

# Alchemist Live IP

User Guide



## **Version History**

Date	Version	Release by	Reason for Changes	
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\*Dolby - Dolby is a registered trademark of Dolby Laboratories.

## 1. Definitions, Acronyms and Abbreviations

#### Table 1: Table of Terminology

Term	Definition
3G	3G (standardized in SMPTE 424M) consists of a single 2.970 Gbit/s serial link, that is required for the transmission of high frame rate, progressive video content (i.e. 1080/50p, 1080/59p).
BMC	<b>Baseband Management Controller:</b> A baseboard management controller (BMC) is a small, specialized processor used for remote monitoring and management of a host system.
Anamorphic	A method of carrying wide screen content, in a comparatively narrower aspect ratio transport.
GPU	<b>Graphical Processing Unit</b> . Very efficient, parallel compute engine for advanced image processing techniques.
HDR	<b>High Dynamic Range</b> . Is a representation that allows extended dynamic range (darker darks, brighter whites) by means of new transfer functions (EOTF/OETF) and Wide Color Gamut (WCG), which replaces the traditional CRT gamma curve and BT709 colorspace.
IPMI	<b>Intelligent Platform Management Interface</b> - is a set of computer interface specifications for an autonomous computer subsystem that provides management and monitoring capabilities independently of the host system's CPU, firmware (BIOS or UEFI) and operating system.
License file	Defines the type & quantity of products available.
License Server	An application that manages product licenses.
License Lock Code	The Lock Code based on specific locking criteria. GV Live product licenses are locked to host machine that the sentinel service is installed on. Since GV Live products are all Turnkey, this will always be the Host Machine.
LLDP	<b>Link Layer Discovery Protocol:</b> The Link Layer Discovery Protocol (LLDP) is a vendor-neutral link layer protocol used by network devices for advertising their identity, capabilities, and neighbours on a local area network based on IEEE 802 technology, principally wired Ethernet.
LUT	<b>Look Up Table:</b> LUT is a term used to describe a predetermined configuration for a specific HDR/Colorspace transform.
Multicast IP	Multicast IP is a method of sending Internet Protocol (IP) datagrams to a group of interested receivers in a single transmission. It is the IP-specific form of multicast and is used for streaming media and other network applications. It uses especially reserved multicast address blocks in IPv4 and IPv6.
NMOS	<b>Networked Media Open Specification:</b> is an IP bridge application enabling easy discovery and routing of NMOS supporting systems on a common network.
NTP	<b>Network Time Protocol:</b> is a networking protocol for clock synchronization between computer systems over packet-switched, variable-latency data networks. NTP is intended to synchronize all participating computers to within a few milliseconds of Coordinated Universal Time (UTC).
Orbit	A GV generic remote control application.
Ph.C	Phase Correlation: GV's advanced motion estimation algorithm.

Term	Definition		
PhC Protect Areas	A defined area of the processed picture that is not subjected to the PhC conversion algorithm, but instead will drop back to a linear algorithm. Fixed objects like logos or static text, can be protected from possible breakup that can be caused by the PhC conversion process.		
РТР	<b>Precision Time Protocol:</b> is a protocol used to synchronize clocks throughout a computer network. On a local area network, it achieves clock accuracy in the sub-microsecond range, making it suitable for measurement and control systems.		
RollCall	GV's generic remote control application.		
GV Live Agent	Virtual software instantiation which adopts a product type to perform a particular media processing function.		
GV Live Host	Host software application which manages one or more GV Live agents.		
SDR	<b>Standard Dynamic Range</b> : describes images/rendering/video using a conventional gamma curve and therefore presenting a dynamic range that is considered standard.		
SNMP	<b>Simple Network Management Protocol:</b> Is an Internet Standard Protocol for collecting and organizing information about managed devices on IP networks and for modifying that information to change device behaviour.		
Synchro	An Alchemist Live conversion mode, where conversion is achieved by a process of either repeating, or dropping source frames. No picture building is performed.		
Trap (SNMP)	<b>SNMP Traps</b> are alert messages sent from a remote SNMP enabled device to a central collector.		
UHD	Ultra High Definition: a 4K video format of a specific spacial resolution: 3840x2160		
VPID	Video Payload Identifier: packets to describe the video format, in accordance to SMPTE 352. VPID information is employed by Alchemist Live for the automatic detection of incoming quad-link format: 2SI or Square Division.		
WCG	Wide Color Gamut. ITU-R BT.2020 works together with the HDR functionality to offer a much wider color gamut than the traditional BT.709.		

## 2. Introduction

Alchemist Live IP offers the very best motion compensated frame rate conversion for Live IP media streams.

Supporting **SD**, **HD**, **3G**, **UHD**, **4K** and **HDR** Alchemist Live provides transparent, artefact free conversion enabling seamless global distribution of live media.

Alchemist Live consists of software architecture combined with state of the art COTS hardware to offer GV's industry leading frame rate conversion quality in a 4U turnkey solution.

Alchemist Live offers native support for a single channel of UHD/4K, or three channels of up to 3G resolution, making it the most flexible solution available today. In addition, a suite of HDR processing tools are included enabling real-time conversion of SDR to HDR, HDR to SDR and HDR to other HDR formats.

The control interface for Alchemist Live is GV's generic RCP (RollCall Control Panel) which can be run either from RollCall, or via GV Orbit. RollCall Lite is available as a free download. Alternatively, there is also an HTML5 web service available.

Alchemist Live runs on the GV Live software framework. This software architecture is the common platform for all the products in the GV Live product portfolio. It consists of a Host software application which manages software agents. Agents adopt a product type based on licenses installed.

For Alchemist Live, an agent represents a channel of process. In single channel UHD/4K mode one Agent will be running, and in three channel 3G mode, three Agents will be running.

## 3. System Requirements / Prerequisites

The control surface for Alchemist Live can be either:

- Orbit.
- RollCall RCP (RollCall Control Panel).
- HTML5 web service

#### GV Orbit:

The Orbit Lite control application is available as a free download from the GV Website here:

#### GV Orbit Download

(Follow the links to the Download section. A login will be required. Customers without a login can register via the website)

At the time of writing, the latest GV Orbit Suite version is: V5.3.0 Orbit should be installed on a remote PC either running Windows 7 or Windows 10. RollCall Control Panel is available within the Orbit application.

#### **RollCall RCP:**

RCP (RollCall Control Panel) is a component part of the RollCall application. RollCall should be installed on a remote Windows computer.

At the time of writing, the latest RollCall Suite version is: V4.19.8

RollCall Lite, of which RCP is a component part, is available as a free download from the GV Website here:

#### RollCall Download

Note: there must be an IP network connection between the PC running RCP and the Alchemist Live.

The default IP address on NIC 1 is 192.168.0.1 (see Appendix A for more details).

Note: this manual demonstrates control via RCP. However, Orbit templates are virtually identical to those of RollCall RCP.

**HTML5 Web Service:** added in V2.0.1.14, Alchemist Live may be controlled via an HTML5 Web service. This can be run directly from a Chrome, Mozilla Firefox, etc, running on either Windows, or Linux, or Safari running on an Apple Mac.

See Appendix C below for more details.

### **3.1 Alchemist Live Hardware**



The Alchemist Live Turnkey is based on a generic COTS Server enclosure.

#### IP interface PCIe card



The network card used is a Mellanox MCX516A-CDAT 100GbE Dual Port PCIe.

## 4. GV Live Architecture

The GV Live software consists of a Host, Agent and License Server.

The **GV Live Host** manages the **GV Live Agents**. Typically there would be one host per physical compute instance. From a RollCall perspective, the **GV Live Host** can be considered as a virtual IQ frame.

**GV Live Agents** are spawned by the Host and adopt a product type based on the nominated product license. Each agent has its own unique RollCall address just like a module would in a frame and can therefore be considered as a virtual slot.

The **License Server** is the local daemon that manages the product license(s). The daemon must be present upon start-up for successful use of the product. If for any reason the license disappears there is a 24 hour grace period before the product will stop working.

## 5. Installing RollCall Control Panel (RCP)

The Alchemist Live IP does not have a dedicated control interface, but instead utilizes RCP.

Note - this guide is not a RollCall tutorial.

RCP is the control application for the GV product range and is available to GV customers free of charge. RCP will need to be installed on a remote Windows PC with a network connection to the host machine.

Installation is very easy. Just launch the RollCall Suite Installer and follow the Install Wizard. Note that part way through the install process, it will be asked which RollCall components are to be installed. All components can be install if desired, but from an Alchemist Live IP perspective, the important components are:

- Control Panel
- IP Control Proxy Service



Follow the RollCall installer wizard to complete the process.

Once installed, control of GV Live products is possible using Control Panel. It is recommended to use Control Panel via IP Proxy service.

## 6. Using RCP via IP Proxy Service

### 6.1 Configuring RollCall Proxy

The following procedure will describe how to set up RollCall IP Control Proxy Service on a remote PC, on the same network as the GV Live host machine.

Note: the advantage of using the IP Control Proxy Service is that control of multiple GV products can be managed from a single RollCall Control Panel session, without the need to keep changing the connection IP Address. By using IP Control Proxy Service, Control Panel can be set to **Localhost** and all devices configured in the IP Control Proxy Service will be visible in the connection pane of Control Panel.

In this example, the GV Live application is configured in RollCall Proxy:

1. On the remote PC, where RollCall has been installed, note the RollCall launch icon present on the task bar.

Note: if it is not visible, go to: **Start/All Programs/Snell** and the RollCall Proxy application can be picked from the listed RollCall components.



Launch RollCall Proxy. The **RollCall IP Proxy** window will open:



2. In the Map Connections to Ethernet Chassis or IP Share pane, select: Add.



The Add New Control Client window will appear:

3. Populate the Add New Control Client:

.dd New Control Client	×
Network Name:	
Alchemist Live 1	
Subnet Address (Hex): 2000 eg., 1000, 1200, 1230, 1234	I Enabled
Primary IPShare Address:	IP Port
10.96.	2050
Secondary IPShare Address:	IP Port
	2050
Tertiary IPShare Address:	IP Port
	2050
OK Cancel	

In this example, the Alchemist
Live has been given the Network
Name:

#### Alchemist Live 1

This unique name will enable it to be easily identified should multiple Alchemist Live systems be configured in RollCall Proxy

- The Network Name is usually an intuitive name that will allow easy identification of the device within the Map Connections to Ethernet Chassis or IP Share pane.
- The Subnet address needs to be set. The actual hex value set isn't important, as long as it's unique. If the Alchemist Live is the first item configured into RollCall Proxy, use the hex address 1000. If it's the second, use hex address 2000 (assuming 1000 has already been used). In this example, it's been set to 4000.
- Enter the Primary IPShare Address. This is the IP Address of the Alchemist Live host machine. If this is not known at this point in time, see Section 10.2.2 below.

#### Click OK.

The configured Client will now appear in the Map Connections to Ethernet Chassis or IP Share pane.



Note: items will only appear in the RollCall Control Connections to Ethernet Chassis or IP Share pane, once RollCall Control Panel has been started.

## 6.2 Connecting to Alchemist Live using RCP

1. On the remote PC, open RollCall Control Panel, via the desktop icon:



The RollCall Control Panel will open:



2. Click on the Connection icon:



The Build Network Window will now appear:

Build Network				×	
The ip address can be one of two formats: ipAddress or ipAddress@port If no port is specified, the default port (2050) is used.					
Note that rebuilding the	hetwork will close a	ll curi	ent control conne	ctions.	
🖌 Auto Reconnect			Configure Redu	ndancy	
IP Address: localhost					
Serial Connection					
	OK Canc	el			

The IP Address will default to: **localhost.** This is the required setting. If the IP Address is set to anything else, set it to **localhost.** 

Select OK.

3. Alchemist Mainframe will now appear in the RollCall connection pane:

RollCall Control Panel					
🔒 🗑 🔗 😕 🗐	×	1			
		40	U	-	
localhost					
25 🖄 🖳 🗄 🖷 🚅 💋 -					
Alchemist Live 1					

4. Right click on Alchemist Live 1.

A drop-down list will appear. Select **Expand**.



#### GV Live will now appear:



Alchemist Live IP - User Guide

5. Right click on GV Live. A drop-down list will appear. Select Connect.



The GV Live Host template will now load.

GV Live 4000.01:00 - Live I Agent Configuration Time Sync Configuration Logging Setup System	Host Agents Running : 1 Agents Disabled: 0 Agents Failed : 0 License Server OK
Agent Configuration	4D) 💌
Licenses Type: Alchemist Live EID:	
Available Agents	Selected Agent Product Alchemist Live Status: Running Process ID: 4526 Licenses: 0 / 3 START STOP Allow Reset RESET STOP ALL

6. In the RollCall Connection pane, expand the tree by selecting the small white arrow to the left of the GV Live icon:



Alchemist Live (1) will appear:



7. Double click on the Alchemist Live listing and the Alchemist Live RollCall Template will load:



Both the GV Live and Alchemist Live templates are now loaded and maybe configured.

Confirmation of the loaded templates is shown under the **Connected Units** tab.

It is possible to quickly change between templates, by simply clicking on the required template, in the **Connected Units** tab.

## 7. Using RCP in Orbit

RCP can be run as a component of Orbit.

Note that the full Orbit product is a GV paid-for Automated Control and Monitoring application. For customers who already own Orbit, RCP can be run as a component within Orbit.

Orbit Lite is available as a free download. Orbit Lite also includes RollCall Control Panel and may be used to control Alchemist Live.

#### Procedure

1. Open the Orbit control panel.



2. Select the New Project button:



A new window will open called New Project

🎼 New Proje	ct			?	×
		Project	Туре		
	ustared ewer Project	Connected Multiviewer Project	CBM Project		
		Descri	ption		
		Deta	ails		

3. In the Project type pane, select C&M Project



The New Project Window will update:



4. Enter a name for the new C&M Project. This can be anything the User chooses, but should be something to make future reference easier.



5. Enter a location where the new C&M Project is to be stored. The URL path can be entered manually, or by use of the Browse button:



In this example the location is the root directory C:

Click OK. This will prompt a new window called Setup to appear:

📓 Setup			?	×
	GV Server			
	100 🗘			
	System Test Close A			

This can be simply closed.

6. At the top of Orbit Client, click on Connections



Clicking **Connections** will expose a drop down menu:

🎬 Alche	mist Live 1		
Project	Connections	Tools <u>W</u> indow	/ Control an
I 🛃 I	GV Server	•	1 🐻 📑
	<u>R</u> ollCall		ъ×
<mark>}</mark> ∮	<u>D</u> ensité <u>G</u> VOP		filter

7. In the Connections dropdown menu, select RollCall. This will expose a new dropdown menu:



A new window called **Open Network** will appear:

🎬 Open Network		?	×			
Enab	Enable Network Map Connection					
Direct IP Share Connections						
Enable	IP Address					
	0.0.0.0@2050					
	0.0.0.0@2050					
	0.0.0.0@2050					
	0.0.0.0@2050					
	0.0.0@2050					
	n n n næ2050					
	K Cancel					

8. In the Open Network window, check the Enable Network Map Connection checkbox.

This will make the Primary address field active. Enter the IP Address of the Alchemist Live that is to be controlled:



9. In the left hand pane of the Orbit Client a RollCall link will appear:



10. Click on the arrow adjacent to RollCall to expand the RollCall Tree



The GV Live host Machine will appear:

Double click on the GV Host. The GV Live Host template will now open:



11. Click on the arrow adjacent to the GV Live to expand the tree.

This will expose the Alchemist Live



Double click on the Alchemist Live to open the template.



## 8. GV Live Template

## 8.1 Agent Configuration

GV Live 4000:01:00 - Live Ho	ost
Agent Configuration Time Sync Configuration SNMP Logging Setup	Agents Running : 1 Agents Disabled: 0 Agents Failed : 0 License Server OK
┌ Agent Configuration ────	
1x Alchemist Live (up to UHD	)) 🗸
Licenses Type: Alchemist Live EID: c74926c5-900d-43	<ul> <li>✓ Available: 0</li> <li>58 Total: 3</li> </ul>
- Available Agents	Selected Agent Product Alchemist Live Status: Running Process ID: 2570 Licenses: 0 / 3  START STOP Allow Reset RESET

Note: that the Alchemist Live Agent should start automatically, and the Unit Status pane will show an Agent running:



If the Agent isn't running, it can be started by selecting the relevant Agent in the **Available Agents** pane, and pressing the **START** button.

If multiple Agents have been configured, all Agents can be started by pressing the **START ALL** button.

### 8.1.1 Agent Configuration



#### Agent Configuration

In the Agent Configuration pane, the Alchemist Live maybe configured to be:

- A single channel Alchemist Live supporting up to 4K resolution conversion.
- A three channel Alchemist Live supporting up to 3G (no 4K).

Configuration is via a drop-down menu:

System
Agent Configuration
1x Alchemist Live (up to UHD)
Select
1x Alchemist Live (up to UHD)
3x Alchemist Live (up to 1080p)
r Available Agents
:01:01 - Alchemist Live Selected Agent

When configured as a single Alchemist Live supporting 4K conversion:



Note that only a single Alchemist Live is available in the connection pane.

When configured as 3x Alchemist Live supporting up to 3G conversion:

RollCall Control Panel      File Edit View RollCall Lock & Feel Window	Halo	
🔩 🛯 🛢 🔑 🖉 🗊	🔏 🕸 🖸 🚯 📅 🐯 🖛 🔿 🗃 📰 📰 🖉 🥕	GV Live (
localhost	CV Live 4000.01.00 - Live Host	
Addemist Live VR	April Configuration Inter System Configuration State Configuration Confi	
	Applied Configuration           Tableword Like (light 10 HoC))           Licenses           Digits - Kenner (Like)           Digits - Configuration           Digits - Configuration           Table - Configuration	
	Available Agents Selected Agent 1.0101 - Alchemist Live Related Agent Mathematical Agent	

3x Alchemist Live Agents are now available in the connection pane.

Note: to reconfigure the Alchemist Live as a single 4K Agent, or as a 3x 1080p (3G) Agents, the Alchemist Live Agent(s) must first be stopped (see part 8.1.1 below).

#### Licenses

Licensing details are displayed within the Available Agents pane.

		License :	Server UK	
	emist Live (up to 1080p)			
Licen: Type:	ses Alchemist Live		Available:	
EID:			Total:	
1		tron& hotrol		_

An Alchemist Live installation will have a total of 3 licenses.

- 3 licenses are required for a single conversion process that includes a 4K resolution (either input or output).
- 3 licenses allow up to 3 independent conversion processes, each up to 1080p resolution (conversions from, or to 4K, will be prohibited).

### 8.1.2 Available Agents

In the Available Agents pane, confirmation that the Alchemist Live Agent is running will be displayed:

:01:01 - Alchemist Live :01:02 - Alchemist Live :01:03 - Alchemist Live	Selected Agent Product: Alchemist Live Status: Running Process ID: 5219 Licenses: 0 / 3	
	START STOP	START ALL

Note: Alchemist Live Agents can be manually stopped and started from within the Configured Agents pane.

## 8.2 Time Sync Configuration

GV Live 8000:01:00 - Live Host	
Agent Configuration Time Sync Configuration SNMP NMOS Logging Warning! Changes can not be made to the Time Sync Configu	Running : 1 Disabled: 0 Failed : 0 Server OK
System Clock Tuesday 13 April 2021, 14:29:48 BST (UTC+01:00 Set Time and Date Time (24h): 00 00 00 1  Jan  2018	Set Time Zone Europe
Time Sync Mode O PTP Multicast O PTP Unicast O NTP O Freerun NTP Server 1 NTP Server 2 Status: Disab	P S P S Ied.
PTP Configuration ens11f0 PTP Domain: 127 ens11f1 Delay Req Freq: 1s Announce Freq: 2s	P S APPLY P P
PTP Status Interface: ens11f0 Status: OK: PTP LC	CKED Show Details
	lock Offset: - eq Adjustment: - ath Delay: -

Although Alchemist Live offers several locking modes, it is highly recommended to lock Alchemist Live to a PTP Server, to ensure optimal performance.

Note: to make changes to the Time Sync Configuration menu, the Agent must be in a stopped state.

### 8.2.1 System Clock

In the System Clock pane, the Set Time and Date menu will only be active if the Time Sync Mode is set to Freerun.

Setup System Clock Wednesday 4 March 2020, 12:33:18 GMT (UTC+00:0	00)	
Set Time and Date Time (24h): 12 :33 :00	Set Time Zone	~
4 • Mar • 2020 SET	London	-
Time Sync Mode NTP Configuration	on	D

The time and date can be manually entered. Time to the nearest second can be configured and synchronised to an external clock by pressing **SET** at a precise moment.

Note: after each set of digits is entered, press 'Return' on the keyboard to make the setting permanent.

When **NTP** mode is selected, the time stamp will referenced to an external NTP server and so there is no requirement to set the system time.

When **PTP** mode is selected, the time stamp will referenced to an external PTP server and so there is no requirement to set the system time.



#### Set Time Zone

The relevant Time Zone can be set using the drop-down menu.

### 8.2.2 Time Sync Mode



Four Time Sync modes are offered:

The Time Sync Mode can be set to be either:

- PTP Multicast
- PTP Unicast
- NTP
- Freerun

#### **PTP Multicast Mode**



This setting will allow the Alchemist Live to be locked to a Multicast PTP Server. The details of the specific PTP server should be configured in the PTP Configuration field (see section 8.2.4 below).

#### **PTP Unicast Mode**



This setting will allow the Alchemist Live to be locked to a Unicast PTP Server. The details of the specific PTP server should be configured in the PTP Configuration field (see section 8.2.4 below).

#### **NTP Mode**

_ Time Sync Mode ————	NTP Cor
O PTP Multicast	NTP Se
O PTP Unicast	NTP Se
O Freerun	Status:
<u> </u>	
r PTP Configuration	

This setting will allow the Alchemist Live to be locked to a NTP Server. The details of the specific NTP server should be configured in the **NTP Configuration** field (see section 8.2.3 below).

#### Freerun Mode

Time Sync Mode ————	_ NTP Cor
O PTP Multicast	NTP Se
O PTP Unicast O NTP	NTP Se
O Freerun	Status:

This setting will allow the Alchemist Live to be locked to the System Clock (described in section 8.2.1 above).

### 8.2.3 NTP Configuration

2018	5E1	London	•	
	NTP Configuration NTP Server 1: NTP Server 2: Status: Disabled.	16.31	P S P S	

Here the NTP timestamp source can be defined. The IP Address of the NTP server can be entered and set by pressing 'S'.

An alternative NTP Server can also be defined. Should something happen the first NTP Server making it unavailable, the alternative NTP server will act as backup.

### 8.2.4 PTP Configuration

PTP Configuration	PTP Domain: Delay Req Freq: Announce Freq:	127 1s ▼ 2s ▼	P S P P	APPLY
PTP Status	Status: OK	PTP LOCKE	,	Show Details

Here the details of the PTP Server are configured.

#### ens11f0 and ens11f1



The Interfaces **ens11f0** and **ens11f1** are used to communicate with PTP Clock Services on the specified domain.

#### **PTP Domain**

		P	S	

This control allow the User to configure the required network domain that the PTP Clock services are running on.

#### **Delay Req Freq**

		1s 🔻	P	
		0.125s 0.25s	Р	
		0.5s		
		1s		
Interface: ens11f0	Status: OK: F	2s 4s		Show Details
		8s 16s		
			ustment: -	

The Delay Request Frequency control is a component of the communication between the PTP Slave and Master. Adjustment maybe necessary to compensate for Network tolerance.

Any changes will only be actioned when pressing: Apply.

#### Announce Freq

	127 1s * 2s *	P P P	
	0.125s 0.25s 0.5s 1s		Show Details
	25 45 85 165		

The **Announce Freq**, as the name suggest, defines the frequency that the PTP Server announces itself to the Alchemist Live.

### 8.2.5 PTP Status

	Announce Freq: 2s 💌 P	
PTP Status Interface: ens11f0	Status: OK: PTP LOCKED	Show Details
Master Offset: -		

The PTP Status pane reports the state of the PTP synchronisation.

The Show Details control, when enabled, will cause the Details pane to become active:

D Status			
iterface: ens1	110 Status: OK: PT	TP LOCKED	✓ Show Details
GM Present: GM Identity:	true (SLAVE) 080011.FFFE.22F5AE	Clock Offset: Freq Adjustment:	58 ns 6983 ppb

## 8.3 SNMP

GV Live 7000:01:0	0 - Live Host			
Agent Configuration Time Sync Configurat SNMP NMOS Logging	ion III			
Read / Write Port — 161	P S Chanı restar	ges require a t to take effect	OID Count 947	Trap Send — Trap Send —
MIB2 System Group				
System Name:	System Name			
System Contact:	www.grassvalley.co	m		
System Location.	Location Name			
Community Names	and the			
Read Community:	public			
Trap Community:	public			P S
 _ Trap Receivers ——				
Trap: Enable:	IP Address:		Port:	
1	0.0.0.0	P S	162	P S
2 .	0.0.0.0	P S	162	P S
3 🗖 .	0.0.0.0	P S	162	P S
4 .	0.0.0.0	P S	162	P S
5 🗖 .	0.0.0.0	P S	162	P S
6 .	0.0.0.0	P S	162	P S
7 🗖.	0.0.0.0	P S	162	P S
8 🗖.	0.0.0.0	P S	162	PS

Alchemist Live supports SNMP version v2c.

