the Action Safe and Title Safe Areas](#).

## Fullscreen

See this button on the screenshot in .

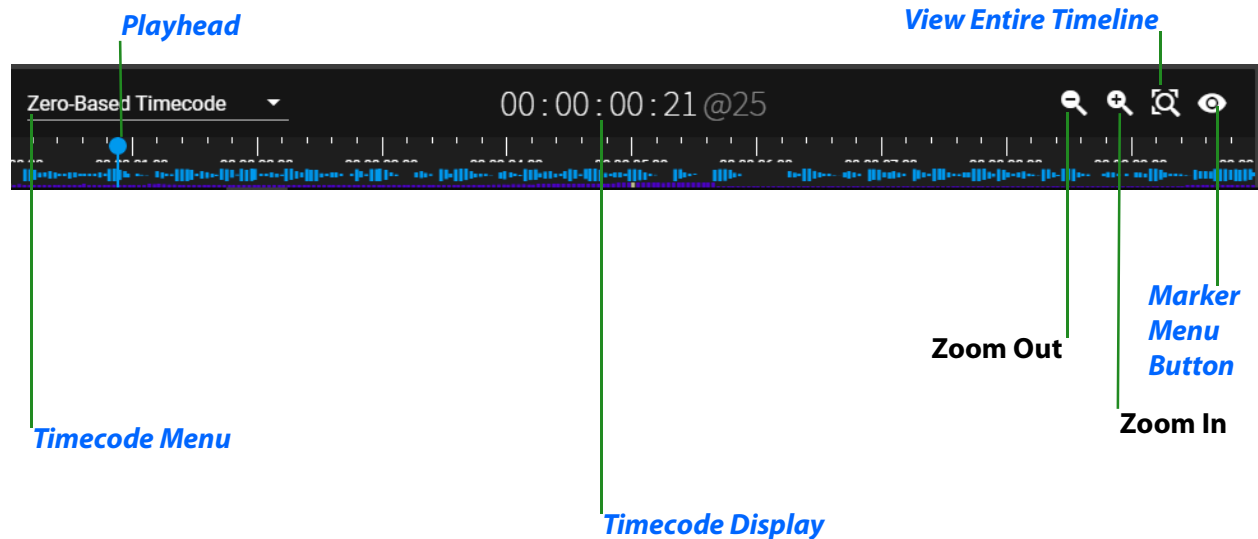
Keyboard shortcut: f

When clicked, GLIM displays the *Media Player* fullscreen. To exit fullscreen display, press *Esc*.



## Mini Timeline Window

**Figure 9.** Mini Timeline Window




---

**Note:** By default, the *Mini Timeline* window displays 10 seconds of the selected file.

---

## Timecode Menu

See this menu on the screenshot in .

The *Timecode Menu* displays Zero-Based Timecode by default. When clicked, GLIM opens the timecode drop-down menu. The drop-down menu lists the types of timecode available in the file selected.

See [Selecting Timecode Type](#) and [Timecode Display](#).

## Timecode Display

See this display on the screenshot in .

Displays the timecode location of the playhead, in the timecode format selected in the Timecode Menu.

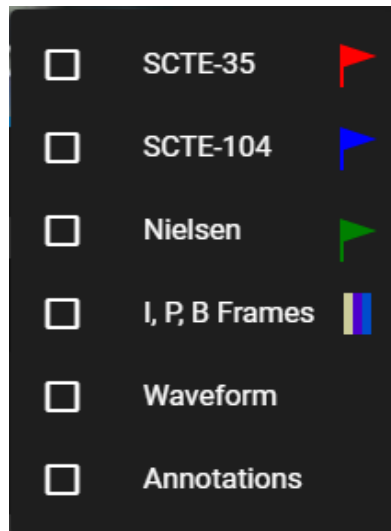
See [Timecode Menu](#) and [Jumping to a Timecode Location](#).

## Marker Menu Button

See this button on the screenshot in [The GLIM Layout](#).

