



Optimizer Operations Manual

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Version: *2.0*

Date: *2025/07/20*

Project Owner: *Cody Polla*

Status: *Draft*
 Routing for Document Approval
 Approved
 Unapproved

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Introduction

The HSG Labs Optimizer is a camera-based device capable of monitoring and maintaining quality in a theatre. The HSG Labs Optimizer will receive calibration automation commands from the SMS Player (Screen Management System) and will communicate with the projector to complete focus, lamp/laser power adjustment, luminance and uniformity detection and full spectrum audio analysis, including Atmos.

The system contains two parts, the Sensors and the Controller. The USB Sensors composed by the camera and microphone. The camera can be mounted inside the port window for easier adjustments and the microphone must be mounted inside the auditorium on or near the rear wall.

The controller board is installed in the projection booth to prevent Ethernet exposure inside the auditorium.



The Optimizer is based on a professional astronomical low resolution black and white camera and a professional microphone.

Technical Specifications

General	
Throw Ratio	4mm – 0.8 to 1.25: 1 6mm – 1.25 to 1.9: 1

	8mm – 1.65 to 2.6: 1 12mm – >2.6:1
Luminance Accuracy	± 2%
Repeatability	1%
Size - Weight	L72 x H48 x W134 mm – 200 g
Control compatibility	VNC and HTML capability or API
Network Interface	Ethernet (in projection booth)
Camera	
Imaging/Pixel Array	1280 x 960 pixels
CCD	Monochrome 4.8 x 3.6 mm
Total Pixels	1.2M
Shutter	Electronic
Size - Weight	L39 x H39 x W75 mm – 200 g
Microphone	
Microphone body	Die cast aluminum
Frequency response	20 Hz – 20kHz ± 1dB
Resolution & Sample rate	24bit ADC @ 44.1 or 48kHz
Max SPL for 1% THD @ 1kHz	133 dB SPL @ 0dB gain settings
Size - Weight	L20 x H20 x W189 mm – 120 g

General Information

Default IP

Ethernet: 192.168.1.5/24

RAW communication port: 32768

Default Password

VNC: **veeone**

HTTP: **no password required**

FTP: **qalif / qalif**

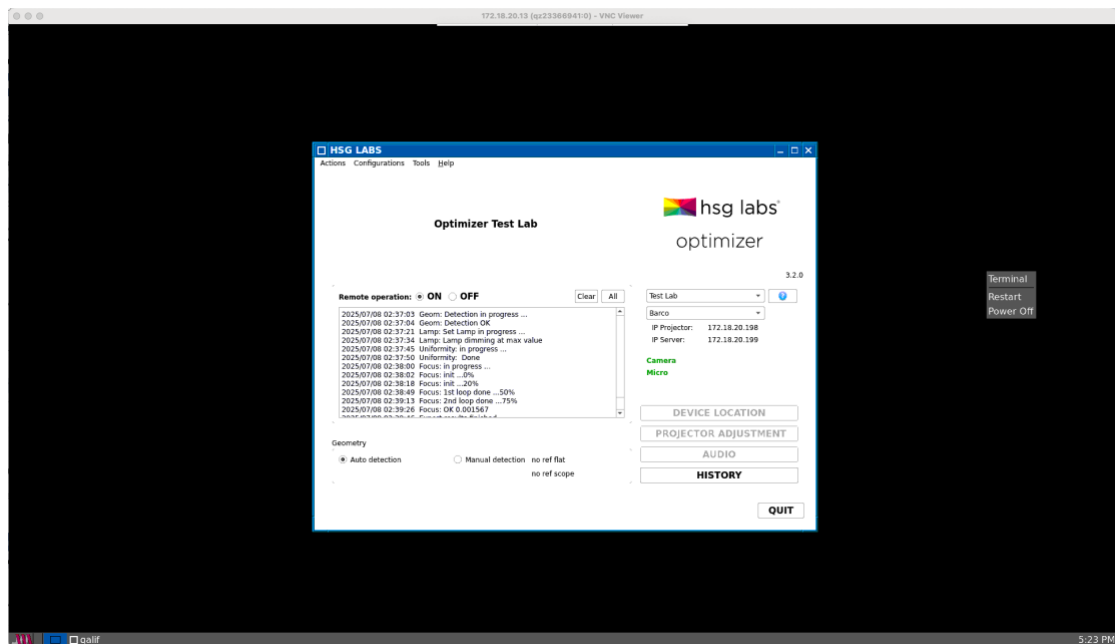
SSH: **sysadmin / veeone**

Control Interfaces

The unit contains a stand-alone Linux based system with all necessary software preinstalled on the controller. This allows control of the unit from any system capable of using VNC, web browser or API commands, no specific software installation is required. There are several connection options described below.

Desktop Interface

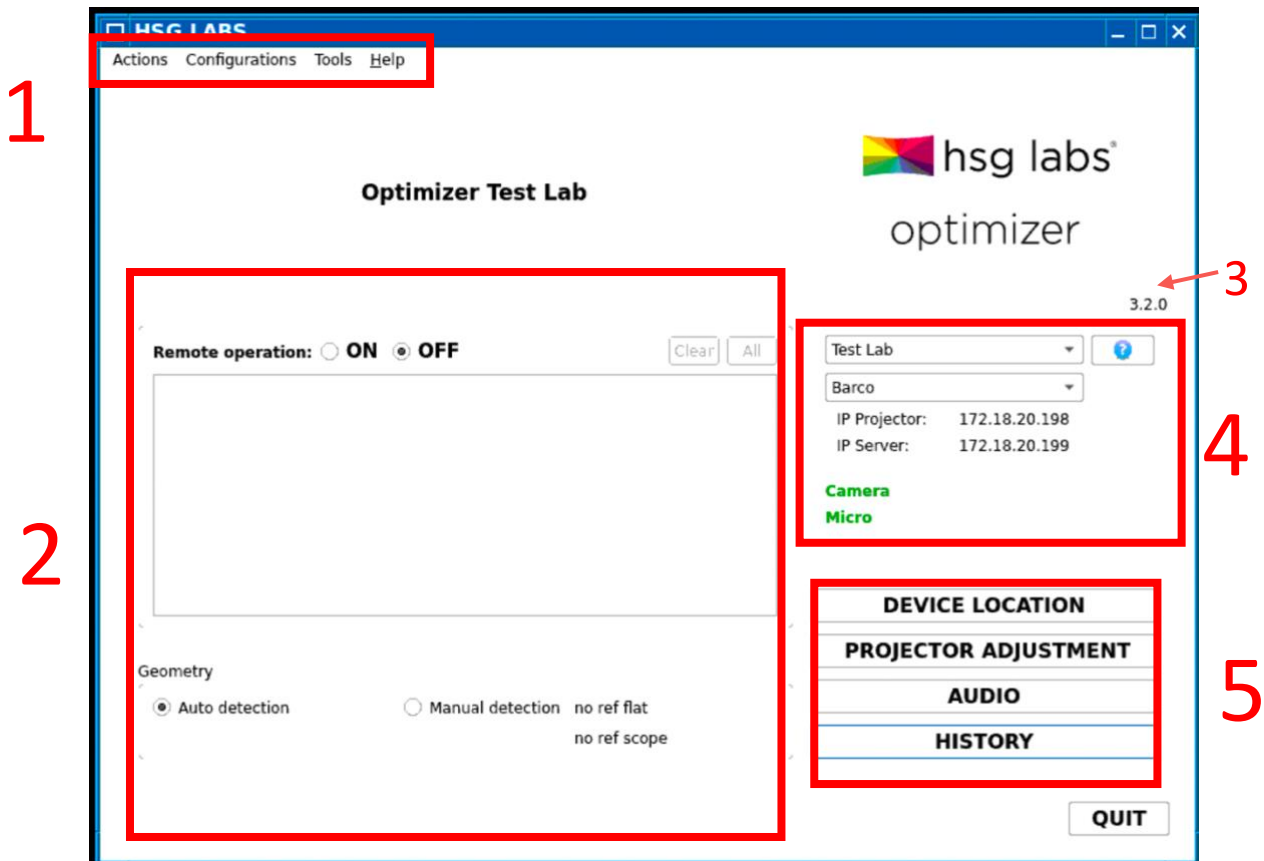
The HSG Labs Optimizer sits on a Linux platform operating system. This interface below is a set resolution and will contain the black desktop with the ability to access several options via a right click. On right clicking, the user can access a terminal window, a restart of the interface or a hard shutdown.



VNC

From a network device, use a standard VNC (Virtual Network Computing) client software to connect to the Optimizer using the configured IP address. Once connected, the Optimizer desktop and the Optimizer software will be running:

1. Menu Selections
2. Remote operations actions and history
3. Version number
4. Projector and server information
5. Action Buttons



Examples of VNC Clients on different Operating System:

- Windows: UltraVNC Viewer, RealVNC Viewer
- Mac OSX: Screen sharing, Chicken of the VNC, RealVNC Viewer
- Linux: RealVNC Viewer, gtk-vnc, TigerVNC

API

All HSG Labs Units share the same API system that allow to remote connection and control the unit via Ethernet. API commands can be used to integrate the product with NOC or TMS system. The primary method for operations for the Optimizer in remote configuration will be via the API using Macros and server playlist commands.

Please contact support for the server specific Installation Manual: support@hsg-labs.com.

Installation Checklist

Operation	Notes
Network Configuration	Configurations > Settings > Network
Update the Optimizer	About > Update
Physically mount the Optimizer	The controller and camera in the booth and the microphone in auditorium
Add HSG Labs Patterns to the system	Ingest all necessary content to the SMS Player
Configure general settings	Configurations > Settings > General
Configure the auditorium	Configurations > Settings > Room Manager
Configure installation settings	Configurations > Settings > Installation
Check connection and control	Tools > Connection Verification
Align Optimizer to the screen	Device Location
Onsite Calibration	Configurations > Settings > Calibration
Configure tolerances	Configurations > Settings > Tolerances
Use Optimizer functionality via the VNC interface	Remote Mode = OFF
Configure automation on the SMS	Remote Mode = ON
Get the report	VNC: History / HTTP: Last values / Cloud: ActiveServices

Installation Steps

Below are the steps required for installation and configuration of the HSG Labs Optimizer. Please ensure to check everything before leaving the auditorium. Server specific configuration guides are available from support.

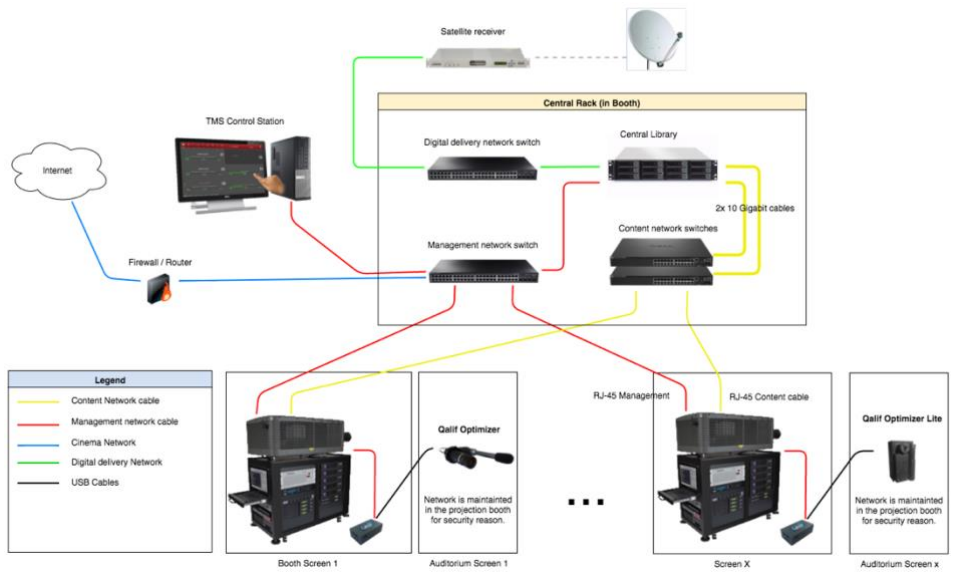
Network Configuration

Each **HSG Labs Optimizer** will need a unique IP address that is configured on the same IP subnet as the projector/server.

