CALICO | PRO
VIDEO PROCESSOR

C7-PRO-2200 CALICO PRO
C7-PRO-1200 CALICO PRO
CALICO Studio

Firmware Version 1.1.0.7 or later

CALICO Studio Version 1.1.3.9 or later

User Guide v1.2.1

Contents

Welcome

Welcome to tvONE Help, the place to get help with your:

CALICO™ PRO and CALICO™ Studio

Check that you have the latest revision of this document. Ensure that it matches your software version

Get more help on-line: CALICO C7-PRO-Help

This manual covers models C7-PRO-2200 (2U) and C7-PRO-1200 (1U).

Differences between the 1200 and the 2200 models

The **1200** model has six HDMI 2.0 inputs and two HDMI 2.0 outputs. There are no expansion module slots. The power supply is internal.

The **2200** model has eight HDMI 2.0 inputs and four HDMI 2.0 outputs. This model also has three optional slots for expansion modules. The power supply is also hot swappable and has a dual redundant option.

Any reference to expansion modules and dual redundant power supplies are only applicable to the **2200** model.

Meet CALICO PRO

CALICO PRO connects to a wide range of sources and outputs and works with CALICO Studio software to allow you to build dynamic video installations with an easy-to-use visual interface.

Features

- Share contents and output to displays dvLED (Direct View LED) controllers, and projectors
- Input and output mapping feature for every input and output
- Window source cropping
- 256 video windows
- Latency is imperceptible at one to maximum two frames at 4K60
- Our largest ever creative canvases at 64,000 x 64,000 pixels
- Canvas watch for monitoring
- Labelling
- Consumes much less electricity than PC based systems
- Wide range of inputs, including HDMI, 12GSDI, HDBaseT, 4K playback, and streaming media **(only 2200)**
- Supports 4:4:4, 4:2:2, or 4:2:0 chroma subsampling on supported modules
- Supports up to HDCP 2.2 on-board and on supported modules
- Embedded audio support
- External S/PDIF and analog audio input and output via the optional audio module **(only 2200)**
- Front panel status screen
- Combination of different sizes and resolutions of displays can be used
- Adjustable bezel compensation
- Edge blending of projectors
- Up-down-cross conversion
- Window luminance keying
- Control your video wall with CALICO Studio, secure IP
- HTTP and HTTPS connectivity, RESTful multi-user control, WebSocket event monitoring
- CALICO Studio mobile apps are available for Android and IOS devices.
- Crestron software module available
- Q-SYS plugin available
- CALICO PRO: 1RU and 2RU frame size, 16 GIGAPIXEL, four separate design canvases

Meet CALICO Studio

CALICO Studio is packed with features to help you create and manage your canvases.

Features

- Simple, powerful, software interface
- Full off-line mode with video to plan and design a project before committing to purchase.
- Manage and control any CALICO PRO on your network
- Update your firmware remotely
- Save window configurations as presets and transition between presets
- Rotate sources and outputs in 1° increments
- Choose sources for windows
- LED tools, markers, grids, and guidelines to help with building and organizing canvases.
- Manage streaming media
- Use custom resolutions, and manage EDID data
- See your changes instantly with live changes mode
- Undo and redo your work
- Control audio, configure labels, borders, and colors
- Position your outputs and windows with pixel-precision

Get to know your product

Learn about the features and functions of your hardware.

About your CALICO PRO 1200

CALICO PRO 1200 has pre-installed video inputs and outputs, so it can work right out of the box.

It can be connected to a wide range of sources and display equipment and has been designed with features that make it easier to work with dvLED controllers by the addition of an output mapper.

CALICO Studio software is the configuration tool for CALICO PRO, and will allow you to build dynamic video installations with an easy-to-use visual interface

Pre-installed inputs and outputs

Your CALICO PRO 1200 comes with six HDMI 2.0 inputs capable of accepting up to 4K60 (4096x2160) 8-bit video 4:4:4, or 4K60 (4096x2160) 10-bit video 4:2:2.

There are two pre-installed HDMI 2.0 outputs capable of up to 4K60 (3840x2160) 8-bit video 4:4:4, or 4K60 (3840x2160) 10-bit video 4:2:2.

All support up to HDCP 2.2

Rear panel

1	Pre-installed inputs	HDMI 2.0 (six inputs)
2	Pre-installed outputs	HDMI 2.0 (two outputs)
3	Ethernet connection	Connect to your network. Calico Studio and other control systems. (for IT use – do not connect to building or external wiring)
4	Reference input and loop out	Genlock (BNC connections)
5	Power connector	Use supplied power cord and connect it to suitable power outlet
6	USB-3.0	Future use. Currently only provides power.

Front panel

The front panel of your CALICO PRO includes a customizable status screen. The status screen can show the IP address of your CALICO PRO, its status, and the name of the device. You can also control the brightness of the status screen.

These can be configured in the **Settings** menu in CALICO Studio when you are connected to the device.

You can choose which of these elements are displayed, for example you could choose not to display the IP address.

You can also decide if you want the blue illuminated chevrons to light up or not and control their brightness.

The front panel has two integrated carry handles that cannot be removed.

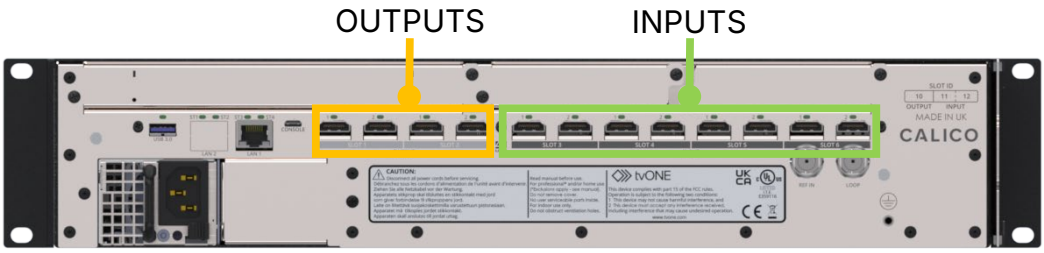
About your CALICO PRO 2200

CALICO PRO 2200 has pre-installed video inputs and outputs, so it can work right out of the box. There are three provided expansion slots, which can be field upgraded to allow more inputs and outputs as well as increased functionality.

It can be connected to a wide range of sources and display equipment and has been designed with features that make it easier to work with dvLED controllers by the addition of an output mapper.

CALICO Studio software is the configuration tool for CALICO PRO, and will allow you to build dynamic video installations with an easy-to-use visual interface

Pre-installed inputs and outputs



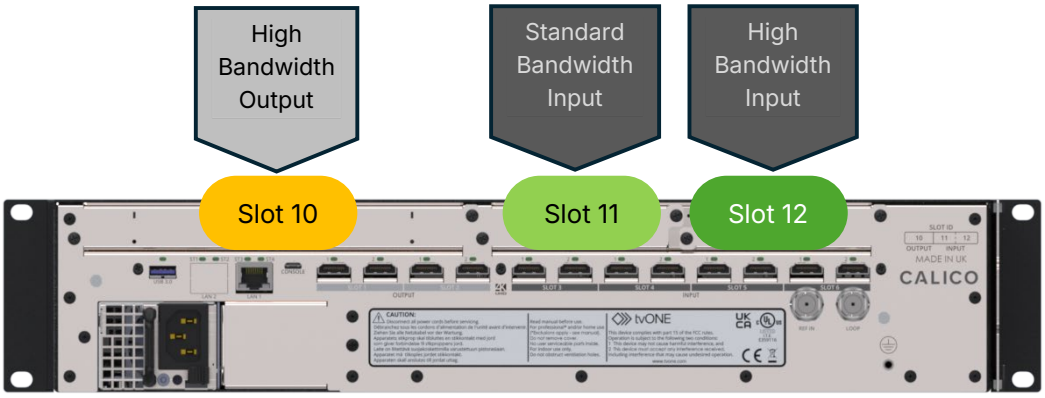
Your CALICO PRO comes with eight HDMI 2.0 inputs capable of accepting up to 4K60 (4096x2160) 8-bit video 4:4:4, or 4K60 (4096x2160) 10-bit video 4:2:2.

There are four pre-installed HDMI 2.0 outputs capable of up to 4K60 (3840x2160) 8-bit video 4:4:4, or 4K60 (3840x2160) 10-bit video 4:2:2.

All support up to HDCP 2.2

Expansion slots

Your CALICO PRO 2200 has 3 slots available for option modules.



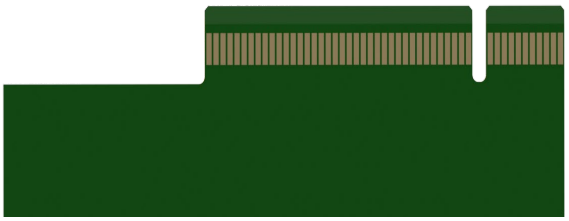
Valid module combinations

Slot 10	Slot 11	Slot 12	Key: SB = standard bandwidth HB = high bandwidth
any HB or none	none	none	Pre-installed inputs and outputs so all modules are optional
any HB or none	none	any SB / HB	Any video module can be installed into slot 12
any HB or none	any SB	none	Any SB video module can be installed into slot 11 when slot 12 is
any HB or none	audio	any SB / HB	Audio module only fits in slot 11with any video module in slot 12
any HB or none	any SB	any HB	With SB modules, only four video channels are available between slots 11 and 12. If two SB modules are fitted, they must both be dual
any HB or none	any SB dual	any SB dual	

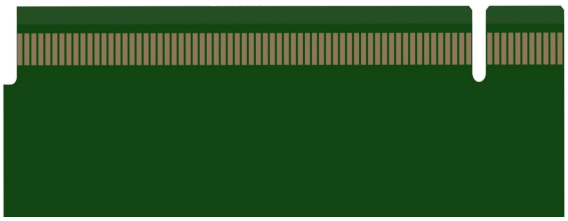
Invalid module combinations

any HB or none	any SB or	audio	Audio module cannot work in slot 12
any HB or none	any HB	any SB or	HB module will not install into slot 11
any HB or none	any SB	any SB	Four video channels are available for SB modules across slots 11 and 12
any HB or none	any SB quad	any SB	

Standard bandwidth (SB) and high bandwidth (HB) module connections



Standard bandwidth module connector



High bandwidth module connector

> **Important note:**
>
> **Risk of damage**- Do not insert high bandwidth input modules into slot 11. The device and module can be damaged. If you are unsure contact your supplier.

Front panel

The front panel of your CALICO PRO includes a customizable status screen. The status screen can show the IP address of your CALICO PRO, its status, and the name of the device. You can also control the brightness of the status screen.

These can be configured in the **Settings** menu in CALICO Studio when you are connected to the device.

You can choose which of these elements are displayed, for example you could choose not to display the IP address.

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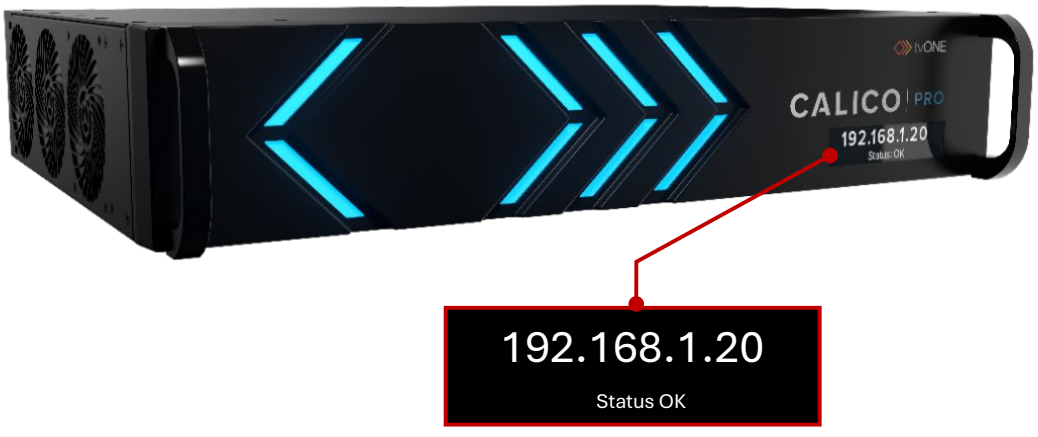
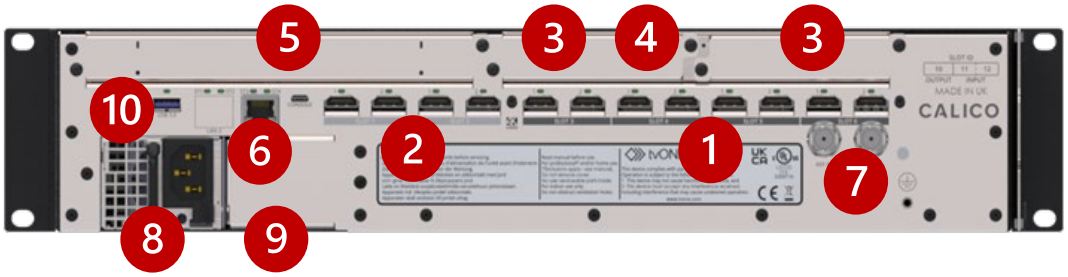
The front panel has two integrated carry handles that cannot be removed.



Rear panel



1	Pre-installed inputs	HDMI 2.0 (eight inputs)
2	Pre-installed outputs	HDMI 2.0 (four outputs)
3	Optional input module slot	Connect to sources
4	Optional audio slot	Optional: connect to audio sources and/or playback devices
5	Optional output slot	Connect to displays, projectors and DVLED controllers
6	Ethernet connection	Connect to your network. Calico Studio and other control systems. (for IT use – do not connect to building or external wiring)
7	Reference input and loop out	Genlock (BNC connections)
8	Dual redundant Hot swappable power supply (PSU)	Use supplied power cord and connect it to suitable power outlet
9	Dual redundant hot swappable power supply (PSU2)	Optional: Use supplied power cord and connect it to suitable power outlet
10	USB-3.0	Future use. Currently only provides power.

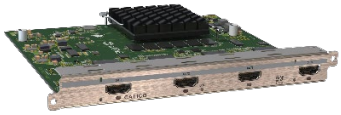
Optional modules and accessories

CALICO PRO 2200 supports a range of options, including input and output modules and accessories, all with model numbers starting with C7-PRO-. Each option module supports specific connections.

Input modules

Module	Product Number	Connections
Quad 12GSDI broadcast input module (*High bandwidth)*	C7-PRO12GSDI-4IN 	4x 12GSDI (Full size BNC) up to: 4096x2160p - 60Hz
Quad 3GSDI broadcast input module	C7-PRO-3GSDI-4IN 	4x 3GSDI up to: 1920x1080p - 60Hz
Quad HDMI input module HDCP 1.4	C7-PRO-HDMI-4IN 	4x HDMI up to: 1920x1080p - 60Hz
Dual HDMI input module HDCP 1.4	C7-PRO-HDMI-2IN 	2x HDMI up to: 4096x2160p Single input = 60Hz Dual input = 30Hz
Quad HDMI input module HDCP 2.2 (High bandwidth)	C7-PRO-HDMI-4K4IN 	4x HDMI up to: 4096x2160p - 60Hz
Dual 4K HDBaseT input module	C7-PRO-HDBT-2IN 	2x HDBaseT up to: 4096x2160p - 60Hz Single input = 60Hz Dual input = 30Hz 1x Ethernet
Media module IP decode Media storage and playback	C7-PRO-MEDIA 	1x USB-3.0 1x Ethernet 1x 128GB SSD Two 4K30 playback channels, both playing a quad split of four 1080p 30 files (synchronized mode) 1x 4K30+1x 1080p (standard)

Output modules

Module	Product Number	Connections
Quad 12GSDI broadcast output module *(High bandwidth)*	C7-PRO-12GSDI-4OUT 	4x 12GSDI (Full size BNC) up to: 3840x2160p - 60Hz
Quad HDMI output module HDCP 2.2 *(High bandwidth)*	C7-PRO-HDMI-4K4OUT 	4x HDMI 2.0 up to: 3840x2160 - 60Hz 1920x1080p - 120Hz
Octad HDMI output module HDCP 1.4 *(High bandwidth)*	C7-PRO-HDMI-2K8OUT 	8x HDMI 1.4 up to: 1920x1080p - 60Hz

Audio module

S/PDIF and analog audio module Audio embed / de-embed	C7-PRO-AUD-2IN-4OUT 	Inputs: 1x analog, 1x S/PDIF Outputs: 1x analog, 4x S/PDIF

Accessories

Power supply Redundant PSU for 2RU series units (400W) Hot Swappable	C7- PRO-4RPS 	1 x IEC power cord
Air filter kit for dusty environments.	C7-PRO-2U-FILTER 	Cleanable and re-usable stainless steel air filter for CALICO 2U models. Comes with installation kit. Easy removal from the rear of the unit for cleaning.

About your 4K media input module

The 4K media input module allows you to decode and play:

- Media and images from a USB drive
- Media and images from internal storage
- Video streams from IP sources

Sources include streaming server, and any device used with an IP encoder, for example, the Magenta Encoder-100.

Features

- Two of these can be installed into a C7-PRO-2200 (slots 11 and 12)
- Play two simultaneous channels of media, including IP streams
- Play video clips from USB drive up to 4K30 3840 x 2160p - 30 Hz
- Play single IP streams up to 100 Mb/s
- Play dual IP streams up to 40 Mb/s
- Play still images up to 8K (stored), scaled to 4K into CALICO PRO.
- Play streams with low latency
- Play media from streaming server
- Create and save up to 20 playlists
- Primary channel supports up to 4K30 3840x2160p - 30 Hz
- Secondary channel supports HD 1920 x 1080p - 60 Hz
- IP streams up to 4K30 3840 x 2160p - 30 Hz
- Save up to 40 IP streams
- Full resolution and frame rate scaling
- Start playing media when your device starts
- Supports USB 3.0
- Synchronized mode - Two 4K30 playback channels, both playing a quad split of four 1080p 30 files
- FTP synchronization for media files
- Support AES CBC encrypted streams with 128- or 256-bit keys
- For CALICO PRO, C7-PRO-MEDIA comes with 128 GB internal storage

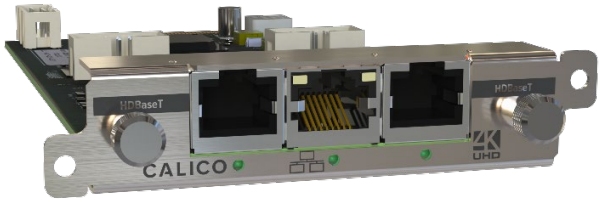
Status LED's and their meaning

USB	Indicates the status of the USB drive. **Green** means that the USB drive is working correctly. **Red** means that too much power is being draw through the connector	**USB 2.0**	For best results, we recommend using quality USB drives compatible with USB 3.0
USB 3.0	Connect a USB drive to play media directly	**ST1**	Indicates the status of the module. **Green** means that the module is working correctly. **Red** means that the module is starting, or that there is a problem
ST2	Indicates the status of the sub-module. **Green** means that the sub-module is working correctly. **Red** means that the sub-module is starting, or that there is a problem	**LAN**	Connect an Ethernet cable to play media over IP. Upload media over FTP

If any status indicator stays **Red,** restart your CALICO PRO. If that does not work, contact tvONE support. Contact details are at the back of this guide.