The SNMP feature allows the Alchemist Live system to be controlled via a universal SNMP Control Application.

Alchemist Live can also report its status to the SNMP Application, via SNMP traps.

### 8.3.1 Read/Write Port



The default port for SNMP is: 161

If required, the port number may be manually set by manually typing it in and selecting the **S** button. Pressing the **P** button will return the port number to the default value.

### 8.3.2 OID Count



OID: Object Identifier.

The OID Count field reports the total number of active OID's configured. Note that the count will vary depending upon the Alchemist Live configuration.

### 8.3.3 Trap Send



The sending of SNMP Traps can be enabled or disabled using the **Send Trap** control.

### 8.3.4 MIB2 System Group

161	S	752	✓ Enable
F MIB2 System Group			
System Name:	System Name		P S
System Contact:	www.grassvalley.com		P S
System Location:	Location Name		P S
Community Names			
Read Community:			
Write Community	nrivate		PS

User information used to easily identify a controlled device, in this case Alchemist Live, from the SNMP control application.
# 8.3.5 Community Names

System Location.	Location Nume		
Community Names			
Read Community:	public		P S
Write Community:	private		P S
Trap Community:	public		P S
Trap Receivers			
Trap: Enable:			
	0.0.0.0	D 492	

SNMP mandates that the SNMP agents should accept request messages only if the community string in the message matches its community name. Therefore, the management application should always communicate with the agents along with the associated community name.

The default SNMP community names are "public" for read-only (GET) operations and "private" for read-write (SET) operations. The management applications should have provision to include the community names in its request messages.

# 8.3.6 Trap Receivers

110000	minianity.	basus						
Write Cor								
Trap Con								
_ Trap Rece	eivers —							
Trap:	Enable:	IP Address:			Port:			
1		0.0.0	Р	S	162	Р	S	
2	□.	0.0.0.0	Р	S	162	Р	S	
3	□.	0.0.0.0	Р	S	162	Р	S	
4	□.	0.0.0	Р	S	162	Р	S	
5	<b>.</b>	0.0.0.0	Р	S	162	Р	S	
6	□.	0.0.0.0	Р	S	162	Р	S	
7	□.	0.0.0.0	Р	S	162	Р	S	
8	□.	0.0.0.0	Р	S	162	Р	S	

A Trap Receiver may be defined by its IP Address. Up to 8 receivers can be defined. Specific Ports can be defined for each SNMP receiver.

In this example a single receiver has been configured:

Trap Cor	nmunity:	public				P	S	
[ Trap Rec	eivers —							
Trap:	Enable:	IP Address:			Port:			
		10.54.25	Р	S	162	Р	S	
	Π.	0.0.0.0	Р	S	162	Р	S	
		0.0.0.0	Р	S	162	Р	S	
	□.	0.0.0.0	Р	S	162	Р	S	
	Π.	0.0.0.0	Р	S	162	Р	S	
	Π.	0.0.0.0	Р	S	162	Р	S	
	Π.	0.0.0.0	P	S	162	P	S	
	□.	0.0.0.0	Р	S	162	Р	S	

# 8.4 NMOS

GV Live 7000:01:00 -	Live Host		
SNMP NMOS Logging Logging - Network Setup			
Update to New Settings After changes to any o NMOS service must be	the settings on this p restarted by clicking	page the I UPDATE	UPDATE
Label			
GV Live			
NMOS Registry Mode — Mode: Auto Interface: 172.19.	▼ :eno1 ▼	Static Registry Details – IP Address: Reg. Port: 3210 Query Port: 3211	P S P S P S
Label Patterns			
{dev} Input {spig}			PS
Input Variables			S
Output Pattern {dev} Output:{spig}			PS
Output Variables			S
Кеу	The pattern is freefo which are substitute Variables are enclos	rm text which can include variab Id dynamically sed with braces e.g. {var}	les
Auto-generated:	{dev} Device la {spig} Spigot n {flow} Flow nur {flowalt} Flow nur restarts {fmt} Flow for	abel umber (offset by {s_off} or {r_off} mber mber (alternative formatting; from 1 for each flow format type) mat type	)
Optional variables:	(uses or output2           (sf_v2)         Output2           (sf_v2)         Output2           (sf_a1)         Output2           (sf_a2)         Output2           (sf_a1)         Output2           (sf_a1)         Output2           (sf_a1)         Input41           (ff_a1)         Input21           (ff_a2)         Input21           (ff_a6)         Input21           (ff_off)         Output1           (s_off)         Output1           (s_off)         Output1           (s_pad)         Output1           (r_pad)         Input nu           leading1         leading1	ne or (s) – (y (s) – 4 (s) – (a) (L) – (y (c) – (d)	-a(t(_0)) It VideoAlt) Ult 'AudioAlt) Ult 'AudioAlt) Ult 'Data) (deo) t 'AudioAlt) t 'AudioAlt) t 'Data') umbers with
e.g.	Output pattern: {dev} Output variables: s_ First output generate	Output{spig}_{flowalt}({fmt}) off=8;sf_v2=V';sf_a1='A';sf_d='D es: AL-1 Output:9_1 (V) AL-1 Output:9_1 (A) AL-1 Output:9_1 (D)	';s_pad=1

With the release of Version 3 software, Alchemist Live now supports NMOS.

Currently Alchemist Live supports IS04 and IS05 parts of the standard.

- IS04 Discovery and Registration
- IS05 Connection Management

The NMOS feature allows for discovery of devices/systems with their capabilities, register these devices/systems (IS-04) and from that the connectivity of devices/systems (IS-05).

The **Pattern Labelling** of the Alchemist Live Host Agent may be configured to enable easy identification, within the NMOS Register. This may be particular important if multiple Alchemist Live systems are discovered by the NMOS Register.

The Pattern Labelling of the Alchemist Live Host Agent will be migrated to the Alchemist Live channel Agents. This means that in circumstances where the Alchemist Live is configured to be a 3x channel processor, it is not required to configure all three Agents, with respect to NMOS, separately.

At the NMOS HOST level, the following can be performed:

- Change the default 'GV Live' LABEL so the system can be more easily identified operationally, particularly if there are multiple Alchemist Live systems. If there is only one system then the default can be used.
- Set how to communicate with the NMOS Registry Automatic or Static. If Automatic is selected then Alchemist
  Live will try and communicate with a Registry using a selected network interface, or it is possible to manually
  set specifics to the registry of choice to which it will communicate via the specified network interface.
- Set LABEL PATTERNS for the AGENTS this acts as a base setting and are migrated to all AGENTS.

## 8.4.1 Update to new settings



If any changes are made to NMOS settings, the NMOS Service will require restarting, using the **UPDATE** button.

## 8.4.2 Label



The label defines how the Alchemist Live IP will appear in the NMOS register.

The default label is:

GV Live

Should there be multiple Alchemist Live systems available, it is probably desirable to give each system a unique label.

In the example below, the Label has be changed:

NMOS Service must be restarted	I by clicking UPDATE	
Label		
GV Live Host 1	PS	
<u> </u>		
NMOS Registry Mode		
Mode: Auto	IP Address	PS

# 8.4.3 NMOS Registry Mode

NMOS Regis Mode: Interface:	ry Mode Auto 172.19.: : eno1	 Static Registry Detail IP Address: Reg. Port: 3210 Query Port: 3211
Label Pattern	s	

Mode

GV LIVe		P	S	
- NMOS Regist Mode:	y Mode Auto	<b>~</b>		
Interface:	Auto Static			

The Mode may be set to either:

Auto:

In the Auto mode, Alchemist Live will communicate and connect with any NMOS Register on the local network.

Static:

In Static mode, Alchemist Live will communicate and connect to the defined NMOS Register. This mode should be used when multiple NMOS Registers are available on the associated network and it is not desired for the Alchemist Live to appear in all of them.

### Interface

NMOS Regis	stry Mode			
	Auto		IP Address:	PS
Interface:	172.19. : eno1	-		P S
	172.19. : eno1			
	172.19. : eno2			
Input Patte				
/dev/Unput	(spin)			

The Interface menu allows the User to configure the NMOS Interface adaptor.

# 8.4.4 Static Registry Details

lode:	Static	IP Address:	172 19.	Р	S
nterface:	172.19 eno1	Reg. Port.	3210	Р	S
		Query Port	3211	Р	S

If the Mode is set to Static, the Static Registry Details field should be used to define the NMOS Registry.

The **Static** mode can be employed in circumstances where there are more than one NMOS Registry on the defined network and it may be desired that the Alchemist Live appears only on a particular NMOS Registry.

The desired NMOS Registry can be configured in the **Static Registry Details** field.

# 8.4.5 Label Patterns

Label Patterns						
Input Pattern						
{dev} Input{spig}						P
Input Variables						
Output Pattern						
{dev} Output:{spig}						P
Output Variables						
Key						
itey	The patter	n is freeform te	ext which can inc	lude varial	oles	
	Which are	substituted dyn	namically with braces e.g. (	warl		
Auto concrete di	(dev)	Device label	viui biaces e.y. į	varj		
Auto-generated.	{aev} {spia}	Spigot numbe	er (offset by {s_c	off}or{roff	73)	
	{flow}	Flow number				
	{flowalt}	Flow number	(alternative form	natting;		
	{fmt}	Flow format ty	/pe	onnactype	)	
		(uses one of	{sf_v1}{sf_a}{sf_	_d}(rf_v1 {{r	f_a}{rf_d}	
Optional variables:	{st_v1}	Output 2022-0	6 format descrip	tion (defau	ilt Video')	AH2
	(si_v2) (sf a1)	Output 2110-2	30 format descri	ption (defa	ault 'Audio	0
	{sf_a2}	Output 2110-	31 format descri	ption (defa	ult 'Audio	Ált)
	{sf_d}	Output 2110-	40 format descri	ption (defa	ault 'Data')	
	{rf_v1}	Input video fo	rmat description	(default V	ideo')	
	{rf_a1}	Input 2110-30	) format descrip	tion (defau	It 'Audio')	140
	{rf_d}	Input 2110-31	) format descrip	tion (defau	it 'Data')	n.)
	{s_off}	Output index	offset (default 0)			
	{r_off}	Input index of	fset (default 0)			
	{s_pad}	Output numbe	er padding to pr	efix small r	numbers	with
	(r. nod)	leading 0's (d	lefault 2) i nadding to prof	iv emall nu	mbore w	ith
	fi_bant	leading 0's (d	lefault 2)	ix siniali nu		
e.g.	Output par	ttern: {dev} Outp	out:{spig}_{flowa	ilt}({fmt})		
	Output var	iables: s_off=8	sf_v2=V;sf_a1:	='A';sf_d='E	D';s_pad=	
	- inst outpt	n generates.	AL-1 Outputs	- (v)		
			AL-1 OUTDUTY	1 (A)		

The configuration of the NMOS menu at the GV Live Host level will act as base settings for each Alchemist Live Agent. Settings within the Host Agent will migrate down to the channel Agents.

### Input Pattern



This allows the User to define how the Input Connector will appear in the NMOS Registry.

The parameters should be entered in terms defined by the Key (see below).

#### Input Variables

{dev} Input{spig}	PS
Input Variables	8
∫ Coutput Pattern	
(dov) Output (opia)	

Allows optional variables to be configured, so adding more detail to the Alchemist Live within the NMOS Registry.

The parameters should be entered in terms defined by the **Optional Variables** in the Key.

#### **Output Pattern**



This allows the User to define how the Output will appear in the NMOS Registry.

The parameters should be entered in terms defined by the Key.

### **Output Variable**

{dev} Output:{spig}	PS
Output Variables	
	S

Allows optional variables to be configured, so adding more detail to the Alchemist Live within the NMOS Registry.

The parameters should be entered in terms defined by the Optional Variables in the Key.

#### Key

Key	The patter which are Variables	n is freeform text which can include variables substituted dynamically are enclosed with braces e.g. {var}	
Auto-generated:	{dev} {spig} {flow} {flowalt} {fmt}	Device label Spigot number (offset by (s_off) or (r_off)) Flow number Flow number flow formating, restarts from 1 for each flow formatitype) Flow format type (uses one of (s'11 y(s_1-2)(sf_0)(r_11)(r_0)(r_0))	
Optional variables:	<pre>{sf_v1} {sf_v2} {sf_a1} {sf_a2} {sf_d} {ff_v1} {rf_a1, {rf_a2} {rf_o1} {rf_o1} {rf_on} {r_onf} {r_ond} {r_pad}</pre>	Output 2022-6 format description (default Video) Output 2110-20 format description (default Video) Output 2110-30 format description (default Video) Output 2110-31 format description (default Video) Output 2110-40 format description (default Video) Input 2110-30 format description (default Video) Input 2110-30 format description (default Audio) Input 2110-40 format description (default Audio) Input functionest (default 0) Output number padding to prefix small numbers with Ieading 0's (default 2)	
e.g.	Output pa Output va First outpi	tern: {dev} Output{spig}_(flowalt}{(fmt)) iables: s_off=8;sf_v2=v7;sf_a1=A';sf_d=D';s_pad=1 ut generates: AL-1 Output9_1 (V) AL-1 Output9_1 (A) AL-1 Output9_1 (D)	

The Key lists the terms that can be used to define the Alchemist Live, in the NMOS Register.

Note: A Label Pattern example is shown in Appendix F below.

# 8.5 Logging

GV Live 7000:01:00 - Live I	Host	
SNMP NMOS Logging Logging - Network Setup	Unit Status Agents Running : Agents Disabled: Agents Failed : License Server OK	
Logging Agent Status Log Enable Num Agents Running Num Agents Falled Num Agents Disabled Agents Running	Log Field NUM_RUNNING= NUM_FAILED= NUM_DISABLED= AGENTS_RUNNING=	Log Value 1 0 0 1
Logging License Log Enable I License Server Host License Server Port	Log Field LICENSE_SERVER_HOST= LICENSE_SERVER_PORT=	Log Value 172.19.217.147 5093
Logging Time Sync Log Enable I NTP Status I PTP Interface I PTP Status	Log Field NTP_STATUS= PTP_INTERFACE= PTP_STATUS=	Log Value Disabled ens11f0 PTP Disabled
Logging Hardware Log Enable PSU1 Status Fan1 Status Fan2 Status Fan3 Status Fan3 Status Fan5 Status Fan6 Status Fan6 Status	Log Field PSU1_STATUS= PSU2_STATUS= FAN1_STATUS= FAN2_STATUS= FAN3_STATUS= FAN4_STATUS= FAN5_STATUS= FAN6_STATUS= FAN6_STATUS= FAN7_STATUS= FAN7_STATUS=	Log Value WARN: Not Fitted WARN: Not Fitted - - - - - -
<ul> <li>✓ Fan8 Status</li> <li>✓ Fan9 Status</li> <li>✓ Fan10 Status</li> </ul>	FAN9_STATUS= FAN9_STATUS= FAN10_STATUS=	· ·
Logging Misc Log Enable Log Server Name Software Version	Log Field LOGSERVER_NAME= SOFTWARE_VERSION=	Log Value LogServer151 3.0.0.1

Logging is reported to RollCall log server and also is used for SNMP traps

In the **Logging** window, Log fields maybe be disabled and enabled. Log fields are sent to the defined Log Server (see 8.7.5 below).

The **default** configuration is everything **enabled**.

# 8.6 Logging - Network

GV Live 0000:01:00 -	Live Host	
Logging Logging - Network Setup System About	Agents Running : 1 Agents Disabled : 0 Agents Failed : 0 License Server OK	
Logging Network Interfa Log Enable I Iface Name I Iface Speed I P Address	ice 1 Log Field LAN_PORT_1_NAME= LAN_PORT_1_SPEED= LAN_PORT_1_IPADDRESS=	Log Value eno1 - 10.96.160.167
<ul> <li>MAC Address</li> <li>Link State</li> <li>Switch Name</li> <li>Switch Chassis ID</li> <li>Switch Port ID</li> <li>Switch Port VLAN</li> </ul>	LAN_PORT_1_MACADDRESS= LAN_PORT_1_LINK_STATE= LAN_PORT_1_SWITCH_NAME= LAN_PORT_1_SWITCH_CHASSIS_ID= LAN_PORT_1_SWITCH_PORT_ID= LAN_PORT_1_SWITCH_PORT_VLAN=	AC:1F:6B:99:9D:7A WARN: DOWN - - -
Logging Network Interfa	ice 2	
✓ Iface Name ✓ Iface Speed ✓ IP Address	LOG FIEID LAN_PORT_2_NAME= LAN_PORT_2_SPEED= LAN_PORT_2_IPADDRESS=	eno2 100 Mbps 10.96.96.26
<ul> <li>MAC Address</li> <li>Link State</li> <li>Switch Name</li> </ul>	LAN_PORT_2_MACADDRESS= LAN_PORT_2_LINK_STATE= LAN_PORT_2_SWITCH_NAME=	AC:1F:6B:99:9D:7B OK: RUNNING -
Switch Chassis ID Switch Port ID Switch Port VLAN	LAN_PORT_2_SWITCH_CHASSIS_ID= LAN_PORT_2_SWITCH_PORT_ID= LAN_PORT_2_SWITCH_PORT_VLAN=	- - -
Logging Network Interfa	log Field	L on Value
<ul> <li>✓ Iface Name</li> <li>✓ Iface Speed</li> <li>✓ IP Address</li> </ul>	LAN_PORT_3_NAME= LAN_PORT_3_SPEED= LAN_PORT_3_IPADDRESS=	-
<ul> <li>✓ MAC Address</li> <li>✓ Link State</li> <li>✓ Switch Name</li> <li>✓ Switch Chassis ID</li> </ul>	LAN_PORT_3_MACADDRESS= LAN_PORT_3_LINK_STATE= LAN_PORT_3_SWITCH_NAME= LAN_PORT_3_SWITCH_CHASSIS_ID=	- WARN: DOWN - -
Switch Port ID	LAN_PORT_3_SWITCH_PORT_ID= LAN_PORT_3_SWITCH_PORT_VLAN=	-
Logging Network Interfa	log Field	L og Value
<ul> <li>Iface Name</li> <li>Iface Speed</li> <li>IP Address</li> <li>MAC Address</li> </ul>	LAN_PORT_4_NAME= LAN_PORT_4_SPEED= LAN_PORT_4_IPADDRESS= LAN_PORT_4_MACADDRESS=	
Link State     Switch Name     Switch Chassis ID     Switch Port ID     Switch Port VLAN	LAN_PORT_4_LINK_STATE= LAN_PORT_4_SWITCH_NAME= LAN_PORT_4_SWITCH_CHASSIS_ID= LAN_PORT_4_SWITCH_PORT_ID= LAN_PORT_4_SWITCH_PORT_VLAN=	WARN: DOWN

In the **Logging - Network** window, Log fields maybe be disabled and enabled. Log fields are sent to the defined Log Server (see 8.7.5 below).

The **default** configuration is everything **enabled**.

# 8.7 Setup

🖻 GV Live 7000:01:00 - Live Host	
Logging Logging - Network <b>Setup</b> System About	Unit Status Agents Running : 1 Agents Disabled: 0 Agents Failed : 0 License Server OK
Rollcall Port 2050 P S Existing connections will persist	Unit Name GV Live P S
DDS for IP Routing DDS Domain: 101 P DDS IP Interfaces 172.19: :eno1 192.168 :ens11f0	S Changes require a restart to take effect 2 172.19. : eno2 192.168 : ens11f1
License Server Host 172.19. License Server Lock Code:	P S Port 5093 P S 16QBKYBHCPZMGGV gents that are already running
O Logging Disabled O Named LogServer O Any LogServer	New Named Log Server GVLiveLogServer P S
	Current Log Server GVLiveLogServer

# 8.7.1 RollCall Port



The default RollCall Port is 2050.

In normal circumstances the **RollCall Port** is left in its default setting. However, an alternative RollCall port can be configure here, if required.

## 8.7.2 Unit Name

▼ Licens	e Server OK	
	Unit Name	P S
intil closed	<u> </u>	
S Cr	ianges require a res	tart to take effect

This is the identifying name of the GV Live product/unit/application. If several GV Live products are running, it may be desirable to give them individual names.

To edit the unit name, simply type the desired name in the box and press 'S' to save.

▼ Licen	se Server OK	
until closed	GV Live - Football 1	P S
e s c	changes require a restart to t	take effect

Pressing the 'P' button will return the name to its default setting: GV Live

# 8.7.3 DDS for IP Routing

DDS for IP Routing	
DDS Domain: 101 P S	Changes require a restart to take effect
<b>172.19.</b> : eno1 192.168. : ens11f0	✓ 172.19. : eno2 ☐ 192.168 : ens11f1
Host	Port

Here the relevant DDS Domain can be defined.

In this example the DDS Domain has been defined to be 101.

### **DDS IP Interfaces**

Here the relevant Interface can be selected for DDS traffic.

DDS traffic cannot be transmitted via the media interfaces ens11f0 and ens11f1, hence these are greyed out and cannot be selected.

# 8.7.4 License Server



This field details the relevant License Server of the Alchemist Live. In normal circumstances the License Server runs on the Product/Turnkey host machine, hence the **Host** is defined as **Localhost**.

The default Port is 5093.

These items are fixed and cannot be changed.

**License Server Lock Code:** The Alchemist Live license is locked to the hardware that the License Server is running on. In normal circumstances the License Server runs on the Product/Turnkey host machine, hence the Lock Code relates to Alchemist Live host machine.

## 8.7.5 Log Server



Here the desired Log Server can be defined.

# 8.8 System

💿 GV Live Val. 8000:01:00 - Live Host	
Logging Unit Ste Logging - Network Agent Setup III Agent System III Licen	
Detected Hardware CPU: 32 Logical Cores, 2 Processors GPU: 3x Display Adapter (02:00.0, 82:00.0, 83:00 SDI: No Devices Detected RTP: 2x High-Speed Ethernet Port (01:00.0, 01:0	0.0) 10.1) Version 3.1.0.8 Hostname E16953527701377
Power Restart	Start Time 12:14:39 UTC 22.06.21
Network Interfaces Select Configuratio Configuration Existing (Stored) Static IP Address: - Subnet Mask: - Default Gateway: - Mode: - State: -	n changes require a restart to take effect New S S S APPLY
⊢ Current Status IP Address: - Subnet Mask: -	MAC Address: - Link Status: -
Switch Information (LLDP) Name: - Chassis ID: -	Port ID: - Port VLAN: -
Hardware Monitoring PSU Monitor PSU 1 Name: PWS-2K04A-1R SN: P2K4AC051ST2650 Status: OK Present	PSU 2 Name: PWS-2K04A-1R SNN: P2K4ACG51ST2647 Status: OK Present
Fan Monitor Fan 1: OK: FAN1 : 3000 RPM Fan 2: OK: FAN2 : 1600 RPM Fan 3: OK: FAN3 : 4000 RPM Fan 4: OK: FAN4 : 4000 RPM Fan 5: OK: FAN5 : 1500 RPM	Fan 6:         OK: FAN6 : 1500 RPM           Fan 7:         OK: FANA : 4500 RPM           Fan 8:         OK: FANB : 3300 RPM           Fan 9:         OK: FANC : 3600 RPM           Fan 10:         OK: FAND : 3500 RPM
GPU Monitor Show GPU Stats GPU Device 1 Temp: - Fan: - Fan: -	GPU Driver Version: 460.80 . [2]. [2]           GPU Device 3           GPU Device 4           Temp: -           Fan: -

# 8.8.1 Detected Hardware



Displays the detected hardware of the host machine.

Note: Alchemist Live IP does not employ SDI Interfaces, hence No Devices Detected will be displayed.

## 8.8.2 Version



Reports the software version of the Alchemist Live.

## 8.8.3 Hostname



The host name of an Alchemist Live displays the Serial Number of the Server Enclosure.

## 8.8.4 Power

RTP: 2x High-Speed Et	iernet Port (01:00.0, 01:00.1)	E18
Power	Restart	— Stari 10:3
Network Interfaces	<ul> <li>Configuration changes require a</li> </ul>	restart to ta

The **Shutdown** and **Restart** controls can be used to remotely either power-down, or power-cycle, the Alchemist Live Host Machine.

Note: that if the Host machine is powered-down, the RollCall Template will close and it will not be possible to restart the system via RollCall.

Remote power-up is possible via the IPMI port (see Section 11, below).

# 8.8.5 Start Time



Reports the start time that the Alchemist Live system was last started up.

## 8.8.6 Network Interfaces



The Alchemist Live Host Machine has two ports: eno1 and eno2. These are used for general network coms.

The other two ports: **ens1f0** and **ens1f1**, are used to interface the video and audio streams, to and from, the Alchemist Live Host Machine. Each NIC can be selected from the drop-down menu:

Shutdown	R		
letwork Interfaces —			
eno1	<ul> <li>Configura</li> </ul>		
eno1			
eno2		172.19.2	
	255.255.254.0	255.255.254.0	
		172.19.2	
		Static	

By definition, NIC eno1 must be configured with a Static IP. It cannot be configured to be DHCP.

All other NICs may be configured to be either Static, or DHCP.

Once the NIC has been selected, the current connection details, if configured, will be displayed in the **Existing (Stored)** field.