To change the default IP of the Optimizer, connect to it remotely with VNC via Ethernet 192.168.1.5/24 or using a monitor, keyboard and mouse.

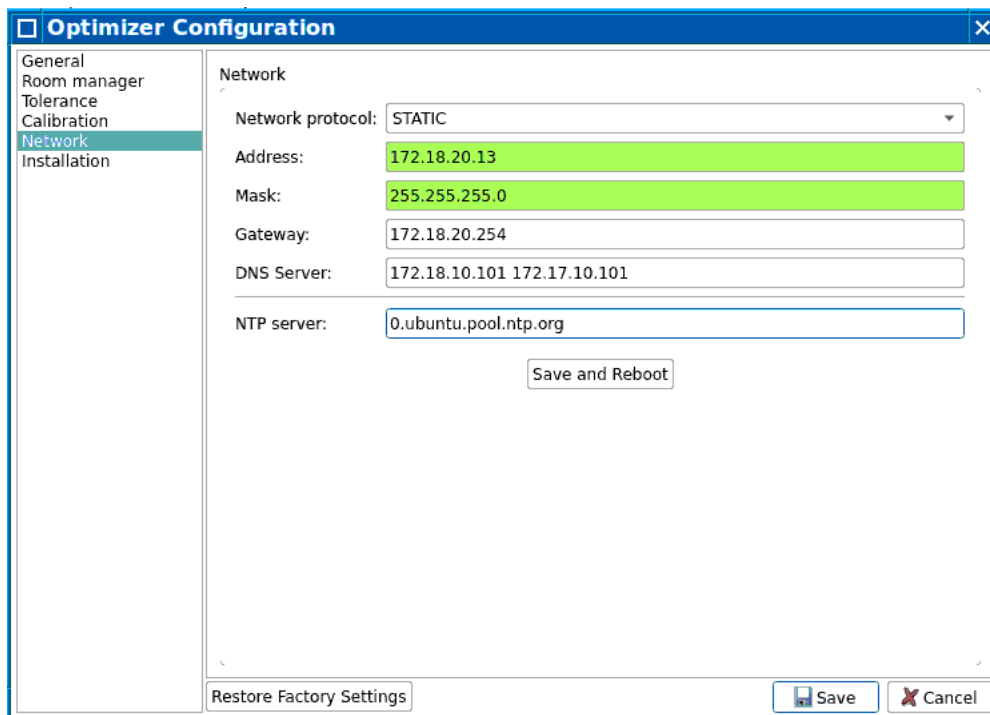
NOTE: The monitor will need to be plugged in to the Optimizer and powered before powering on the Optimizer.

Please ensure that the device is in the same control network as the projection system as represented in the scheme below. The Optimizer will need to be able to communicate with the projector and the server.



To change the network settings, use the menu **Configurations > Settings > Network**.

NOTE: When connected to the internet the Optimizer adjust itself the Time Zone using the public IP address. It is recommended to configure the Optimizer with an NTP server as the unit does not have a time clock battery.



Find Optimizer IP

Using an External Monitor

Connect an HDMI monitor to the unit and an USB mouse. Boot the unit and then click on **Tools > Display IP Address**. A popup will appears showing the current IP address.



Via USB

If the IP is unknown, a FAT Formatted USB drive inserted into the Optimizer USB port, the software will dump the IP configuration data onto the USB drive (**ifconfig.txt**).

NOTE: Please be sure that the Ethernet cable is connected before this operation.

Configure NTP

Please configure the NTP server in **Configurations > Settings > Network**. More NTP servers can be defined by using a space between IP address. To save the configuration, click **Save and Reboot** button.

Update Time Zone

1. Open a terminal on an Optimizer.
 - Right click on Optimizer black desktop OR type in a shell **ssh sysadmin@<OptimizerIP>** (password is **veeone**)
2. Login as sysadmin.
 - Type: **su sysadmin** (password is **veeone**)
3. Edit the time zone file.
 - Type: **sudo nano /etc/timezone**

```
GNU nano 2.2.6 File: /etc/timezone
Europe/Paris
```

4. Write the current time zone in the document depending on the location (some examples below)
 - **Europe/Rome** (Central Europe)

- **Europe/London** (UK)
 - **US/Eastern** (Eastern)
 - **US/Central** (Central)
 - **US/Mountain** (Mountain)
 - **US/Pacific** (Pacific)
 - **Asia/Hong_Kong** (China)
5. Save the document.
 - Press **CTRL + O** and **Enter**
 6. Close the document.
 - Press **CTRL + X** and **Enter**
 7. Reconfigure the time zone.
 - Type: **sudo dpkg-reconfigure --frontend noninteractive tzdata**
 8. Check that the date is correct.
 - Type: **date**

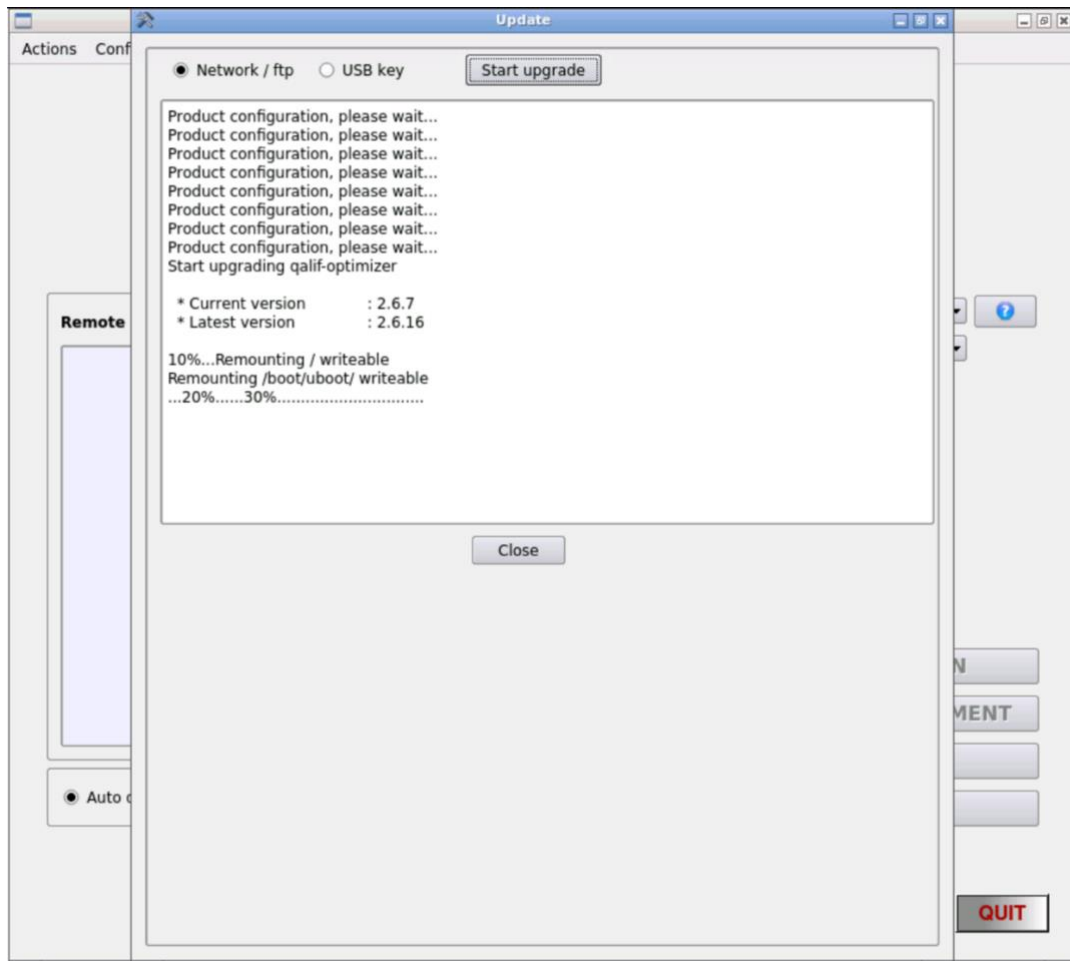
NOTE: A list of possible time zones could be found here:

https://en.wikipedia.org/wiki/List_of_tz_database_time_zones

Update the Optimizer

Please ensure that the Optimizer is running on the most current stable software version by updating it. To access to the update windows, click on Help > Update.

By default, the Optimizer will try to update over internet, but USB and FTP methods are possible options.



By USB

1. Take a USB key formatted (FAT Filesystem) and empty
2. Copy the .deb package on the root directory of the USB key
3. Connect to the unit using VNC or a HDMI monitor
4. In the main interface select **About > Update**
5. Select USB update and click update
6. The unit will install the update and reboot automatically

By External FTP (when enabled)

The Optimizer can be configured to use the internet update to a dedicated FTP; they can be changed in the settings in the `/run/env/qalif-upgrade-external.conf` file.

If the external update is disabled, the Optimizer will update by Internet (default HTS repository). If enabled, the Optimizer will connect to an FTP per the file information.

1. Open a terminal on the Optimizer.

- Right click on Optimizer black desktop OR type in a shell **ssh sysadmin@<OptimizerIP>** (password is **veeone**)
2. Login as sysadmin.
 - Type: **su sysadmin** (password is **veeone**)
 3. Edit the Timezone file.
 - Type: **sudo nano /opt/qalif/run/env/qalif-upgrade-external.com**

```

GNU nano 2.2.6 File: /opt/qalif/run/env/qalif-upgrade-external.conf Modified
# '0' for disable, '1' for enable
EXTERNAL="0"

# Dns or IP of the ftp server
EXTHOST="ftp.cloud.com"

# Port of the ftp server
EXTPORT="21"

# Credential to access the ftp server
EXTUSERNAME="johndoe"
EXTPASSWORD="azerty"

# Path of the package on the ftp server
# If the package is in a subdirectory "public" for exemple,
# you need to put public/qalif.deb on this variable
EXTPKGPATH="qalif.deb"

```

4. Edit the file name, location, credentials per requirements.
5. Save the document.
 - Press **CTRL + O** and **Enter**
6. Close the document.
 - Press **CTRL + X** and **Enter**

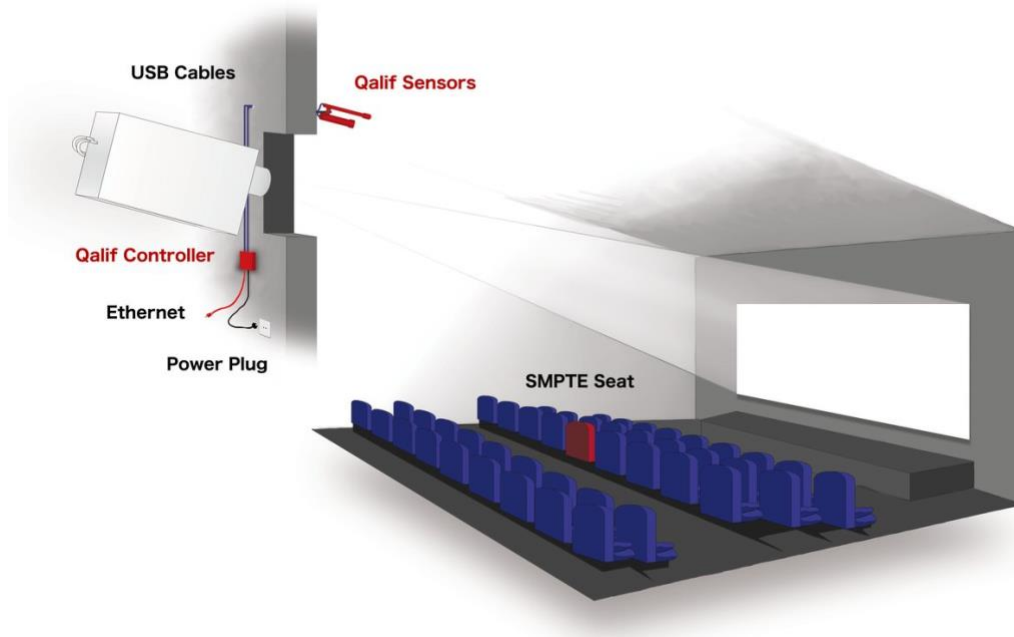
To run the update, select **network / ftp** update from **About > Update** panel and click update button

Physically Mount the Optimizer

The Optimizer is composed by different hardware parts that we call the Controller and the Sensors, the connection between them is done by two different USB cables.