About your HDBaseT input module

The 4K HDBaseT module allows you to receive uncompressed, high-resolution 4K video and audio from stand-alone transmitters located up to 150 meters away. The input module also allows you to extend Ethernet from remote transmitters that support HDBaseT Class A and HDBaseT Class B.



Features

- Two of these can be fitted into a C7-PRO-2200 (slot 11 and 12)
- HDBaseT class A to 150m
- HDBaseT class B to 60m
- 1x channel 4K60 or 2x channels 4K30 or below
- Audio support

Status LED's and their meaning

<table>
<tr><td>Status indicator</td><td>Indicates the status of the module by the LED directly below the middle RJ45 connector
Green means that the module is working correctly
Red means that the module is starting, or that there is a problem
Off means the module is powered down</td></tr>
<tr><td>Ethernet links</td><td>Two LEDs that are built into the middle RJ45 connector
Left LED Ethernet Link/Activity
Right LED Ethernet speed, Off for 10 Mbps or Green for 100 Mbps</td></tr>
<tr><td>HDBaseT link</td><td>Indicates the link status by the LED directly below the left and right RJ45 connectors.
There is a Green LED for the HDBaseT status and Red LED for the HDMI status, they can combine to make Orange
<table>
<tr><th>LED status</th><th>No Link</th><th>Ethernet</th><th>HDBaseT</th></tr>
<tr><td>No HDMI</td><td>Off</td><td>fast Green / Off</td><td>Green</td></tr>
<tr><td>HDMI with HDCP</td><td>Red</td><td>Orange / Off</td><td>Orange</td></tr>
<tr><td>HDMI without HDCP</td><td>Red / Off</td><td>Orange / Red / Off</td><td>Orange / Green</td></tr>
</table>
</td></tr>
</table>

If any status indicator stays Red, restart your CALICO PRO. If that does not work, contact tvONE support. Contact details are at the back of this guide.

About your HDMI input and output modules

The High-Definition Multimedia Interface (HDMI) modules are an industry standard audio/video interface for transmitting uncompressed video data and uncompressed digital audio data from an HDMI-compliant source device.

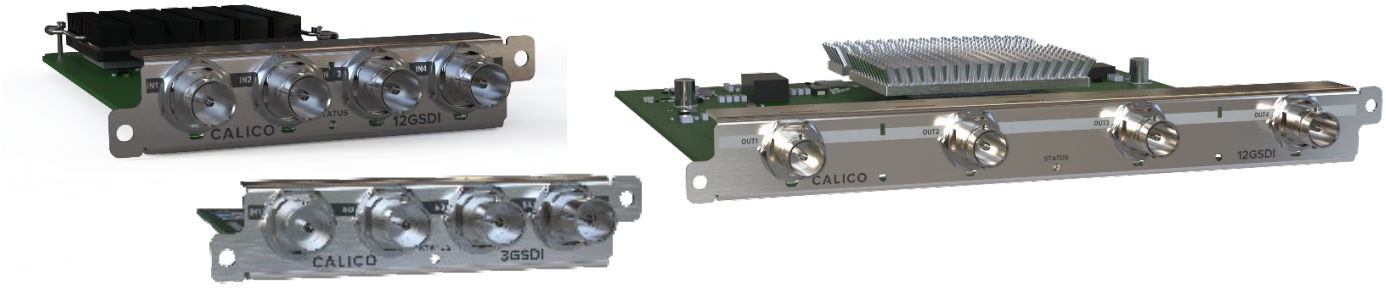
Status LED's and their meaning

Status indicator	Indicates the status of this module. Green means that the module is working correctly Red means that the module is starting, or that there is a problem Off means the module is powered down	
HDMI	Indicates the status by the LED directly below the HDMI connectors on supported modules	
	LED status patterns	
	Off	No signal
	Green	Valid signal with HDCP 2.2
	Green / **short Off**	Valid signal with HDCP 1.4
	Orange	Valid signal without HDCP
	Red	HDCP problem
	Red / **Off**	Fault or unrecognized image resolution

If any status indicator stays Red, restart your CALICO PRO. If that does not work, contact tvONE support. Contact details are at the back of this guide.

About your SDI input and output modules

The Serial Digital Interface (SDI) modules are a professional standard video and audio interface for transmitting uncompressed/unencrypted video data and embedded audio data from an SDI-compliant device. SDI is commonly used in broadcast environments.



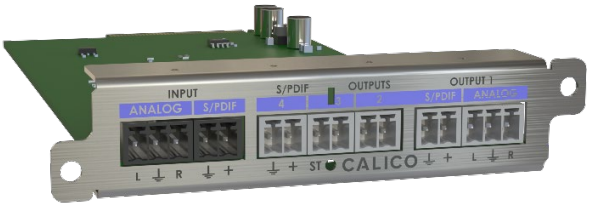
Status LED's and their meaning

Status indicator	Indicates the status of this module. **Green** means that the module is working correctly. Blinking **Green / Off** or **Red** means that the module is starting, or that there is a problem. **Off** means the module is powered down.			
SDI	Indicates the status by the LED directly below the SDI connectors on supported modules			
	LED status patterns	**Stable**	**Unstable/Invalid**	**Resolution**
	No signal	**Off**		
	12G	White	White / **Off**	2160p 50 – 60Hz
	6G	**Blue**	**Blue** / **Off**	2160p 23.98 – 30Hz
	3G-A	**Green**	**Green** / **Off**	1080p 50 – 60Hz
	3G-B	**Cyan**	**Cyan** / **Off**	1080p 50 – 60Hz
	HD	**Yellow**	**Yellow** / **Off**	720p / 1080i / 1080p 23.98 – 30Hz
	SD	**Purple**	**Purple** / **Off**	PAL / NTSC

If any status indicator stays **Red**, restart your CALICO PRO. If that does not work, contact tvONE support. Contact details are at the back of this guide.

About your digital and analog audio module

The digital and analog audio module allows you to de-embed and also embed both S/PDIF (digital), and analog audio, to and from external devices. The module has a single digital and a single analog input. There are five outputs in total, four digital and one analog. Each of the four CALICO canvases has a digital output (stereo pair) and canvas one also has an analog output that mirrors the digital one.



Supplied terminal block connectors allow connection to external equipment.

Input, Analog	Connect an analog audio device
Input, S/PDIF	Connect a digital audio device
Output 1, Analog or S/PDIF	Connect an analog or digital device to play audio from the video installation on canvas 1
Output 2, S/PDIF	S/PDIF output. Connect a digital device to play audio from the video installation on canvas 2
Output 3, S/PDIF	S/PDIF output. Connect a digital device to play audio from the video installation on canvas 3
Output 4, S/PDIF	S/PDIF output. Connect a digital device to play audio from the video installation on canvas 4

Status LED's and their meaning

Status	Indicates the status of the module. Green means that the module is working correctly. Red means that there is a problem

If any status indicator stays Red, restart your CALICO PRO. If that does not work, contact tvONE support. Contact details are at the back of this guide.

Supported formats

The S/PDIF and analog audio module supports all audio formats output as PCM with a frequency of 48 kHz.

Audio inputs

Your S/PDIF and analog audio module has two inputs, one analog and one digital input. You can use inputs from the S/PDIF and analog audio module as breakaway audio only.

What is breakaway audio?

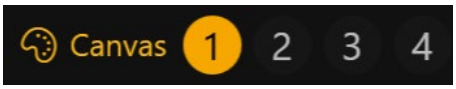
Breakaway audio is independent of the windows on your video wall. It does not change when the sources playing in your windows change. The audio is sent to all enabled outputs.

Audio Outputs

Your S/PDIF and analog audio module has four outputs. Each output is locked to a canvas in the Editor.

- Output 1 is locked to canvas 1
- Output 1 has one analog and one S/PDIF digital port. Both connectors will transmit the same audio source.
- Output 2 is locked to canvas 2, and has one S/PDIF digital port
- Output 3 is locked to canvas 3, and has one S/PDIF digital port
- Output 4 is locked to canvas 4, and has one S/PDIF digital port

To choose a canvas, select a canvas number from the editor.



Hardware Recommendations

At tvONE, we design our products to the highest quality standards. To get the best results from our products, we recommend that you use the best quality connectors, cables, and adapters. Consider the points below when you choose accessories and position equipment.

- For best results at resolutions of 1080p – 60Hz or below with HDMI, use cables under 15m long, or shorter if you use connection adapters. If you need to place your products more than 15m apart, use active optical cables or a signal extender.
- For best results at resolutions above 1080p – 60Hz with HDMI, use cables under 2-3m, or shorter if you use connection adapters. If you need to place your products more than 3m apart, use active optical cables or a signal extender.
- For the best results with HDMI, use High Speed, Premium High Speed, or Ultra High-Speed HDMI cables.
- In industrial environments, use shielded Ethernet cables.
- Shielded Ethernet cables are often marked F/UTP, FTP, or STP. Use shielded Cat 6 or above cables with HDBaseT input and output modules and Streaming media and 4K playback input modules.
- Use good quality USB 3.0 drives.

For more hardware recommendations for your product, see the specification sheet on our website:

https://www.tvone.com

Read more about HDMI at:

https://www.hdmi.org

Get help with your Magenta Encoder-100

The Magenta Encoder-100 works with the optional media module for your CALICO PRO. Find more information on this product on our website:

help.tvone.com/encoder-100

Planning and configuring video installations

The first step towards creating a video installation with your CALICO PRO is planning and setting up your hardware.

It's helpful to write a plan before you start installing. A plan saves you time and effort later, and helps you make sure you have all the equipment you need.

Think about the following questions:

- What do you want the final effect to be? – This will drive the budget and what products will be required to deliver the project
- What is the scope of the project?
- What will you need a video processor to do?
- What kinds of display technology will be used?
- How far away are the displays from the processor, and how will you connect them?
- How many outputs do you need?
- What sizes are the displays you will connect to the outputs?
- What are the bezel sizes of the displays?
- Are there any dvLED walls in the installation, think about how these will be mapped?
- What is the native resolution of each display?
- Do you need displays that support HDCP (High-bandwidth Digital Content Protection)?
- How many projectors do you need?
- Do you need to blend the edges of projectors and how much overlap do you need?
- What types of source do you need?
- Are they composite sources, and can they be mapped?
- What is the native resolution of each source?
- What is the frame rate of each source?
- Will the sources always be available during operation?
- Is there any switching or processing before the source reaches your CALICO PRO?
- How many windows will you need to create the effect you want?
- Do the displays and/or sources need to be rotated, and at what angles?
- Do you need labels?
- Will you need to monitor anything? - Think about how you can use **Canvas watch**
- How will you control the devices?
- Do you need any audio?
- How much physical space do you have to mount the video processor?
- How will the processor be mounted?
- What power budget do you have to run a video processor?

Note:

Video tearing - For best results, make sure all your outputs used on each individual canvas are operating at the same frame rate. If you have display devices of different frame rates in your installation, keep them on separate canvases. Each of the four canvases in a CALICO PRO can be set to a different frame rate.

What is a window?

A window is a container for a source, a mapped virtual source or a cropped source. You can have multiple windows playing the same source. Windows can be scaled, moved, faded, rotated and more using presets. All of this can be set up using CALICO Studio.

What is a Preset?

A preset stores information about windows and labels, including positions, transitions, and effects such as borders or rotation. You can save presets and recall them later from the dashboard, mobile application or an external control device.

CALICO PRO has the capacity to store up to 500 presets, that have been created in CALICO Studio.

Installing your hardware

When deciding where to place your hardware, consider these points:

- Availability of electrical outlets (CALICO PRO requires one outlet per power supply)
- Distance from CALICO PRO to sources and display equipment
    - For best results with HDMI at resolutions of 1080p60 or below, use cables under 15 meters long, or shorter if you use connection adapters. If you need to place your products more than 15 meters apart, use active optical cables or a signal extender. tvONE offer a range of these.
    - For best results with HDMI at resolutions above 1080p60, use cables under 3 meters, or shorter if you use connection adapters. If you need to place your products more than 3 meters apart, use active optical cables or a signal extender. tvONE offer a range of these.
- Make sure your devices and accessories are installed and used within their operating specification.
- Installation environment, moisture, heat, vibration, dust etc.
- In industrial environments, use shielded Ethernet cables.

Installing an optional input and/or output expansion module

CALICO PRO C7-PRO-2200 has three slots available on the rear panel, for optional expansion modules to be installed. A range of modules is available that add functionality and additional input and output connectivity to your CALICO PRO. It also allows for future expansion as tvONE is constantly developing new options for these optional slots.

Two of the slots are for input modules. These are slots 11 and 12. Slot 11 can only accept standard bandwidth video modules or an audio module. Slot 12 is a high bandwidth module slot but can accept any video module.

The remaining double width slot on the left of the image shown is for a high bandwidth output module.

These modules are field installable / swappable, so can be separately purchased and installed when required. CALICO PRO has pre-fitted inputs and outputs, so it can work without any option modules installed.

Useful information:

There are two module extraction tools in the accessory pack that comes with your CALICO PRO. Use these to remove the expansion modules by inserting them into the slots in the modules as shown in the above diagram. To insert the tool, locate the key slots in the module and push the tool in. Slide down until the hook on the tool locates in the slot, then pull towards you to remove the module. There will be some resistance due to the module edge connector. Take care not to injure yourself with the tools during use.

Important notes:

- Before starting any disassembly or reassembly, suitable anti-static precautions must be taken to prevent any damage to CALICO PRO and its modules.
- CALICO PRO must be removed from the power by disconnecting ALL power cords from the rear of the unit. Optional modules are supplied in anti-static packages and must stay in them until the proper anti-static precautions have been set up.
- The modules themselves have exposed electronic components that can be physically damaged if mis-handled. Take precautions to make certain that the module is inserted into the unit correctly, using its guide rails. Do not force the module above or below the rails. If the module cannot be inserted smoothly, do not try to force it.
- Do not attempt to install a high bandwidth input module into slots 10 or 11, doing so will damage the module and CALICO PRO.
- If there are any doubts about installing expansion modules, please consult a qualified professional.
- Units that are damaged by static or physically damaged during the assembly or reassembly process are not covered by the manufacturer's warranty.
- The lid of CALICO PRO does not need to be removed to fit any of the optional modules, power supplies or filters. If the lid is removed it will break the warranty seal, and in doing so void your manufacturer's warranty.

Installation / de-installation procedure

1. Power down your device.
2. First locate the two screws that hold the blanking plate or module in place. These are fitted one on each side of the plate or module faceplate.
3. Use a suitable screwdriver and unscrew the screws. **The screws have non-captive washers which can be dropped on the floor or inside the CALICO PRO. Make sure that these washers are re-fitted correctly during reassembly.**
4. Use the silver thumbscrews or module extraction tools to pull the plate or module backward out of your CALICO PRO. The modules are fitted into an edge connector so there will be some resistance when trying to remove them. The blanking plate has no back part so it should come free of the unit easily. Keep any blanking plates in a safe place as you will need them should you ever remove any module in the future. Pull the module towards you and out of the guide rails then remove it. Place any modules that have been removed back into their antistatic packaging.
5. To reinstall follow the reverse procedure.
6. Make certain that the module you are fitting is going into the correct slot
7. Slide the rear of the module into your CALICO PRO so that the main board slots into the guide rails in the device on both sides. If the module is in the correct position, it will move easily.
8. Push the module into the unit until it connects to the edge connector (there will be some slight resistance), and the module should be fully in position.
9. Replace the two screws taking care of the washers.
10. Power up your CALICO PRO. Any new modules should be automatically discovered then configured by the unit.

Make sure that a suitable configuration is now loaded as the inputs and outputs may differ from the previous set-up.

Rack mount or tabletop use

CALICO PRO comes with two rack mounting brackets and four feet that can be fitted to the underside of the unit for tabletop use.

C7-PRO-2200

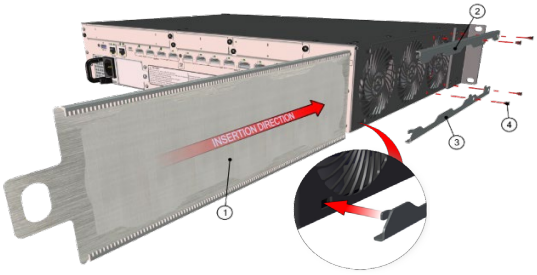
C7-PRO-1200

Air filter

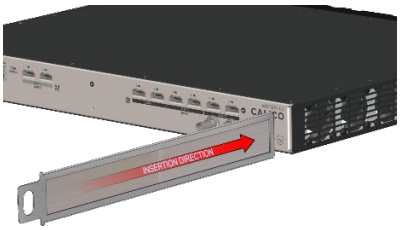
An optional air filter kit is available for CALICO PRO 2200. The kit can be ordered from your supplier using the code C7-PRO-2U-FILTER. This includes a stainless-steel filter that will never need to be replaced, just periodically cleaned using a vacuum.

The 1200 model comes with a supplied filter.

1. Fan filter
2. Top rail
3. Bottom rail
4. Screw



C7-PRO-2200



C7-PRO-1200

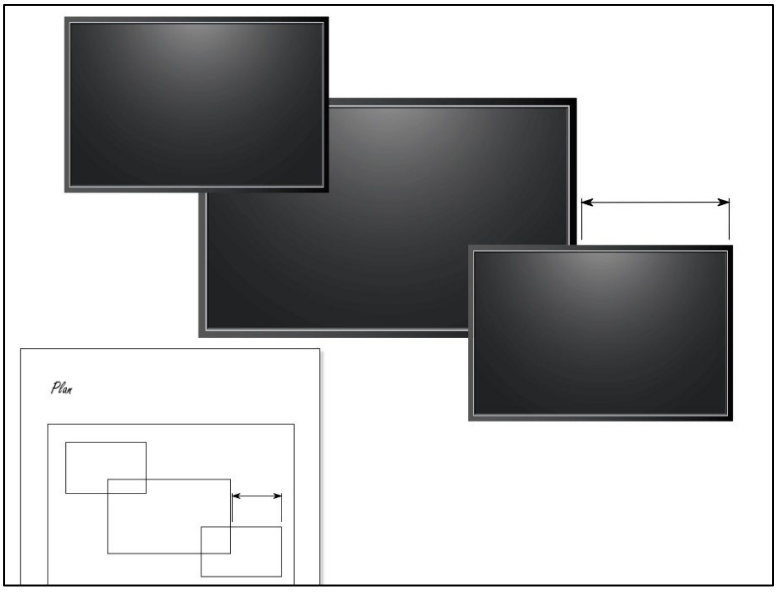
Cable mount bracket

It is recommended to install the cable mount bracket as shown below. You will find the bracket in the accessory kit inside the box. Remove the three screws shown, fit the bracket, then re-fit the screws to hold in place.