If a new connection is to be configured, the details should be entered in the New field:

no1	<ul> <li>Configura</li> </ul>	ation changes require a restart	to take effect
Configuration Existing (Stored) Static IP Address: Subnet Mask: Default Gateway: Mode: State:	172.19.2 255.255.254.0 172.19.2 Static ENABLED	New 172.19.2 255.255.254.0 172.19.2 Static * Enabled *	S S S
State:	ENABLED	Enabled 👻	APPLY

Select Apply to make the changes permanent.

The changes to the Network configuration will only be adopted once the Agent is restarted.

#### **Current Status**

Current Status			
IP Address:	10.96	MAC Address:	0C:C4:7A:E6:4C:A4
Subnet Mask:	255.255.254.0	Link Status:	RUNNING
Switch Informat	ion (LLDP)		
Name:	Leaf2	Port ID:	ifname mgmt0

This field will display the status of the current NIC (as selected above).

Conformation of the current IP Address, the MAC Address and Link Status are displayed in the Current Status field.

## Switch Information (LLDP)

Subnet Mask:			
Switch Informatic	on (LLDP)	Port ID:	ifname momt0
Chassis ID:	mac f4:0f:1b:6f:a7:c8	Port VLAN:	0

LLDP enables the reporting of upstream network connections if the neighbours are LLDP enabled.

The details of the network connection are reported back to the Alchemist Live.

This could include the switch Port ID of the Network Switch Alchemist Live is connected to, and if capable, the associated VLAN Port.

Note: LLDP is an acronym of: Link Layer Discovery Protocol (see Table 1: Table of Terminology section 1 above).

# 8.8.7 Hardware Monitoring

IF Address.	
lardware Monitoring	
PSUMonitor	
- PSI 1	
Name/Model: PWS-2K04A-1R	Name/Model: PWS-2K04A-1R
Serial Number P2K4ACG51	Serial Number: P2K4ACG51
Status: OK: Present	Status: OK: Present
Fan Monitor	
Fan 1: OK: FAN1 : 2600 RPM	Fan 6: OK: FAN6 : 1300 RPM
Fan 2: OK: FAN2 : 1300 RPM	Fan 7' OK' FANA : 4400 RPM
Fan 3: OK: FAN3 : 3600 RPM	Fan 8: OK: FANB : 3200 RPM
Fan 4: OK: FAN4 : 3500 RPM	Fan 9: OK: FANC : 3400 RPM
Fan 4: OK: FAN4 : 3500 RPM Fan 5: OK: FAN5 : 1300 RPM	Fan 9: OK: FANC: 3400 RPM Fan 10: OK: FAND: 3300 RPM
Fan 4: OK: FAN4 : 3500 RPM Fan 5: OK: FAN5 : 1300 RPM	Fan 9: OK: FANC : 3400 RPM Fan 10: OK: FAND : 3300 RPM
Fan 4: OK: FAN4 : 3500 RPM Fan 5: OK: FAN5 : 1300 RPM GPU Monitor	Fan 9: OK: FANC : 3400 RPM Fan 10: OK: FAND : 3300 RPM
Fan 4: OK: FAN4 : 3500 RPM Fan 5: OK: FAN5 : 1300 RPM GPU Monitor ☐ Show OPU Stats	Fan 9: OK: FANC 3200 RPM Fan 9: OK: FANC 3200 RPM Fan 10: OK: FAND 3300 RPM OPU Driver Version: 430.40 . [1] . [1] . [1]
Fan 4: OK: FAN4 : 3500 RPM Fan 5: OK: FAN5 : 1300 RPM GPU Monitor Show GPU Stats - GPU Device 1 GPU Device 2	Pan 9: OK: FANC 3200 RPM Fan 9: OK: FANC 3300 RPM Fan 10: OK: FAND 3300 RPM OPU Driver Version: 430.40 .[1].[1].[1]
Fan 4: OK: FAN4 : 3500 RPM Fan 5: OK: FAN5 : 1300 RPM CPU Monitor Show GPU Stats GPU Device 1 GPU Device 2 Temp: Temp: -	Fan 9:         OK: FANC: 3200 RPM           Fan 10:         OK: FANC: 3300 RPM           OPU Driver Version:         3300 RPM           OPU Driver Version:         430.40 . [1] . [1] . [1]           OPU Device 3         GPU Device 4           Temp: -         Temp: -
Fan 4: OK: FAN4 : 3500 RPM Fan 5: OK: FAN5 : 1300 RPM GPU Monitor GPU Device 1 Temp: - Fan - Fan - GPU Device 2 Temp: - Fan -	Fan 9:         OK: FANC: 3400 RPM           Fan 10:         OK: FANC: 3300 RPM           OPU Driver Version: 430.40         [1]. [1]           OPU Device 3         GPU Device 4           Temp:         Temp:           Fan:         -

The Alchemist Live Hardware Monitoring feature constantly monitors the Host hardware.

Hardware Monitoring reports the state of:

- PSU (x2)
- Fans (x10)
- GPU (x3)

When Show GPU Stats is checked, the temperature and fan status will be displayed for each installed GPU:

Fan 4: OK: FAN4:3	500 RPM	Fan 9: OK: FANC	: 3500 RPM
	300 RPM		: 3400 RPM
- GPU Monitor			
Chow OBLI State		GPU Driver Versig	00:420.40 [11 [11 [1]
Show GPO stats		OF O Driver versio	///. 430.40 . [1] . [1] . [1]
GPU Device 1	GPU Device 2	GPU Device 3	
Temp: 66 C	Temp: 26 C	Temp: 24 C	
Fan: 39 %	Fan: 23%	Fan: 23 %	

# 8.9 About



## 8.9.1 Software Version



Reports the installed version of Alchemist Live software.

# 8.9.2 Copyright Notice



Reports Copyright information.

# 8.9.3 Licenses



Reports information pertaining to third party licensing associated with Alchemist Live.

Specific licensing can be selected from a drop-down menu:



Once selected, specific license information will appear below.



# 9. Alchemist Live

Alch Val UHD 8000:01:01 - Alchemist Li	ve	
Input Audio Input Andiary Output Andiary Output - Audio Client Control Mode:	Input Status Video: ST 2110 1080 59p Audio: ST 2110 16 Channels Ancili: ST 2110 Last Changed: 10:04:10 UTC 30.06.21	Output Status Video: ST 2110 UHD 59p Audio: ST 2110 16 Channels Ancili: ST 2110 Latency: 265 ms
Input Configuration © RTP Input O RTP Quad SQD (UHD/4K) O RTP Quad 2SI (UHD/4K)	O SDI Input         SDI Quad SQD (UHD/4K)            O SDI Quad ZSI (UHD/4K)	BDI SMPTE 352
Video Destination Streams           Video Stream 1           Current Stream 1           Primary           Multicast IP: 239 100.1.2           Source IP: 10.96           Port: 50100           Secondary           Multicast IP: 239 101.1.2           Source IP: 10.96           Port: 50100           Secondary           Source IP: 10.96           Port: 50100           Stream Type: ST 2110	TAKE           Primary Multicast IP:         233.100.1.2         P         E           Source IP:         10.96         P         E           Secondary Multicast IP:         239.101.1.2         P         E           Source IP:         10.96         P         E           Secondary Multicast IP:         239.101.1.2         P         E           Source IP:         10.96         P         E           Source IP:         10.96         P         E           Stream Type:         Auto	Show Stream Statistics  Statistics  SSRC: 0  Type ID: 96  Av Rate (Mbifs)  2640 / 2640  Packets Recvd (b): 461432 / 461380  Discontinuity Count 0 / 0  Packets Lost 0

# 9.1 Unit Status



Here confirmation is given that the:

- System (SYS) is running.
- License (LIC) is valid and present.
- Input (INP) is valid.
- Output (OUT) is valid.

# 9.2 Input Status

mist Live Input Status Video: ST 2110 1080 5 Audio: ST 2110 16 Chi Last Changed: 10:16:47 UTC 04.11.20	50i Annels Cutput Sta Video: ST Audio: ST Latency: 2
trol	

Here Video and Audio sources are confirmed.

The Input Video standard is confirmed. In this example it is:

- 1080/50i video compliant to: SMPTE ST 2110 (-20)
- 16 channels of audio, compliant to: SMPTE ST 2110 (-30)

# 9.3 Output Status



Here the configured output video format and standard are confirmed.

The number of output audio channels is confirmed.

The system latency is reported in terms of ms.

# 9.4 Client Control Mode

Input Audio Input - Audio Unput - Ancillary Output Output - Audio	SYS: Running LIC: Valid INP: OK OUT: OK	Video: ST 2110 1080 59p Audio: ST 2110 16 Channels Ancili: ST 2110 16 Channels Last Changed: 10:04:40 UTC 20:05 21	Video: ST 2110 Audio: ST 2110 Ancill: ST 2110 Latency: 265 ms	UHD 59p 16 Channels
Client Control Mode:	Normal: Full Control			

The Client Control Mode has two possible settings, selectable from a drop-down menu:



Normal: Full Control:

Safe: Monitor Only:

Full control via RCP, enabled.

: Control via RCP inhibited, but template can be viewed.

# 9.5 Input

Alch Val UHD 80	100:01:01 - Alchemist Li	ive					
Input Input - Audio Input - Ancillary Output Output - Audio Client Control Mode	Unit Status SYS: Running LIC: Valid INF: OK OUT: OK Normal: Full Contro		tatus — 57 2110 1 ST 2110 1 ST 2110 1 ST 2110 nanged: 10 UTC 30.0	080 59p 6 Channels 6.21		out Status	UHD 59p 16 Channels
Warning!	of the controls on this pa	ide could lead to t	emporarv dis	ruption of all	outputs!		
r Input Configuratio	n						
RTP Input		O SDI Input					
O RTP Quad SQ O RTP Quad 2S	D (UHD/4K) (UHD/4K)	SDI Quad 25					
Video Destination	D (UHD/4K) (UHD/4K) Streams	O SDI Quad 25 O SDI Quad Au	si (UHD/4K) ito (UHD/4K)	ТАКЕ		Show Sti	eam Statistics
Video Destination	D (UHD/4K) (UHD/4K) Streams 11 239 100 1 2	New Stream 1 Primary Multicast IP:	239.100.1.2			Show Statistic: Statistic: SSRC:	eam Statistics s0
Video Destination     Video Stream 1     Current Stream     Multicast IP:     Source IP:     Port.	D (UHD/4K) (UHD/4K) Streams 11 239.100.1.2 10.96. 50100	New Stream 1 Primary Multicast IP: Source IP: Port:	239.100.1.2 10.96. 50100	TAKE P P	8	Statistic: SSRC: Type ID: Av. Rate 264	eam Statistics 3 96 (Mbit/s): 0/2640
Video Destination Video Destination Video Stream 1 Current Stream Multicast IP: Source IP: Port Secondary Multicast IP:	D (UHD/4K) (UHD/4K) Streams 11 239.100.1.2 10.96. 50100 239.101.1.2	New Stream 1 Primary Multicast IP: Source IP: Port: Secondary – Multicast IP:	239.100.1.2 10.96. 50100 239.100.1.2 10.96. 50100 239.101.1.2	P P P P	8	Statistic: SSRC: Type ID: Av. Rate 264 Packets 84233	eam Statistics 9 (Mbit/s): 0 / 2640 Recvd (k): 5 / 842283
Video Destination     Video Destination     Video Stream 1     Current Stear     Primary     Multicas IP:     Source IP:     Port     Secondary     Multicas IP:     Source IP:     Source IP:     Source IP:     Port	D (UHD/4K) (UHD/4K) Streams 11 239.100.1.2 10.96. 50100 239.101.1.2 10.96. 50100	New Stream 1 Primary Multicast IP: Port: Source IP: Port: Source IP: Port: Port:	239.100.1.2 10.96 50100 239.100.1.2 10.96 50100 239.101.1.2 10.96 50100	TAKE 2 P P P 2 P P	888	Statistic: SSRC: Type ID: Av. Rate 264 Packets 84233 Disconti Packets	eam Statistics 96 (Mbit/s): Revol (8): 5 / 842283 nuity Count 0 / 0 Lost

9.5.1 Input Configuration: RTP Input / RTP Quad Link



The input format is selected in the **Input Configuration** field.

### **RTP Input:**

RTP Input supports formats SD, HD, 3G and now in V3, single stream 4K.



The detected input is reported in the Input Status pane.

#### RTP Quad Link - UHD/4K (SQD or 2SI)

UHD or 4K Inputs can either be Single Stream, or Quad Link.

When Quad Link inputs are applied, the relevant control should be set in the Input Configuration window.

r Input Configuration	ns page could lead to temporary distuption o	an ouiputs)
O RTP Input O RTP Quad SQD (UHD/4K) O RTP Quad 2SI (UHD/4K)	O SDI Input O SDI Quad SQD (UHD/4K) O SDI Quad 2SI (UHD/4K) O SDI Quad Auto (UHD/4K)	SDI SMPTE 352 SOD, Level A
r Video Destination Streams	Т	AKE Show Stream Statistics

When the applied input is UHD or 4K Quad Link, the appropriate setting is either:

- RTP Quad Square (UHD/4K)
- RTP Quad 2SI (UHD/4K)

## 9.5.2 Video Destination Streams



Note: The incoming RTP Streams to Alchemist Live are referred to as Destination Streams. The IP details entered will be the output side of the source device i.e. the upstream source device's destinations.

#### Take



Changes made to the **Video Destination Streams** menu will only be implemented by pressing the **Take** button.

### Video Streams

				TAKE	✓ Show Stream Statistic
Current Stream		New Stream 1			Statistics
Multicast IP:	239.100.1.2	Multicast IP:	239.100.1.2	PS	SSRC: 0
Source IP:	10.96.	Source IP:	10.96.	PS	Av. Rate (Mbit/s):
Port	50100	Port	50100	P S	
Secondary		Secondary			Packets Recvd (k):
Multicast IP:	239.101.1.2	Multicast IP:	239.101.1.2	PS	Discontinuity Count
Source IP:	10.96.	Source IP:	10.96	PS	Discontinuity Court.
Port	50100	Port	50100	PS	Packets Lost:
Stream Type:	ST 2110	Stream Type:	Auto 💌		

The appropriate **RTP Source** details are configured in the **Video Stream 1** menu.

#### **Single Stream Input**

When the input is SD, HD, 3G, or 4K single stream, the transmission is via a single video stream, hence only **Video Stream 1** will appear and require configuration.

The input video should be compliant to: SMPTE ST2110-20, SMPTE ST2022-6 or SMPTE ST2110-40

Note: SD SMPTE ST2022 formats are not supported by Alchemist Live IP.

#### **Current Stream 1**

The Current Stream 1 field will report the current connection.



### New Stream 1

New Stream 1         State           1.2         Primary         Multicast IP:         239.100.1.2         P 8         SR0           4.192         Source IP:         10.96.         P 8         Av. Re         2         2           1.2         Source IP:         10.96.         P 8         Av. Re         2         2           1.2         Multicast IP:         239.101.1.2         P 8         Bottom 1000         P 8         Packation 1000         P 8         P 8         P 8         P 8         P 8         P 8         P 8         P 8         P 8 <td< th=""><th></th><th></th><th></th><th>TAKE</th><th>🗸 Show</th></td<>				TAKE	🗸 Show
Multicidit         Source IP:         10.96.         P         Source IP:         Av. Re           Port:         50100         P         S         2         2           1.2         Source IP:         239.101.1.2         P         S         18718           8.192         Source IP:         10.96.         P         S         Disco           Port:         50100         P         S         Disco           Stream Type:         Auto         Y         Packa	12	New Stream 1 Primary	239 100 1 2	P	Statis SSRC
Secondary     Packa       1.2     Secondary     Packa       8.192     Source IP: 10.96.     P S       Port     50100     P S       Packa     Stream Type:     Auto	4.192	Source IP:	10.96.	P S	Type I Av. Ra
8.192 Source IP: 10.96. P S Disco Port: 50100 P S Packs Stream Type: Auto	1.2	Secondary Multicast IP:	239.101.1.2		Packe 18716
Stream Type: Auto	6.192	Source IP: Port:	10.96. 50100	P S P S	Disco
		Stream Type:	Auto 👻		Packe

Should the input require reconfiguration to a different source, the details of the new source should be entered in the relevant **New Stream 1** field and the **Take** button pressed to action the change.

## Statistics



When enabled the Statistics field will detail statistics of the associated video stream.

Stream statistics can be shown, or hidden, by setting the check-box Show Stream Statistics.

### **RTP Quad Output**

#### **Video Destination Streams**

When the applied input is UHD/4K Quad Link, the **Video Destination Streams** menu will display four input streams that will require configuration:

* Input Configuration ORTP Input OBTP Input OBTP Outs SOD (UHD44) BID Outs SOD (UHD44) BID Outs SOD (UHD44) BID Outs SOD (UHD44)	
O RTP Input         O SDI Input         SDI ShIPTE 352           O RTP Quad SQD (UHD/4K)         O SDI Quad SQD (UHD/4K)         SQD, Level A	
O RTP Guad 2SI (UHD/4R) O SDI Quad 2SI (UHD/4R) O SDI Quad Auto (UHD/4R)	
Video Destination Streams	
TAKE	atistics
Nuevo survaini ( Current Stream 1 Primary Muticast IP: 239 100 1 2 Bource IP: 10.96 Port: 50100         New Stream 1 Primary Muticast IP: 239 100 1 2         Statistics           Source IP: 10.96 Port: 50100         Source IP: 10.96 Source IP: 10.96         Port         Source IP: 10.96 Port         Port           Source IP: 10.96 Port: 50100         Source IP: 10.96 Source IP: 10.96         Port         Source IP: 10.96 Discontaut Co 0 00         Port           Source IP: 10.96 Port: 50100         Port         Source IP: 10.96 Discontaut Co 0 00         Port         Source IP: 10.96 Discontaut Co 0 00         Port           Stream Type:         Stream Type:         Stream Type:         Auto         0	
Video Streams 2-4         New Stream 2         Statistics           Current Stream 2         Primary         Muticast P:         239 100 2.2         P is           Muticast P:         239 100 2.2         P is         Source IP:         10.96         P is           Port         50100         Port         Source IP:         10.96         P is         V Rate Ubrieg           Source IP:         10.96         P is         Source IP:         10.96         P is           Port         50100         Source IP:         10.96         P is         O is         O is contany           Muticast IP:         239 101 2.2         P is         Source IP:         10.96         P is           Port         50100         Port         Source IP:         10.96         P is           Stream Type:         F72110         Source IP:         10.96         P is           Source IP:         10.96         P is         Source IP:         10.96         P is           Port         50100         Source IP:         10.96         P is         Source IP:         0.96           Source IP:         10.96         P is         Source IP:         10.96         P is         0.70           Port <t< td=""><td></td></t<>	
Current Stream 4         New Stream 4         Statistics           Primary Muticast IP: 239 100 4.2         Pimary Primary Muticast IP: 239 100 4.2         P S         SSRC: Type ID: Av Rate (Motifs)           Port         50100         Port         50100         P S           Port         50100         Port         50100         P S           Source IP:         10.96         P S         0/0           Secondary Muticast IP:         239.101.4.2         P S         0/0           Source IP:         10.96         P source IP:         0.96           Port         50100         P source IP:         0.97           Port         50100         P source IP:         0.98           Port         50100         P source IP:         0.98	

## Current Stream (1, 2, 3, & 4)



The Current Stream field will report the current connections of the incoming stream.

### New Stream (1, 2, 3, & 4)



Should the input require reconfiguration to a different input, the details of the new input should be entered in each of the four **New Stream** fields and the **Take** button pressed to action the change.

### Statistics



When enabled the Statistics field will detail statistics of the associated video stream. Stream statistics can be shown, or hidden, by setting the check-box **Show Stream Statistics**.

# 9.6 Input - Audio

EE Alch Val UHD 8000:01:01 - Alc	nemist Live		
Input Audio Input - Ancillary Output - Ancillary Output - Audio Output - Audio Client Control Mode: Normal: Fi	Input St Infing It d Audio: Last Ch 10:04:	atus ST 2110 1080 59p ST 2110 16 Channels ST 2110 angad: 10 UTC 30.06.21	Output Status Video: ST 2110 UHD 59p Audio: ST 2110 16 Channels Ancili: ST 2110 Latency: 254 ms
Changes to any of the controls d	n this name could lead to te	emporant discuption of all out	nitel
Audio Destination Streams			Show Stream Statistics
		TAKE	
Audio Stream 1 Current Primary Multicast IP: 239.100.1.3 Source IP: 10.96 Port: 5004 Secondary Multicast IP: 239.101.1.3 Source IP: 10.96 Port: 5004	New Primary Muticast IP: Source IP: Port: Secondary Muticast IP: Source IP: Port	239.100.1.3 P 3 10.96 P 3 5004 P 3 239.101.1.3 P 3 10.96 P 3 5004 P 3	Statistics SSRC: 0 Type ID: 97 Av: Rate (MbtHS): 20 / 20 Packets Recvd (k): 168/27 8 / 168/278 Discontinuity Count 0 / 0 Packets I ost
Stream Type: ST 2110-30	Stream Type:	ST 2110-30 💌	0
Channels: 16 [ 500			Off: OK
Audio Stream 2 Current Primary Multicast IP: 239.100.1.3 Source IP: 10.96 Pont 5004	New Primary Multicast IP: Source IP: Port	239.100.1.3 P ( 10.96. P ( 5004 P (	Statistics SSRC: - Type ID: - Av. Rate (Mbit/s):
Secondary Multicast IP: 239.101.1.3 Source IP: 10.96. Port: 5004 Stream Type: Disabled Chamnels - [	Secondary Multicast IP: Source IP: Port: Stream Type:	239.101.1.3 P 3 10.96. P 3 5004 P 3 Disabled V	Packets Recvol (k): Discontinuity Count Packets Lost: Off
Audio Stream 3 Current Primary Muticast IP: 239,100,33 Source IP: 10.96 Port: 5004 Secondary Muticast IP: 239,101,33 Source IP: 10.96 Port: 5004 Crease Tach Dicolad	New Primary Multicast IP: Port Secondary Multicast IP: Source IP: Port	239.100.3.3 P 3 10.96. P 3 5004 P 3 239.101.3.3 P 3 10.96 P 3 5004 P 3	Statistics SSRC: Type ID: Av. Rate (Mbil/s): Packets Recvd (A): Discontinuity Count Packets Lost
Channels: - [ -	biream type.	Disableu	Off: -
Audio Stream 4 Current Primary Multicast IP: 239,100.3.3 Source IP: 10.96.	New Primary Multicast IP: Source IP:	239.100.3.3 P 8	Statistics SSRC: - Type ID: - Av. Rate (Mbit/s):
Port: 5004	Port	5004 P	- Packets Recvd (k)
Secondary Multicast IP: 239.101.3.3 Source IP: 10.96. Port: 5004	Secondary Multicast IP: Source IP: Port:	239.101.3.3 P 5 10.96. P 5 5004 P 5	Discontinuity Count:
Stream Type: Disabled Channels: - [ -	Stream Type:	Disabled 🔻	off:

A video stream compliant to SMPTE, ST 2110-20 will be video only (no audio). Any associated audio will be carried in a separate stream, or could be multiple streams and this will require configuration.

Alchemist Live IP supports up to four input audio streams.

Alchemist Live IP is limited to processing 16 channels of audio in total. These 16 channels can be chosen from any of the input audio streams.

An audio stream can carry up to 64 channels of audio. Alchemist Live can only map audio from the top 16 channels of any input stream.

Audio mapping is explained below in section 9.13.3

# 9.6.1 Audio Destination Streams

## Audio Stream (1, 2, 3 & 4)

## Current

The Current Stream field will report the current connection.

					🗸 Shi
Audio Stream 1 -					
Current					
Primary					
Multicast IP:	239.100.1.3	Multicast IP:	239.100.1.3	PS	
Source IP:	10.96				
Port:	5004				
Secondary		Secondary			
Multicast IP:	239.101.1.3	Multicast IP:			
Source IP:	10.96.				
Port:	5004		5004		Pa
Stream Type:	ST 2110-30		ST 2110-30		
Channels:	16 [125 us 1				Off

### New

Should the input require reconfiguration to a different input, the details of the new input should be entered in the relevant **New** Stream field and the **Take** button pressed to action the change.

- Audio Destination Stri	eams			TAKE	Show
Audio Stream 1 Current	I	New			
Multicast IP: 2		Multicast IP:	239.100.1.3	PS	SSRC
		Source IP:	10.96.	PS	Av. Ra
		Port:	5004	P S	
Secondary Multicast IP: 2		Secondary Multicast IP:	239.101.1.3	PS	Packe 33
		Source IP:	10.96	PS	Disco
		Port:	5004	P S	
Stream Type: S Channels: 1		Stream Type:	ST 2110-30 💌		

#### **Stream Statistic**



Stream statistics can be shown, or hidden, by setting the check-box Show Stream Statistics.

## Off (Offset)



The **Off:** statistic indicates the offset of the Audio Stream, compared to the Video Stream. Measurement is made using Timestamp of the associated streams.

Any offset should be less than a frame and will indicate OK.

In circumstances where the offset exceeds a frame, an error will be reported.