Controller

The Controller needs to be connected to the projection system network and is to be installed in the projection booth to ensure the network security. This device should be installed on the booth wall to allow for sufficient cable reach for the Camera and Microphone mounting positions.



Camera

The Optimizer camera can be installed inside the port window or can be installed inside the auditorium. The camera is capable of accurate measurements through a port glass, once calibrated. The supplied mount can be fixed in several positions including right side up and upside down. Any port window can be used if the camera can see the entire screen in the view window.

The camera should be centered to the screen horizontally, usually mounted above the port window. If the camera is provided with the cable fixing ring, please use it as illustrated in the following pictures. Remove the lens cap.

WARNING: Do not over-tighten the screws of the ring as this could damage the camera USB 3 connectors.



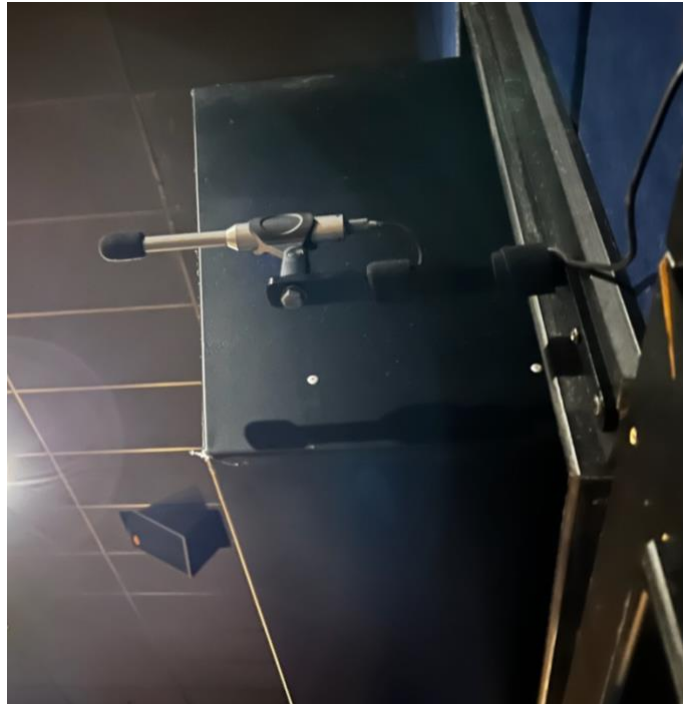


WARNING: The camera needs to be secured with the mount screw on the bottom or top with the accompanying setting.

Microphone

The UMIK-1 Microphone should be installed inside the auditorium to take the measurements correctly. Use the supplied bracket to mount it to the back wall or ceiling. A USB extension cable can be used as needed, please reach out to support for best practices and cable models that have been verified.

Please be sure that the sensors are secured in fixed position and that does not move during normal operation.



Later in this document, details are available on how to center the unit to the screen and to calibrate from the SMPTE Seat.'

Add Optimizer Patterns to the System

The Optimizer uses specific patterns to take the measurements and calibrations. The Optimizer will automatically load the correct patterns on the projector or server, if supported.

Below is the list of the patterns that the Optimizer will use, please ensure that they are ingested into the projector in the correct format (CPL or PNG):

- QF-Geom-x.0_TST_x_xK_HT
- QF-White-x.0_TST_x_xK_HT
- QF-Checkerboard-x.0_TST_x_xK_HT
- QF-Audio-2S_TST_C_2K_8CH_HT

NOTE: There are different versions of the same pattern: 5s or 15s long, 4K and 2K resolution, full Container or Scope format, please ingest per your needs.

More details about the patterns and the automatic pattern change feature are available in the HSG Labs Pattern Description and Usage document.

Depending on the server, specific content versions are required. Quick reference details are below.

Dolby IMS: 2.0 version (5 second)

Barco IMS, GDC Server: 3.0 version (15 second)

For Silver screens or steep angles with large variance from top to bottom luminance:
5.0 version

Configure General Settings

Please configure the **Settings > General** with the site information.

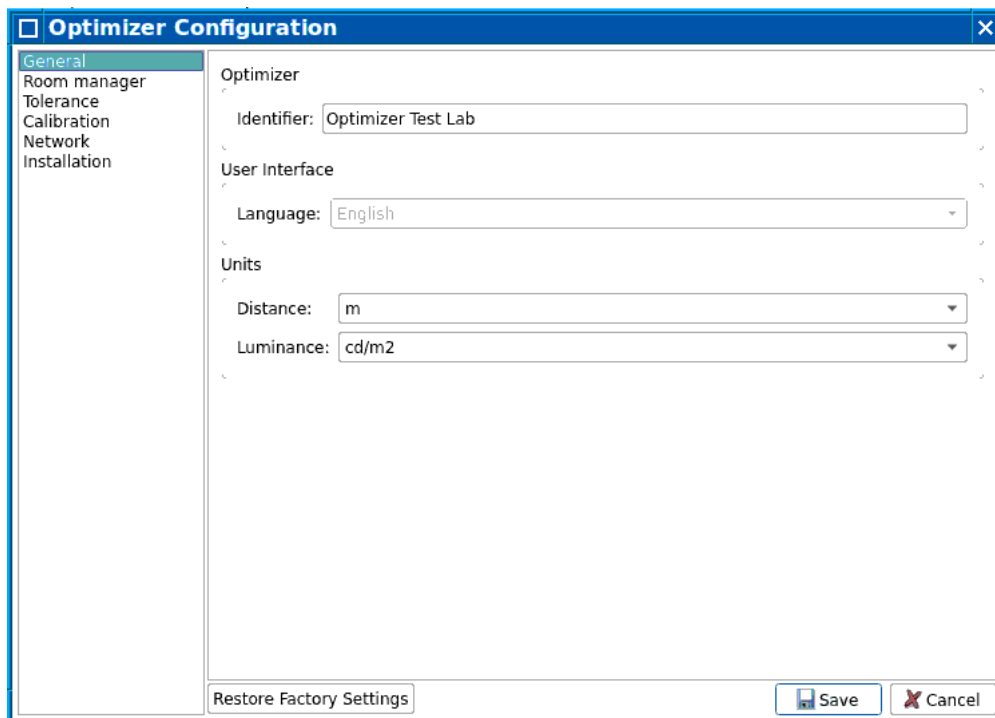
Device Identifier: Is the name that is shown in the main interface. It is useful to recognize the unit the user is connected to

Units:

Distance: m of ft.

Luminance: Foot-Lamberts(fL) or Candelas (cd/m²)

Currently only English is available in the interface.



The screenshot shows a window titled "Optimizer Configuration" with a close button (X) in the top right corner. On the left is a sidebar with a tree view containing the following items: "General" (highlighted), "Room manager", "Tolerance", "Calibration", "Network", and "Installation". The main area of the window is divided into sections with expandable arrows:

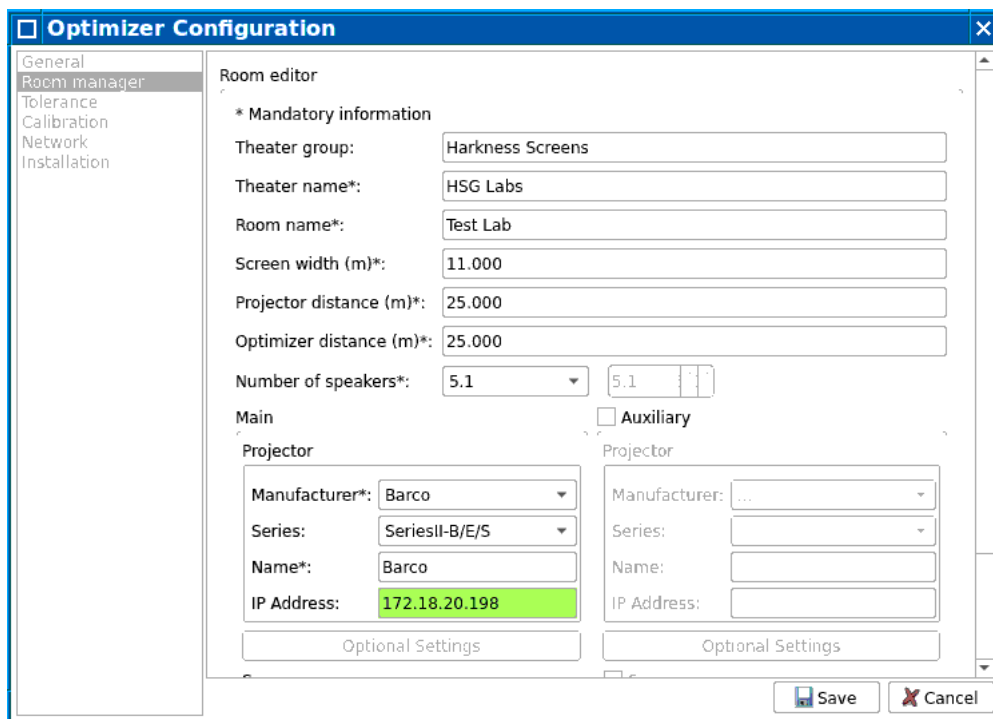
- Optimizer:** Identifier: Optimizer Test Lab
- User Interface:** Language: English
- Units:** Distance: m, Luminance: cd/m2

At the bottom of the window, there are three buttons: "Restore Factory Settings", "Save", and "Cancel".

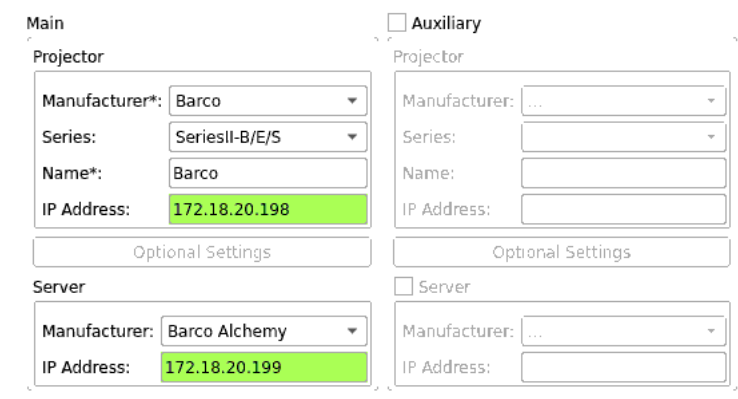
Configure the Auditorium

The configuration for a specific auditorium is done in the **Configuration > Settings > Room Manger** menu.

Click on the + button to add a new auditorium and configure per the auditorium specifications.



The screenshot shows the 'Optimizer Configuration' dialog box with the 'Room editor' tab selected. The left sidebar contains a tree view with 'Room manager' highlighted. The main area is divided into 'Mandatory information' and 'Main' sections. The 'Mandatory information' section includes fields for Theater group (Harkness Screens), Theater name* (HSG Labs), Room name* (Test Lab), Screen width (m)* (11.000), Projector distance (m)* (25.000), Optimizer distance (m)* (25.000), and Number of speakers* (5.1). The 'Main' section has two columns: 'Main' and 'Auxiliary'. The 'Main' column has a 'Projector' section with fields for Manufacturer* (Barco), Series (SeriesII-B/E/S), Name* (Barco), and IP Address (172.18.20.198). The 'Auxiliary' column has a 'Projector' section with fields for Manufacturer, Series, Name, and IP Address. At the bottom right are 'Save' and 'Cancel' buttons.