C7-PRO-2200

C7-PRO-1200

Positioning your displays and sources



- Use your plan to help you position your displays, which can be dvLED walls, screens, projectors or a combination of all these.
- Make sure you note all the measurements, so you can make an accurate installation in CALICO Studio.
- Position your sources.
- Connect your dvLED controllers, displays and projectors to the outputs of your CALICO PRO.
- Connect your sources to the inputs of your CALICO PRO.
- Connect your CALICO PRO to your network.
- Connect your CALICO PRO to an electrical outlet and power it on. If you are using the optional redundant PSU, you must connect this to a separate electrical outlet
- You can now connect to your CALICO PRO and create your canvases in CALICO Studio.

Useful information:

Keep a note of which source or display is connected to which port. You can use this information later when you name inputs and outputs in CALICO Studio. You can also label the inputs and outputs directly.

About CALICO Studio

CALICO Studio is the software that configures and controls your CALICO PRO. You can create multiple video installations on any of the four available canvases. Each can have multiple outputs, maps, video windows, crops and labels. Transitions and effects can be added for a state-of-the-art dynamic video installation.

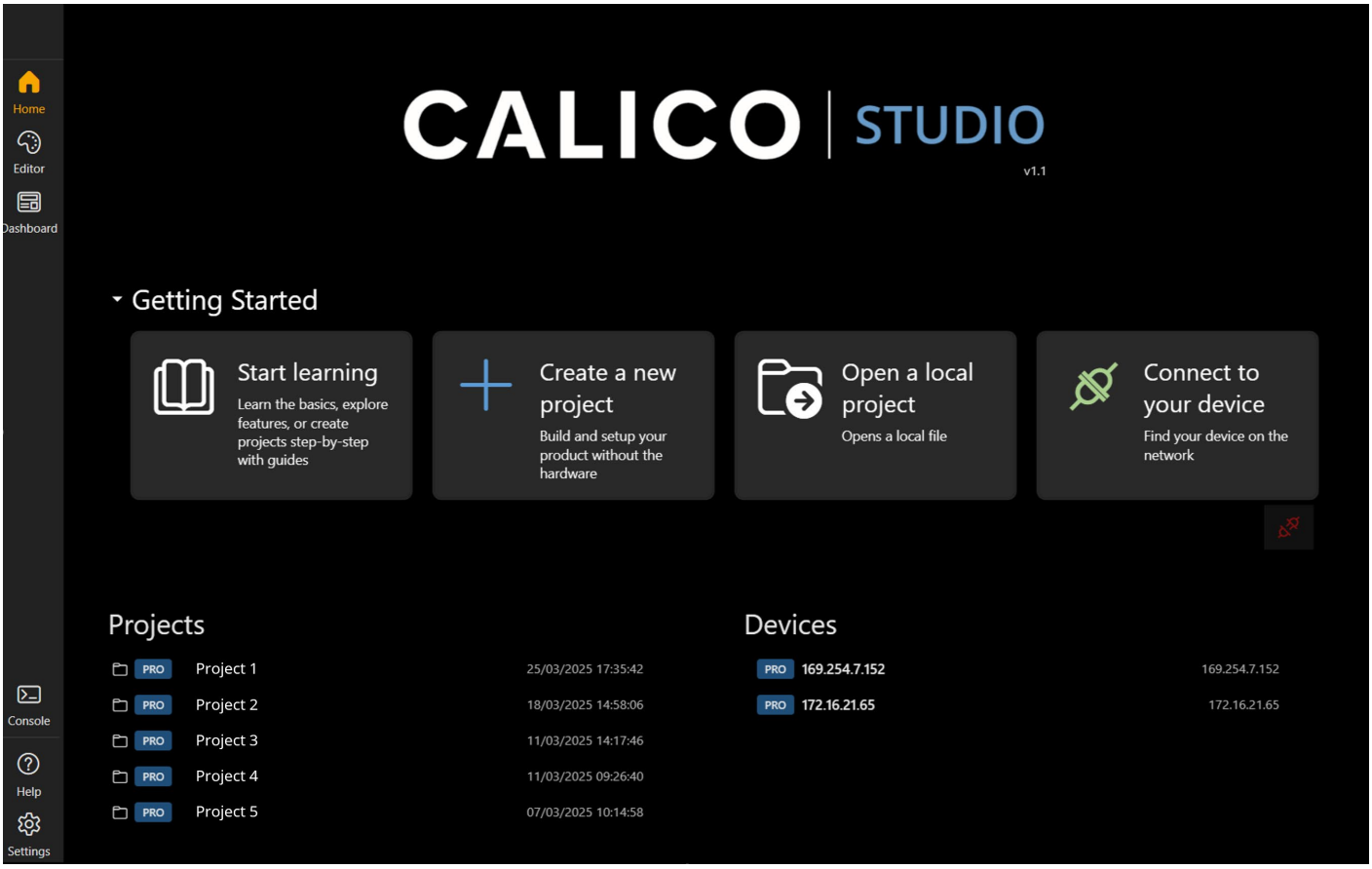
Download the latest version from https://tvone.com/tech-support/software

CALICO Studio system requirements

- Works with PCs running Windows® 10 and 11
- Works with Microsoft Surface Pros and similar touch screen devices
- Does not work with touch-screen-only devices, including tablets or phones
- Full support for touch screen devices is under development
- Installs Windows .NET 9, if you don't have it
- Needs 600 MB of disk space during installation n Is approximately 150 MB in size once installed
- Minimum 8GB RAM, 16GB recommended.
- To use the preview feature, your PC must have Windows Media Player installed, and it must have been launched at least once. Preview performance depends on the specifications of your PC and number of windows in your installation. A dedicated GPU is recommended.

Getting started with CALICO Studio

When you first open CALICO Studio, you see the Home page.



If you have already set up your hardware, you can **Connect to your device** and get information about its configuration.

If you have not set up your hardware yet, you can **Create a new project**. Or you can load a configuration from a **Project** file if you have one. You can save your configuration and send the configuration to your CALICO PRO later. You can also use saved configurations to configure other CALICO PRO units.

If you need help, the **Start learning** button will take you to an area on-line where you can download information and watch instructional videos about the product.

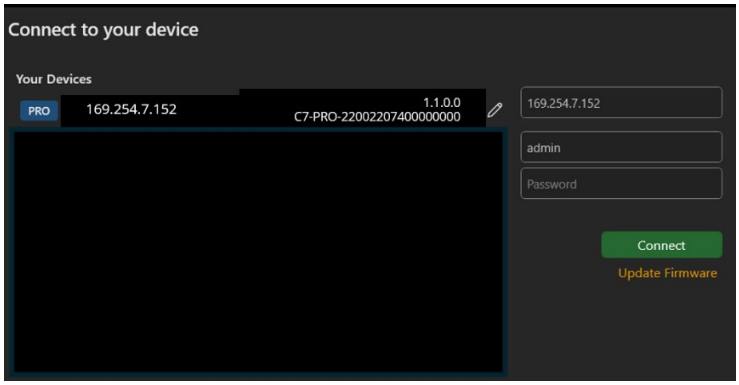
Connect to your CALICO PRO and get its configuration

The easiest way to get started using CALICO Studio is to get the configuration of inputs and outputs directly from your CALICO PRO.

If you have recently connected to your device and want to re-connect, you can find your device from the **Devices** list on the home page. Just select your device to get to the login screen.

You can use the **pin** next to the items in the list. If you select this the item is pinned and will stay at the top. You can use this to pin devices that you always connect to. The last device you connected to usually appears at the top and the others are pushed down and eventually off the list. You can also remove devices from the list with the **X** button. This does not remove the device information; it simply removes it from this list.

If this is the first time you are connecting to this device or it's been a while since you did, then you will need to discover the device on your network.



1. From **Home**, select **Connect to your device**, then find your CALICO PRO from the list of discovered Devices. If your CALICO PRO isn't on the list, try typing in its IP address.
2. If you were previously connected to the device but now the device is no longer powered on or is disconnected from the network, it may appear in the list of your devices, but it will have an **[offline]** message next to the IP address.
3. Enter your administrator login details.
4. When you are logged in to your CALICO PRO, if prompted select **Read** to get its configuration.

When you first log in as an administrator, enter the username **admin** and password **adminpw**

CALICO Studio always connects to your device securely. If you connect via RESTful API, you will need to set up a secure connection. ▌

Create an off-line configuration

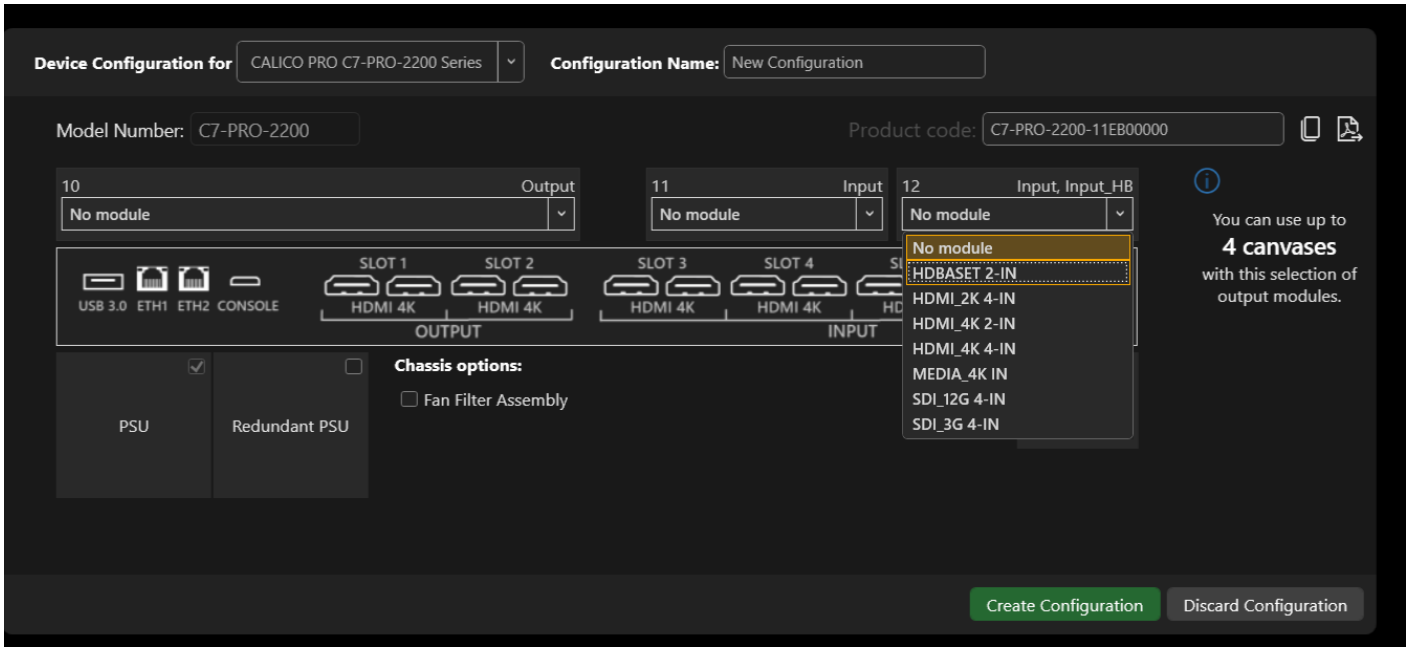
You don't need to be connected to a CALICO PRO to create video installations, but you do need to recreate the configuration of your CALICO PRO so that you're using the correct inputs, outputs, and devices.

You can also create offline configurations to help you decide what hardware you need.

1. From **Home,** select **Create a new project**.
2. In **Configuration Editor**, choose a device, and give your configuration a name.
3. If you have a product code, enter it in **Product code** to automatically populate your modules.

Or

4. If you do not have a product code, configure your product by choosing a module from the dropdown list for each slot. Add accessories as required.

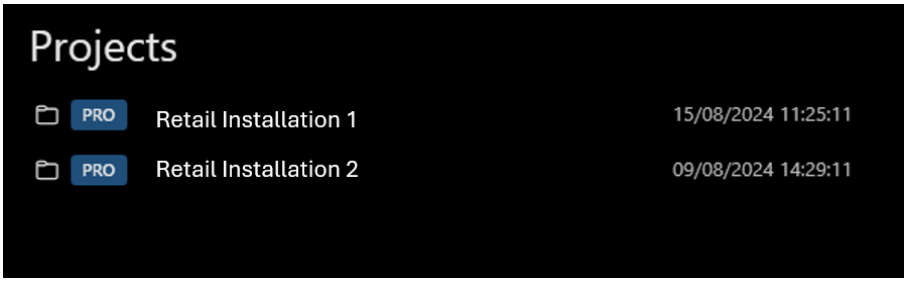


- The number of slots available depends on your device.
- You don't have to use any of the expansion slots unless extra inputs and outputs or different types of inputs and outputs are needed. CALICO PRO (C7-PRO-2200) ships with 8x 4K60 Inputs and 4x 4K60 outputs provided.
- If you are creating a configuration for an existing CALICO PRO, make sure its configuration matches the device you have.

- The configurator will guide you as to what modules can be fitted to the unit and in what positions. Invalid configurations will be flagged with a red warning message.
- **OPTIONAL**: You can copy the product code to the clipboard, so you can paste the product code into your email or document.
- **OPTIONAL**: You can export the product configuration summary to a PDF file to include in your documentation. If you intend to do this, you must create a pdf before clicking the **Create Configuration** button. You will be unable to create the summary .pdf after you have created the configuration.

Send a configuration to your CALICO PRO

You can send a configuration to your CALICO PRO from the home screen. If the configuration was created with your version of CALICO Studio and saved as a file, it may appear on the Projects list on the home screen. If it does, select the file to load it



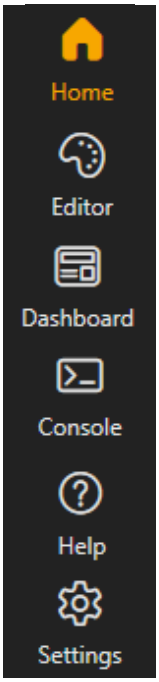
You can either load a saved configuration or create a new configuration offline and send it to your device.

Create or load a configuration.

1. In **Home**, select your device from the **Devices** list, or by selecting **Connect to your device** and then enter your administrator login details.
2. The default username is **admin,** and the default password is **adminpw**
3. Select **Send**.

CALICO Studio menu ribbons

Side menu – always visible



Home is where you connect a device, load a configuration from a file, or create an off-line configuration.

Editor is where you create your installations on each canvas. CALICO PRO models have four canvases.

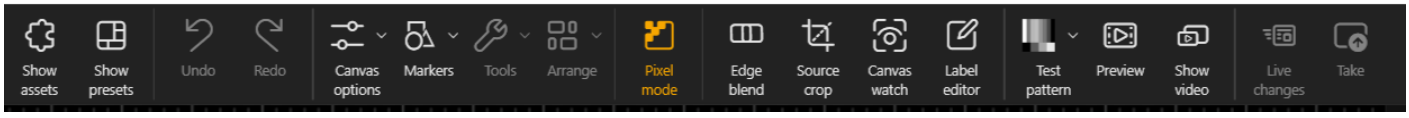
Dashboard is where you control the actions of your canvases.

Console opens a window where you can see commands sent by CALICO Studio to CALICO PRO and vice versa. You can manually send commands using this interface and save the current activity to a file.

Help takes you to the tvONE website and opens tvONE help for your product.

Settings is where you configure your system, network, modules, and more.

Top menu – available in Editor



Show assets opens the Assets panel on the left side of the editor, and lists all outputs, sources and labels that have been created, used or still available to use for your set-up.

Show presets opens the Presets panel on the left side of the editor, and allows you to create, add and manage presets. Created presets appear in this list.

Undo and redo each press allows a step through, undoing or redoing the last action. Each can be repeatedly used to step back or forward depending on the number of actions created.

Canvas options settings that allow snapping, grouping and adding gridlines for positioning canvas elements.

Markers create and configure canvas markers for positioning, area marking and more.

Tools grow or shrink canvas outputs, maps, windows and labels by a set percentage or number of canvas points.

Arrange align, position and match sizes of canvas elements.

Pixel mode toggle between the canvas using pixels as a reference for canvas elements, or a physical mode indicating physical sizes and positioning of elements in inches or millimeters

Edge blend set up your outputs for projector edge blending.

Source crop quickly crop any section of any source and use anywhere in your set up. You can crop multiple times up to the available layers / windows left in the system.

Canvas watch is a feature that allows any output to be used as a monitor.

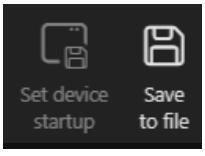
Label editor create and save text, source, image or live source labels for use anywhere in your set up. Parent these labels to any layout, output or window.

Test pattern switch on the test pattern generator, select a test pattern. The pattern will appear on all windows on an output. Windows can be selectively switched to allow the test pattern or source to be displayed.

Preview allows the canvas to display a media file into any window that is placed over an output on the canvas. This can be used on or offline. Several different media files are available by selecting the window and opening its Properties panel on the right-hand side of the editor

Show video uses the same media files as preview but will show video on the whole window regardless of it being placed over any output. Used for off-line source cropping and canvas watch set-ups.