When clicked, the *Marker Menu* eyeball button opens the *Marker Menu*, as shown in the following screenshot:

**Figure 10.** Marker Menu



The *Mini Timeline* also displays the following color-coded elements in the overlay:

- **SCTE-35 Red flags** SCTE-35 markers are standard Digital Program Insertion Cueing Messages. These can be used at advertising insertion points to trigger advertising messages.
- **SCTE-104 Blue flags** SCTE-104 markers are standard Automation System to Compression System Communications Applications Program Interface messages. This standard defines the Communications API between an Automation System and the associated Compression System that will insert SCTE-35 private sections into the outgoing Transport Stream.

---

**Note:** To view the metadata for an SCTE marker, select the Metadata sub-tab in the Properties pane. See [Container Sub-tab](#).

---

- **Nielsen Green flags** Nielsen audio watermarks are sub-audible low-frequency tones inserted into a soundtrack containing data about the media file. Nielsen data-collection systems aggregate this data.
- **I frame Yellow markers** I frame markers show the location of MPEG video Intra-frames. Unlike compressed frames, an I frame contains complete data. Codecs use I frames as reference frames for compressing and decompressing MPEG video.
- **P frame Lavender markers** P frame markers show the location of MPEG video Predictive frames. A P frame is a compressed frame that follows an I frame, and relies

on the I frame to supply data missing from the P frame. Codecs use P frames and B frames in conjunction with I frames to compress and decompress MPEG video.

- **B frame Blue markers** B frame markers show the location of MPEG video Bi-directional frames. A B frame is a compressed frame that relies on the frames immediately preceding and following the B frame to supply data missing from the B frame. Codecs use P frames and B frames in conjunction with I frames to compress and decompress MPEG video.
- **Waveform** When checked, the Mini Timeline displays the audio waveform.
- **Annotations** When checked, the Mini Timeline displays annotation markers.



# Appendix: Configuring GLIM with JSON Files

You can configure GLIM for your particular set of hardware, assets, and plugins by editing JSON files.

## Topics

- [Configuring GLIM with JSON Appsettings](#)
- [Specifying Minimum Log Event Level with Json Appsettings](#)
- [Aliases](#)
- [Logs](#)
- [Plugins](#)
- [API](#)
- [Customizing the Clip List Plugin Via JSON](#)

## Configuring GLIM with JSON Appsettings.other

Telestream can provide a JSON appsettings.other file for configuration of such features as grouping of machines, GPU decode mode, and image sequences. JSON configuration should be done by administrators only.

See also [Configuring GLIM with Settings](#).

## Grouping Machines with JSON Appsettings.other

You can increase the number of available sessions by grouping machines into a single session. To group machines into a single session, do the following:

1. In a text editor, open the appsettings.other.json file  
C:\programdata\telestream\glim\.
2. Scroll down to the `LoadBalance` section.
3. Change `Enabled` to `true`.
4. Under `Nodes`, enter the IP of each machine in the group.

5. Make sure each machine uses a different port, and make sure the locations and settings on each machine match.

You can change the port, location, and settings assignments in the appsettings.webserver.json file in the C:\programdata\telestream\glim\ folder.

See also [Adding Your Network Locations With Location Aliases](#).

---

**Note:** Tip: you can copy settings for one machine to the settings for another in the JSON file.

---

6. In appsettings.other.json, change the re-direct line to match the URL for both machines.

7. Restart services.

If you restart in console, GLIM displays a message indicating that the machine is part of a group.

An example of a typical `LoadBalance` section follows:

```
"LoadBalance": {
  "Enabled": true,
  "Nodes": [
    {
      "Host": "10.0.25.155",
      "Port": 5000,
      "RedirectUri": "http://10.0.25.155:5000"
    },
    {
      "Host": "10.0.7.70",
      "Port": 5002,
      "RedirectUri": "http://10.0.7.70:5002"
    }
  ],
}
```

## Configuring GLIM with JSON Appsettings

You can configure GLIM with the JSON file located at:

C:\program files\telestream\glim\appsettings.json.

This JSON file has various keys which are described in the sections that follow.

### Encode Section

#### Subtitle

Enables the subtitles setting to be displayed in the UI.