This image shows a detailed view of the projector configuration fields. It is divided into two columns: 'Main' and 'Auxiliary'. The 'Main' column has a 'Projector' section with fields for Manufacturer* (Barco), Series (SeriesII-B/E/S), Name* (Barco), and IP Address (172.18.20.198). Below this is an 'Optional Settings' button. The 'Auxiliary' column has a 'Projector' section with fields for Manufacturer, Series, Name, and IP Address. Below this is an 'Optional Settings' button. At the bottom of the 'Main' column is a 'Server' section with fields for Manufacturer (Barco Alchemy) and IP Address (172.18.20.199). Below this is another 'Optional Settings' button. The 'Auxiliary' column has a 'Server' section with fields for Manufacturer and IP Address. Below this is another 'Optional Settings' button.

Configure Installation Settings

Please fill the information about the projection system resolution and the screen type for the installed screen.

Orientation: The Optimizer mounting position. The unit can be mounted right side up (1/4" mount on the bottom) or inverted

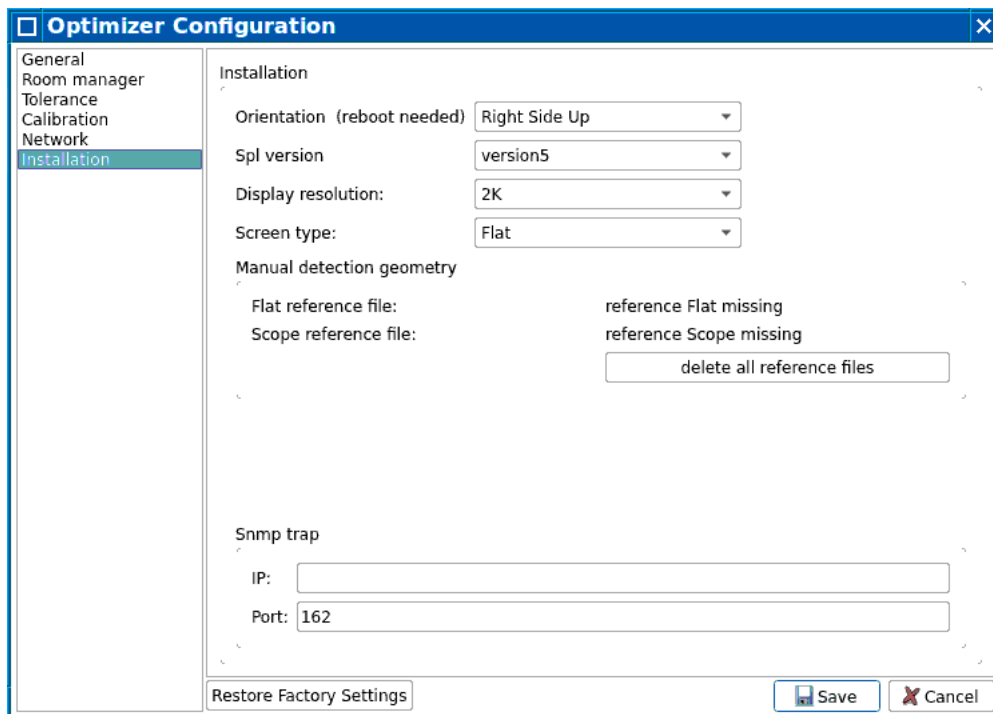
SPL Version: The version of patterns that have been loaded on the server

Display Resolution: The native resolution of the projector, 2K or 4K

Screen Type: The screen format, flat or Scope

Manual Detection Geometry: Identifies that last save reference when using a fixed geometry, manual setting

SNMP Trap: IP address of the configured SNMP server



WARNING: The resolution and screen settings will be used by the Optimizer to automatically load the correct patterns and will also be used for during the SMPTE calibration and during local adjustment. Please ensure to select the correct configuration.

Configure the Tolerances

Optimizer has predefined tolerances for industry defined standards. These standards are compared to the Optimizer measurements for validation. Any desired standard adjustments can adjust those settings according to the site needs under **Configurations > Settings > Tolerance**.

Possible image standards are:

Custom
DCI - Review Room
DCI - Theater
SMPTE 431-1-2006 - Review Room
SMPTE 431-1-2006 - Theater
CST
User example [CST]

Possible uniformity standards are:

DCI - Review Room (9 points)
DCI - Theater (9 points)
SMPTE 431-1-2006 - Review Room (9 points)
SMPTE 431-1-2006 - Theater (5 points)
CST (9 points)
Qalif (144 points)
User example [CST (9 points)]

NOTE: The tolerances can be configured based site-specific standards. Please contact Harkness for more information.

- *Expected 2D / 3D Luminance and White tolerance is used for the Lamp Calibration.*
- *Uniformity tolerances are used when measuring the light uniformity across the screen.*
- *Audio warning levels are used for the audio analysis.*
- *Focus Criteria is used during the automatic focus to define if the lens file needs to be saved.*

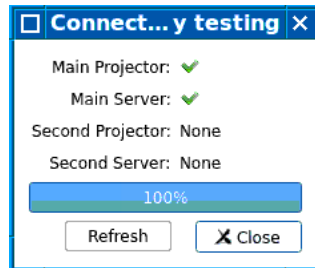
The screenshot shows the 'Optimizer Configuration' dialog box with the 'Tolerance' tab selected. The dialog has a sidebar with options: General, Room manager, Tolerance (selected), Calibration, Network, and Installation. The main area contains the following settings:

Image standard:	Custom
Expected 2D luminance (cd/m2):	48.0
Expected 3D luminance (cd/m2):	68.5
White tolerance (cd/m2):	5.0
Min uniformity tolerance (%):	70
Max uniformity tolerance (%):	100
Uniformity standard:	SMPTE 431-1-2006 - Theater (5 points)
Audio warning level - loss (dB):	-3.0
Audio warning level - amp (dB):	3.0
Focus criteria (grad):	0.010

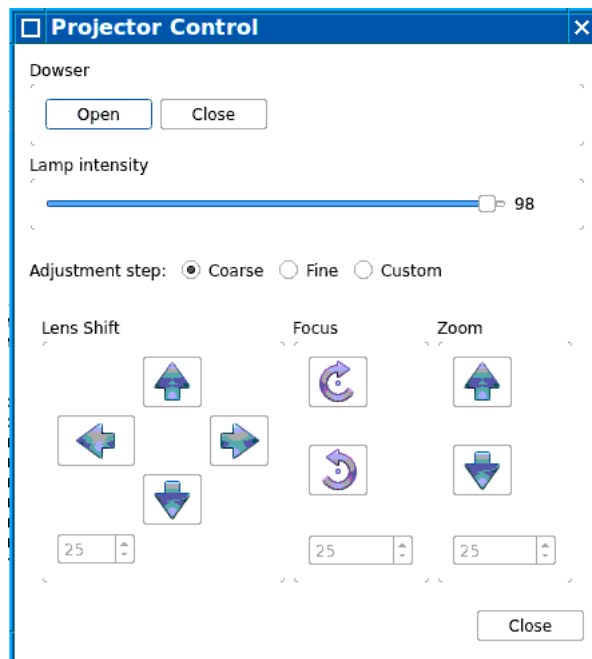
At the bottom, there are buttons for 'Restore Factory Settings', 'Save', and 'Cancel'.

Check Connection and Control

The connection with the projector and server can be checked using the connectivity testing tool located under **Tools > Connection Verification**.



The projector specific operations can be controlled under **Tools > Projector control**. During the installation, please ensure the projector can be controlled by the Optimizer.



Align Optimizer to the Screen





The Optimizer will need the camera to be manually aligned using the Checkerboard test pattern on initial setup. The Optimizer will automatically be able to detect screen position using the Geometry pattern during normal operations. All squares of the Geometry pattern must be visible during alignment for automatic geometry detection.

The following operations need to be with **remote operation = OFF**

Remote operation: ON OFF

2025/07/08 02:37:03 Geom: Detection in progress ..
2025/07/08 02:37:04 Geom: Detection OK

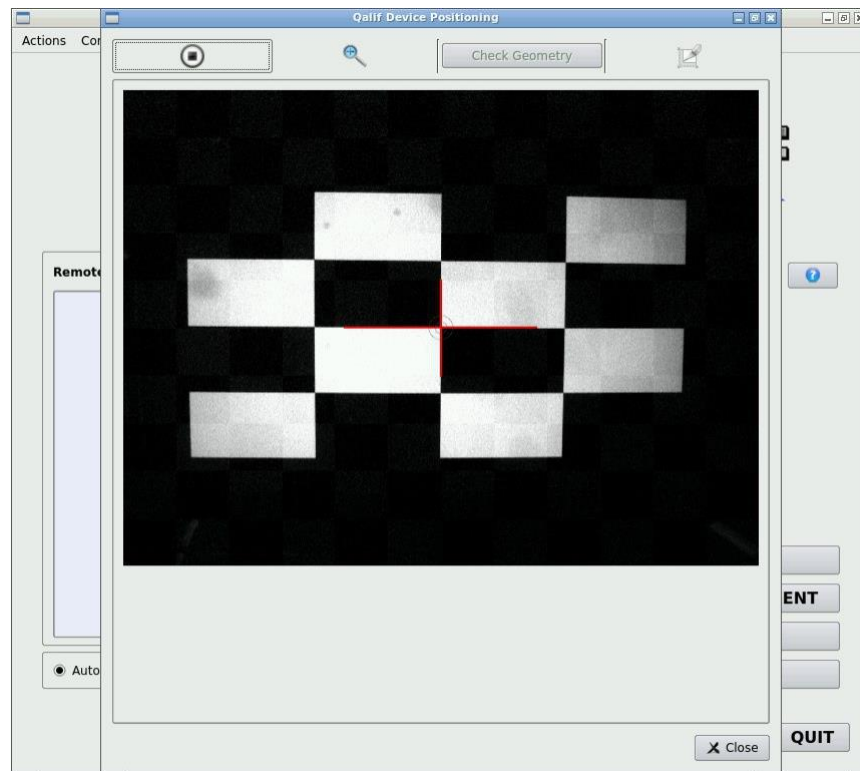
Alignment Procedure

- *Select Device Location.*
- *Hit the play button  , to start the camera capture.*
- *Manually align the camera to the center of the test pattern. Use magnifier mode by clicking on  to zoom in the red cross.*
- *Hit the stop button  , to stop the camera capture.*
- *Click on  to validate geometry can be detected by camera.*

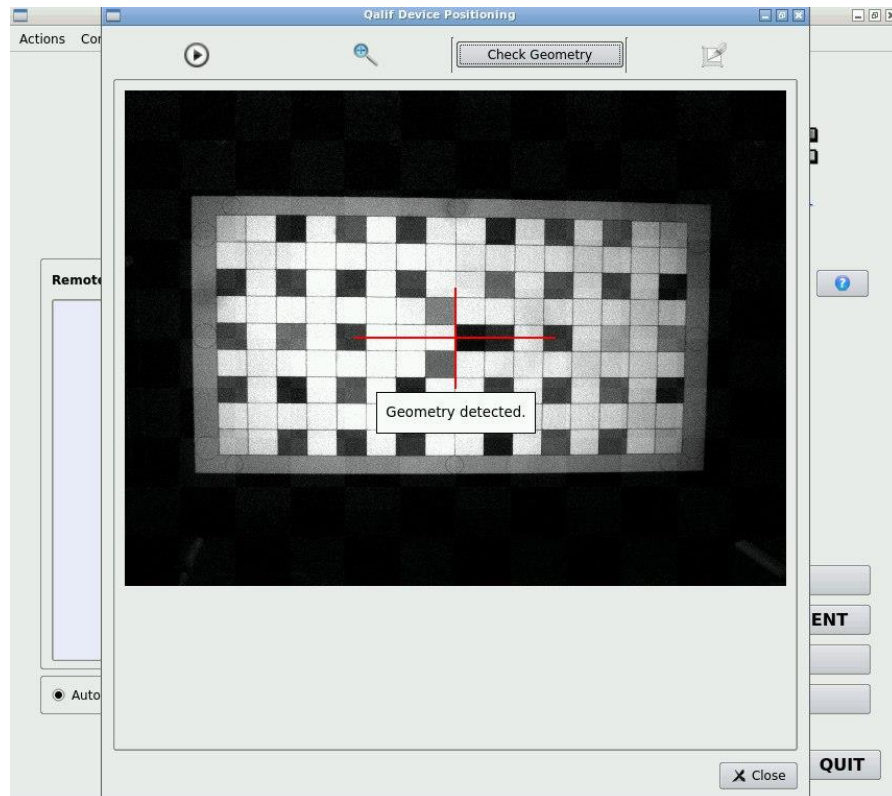
NOTE: If during this operation, the image from the camera becomes black, the camera has become disconnected from the USB Cables. Please restart the Optimizer software by clicking on **Quit** button to restart the communications again.