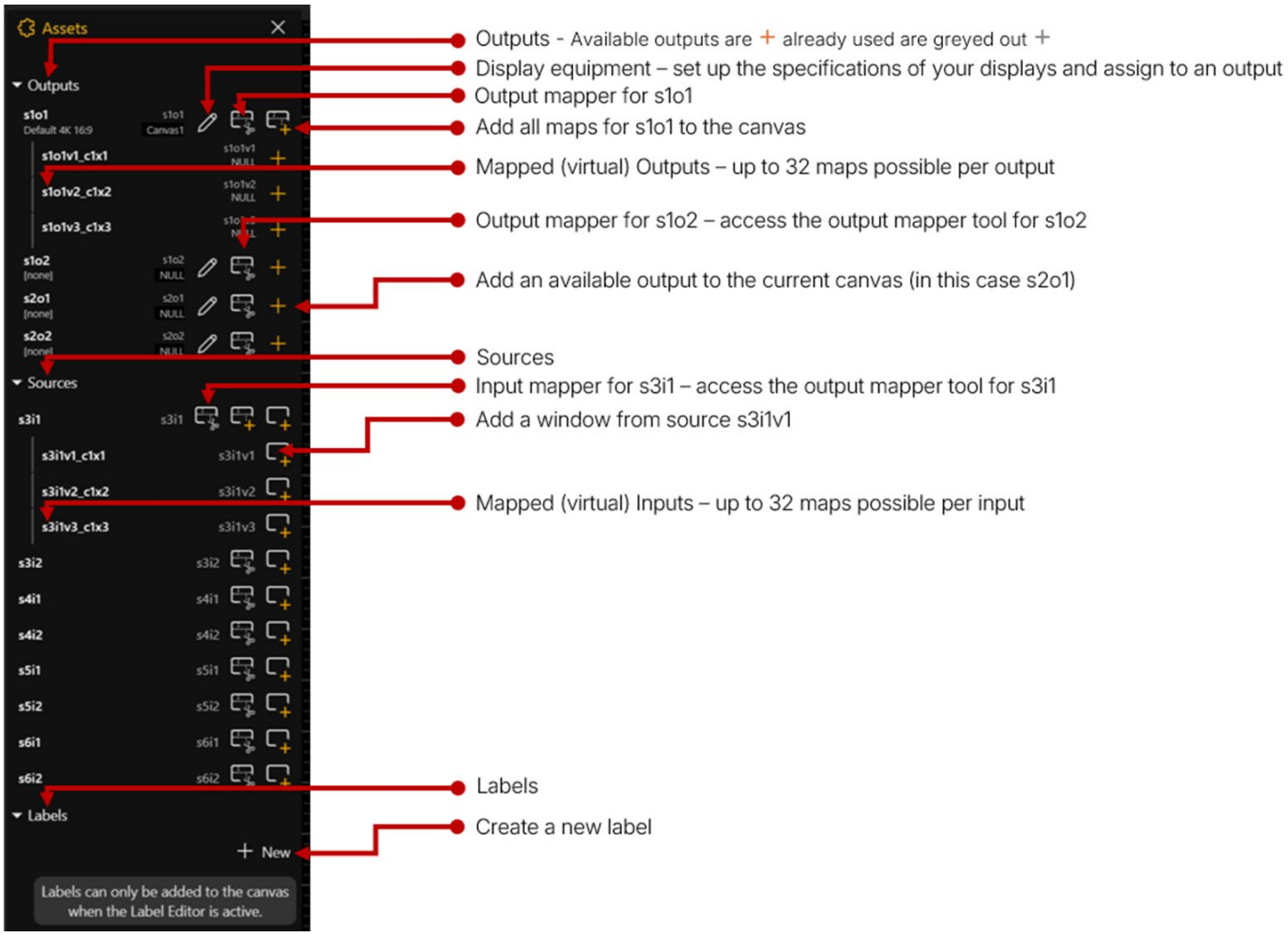
Live changes and Take only available when connected to a live system. When live changes is on, any user input will be immediately visible on the systems output. Use Take if you want to control when updates will happen, for example in a broadcast or live event scenario.



Set device start up save the current setup to your CALICO PRO. This overwrites the previous set-up stored in the device. This will become the set up when the device boots.

Save to file save the current setup to a file that is stored locally. The file can then be sent to any CALICO PRO with the same physical configuration.

Assets panel



Preset panel

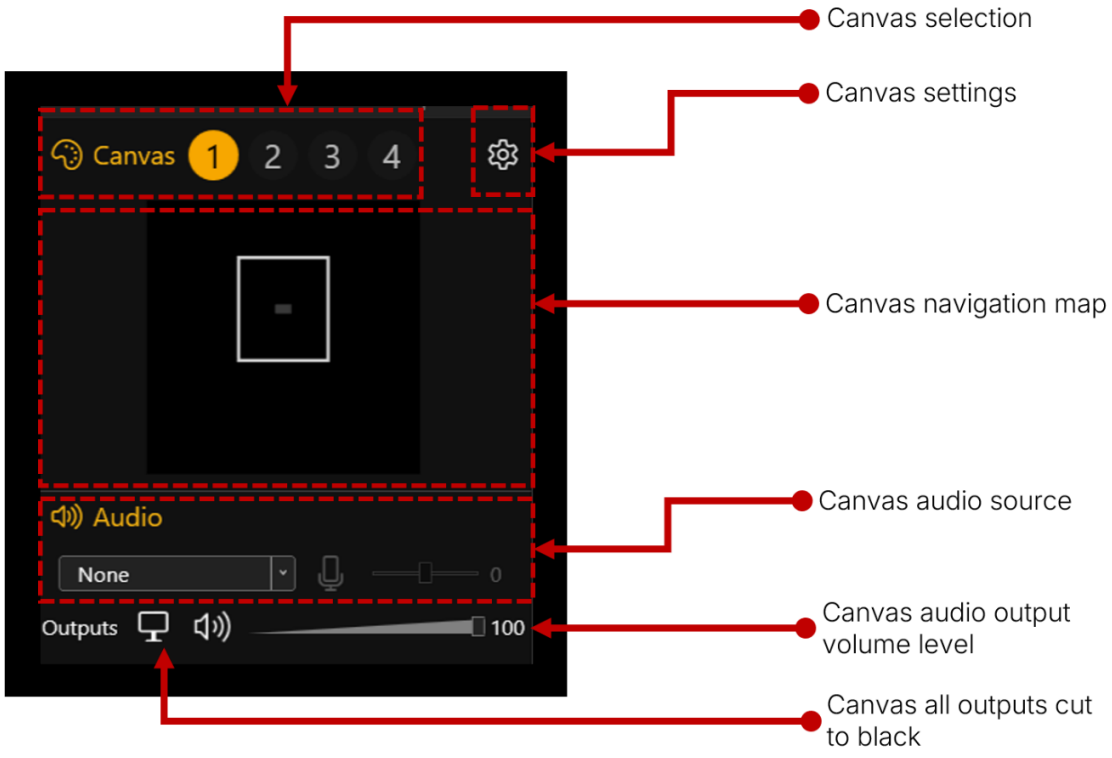
When no presets have been created

After some presets have been created

A CALICO PRO device has storage for up to 500 presets.

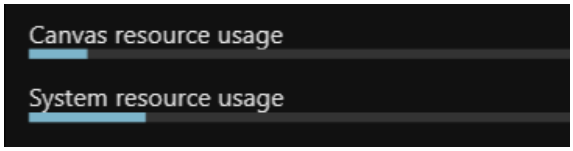
Canvas set-up

Switch the editor between each of the four available canvases. Use the settings cog to access the canvas refresh rate settings and synchronization modes for each canvas. Shows a map of each canvas and the area visible on your monitor. Control canvas audio mute and volume and control all canvas outputs to show video sources or switch to black.



Canvas and system resource usage

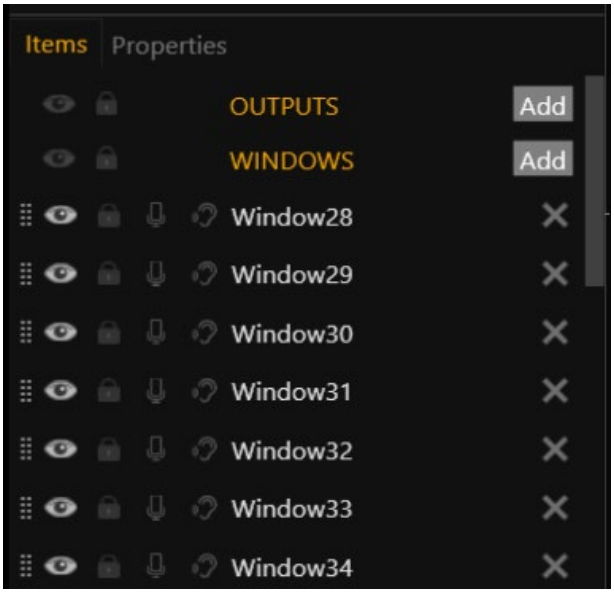
Gauges that give you a visual indication of the windows used for the current canvas and the complete system.

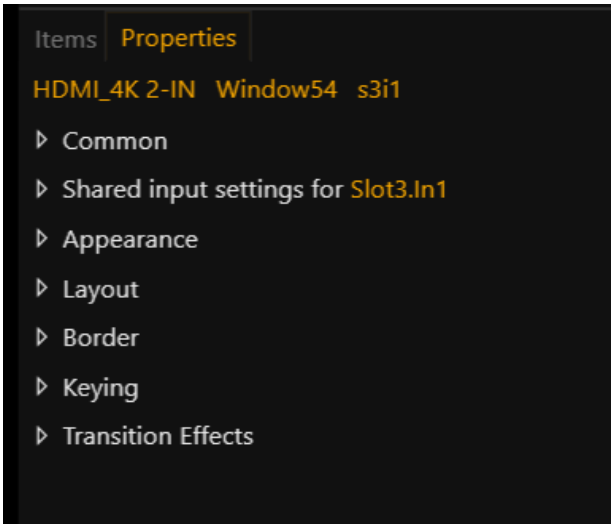


Canvas pan and zoom tools

Available in the bottom right-hand corner of the editor area and allow you to change your viewing area when editing a canvas.

Items and Properties panels





See a list of items that are on the current canvas and their layer order (z-order). Selecting any window, output, or label will show the Properties panel for that item.

Naming input and output ports and channels

You can name the input and output ports and channels for each slot in CALICO Studio.

Why should I name input and output ports and channels?

CALICO Studio uses aliases to give each input or output port or channel in each slot a unique name. CALICO uses slot aliases for its expansion module slots but also uses them for the pre-fitted inputs and outputs. This is done to simplify the set-up process.

For example, the first port in **slot 1** is named **s1o1** for **slot 1 output 1**. These unique identifiers tell you the position, but not what is connected to that input or output.

Name your ports and channels with something that indicates what is connected to the port or playing on the channel. Doing this can help you identify what devices are connected in your configuration and makes it easier for you to see quickly which source is playing in which window. For example, you might rename **s3i1** to **Camera 1**.

Naming the channels of a Streaming media and 4K playback input module

The media input module has two channels. Each channel refers to a play queue, not to a specific streaming source. If you intend to build play queues with multiple sources, for example, one or two streaming sources and media items from a USB drive, then consider unique names such as PlayQueue1 and PlayQueue2. If you intend to always have just one streaming source in a play queue, then you could use names like WOWZAstream, or LectureTheatreStream.

Naming rules

Names must be unique and start with a letter. They can contain letters, numbers, and underscores, and can be up to 21 characters long.

Naming input and output ports

1. In CALICO Studio, select **Settings** then **Slot Status**
2. For each port, enter a useful name, following the rules above
3. To save your new names, select **Apply (inputs and outputs only)**
4. If you are creating an offline configuration, select **Editor** then **Save to file**

HDCP (High-bandwidth Digital Content Protection)

HDCP is a form of digital copy protection developed to prevent copying of digital audio and video content as it is sent between devices, for example protecting the content as it travels from a Blu-ray player to an amplifier to your TV.

What support does my CALICO PRO have for HDCP?

Your CALICO PRO can support video inputs and outputs with no HDCP or with HDCP versions 1.4, or 2.2 when using supported modules.

How does my CALICO PRO handle a mixing of HDCP versions?

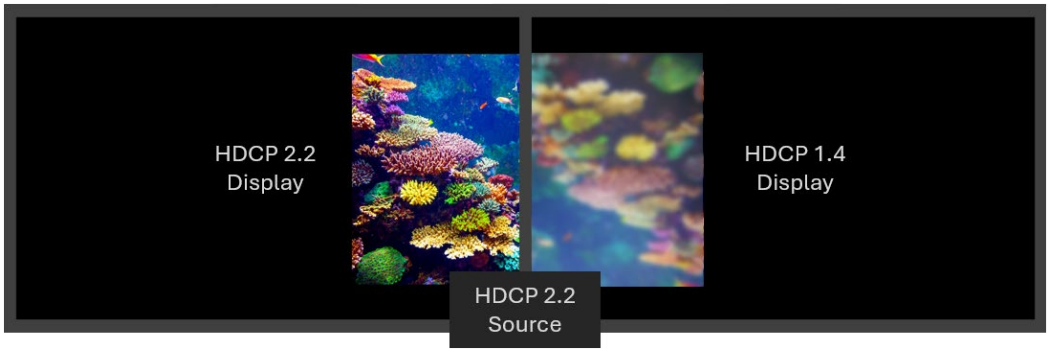
CALICO PRO will soften the image of a window visible on any outputs that are connected to display devices, including projectors and dvLED controllers that are using a lower HDCP encryption than required by the input sources. For example, a Blu-ray player with an HDCP encrypted movie as a source and playing out to a non-HDCP compliant PC monitor.

Use this table to identify HDCP compatibility between your sources and display devices:

Display Devices	HDCP Versions	None	1.4	2.2
Sources	None	✔	✔	✔
	1.4	Downscaled	✔	✔
	2.2	Downscaled	Downscaled	✔

Show me an example

The left display has HDCP encryption high enough for the input source, but the right display doesn't, so the part of the window shown in the right display is softened.



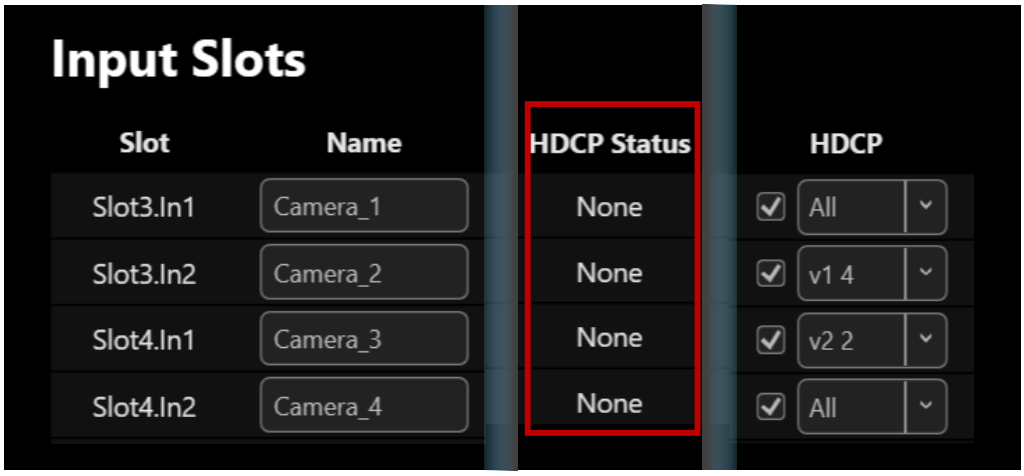
Change the HDCP version of an input

Your CALICO PRO's inputs negotiate with each connected source as to which version of HDCP to use, and the source will then make decisions on how to present the content, which may be *no video*.

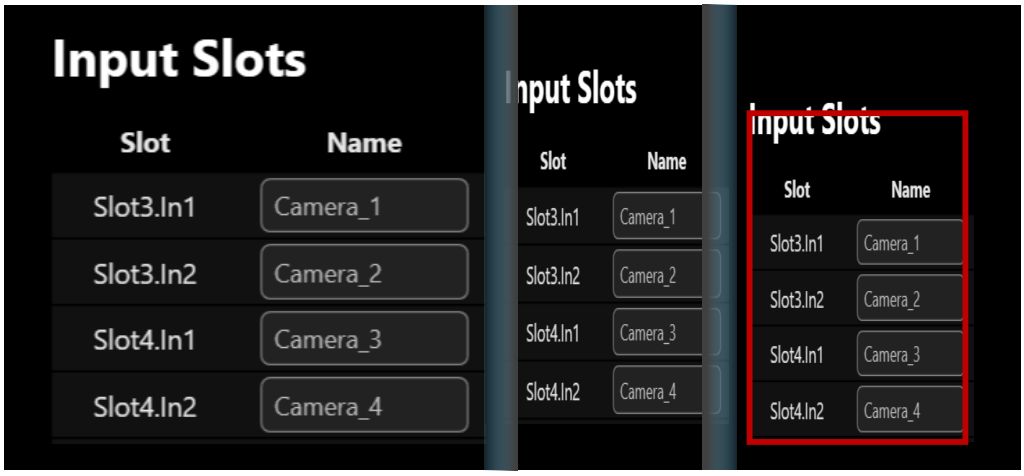
You can choose to disable HDCP support, and on supported modules which version the input will try to negotiate. This may help to force the source to send content in a particular version, for example you have HDCP 2.2 sources but only HDCP 1.4 displays.

Bulk updating the input HDCP properties

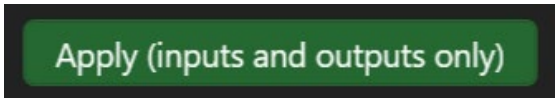
1. In CALICO Studio, select **Settings** then **Slot Status**
2. When connected to your device the HDCP Status will automatically update to show the version negotiated with the source.