Note that Alchemist Live cannot correct this error and the source of the offset should be investigated upstream.

# 9.7 Input – Ancillary

	00:01:01 - Alchemist	Live			
but Jut - Audio but - Ancillary liput Hiput - Audio ient Control Mode: Warning! Changes to any o Ancillary Destinatio	Unit Status SYS: Furning LIC: Yalid INP: OK OUT: OK Normal: Full Cont fthe controls on this p	rol I water the second	2 110 1080 59p 110 16 Channe 110 ed: TC 30.06 21 orary disruption of	output Video: Audio: Ancili: Latenc	Status ST 2110 UHD 59p ST 2110 16 Channels ST 2110 10 y, 254 ms 9 9 9 9 9 9 9 10 10 10 10 10 10 10 10 10 10
Ancillary Stream Current Primany Multicast IP: Source IP: Port: Secondary Multicast IP:	239.100.1.4 10.96. 5008 239.101.1.4 10.96.	New Primary Multicast IP: 23 Source IP: 100 Port: 500 Secondary Multicast IP: 23 Source IP: 10	8.100.1.4 96. 08 9.101.1.4 96	PS PS PS PS	Statistics           SSRC:         0           Type (D:         100           Av Rate (kbit/s):         223/223           Packets Recvd (k):         20037           Discontinuity Count:         20037

Introduced in V3.1.0.8, Alchemist Live IP now supports SMPTE ST2110-40.

SMPTE ST2110-40 supports the passing of Ancillary data which is transported in a separated stream.

# 9.7.1 Ancillary Destination Stream

			TAKE	] Show Stream Statist
Ancillary Stream				
Current		New		Statistics
Primary		Primary		SSRC:
Multicast IP:	239.100.1.4	Multicast IP:	239.100.1.4 P S	Type ID: 10
Source IP:	10.96.	Source IP:	10.96. P S	Av. Rate (kbit/s):
Port:	5008	Port:	5008 P S	
- Secondary		Recordary		Packets Recvd (k):
Multicast IP:		Multicast IP:	239.101.1.4 P S	20038/20037
Source IP	10.96	Source IP	10.96 P S	Discontinuity Count:
	5000		5000	
Port:	5008	Port	5008 P S	Packets Lost
Stream Type:	ST 2110-40	Stream Type:	ST 2110-40 💌	
				Off: OI

## **Ancillary Stream 1**

## Current

The Current field will report the current connection.

Ancillary Strear Current — Primary —	n 1	New — Primary —
Multicast IP	239.100.1.4	Multicast IP
Source IP:	10.96.	
Port:	5008	
- Secondary Multicast IP	239.101.1.4	Secondary Multicast IP
Source IP:	10.96.	
Port:	5008	
Stream Type:	ST 2110-40	

#### New

100.1.4 5.	New Primary Multicast IP: Source IP: Port:	239.100.1.4 P 10.96. P 5008 P	Statistics SSRC: Type ID: Av. Rate (kb 223 / 2
101.1.4 3.	Secondary Multicast IP: Source IP: Port:	239.101.1.4 P 10.96. P 5008 P	Packets Rev 2238877 Discontinuit 070 S Packets Los
110-40	Stream Type:	ST 2110-40 💌	0 Off:

Should the input require reconfiguration to a different input, the details of the new input should be entered in the relevant **New** stream field and the **Take** button pressed to action the change.

## Statistics



Stream statistics can be shown, or hidden, by setting the check-box Show Stream Statistics.

### Off (Offset)



The **Off:** statistic indicates the offset of the Ancillary Stream, compared to the Video Stream. Measurement is made using Timestamp of the associated streams.

Any offset should be less than a frame and will indicate OK.

In circumstances where the offset exceeds a frame, an error will be reported.

Note that Alchemist Live cannot correct this error and the source of the offset should be investigated upstream.

# 9.8 Output

Alch Val UHD: 8000:01:01 - Alchemist Live						
Input-Audio Input-Ancillary Output- Output-Audio Output-Audio Output-Audio Output-Audio Client Control Mode: Normal: Full Control						
Warning! Changes to any of the controls on this pa	ige could lead to temporary disruption of all outputs!					
Output Configuration O RTP Output O RTP Quad SQD (UHD/4K) O RTP Quad 2SI (UHD/4K)	O SDI Output 🔲 36 Level B O SDI Quad SOD (UHD/4K) O SDI Quad 2SI (UHD/4K)					
Video Source Streams	TAKE					
Video Stream 1 Current Stream 1 Primary Multicast IP: 239.100.1.1 Dest Port: 50100	New Stream 1         Statistics           Primary MulticastiP:         239.100.1.1         P           Dest Port         50100         P         S					
Secondary Multicast IP: 239.101.1.1 Dest Port: 50100	Secondary MuticastiP: 239.101.1.1 P S Dest Port: 50100 P S					

# 9.8.1 Output Configuration

The output format is selected in the Output Configuration field.

## **RTP Output**

When the required output is SD, HD or 3G, or single stream 4K, RTP Output should be selected.

Client Control Mode: Normal: Full Co Warning! Changes to any of the controls on this	ntrol page could lead to temporary dism	uption of all outputs!	¥
Output Configuration O RTP Output O RTP Quad SQD (UHD/4K) O RTP Quad 2SI (UHD/4K)	O SDI Output O SDI Quad SQD (UHD/4K) O SDI Quad 2SI (UHD/4K)		Level B
Video Source Streams			Show Stream Statistics

When the output is configured to be RTP the output will conform to:

- Video SMPTE ST 2022-6, or ST 2110-20
- Audio SMPTE ST 2110-30 or ST 2110-31

## RTP Quad Output (SQD or 2SI)



When the desired output is to be UHD/4K Quadlink, the output may be configured to be either:

- RTP Quad SQD (UHD/4K)
- RTP Quad 2SI (UHD/4K)

## 9.8.2 Video Source Streams



Note: The output video streams of the Alchemist Live are referred to as **Source Streams**. This is because the IP details of the Alchemist Live output represent the source streams of the downstream destination.

The appropriate RTP details are configured in the **Video Source Streams** menu. When the output is SD, HD, 3G, or single stream 4K, transmission is via a single video stream hence only **Video Stream 1** is configured.

The **Current Stream** field will report the current connection. Should the output require reconfiguration, the details of the new source should be entered in the relevant **New Stream** field and the **Take** button pressed to action the change.

#### Stream Type



The video out may be configured to be either:

- ST 2022
- ST 2110-20

Alternatively, the output stream maybe disabled.

Note: ST2022 does not support SD resolutions. Hence when the output is SD, the **Steam Type** can only be configured to be ST 2110-20.
## **RTP Quad Source Streams**

### Video Streams

When the output is configured to be RTP Quad, all four output Streams (1 to 4) will need to be configured.

EE Alchemist Live (1) 7000:01:01 - Alc	hemist Live	
O RTP Output O RTP Quad SQD (UHD/4K) O RTP Quad 2SI (UHD/4K)		
r Video Source Streams		
		TAKE
Video Stream 1		
Current Stream 1	New Stream 1	Statistics
Primary Multicast IP: 239 100 1 1	Primary Multicast IP: 239 100 1.1	P S Av. Rate (Mbit/s):
Dest Port: 50100	Dest Port 50100	P S Packets Sent (k):
Secondary	Secondary	42191389 / 42191389
Multicast IP: 239.101.1.1	Multicast IP: 239.101.1.1	P S
Dest Port: 50100	Dest Port 50100	PS
Stream Type: ST 2110	Stream Type: ST 2110-20	
Video Streams 2-4		
Current Stream 2	New Stream 2	Statistics
Primary Multicast IP: 239.100.2.1	Primary Multicast IP: 239,100,2,1	P S Av. Rate (Mbit/s):
Dest Port 50100	Dest Port 50100	P S Packets Sent (k):
Secondary	Secondary	42191389 / 42191389
Multicast IP: 239.101.2.1	Multicast IP: 239.101.2.1	PS
Dest Port: 50100	Dest Port: 50100	PS
Stream Type: ST 2110	Stream Type: ST 2110-20	
Current Stream 3	New Stream 3	Statistics
Primary Multicast IP: 239.100.3.1	Primary Multicast IP: 239.100.3.1	P S Av. Rate (Mbit/s):
Dest Port 50100	Dest Port 50100	2201/2201
Secondary	Secondary	42191389 / 42191389
Multicast IP: 239.101.3.1	Multicast IP: 239.101.3.1	PS
Dest Port: 50100	Dest Port: 50100	PS
Stream Type: ST 2110	Stream Type: ST 2110-20	
- Current Stream 4	New Stream 4	Statistics
Primary	Primary	Av. Rate (Mbit/s):
Multicast IP: 239.100.4.1	Multicast IP: 239.100.4.1	P S 2201/2201
Dest Port: 50100	Dest Port: 50100	P S Packets Sent (k):
Secondary Multicast IP: 239.101.4.1	Secondary Multicast IP: 239.101.4.1	42191389 / 42191389 P S
Dest Port: 50100	Dest Port: 50100	P S
Stream Type: ST 2110	Stream Type: ST 2110-20	

Each output Video Stream is defined by a Multicast IP.

The **Current Stream** field will report the current connection. Should the output require reconfiguration, the details of the new source should be entered in the relevant **New Stream** field and the **Take** button pressed to action the change.

## Stream Type

When the output is RTP Quad, the output may be configured to be either:

- SMPTE ST2022
- SMPTE ST2110-20

0100	Dest Port:	50100	P S	Packets Se
39.101.1.1	Secondary Multicast IP:			42255259 /
0100				
T 2110	Stream Type:	ST 2110-20	-	
,		Disabled ST 2022		
	New Stream 2	ST 2110-20		Statistics
39.100.2.1	Multicast IP:			Av. Rate (N 2201 /
0100				Packets Se
39.100.2.1 0100	New Stream 2 Primary Multicast IP: Dest Port:	ST 2110-20 239.100.2.1 50100	P S P S	Statistic Av. Rate 220 Packets

# Statistics



Stream statistics can be show, or hidden, by setting the check-box Show Stream Statistics.

# 9.9 Output - Audio

Alch Val UHD 80	00:01:01 - Alchemist	
utput utput - Audio utput - Ancillary onversion ilities ient Control Mode:	Unit Status SYS: Running LIC: Valid INP: OK OUT: OK Normal: Full Cont	Input Status         Output Status           Video: ST 2110         1080 59p           Audio: ST 2110         16 Channels           Andit: ST 2110         16 Channels           Ist Changed:         Latency: 254 ms           1004:10 UTC 30 06.21         Latency: 254 ms
VVarning! ———		
Changes to any o	f the controls on this p	age could lead to temporary disruption of all outputs!
Audio Configuratio		
O 1 Stream - 16	Channels C	2 Streams - 8 Channels O 4 Streams - 4 Channels
Audio Source Stree		
	2010	Show Stream Statistics
		IAKE
Audio Stream 1 -		New Statistics
Primary	222.422.4.2	Primary Av. Rate (Mbit/s):
Multicast IP:	239.100.1.3	Multicast P: 239.100.1.3 P S 23/23
Secondary		Secondary 796674 / 796674
Multicast IP:	239.101.1.3	Multicast IP: 239.101.1.3 P S
Dest Port:	5004	Dest Port. 5004 P S
Stream Type:	ST 2110-30	Stream Type: ST 2110-30 💌
Packet Time:	125 us	Packet Time: 125 us
Ciramiens.		
		Multicast IP: 239.100.2.3 P S Av. Rate (Minuts).
		Dest Port: 5004 P S Packets Sent (k):
Secondary — Multicast IP:		Secondary Multicast IP: 239.101.2.3 P S
		Dest Port: 5004 P S
		Stream Type: Disabled 💌
		Packet Time: 125 us 💌
		Multicast IP: 239.20.1.19 P S AV. Rate (Mbit/s):
		Dest Port: 5004 P S Packets Sent (k):
Secondary -		Secondary -
		Dest Port 5004
		Stream Type: Disabled
		Packet Time: 125 us
	239 20 1 20	Primary Multivact ID: 239 20 1 20 AV. Rate (Mbit/s):
Dest Port		Dest Port 5004 P 8 Destrote Cent 44
		Secondary Packets Sent (k):
		Multicast IP: 239.21.1.20 P 8
		Dest Port: 5004 P S
		Stream Type: Disabled 💌
		Packet Time: 125 us

# 9.9.1 Audio configuration



Alchemist Live supports up to four output audio streams. The output may be configured to have:

### 1x Output Audio Stream

When the output is configured to carry a single audio stream, up to 16 channels can be carried.

## 2x Output Audio Stream

When the output is configured to carry 2 audio streams, each stream must carry 8 audio channels.

If there are insufficient channels in the input to fill the 8 channel per stream requirement, the shortfall will be made up using audio mute channels.

Note: 1ms Packet time is not supported for 2110-31 in this configuration.

### 4x Output Audio Stream

When the output is configured to carry 4 audio streams, each stream must carry 4 audio channels.

If there are insufficient channels in the input to fill the 4 channel per stream requirement, the shortfall will be made up using audio mute channels.

# 9.9.2 Audio Source Streams

		O 2 Streams - 8 Ch		O 4 Streams - 4 (	
dio Source Stre:	1ms				
					🗹 Show Stream Statis
Audio Stream 1					
Current		New			Statistics
Multicast IP:		Multicast IP:	239.100.1.3	PS	Av. Rate (Mbit/s):
Dest Port:	5004	Dest Port:	5004	PS	Packets Sent (k):
Secondary		Secondary			796674/796674
Multicast IP:	239.101.1.3	Multicast IP:	239.101.1.3	PS	
Dest Port:	5004	Dest Port:	5004	PS	
Stream Type:	ST 2110-30	Stream Type:	ST 2110-30		
Packet Time:	125 us	Packet Time:	125 us		
Channels:		Channels:			
Multicast IP:		Multicast IP:		P S	
				P S	
			Disabled		
			125 µ8		
- Current					
				P S	
				P S	
				PS	
				PS	
			Disabled		
			125 us		
			239.20.1.20		
			5004	P S	
Secondary – Multicast IP		Secondary Multicast IP		P S	
			Disabled		
			125 US		

Each output Video Stream is defined by a Multicast IP.

# **Current Stream**

- Audio Stream 1	
Current New Primary Primary	
Multicast IP: 239.100.1.3 Multicast	
Dest Port: 5004 Dest Port	
Secondary Multicast IP: 239.101.1.3 Multicast	
Dest Port: 5004 Dest Port	
Stream Type: ST 2110-30 Stream Typ	
Packet Time: 125 us Packet Tim	
Channels: 16 Channels:	

The **Current Stream** field will report the current connection. Should the output require reconfiguration, the details of the new source should be entered in the relevant **New Stream** field and the **Take** button pressed to action the change.

#### Stream Type

The audio output can be configured to be compliant to either:

- SMPTE ST 2110-30
- SMPTE ST 2110-31

## **Packet Time**

	Secondary Multicast IP:		Secondary Multicast IP:				
				ST 2110-30			
			Packet Time:	125 us	▼		
				125 us			
1				250 us			
,				500 us			
ľ				1 ms			
	Primary		Primary				
				239.160.201.3			AV. Ra

The audio packet time may be defined using the Packet Time control.

Packet time may be defined to be:

- 125us
- 250us
- 500us
- 1ms

Note – when the output audio is configured to be  $2 \times 8$ ch (see section 9.8.1 above) and the stream type is configured to be SMPTE ST 2110-31, that the maximum packet time configurable to is 500us. It is not possible to configure a packet time of 1ms because such a configuration can only support x6 audio channels.

There is no such restriction when the output is configured to be SMPTE ST 2110-30.

#### Channels

04			
2110-30			
5 us			
	Channels:	16 💌	
		9	
		10	
		_11	Statistics
9.160.170.4	Primary Multicast IP:	12 13 0.4	Av. Rate (
04		14	Packets S
9.161.170.4	Secondary Multicast IP:	15 16 235.101.110.4	

The **Channels** control allows the actual number of channels the specific stream can carry to be defined. The actual number of channels that can be configured will depend upon the **Audio Configuration** (see section 9.9.1, above).

- When a single output stream is configured, up to 16 channels can be set.
- When 2 output streams are configured, each Steam will carry 8 audio channels. Configuration of the number of channels carried is inhibited.
- When 4 output streams are configured, each channel will carry 4 audio channels. Configuration of the number of channels carried is inhibited.

## Statistics



Statistics can be configured to be displayed, by checking the **Show Stream Statistics** control.

# 9.9.3 Output - Ancillary

Warning!       Changes to any of the controls on this page could lead to temporary disruption of all outputs!         Ancillary Source Streams       Image: Control is an image: Contro image: Control image: Control image: Contro image: Control image:	Alch Val UHD 80 Output Output - Audio Output - Audio Conversion Utilities Client Control Mode:	00:01:01 - Alchemist Liv Unit Status SYS: Running LIC: Valid INP: OK OUT: OK Normal: Full Control	e Video: 3 Audio: 3 Ancill: 3 Last Ch 10:04;	tatus ST 2110 1080 59 ST 2110 16 Cha ST 2110 Ianged: 10 UTC 30.06.21	3p nnels	Output Status Video: ST 2110 UHD 59p Audio: ST 2110 16 Channels Ancill: ST 2110 Latency: 254 ms
New         New         Statistics         Statistics           Primary         Multicast IP: 239 100.1.4         P         B         42/.42         42/.42           Dest Port.         5008         P         S         42/.42         Packets Sent (%): 6152/6152           Multicast IP: 239.101.1.4         Multicast IP: 239.101.1.4         P         S         6152/6152           Multicast IP: 239.101.1.4         Dest Port.         5008         P         S	Warning! Changes to any o Ancillary Source St	f the controls on this pag rearns 1	e could lead to te	emporary disruption	n of all outpu TAKE	Its!
Becondary Multicastile: 239.101.1.4         Secondary Multicastile: 239.101.1.4         P 5           DestPort:         5008         DestPort:         5008         P 5	Current Primary Multicast IP: Dest Port:	239.100.1.4 5008	New Primary Multicast IP: Dest Port:	239.100.1.4 5008	P S P S	Av. Rate (kbit/s): 42 / 42 Packets Sent (k):
	Secondary Multicast IP: Dest Port:	239.101.1.4 5008	Secondary Multicast IP: Dest Port:	239.101.1.4 5008	P S P S	6152/6152
Stream Type: ST 2110-40 Stream Type: ST 2110-40 V	Stream Type:	ST 2110-40	Stream Type:	ST 2110-40 🔻		

# **Ancillary Source Streams**

Changes to any of the controls on this ; r Ancillary Source Streams	sage could lead to temporary disruption of all or TAKE	Itputs!
Ancillary Steam 1 Current Primary Multicast IP: 239.100.1.4 Dest Port: 5008 Secondary Multicast IP: 239.101.1.4 Dest Port: 5008	New Primary MulticastiP: 239 100 1.4 P Dest Port 5008 P Secondary MulticastiP: 239 101 1.4 P Dest Port 5008 P	Statistics Av. Rate (xbit/s): 42/42 Packets Sent (k): 6152/6152
Stream Type: ST 2110-40	Stream Type: ST 2110-40 💌	

## Current



The Current Stream field will report the current connection.

New

eams				
			TAKE	🖌 Show
	New			
239.100.1.4	Primary Multicast IP:	239.100.1.4	PS	
5008	Dest Port:	5008	PS	
	- Secondary -			
239.101.1.4	Multicast IP:	239.101.1.4	PS	
5008	Dest Port:	5008	PS	
ST 2110-40	Stream Type:	ST 2110-40	•	

Should the input require reconfiguration to a different input, the details of the new input should be entered in the relevant **New** stream field and the **Take** button pressed to action the change.

# Stream Type

Multicast IP:	239.101.1.4		Р	8	
	5008				
Stream Type:	ST 2110-40	•			
	Disabled				
	ST 2110-40				

Output Ancillary data, when enabled, will comply to: ST2110-40

Output ancillary data can be disabled using the appropriate setting.

### Statistics



Stream statistics can be show, or hidden, by setting the check-box Show Stream Statistics.

# 9.10 Conversion

Alchemist Live Val 80	00:01:01 - Alchen	nist Live						
Output - Audio Output - Ancillary Conversion Utilities Color LUTs	Unit Status SYS: Running LIC: Valid INP: FAIL: Lo OUT: -					Output Statu Video: ST 2 Audio: ST 2 Latency: - Health: Of		D 50p Channels :(s)
								~
Video Input Resolution: - Frame Rate: - Scan Type: O O	Interlaced Segmented Fram Progressive	ie (psf)		Video Ou Resolutio Frame R: Scan Typ	itput ——— on: ate: e:	UHD (3840x216 50 Hz O Interlaced O Segmented F O Progressive	i <b>0)</b> Trame (psf)	*
Conversion Mode and A	Aperture							
Aperture Select: N	ormal		Mode S	elect: Mo	t Comp (Ph	C High) 🔻	🗸 Clea	n Cut
Alias Suppression Horizontal:	-0		Р	Vertical:		- <u>o</u>		Р
Linear Enhancement Horizontal:		0.0 dB	P	Vertical:	•—		0.0 dB	P
Aspect Ratio Input Screen Aspect Output Screen Aspect Source Image Aspect	16x9 16x9 16x9			Sou Of Of Of	urce Transla Fit to Width Fit to Height Anamorphic	tion —		
Custom Size: Pan:	<u> </u>	100.0 % 0.0 %	P P	Aspect: Tilt:	°	•	0.0 %	P
Blanking Left: O Top: O		0 0	P P	Right: Bottom:	。 		0	P P
F Ph.C Protect Areas								
Protect Area 1						0	verlay Area	Keys
Left: Top:		53.0 % 61.2 %	P P	Right: Bottom:	_		78.4 % 79.5 %	P P
Protect Area 2		0.0 %	P	Right:			20.0 %	P
Тор:		61.0 %	P	Bottom:			80.0 %	P
Protect Area 3		76.1 %	P	Right			100.0 %	Р
Тор:		83.6 %	P	Bottom:			100.0 %	P

		11:30:30 UTC 23.11
Video Input	UHD	Video O Resoluti
Frame Rate:	59 Hz	Frame R
Scan Type:	O Interlaced O Segmented Frame (p O Progressive	Scan Ty
	and Aperture	
	Normal	

# 9.10.1 Video Input: Interlaced / Segmented Frame (psf) / Progressive

Alchemist Live relies on automatic standards detection of the incoming source signal.

This field reports the detected/configured input video format.

- When the input is Progressive, the Progressive input flag will be set and the Interlaced and PsF flags will be greyed out (not available).
- When the input is interlaced, it will be assumed that the incoming signal is true high frame rate, and the **Interlaced** flag will be set.

If the input is actually **psf**, it will be detected as true high frame rate content. For example, if the input is **1080 25psf**, Alchemist Live will detect the input as **1080 50i** (since the video transport is the same for both). Therefore, in such a scenario, it is important that the **psf** input flag is manually selected.

Note: for optimal conversion performance of psf sources, it is important that the input is identified as psf and not processed as true high frame rate interlaced input.

# 9.10.2 Video Output: Interlaced / PsF / Progressive

Last Chang 12:27:49 1	geu. 5.12.2017	Latency. 270 ms	
	r Video Output		
	Resolution:	UHD (3840x2160)	•
	Frame Rate:	59.94 Hz	•
	Scan Type:	O Interlaced O Segmented Frame (psf) O Progressive	
-	Mode Select:	Motion Comn (Ph.C)	

In the Video Output field, the output video format can be defined in terms of **Resolution**, **Frame Rate** and **Scan Type**.

Note: the options offered in the Video Output pane will depend on the settings of the Output Configuration tab (see paragraph 9.8.1 above).

Note: that when the output is configured to be **UHD/4K**, the options: **Interlaced**, and **Segmented Frame (psf)** will be greyed out (not available).

# 9.10.3 Conversion Mode and Aperture

	<ul> <li>Segmented Fran</li> <li>Progressive</li> </ul>	ne (psf)			O Segm O Progr	ented Frame (p assive	st)
Conversion Mode an	nd Aperture	-	Mode Seler	t Motion Com	n (Ph (^)	▼ <b>1</b> 70	ean Cut
Alias Suppression Horizontal:			P Vei	tical:	<b></b> @		P
Linear Enhancem Horizontal: 👁	ent	0.0 dB	P Vei	tical: 💿 🗕		0.0 dB	P
	t: 16x9						
				<ul> <li>Fit to Widt</li> <li>Fit to Heig</li> </ul>	h ht		

### Aperture Select: Sharp / Normal / Anti-alias

This control can be used to set the appropriate conversion aperture.

An externa Onlard	haven	_	
Apenure Select	Normai		Mode S
	Sharp		
Horizontal:	Normal		
	Anti-alias		

Available settings are Sharp, Normal & Anti-alias. The default setting is Normal.

Sharp preserves the most vertical resolution from the input picture.

Normal provides the best compromise for typical input pictures.

**Anti-alias** is designed to prevent objectionable aliases in the output pictures. Aliasing refers to an artefact associated with sampled signals. This undesirable effect is caused by sampling frequencies being too low to faithfully reproduce the frequencies present in the original source.

### **Mode Select**

This control is used to set the conversion mode.