### VideoSegmentDuration

Controls the duration (in seconds) that the video and audio media will be segmented into for delivery over the Internet.

### SubtitleSegmentDuration

Controls the duration (in seconds) that the subtitles will be segmented into for delivery over the Internet.

### Interpolation

Sets the mode of the scaling algorithm used to resize the original media before encoding. The possible values in order of increasing CPU complexity are "NearestNeighbor", "Linear", "Cubic", "Lanczos".

See also [Enabling Watermark Analysis](#).

### Levels

Each object consists of a "Width" and "Bitrate" key. The desired width of the encoded picture is specified in pixels and the desired bitrate in bits per second.

### Preset

Specifies the video encoder preset. For x264, recommended values include "ultrafast", "superfast", "veryfast", "faster" and "fast".

### Threads

Allows control over the number of CPU threads that should be used to perform the video encoding. A value of 0 indicates auto-configuration.

An example of a typical `Encode` section follows:

```
"Encode": {
  "Gpu": n,
  "MaxGpuSessions": n,
  "Subtitle": true,
  "VideoSegmentDuration": 1.0,
  "SubtitleSegmentDuration": 1.0,
  "Interpolation": "NearestNeighbor",
  "Preset": "fast",
  "Threads": 0,
  "Levels": [
    {
      "Width": 360,
      "Bitrate": 750000
    },
    {
```

```
        "Width": 480,  
        "Bitrate": 1000000  
    }  
]  
},
```

## Container Section

You can configure certain aspects of file loading in GLIM.

### **IdleTimeout**

The time (in seconds) after which the underlying file will be released back to the operating system if no segments are retrieved by the client.

### **ImageSequence**

Set to true if images within the same folder should be treated as an image sequence rather than individual pictures.

### **DefaultFrameDuration", "DefaultTimeScale**

Used in combination to determine the frame rate of the media if none is provided by the container.

### **OpenTimeOut**

The amount of time to check if the clip is still in the *open* mode.

The following is an example of a typical `Container` section:

```
"Container": {  
    "IdleTimeout": 180.0,  
    "ImageSequence": false,  
    "DefaultFrameDuration": 1001,  
    "DefaultTimeScale": 30000  
    "OpenTimeOut": [value]  
},
```

## Overlay Section

GLIM provides the ability to superimpose an SVG file over the playing video. You can use SVG to specify vector graphics, images or text to appear over the video. SVG supports transparency.

---

**Note:** The default svg file displays the username of the current user over content playing in GLIM.

---



### Path

A user specified path to a valid SVG file that will be used to create the overlay.

### Top

Specifies the number of pixels from the top of the image where the overlay will be placed.

### Left

Specifies the number of pixels from the left of the image where the overlay will be placed.

The following is an example of a typical `Overlay` section:

```
"Overlay": {
  "Path": "protect.svg",
  "Top": 100,
  "Left": 100
},
```

See also [Defining Overlay Positions](#).

## RequireHttps Section

The `RequireHttps` key is a simple boolean: `true` for GLIM to require that all communications must be secured with HTTPS; or `false` if unencrypted HTTP is permissible.

## Authentication and Credentials Sections

GLIM ships with authentication disabled: a user is not required to log into the system before remotely viewing media files. If user authentication is required, you can set `Authentication` to `Windows`. GLIM then uses the Windows-native users. Alternatively, use `BuiltIn` to specify users directly in the configuration file, via the `UserName` and `Password` keys.

To log in the first time as the `BuiltIn` user, enter “admin” as the user name, and “admin” as the password.

---

**Caution:** To minimize your security risk, change the password for the `BuiltIn` user the first time you log in.

---



---

**Note:** When changing the authentication method between `BuiltIn` and `Windows` settings, you must reconfigure the user group settings.

---

The following is an example of typical `Authentication` and `BuiltIn` sections:

```
"Authentication": "BuiltIn",
```

```
"Credentials": {  
  "UserName": "user",  
  "Password": "pass"  
},
```

See [Installing Your Own Certificate](#) and [Setting the Type of Authentication](#).