3. For each port, select if HDCP is enabled and if available which HDCP version to negotiate with the source.



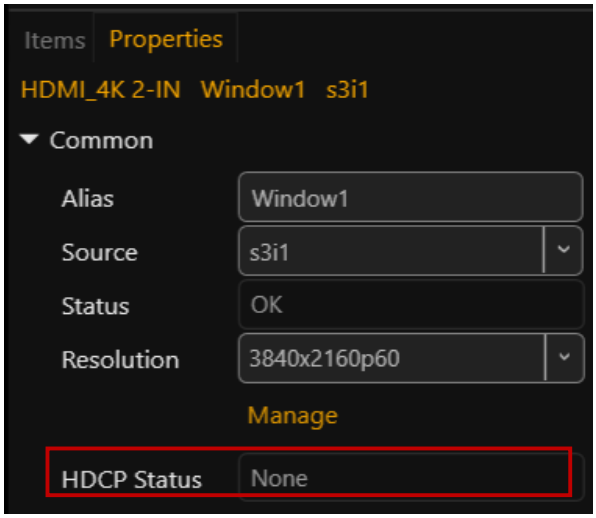
4. To save your changes select Apply (inputs and outputs only)

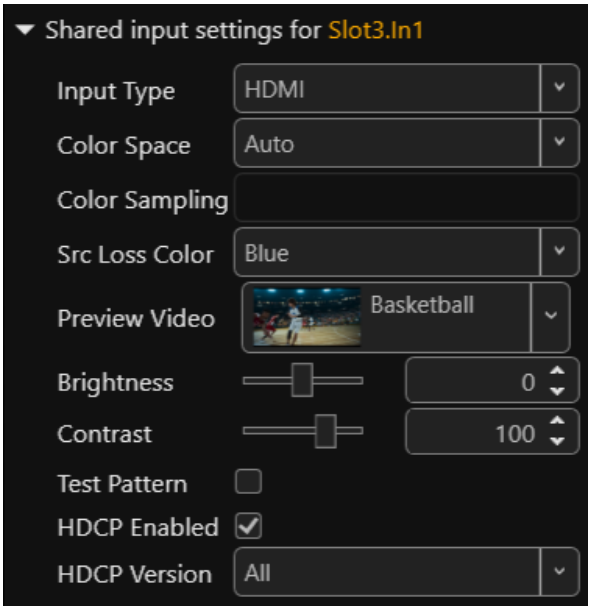


5. If you are creating an off-line configuration select **Editor,** then **Save to File**

Individually from each window

1. In CALICO Studio, select **Editor**, select the window on the canvas that you want to set then go to the right-hand side and select the **Properties** panel (you can also select the window from the items list). As you mouse over each window it will be indicated on the canvas by a yellow highlight.
2. When connected to your device the HDCP Status will automatically update to show the version negotiated with the source.
3. If there is no HDCP you can disable it by clearing the HDCP Enabled option, or if available, select the HDCP Version which will force the input to try to negotiate that version with the source.





4. When you are happy, select **Take** from the top menu ribbon, and then **Set Device Startup** to save the take on your CALICO PRO. Your changes will then be restored on start-up.
5. If you are creating an offline configuration, select **Save to File**

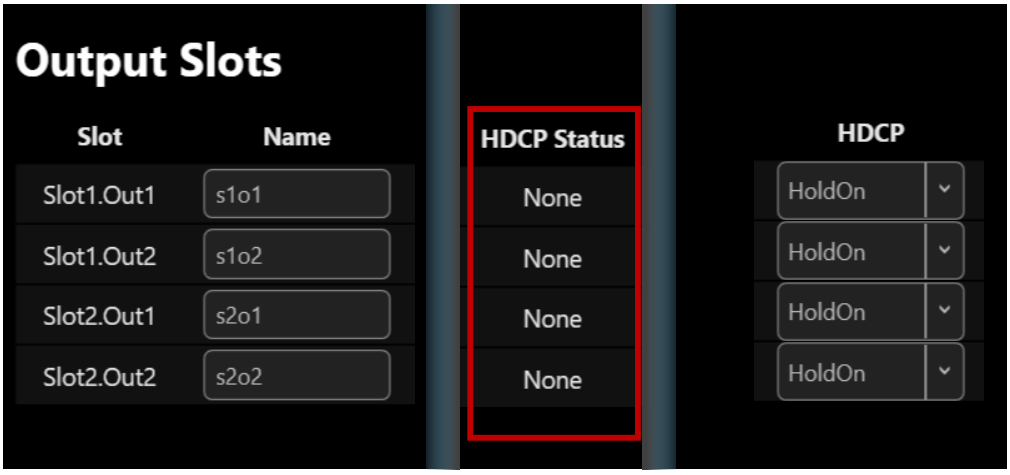
How do I change the HDCP support for an output?

Your CALICO PRO's outputs negotiate with each connected display which version of HDCP to use.

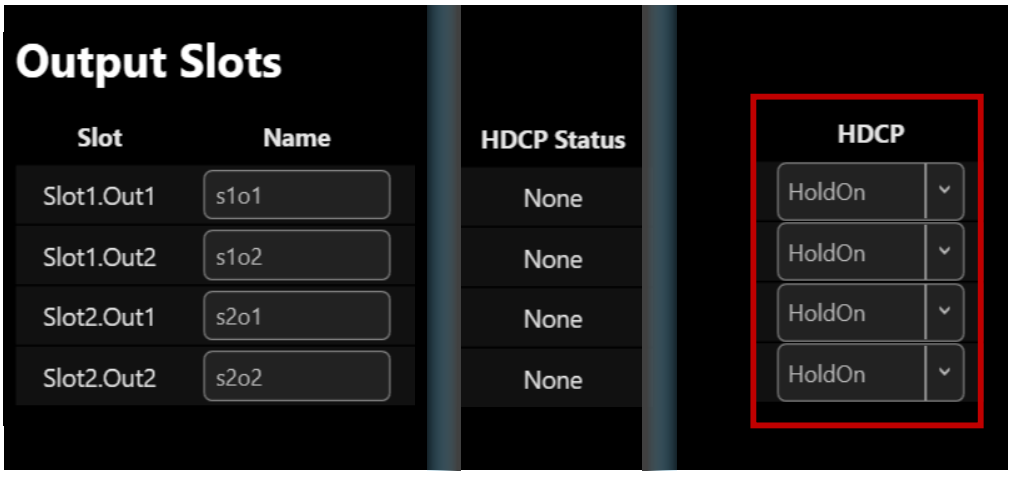
> Important note:
>
> HDCP encrypted contentcannot be displayed in high definition on unsupported or lower HDCP version displays

Bulk updating the output HDCP properties

1. In CALICO Studio, select **Settings** then **Slot Status**
2. When connected to your device HDCP status will automatically update to show if HDCP is active.

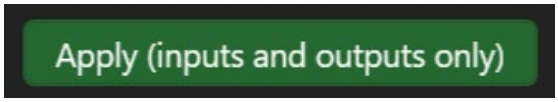


3. For each port, select the HDCP mode to tell the output how to handle the display



- HoldOn : Keeps HDCP active
- KeepOff : Turns off HDCP (There is no HDCP negotiation. Only non-HDCP content can be outputted)

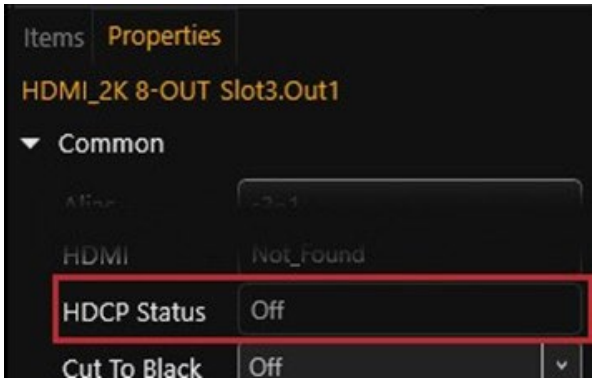
4. To save your changes select Apply (inputs and outputs only)



5. If you are creating an off-line configuration select **Editor,** then **Save to File**

Individually from each output

1. In CALICO Studio, select **Editor**, select the output on the canvas that you want to set then go to the right-hand side and select the **Properties** panel (you can also select the output from the items list). As you mouse over each output it will be indicated on the canvas by a yellow highlight. **(If a mapped output is selected, any settings will apply to the entire output)**
2. When connected to your device the HDCP Status will automatically update to show if HDCP is active.



3. Select the HDCP mode to tell the output how to handle the connected display.

4. When you are happy, select **Take** and then **Set device startup**
5. If you are creating an off-line configuration, select **Save to file**

Settings

You can manage device settings, network settings, and user settings. You can also get information about your CALICO PRO and name your modules.

Device settings

Administrators can configure settings for your CALICO PRO, including creating and changing its name, changing the measurement units you use to create video walls, backing up and restoring your configuration, and resetting the CALICO PRO to its factory default settings.

Naming your CALICO PRO

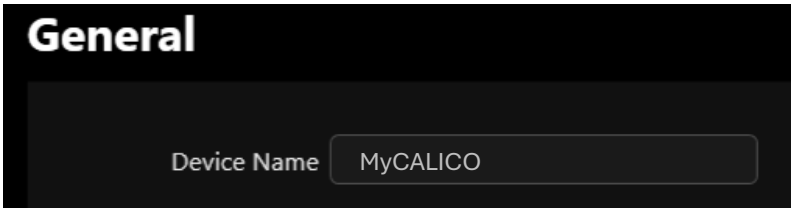
You can give your CALICO PRO a unique name.

Why should I name my CALICO PRO?

If you have more than one CALICO PRO device on your network, giving each device a unique name can make it easier to find and log in to that device quickly.

To name your CALICO PRO

1. Select Settings then General
2. Enter a name for your CALICO PRO in the Device name box.
3. Select Save

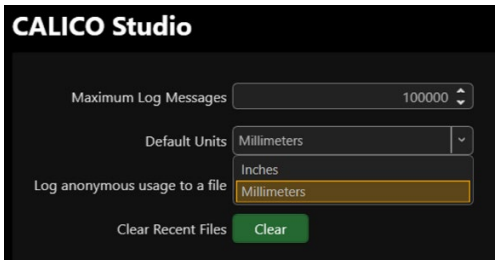


Choosing your working units

You can choose to work in inches or millimeters when you build video installations in CALICO Studio

To choose a unit

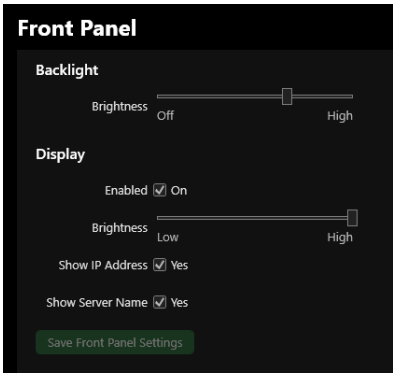
1. Select **Settings** then **CALICO Studio**.
2. From **Default units,** choose your preferred units



Customizing the front panel of your CALICO PRO

You can choose what information appears on the OLED display of your CALICO PRO.

1. Select **Settings** then **Front panel** then **Settings**
2. Select or change the options you want to customize the front panel and display.
3. Select **Save front panel settings**



Backing up and restoring your settings

You can save your settings to a file on your CALICO PRO, or to a file on your computer. You can restore your settings from either file. You can share a file saved on a computer between several CALICO PRO units that have the same configuration of modules.

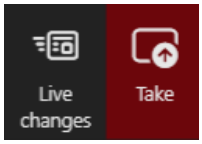
Backing up your settings and what is saved on your CALICO PRO

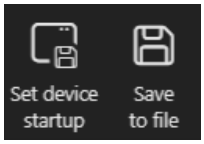
All settings are saved to a backup file on your CALICO PRO, including:

- Presets
- Configuration, including custom names
- Canvases
- The play queue of a media module
- Network settings
- Manually added streams

What is not saved on your CALICO PRO

Any work that you have not saved to the device, with **Take** and **Set device startup**, will not be saved to the CALICO PRO backup file.





Useful information:

It is recommended you save your configuration to a file to keep a backup on your computer.

To back up your settings on your CALICO PRO

1. Check that you have saved all your work.
2. Select **Settings** then **Backup and Restore** then **Backup to SD Card**

Note: The SD Card is inside CALICO PRO and is not removable or accessible

Restoring your settings from your CALICO PRO

1. Select Settings then Backup and Restore
2. Select Restore to SD Card

Backing up your settings to a file on your computer

Settings that are saved on your computer

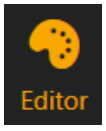
Most settings are saved to a backup file on your computer, including:

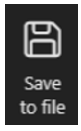
- Presets
- Configuration, including custom names
- Canvases n Network settings
- Manually added streams
- Custom resolutions

What is not saved to your computer

The play queue and playlists of any fitted media modules are not saved to your computer.

To back up your settings to a file on your computer

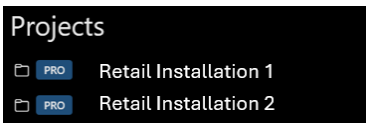


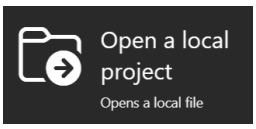


1. Select **Editor** then **Save to file**
2. Choose a location for the file and then save it on your computer.

Restoring or copying settings from a file on your computer

1. Connect to the CALICO PRO that you want to update with saved settings
2. Select **Home**
3. If the saved file appears in the **Projects** list, it can be loaded from there. If it is not, then select **Open a local project** to locate the file
4. Load the configuration file into CALICO Studio





Problems sharing settings between CALICO PRO units

You can't share saved settings between devices with different configurations of modules.

You might not be able to copy settings from one CALICO PRO to another if they have very different firmware versions, or you might lose some data in the process.

Resetting your CALICO PRO to factory default settings

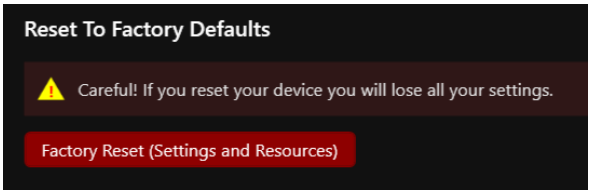
Why restore factory default settings?

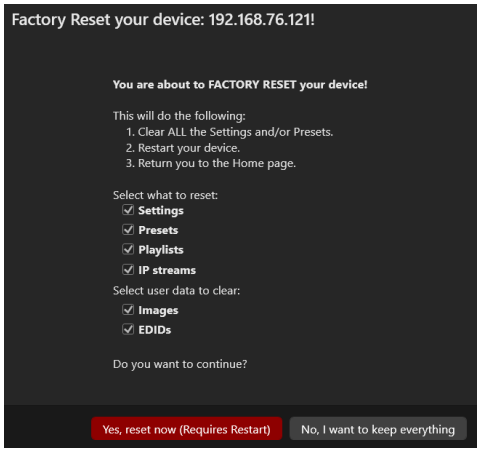
If your CALICO PRO has become unstable, you have repeated errors that you cannot fix, or you need to remove all settings and presets, you can reset your CALICO PRO to its factory default settings.

Before you reset your CALICO PRO, you might want to back up your configuration. When you set up your CALICO PRO, you can restore your configuration.

To reset your CALICO PRO to factory default settings

1. Select Settings then General
2. Under Reset to factory defaults select Factory reset (Settings and Resources)
3. You can choose what is reset and what will be kept.





Important note:

When you reset your CALICO PRO to factory default settings, all your settings and configurations are deleted.

User settings

Administrators can create and edit users, change user roles, and enable specific timeout times. Users and power users can change their own passwords.

Creating and editing users

You can create and edit users, change user roles, and enable specific timeout times. You can have up to four additional users.

Who can do this?

Administrators can do this

User roles

CALICO Studio has three types of users. These are **Administrator, Power user** and **User**.

Permissions	Users	Power Users	Administrators
Use the dashboard inc. loading presets and using audio controls	✓	✓	✓
Send configurations to CALICO PRO		✓	✓
Create offline configurations		✓	✓
Save and load configurations		✓	✓
Set window and output properties including disabling audio		✓	✓
Create and edit video installations		✓	✓
Create and edit presets		✓	✓
Use the console			✓
Change settings, including creating and editing other users			✓
Set up a new CALICO PRO			✓

To create a new user, or edit an existing user

1. Select **Settings** then **Users**
2. Choose and empty user slot **User 1 - 4**
3. Create a **username, password, user role** and decide if the auto logout (**timeout**) is enabled and what the time will be.
4. Select **Save** to create the new user or **Cancel** to exit without saving.

Notes:

- Usernames must start with a letter, and can contain only letters, numbers and underscores
- Passwords must be between 5 and 32 characters. They can contain any number of alphanumeric characters and symbols but cannot contain spaces.

Useful information:

tvONE recommends a timeout of between 1 and 5 minutes

Changing other user's passwords

Who can do this?

Only **administrators** can make changes to other user's passwords.

1. Select **Settings** then **Users**
2. Find the user whose password you wish to change and enter and confirm the new password
3. Refer to Passwords shown in the **Note** above explaining the password creation rules.

Changing your own password

Who can do this?

Administrators, Power users and users can make changes to their own password.

1. Select **Settings** then **Users**
2. Find your user details and enter and confirm the new password
3. Refer to Passwords shown in the **Note** above explaining the password creation rules.

Important note:

By default, a connection to CALICO PRO must stay active, or it is disconnected after 5 minutes. You can change this by setting a longer timeout for a user or disabling timeout for that user. CALICO Studio will only allow one connection to CALICO PRO at a time, so a user with a long or no timeout setting could block other uses from connecting at all. To fix this, use the REST API with WebSocket events to allow other control systems to connect in parallel. The API is available from https://api.tvone.com/

Network settings

Administrators can configure network settings for CALICO PRO units and any installed media modules.

Configuring network settings for your CALICO PRO

You can choose a DHCP or static IP address and configure your static IP settings.

Static IP addresses

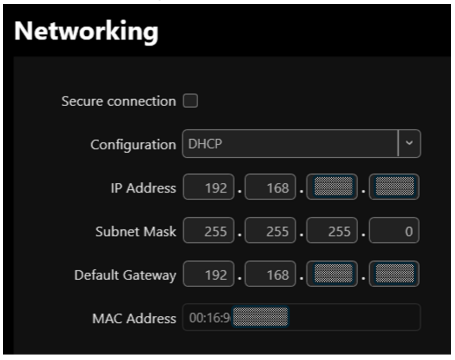
If you want to use a static IP address, you need some information about the range of available IP addresses on your network. Your network administrator should be able to help you.

> **Important note:**
> If a static IP address is used, it must be set to unique value on your network. Using the same IP address on more than one device will cause network issues such as disconnections.

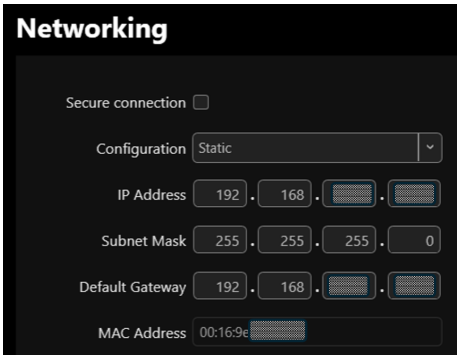
To configure network settings for your CALICO PRO

1. In CALICO Studio, select **Settings** then **Networking**
2. Choose an IP **Configuration**
3. If you choose **DHCP** a dynamic IP address is assigned to you by the network router. If you choose **Static** the IP address will need to be manually configured

Dynamic IP



Static IP



To configure a static IP address

1. In CALICO Studio, select **Settings** then **Networking**
2. Choose IP **Configuration** and set to **Static**
3. Enter the **IP address** and **Subnet mask**
4. If your PC and CALICO PRO are on a different network, enter a value for your **Gateway**
5. Contact your network administrator if you need help with these values.