Three modes of operation are available:

- Motion Comp (Ph.C High)
- Motion Comp (Ph.C Low)
- Linear (Ph.C off)
- Synchro (Ph.C off)

Motion Comp (Ph.C High)	is the default and applies Motion Compensated Interpolation when converting from one frame rate to another.
	As the name suggests, Motion Comp (Ph.C High) performs the highest quality motion compensation conversion.
Motion Comp (Ph.C Low)	is a less aggressive form of PhC motion compensation.
	In circumstances were Ph.C High may introduce unacceptable conversion artefacts associated with certain source content.
	Examples may include:
	<ul> <li>burnt in captions over complex moving content</li> </ul>
	<ul> <li>object periodics</li> </ul>
	<ul> <li>fixed transparent logos or captions over complex moving content</li> </ul>
	<ul> <li>scrolling captions over complex moving content</li> </ul>
Linear (Ph.C off)	disables the Motion Compensation, and employs a linear interpolation when converting from one frame rate to another.
Synchro (Ph.C off)	converts from one frame rate to another, by dropping or repeating input pictures as required. Depending on the conversion requested, field or frame based synchronise events could occur.

# **Clean Cut**



This control allows the User to configure the **Clean Cut** feature to be either *enabled* or *disabled*. Default setting is: **Enabled** 

# Alias Suppression: Horizontal / Vertical

The **Alias Suppression** feature allows the User to manually increase, or decrease, the magnitude of alias suppression.

Separate horizontal and vertical controls are available.

0	Segmented Frame Progressive	i (psi)				<ul> <li>Progres</li> </ul>	iteu manie (ps islve	21 <i>j</i>
	Aperture				Mot Comp (Pl			
Alias Suppression Horizontal:		0	Р	Vertical:		-0	0	Р
Linear Enhancement Horizontal:					•—			
					Source Transl			

Two slider controls are offered. Default setting is zero.

Positive settings increase alias suppression.

Negative settings decrease suppression.

Alias Suppression should be used to balance 'perceived resolution' against unwanted aliasing.

### Linear Enhancement

The **Linear Enhancer** feature allows the User to increased perceived sharpness. Separate horizontal and vertical controls are available.

	Segmented Frame Progressive				<ul> <li>Segmen</li> <li>Progress</li> </ul>		
Conversion Mode and	Aperture			Motion Comp			
Alias Suppression - Horizontal:					-0	0	
Linear Enhancemer	nt (	).0 dB P	Vertica	• •			P
				Fit to Width			
	F 1.6v0			O FILLO Height			

Note that the effectiveness of the **Linear Enhancer** is affected by the chosen settings of the **Alias Suppression** controls.

# 9.10.4 Aspect Ratio: various

The user can specify aspect ratio translations using either the drop down pre-sets, or the custom settings.

Horizontal: O		0.0 dB	Р	Vertical:	•	0.0 dB	P
_ Aspect Ratio							
Input Screen Aspect	16x9			So So	urce Translation —		
Output Screen Aspect:	16x9			0	Fit to Width		
Source Image Aspect:	16x9			ŏ	Fitto Height 14x9		
Custom Aspect				ŏ	Anamorphic		
Custom					-		_
Size:			P			100.0 %	P
Pan: —	•		P		<u>_</u>	0.0 %	P
- Planking							
Left O-					o		

ARC controls include:

- Input screen aspect
- Output screen aspect
- Source image aspect
- Source translation (to output)

### **Input Screen Aspect**

**Input Screen Aspect** is used to describe the source screen input aspect ratio by selecting the relevant setting from the drop down list:

Aspect Ratio		
Input Screen Aspect:	16x9 💌	- Source
Output Screen Aspect:	4x3	O Fitt
Source Image Aspect	16x9	O 1 4v
	1.37x1	
	1.85x1	
	17x9	
Size:	2.35x1	Aspect: =
Pan:	2.39x1	Tilt =

### **Output Screen Aspect**

Output Screen Aspect is used to describe the output screen aspect ratio from the drop down list.

_ Aspect Ratio			
	16x9		[ Source
Output Screen Aspect:	16x9	•	OFitt
	4x3		O 14x
Custom Aspect	16x9		Ö Ana
	1.37x1		
Size -	1.85x1		Aspect:
	17X9		Til+ _
	2.30x1		
	2.3381		

## Source Image Aspect

The **Source Image Aspect** control is used to define the aspect ratio of the active image within the input screen aspect.

Input Screen Aspect:	16x9		Source	
Output Screen Aspect:	16x9		OFitt	
Source Image Aspect:	16x9	•	O 14x	
Custom Aspect	4x3		Ō Ana	
Quatam	16x9			
Size:	1.37x1		Asnert -	
0.120.	1.85x1			
Pan:	17x9		liit: =	
1	2.35x1			
r Blanking	2.39x1			
	·	_	-	

### **Source Translation**

The **Source Translation** control is used to describe the translation required from source to output image.

* * *	urce Translation – Fit to Width Fit to Height I 4x9 Anamorphic		
Р		100.0 %	P
Р		0.0 %	Р

#### **Custom Aspect**

The **Custom** controls can be enabled to activate the custom display setting sliders, using the **Custom Aspect** checkbox.

Output Screen Aspect: Source Image Aspect Custom Aspect				
Custom Size:	0.0%	P Aspe P Tilt	ect0 100.0 % P	

The controls: Size, Pan, Asp and Tilt can now be used set any desired display settings.

Note: an Application Note is available called How to Configure the ARC (Aspect Ratio Converter).

This App Note offers a more in depth explanation of this Alchemist Live feature and may be downloaded from the GV Website here:

App note - How To Configure the ARC - download.

# 9.10.5 Blanking: Left / Right / Top / Bottom



The **Blanking** slider controls allow the User to blank areas of the output image. Blanked areas will appear black in the output image.

# 9.10.6 Ph.C Protect Areas



The **Ph.C Protect Areas** feature allows up to three separate areas of the processed picture to be excluded from the Ph.C process. Fixed objects like Logos or static text will be protected from motion prediction artefacts that can be associated with Ph.C frame rate conversion.

# Protect Area 1, 2, & 3

Each of the three areas can be configured as a rectangle, which will be defined by the four controls:

- Left,
- Right
- Top
- Bottom

The feature can be enabled using the relevant **Enabled** button:

Blanking — Left: Top:	°		0 0	P P	Right: Bottom:	° °	0 0	P P
Ph.C Protect	t Areas ——— ea 1 ————						🔲 Overlay Are	a Keys
Left: Top:		•	20.9 % 56.0 %	P P	Right: Bottom:	°	37.3 %	P P
Protect Are Enable Left:	2 2		0.0 %	P	Right:	o	0.0 %	P

Note:

- The **Right** control must be a higher percentage setting than the **Left** control.
- The **Bottom** control must be a higher percentage setting than the **Top** control.

## **Overlay Area Keys**



When enabled the defined areas of the configured keys will be shown on the output video picture.

- Ph.C active areas will be detailed by areas shown in monochrome.
- Non-Ph.C areas (where linear conversion will take place) will be detailed by areas shown in red.

Each Key will describe a rectangular protected area.

In the following example, a single protected area is defined by the key: Protected Area 1



Multiple keys can be configured to create more complex shapes, or to protect multiple objects:

Left	•	U	P	Right	·		
	°				°		
- Ph C Protect	Aroos						
FILC FIDIECL	nicas					Overlay Area	Kevs
Protect Area	a 1						
Enable							
Left		18.2 %	P	Right:		48.5 %	P
Top:	-0	6.3 %	P	Bottom:	-0	11.9 %	P
Protect Area	a 2						
🗹 Enable							
Left:		19.7 %	Р	Right:	<u>_</u>	35.0 %	P
Top:		11.2 %	Р	Bottom:		15.9 %	Р
Protect Area	a 3						
Enable	•	75.0 %	_				
Left		75.2 %	P	Right		81.2%	
Top:		86.6 %	Р	Bottom:	-		Р



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Version Number: 2.4

# 9.11 Utilities

Alchemist Live (1) 7000:01:01 - Alchemist Live	
Output Audio Output - Audio Conversion United Color LUTs Cilent Control Mode: Normat: Full Control	Input Status Video: ST2110 UHD 59p Audio: ST2110 16 Channels Last Changed: 15:09:20 UTC 23:11:20
Procamp Y Gain: 0.00 dB Black Level: 0 mV	P C Gain: 0.00 dB P
Luma Olipper - Enable White Maximum	P Max Knee: 100.0 % P
Color Space Conversion Input Color Space Ø Auto (FEC601 / BT709) Ø REC601 Ø BT709 Ø BT2020	Output Color Space O Auto (REC601 / BT709) O REC601 O BT709 O BT2020
r HDR Conversion ☐ Enable Color LUT ④ NotUsed ④ LUT 1: [NotLoaded] ④ LUT 2: [NotLoaded]	
Input Transfer Fundion O P0 (SDR) O P0 O S-Log3 O HLG	Output Transfer Function O B1709 (SDR) O P0 O S-Log3 O HLG
Sys Gamma:1.20 SDR Range: 200 nits (default) ▼ HDR Range: Auto ▼	P         Sys Gamma         ●         1.20         P           P         SDR Range:         200 nits (default)         ▼         P           HDR Range:         Auto         ▼         P
Gain Adjustment:	1.00 P
RGB Legalizer Level: Off Maximum:0 763.0 mV Minimum:51.0 mV	P Max Knee: 763.0 mV P P Min Knee:51.0 mV P

# 9.11.1 Proc Amp: Y Gain / C Gain / Black Level

Utilities Color LUTs	OUT: OK	15:09:20 UTC 23.11.20	Laidicy. 201 III3
			~
Procamp Y Gain: Black Level:	0.00 dB	P C Gain:	- <b>0</b> 0.00 dB P
Luma Clipper Enable			

- The Luma gain may be adjusted using the slider control **Y** Gain. The range is +/- 6dB.
- The Chroma gain may be adjusted using the slider control **C Gain**. The range is +/- 6dB.
- The Black level may be adjusted using the slider control **Black Level.** The range is +/- 80mV.

# 9.11.2 Luma Clipper: White Max / White Knee / Black Min / Black Knee



The Luma Clipper feature is enabled with the tick box.

The default setting is disabled.

When **Enabled**, the controls: **White Maximum**, **White Knee**, **Black Minimum** and **Black Knee** all become active and may be configured.

# 9.11.3 Color Space Conversion: Auto / REC601 / BT709 / BT2020



# Input Color Space

In Auto mode, if the input is:

- SD, it will be assumed that the source complies with REC601.
- HD, it will be assumed that the source complies with BT709.
- UHD/4K, it will be assumed that the source complies with BT709.

The User can manually force the desired **Input Color Space** setting. This is important when inputting sources compliant to BT2020, as currently there is no automatic signalling present.

Color Space Conversion Input Color Space © Auto (REC601 / BT709) O REC601 O BT709 O BT2020	Outpu O Aut O RE O BT O BT
HDR Conversion	

# **Output Color Space**

In Auto mode, if the output is:

- SD, it will comply with REC601.
- HD, it will comply with BT709.
- UHD/4K, it will comply with BT709.

The User may choose to manually force the desired **Output Color Space** setting.



If it is desired that the output be BT2020, then the control should be set to:

BT2020



# 9.11.4 HDR Conversion



Alchemist Live supports HDR processing.

Supported transfer functions are:

- BT709 (SDR)
- PQ
- S-Log 3
- HLG

Note: although HDR10 doesn't appear in the menu, HDR10 employs the same HDR curve as PQ, hence HDR10 content can be processed by configuring as PQ.

Alchemist Live supports the following conversion modes:

- Conversion from HDR to SDR
- Conversion from SDR to HDR
- Retention of HDR
- Translation of HDR

# Enable

Note that in its default state, the HDR Conversion menu is disabled.

ColorLUT O NotUsed O LUT 1: [NotLoaded] O LUT 1: [NotLoaded]	
Input Transfer Function ③ 17709 (SDR) ○ PL0 ③ 200 nts (default) HDR Range: 200 nts (default) Gain Adjustment	Output Tarnsfer Function P0 P0 P0 P1 P0 P1 P1 P1 P1 P1 P1 P1 P1 P1 P1

To make the controls active it is first necessary to configure the checkbox: Enable

HDR Conversion ☑ Enable Color LUT O Not Used O LUT 1: [NotLoaded] O LUT 2: [NotLoaded]	
Input Transfer Function © 87709 (SDR) © 9 - 0 © 9 - Log3 O HLG	Output Transfer Function Ø B7708 (SDR) Ø PL0 Ø St.093 Ø HL6
Sys Gamma: 1.20 P	Sys Gamma:
SDR Range: 200 nits (default) 💌 P	SDR Range: 200 nits (default) 💌 P
HDR Range: Auto 💌 P	HDR Range: Auto P
Gain Adjustment	1.00 P

Once enabled, the HDR Conversion menu will become active.

# Color LUT

- HDR Conversion [7] Enable Color LUT O Not Used O LUT 1: [Not Loaded] O LUT 2: [Not Loaded]	
Input	Output
Transfer Function	Transfer Function
O BT709 (SDR)	O B1709 (SDR)

Introduced in V2.1.0.20 Alchemist Live supports Custom LUTs (Look Up Tables).

LUT files should be in the form of .cube

The procedure of loading LUTs into the Alchemist Live system is described in the Color LUTs menu described in Section 3 below.

A LUT will describe the overall characteristic from input to output.

The LUT will take priority over the setting of Input Transfer Function and Output Transfer Function.

Once LUT 1 and LUT 2 are loaded, they will appear in the Color LUT menu.



Up to two LUTs can be loaded at a time. Either LUT can be easily applied to a particular conversion process.

Alchemist Live can store many LUTs, but only two may be loaded into the LUT Cache (in the Color LUT menu) at a time.

## Input

O Not Used O LUT 1: [Not Loaded] O LUT 2: [Not Loaded]	
Input Transfer Function O BT709 (SDR) O PQ O S-Log3 O HLG	Outpu Trar O B O P O S O H
Sys Gamma: 🗢 1.00	P Sys G
SDR Range: 200 nits (default)	P SDR F
HDR Range: Auto	P HDR I
Gain Adjustment.	

### Transfer Function (Input)

O LUT 1: [3a_BT709_HLG_DISPLAY.cube] O LUT 2: [3b_BT709_HLG_DISPLAY.cube]	
Input	Output
Transfer Function	Transfre Function
Ø B1709 (SDR)	O 8709 (8DR)
Ø P-0	O 9-Log3
Ø S-Log3	O 4Log3
Ø H-0	O 4LO
Sys Gamma: 1.20 P	Sys Gamma: 1.20 P
SDR Range: 200 nits (default) P	SDR Range: 200 nits (default)   P

The Input control allows the Operator to define the input with respect to HDR.

If an SDR to HDR process is to be configured, the input should be defined as: BT709 (SDR).

The default setting is: BT709 (SDR)

### System Gamma (Input)



This control is only active when the input HDR standard is defined to be either HLG or S-Log3. It is not relevant for inputs that conform to PQ, or SDR formats and the control will be greyed out. When active, **Input System Gamma** may be defined to a value between 1.0 and 2.0.

The default setting is: 1.2

Note – this is an input control and defines the brightness of the HDR input. A higher setting will result in a darker output picture.

### SDR Range (input)

O HLG			ŏ
			Sys
SDR Range:	200 nits (default)	▼ Р	SDF
	200 nits (default) 300 nits	<b>P</b>	HDF
	500 nits <sup>t</sup> 750 nits		
	1000 nits 1250 nits		
RGB Legalizer —	1500 nits 2000 nits	<b>•</b> •	

This control is only active when the conversion mode is SDR to HDR. The control is used to define how bright the SDR input is. The desired setting can be configured using the drop-down menu.

The range of the control is: 20 to 3000 nits.

The default value is: 200 nits

## Note - The higher the nit level set, the brighter the output picture will be.

## HDR Range (input)

O S-Log3 O HLG		
	<b>— 0</b> —— 1.20	P
	200 nits (default) 🛛 🔻	P
HDR Range:	Auto 🗸	P
	Auto	
	Narrow Full	
Soft Clip Level:		
RGB Legalizer —		

This control is only active when the input is defined to be HDR compliant. The HDR Range may be set to **Auto**, **Full** or **Narrow**, using the drop down menu.

In Auto mode outputs compliant to:

- PQ will be set to Full
- HLG will be set to Narrow
- S-Log3 will be set to Narrow

When set to Full, sub-blacks and super-white luminance values are included.

When set to Narrow, sub-blacks and super-whites are clipped.

## Output

	Output Transfer Fur O BT709 (S O PQ O S-Log3 O HLG	nction DR)		
1.00 P P P P	Sys Gamma: SDR Range: HDR Range:	C 200 nits (default) Auto	- 1.00 - *	P P P
		1.00 100.0 %	P	

# Transform Function (output)

OLUT1: [3a_BT709_HLG_DISPLAY.cube] OLUT2: [3b_BT709_HLG_DISPLAY.cube]	
Input	Output
Transfer Function	Transfer Function
© BT709 (SDR)	© BT709 (SDR)
O PO	© PL0
O S-Log3	© \$1.093
O HLG	O HL0
Sys Gamma:1.20 P	Sys Gamma: 1.20 P
SDR Range: 200 nits (default) V P	SDR Range: 200 nits (default) P

The output control allows the Operator to define the output with respect to HDR.

If an HDR to SDR process is to be configured, the output should be defined as: BT709 (SDR).

The default setting is: BT709 (SDR)

Note: if it is a requirement that the output conform to HDR10, the output should be set to PQ. PQ and HDR10 employ the same HDR curve so setting PQ will effectively make the output compliant to HDR10

### System Gamma (output)



This control is only active when the Output HDR standard is defined to be either HLG or S-Log3. It is not relevant for outputs that conform to PQ, or SDR formats and the control will be greyed out. When active, **Output System Gamma** may be defined to a value between 1.0 and 2.0. The default setting is: 1.2

Note: this is an output control and a higher setting will result in a brighter output picture.

### SDR Range (output)

	O HLG			
Р				Р
P	SDR Range:	200 nits (default)	•	Р
P		200 nits (default)	<b>^</b>	P
		300 nits		
		500 nits		
		750 nits		
		1000 nits		
		1250 nits		
		1500 nits		
		2000 nits		
		0700-94-	<b>T</b>	
Р	Max Knee: 💻		763.0 r	nV P

This control is only active when the conversion mode is HDR to SDR. The control is used to define the SDR brightness of the output.

The range of the control is: 20 to 3000 nits.

The default value is: 200 nits

Note – somewhat unintuitively, the higher the nit level set, the darker the output picture will be.

### HDR Range (output)

OHLG		
	<b></b> 1.20	
	200 nits (default) 🛛 👻	Р
HDR Range:	Auto 💌	Р
	Auto	
	Narrow	
	Full	

This control is only active when the output is defined to be HDR compliant. The HDR Range may be set to **Auto**, **Full** or **Narrow**, using the drop down menu.

In Auto mode outputs compliant to:

- PQ will be set to Full
- HLG will be set to Narrow
- S-Log3 will be set to Narrow

When set to **Full**, sub-blacks and super-white luminance values are included. When set to **Narrow**, sub-blacks and super-whites are clipped.

# **Gain Adjustment**

Sys Gamma:	_ <b>o</b>	=1.20 P	Sys Gamma:		- 1.20 P
SDR Range:					
HDR Range:					
Gain Adjustmer	: <u> </u>			1.00	P
Soft Clip Level:				100.0 %	P
- DOD Logalizar					
Level: Off					
Maximum:		763.0 mV	Max Knee: 💻		🗢 763 0 mV 🛛 P

Gain Adjustment: this control allow the User to adjust the brightness of the output picture.

The control scale is 0.1 to 10.00

Default value is 1.00

Setting a higher value will make the output picture brighter.

## Soft Clip Level

Sys Gamma:		=1.20 P	Sys Gamma:	 — 1.20 P	
	200 nits (default)				
	nt:				
Soft Clip Level:				 P	
Mavimum				-0 763 0 mV	

The Soft Clip Level control scale is 60 to 100%

Default value is dependent upon the conversion being performed:

If the process is:

- SDR to HDR, the default values is: 100%
- HDR to SDR, the default values is: 80%
- HDR to HDR, the default values is: 100%

Note that if the conversion mode configured is: BT709 (SDR) to BT709 (SDR), these controls will be unavailable (greyed out).

The effect of the White Clip control is to increase detail in the high luminance areas of picture. This maybe important when there are high luminance levels in the source

# 9.11.5 RGB Legalizer: Off / 700mV / 721mV / 735mV / Custom

The default setting of the RGB Legalizer is: Off



Three preset settings are offered for the RGB Legalizer **Level** control: 700mV, 721mV or 735mV. These can be selected using the drop-down menu.

	vei:		UU	
RGB Legaliz	er			
Level:	Off Off	×		
	700mV 721mV	P	•	-51.0 mV
	735mV Custom			

Alternatively, a **Custom** setting can be configured. When set to **Custom**, the custom controls become active allowing the User to set any combination of values:

r RGB Legali	zer ———			
Level:	Custom			
Maximum:			Max Knee:	
Minimum:	-@	-36.4 mV P	Min Knee: 👓	-36.4 mV P

Note: an expanded description of the RGB Legaliser is offered in Appendix D below.

# 9.12 Color LUTs

Alchemist Live (1)	7000:01:01 - Alchemist Live			
Utilities Color LUTs Audio Dolby E Reference Vice Control Mode	Unit Status SYS: Running LIC: Valid INP: OK OUT: OK	Input Status Video: ST 2110 UHD 59p Audio: ST 2110 I 6 Channels Last Changed: 15:31:27 UTC 23:11:20	Output Status Video: ST 2110 UHD 50 Audio: ST 2110 16 Cha Latency: 278 ms	)p nnels
Color LUT Loading				
Warning!				
It is not possible	to load a new Color LUT into t	he active LUT Cache unless it is de-se	elected	
LUT Cache				
LUT 1:	NotUsed			
LUT 2:	NotUsed			
Scan USB	USB *.cube files		Uploa	d All
Uploaded Files:	Available LUTs		Allow De	lete
			Delet	e
			Delete	All

The Color LUTs menu is used to load LUTs.

LUTs in the form of a .cube file, are loaded from a USB Drive inserted into the Alchemist Live mainframe.

# Scan USB



When pressed, the inserted USB Drive will be scanned. Any LUTs tables in the form of .*cube* files, will appear in the **USB \*.cube files...** field:



A LUT may be selected in the USB \*.cube files... field.

## Upload

Pressing the Upload button will result in the selected LUT appearing in the Available LUTs field.



### **Upload All**

Pressing the Upload All button will result in all the available LUTs appearing in the Available LUTs field.



# LUT Cache

A LUT may be assigned to either the LUT 1 Cache or LUT 2 Cache, using the associated drop down menu:

Color LUT Loading				Color LUT Loading	]	
It is not possible				It is not possible		
LUT Cache				LUT Cache		
LUT 1:	3a_BT709_HLG_DISPLAY.cube			LUT 1:	3a_BT709_HLG_DISPLAY.cube	
	Not Used			LUT 2:	3b_BT709_HLG_DISPLAY.cube	
	3a_BT709_HLG_DISPLAY.cube				Not Used	
	3b_BT709_HLG_DISPLAY.cube				3a_BT709_HLG_DISPLAY.cube	
		Ê	heolol I	Scan USB	3b_BT709_HLG_DISPLAY.cube	Upload
	3a_BT709_HLG_DISPLAY.cube		Opioau		38_B1709_HEG_DISPERT.Cube	
					3b_BT709_HLG_DISPLAY.cube	
			Upload All			III Upload All

Note 1 – the same LUT cannot be loaded into both LUT 1 Cache, or LUT 2 Cache at the same time.

Note 2 – a LUT in the LUT Cache cannot be changed if it is active in the HDR Conversion menu.

 O BT2020
 O BT2020

 HDR Conversion
 Image: Conversion

 Image: Conversion
 Image: Conversion

 O NotUsed
 Out71: [3a, BT709,HL0\_DISPLAY.cube]

 O LUT 2: [3b\_BT709,HL0\_DISPLAY.cube]
 Output

 Image: Transfer Function
 Transfer Function

 O PT09 (SDR)
 O BT709 (SDR)

 O P10 (SDR)
 O P20 (SDR)

 O P20 (SDR)
 O P20 (SDR)

The LUT may be applied to a conversion by selecting it in the **Utilities/HDR Conversion** menu:

## Delete

LUTs maybe deleted from the Available LUTs field, by first selecting the LUT to be deleted, then checking the **Allow Delete** box and then pressing the **Delete** button:



# 9.13 Audio

序 Alchemist Live (1) 7000:01:01 - Alchemist Live	
Conversion Conversion Conversion SYS: Running Lic: Valid Audio: ST 2110 UHD 59p Audio: ST 2110 UHD 59p Audio: ST 2110 16 Channels Lic: Valid INF 0K Last Changed: 15:31:27 UTC 23:11:20 Lastency: 278 ms Conversion Conversi	els V
Dolby E Bitstream 1 Input Stream: Stream 1 Channel Pair: Not Active Dolby E Bitstream 3 Input Stream: Stream 1 Channel Pair: Not Active Channel Pair: Not Active	<b>*</b>
Input Channel Status           Str 1:         Str 2:   Str 3: Str 4: Str 4: Str 4:	
Audio Channel Routing Input Stream Select Str 1 × Str 1	•
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	
PCM         PCM <td></td>	
Audio Delay (Ali Channels) - Delay. Oms P	
P Test Tone 1: TKHZ-6 dBFS P Test Tone 2: TKHZ-6 dBFS P	

Alchemist-Live IP supports 16 channels of audio.