## LocationAliases Section

By default, GLIM presents a file browser whose roots are the known hard drives on the system. This can be overridden to display only certain directories using the `LocationAliases` array.

---

**Note:** We recommend you use the user interface to configure locations rather than manually altering the json files.

---

Each element in the array includes a `Name` which is simply an alias that will be displayed in the user interface to assist the user and a `Path` which can either be a UNC path or a local path. Note that backslash characters must be escaped with an additional backslash in JSON files.

The UNC path must be accessible to the user logged in to the service. In practice, this means that UNC paths are not be available when GLIM is running as a service, since the Local Service user does not have network access. Instead, you can run GLIM in Console Mode with the same privileges as the logged in user.

---

**Note:** You may want to use a user group to define which users have access to particular `LocationsAliases`.

---

The following is an example of a typical `LocationAliases` section:

```
"LocationAliases": [  
  {  
    "Name": "Location name",  
    "Path": "\\host-name\\share-name" // Use '\\' as a single '  
  },  
  {  
    "Name": "Local location",  
    "Path": "C:\\Media"  
  }  
],
```

## SurroundChannelMappings Section

Wherever possible, GLIM identifies audio channel labels to allow the remote player to correctly play surround-sound tracks. However, some source files may not be attributed with these labels. These require the appSettings.json file to hint at the probable channel layout.

The following is an example of a typical `SurroundChannelMappings` section. This example shows a configuration where GLIM assumes that the channel layout for an 8 channel unlabeled track is L, R, C, LFE, Ls, Rs whereas the channel layout for a 6 channel unlabeled track would be L, C, R, LFE, Ls, Rs.

```
"SurroundChannelMappings": {
  // Applied when channels are not labeled in an 8 channel PCM
  track
  "8": {
    "L": 0,
    "R": 1,
    "C": 2,
    "LFE": 3,
    "Ls": 4,
    "Rs": 5
  },
  // Applied when channels are not labeled in a 6 channel PCM track
  "6": {
    "L": 0,
    "C": 1,
    "R": 2,
    "LFE": 3,
    "Ls": 4,
    "Rs": 5
  }
}
```

## Specifying Minimum Log Event Level with Json Appsettings

Settings for logging are in the JSON file located at:

C:\Program Files\Telestream\GLIM\appSettings.json

The `MinimumLevel` configuration object lets you specify one of the log event levels as the minimum. In the example below, log events with level `Debug` and higher are processed and written to the console. If you specify no `MinimumLevel`, then `Information` level events and higher are processed.

### **Verbose**

Verbose is the noisiest level, rarely enabled for a production app.

### **Debug**

Use `Debug` for internal system events that are not necessarily observable from the outside. `Debug` is useful for determining how something happened.

### **Information**

`Information` events describe things happening in the system that correspond to its responsibilities and functions. Generally `Information` events are the observable actions the system can perform.

### **Warning**

When service is degraded, endangered, or may be behaving outside of its expected parameters, use `Warning` level events.

### **Error**

When functionality is unavailable or expectations broken, use an `Error` event.

### **Fatal**

The most critical level, `Fatal` events demand immediate attention.

The following is an example of a typical `Logging` section:

```
{
  "Logging": {
    "LogLevel": {
      "Default": "Debug",
      "System": "Information",
      "Microsoft": "Information"
    }
  },
  "Serilog": {
    "MinimumLevel": {
      "Default": "Debug",
      "Override": {
        "System": "Information",
        "Microsoft": "Information",
        "Microsoft.AspNetCore": "Warning"
      }
    }
  },
  "WriteTo": [
    {
      "Name": "Console",
      "Args": {
```

```

        "outputTemplate": "[{Timestamp:HH:mm:ss} {Level:u3}
{SourceContext:l}] {Message:l}{NewLine}{Exception}"
    },
    {
        "Name": "File",
        "Args": {
            "path": "%PROGRAMDATA%\Telestream\GLIM\Telestream-
GLIM-log-.txt",
            "rollingInterval": "Day",
            "outputTemplate": "[{Timestamp:HH:mm:ss} {Level:u3}
{SourceContext:l}] {Message:l}{NewLine}{Exception}"
        }
    }
]
}

```

## Aliases

GLIM operates in one of two modes depending on whether any `LocationAliases` have been configured. If no aliases have been configured then the entire file system of the remote machine is browsable and the actual path of the remote media is displayed in the user interface. This could be a security risk. You can mitigate the risk by using the second mode which is entered when one or more aliases are configured. In the second mode, only the directories corresponding to the configured aliases are browsable, and all references to the remote media are relative to the alias name (denoted by a two colon prefix, e.g. `::alias`.)