Secure mode

You can use secure mode to encrypt information you send and receive from your CALICO PRO.

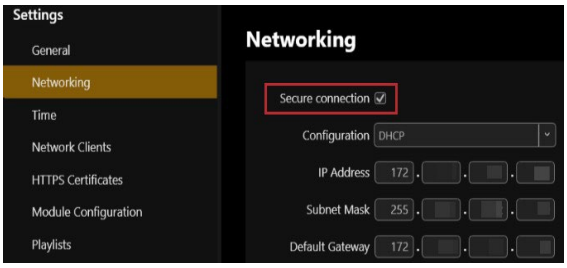
About secure mode

Secure mode uses HTTPS to encrypt all communication between CALICO Studio, or another secure controller, and your CALICO PRO. HTTPS encryption uses TCP port 443.

When secure mode is active, in **Home** you can see the padlock 🔒 next to the name of the CALICO PRO.

Enabling secure mode

1. Select **Settings** then **Networking**
2. Select **Secure connection**
3. Select **Save** and **Yes**. CALICO PRO will restart
4. When CALICO PRO restarts, **login**



Notes:

- Secure mode disables unsecured connections over Ethernet. Unencrypted third-party controllers do not work over Ethernet when you use secure mode.
- CALICO Studio always connects securely

Configuring network settings for media modules

If you want to stream media over your network, or from the internet, configure the network settings for your media module.

This is an optional module and only applicable to the 2200 model

If you only want to use your media module to play media from a USB drive, you don't need to configure network settings.

Static IP addresses

If you want to use a static IP address, you need some information about the range of available IP addresses on your network. Your network administrator should be able to help you.

> **Important note:**
> If a static IP address is used, it must be set to unique value on your network. Using the same IP address on more than one device will cause network issues such as disconnections.

To configure network settings for media modules

1. In CALICO Studio select **Settings** then **Module configuration**
2. Locate the media module that you want to set up **(slots 11** and/or **12)**
3. Select the three dots in the top right of the module ● ● ●
4. From the dropdown list, select **Configure**
5. Follow the same process as for the main unit to configure the modules network properties.

> **Useful information:**
> - If you want to decode IP streams from an internet server, you must set a value for your gateway.
> - If you want to refer to a source by name you must set a value for DNS

Playlist settings

If you have a media module installed, you can view the status of your playlists, delete all playlists or individual playlists, move playlists between modules, and rename playlists.

Renaming playlists and moving playlists between modules

1. Go to Settings then Playlists

> **Important note:**
> The media module has two operating modes, each with separate playlists. These playlists are not compatible with each other and won't be visible when set into the other mode.

Renaming playlists

1. In CALICO Studio select **Settings** then **Playlists**
2. Locate the playlist you want to rename and enter a new **Name**

Moving playlists

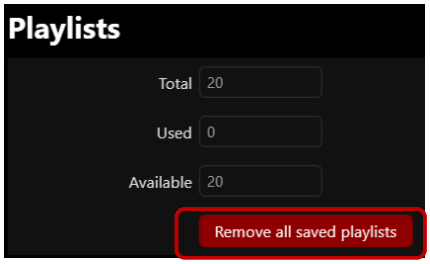
1. In CALICO Studio select **Settings** then **Playlists**
2. Locate the playlist you want to move and select a new module from the dropdown list

Deleting individual playlists

1. In CALICO Studio select **Settings** then **Playlists**
2. Locate the playlist you want to delete and select **Remove**

Deleting all playlists

1. In CALICO Studio select **Settings** then **Playlists**
2. Select **Remove all saved playlists**



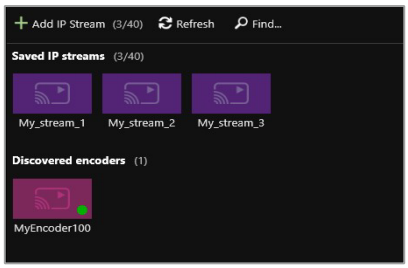
Managing encoders and streams

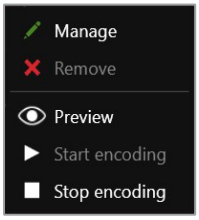
You can view and manage all your encoders and saved streams.

Select **Settings** then **IP Streams**

Managing your encoders

Encoders that CALICO Studio detects appear under Discovered encoders.





You can:

- Refresh the list of encoders
- Search for an encoder that does not appear automatically
- Select and encoder to see details about it

Select more ••• to:

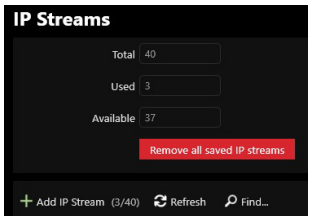
- Manage the encoder or change your configuration
- Remove an inactive encoder
- Preview the stream from an encoder
- Start or stop encoding

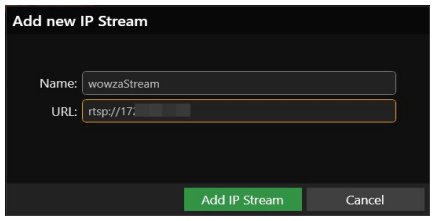
Managing your saved streams

Streams that you add and save manually appear under Saved IP streams.

You can:

- See how many streams you have
- How many slots you have left
- Add new streams
- Remove all saved streams





Editing the name and URL of saved streams

- Select the stream then select more ••• then, **Edit**
- Edit the name and URL of the media stream

Resolution editor

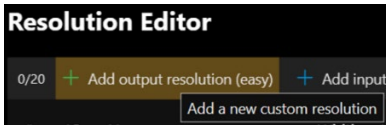
Creating and editing custom resolutions

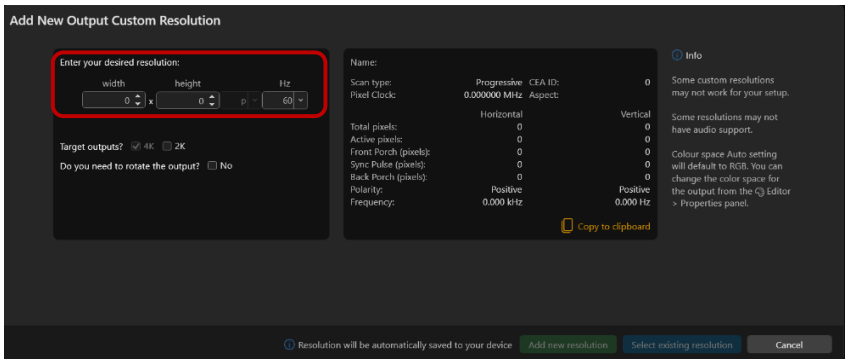
The resolution editor will allow up to 20 extra custom resolutions to be created and stored in the editor, in addition to the system resolutions already included. We've created a tool with a custom resolution algorithm that maximizes the likelihood that the resolution will work in your setup. Once created, these resolutions can be chosen from the dropdown lists when creating display equipment.

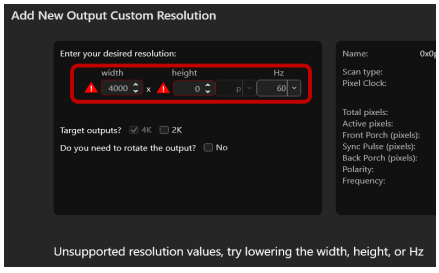
Custom resolutions are often unreliable and are not guaranteed to work with your display equipment. If your set-up is an LED wall, then output mapping should be used instead of creating custom resolutions.

Custom resolutions are only for outputs and cannot be used with inputs. You need to upload an EDID to use with inputs.

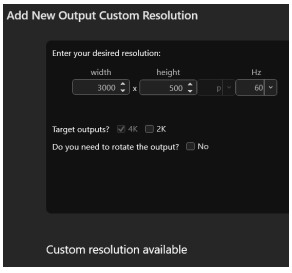
1. In CALICO Studio select **Settings** then **Resolution editor**
2. Select **+ Add output resolution (easy)** to show the dialog
3. Enter the resolution you need and the frame rate
4. Click **Add new resolution** to save it in CALICO PRO



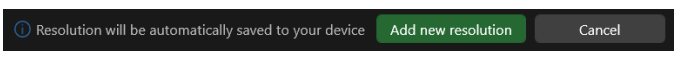




Entering a resolution that is not supported will show an error



Entering a resolution that the algorithm is happy with (remember that it's not guaranteed to work with your setup



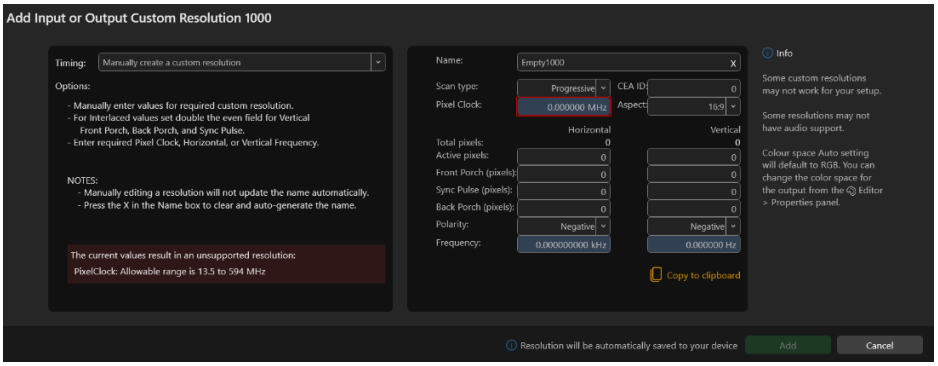
> **Note:**
> We will search the CEA-861-F (Consumer Electronics Association) resolution list for matches and if found you can add this instead of creating a new custom resolution

Add a custom resolution with the advanced options

Sometimes you might already know the resolution timing values from the manual or specification sheets of the connected devices. These could be specific to the device, or from an existing standard. This is also the option if you have tried the **+Add output resolution (easy)** tool and it did not work.

In CALICO Studio select **Settings** then **Resolution editor**

1. Select **+ Add output resolution (advanced)** to show the dialog
2. Enter the timing method you want to use to add this resolution
3. Enter the required values
4. Click **Add new resolution** to save it in CALICO PRO



- Manual: - Allows you to enter the values directly. The blue boxes are linked depending on the total values, so changing one will update the other two.
- CALICO PRO output resolution generator (tvONE): - Enter the values to create a custom resolution for your outputs that is compatible with the requirements of the system outputs.
- CVT v1.2 Standard (VESA Coordinated Video Timing): - This method uses the CVT formula to create a resolution which are best for analog devices.
- CVT v1.2 Reduced Blanking (VESA Coordinated Video Timing): - This method uses the CVT Reduced Blanking formula to create a resolution which are best for analog devices.
- DMT 1.0r11 (VESA Display Monitor Timing): - Select from the list of DMT resolutions which are best for analog devices.
- CEA-861-F (Consumer Electronics Association): - Select from the list of CEA resolutions which are best for digital devices.

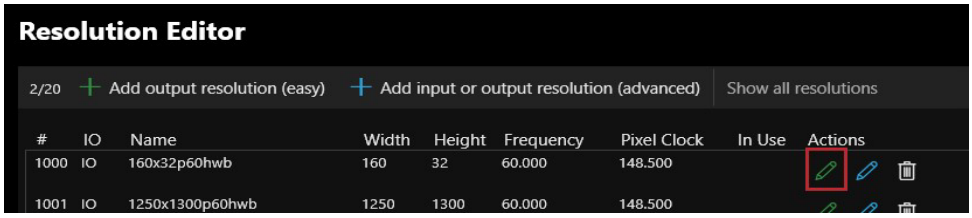
Notes:

- Resolutions and timings outside of the allowable range for the hardware will result in warning messages and the resolution will not be created
- For interlaced resolutions the vertical sync pulse, and front and back porches must be twice the even field.
- CALICO PRO output resolution generator (tvONE) uses the same method as + **Add output resolution (easy),** but will not search the existing resolutions, or the CEA list for matching resolutions.
- Resolutions that are in use and then deleted will be set back to their assigned equipment's default resolution. You may have to adjust them manually from the Editor.

Edit a custom resolution for outputs

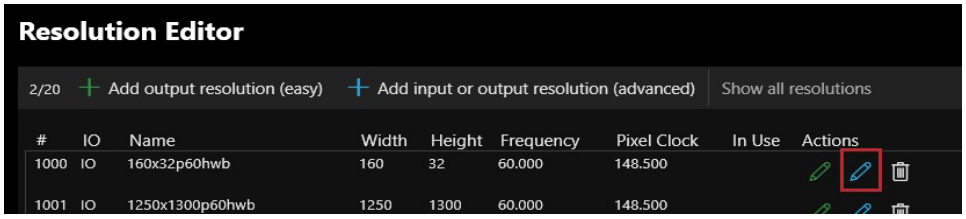
You might just want to make a small adjustment to a resolution instead of deleting and creating it again.

1. In CALICO Studio select **Settings** then **Resolution editor**
2. Find the resolution you want to edit then select the (green) dialog
3. Make the edits in the resolution editor then select **Update resolution**



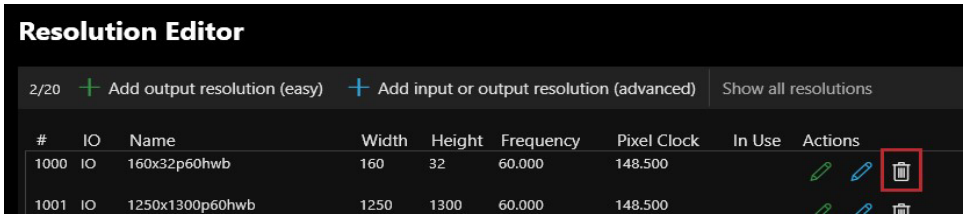
Edit a custom resolution with the advanced options

1. In CALICO Studio select **Settings** then **Resolution editor**
2. Find the resolution you want to edit then select the (blue) dialog
3. Make the edits in the resolution editor then select **Update resolution**

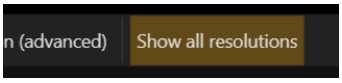


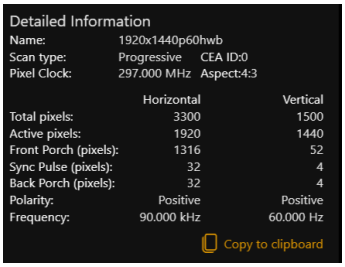
Delete a custom resolution

1. In CALICO Studio select **Settings** then **Resolution editor**
2. Find the resolution you want to delete then select the (bin) dialog



Show all loaded resolutions





1. In CALICO Studio select **Settings** then **Resolution editor**
2. Select **Show all resolutions**
3. All pre-installed and added resolutions will now be shown in a list
4. You can select any resolution from the list and copy its parameters as **Detailed information**

EDID manager

You can upload an EDID file saved to your PC to your CALICO PRO. You can manage the EDID files saved to your CALICO PRO in CALICO Studio.

CALICO PRO cannot create new EDID files. This must be done by an external tool then the file uploaded to CALIC PRO's EDID manager.

You might want to upload a saved EDID file if a source, for example, a PC, is using the preferred resolution from your CALICO PRO rather than the resolution you wanted for the source device. **This can cause unexpected effects**.

You can create an EDID file for the resolution you selected for the source device and upload it to your CALICO PRO.

EDID files must:

- Be a binary EDID file
- Have a filename in 8.3 format
- Have a .edd extension, or a .bin (as this can just be renamed to a .edd file)

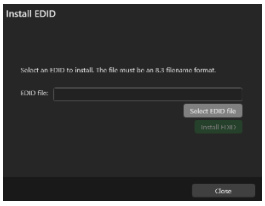
Have a filename no longer than 8 ASCII characters

Before you start

Before you add custom EDID files or remove saved EDID files, we recommend that you make a backup copy of your configuration.

Adding a saved EDID file

1. In CALICO Studio select **Settings** then **EDID manager**
2. Select **Install new EDID**
3. Select, **Select EDID file** and browse to a saved EDID file stored on your PC
4. Select **Start install**



Removing EDID files

1. In CALICO Studio select **Settings** then **EDID manager**
2. Find the **EDID** you want to delete
3. Select **Remove**

Notes:

- Risk of unexpected effects. If you delete an EDID file that is in use and then reboot your CALICO PRO, it reports that it is using the deleted EDID file but is really using the default EDID file
- Your uploaded EDID files can only be used with sources
- CALICO Studio does not check that a custom EDID file is valid or supported. Uploading an invalid or unsupported EDID file can cause source loss and unexpected results. Creating custom EDID files is an advanced task. If in doubt, contact a qualified AV professional.

Editor tools

Various tools are available to help you create and organize your canvas.

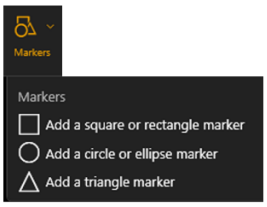
Hundreds of different elements can be present on a canvas. Outputs, windows, and labels are some of these and will need to be properly aligned with each other.

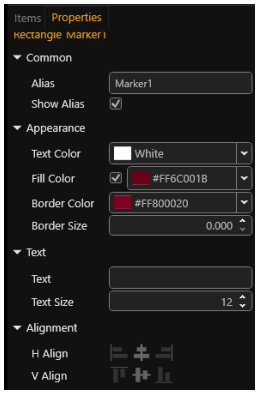
Markers

Markers are used to help organize your canvas into groups, position items, indicate where an obstruction is located, mark areas of a display that are not in use.