Audio features include:

- Audio Routing
- Audio Channel Mapping
- Audio Gain
- Audio Delay
- Tone Generation.
- Dolby E Transcode (option)

# 9.13.1 Dolby® E Bitstream \*

Audio	▼ 0UT: 0	OK	17:32	2:56 UTC 23.1	1.20						
Colby E Bitstrea	Colby E Bitstream 1 Colby E Bitstream 2 Colby E Bitstream 3										
Input Stream:	Stream 1		Input Stream:	Stream 1		Input Stream:	Stream 3				
Channel Pair:	Not Active	*	Channel Pair:	Not Active		Channel Pair:	Not Active	*			

The Dolby E feature for the IP variant of the Alchemist Live, is introduced in V3.

Dolby E is a licenced optional feature. A license may be obtained to allow transcoding of either one, two, or three Dolby E bitstreams.

When Alchemist Live IP is configured to be a single channel converter, up to three Dolby E bitstreams can be transcoded.

When Alchemist Live IP is configured to be a three channel converter, each channel can transcode a single Dolby E bitstream.

### **Single Channel Mode**



The input audio stream(s) carrying the Dolby E bit-stream(s) can be defined using the relevant **Input Stream** drop-down menu:

Colby E Bitstrea	ım 1		Colby E Bitstre	am 2 ——	 Colby E Bitstre	am 3	
Input Stream:	Stream 1	•	Input Stream:	Stream 1	Input Stream:	Stream 3	
Channel Pair:	Stream 1		Channel Pair:	Not Active	Channel Pair:	Not Active	
	Stream 2 Stream 3		1		·		
	Stream 4						

The specific input channels carrying the Dolby E bit-stream can be defined using the **Channel Pair** drop-down menu:

Dolby E Bitetres	de: Normal:	Full	- Dolby	= Ditetre	am 2 —		- Dol	by E Bite	troop	.2 —		
Input Stream:	Stream 1		Input 9	tream:	Stream	13	Inp	ut Stream	n: S	itream		
Channel Pair:	Channel Pair: Chans 3/4		Chanr	el Pair:	Chans	3/4		annel Pa		hans	5/6	
	Not Active Chans 1/2 Chans 3/4 Chans 5/6											
	Chans 7/8 Chans 9/10 Chans 11/12 Chans 13/14	×										

#### **Three Channel Mode**

When Alchemist Live IP is configured as a three channel system, each channel supports the passing of a single Dolby E bitstream:



\*Dolby - Dolby is a registered trademark of Dolby Laboratories.
## 9.13.2 Input Channel Status



The Input Channels Status menu displays the actual audio present in the selected input stream.

In this example shown here, Stream 1 has 16 channels of audio, with channels 3/4 carrying a Dolby E bitstream.

## 9.13.3 Audio Channel Routing



The **Audio Channel Routing** matrix allows routing of input audio channels, from any input stream, to any output audio channel, in any output stream.

Although an input audio stream can contain up to 64 audio channels, only audio channels from the top 16 can be chosen to be routed. Any input audio channels below the top 16 will be discarded.

Note that the number of output streams is defined in the **Output Audio** menu (section 9.9.1 above).

- When the output is configured to have a single output audio stream, all 16 output audio channels will be routed to the output stream.
- When the output is configured to have two output streams, output channels 1 to 8 will be routed to output audio stream 1, and output channels 9 to 16 will be routed to output audio stream 2.
- When the output is configured to have four output streams, output channels 1 to 4 will be routed to output audio stream 1, output channels 5 to 8 will be routed to output audio stream 2, output channels 9 to 12 will be routed to output audio stream 4.

### Input Stream Select

Audio Chann	el Routir	1 <b>g</b> —														
1	Input St	ream	Select													
	Str 1	•	Str 1		Str 2		Str 2		Str 3		Str 3		Str 4		Str 4	
	Str 1															
	Str 2															
input	Str 3															
Ch 1:	Str 4		No.	ğ		S.	N N	ğ		S .	No.	<u>S</u>		ğ	N N	S I
Ch 2:			No.	S	No.		No.	×	No.		No.	×	N N		No.	8
Ch 3:		S.	No.	ğ	Š.	×	ě	Š.	Š.	×	ě	ğ	Š	×.	Ö	ğ

The source stream for each output audio pair is defined using the relevant drop-down menu.

Audio Chanr	1el Rou	ting —														
	Input	Stream	Selec													
	Str 1		Str 1		Str 2		Str 2		Str 3		Str 3		Str 4		Str 4	
	Outp	ut Chan	nels													
nput —	_ 1-2		<sub>-</sub> 3-4		5-6		7-8									16 —
	0	õ	Q	ō	Q	õ	0	õ	0	õ	Q	õ	o	õ	Q	o
Ch 2:		8	S S	8	8	8	8	8	18	0	2	8	N N	0	No.	8
Ch 4:	ŏ	ŏ	ŏ	õ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	õ
Ch 5:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ch 6:	o	o	Q	0	Ō	Ō	Ō	Ō	Q	Ō	Ō	ō	o	ō	o	o II
Ch 7:	2	8	2	2	8	8	NO.	8	18	8	l Q	8	2	8	2	8
	Š	Š	1 de la	Š	1	š	Š	Š	1 de la	č	l.	š	Š	š	Š	č
Ch 10	ŏ	8	10	8	18	ö	18	ŏ	18	ŏ	10	ö	ŏ	ŏ	ŏ	ŏ
Ch 11:	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ
	0	0	0	0	0	0	•	0	0	0	0	0	0	0	0	0
Ch 13:	0	õ	0	0	0	õ	0	0	0	0	0	0	Q	0	0	0
Ch 14:	No.	8	No.			N N	N N	No.	1 X	No.	No.	N N	N N	No.	No.	8 II
Ch 16:	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ	ŏ
Tone1:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tone2:	Q	<u>ō</u>	Q	Ō	Ō	ō	Ō	Ō	Ō	Ō	Q	Ō	Q	Ō	Ō	<u>ō</u>
Mute:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	σ
	Р	ΓP	Р	Р	Р	Р	Р	P	Р	Р	Р	Р	Ρ	Р	Ρ	P
	PCM	PCM	DbE	DbE	PCM	PCM	PCM	PCM	PCM	PCM	РСМ	РСМ	РСМ	РСМ	PCM	PCM

Example of a custom audio routing configuration

Each Audio route can be set to its default setting by pressing the associated 'P' (preset) button.

#### **Tone Generator**

Alchemist Live has two tone generators. Each output audio channel can be configured to be either tone:

15: PCM 16: PCM	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	0
Tone1: Tone2:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
r Audio Output		nel Gair														
Gang																

In this example:

- output audio channel 1 has been configured to be Tone1
- output audio channel 2 has been configured to be **Tone2**

The tones generated by **Tone1** and **Tone2** can be configured in the **Test Tone Configuration** field:

Addid Delay (All					
Delay: 💿=					Ums P
Test Tone Conf	iguration				
Tool Topo 4			Test Tess 2		-
restione 1:	T KH2-0 UBFS		rest rone 2:	4 KH2-0 UBFS	
	1 KHZ-6 dBFS				
	2 KHz-6 dBFS				
	4 KHz-6 dBFS				
	8 KHz-6 dBFS				
	1 KHz-12 dBFS				
	2 KHz-12 dBFS				
	4 KHz-12 dBFS				
	8 KHz=12 dBES				

Tones may be configured with various frequencies and levels.

## 9.13.4 Audio Output Channel Gain (dB)



Each audio output channel has its own associated gain control slider, meaning each output audio channel can be configured with a specific audio gain.

Mute:	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
r Audio Outpu	t Chanr	iel Gair	1 (dB) -													
Gang			•		,				,		,		,			•
	0.00	4.57	2.40	-1.70	0.00	1.83	0.00	-1.70	0.00	2.61	0.00	-5.61	0.00	4.70	0.00	-1.83
	P	P	P	P	P	P	P	P.	P	P.	P	P	P	P.	P	
														- u ms		

Alternatively, the gain controls can be 'ganged' enabling a global gain setting to be applied:



Each channel has an associated preset button **P.** When selected, the audio gain will return to unity.

# 9.13.5 Audio Delay (All Channels)

0.00 0.00 0.00 P P P	0.00 0.00 0.00 P P P	0.00 0.00 0.00 P P P	0.00 0.00 0.00 0.00 P P P P P	0.00 0.00 0.00 P P P
Audio Delay (All Channels) — Delay:				— Oms P

The **Delay** control allows a global delay to be applied to all audio channels. The control will delay audio relative to video.

The delay may be configured to be between 0ms to 500ms.

Default setting is: 0ms

Pressing the preset button **P** will apply the default setting.

# 9.14 Reference

Alchemist Live (1) 7000:01:01 - A	chemist Live	
Color LUTS Audio SYS: Runi Dolby E III Reference VIII: VAI: Pattern Generator	Ing Video: ST 2022 1080 5 d Audio: ST 2110 16 Cha Last Changed: 13:43:39 UTC 24.11.20	9p snneis Latency: 208 ms
Client Control Mode: Normal: Full		×
Reference Mode O Freerun O Reference Lock O Clock Lock Reference Status OK. PTP LOCKED	External Reference Standard: - Error Count: - Since: -	RESET
		0 pixels P
Vertical Timing Adjustment	•	0 lines P

## 9.14.1 Reference Mode

Client Control Mode:	Normal: Full	Control
Reference Mode O Freerun O Reference Lock O Clock Lock		External R Standard Error Cou
Reference Status		

Currently, there is only a single reference mode relevant to the Alchemist Live IP: Clock Locked.

In circumstances where the input frame rate is different from the output frame rate, the locking condition will be 'clock-locked'.

Clock-lock example: if the Alchemist Live is converting 50 fps to 60 fps, then 50 frames of input will exactly align with 60 frames of the output.

|--|

Note: the modes **Freerun & Reference Lock** are only relevant to the SDI variant of Alchemist Live, hence they are disabled (greyed out).

## 9.14.2 External Reference

This menu is only relevant to the SDI variant of Alchemist Live, hence nothing is reported here.

ormai. Fuii	Control			
	External Refer	ence ———		
	Standard:			
	Error Count:		Since: -	RESET

## 9.14.3 Reference Status



A successful locked condition will be identified in the Reference Status pane, as: Locked

The actual lock condition will depend on configuration of the **Time Sync Mode** menu, in the **Time Sync Configuration** template (see section 8.2 above).

In the example shown here, the system is locked to a PTP clock, hence **OK: PTP LOCKED** is reported.

## 9.14.4 Genlock Timing



This menu is only relevant to the SDI variant of Alchemist Live, hence these controls are inactive.

# 9.15 Pattern Generator

Akhemist Live (1) 7000-01-01 - Akhemist Live      Dotby E     Reference     Pattem Generator     Logo     NNIOS	Output Status         Output Status           Video: ST 2022         1080 59p           Audio: ST 2110         16 Channels           Last Changed:         Latency. 221 ms
Client Control Mode: Normal: Full Control Test Patterns Pattern Enable Pattern Select Black Action on Input Loss O Nothing O Black	Caption Overlay  Mode  Off (No Caption)  Ouser Caption  Ouser Caption  Ouser Caption  User Caption  Atchemist Live (1)  P S

## 9.15.1 Test Patterns



The test pattern generator is enabled using the **Pattern Enable** check box:



### Pattern Select



The required pattern can be configured using the drop-down menu.

### **Action on Input Loss**

┌ Test Patterns		Caption Ov
Pattern Enabl		Mode -
	Black	O Use O Qua
Action on Input O Nothing O Black O Black and S	Loss ———	Ö Statu User Ca
O Test Pattern		Alchem

The **Action on Input Loss** control allows the Operator to configure the output in the event of the input becoming lost.

Should the setting be: **Black and Status**, upon loss, the output will cut to a black field, with a caption indicating input loss:



## 9.15.2 Caption Overlay



The Caption Overlay feature allow the Operator to easily identify the downstream transmission path.

### Mode – Off (No caption)

The default mode is **Off.** No caption is inserted in the output.

### Mode - User Caption



If required, the caption can be changed to something more meaningful:





## Mode – Quadrant Ident

14:52:27 U	TC 05.07.21	
	Caption Overlay Mode O Off (No Caption) User Caption O Status Display User Caption Alchemist Live (1) P S	3

When the output is UHD SQD or 2SI or 4K.

### Mode – Status Display



When enable, the **Status Display** feature will insert text describing the current conversion configuration.

# 9.16 Logo

Alchemist Live (1)	7000:01:01 - Alchemist	Live			
Reference Pattern Generator Logo NMOS Logging	Unit Status SYS: Running LIC: Valid INP: OK OUT: OK	Input Status Video: ST 2022 Audio: ST 2110 Last Changed: 13:43:39 UTC 24	1080 59p 16 Channels 4.11.20	Output Status Video: ST 2022 Audio: ST 2110 Latency: 209 ms	1080 50i 16 Channels
	Normal: Full Control				~
Logo Insertion					
H Position	-5% P	V Position 5 %	P	ansparency Description of the second s	% Р
Scan USB	USB *.png files				Upload Upload All
Uploaded Files:	Select Logo GrassValley.100.png		-		Allow Delete Delete
					Delete All

## 9.16.1 Logo Insertion

## Logo Enable



Logo insertion into the output video stream is activated using the: Logo Enable control. The default setting is: Disabled.

### Scan USB



Logos are imported to the Alchemist Live system via a USB Drive. Logo should be in the form of a .png file. Any .png files present on the USB drive will appear in the top pane, when the USB is scanned:



Any logo file appearing in the left pane can be uploaded to the Alchemist System by selecting the appropriate logo file and pressing the Upload button.

- Logo Incortion		
- Logo inseruon		
Logo Enable		
H Position	- 5 % P V Position Transparency	-0% P
Scan USB	USB * png files logos/test/GV-log-2 png logos/test/GV-log-2 png	Upload
	logos/test/GV-log-1.png	Linioad All
	New-GV-Logo png	
	Select Logo	Allow Delete
	GrassValley.100.png	
	GV-log-1.png	Delete
		Delete All

The Logo file will now appear in the lower pane:

Any logo appearing in the lower pane can be selected and then inserted into the output picture by checking the **Logo Enable** control:



#### H Position & V Position

The position of the inserted Logo may be adjusted using the **H Position** and **V Position** controls.

Logo Insertion	
H Position	- 75 % P
	USB * png files logositest/GV4og-2 png logositest/GV4og-3 png logositest/GV4og-3 png
	New-GV-Logo.png



#### Transparency

The transparency of the inserted logo may be adjusted using the **Transparency** control:

V Position 80 % P	— 0 % P		C grass valles
ng	Upload		
ng ng	Upload All		
		- Carlo - Sala	- hate

Note that the resolution of the Logo .png file, will dictate the size of the logo on screen.

Example – a logo with a resolution of 100 x 50 pixels, will be 100 pixels wide and 50 lines high, within the output video raster.

### Delete

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	Select Logo GrassValley 100 ppg	Allow Delete
	GV-log-1.png	Delete
		Delete
		Delete All

Any logo appearing in the **Select Logo** pane may selected and deleted using the **Delete** button. All the logos appearing in the **Select Logo** pane may be deleted by selecting the **Delete All** button

# 9.17 NMOS

Alchemist Live (1) 70	00:01:01 - A	chemist Live			
eference 🔺	Unit Status SYS: Runn LIC: Val:	ing Video	Status ): ST 2022 1080 59p ): ST 2110 16 Channels	Output Status Video: ST 2022 Audio: ST 2110	1080 50i 16 Channels
ogo III					
	Normal: Full				
Update to New Settings				Label	
After changes to any of NMOS service must be	the controls restarted by	on this page the clicking UPDATE	UPDATE	Alchemist Live (1)	PS
Label Patterns ——					
Input Pattern					
{dev} Input:{spig}					PS
- Input Variables					
					5
Output Pattern					
{dev} Output:{spig}					PS
Output Variables					
					S
Kau					
Ney	The patterr which are	i is freeform text which substituted dynamicall	n can include variables ly		
	Variables a	ire enclosed with brac	es e.g. {var}		
Auto-generated:	{dev}	Device label Spigot number (offse	thuis officir offic		
	(spig) (flow)	Flow number	r by (s_on) or (i_on))		
	(flowalt)	Flow number (alterna	ative formatting;		
		restarts from 1 for ea	ch flow format type)		
	(fmt)	Flow format type	ef allef dild utild allef.	41)	
Ontional variables:	(sf v1)	Output 2022-6 format	si_axsi_uxii_vi xii_axii_ t description (default Vide	<i>וו</i> ב רו	
	{sf_v2}	Output 2110-20 forma	at description (default Vid	aoAit)	
	{sf_a1}	Output 2110-30 form	at description (default 'Auc	io')	
	{sf_a2}	Output 2110-31 form:	at description (default 'Auc	ioAlt')	
		Output 2110-40 form:			
	{sf_d}		at description (default Dat	a)	
	{sf_d} (rf_v1)	Input video format de	at description (default 'Dat scription (default 'Video') description (default 'Video')	a) 	
	{sf_d} {rf_v1} {rf_a1} {rf_a2}	Input video format de Input 2110-30 format Input 2110-31 format	at description (default 'Dat scription (default 'Video') : description (default 'Audio : description (default 'Audio	a) •) •Alth	
	{sf_d} {rf_v1} {rf_a1} {rf_a2} {rf_d}	Input video format de Input 2110-30 format Input 2110-31 format Input 2110-40 format	at description (default 'Dat scription (default 'Video') : description (default 'Audio : description (default 'Audio : description (default <u>'Data</u> '	a) /) /Alt/) )	
	{sf_d} {rf_v1} {rf_a1} {rf_a2} {rf_d} {s_off}	Input video format de Input 2110-30 format Input 2110-31 format Input 2110-40 format Output index offset (d	at description (default Dat scription (default Video) description (default 'Audio description (default 'Audio description (default Data' lefault 0)	a) /) /Alt) )	
	(sf_d) (rf_v1) (rf_a1) (rf_a2) (rf_d) (s_off) (r_off)	Input video format de Input 2110-30 format Input 2110-31 format Input 2110-40 format Output index offset (del Input index offset (del	at description (default Dat scription (default 'Video') description (default 'Audio description (default 'Data' description (default Data' lefault 0) fault 0)	a) ,) ,Alt) ) 	
	(sf_d) (rf_v1) (rf_a1) (rf_a2) (rf_d) (s_off) (r_off) (s_pad)	Input video format de Input 2110-30 format Input 2110-31 format Input 2110-40 format Output index offset (de Output index offset (def Output number padd	at description (default Dat scription (default 'Video') description (default 'Audio description (default 'Audio description (default Data' (default 0) fault 0) ing to prefix small number	a) /Ait) ) s with	
	(sf_d) (rf_v1) (rf_a1) (rf_a2) (rf_d) (s_off) (r_off) (s_pad) (r_pad)	Input video format de Input 2110-30 format Input 2110-31 format Input 2110-31 format Output index offset (de Output index offset (de Output number paddin Ieading 0's (default 2 Input number paddin	at description (default Dat scription (default Ndeo) description (default Audic description (default Audic description (default Data efault 0) fault 0) ing to prefix small numbers 0 prefix small numbers	a) ;) ;Ait) ) s with with	
40	{sf_d} {rf_v1} {rf_a1} {rf_a2} {rf_d} {s_off} {s_pad} {r_pad}	Input vide format de Input 2110-30 format Input 2110-30 format Input 2110-40 format Output index offset (def Input index offset (def Input index offset (def leading 0's (default 2 Input number paddin leading 0's (default 2 ear, if ea/) Output fanie	at description (default Dat scription (default Video) description (default Audic description (default Audic description (default Data default 0) fault 0) ing to prefix small number g to prefix small numbers ) 1. (fowalt//fmtt)	a) ;) ,Alt) ) s with with	
	{sf_d} {(f_v1) {(f_a1} {(f_a2) {(f_d) {s_off} {(_off) {s_pad} {(_pad) Output patt Output patt	Input video format de Input 2110-30 format Input 2110-31 format Input 2110-40 format Output index offset (del Output number paddin Ieading 0% (default 2 Input number paddin Ieading 0% (default 2 em. (dev) Output spig bles soff-8,51 <u>v2-</u>	at description (defauit Dati description (defauit Xudio description (defauit Xudio description (defauit Xudio description (defauit Data efauit 0) ing to prefix small numbers ) )]_(flowait)((fmt)) \/sf_af=X^3(_d=D) <u>'s_pa</u>	a) ) Alt) ) with #=1	
	{sf_d} {(f_vt) {(f_a1} {(f_a2} {(f_a2) {(r_off) {s_off} {(s_off) {s_pad} {(r_pad} Output patt Output vari First output	Input video format de Input 2110-30 format Input 2110-31 format Input 2110-31 format Input 2110-40 format Output Index offset (de Output number paddin Ieading 0's (default 2 Input number paddin Ieading 0's (default 2 erm: (dev) Output (spic) spices 5, ef x=5, f x>= 1 generates: AL-1 (	at description (defauit) Dati description (defauit X-uid description (defauit X-uid description (defauit X-uid description (defauit T-Data) efauit 0) fount 0) g to prefix small numbers ))_(forwait)((fmt)) V_s(_s1=X,S(_d=D);s_paa Uptiot_1 (V,	a) ) Alt) ) with #=1	
	{sf_d} {rf_vr} {rf_a1} {rf_a2} {rf_d} {s_off} {s_pad} {r_pad} Output patf Output vari First outpu	Cliput video format de Input 2110-30 format Input 2110-31 format Input 2110-41 format Input 2110-40 format Output index offset (d Input index offset (d I	at description (default Dati description (default Audi description (default Audi description (default Audi description (default Data lefault 0) aut 0) g to prefix small numbers )) [flowatt)((fmt)) Ysfg a1=X/sf_d=D's_pa Upturk1=1 (K) Upturk1=1 (K)	a) ;) (Att) ; with ;=1	

With the release of Version 3 software, Alchemist Live now supports NMOS.

Currently Alchemist Live supports IS04 and IS05 parts of the standard.

- IS04 Discovery and Registration
- IS05 Connection Management

The NMOS feature allows for discovery of devices/systems with their capabilities, register then (IS-04) and from that the connectivity of devices/systems (IS-05).

The **Pattern Labelling** of the GV Live Host will be migrated to the Alchemist Live NMOS menu. This means that in circumstances where the Alchemist Live is configured to be a 3x channel processor, it is not required to configure all three NMOS channels separately.

The NMOS configuration of the Agent will override the NMOS configuration of the Alchemist Live Host.

At the NMOS Agent level, it is possible to:

- Give set the labels to the Agents so they can be named and that helps identification within the registry. By default they are unique within the Alchemist Live :Alchemist Live (1), Alchemist Live (2), Alchemist Live (3), for 3x HD Agents or 1x UHD Agent it is (Alchemist Live (1)) but it the environment has multiple Alchemist Live system then each server should have unique Labels set to help operationally.
- By default each Agent inherits the Label Patterns set on the Host NMOS menu but you can create more specific Label Patterns on each Agent to identify the Alchemist Live connections. The Agent Label Patterns take priority over the Host Label Patterns.

## 9.17.1 Update to New Settings



If any changes are made to NMOS settings, the NMOS Service will require restarting, using the **UPDATE** button.

## 9.17.2 Label Patterns



A unique Label can be assigned to ease identification in the NMOS Register.

This feature is particularly useful when the Alchemist Live is configured as a three channel system, enabling individual agents to be easily identified in the NMOS Register. Or, if multiple Alchemist Lives are present and require easy identification.

## 9.17.3 Label Patterns

abel Patterns				
Input Pattern				
{dev} Input:{spig}				PS
Input Variables				
				9
Output Pattern				
{dev} Output:{spig}				P S
Output Variables				
				5
Key	The			
	which are	substituted dynamically	es	
	Variables	are enclosed with braces e.g. {var}		
Auto-generated:	(dev)	Device label		
	{spig}	Spigot number (offset by {s_off} or {r_off}		
	{flow}	Flow number		
	(nowait)	restarts from 1 for each flow format type)		
	{fmt}	Flow format type		
		(uses one of {sf_v1 }sf_a }sf_d rf_v1 }rf_	_a){rf_d})	
Optional variables:	{sf_v1}	Output 2022-6 format description (defaul	t Video)	
	{sf_v2}	Output 2110-20 format description (defai	ult VideoAlt')	
	(st_a1)	Output 2110-30 format description (defail	UT AUGO)	
	(si_d2) {sf_d}	Output 2110-31 format description (defail	ilt Data'i	
	{rf_v1}	Input video format description (default Vi	deo')	
	(rf_a1)	Input 2110-30 format description (default	'Audio')	
	{rf_a2}	Input 2110-31 format description (default	'AudioAlt')	
	{b_1n}	Input 2110-40 format description (default	(Data)	
	(S_0T)	Output index offset (default 0)		
	(s_on)	Output number padding to prefix small n	umbers with	
		leading 0's (default 2)		
	{r_pad}	Input number padding to prefix small nur leading 0's (default 2)	nbers with	
e.g	. Output pa	ttern: {dev} Output:{spig}_{flowalt}({fmt})		
	Output va	iables: s_off=8;sf_v2=V;sf_a1='A';sf_d='D	s_pad=1	
	First outp	ut generates: AL-1 Output:9_1 (V)		
		AL-1 Output:9_1 (A)		

### **Input Pattern**



This allows the User to define how the Input Connector will appear in the NMOS Registry.