## Logs

GLIM logs errors to a log file which may be examined if the application behaves in an unexpected manner. The quickest way to navigate to the log directory is to issue the command `%programdata%\Telestream\GLIM` from the Run prompt.

## Plugins

GLIM is designed to be extensible through the use of plugins. Users may implement their own plugins using the C# programming language. Plugins are compiled each time the application is started.

## Example Plugins

Example plugins are provided during installation and placed in the `c:\Program Files\Telestream\GLIM\plugins` directory. These include Unload, Backend Path, and Clip List plugins. Some examples follow.

### **backend path.cs**

Defines backend paths.

See [Machine Groupings](#).

### **clip link.cs**

Creates a shareable link that creates a GLIM sub-clip given a mark in and mark out point.

See [Copying a Clip Link](#).

### **clip list.cs**

Creates lists of sub-clips that can be sent to other applications.

---

**Note:** There is no filename collision avoidance with the example plugin.

---

See [Creating a Clip List](#).

### **image link.cs**

Creates a link to a full resolution JPEG of a specified frame.

See [Creating an Image Link](#).

### **sample.cs**

Example plugin demonstrating advanced techniques such as limiting the plugin to certain users.

### **unload.cs**

Unloads the currently selected media file.

### **videoscope.cs**

Displays scopes for signal diagnostics.

See [Scopes](#).

## Plugin Design

GLIM plugins require users to conform their plugin code to the following design:

- Plugins make heavy use of JSON Schema and the associated uiSchema. Ensure that the desired user interface is describable using these concepts.
- The plugins must derive their class from `Telestream.GLIM.Plugin`.
- The implementation must include overrides for `GetSchema` and `Execute` and may include overrides for the `GetEnabled.Execute` function.

The core function that must be implemented in a plugin has the definition `public override string Execute(string model, string path, Context context)`. The parameters `model` and `path` contain the UI parameters as a JSON string and the path of the file it pertains to.

The path may be specified relative to the alias. The path relative to the backend can be obtained using the `Context` object, defined as follows:

```
public struct Context
{
    // the identity of the logged on user
    public IIdentity Identity { get; set; }
    // the backend host relative to the client
    public string Host { get; set; }
    // the query parameters requested by the client
    public string Parameters { get; set; }
    // the path of the file relative to the backend
    public string Path { get; set; }
}
```

## Plugin functions

A plugin may call the following functions.

- `public Int32 GetFrameNumberForTimeCode(string path, string timeCode)`
- `public void Unload(string path, Action<string> OnIdle)`
- `public void Alert(string message)`

You may use `Unload` when a plugin is used to perform some operation on a file that isn't currently loaded into GLIM, e.g. moving the file to another directory. The `Unload` method requires the plugin to provide a delegate that is called when the clip has been completely unloaded. The following code snippet demonstrates the use of the `Unload` and `Alert` functions:

```
public void OnIdle(string path)
{
    Alert(path + " has been unloaded.");
    // ... execute logic that requires clip be unloaded goes here
}

public override string Execute(string model, string path, Context
context)
{
    // ... execute logic that does not require clip be unloaded goes
here
    Alert("Unload request for " + path + " submitted.");
    Unload(path, OnIdle);
}
```

## API

You can use the server component of GLIM without the web client. For example, you might enhance external applications with remote viewing of media files provided by the GLIM server. GLIM has two main APIs, described as follows.