Add a marker

1. From **Editor** select **Markers** from the top menu ribbon, then select the markers you want to add to the canvas.
2. Position and size the markers to the required locations.
3. Select the marker to show the **Properties** panel on the right-hand side.
4. Adjust the settings to your requirements, for example show a border, or enter custom text.
5. Clear the Fill Color check box to allow you to select items under the marker, for example when using the marker border as a zone around windows and displays.
6. Hide the alias text if you want to just have a marker with no text.
7. Lock the markers in place from the **Items** list on the right-hand side, then select the padlock symbol next to the item. Toggle to lock and unlock





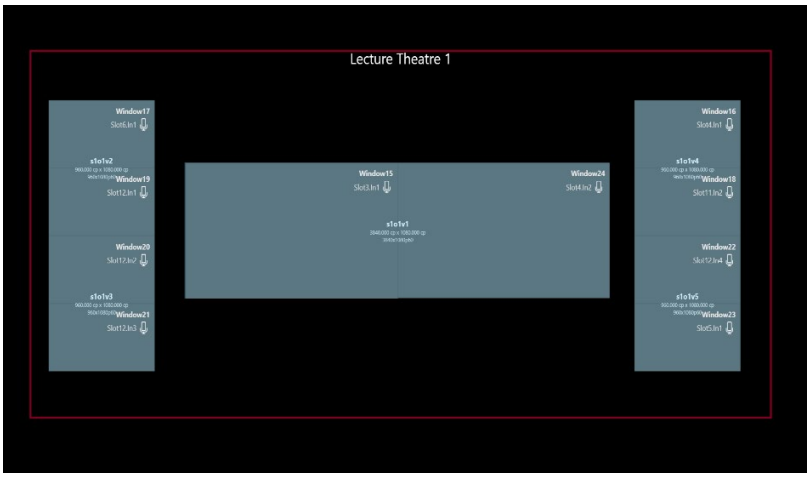
Useful information:

- Other items can be snapped to markers, for example windows and outputs.
- Markers are like windows and outputs within the editor, but they are only visible in CALICO Studio and not on the output.
- Clear the fill color check box to allow you to select items under the marker. For example, when using the marker border as a zone around windows and outputs.
- Hide the alias text if you want to just have a marker with no text.
- Lock the markers in place from **Items** then select the **padlock** next to the item.

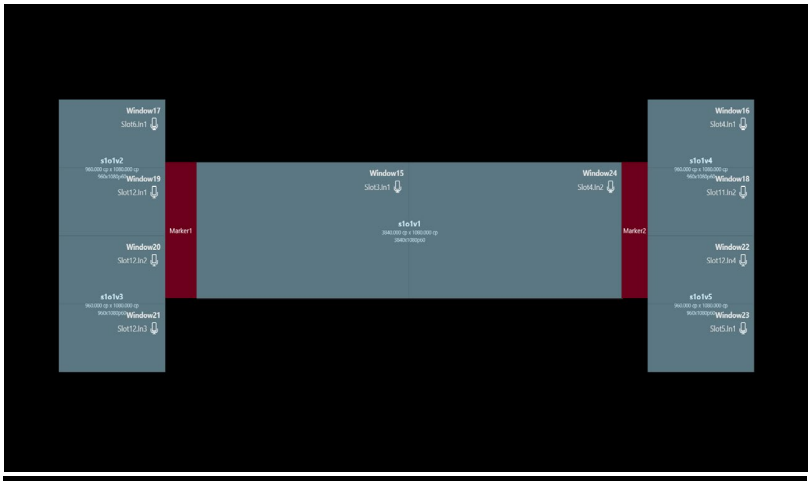
Show me some examples

Each marker can be used to define a zone that exists in a different physical space on a canvas with their own sources and presets controlling them.

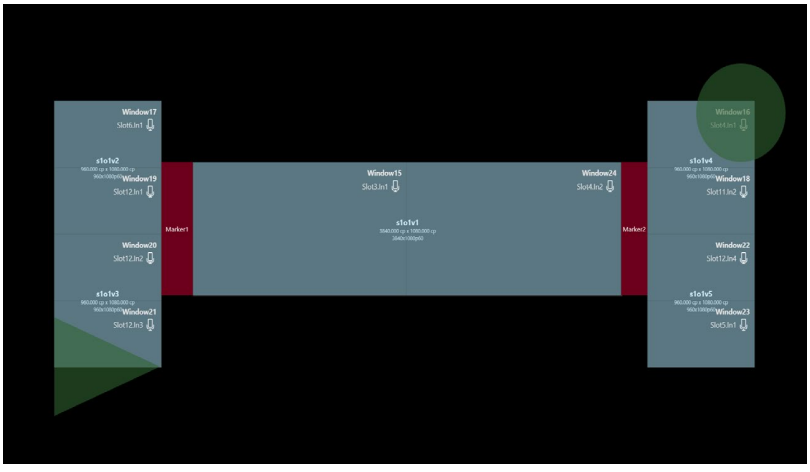
The example here is a dvLED wall installed in **Lecture Theatre 1**



Markers are being used here on the canvas, as positioning guides that set the physical gap between wall sections



Here the green markers are being used as a guide for areas that are obscured from the viewer due to an obstruction. The guides can help you to place relevant contents on the wall.

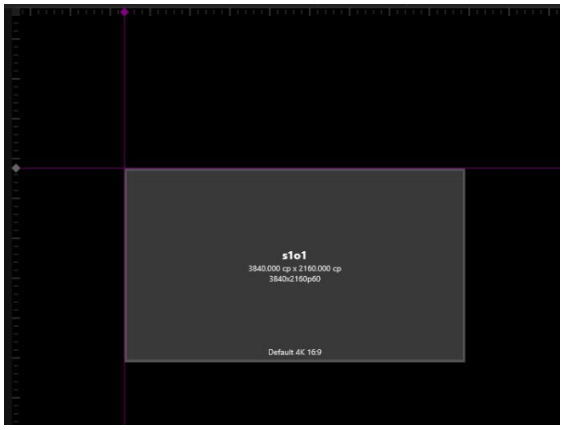


> **Note:**
>
> Markers are not visible on any outputs. They are only guides visible on the canvas editor in CALICO Studio.

Guidelines

Guidelines help to align items on your canvas, they are purple lines that can be added and stretch from the top to bottom or left to right of your canvas.

Add a guideline



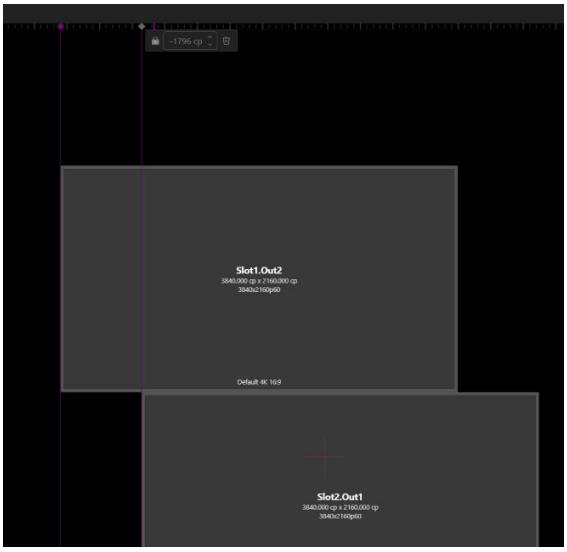
1. From **Editor**, place the mouse pointer over the top or left edge of the canvas.
2. Click on the location where you want to add a guideline.
3. Click and drag the guideline diamond to move the guideline's location.

Edit, lock, or remove a guideline

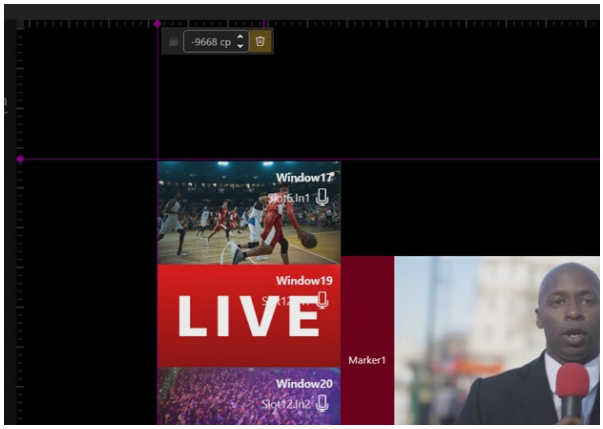
From **Editor**, right click on the guideline diamond to show their properties.

1. You can enter the exact value to position the guideline on the canvas. or
2. Lock the guideline to stop it from being accidentally moved by selecting the **padlock**. or
3. Remove the guideline from the canvas by selecting the **bin**.

Using guidelines to space the outputs correctly

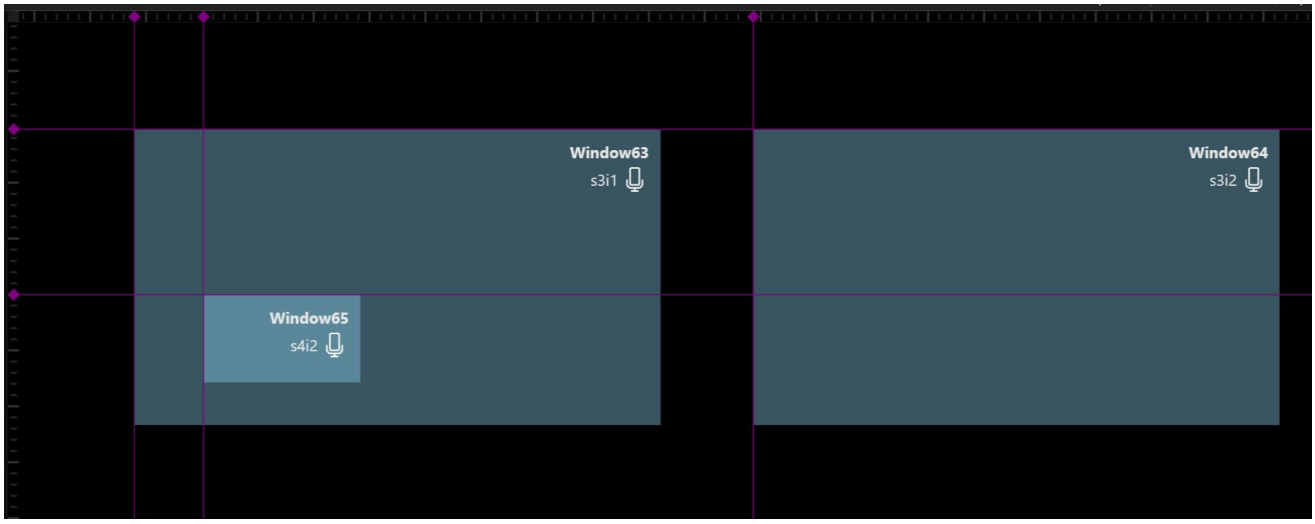


Using guidelines to space the windows correctly



> **Note:**
> Guidelines are not part of the undo history

Turn off snapping to displays and windows and use guidelines to arrange your windows in specific locations.



Canvas grid

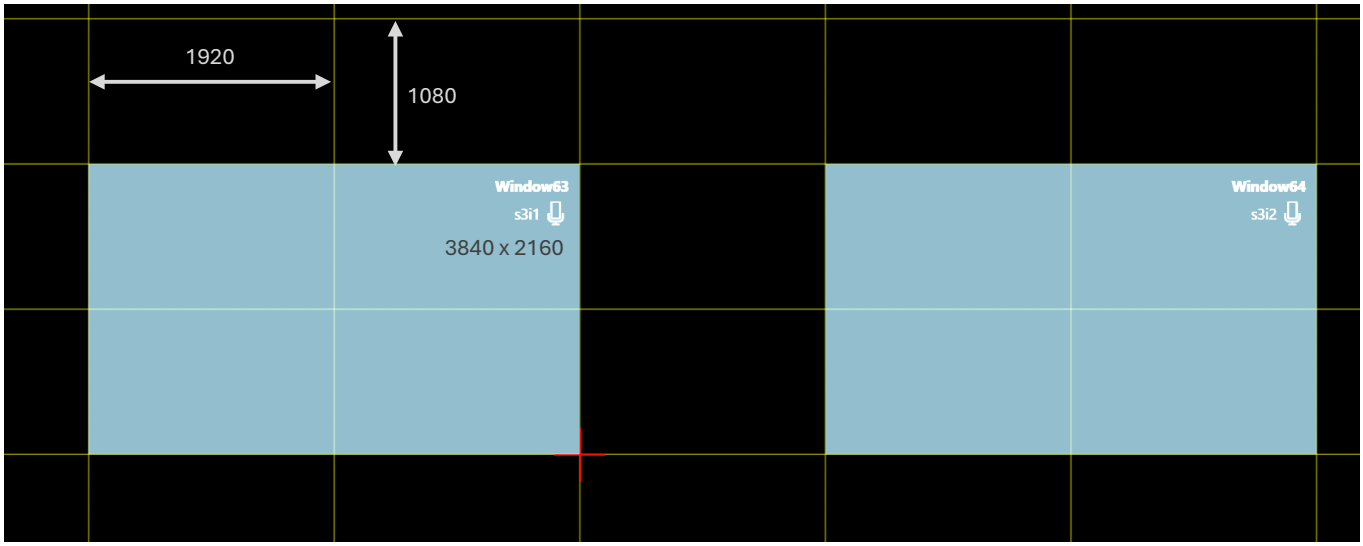
You can show a customizable canvas grid to help arrange items.

Show the canvas grid

1. From **Editor** select **Canvas options** from the top menu ribbon.
2. Select **Grid** then check the **Show grid lines** box.
3. Change the Width and Height values to your requirements.
4. If you want editor items to snap to the grid, select **Snap** then **Snap to Grid**.

Show me an example

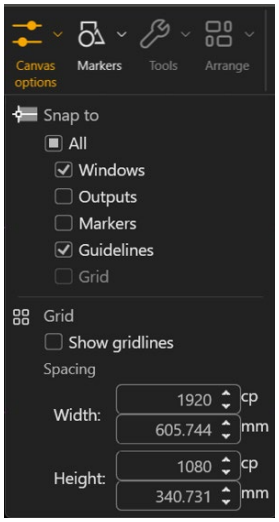
Here the canvas grid is set to 1920x1080. Windows are 4K 3840x2160. Grid snapping allows precise alignment.



Snapping options

You can control what items will snap to on a canvas, when moving them around or resizing them. This can make it easier to set up complex layouts with many items.

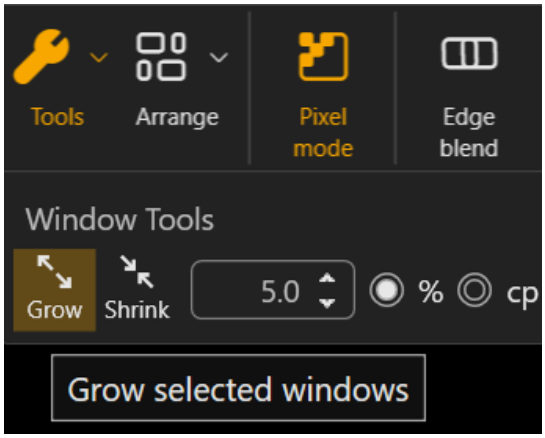
How to customize the canvas snapping feature



1. From **Editor** select **Canvas options** from the top menu ribbon.
2. Select or clear which options to change the snapping behavior.

Shrink or grow a window or label

1. From **Editor** select a window or a label you want to grow or shrink.
2. You can select to shrink or grow a window as a percentage of the current size, or the canvas units.
3. From **Tools** select **Grow** or **Shrink**.



Useful information:

Pixel mode should be switched ON to adjust in pixels

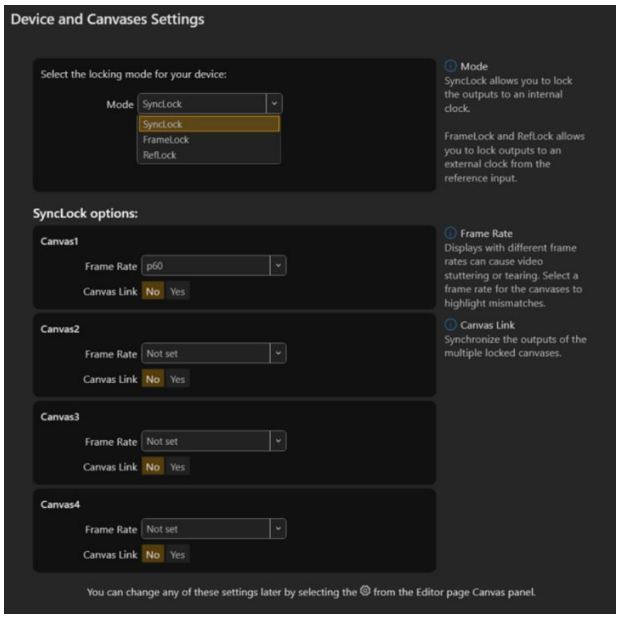
Note:

To select a label on the canvas, you must first be in the label editor

Creating a video installation on a canvas

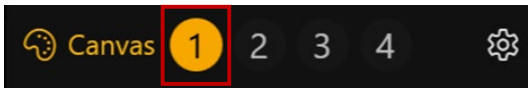
To create a video installation in CALICO Studio, you need sources and displays to connect to your inputs and outputs. Make sure you've either loaded your configuration from your CALICO PRO or created an offline configuration.

When connecting to a new CALICO PRO or one that has been factory reset, CALICO Studio will present the screen shown and ask you to set up at least one canvas refresh rate (frame rate). Each canvas can only be set to one refresh rate, but you can set each canvas up with a different one if required. All outputs added to a canvas must then be set to the canvas refresh rate. Any output that is added with a different rate to the canvas rate will be colored red.

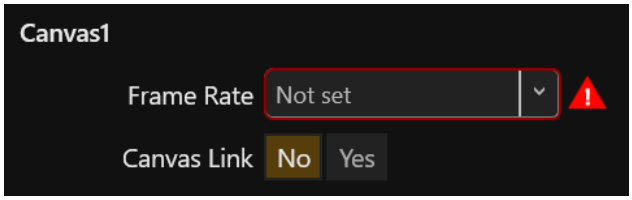


Setting the canvas frame rate

1. Go to **Editor** then choose a **Canvas.** In this example we have chosen canvas 1.



2. If you have not set the frame rate for the chosen canvas, the device and settings menu will appear and warn you a frame rate is not set. Set one and apply it to return to the canvas editor



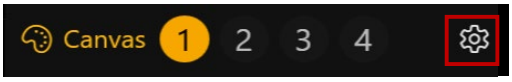
3. You can also link canvases together using the canvas link setting. Do this to synchronize canvases using a system-wide internal or external reference.

Canvas locking (system-wide synchronization mode)

There are three methods that can be used to synchronize your canvases to a system-wide internal or external reference frame.

1. Synclock – Canvases are frame locked to an internal system clock. This is the default mode.
2. Framelock – Any incoming video source can be chosen as a frame reference
3. Reference lock – (genlock). Uses the external BNC input as a frame reference

The settings can be changed later by going to **Editor** then go to Canvas and click on canvas settings.

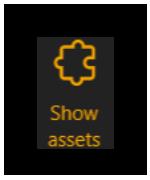


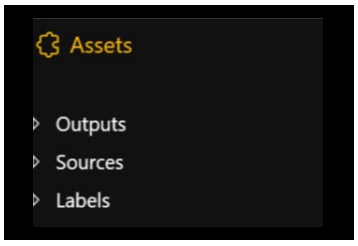
Adding available assets to your canvas

Assets are outputs, sources and labels, that can be used to create your video installation.