The parameters should be entered in terms defined by the Key.

### **Input Variables**



Allows optional variables to be configured, so adding more detail to the NMOS Register. The parameters should be entered in terms defined by the **Optional Variables** in the **Key**.

### **Output Pattern**



Allows the User to define how the Output Connector will appear in the NMOS Registry. The parameters should be entered in terms defined by the **Key**.

### **Output Variables**



Allows optional variables to be configured, so adding more detail to the NMOS Register.

The parameters should be entered in terms defined by the **Optional Variables** in the **Key**.

Key

Key ———	The pattern is freeform text which can include variables which are substituted dynamically Variables are enclosed with braces e.g. (var)		xt which can include variables amically ith braces e.g. (var)	
Auto-generated:	{dev} {spig} {flow} {flowalt} {fmt}	Device label Spigot number Flow number restarts from Flow format ty (uses one of 6	er (offset by (s_off) or (r_off)) (alternative formatting; 1 for each flow format type) pe st vill st allst diktr vill fr allrf di))	
Optional variables:	<pre>{sf_v1} {sf_v2} {sf_a2} {sf_a2} {sf_a2} {rf_v1} {rf_a1} {rf_a2} {rf_a3} {r_a3} {r_a3} {r_pad} {r_pad}</pre>	Output 2022-6 Output 2022-6 Output 2110-3 Output 2110-3 Output 2110-3 Input 2110-40 Output 2110-40 Output 10-30 Input 110-40 Output index off Output number leading 0's (d	energiene energiene (mini-ani-ani-ani-ani-ani-ani-ani-ani-ani-	
e.g.	Output pat Output var First outpu	tern: {dev} Outp iables: s_off=8; it generates:	ut{spig}_(flowalt){(fmt})) sf_v2=V;sf_a1='A';sf_d='D';s_pad=1 AL-1 Output9_1 (V) AL-1 Output9_1 (A) AL-1 Output9_1 (D)	

The Key lists the terms that can be used to define the Alchemist Live, in the NMOS Register.

# 9.18 Alchemist Live Logging

Achemist Live (1) 7000.01:01 - Alchemist Live				
Pattern Generator Audio Unit Status - SYS: Runni LIC: Valid INP: Audio OUT: OK	ng Video: ST 2110 UHD 50p Audio: ST 2110 UHD 50p Audio: ST 2110 16 Chann Last Changed: 12:43:59 UTC 25:11.20	Output Status Video: ST 2110 1080 59p Audio: ST 2110 16 Channels Latency: 317 ms		
		<b>~</b>		
Logging Input	Log Field	Log Value WARN: Audio Error		
Input Video Transport	INPUT 1 VIDEO TRANSPORT=	ST 2110		
Input Standard	INPUT_1_STANDARD=	UHD 50p		
✓ Input Audio Transport	INPUT_1_AUDIO_TRANSPORT=	ST 2110		
Input Last Changed	INPUT_1_LAST_CHANGED=	12:43:59 UTC 25.11.20		
Logging Output				
Log Enable	Log Field	Log Value		
Output State	OUTPUT_1_STATE=	OK OT 2110		
Uutput Video Transport	OUTPUT_1_VIDEO_TRANSPORT=	1020 500		
Output Standard	OUTPUT_1_STANDARD=	1080 S9p		
	OUTFOT_T_AODIO_TRANSFORT=	512110		
r Longing Reference				
Log Enable	Log Field	Log Value		
Reference Source	REFERENCE_1_SOURCE=	Clock		
Reference State	REFERENCE_1_STATE=	OK: PTP LOCKED		
Reference Standard	REFERENCE_1_STANDARD=	-		
Reference Error Count	REFERENCE_1_ERR_COUNT=	·		
Reference Error Reset Time	REFERENCE_1_ERR_RESET_AT=	-		

Here items relevant to: Input, Output, can be configured to be logged.

Although **Reference Logging** appears, because Alchemist IP cannot actually be referenced externally, these logging fields will always remain blank.

In the **Logging** menu, log fields may be *enabled*, or *disabled*. Log fields are sent to the defined Log Server (see section 8.7.5 above).

The default configuration is; everything enabled.

# 9.19 Logging – Audio

Alchemist Live (1) 7000:01:01 - Alc	hemist Live	
NMOS Logging Logging-Audio Logging-Setup Setup	Input Status ng Video: ST 2110 UHD 50p Audio: ST 2110 16 Chann Error Last Changed: 14:15:27 UTC 25:11.20	Output Status Video: ST 2110 1080 59p Audio: ST 2110 16 Channels Latency. 316 ms
Logging Input Audio Stream 1 Log Enable I I Audio Stream 1 Type	Log Field AUDIO STREAM 1 TYPE=	Log Value ST 2110-30
✓ Audio Stream 1 Channels	AUDIO_STREAM_1_CHANS=	16
Audio Stream 1 Pkt Time	AUDIO_STREAM_1_PTIME=	125 us
Audio Stream 1 Offset	AUDIO_STREAM_1_OFFSET=	807 ms
,		
Logging Input Audio Stream 2	Log Field	Log Value
Audio Stream 2 Type	AUDIO_STREAM_2_TYPE=	Disabled
Audio Stream 2 Channels	AUDIO_STREAM_2_CHANS=	-
✓ Audio Stream 2 Pkt Time	AUDIO_STREAM_2_PTIME=	-
Audio Stream 2 Offset	AUDIO_STREAM_2_OFFSET=	0 ms
Logging input Audio Stream 3	Log Field	Log Value
Audio Stream 3 Type	AUDIO STREAM 3 TYPE=	Disabled
Audio Stream 3 Channels	AUDIO_STREAM_3_CHANS=	
Audio Stream 3 Pkt Time	AUDIO_STREAM_3_PTIME=	-
Audio Stream 3 Offset	AUDIO_STREAM_3_OFFSET=	0 ms
r Logging Input Audio Stream 4		
Log Enable	Log Field	Log Value
Audio Stream 4 Type	AUDIO_STREAM_4_TYPE=	Disabled
Audio Stream 4 Channels	AUDIO_STREAM_4_CHANS=	-
Audio Stream 4 Pkt Time	AUDIO_STREAM_4_PTIME=	-
Audio Stream 4 Offset	AUDIO_STREAM_4_OFFSET=	0 ms

Here, items relevant to Audio can be configured to be logged.

In the **Logging** menu, log fields may be *enabled*, or *disabled*. Log fields are sent to the defined Log Server (see section 8.7.5 above).

The default configuration is; everything enabled.

# 9.20 Logging - Setup

NMOS Logging Logging - Audio Logging - Setup Setup	us Input Status	Output Status Video: 57 2110 1080 59p Audio: ST 2110 16 Channels Latency: 316 ms
r Logging License		
Log Enable	Log Field	Log Value
✓ License Server Host	LICENSE_SERVER_HOST=	10.96.168.134
License Server Port	LICENSE_SERVER_PORT=	5093
License Server State	LICENSE_SERVER_STATE=	Connected
License State	LICENSE_STATE=	Valid
r Logging Misc		
Log Enable	Log Field	Log Value
Software Version	SOFTWARE_VERSION=	3.0.0.1
Network Status	NETWORK_STATE=	ок
Log Server Name	LOGSERVER_NAME=	LogServer
Processing Latency	PROCESSING_LATENCY=	316 ms

Here items relevant to: Licensing and Miscellaneous items can be configured to be logged.

In the **Logging - Setup** menu, log fields may be *enabled* and *disabled*. Log fields are sent to the defined Log Server (see section 8.7.5 above).

The default configuration is; everything enabled.

# 9.21 Setup

Alchemist Live (1) 8000:01:01 - Alchemi	st Live	
NMOS Logging - Audio Logging - Setup Setup Client Control Mode: Normal <u>Full Control</u>	Input Status Video: \$7 2110 UHD 50p Audio: None - Last Changed 10:15:19 UTC 13.04.21	Output Status Video: ST 2110 UHD 59p Audio: ST 2110 16 Channels Latency: 280 ms
Warning! Changes to any of the controls on this pa	ge could lead to temporary disruption of	all outputs!
Unit Name Alchemist Live (1)	S STOP	Misc Version Start Time 3.0.0.44 10:15:04 UTC 13.04.21
Licensing Information License Server: Iocalhost	License Status:	Proc ID CPU Mask 1870 0xFCFEFCFE
Port: 5093 Server Status: Connected	Valid	Current Log Server AGLiveLogServer
Option Licensing Dolby E No Licenses In Use Available	a: 3/3 not be applied	e Option Licensing will until the Agent is restarted
IP Routing           Current           Primary IP:         10.96           Second IP:         10.96           DDS Domain           24	New           Primary IP:         10.96.           Second IP:         10.96.           Device UUID           IF2A626FC-096F-4C17-950B-1FE	110   TAKE
SMPTE 2110-20 SD 525 Bottom Field First		
RTP Payload Types	2022: 98 <b>Y P</b> SM	APTE 2110-30: 97 ▼ P
Ratified	2110-20: 06 V P SN	(PTE 2110-31: 97 Y P
O Custom	SN	IPTE 2110-40: 100 ▼ P
System Configuration Supported Field/Frame Rates: All (D	Default) 💌 P	
Hardware		
I/O Configuration: RTP Interface O	nly 🔻 GPU Devices	
	1: NVIDIA[2] Di	splay Adapter (0) 👻
	2: NVIDIA[2] Di	splay Adapter (1) 👻
	ler Level: 0 3: NVIDIA[2] Di 4: Not Used	splay Adapter (2)

## 9.21.1 Unit Name



An Alchemist Live running in UHD/4K mode will only have a single Alchemist Live channel. The default name will be:

Alchemist Live (1)

An Alchemist Live running in 3x 1080p (3G) mode will set the default names as:

- Alchemist Live (1)
- Alchemist Live (2)
- Alchemist Live (3)

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In all cases, the Unit Name may be edited:



Once the new name has been typed in, pressing the **S** button will save the change. Pressing **P** will reset the Unit Name to the default setting.

# 9.21.2 Agent STOP



Pressing the STOP button will stop the Alchemist Live Agent.

If the Agent is stopped, the template will close.

The Agent can be restarted from the GV Live template (see part 8.1.2 above).

## 9.21.3 Misc: Version / Start Time / Proc ID / CPU Mask / Current Log Server



The Misc menu offers a number of useful information fields.

## 9.21.4 Licensing Information

- Licensing Informa License Server:	ation localhos		License Status:	Proc 64
Port	5093		Valid	- Curre
Server Status:	Connecte	d		LogS
Option Licensing				

In the License Information pane, details of the license server are reported.

# 9.21.5 Option Licensing

Server Status: Connected		LogServer
Option Licensing Dolby E 3 Dolby E Licenses  Available:		Changes to the Option Licensing will not be applied until the Agent is restarted
IP Routing	New	

Currently the only optional license applicable to Alchemist Live is for the Dolby E Transcode feature.

Alchemist Live can be licensed to have just a single Dolby E License, 2x Dolby E licenses, or 3x Dolby E Licenses.

The actual number of Dolby E license available will be reported here.

# 9.21.6 IP Routing



#### Current

IP Routing — Current Primary IP: Second IP:	10.96. 10.96.	: ens11f0 : ens11f1
DDS Domai 24	n	

The **Current** pane details the current IP addresses of the Mellanox network adaptors and describes which the Primary is and which the Secondary is.

Note – the Mellanox interface has two network ports. The Primary and the Secondary. The function of the Secondary port is to act as a redundant interface, should something adverse happen to the Primary. It is not a mandatory requirement that the Secondary port is configured.

In normal circumstances Network Port **ens11f0** is defined as the Primary and **ens11f1** as the Secondary. However, the designation of Primary and Secondary can be modified using the dropdown menu.

New			
Primary IP:	10.96. : ens11f0	•	TAKE
Second IP:	10.96. : ens11f1	-	IANE
	Not Used		
Device UUID			
{6E5FB411-6	10.96. : ens11f0		
	10.96. : ens11f1		

The change will take effect upon pressing the **TAKE** button.

### **DDS Domain**



Here the **DDS Domain** is confirmed.

In this example the DDS Domain has been confirmed to be: 101

Note: The DDS Domain is configured at Host level (see section 8.7.3 above).

#### Device UUID



Reports the UUID (Universal Unique Identifier) of the host machine.

### SMPTE 2110-20



When the defined output standard is 525/59i, this control enables the output to be BFF (Bottom Field First).

# 9.21.7 RTP Payload Types



The RTP Payload Type is a 7 bit code in the RTP Packet Header. It indicates the format of the payload and determines its interpretation by the application.

- Pre-Ratification RTP payload type IDs used by some GV equipment prior to SMPTE ratification.
- Ratified RTP payload type IDs agreed and ratified by SMPTE.
- Custom Fully customizable RTP payload type IDs for specific user applications.

## 9.21.8 System Configuration

▼ P
GPU Devices
2: NVIDIA[1] Display Adapter (1)
3: NVIDIA(1) Display Adapter (2)

#### **Supported Field/Frame Rates**

System Configuration -				
Supported Field/Frame	e Rates:	All (Default)	-	Р
		All (Default)		
		High Only (50-60Hz) Low Only (23-30Hz)		Devices NVIDIA[1] Display

The **Supported Field/Frame Rates** control allows the Alchemist Live to be configured to allow either only high frame rate conversion, or only low frame rate conversion.

#### **I/O Configuration**



The initial version of Alchemist Live IP will only support Video over IP. There is not the option of configuring the system to be either an IP version, or SDI version. Hence the I/O configuration control has no effect.

In a future release, it is anticipated that Alchemist Live will support both Video over IP and SDI.

### **GPU Devices**

			01 ackets	
	- GPU 1:	J Devices NVIDIA Display Ada	apter (0)	
		NVIDIA Display Ada	apter (1)	
		NVIDIA Display Ada	apter (2)	
		Not Used		

The GPU Devices field confirms the GPU resource available for video processing.

This field is non-interactive.

Alchemist Live requires 3 GPU, hence 3 GPU are reported and the forth slot is vacant.

Supported Resolution	Framerate
525i (720x480)	29.97psf, 59.94i
625i (720x576)	25psf, 50i
720 (1280x720)	50p, 59.94p, 60p.
1080 (1920x1080)	23.98p, 24p, 25psf, 25p, 29.97psf, 29p, 30psf, 30p, 50i, 50p, 59.94i, 59.94p, 60i, 60p
UHD (3840x2160)	23.98p, 24p, 25p, 29.97p, 30p, 50p, 59.94p, 60p
4K (4096x2160)	23.98p, 24p, 25p, 29.97p, 30p, 50p, 59.94p, 60p

# Table 2: Supported Resolution/Framerate

## Notes:

- 1. The supported Resolutions/Frame Rates apply to both Alchemist Live input and output.
- 2. *High* to *Low* frame rate conversion is not supported (i.e 50p to 23p).
- 3. Low to High frame rate conversion is not supported (i.e 29.97p to 50p).

# 10. The Console

# **10.1 Introduction**

Alchemist Live includes a Console application offering easy configuration of key elements of the system.

Some of the Console features require the use of a USB stick. USB sticks will be automatically mounted and should be formatted as FAT32.

Warning – the Console should not be interacted with when Alchemist Live is processing video as part of a live broadcast, as this can cause minor disturbances on the output pictures.

Using the Console, the following items are easily configured:

- Network NIC 1 (eno1) static IP only, NIC 2, 3 and 4 may be configured to be either Static IP or DHCP.
- The *time* and *date* may be set.
- An upgrade process may be initiated.
- A new license may be installed.
- The status of the system may be displayed.
- Operational Logs may be retrieved.
- The Server can be re-started.
- The Server can be shut down.

# **10.2 Accessing the Console**

To access the Console connect a monitor to the on-board VGA and connect a USB mouse and keyboard.

1. Connect a Monitor and Keyboard to the Alchemist Live Host machine:



2. Connect a Network cable to the Server:

Note that there are 3 network ports.



- NIC 1 (eno1) is factory configured with the default Static IP Address: 192.168.0.1. This port maybe set to another static IP address but cannot be set to DHCP.
- NIC 2 (eno2) is factory configured as DHCP. This port may also be configured as Static.
- IPMI port allows control of the IPMI interface (see section 11, below).
- 3. Boot up the Alchemist Live. Once the boot sequence has completed, the Console will appear automatically:



## 10.2.1 Retrieval of the License Lock Code:

The License Lock Code is reported in the Console:



## 10.2.2 Configure Network – Standard (Recommended)

Using the up/down arrows on the keyboard, highlight the item to be configured.

In this case: Configure Network



Press return and the Network Configuration menu will now be displayed:



Note that in the Console:

- NIC 1 equates to eno1\*
- NIC 2 equates to eno2
- NIC 3 equates to ens1f0 ConnectX-5 Port 1
- NIC 4 equates to ens1f1 ConnectX-5 Port 2

\* This port maybe set to another static IP address, mask and gateway but cannot be set to DHCP.

Using the up/down arrows on the keyboard, highlight the NIC to be configured. In this example NIC 2 is selected:

GV Live -	Network Configuration ————
Select	an interface to configure:
	(X) = ma2 $() = ms1f0$
	() ens1f1
Select	an action for interface eno1:

Now press the space bar on the keyboard to select the NIC.

Using the up/down arrows on the keyboard, move down to the **Configure** section. Note that the menu options will update to:

GV Live - Net	work Conf	iguration —————
Select an i	nterface () (X) () ()	to configure: eno1 eno2 ens1f0 ens1f1
Select an a (X) Config () Enable () Disabl	ction for ure Stati e	interface eno2: c/DHCP
Type :	(X) (_)	Static DHCP
IP:		

Select the desired configuration.

If the selection is **Static**, press the **Tab** button again and the display will update again, this time with fields to enter an **IP Address** and **Gateway** visible:

GV Live - Net	work Conf	iguration —————
Select an i	nterface ()	to configure: eno1
	(X)	eno2
		ensiife
	0	Elistitit
Select an a (X) Config	ction for ure Stati	interface eno2: c/DHCP
() Disabl	e	
Type :	(X)	Static
		DHCP
IP:		
Catewaut		

Using the up/down arrows on the keyboard, highlight **IP** (IP will turn white):

Select an a (X) Config	ction for u <b>re</b>	interface	eno2:
() Enable			
() Disable	B		
Tupe:	()	DHCP	
	(X)	Static	
IP:			
Gatewau:			

### Type in the required address:

r SAM Live − Net	twork Configuration —————	
Select an in	nterface to configure:	
	(X) eno2	
	() ens1f0 () ens1f1	
The second second second	STATE STREET	
Select an au (X) Configu () Enable	ction for interface eno2: ure Static/DHCP	Note:
Type:	e (X) Static ( ) DHCP	To specify the Subnet Mask, the IP Address <u>must</u> be appended with: /xx
IP: Gateway:	192.164.200.2/24 192.164.200.1	For example: <b>192.164.200.2/24</b> with a Gateway <b>192.164.200.1</b>
Apply		where <b>/24 = 255.255.255.0</b> subnet mask.

If it is desired to communicate over an associated/trunked/bridged network, then a Gateway Address will be required:



Once **IP Address** and **Gateway** have been configured, using the up/down arrows on the keyboard, navigate to and highlight: **Apply** 

Press return and a confirmation of the configuration change will be asked for:



Select OK.



Note that confirmation of the new Static IP Address is displayed in the **Current status** section:

If the NIC has been configured to be DHCP, the IP Address will be displayed in the Current Status section.



Next, configure the static addresses for NIC3 (ens1f0) and NIC4 (ens1f1)

To exit the **Configure Network** menu, navigate down to the **OK** symbol (bottom right corner of display):



Select **OK**. This will return the display to the top menu of the Console.

Note: only one gateway address for the various NICs should be defined. One NIC should not be defined to have a different Gateway Address to another NIC. This restriction is a feature of Linux.

If multiple Gateways are required the Advanced Network Config menu can be used to define static routes.

## 10.2.3 Configure Network – Custom (Advanced)



Selecting Configure Network – Custom (Advanced) will bring up the Advanced Network Configuration menu:



The GV Live Console network configuration now includes an 'Advanced' option which is an alternative to the basic approach offered by previous versions of Alchemist Live.

This allows full manual configuration of the unit's Debian-style network script and allows more sophisticated routing options should it be required. An example would be the creation of static routes.

## **10.2.4 Network Diagnostics**



Network Diagnostics includes a Ping feature allowing interrogation of associated networks.

## 10.2.5 Set Time and Date

Using the up/down arrows on the keyboard, highlight Set Time and Date:



Press return to enter the **Set Time and Date** menu:



Select OK to complete the process, and return to the top menu.

## 10.2.6 Upgrade GV Live

The Software Update will need to be uploaded to a USB Drive.

If the software package is in the form of a Zip file, it should be unzipped prior to being uploaded to the USB drive:

🗕   🕑 📙 🖛	Dri	ve Tools USB Drive (D:)			
File Home Share	View M	anage			
$\leftrightarrow \rightarrow \neg \uparrow \blacksquare \rightarrow$ This P	C → USB Driv	e (D:)			
1 Culture		Name	Date modified	Туре	Size
Curck access		gvLive-2.1.1.16-Linux-x86_64	18/05/2020 15:48	deb Archive	159,737 KB
Desktop	<i>R</i>	( gvLive-3.0.0.44-Linux-x86_64	02/04/2021 18:34	deb Archive	159,712 KB
Downloads	×				
🖹 Documents	*				
GV Live	*				
scratch	*				

In this example there are two versions of code present on this USB drive.

Using the up/down arrows on the keyboard, highlight Upgrade GV Live:



Press return and a system prompt will appear to insert the USB Drive.

GV Live	- Upgrade
	Message
	Insert a USB stick containing the GV Live upgrade files
	Cance) UX
	Service 2

Insert the USB drive.

Note that if there are multiple versions of Alchemist Live software on the USB drive, a menu will appear where by the desired version can be chosen:



Select **Install** to complete the process.

After install a prompt will appear to re-boot the system.
### 10.2.7 Add New License

The License File will need to be copied onto the root of the USB Drive.

Using the **up/down** arrows on the keyboard, highlight **Add New License**:



Press return and a system prompt will appear to insert the USB Drive.



Follow the on-screen instruction to complete the process.

### 10.2.8 Display License Info



When selected, the details of the installed License will be displayed.



### 10.2.9 Display Status

Using the up/down arrows on the keyboard, highlight: Display Status



Press return and the Status page will be displayed:



### 10.2.10 Retrieve Operational Logs

The Operational logs will be downloaded onto a USB Drive.

Using the up/down arrows on the keyboard, highlight: Retrieve Operational Logs



Press return.

The logs would usually be written to a USB Drive.

If no USB is present, a message will appear prompting the Operator to insert a USB drive:

ſ	Hessage
	Insert a USB stick to save the operational logs to
	Cancel OX

Once a USB Drive is available, the User will be prompted to write the file:



### 10.2.11 Restart

Using the up/down arrows on the keyboard, highlight: Restart



Press return to restart the GV Live Host machine.

### 10.2.12 Shut Down

Using the up/down arrows on the keyboard, highlight: Shut Down



Press return to power down the GV Live Host machine.

Note: Pressing and holding the chassis power button will also stimulate a system Shut Down.

## 11. IPMI

### **11.1 Introduction**

The **Intelligent Platform Management Interface** (**IPMI**) is a set of computer interface specifications that provides management and monitoring capabilities independently of the host system's CPU, firmware (BIOS or UEFI) and operating system.

Practical uses of this application for Alchemist Live include:

- Remote access to the host machine.
- Remote power cycling.
- Remote access to the BIOS of the host machine.

Warning – the Host Machine should not be interacted with, via the IPMI port, when Alchemist Live is processing video as part of a live broadcast, as this can cause minor disturbances on the output pictures.

## **11.2 IPMI IP Address Configuration**

The initial configuration of the IPMI network address will require local access to the GV Live host machine.

1. Connect a Monitor and Keyboard to the Alchemist Live Host machine:



2. Connect the IPMI network port to the LAN.



3. Boot up the GV Live host machine.

Note that the current IPMI IP Address will be displayed on the opening splash screen:

				8000 00000 000000 0000000 000000 00000 0000
PEIIPMI Initiali	zation		BMC IP:1	92.16.77.125

4. Upon seeing the SAM splash screen, press **DEL** to enter the BIOS Menu:



The BIOS menu will now appear:

Aptio Setup Utility Main Advanced Event Logs IPMI	y − Copyright (C) 2017 America : Security Boot Save & Exit	n Megatrends, Inc.
System Date System Time	[Thu 12/14/2017] [09:06:34]	▲ Set the Date. Use Tab to switch between Date elements.
Supermicro X100RM-i BIOS Version Build Date CPLD Version	2.0b 04/13/2017 03.a1.00	
Memory Information Total Memory Memory Speed	65536 MB 2400 MHz	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F4: Sour defaults F4: Sour & Exit ESD: Exit
Version 2.17.1249.	Copyright (C) 2017 American	Megatrends, Inc.