### Rest API

An HLS endpoint is available at `play/master.m3u8?path=`. e.g. if a GLIM server is running on port 5000 at an IP address of 192.168.100.1, and the user wishes to connect to an HLS rendering of the file at `c:\media\file.mov` then the appropriate URL is `http://192.168.100.1:5000/play/master.m3u8?path=c:\media\file.mov`

Other endpoints, for sub-clips, full resolution JPEG images etc. are available on request.

---

**Note:** You can find further information about the REST API here:  
`http://[machine name]:5000/swagger/index.html`

---

### gRPC API

Details of the gRPC API are available on request.

## Customizing the Clip List Plugin Via JSON

GLIM ships with a plug-in system that allows the system to be extended for bespoke uses. Plug-ins are written using the C# programming language and provide a way to specify a user interface that is presented in the GLIM user interface. A set of sample plug-ins is shipped with GLIM. Use these as examples to accelerate development.

The Clip List plug-in demonstrates how GLIM can be extended to provide a user interface suitable for constructing a list of clips with mark in and mark out points, suitable for further processing by an external system.

The sample constructs a CML document. Vantage workflows, for example, can stitch, conform, or transcode media files defined in CML files. Use this sample as a starting point for applications that require the construction of a list of clips and submission of this list to an external system.

The plug-in user interface is specified as a JSON formatted string inside the plug-in code.



**Figure 1.** The Clip List Panel

The screenshot shows the 'Clip List' panel in the GLIM interface. The panel is divided into two main sections. The left section is a large, empty list area. The right section contains several input fields and a 'SUBMIT' button. The input fields are: 'Black Duration' with a value of '0', 'Clips' with a '+' and 'x' button, 'CML', 'Total Duration', 'Clip Count' with a value of '0', and 'Output Name'. The 'SUBMIT' button is located at the bottom right of the panel.

That code is then rendered automatically in the user interface. For example, the *Black Duration* parameter is defined in the JSON document in two places (as highlighted below).

```
...
  "model":{
    "blackDuration":0,
  },
  "schema":{
    "type":"object",
    "properties":{
      "blackDuration":{
        "type":"number",
        "title":"Black Duration"
      },
    },
  },
  ...
```

The first location is in the “model” property. The model is the data that is interchanged between the UI and the plug-in, it is the data that has been entered by the user and is required by the plug-in to perform its function. The second location is in the “schema/properties” property. This is the definition of how the UI for the property should be rendered. In this case, the UI schema tells the UI that the definition should be rendered as a numerical entry field and should be displayed with a label of “Black Duration”. To add another property to the plug-in, a pair of entries like this should be added to the string returned by the GetSchema method.

```
...
    "model":{
        "blackDuration":0,
        "action": "",
    },
    "schema":{
        "type":"object",
        "properties":{
            "blackDuration":{
                "type":"number",
                "title":"Black Duration"
            },
            "action":{
                "type":"string",
                "enum": [
                    "Create EDL file",
                    "Submit to Vantage",
                    "Submit to Transform"
                ],
                "title":"Submission Action"
            },
        },
    },
    ...
```

This is sufficient to create a new entry in the user interface. However, to transform the JSON model that is returned to the plug-in the C# model class should also be updated to accommodate the new parameter.

```
public class ClipListModel
{
    public double blackDuration { get; set; }
```

```
public string action { get; set; }
public List<ClipModel> clips { get; set; }
public string duration { get; set; }
public int count { get; set; }
public string cml { get; set; }
public string outputname { get; set; }
}
```

The plug-in's Execute method is called when the user clicks the Submit button in the plug-in user interface. It is at this point that the new parameter can be examined to determine the course of action.

```
public override string Execute(string model, string path, Context
context)
{
    ClipListModel clipListModel =
    JsonSerializer.Deserialize<ClipListModel>(model);

    if (clipListModel.action.Equals("Submit to Vantage") == true)
    {
        Alert("Submission to Vantage is not yet implemented");
        return null;
    }
    else if (clipListModel.action.Equals("Submit to Transform") ==
true)
    {
        Alert("Submission to Transform is not yet implemented");
        return null;
    }
    ...
}
```

See also [Creating a Clip List](#).