If the geometry is not detected, please check:

- **That all the pattern is visible inside the camera in the device location section**



- *All the geometry squares are visible inside the camera*



- Check that the masking is only in the buffer section of the pattern (all the square zones must be visible)
- Check that the Optimizer is in the correct format for the active test pattern (trying to detect the geometry of a Scope image in a Flat channel will not work)
- Check for cases of extreme luminance variance or low contrast that wash out the image to be undetectable.

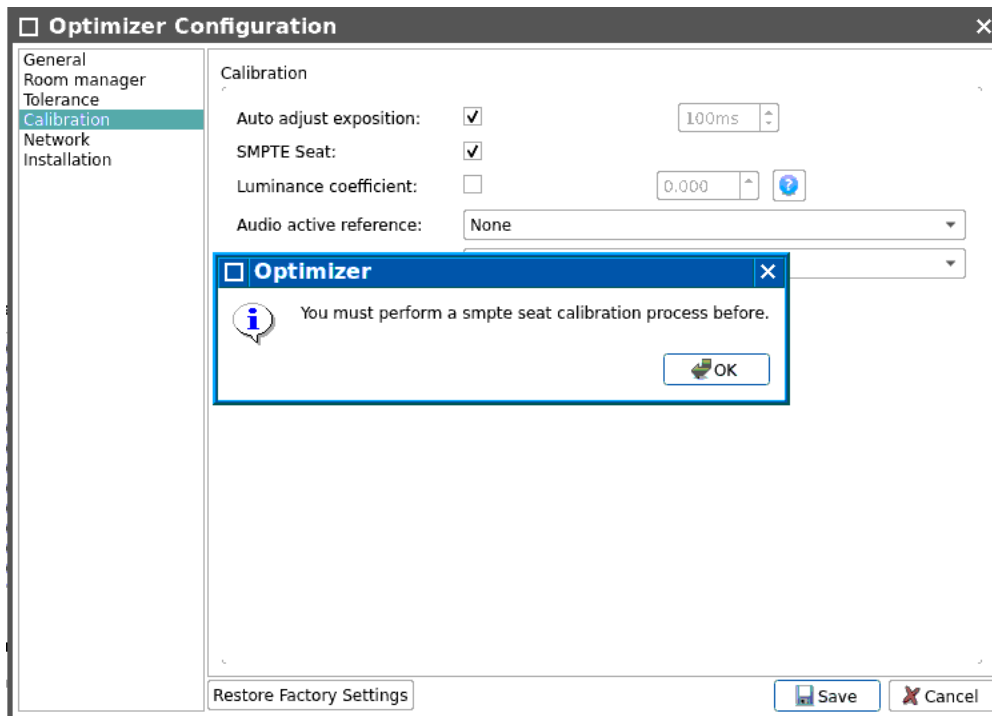
Onsite Calibration

The HSG Labs Optimizer is now installed in a fixed position, centered to the screen but as the sensors are installed at the projection booth level. The Optimizer needs to be calibrated correctly for the seating area viewing position. There are two operations that need to be done:

- Record the audio reference of the auditorium, after calibration
- Calibrate light levels from SMPTE Seat position

NOTE: Harkness suggests doing these operations with a HSG Labs Ultimate at least once a year during planned projection system maintenance.

In the **Configurations > Settings > Calibration** enable SMPTE Seat is active, and it there is an active audio reference.



SMPTE Seat Calibration

The Optimizer can be calibrated to read luminance values as if it were placed in the SMPTE Seat, centered in the cinema seating area. The HSG Labs Optimizer measures the Luminance value of the screen at up to 144 points, however those values need to be calibrated by HSG Labs Ultimate or Spectro.

Using HSG Labs Ultimate

The calibration of the SMPTE Seat using a HSG Labs Ultimate is automated process but requires a HSG Labs Ultimate to configure

1. *Install the Ultimate in the SMPTE Seat or preferred measurement position.*

Extract of SMPTE ST 431-1:2006

4.3 Measurement locations in the auditorium

All screen measurements shall be performed at the center of the seating row closest to the geometric center of the seating area. All readings shall be taken at a height of approximately 1.1 m (43 in) above the floor to simulate the eye height of an audience member.

2. *Configure the auditorium on the Ultimate.*

3. Select the correct screen format on the main interface (the same that is configured on the optimizer).

ULTIMATE

Projection format: Full Scope

Projection resolution: 2K 4K

OPTIMIZER

Optimizer Configuration

General
Room manager
Tolerance
Calibration
Network
Installation

Installation

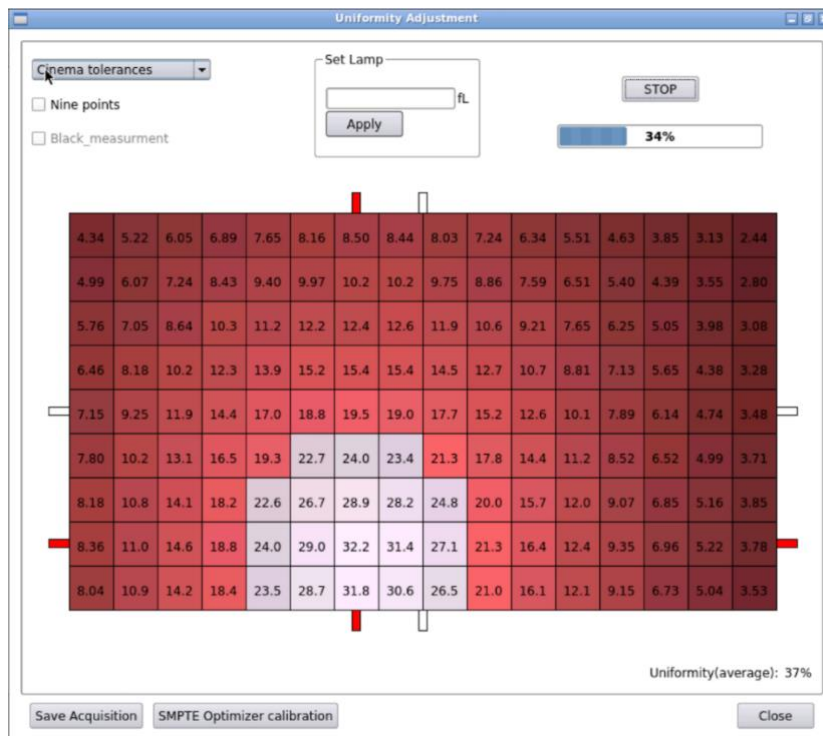
Orientation (reboot needed): Right Side Up

Spl version: version5

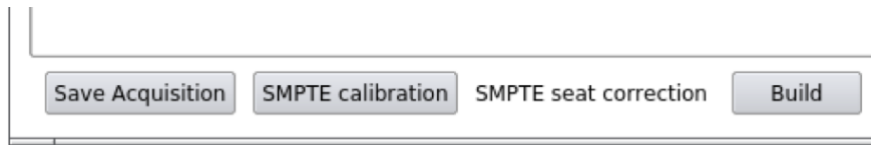
Display resolution: 2K

Screen type: Scope

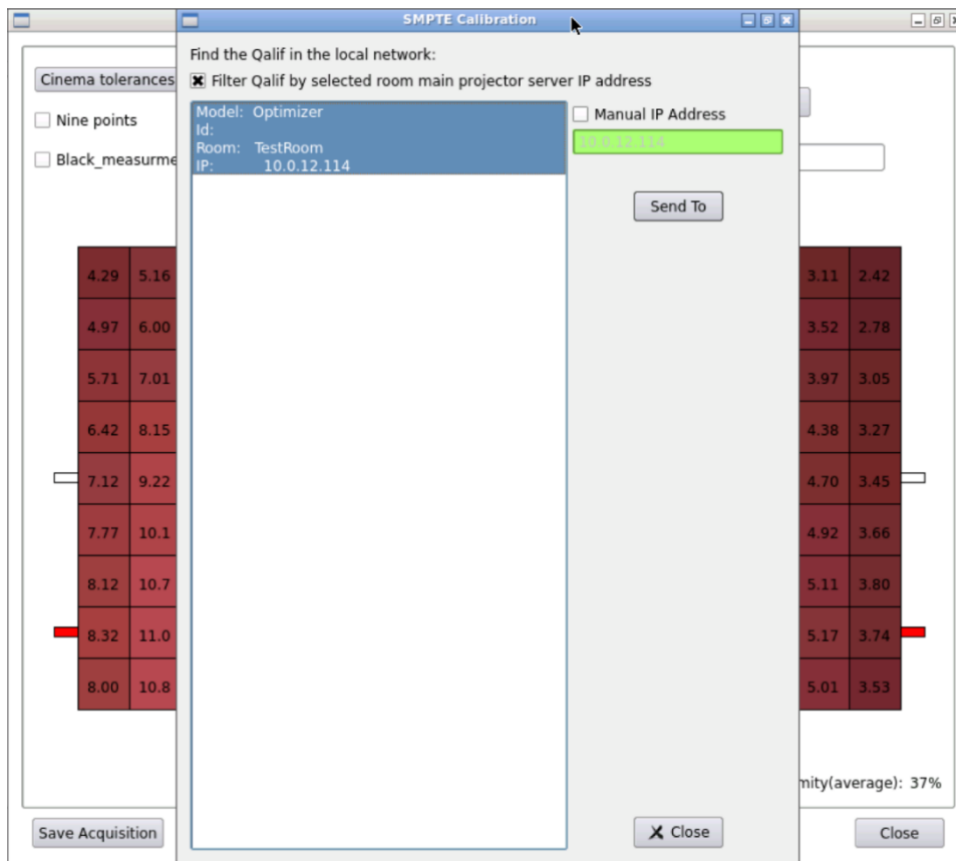
4. Center the Ultimate to the screen **Device Location**.
5. Go in the Uniformity detection on the Ultimate: **Projector Adjustment > Uniformity** and hit **PLAY** button.



6. Once ready click on **SMPTE calibration** from the bottom left of the Ultimate interface.



7. A popup will appear listing the Optimizer available on the network. If using the mobile kit of the Ultimate, the automatic network scan will not work the Ultimate and Optimizer are on different networks, manually add the IP address of the Optimizer.



8. Select the correct Optimizer and click on **Send To** button.
9. The Optimizer will then perform a geometry and a white measurement to complete the calibration.

WARNING: If using automatic pattern change on the Optimizer, connect to its VNC interface and follow the instructions that will be displayed in the popups.

10. The Calibration is done when the Optimizer log: **Build SMPTE Seat Success.** (no matter what Ultimate displays).

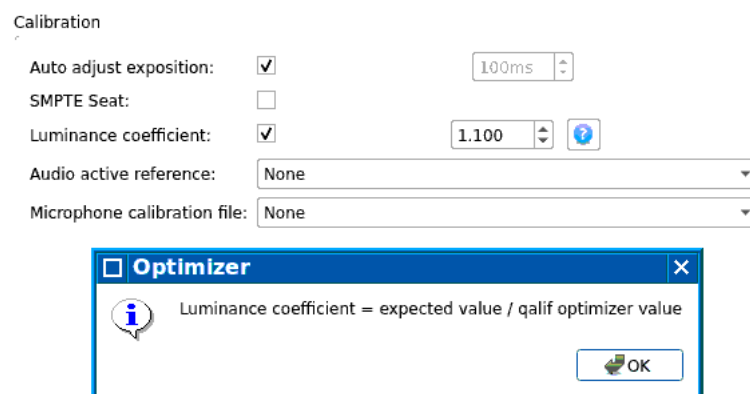
Using Spectro

Using a spectrometer or luminance meter, the calibration can be done for the center point only using a luminance coefficient calculation.