5. Navigate to the IPMI menu:

BMC Firmware Revision IPMI STATUS	3.58 Working	Press <enter> to change th SEL event log configuration</enter>
System Event Log BMC Network Configuration		
		++: Select Screen 11: Select Item
		Enter: Select +/-: Change Opt. F1: General Heip F2: Previous Values F3: Optimized Defaults F4: Save & Exit

6. Enter the **BMC Network Configuration** submenu.

Aptio Setup Utility - IPMI	Copyright (C) 2017 American	Megatrends, Inc.	
BMC Network Configuration IPMI LAN Selection IPMI Network Link Status: Update IPMI LAN Configuration	[Failover] Dedicated LAN [No]	BIOS will set below setting to IPMI in next BOOT	Update IPMI LAN Configuration
Configuration Address Source Station IP Address Submet Mask Station McC Address Bateway IP Address VLAN	[DHCP] 192.15.77.125 255.255.224.0 ac-1f-6D-4a-1a-CO 192.15.71.20 [Disable]		Default setting = [No]
		++: Select Screen 14: Select Item Enter: Select +/ Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.17.1249. Co	puright (C) 2017 American M	evatrends. Inc.	

Note that it is possible to lockdown the **BMC Network Configuration** menu, to deter unauthorised configuration.

This is the Factory Default condition of this menu.

If the menu is in lockdown mode, the menu item **Update IPMI LAN Configuration** will be set to **[No]**, as shown above.

In order to interact with the **BMC Network Configuration** menu, it must be unlocked. This is done by setting **BMC** Network Configuration menu to [Yes].

IPMI Network Link Status:	Dedicated LAN
	[NO]
Configuration Address Source	[DHCP]
Station IP Address	192.16.77.125
Subnet Mask	255.255.224.0
Station MAC Address	ac-1f-6b-4a-1a-c0
Gateway IP Address	192.16.71.20
VLAN Upde Ves	ate IPMI LAN Configuration
	++: Sel

7. The BMC Network Configuration menu will now be active.

In this example the Configuration Address Source is set to [DHCP].

BMC Network Configuration		BIOS will set to IPMI in ne
IPMI LAN Selection	[Failover]	
IPMI Network Link Status:	Dedicated LAN	
Configuration Address Source	[DHCP]	
Station IP Address	192.16.77.125	
Subnet Mask	255.255.224.0	
Station MAC Address	ac-1f-6b-4a-1a-c0	
Gateway IP Address	192.16.71.20	
VLAN	[Disable]	

8. If it is desired to configure the address source to be a Static IP Address, select the menu item **Configuration** Address Source:

BMC Network Configuration		Select to configure LAN
IPMI LAN Selection	[Failover]	statically or
PMI Network Link Status:	Dedicated LAN	dynamically(by BIOS or
pdate IPMI LAN Configuration	[Yes]	BMC). Unspecified option
		will not modify any BMC
tation MAC Address	ac-1f-6b-4a-1a-c0	network parameters during
Station IP Address	192.016.077.125	BIOS phase
Subnet Mask	255.255.224.000	
Lateway IP Address	192.016.071.020	
VLAN Con Static DHCP	ifiguration Address Source -	
LAN COC Statu DHCP	figuration Address Source -	
Con Static DHCP	figuration Address Source -	++: Select Screen
JLAN CON Static DHCP	figuration Address Source –	++: Select Screen 11: Select Item
LAN CON Static DHCP	figuration Address Source -	++: Select Screen 11: Select Item Enter: Select
ALAN CON Static CHCP	figuration Address Source –	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt.
/LAN CON Static DHCP	figuration Address Source -	+: Select Screen 11: Select Item Enter: Select 4-: change Opt. F1: General Help 54: General Help
JLAN CONSTANT	figuratian Address Source -	++: Select Screen 11: Select Item Enter: Select +/-1 Change DTL F1: General Help F2: Previous Values E4: Orbized Defaults
VLAN CON Static OHOP	figuratian Address Source -	++: Select Screen 14: Select Item Enter: Select +/-: Change Ont. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Sure & Evit

The menu items:

- Station IP Address
- Subnet Mask
- Gateway IP Address

will all now become active and the desired Static IP Address details maybe configured.



Save and exit the BIOS menu and the GV Live host machine will continue to boot normally.

## **11.3 Remote Access via Control Panel Embedded Java Applet**

Remote access to the Alchemist Live, via the IPMI port, is possible from a remote PC. This procedure should work on a PC running Windows, Linux or Apple Mac OS.

The following example details remote access from a Windows PC (procedure should also work for Mac, or Linux)

It is a requirement that Java be installed on the remote PC.

### **BMC Login**

Alchemist Live architecture is based on a Supermicro workstation. Supermicro workstations are pre-configure with unique BMC login details. The login details can be found attached to the shipping carton.

Please refer to the Supermicro document: **BMC Unique Password** for more information.

This can be downloaded from the Supermicro website, here:

https://www.supermicro.com/support/BMC\_Unique\_Password\_Guide.pdf

1. Open an Internet Browser

The following have been tested by GV.

- Windows: Google Chrome / Mozilla Firefox / Internet Explorer
- IOS: Safari

In this example, on a Windows system Google Chrome is the browser of choice:



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2. In the Address Bar, enter the IPMI IP Address:



A login page will appear



3. Enter the User Name and Password.

Note: the login details are unique to the Alchemist Live host machine. These are factory set (see preamble above).

SUPERMICR	
	Please Login
	Username ADMIN
	Password ·····
	Login

Press return to continue.

The SuperMicro System menu will load:



4. In the option bar, hover mouse over Remote Control. A drop down menu will appear.

### Select IKVM/HLML5

User:	ADMIN	(Administrator)	-	
Configuration		Remote Control	Virtual Modia	Mainte
connyuration		Remote Control	Virtuar Meura	Mainte
		Console Redirection	1	
		Power Control		
əm		Launch SOL		
evision : 03.58	3	IP Address: 198	3.160.10.1	
uild Time : 06/	09/2017	BMC MAC Addre	ess: ac:1f:6b:4a:1b:	60
on: 2.0b		System LAN1 M	AC address :ac:1f.6	ib:44:5e:40
Time: 04/13/20	17	System LAN2 M	AC address :ac:1f.6	ib:44:5e:41
'sion : 1.0.1				
ion: 03.a1.00				
	emote C	onsole Preview		
D	ofrach D	roviow Imano		

The IKVM/HTML5 page will appear:

SUPERMICR			Host	Identification Server: 198.160.10.1 User: ADMIN	(Administrator)			
System	Server Health	Configuration	Remote Control	Virtual Media	Maintenance	Miscellaneous	He	
Remote Control	<b>e</b> ) i	iKVM/HTML5						
Console Redirect	tion							
ikvm.html5		Press the button to launch	the iKVM HTML5 and mana	ige the server remotely.				
Power Control								
Launch SOL	[	IKVM/HTML5						<ul> <li>Sele</li> </ul>
Launch SOL		INVARIATINES						

Select IKVM/HTML5

### The Console should now be displayed

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GV Live

Grass Valley - http://www.grassvalley.com/

For product support, please visit the Grass Valley support website at http://www.grassvalley.com/support/

License Lock Code: \*1C4 TRYR 4UAV BDM6 Chassis Host Name: E16953529402072

Configure Network - Standard (Recommended) Configure Network - Custon (Advanced) Network Diagnostics Set Time and Pate Upgrade GU Live Add New License Display License Info Display License Info Display Status Retrieve Operational Logs Restart Shut Down

# Appendix A. System Latency

The system latency is reported on the **Output Status** pane of the Agent template:

Alchemist Live (1)	8000:01:01 - Alchemist Liv	e		
Input Audio Output Output - Audio Conversion	Unit Status SYS: Running LIC: Valid INP: OK OUT: OK	Input Status Video: ST 2110 UHD 50p Audio: ST 2110 32 Channels Last Changed: 10:26:27 UTC 14.01.21	Output Status Video: ST 2022 UH Audio: ST 2110 16 Latency: 345 ms	ID 59p Channels
ORTP Input				

Note that the actual latency will depend on the conversion process being performed. Low frame rate conversion processes typically have a higher latency value, compared to high frame rate processes.

## **Appendix B. BIOS Settings**

The following BIOS settings are configured from the factory and are required to ensure Alchemist Live performs in the intended and optimal manner.

The **BIOS** can be entered by pressing **DEL** on boot.

#### Advanced > CPU Configuration

- Hyper-threading
   Enable
- AES-NI
   Enable
- Virtualization
   Disable

#### Advanced > CPU Configuration > Advanced Power Management Configuration

- Power technology
   Custom
- Energy Performance Tuning Disable
- Energy Performance BIOS Setting Performance
- Energy Efficient Turbo
   Disable

### Advanced > CPU Configuration > Advanced Power Management Configuration

- Power technology
   Custom
- Energy Performance Tuning Disable
- Energy Performance BIOS Setting Performance
- Energy Efficient Turbo
   Disable
- Enter CPU P-States
  - EIST Enable
  - Turbo Enable
  - P-State Coordination
     HW\_ALL
- Enter HWPM State Control
- HWPM State Control
   Disable
- Enter CPU C-States
  - Package C-State Limit
     C0/C1 State
  - C3 Report **Disable**
  - C6 Report
     Disable
     Enhanced Halt State
     Disable

- Enter CPU T-States
  - T-State Control Disable
  - C3 Report Disable

Advanced > Chipset Configuration > North Bridge > Integrated IO Configuration > QPI Configuration

Link Frequency Select 9.6GT/s

### Advanced > ACPI Settings

Numa
 Enabled

## Appendix C. HTML5 Web Browser

Introduced in V2.0.1.14, the HTML5 web service offers a control surface for Alchemist Live, directly from a web browser installed on a remote workstation.

On Linux and Windows platforms, Mozilla Firefox and Chrome web browsers are supported.

On Apple Mac, Safari is supported.

The following procedure describes how to launch the HTML5 web service. In this example Google Chrome is the chosen web browser, but the procedure is the same for all supported web browsers. Note that other web browsers may work, but these are untested by GV.

#### Procedure:

1. On the remote workstation, launch the web browser:



2. Enter the IP Address of the Alchemist Live:



The Alchemist Live HTML5 web service will now load.



3. Press the Launch System Host Menus button.



The Give Live menu will now load.



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4. Press the Launch Channel Menus button:

The Alchemist Live Channel menu will now load.

$\leftarrow \ \rightarrow$	G		A N	ot sec	ure   1	10.96									
Apps	e /	Alchem	ist File	Gra	er (	Grass	Valley	Home	ø	Kron	os Fil	e   Gras	s	•	Qua
Alchemist L	ive (1	) - 000	0:01:0	1 - 80	6										
Input Input - Audio Output Output - Audi Conversion Client Control M	ode:	Unit SYS: LIC: INP: OUT:	Status Running /alid AudioErro OK al:Full Co	ntrol	Inp Vide Aux Las 16	ut Statu eo: ST fio: ST t Chang t 18:15 l	s 2110 2110 ed: ЛС 27.1	1080 50p 32 Chann 1.20	els	O. Vid Au Lat	utput Si leo: S dio: S lency:	atus T 2110 T 2110 224 ms	UHD 59 16 Char	p inels	~
Warning!	Warning!														
Changes to a	any of the	controls	on this pag	je could le	ad to tem	porary o	isruption	of all outpu	ts!						
Input Configu	ration														٦
ORTPInp ORTPOL ORTPOL	ut ad SQD ( ad 2SI (U	(UHD/4K) IHD/4K)			SDI Inpu SDI Qua SDI Qua SDI Qua	rt id SQD id 2SI (L id Auto (	(UHD/4K) IHD/4K) UHD/4K;				SMPT				]
Video Destina	ation Stree	ams									_				٦
								٦	TAKE			Show S	trearn Sta	distics	
Video Strea	am 1														וה
Current	Btream 1				ew Stream	m 1						Statistics			
Mulica	st IP:	239.120.	163.10		Multicast		39.120.1	63.10				SSRC:			
Source		10.98			Source IP		0.96.		Р			Av. Rate (	Mbil/s):		
Port		50100			Port		i0100		Ρ			2202/22	02		
Secon	dary				Seconda	ŋy						Packets F	Recvd (k):		
Mutica	st IP:	239.121.	163.10		Multicast		39.121.1	63.10				Disconfin	47 43808 uity Couri	380 F	
Source		10.96			Source IF		10.96.					0/0	.,		
Port		50100			Port	1	0100		P			Packets L			
Stream T	ype:				tream Typ	× [	Auto	~							J

The menu structures are the same as RCP.

## Appendix D. RGB Legalizer

The purpose of the RGB Legalizer is to define limits of YUV peak Luma and Saturation, such that when matrixed to RGB, no illegal colors are generated. Different Broadcasters/Vendors have differing definitions of what constitutes an illegal color, hence several settings are offered, including the Custom mode, making any specific requirements possible.

Alchemist Live incorporates an RGB Legalizer and comprehensive Luma Clipper. The Luma Clipper can be used in combination with the '735mv' legalizer selection to generate images which adhere to EBU R103-200 specification.

#### **RGB Legalizer Overview**

Illegal colors are represented by values of RGB that are outside a nominal range (typically 0 to 700mV) when converted to analog values. Illegal RGB colors are easily generated in YCbCr space because of the differences in the valid colorspace between RGB and YCbCr.

RGB occupies a restricted colorspace in the shape of a paralleloid within the YCbCr cube as illustrated in the diagram below.



It can be seen there are many YCrCb values which lie outside the RGB space, and would consequently generate illegal values when converted to analog for display.

Upon detection of illegal RGB colors, there are a variety of techniques to bring them back into legal colorspace. Most legalizers will simply de-saturate the chrominance, leaving the luminance unaltered. The legalizer in the Alchemist Live is more advanced, and is able to preserve the original saturation to a much greater extent by modifying the luminance and chrominance signals simultaneously, giving the best visually subjective results.

### **RGB Legalizer Controls**

•	Off	Disables RGB legalization.
•	700mV	RGB Low 0mV, RGB High 700mV, will comply with area mask set 1% or greater,
•	721mV	RGB Low -21mV, RGB High 721mV, will comply with area mask set 0% or greater.
•	735mV	RGB Low -35mV, RGB High 735mV, will comply with area mask set 0% or greater.

Note: The 735mV selection should be used in conjunction with the Luma clipper (set at presets) to generate images that adhere to: **EBU R103-200** specification.

#### Luma Clipper Overview

When luminance levels are too high or too low, devices such as encoders and displays can have problems. The luminance clipper is used to limit signals above and below predefined limits. Minimum and maximum limits can be set, in addition a knee that allows for a graduated transition to the limit.

### Luma Clipper Controls

- Luma Clipper Enable: This enables the clipper.
- White Max This sets up the upper limit (hard clip point) of the clipper. The range is minimum 90% (852 digital 10-bit value) to maximum 109% (1019) with increments of 1%. Preset is 103% (966).
- White Knee This sets up the knee for the maximum white limit of the clipper. This can be set up to give a "soft clip" from this knee point to the hard white clip point. The range is minimum 60% (590) to maximum 109% (1019) with increments of 1%. Preset is 100% (940).
- Black Min This sets up the lower limit (hard clip point) of the clipper. The range is minimum -7% (4) to maximum 10% (152) with increments of 1%. Preset is -1% (55).
- Black Knee This sets up the knee for the minimum black limit of the clipper. This can be set up to give a "soft clip" from this knee point to the hard black clip point. The range is minimum -7% (4) to maximum 60% (590) with increments of 1%. Preset is 0% (64).

Note: The Luma clip preset values configure the clipper to meet Luma limits as specified by EBU R103-200.



To achieve a hard white clip set the **White Max** and **White Knee** to the same value. Similarly to achieve a hard black clip set the **Black Min** and the **Black Knee** to the same value.

# Appendix E. NMOS Example

### **Default Settings**

When the NMOS Label Pattern menu is configured with default settings:

### i.e.

[ Label				
	y Mode Static 172.19.: : eno1		Static Registry Details IP Address: 172.19 Reg. Port: 8181 Query Port: 8181	P S P S P S
Label Patterns Input Pattern (dev) Input (s	s a spig} les			PS
- Output Patte	m			S
{dev} Output	(spig)			PS
- Output Varia	bles			S
Key	The pattern is fi	reeform tex	t which can include variables	

In a typical NMOS Register, Alchemist Live may appear like this:

HOSTS		AGENTS	
Nodes	Devices	Senders	Receivers
GV Live	Alchemist Live (1)	Alchemist Live (1) Output:05 Video source 04	Alchemist Live (1) Input:01 Video
		Alchemist Live (1) Output:05 Audio source 04	Alchemist Live (1) Input:01 Audio
		Alchemist Live (1) Output:05 Data source 04	Alchemist Live (1) Input:01 Audio
			Alchemist Live (1) Input:01 Audio
			Alchemist Live (1) Input:01 Audio
			Alchemist Live (1) Input:01 Data
Key: Activ Not	/e active/Disabled		

Note, in this example:

- 1. Only a single audio stream is applied to the input, hence only the one audio Receiver is active, while the other three are inactive.
- 2. Data sources are not supported by Alchemist Live, hence appear as Not Active.

### **Custom Label Pattern**

Consider the following configuration:

GV Live Test				
	Static			P S
				P S
r Label Pattern	s			
□ Input Patter	- n			
{dev} IN:{spi	ig}:{flow}:{fmt}			PS
- Innut Variah				
rf_v1=Video	;rf_a1=PCM;rf_a2=2110-31			S
Output Patte	ern			
{dev} OUT {	spig}{flow}{fmt}			PS
🛛 Output Varia	ables			
sf_v1=2022	;sf_v2=2110;sf_a1=PCM;sf	_a2=2110	D-31	S
1/01				
Ney	The pattern is fr	eeform te	xt which can include variables	
	which are subs Variables are e	tituted dyr nclosed w	hamically with braces e.g. (var)	
	Variables are e	nclosed w	vitn braces e.g. {var}	

In a typical NMOS Register, Alchemist Live may appear like this:

HOSTS		AGENTS	
Nodes	Devices	Senders	Receivers
GV Live Test	Agent1	Agent1 OUT:00:2110 Video source 04	Agent1 IN:00:Video Video
		Agent1 OUT:01:2110-30 Audio source 04	Agent1 IN:01:PCM Audio
		Agent1 OUT:05:no flow Data source 04	Agent1 IN:02:PCM Audio
			Agent1 IN:03:PCM Audio
			Agent1 IN:04:PCM Audio
			Agent1 IN:05:Data Data

How they actually appear will depend upon the actual NMOS Register used.

# Appendix F. Dolby E Transcode Configuration

Introduced in the IP variant of Alchemist Live in Version 3.0.0.36, Alchemist Live allows transcoding of up to three Dolby E audio streams.

When Alchemist Live is configured as a single channel video processor, up to three Dolby E audio streams can be transcoded.

When Alchemist Live is configured as a three channel video processor, one Dolby E audio stream per video processor channel, can be transcoded:



Note that it is not possible, in a 3 channel Alchemist Live configuration, to configure multiple Dolby E channel transcoding, with regard to a single video channel:



### Alchemist Live – Dolby Configuration Procedure

### 1. Applying the Option Licensing

In the Alchemist Live Setup menu, configure the **Option Licensing**:

Aich Val UHD 8000 NMOS Logging Logging - Audio Logging - Setup	01:01 - Alchemist Live Viit Status SYS: Running LIC: Valid INP: OK	- Input Status Video: ST 2110 1080 59p Audio: ST 2110 16 Channels Ancili: ST 2110	Output Status Video: ST 2110 UHD 59p Audio: ST 2110 16 Channels Ancili: ST 2110 Listoper: 233 ms
Client Control Mode: Warning! Changes to any of th			
Unit Name Alch Val UHD Licensing Information License Server:		S STOP	Misc Version Start Time 3.1.0.8 10:03.47 UTC 30.06.21 Proc ID CPU Mask 840 0xFCFEFCFE
			Current Log Server No Active Logger
Option Licensing Dolby E 3 Dolby E Licenses	s 💌 Available: 871	Changes to the C 0 not be applied ur	Option Licensing will ttil the Agent is restarted

Note that the number of available licenses will depend upon how many have been purchased.

A single Alchemist Live can support up to three separate Dolby E transcodes.

In the example above, three Dolby E licenses are available, but none have been applied.

The required license configuration can be selected using the drop down menu:



2. In the Alchemist Live Audio menu, it is required to define the incoming audio pairs that contain the incoming Dolby E stream(s).

When Alchemist Live is configured as a single channel video processor, the menu offers configuration of up to three Dolby E licenses:

Color LUTs Audio Dolby E	NP: OK UT: OK	Last Changed: 10:15:19 UTC 13.04.21	Later	ncy: 270 ms
Colby E Bitstream 1	Dolby E	E Bitstream 2	Dolby E	Bitstream 3
Input Stream: Not Licen	ised 💌 🛛 Input S	tream: Not Licensed 💌		eam: Not Licensed 💌
Channel Pair: Not Licen	ised 💌 Chann	el Pair: Not Licensed 🔻		Pair: Not Licensed 💌

When Alchemist Live is configured as a 3 channel video processor, the menu offers configuration of a single Dolby E license (one per video channel):

Color LUTS Audio Dolby E	ок ок	Last Changed: 10:15:19 UTC 13.04.21	Latency: 270 ms
			<b>v</b>
Dolby E Bitstream			
Input Stream: Not Licensed			
Channel Pair: Not Licensed			
			Str 4:

The default state is Not Licenced.

Licenses may be configured using the drop-down menus:

Client Control Mode: Normal.	Client Control Mode: Normal, Full Control						
Input Stream: Stream 1			m: Not Licer	nsed 💌		m: Not Licensed	-
Channel Pair: Not Licensed			air: Not Licer	nsed 💌		air: Not Licensed	-
Not Licensed	<u> </u>						
r Input Channel S Not Active	-						
Str 1: Chans 1/2			Str 3		Str (		
Chans 3/4							
Chans 5/6							
- Audio Chainer Chans 7/8							
Chans 11/12		- 01-4 -	01-4	01-4	044	044 👻 044	-
5 Chans 1012	-		0111	0011- 1	301 *	501 - 501	
	Output Channels						
Innut 1-2 3-	4	5-6	7-8	9 - 10	- 11 - 12	13-14 15-	16

The following example shows a single channel Alchemist Live, configured for three incoming Dolby E streams:

Audio Dolby E v OUT:	ок	10:15:19 UTC 13.04	4.21	,	
					٣
Colby E Bitstream 1	Dolby I	E Bitstream 2	Dolby I	E Bitstream 3	
Input Stream: Stream 1	<ul> <li>Input 9</li> </ul>	itream: Stream 2	<ul> <li>Input 9</li> </ul>	tream: Stream 4	•
Channel Pair: Chans 1/2		el Pair: Chans 3/4		el Pair: Chans 7/8	•
Str 1:	Str 2:	Str 3:		Str 4:	

Note that the configured **Dolby E Stream Select** menu will be reflected in the **Audio Channel Routing** menu:



# Appendix G. Alchemist Live IP Connectivity Table

Connectivity to Alchemist Live IP will depend on many factors, such as:

- The speed of the Ethernet switch Alchemist Live IP is connecting to.
- The network range that the connection is required to work over.
- If redundancy is required.

The table below list the various connections that can be supported.

#### **Table 3: Alchemist IP Connectivity**

Alchemist Live IP connecting to:	Ports used	IP Option	Description	1 x UHD	3 x HD	QSFP / SFP required (not included)
100G IP Switch (non-redundant)	1	1 x FCQ-100GE-SR4	100GBASE-SR short range QSFP for MMF	Yes	Yes	QSFP-100G-SR4 (x1)
100G IP Switch (redundant)	Not Available *					
25G IP Switch (non-redundant)	1	1 x FCQ-ADPT-SR	Ethernet adapter 100 Gb/s to 25 Gb/s QSFP28 to SFP+	Yes	Yes	SFP-25G-SR (x1)
25G IP Switch (redundant)	2	2 x FCQ-ADPT-SR	Ethernet adapter 100 Gb/s to 25 Gb/s QSFP28 to SFP+	Yes	Yes	SFP-25G-SR (x2)
40G IP Switch (non-redundant)	1	1 x FCQ-40GE-SR	40GBASE-SR short range QSFP for MMF	Yes	Yes	QSFP-40G-SR4 (x1)
40G IP Switch (redundant)	2	2 x FCQ-40GE-SR	40GBASE-SR short range QSFP for MMF	Yes	Yes	QSFP-40G-SR4 (x2)
10G IP Switch (non-redundant)	1	1 x ADPT-10	Ethernet adapter 40 Gb/s to 10 Gb/s QSFP to SFP+	No	Yes	SFP-10G-SR (x1)
10G IP Switch (redundant)	2	2 x ADPT-10	Ethernet adapter 40 Gb/s to 10 Gb/s QSFP to SFP+	No	Yes	SFP-10G-SR (x2)

\* 100G connectivity with redundancy is not possible to support because the resultant 200G total bandwidth required will exceed the maximum bandwidth of the PCIe bus.