1. Install the Spectro in the SMPTE Seat or preferred measurement position.
2. On Optimizer, open **Projector Adjustment > Uniformity** and note the light value in the center (QOReading).
3. Shoot with the Spectro the same white (SReading).
4. Calculate the luminance coefficient:

$$\text{Luminance Coefficient} = \text{SReading} / \text{QOReading}$$

5. Set and save the luminance coefficient in the settings of the Optimizer **Configurations > Settings > Calibration**.



WARNING: Using the luminance coefficient only the central uniformity point value will be right from the SMPTE Seat.

Audio Measurement

The Optimizer does not make any audio adjustments but is checking that the audio conforms to the reference values using a pre-saved recording.

Steps on how the Optimizer audio check and reference works:

- Calibrate the audio with standard cinema audio tools.
- Disable remote mode and open **Audio** panel on the main Optimizer interface.
- Record the reference of the auditorium on the Optimizer.
- Every measurement, the Optimizer will compare the reference with the last measurement.
- Optimizer will log if there is a difference with the reference.
- These values can be check in the History log.

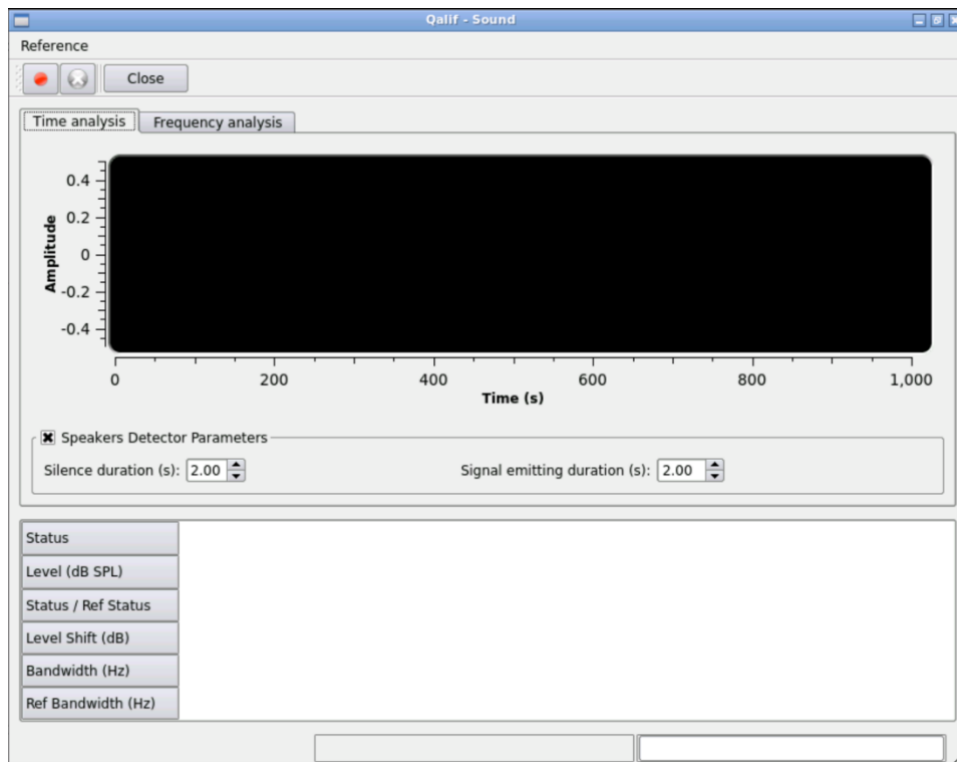
WARNING: Every time a change is made to the audio system (calibration, speaker, amps, ...) a new reference is required.


Audio Reference Recording

1. Deactivate the remote mode.
2. Click on **AUDIO** button from main interface:



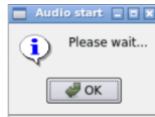
3. The audio Interface will then open.



4. To start the reference recording, click on the red dot  button and follow the popup instructions.



The user will need to be manually prepared to play the audio pattern on the sever within 15 seconds after the "Please wait" popup disappear.

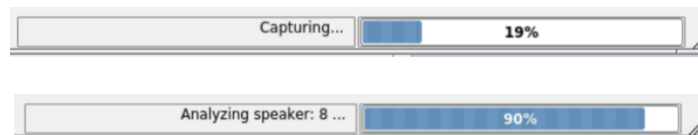


NOTE: If ATMOS system is present, with Atmos license activated, the Optimizer will automatically communicate with the CP850/CP850 sound processor to activate the audio test.

5. During the recording, the first pass audio analysis is displayed.



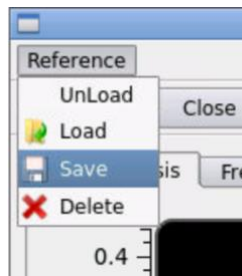
NOTE: The status of the recording is located at the bottom right part of the window.



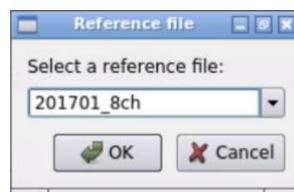
6. An alert will Pop up when the analysis is finish.



7. Save the current audio test as a reference by clicking on Reference > Save.



8. Assign a name to the reference so the file be recognized during measurements and confirm by clicking OK button.



NOTE: To change the active audio reference file, use the **Configurations > Settings > Calibrations** menu.

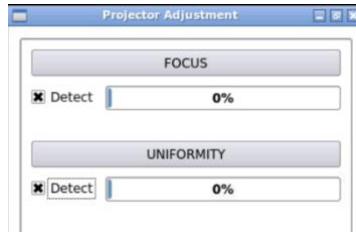
WARNING: The reference needs to be measured at the same auditorium condition number of speakers and volume level as the automated playlist check.

Use Optimizer Functionality via the VNC Interface

The Optimizer Lite functionality can be used manually via the interface by clicking on the **PROJECTOR ADJUSTMENT** button in the main interface.



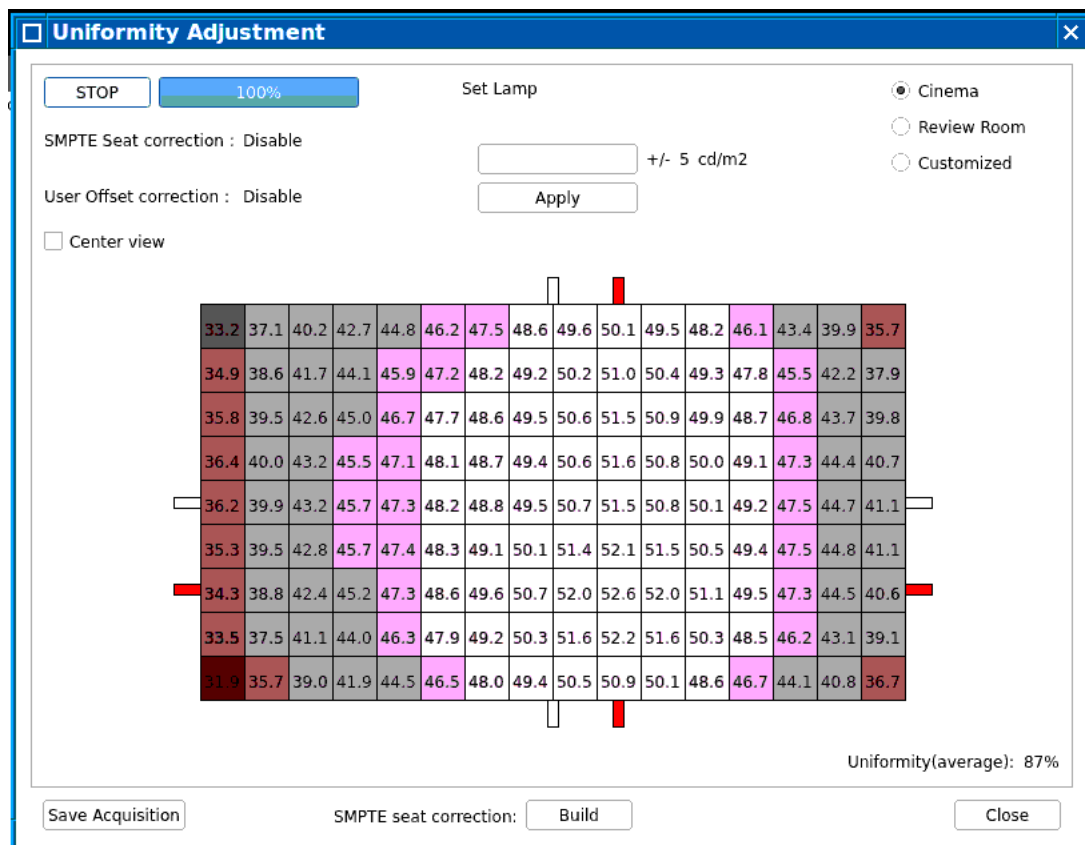
The user will have the choice to enter in the **Focus** adjustment or **Uniformity** and Lamp section.



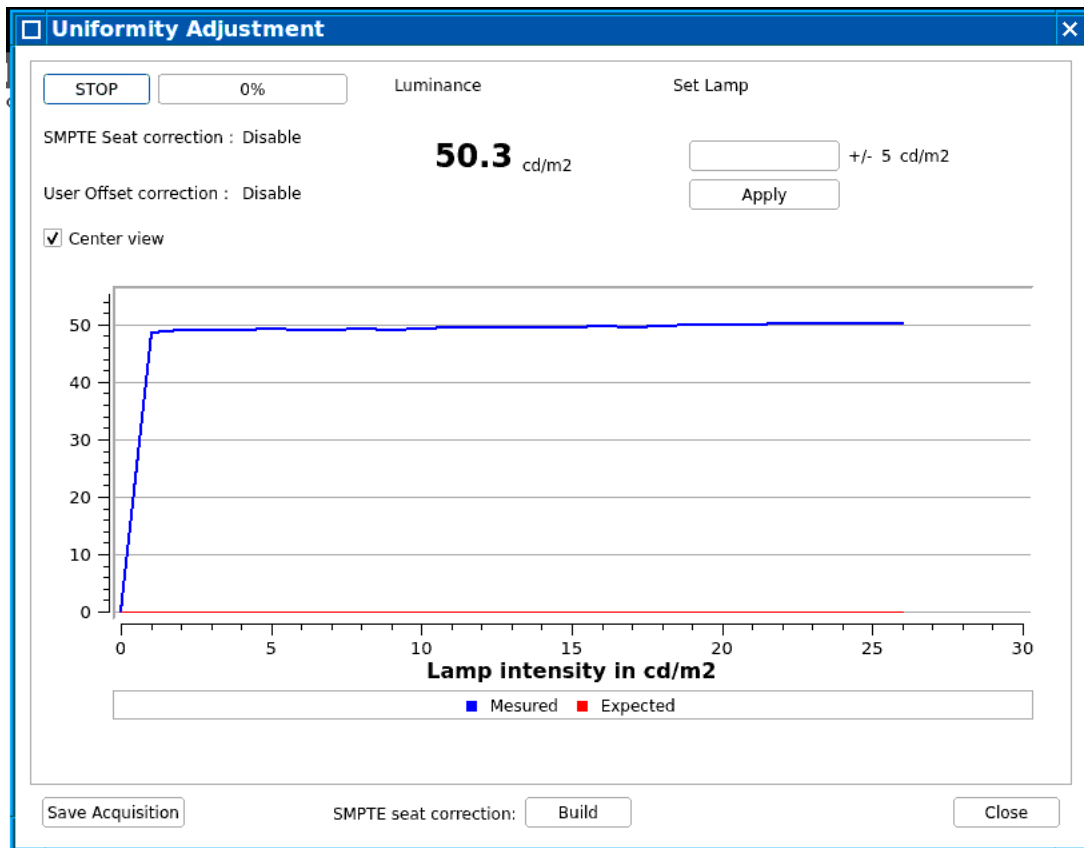
NOTE: As explained, the Optimizer will automatically load or will direct the user to load the correct test pattern per the format that is selected in the **Configurations > Settings > Installation**.

Uniformity

Click on **START** to begin the measurement. This process will continually refresh until the **STOP** button is pressed.



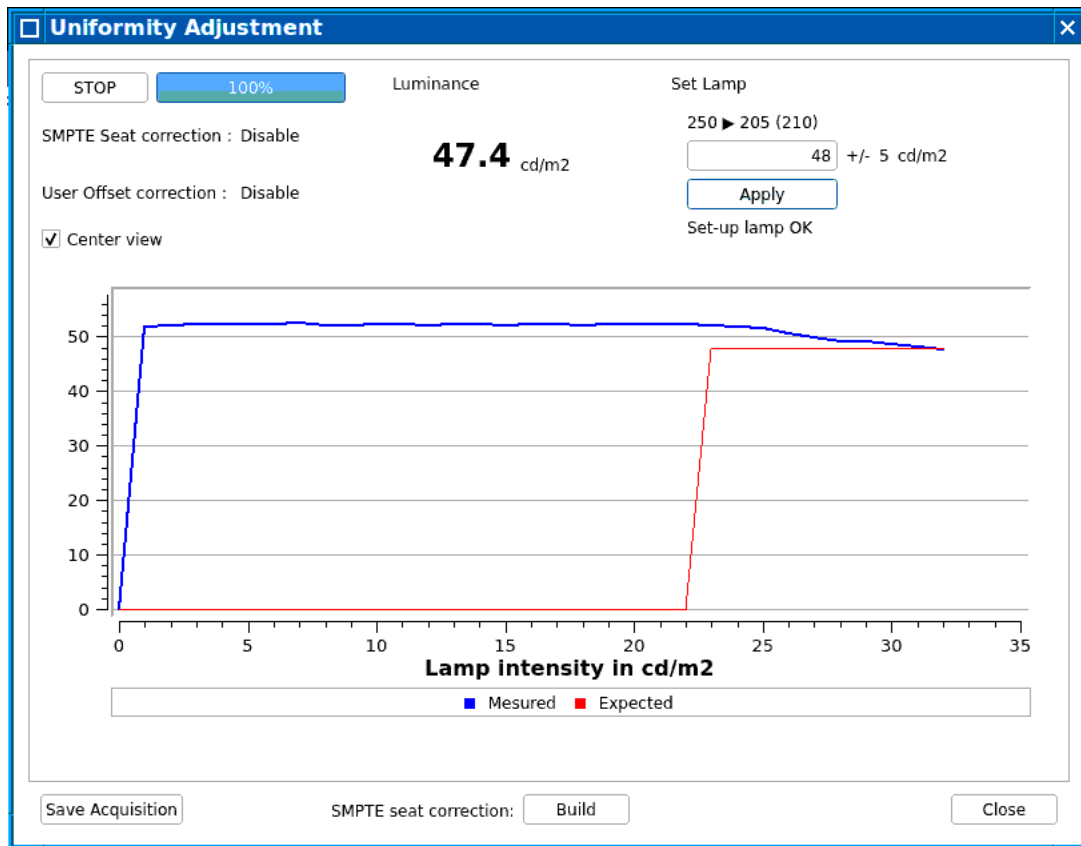
Selecting the **Center view** button will change from 144 points to a single average center point.



Lamp Power Adjustment

Set the desired value and click on Apply to start the calibration. The process will proceed until the value has been reached or the min/max value of the lamp has been set. The lamp power will be saved to the active lamp file.

NOTE: Current software versions only can control the lamp power on xenon projectors due to advanced algorithms on RGB projectors.



Focus

Click on **START** to begin the focus calibration. The process will continue until the focus process is completed. The active lens file will be saved if the minimum tolerance criteria is passed.




NOTE: The focus is done by analyzing the contrast on the screen. It is best to complete the analysis in cinema conditions but can be done with auditorium lights off or on but the please do not change the environmental light conditions during the adjustment.

Audio

For audio manual check, click on **AUDIO** button from main interface:



To start the recording click on the red dot  button and follow the instructions. A popup will appears showing the analysis results.



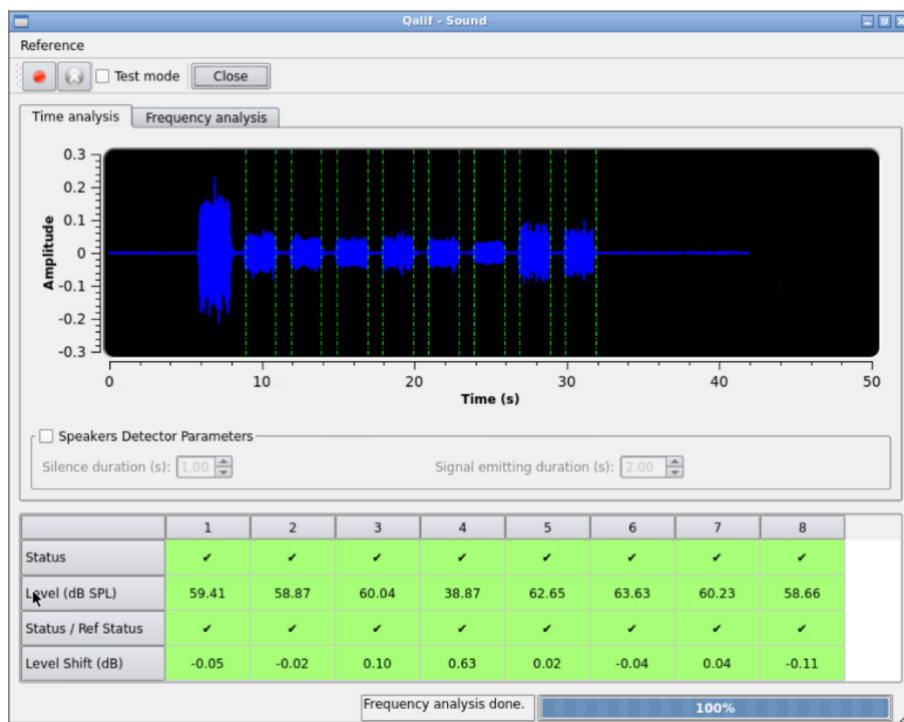
	VALUES	DESCRIPTION
Conformity	Checked / Failed	Shows if the number of the reference speakers are the same as the number of speakers detected
Level Conformity	Checked / Failed	Shows if the dB levels of the actual measurements are out of tolerance

Room status	Valid / Out-of-order speakers	Shows if the number of the configured speakers are the same as the ones detected
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NOTE: For audio measurement Optimizer does not automatically load the test pattern. The user must select the correct audio CPL (6 or 8 channels) and play the content as directed by the Optimizer software.

Time Analysis Tab

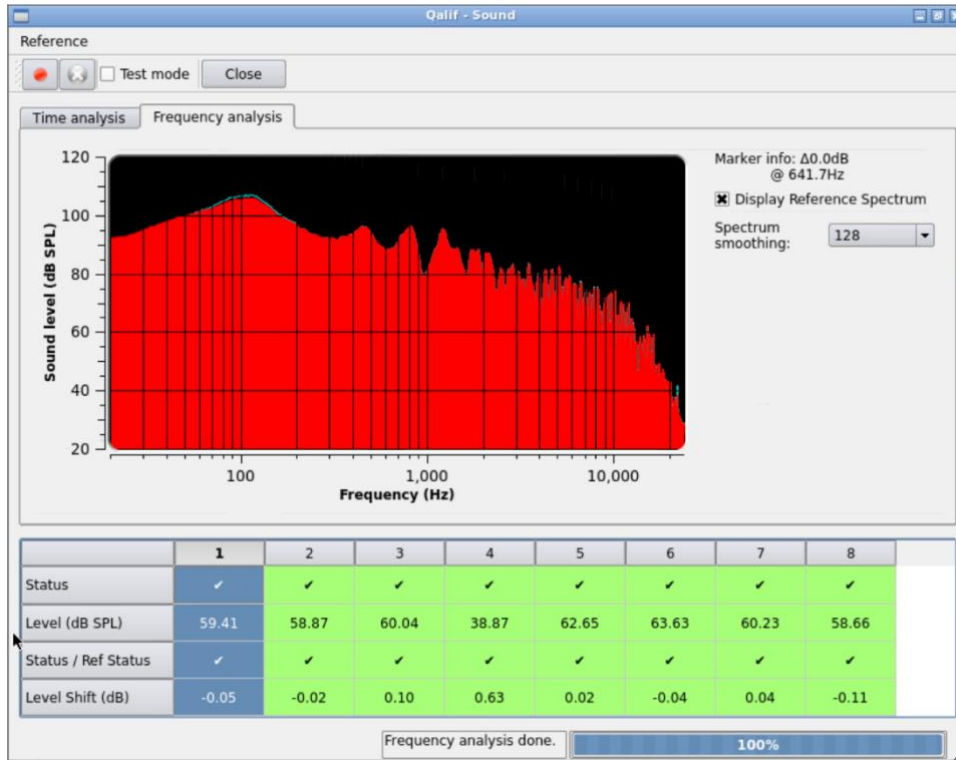
After the audio measurement, the display shows the analyzed channels, the differences between, the reference and the recording.



	VALUES	DESCRIPTION
Status	✓ / ✗	Shows if the speakers have been detected
Level (dB SPL)	Value	Shows the dB of the speaker from where the microphone is installed
Status / Ref Status	✓ / ✗	Show if there is a difference between the reference to the current measurement
Level Shift (dB)	Ref dB – Level dB	Differences between current reading / reference
Bandwidth (Hz)	Min - Max	Current analyzed min - max bandwidth
Ref Bandwidth (Hz)	Min - Max	Reference analyzed min - max bandwidth

Frequency Analysis Tab

In this tab, each channel can be selected to analyze the frequency and the frequency differences between the reference to identify the faulty part of the speaker.



Configure Automation on the SMS

HSG Labs Optimizer allows calibrating the projection systems automatically using SMS (Screen Management System) playlist and automation features. To make this possible, the user will need to define an TCP RAW device on the SMS and create automations macros that can be added to the calibration playlist.

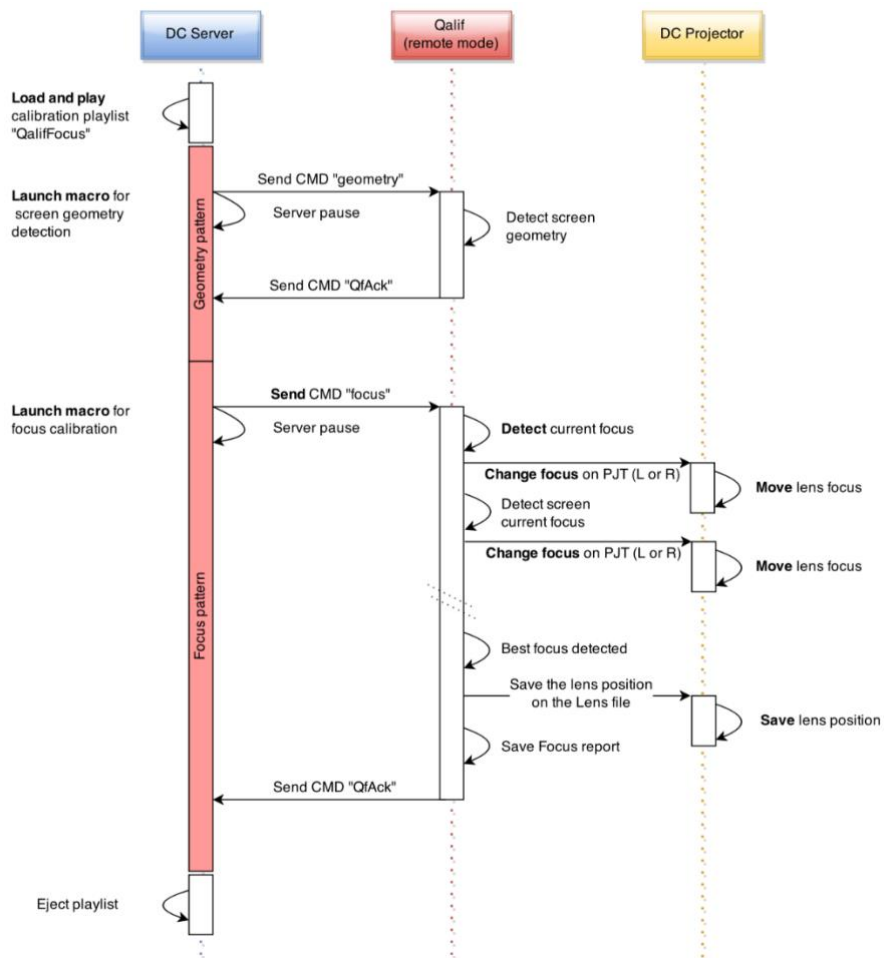
Device is typically a TCP RAW device that use port **32768**.

A typical automation ASCII string for the Optimizer is: **[Focus --Start --QfAck]** . Below is the full list of required macros for the Optimizer.

Macro Name	Content required	Macro	Pause Required
Geometry	QF-Geom-2.0_TST_X_XX_HT	[Geometry --Check --QfAck]	Yes
Uniformity	QF-White-2.0_TST_X_XX_HT	[Uniformity --Start --QfAck]	Yes
Lamp 2D Adj	QF-White-2.0_TST_X_XX_HT	[Lamp --Start --Mode 2D --QfAck]	Yes
Focus Adj	QF-Checkerboard-2.0_TST_X_XX_HT	[Focus --Start --QfAck]	Yes
Audio Record	QF-Audio_TST_C_2K_XXCH_HT	[Audio --Start --QfAck]	Yes, following Black clip
Export Results	Black	[ExportResults --QfAck]	No

Please refer to the manual: **Qalif Macro and SPL Automation** document to get more details on this procedure.

A typical focus workflow is represented in the following diagram:



WARNING: Remember that the automation of the Optimizer works only if the **Remote mode = ON**. The remote mode is enabled by default at every restart.

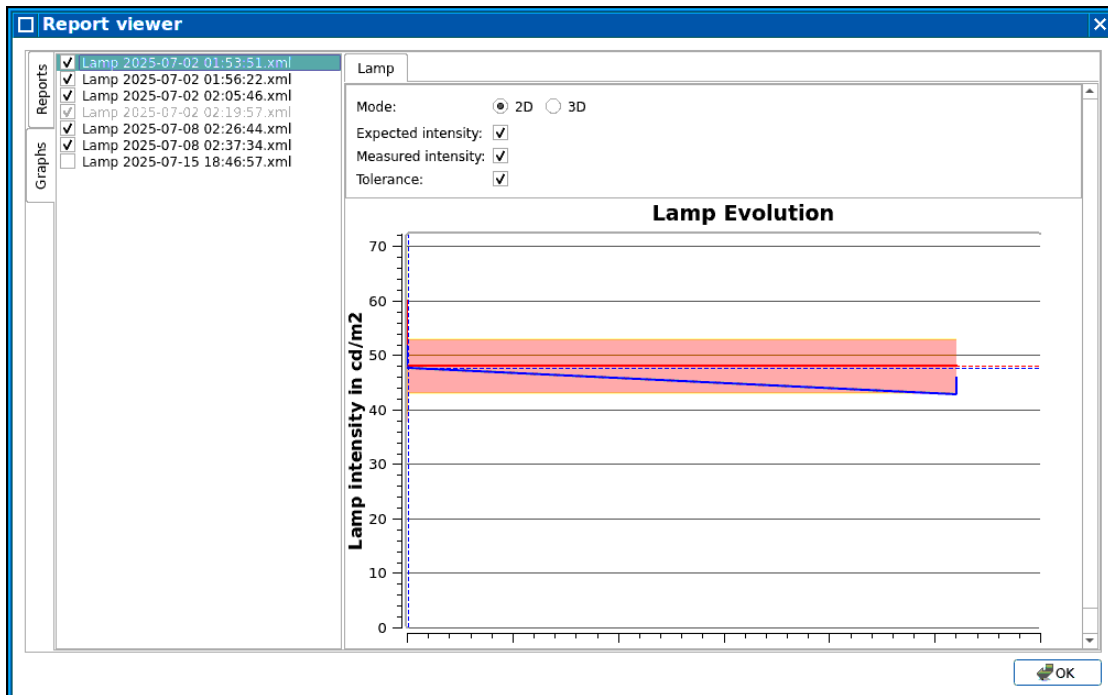
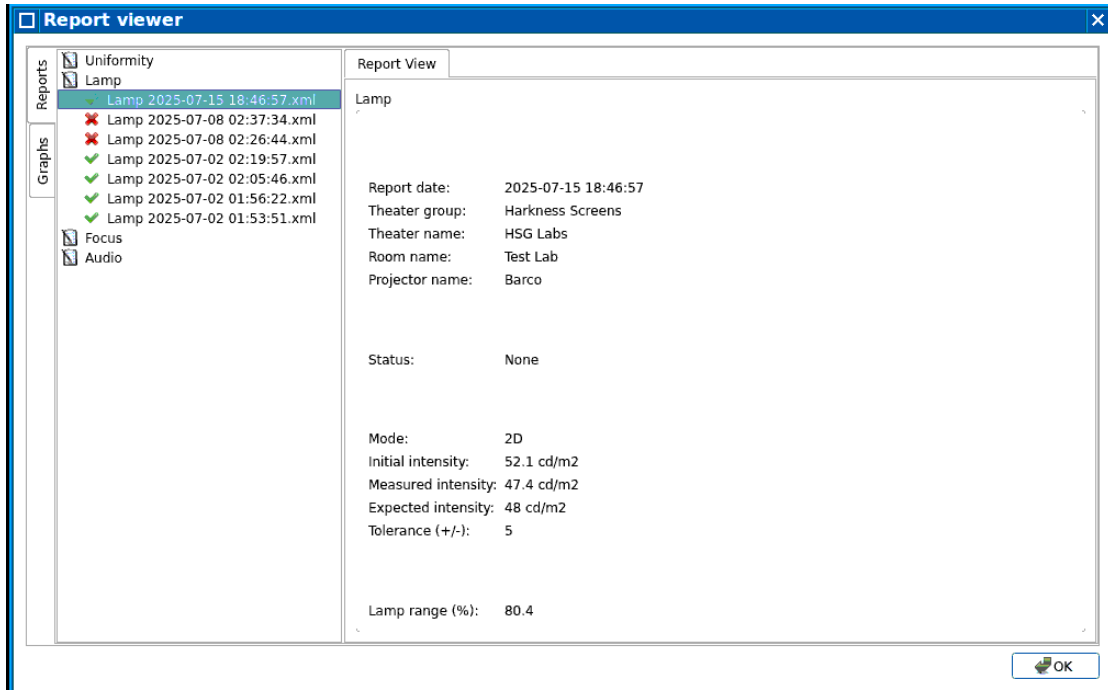
History and Reporting

There are different ways to browse and retrieve the reports from the Optimizer.

History via VNC GUI

Click on **HISTORY** button from the main interface of the Optimizer. Historic logs of pats measurement are sorted by measurement type, date, and time.





Connecting via FTP

Use an FTP client (like FileZilla Client, WinSCP) to connect to the unit using **qalif** username and **qalif** password. The xml reports are organized in sub-folders:

- ▢ Reports
- ▢ Audio
- ▢ Focus
- ▢ Graph
- ▢ Lamp
- ▢ Uniformity

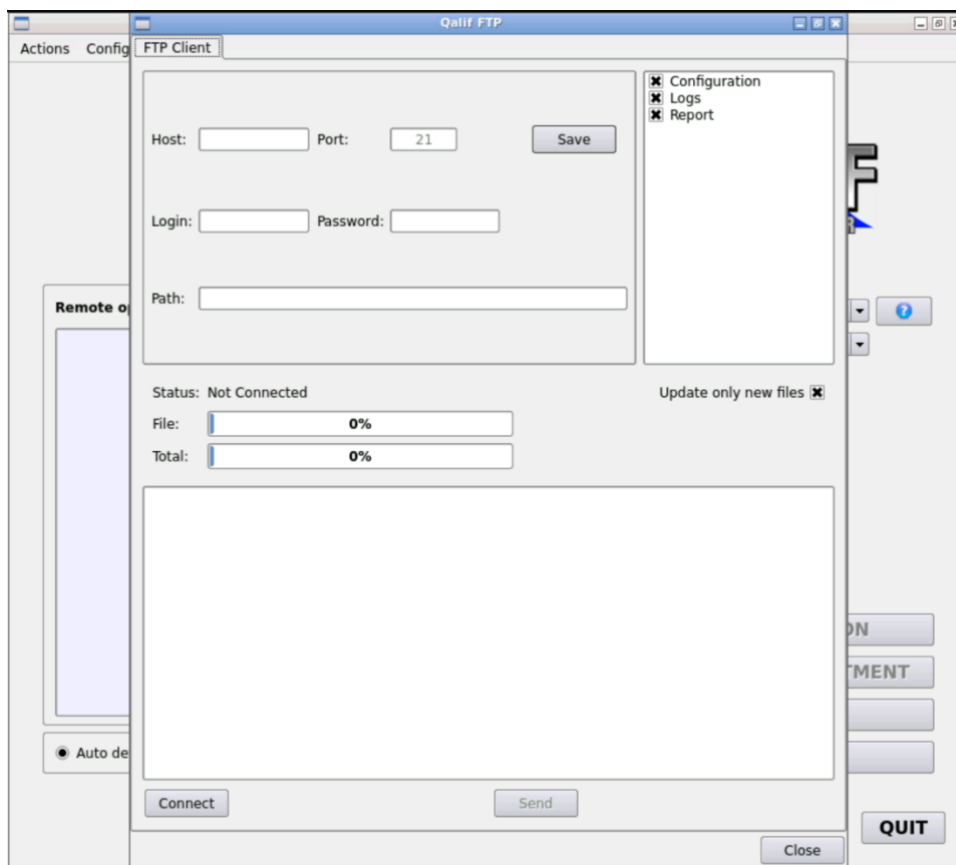
Using the API

Using the full Optimizer API to access to the report, settings and measurements.

Please contact your account sales representative for more info.

Push to External FTP

The Optimizer can be configured to automatically push the reports to an FTP server using **Configurations > Save FTP**.



Extract Measurement Reports

Insert a USB into the Optimizer USB port. A compressed file named **Reports-<UnitSerialNumber>-<DATE>_<TIME>.tar.gz** will contain all the Optimizer history and reports.

Extract Logs

Insert a USB into the Optimizer USB port. A compressed file named **Logs-
<UnitSerialNumber>-<DATE>_<TIME>.tar.gz** will contain all the Optimizer logs folder.

Light Calibration for 3D

Step A: Full 3D Measurement

At the installation stage, perform a lamp power adjustment to have the expected lamp level on the screen with:

- *Projector in 3D format*
- *Server in 3D mode*
- *Projector 3D system IN*
- *Glasses in front of Optimizer lens*

For example, in this configuration, perform a Lamp3D adjustment with 6fL in the 3D value.

Step B: Partial 3D Measurement

Next, determine with a uniformity measurement the value without glasses, this will help avoid manual action for each daily adjustment:

- *Projector in 3D format*
- *Server in 3D mode*
- *Projector 3D system IN*
- *Glasses out of Optimizer lens*

For example, 24fL.

Step C: Define 3D Tolerance value

Set the tolerance to 24fL in the Optimizer settings for the Lamp3D parameter to be sure to have 6fL for the 3D experience.

Schedule the Lamp3D Macro every day and guarantee the expected lamp level without manual action to move the dedicated glasses.