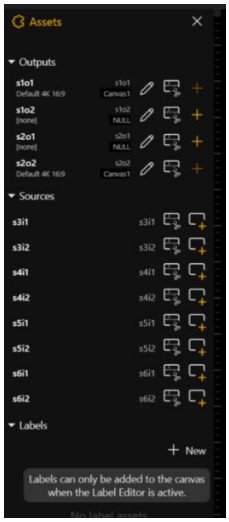
To see what assets are available, do the following:

1. Select Assets from the top ribbon menu. The assets panel will be shown on the left side of the editor.





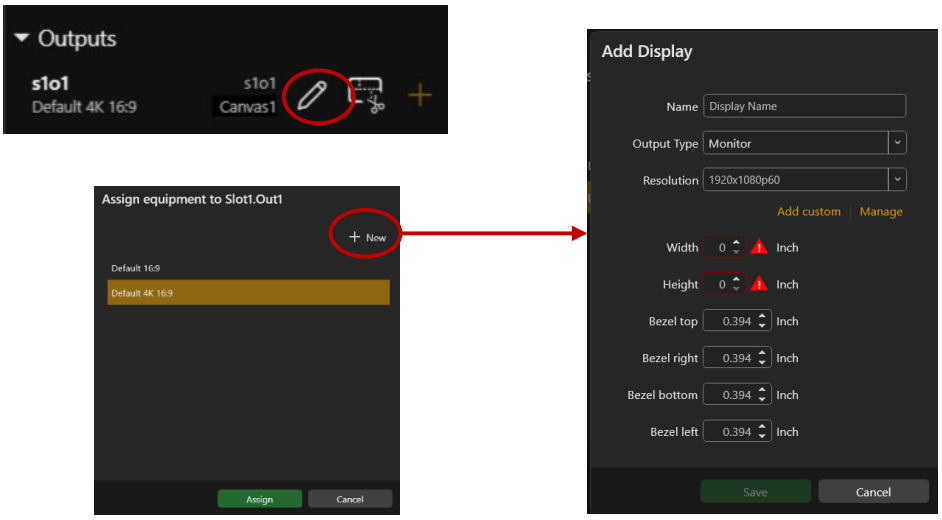
2. Click the arrow next to each item to open up the list.



3. Available assets are indicated by the orange +. Used assets will have this greyed out.
4. The list will show all outputs, including mapped outputs and all sources including mapped sources.
5. Labels will be listed if they have been created and added to the on-board storage area.

Creating display equipment

An optional, but recommended step for your outputs is to assign equipment to an output by selecting the **pencil** icon. In the equipment editor select or create the equipment then assign it to the chosen output. This step will involve you knowing the specifications of your equipment and will include physical sizes, as well as resolutions. In the case of displays there are also settings for each bezel size. CALICO PRO needs this information if you plan to mix display types or indeed match the physical world where the displays will be installed.



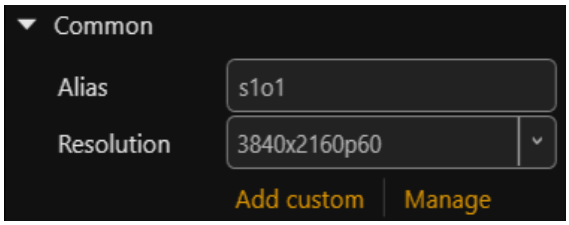
5. Click the pencil icon next to the output you want to assign display equipment to (the assigned equipment will be shown under the name of the output. In this case **s1o1**
6. Select display equipment from the list. Any new equipment you create will appear in this list.
7. To create a new equipment set-up, select **+ New**, then create your display.
8. Give your display a unique name
9. Select the display type (for projectors, this allows you to edge blend). For connection to a dvLED use the **Monitor** output and set bezels to zero.
10. Set the display resolution from the drop-down list. If the resolution you need is not listed, the Add custom link allows you to create a custom resolution. Consider if mapping the output is not a better option than using a custom resolution, which is not recommended as there may be compatibility / timing issues with your display equipment.
11. Add the width and height of the display
12. Add the dimensions of any bezels
13. Save your settings to create the equipment
14. Assign the equipment to the output

> **Useful information:**
>
> You can change or assign equipment later from the Assets panel.

Custom resolutions

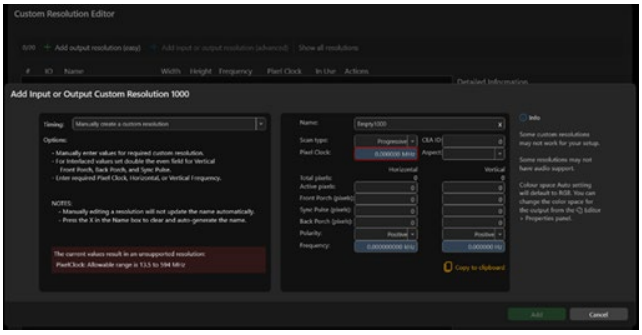
If your display equipment uses a resolution that is not supported as standard by CALICO, you can try to create a custom resolution.

If supported by the connected device, you can add a custom resolution by selecting **Add custom** or **Manage**.



Add Custom opens a dialogue that guides you to set a custom resolution. The tool uses a special algorithm to assess if the desired resolution is possible with that output. The algorithm maximizes the likelihood (but does not guarantee) that the resolution will work in your setup.

Manage opens the advanced dialog where you can manually enter timing values or use one of the timing providers.



Notes:

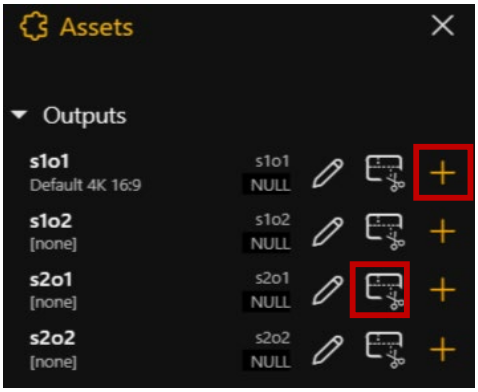
- Custom resolutions may not work correctly with your chosen display equipment.
- When using dvLED, it is far better to make use of output mapper and use standard resolutions for the set-up.
- CALICO cannot output any resolution wider than 3840 pixels from a single output.
- The total number of pixels from a single output cannot be more than 3840 x 2160.
- Ensure that the refresh rate for the custom resolution matches the canvas refresh rate, otherwise you will get a warning message (display turns red) when you try to add it to the canvas.

Add outputs to a canvas

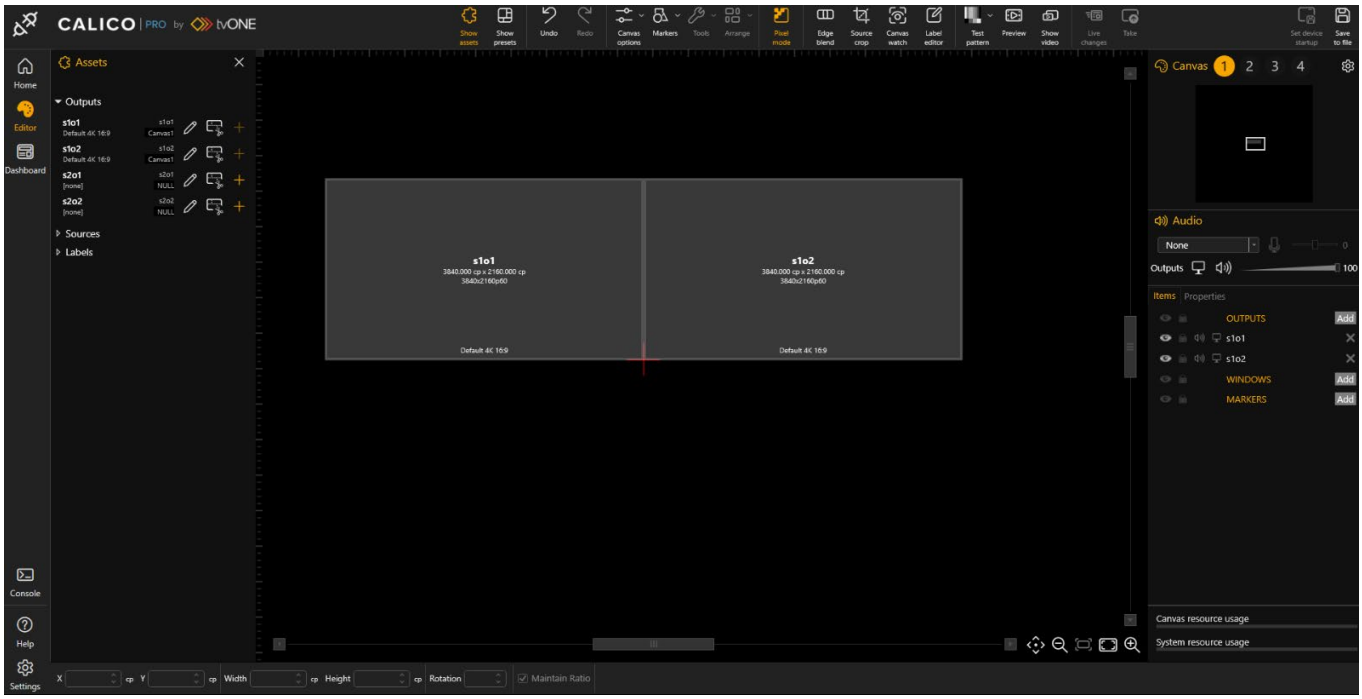
Every output from CALICO PRO can be used to connect to any kind of display device that has a suitable video connector. This includes displays and monitors, projectors and dvLED controllers.

There are two ways to add outputs to your canvases.

1. Add a single output, using the + button next to an available display in the Assets list, or by simply dragging and dropping an output to a canvas. You can drop it anywhere and scale and position it later.
2. Map the display using **Output mapper** and create a series of virtual outputs that can be used as mapped areas for an dvLED setup or as separate sections of a single output to a monitor set up as a canvas watcher.



Outputs from s1o1 and s1o2 have been added to Canvas 1



Output mapper

When the output goes to a display monitor or Projector, the aspect ratio of the output is known and one output drives one display. When connected to a dvLED (direct view LED) controller however, the display is built using cabinets or tiles of a size and resolution decided by the LED manufacturer. It is rare that these are used with conventional aspect ratios, resolutions, and standard layouts. dvLED controllers are designed to manage this arrangement by using mapping techniques but still expect a standard resolution as a single input from a source in most cases.

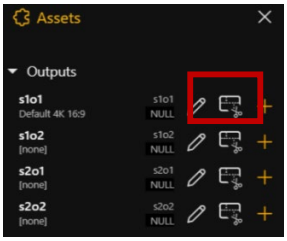
CALICO PRO can **map** its outputs to match the mapping used by the controller that drives the dvLED wall, which may have been installed with multiple pieces and patterns.

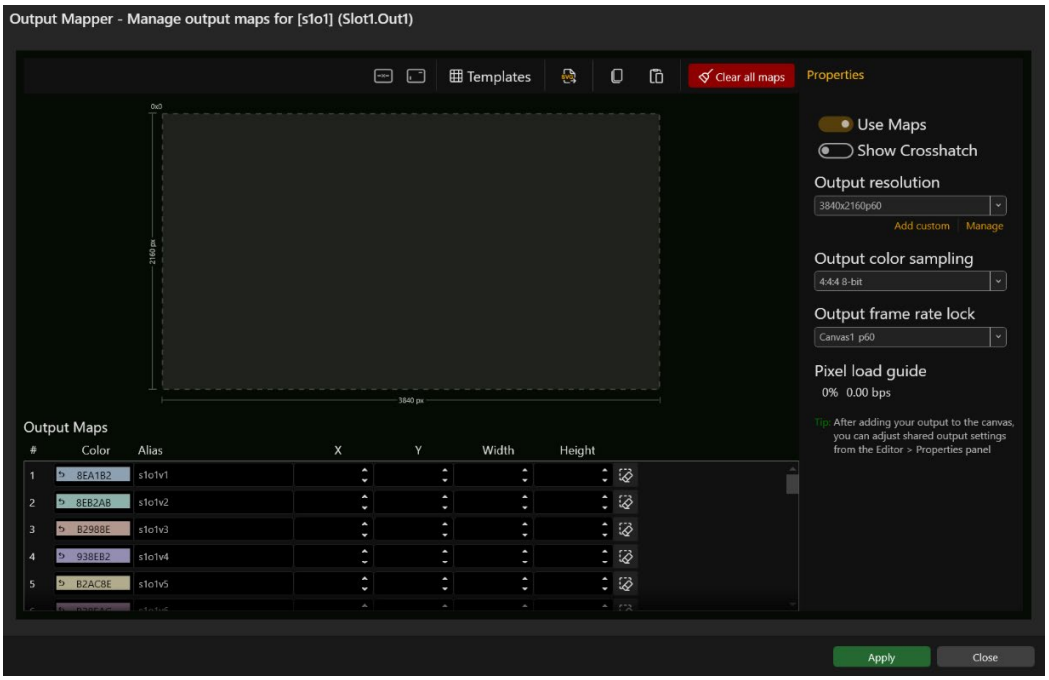
The **output mapper** can be used to create virtual outputs that can then be positioned correctly on a CALICO canvas to mimic a real-world installation, ensuring that content placed on the wall is displayed correctly and is easy to manage with CALICO Studio. Using CALICO PRO to map the output and manage the content, makes the job of setting up the dvLED controller much simpler.

Using CALICO PRO's output mapper also maximises the use of every available pixel, potentially cutting down the number of dvLED controllers that would be needed for a large installation.

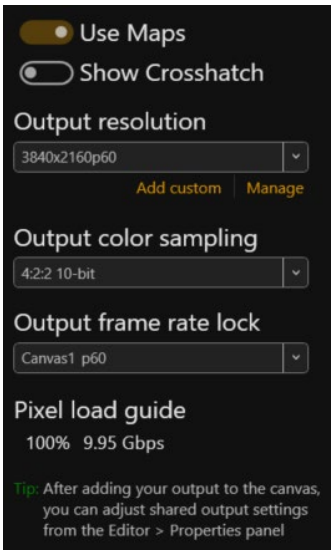
Mapping an output

1. Select an available output from the **Assets** list then **Outputs**.
2. Click the output mapper button for the output to access the mapping tool.

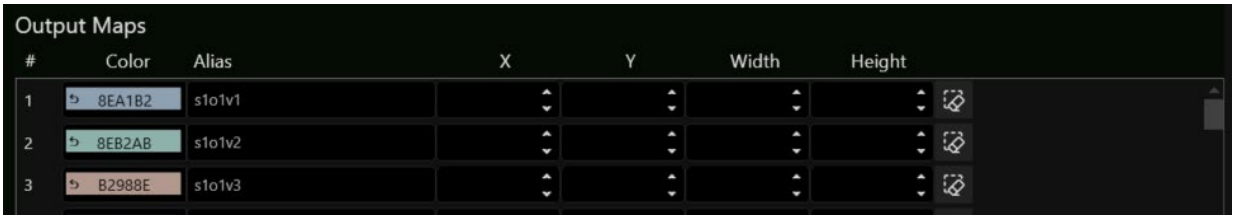




3. To activate or deactivate the map for the chosen output, select **Use Maps**
4. You can decide if any unmapped areas of an output will show as black or show as a as a **Crosshatch** pattern. The setting shown in this example would output black.
5. Check that the **Output Resolution** is set correctly. If it is not, then select a new one from the drop-down list or create a custom resolution by selecting **Add custom.**
6. You can set the output to **8 or 10-bit processing**
7. Using the **Output frame rate lock drop-down**, check that the mapped output will be added to the chosen canvas and that the canvas refresh rate is set as you expect. Maps can be added on any canvas as long as the frame rate is correct.
8. The **Pixel load guide** will tell you the percentage of the output pixels used and the bit rate.



There are several ways to create output maps in this tool. You can directly enter the mapping information for each mapped area by entering the values **(X, Y, Width and Height)** into the table at the bottom labelled **Maps**



You can add up to 32 mapped areas per single output from CALICO PRO, and each map is represented by a different colour in the mapping tool.

In this example, a single map has been created for s1o1. The map starts at 150 pixels in from the left **(X)** and 400 pixels down from the top **(Y)** and is **1100 pixels wide and 500 pixels high**. The map has been given a virtual output name of **s1o1v1**.

Mapped areas can be moved to another position within the output by selecting them and dragging them to a new position or by adding new information into the table.

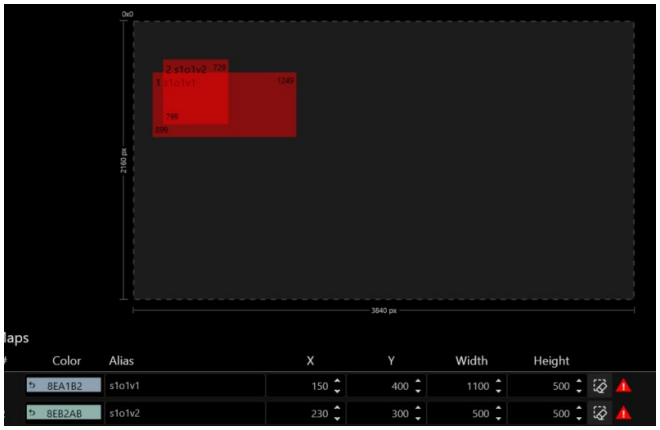
Toggle this button to display the resolution of each mapped area.

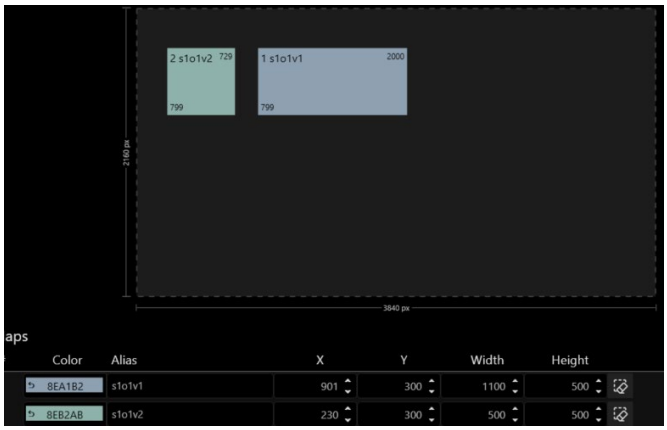
Toggle this button to display the pixel positioning of each mapped area right and bottom edges.

In the example below, a second mapped area has been created that is overlapping the first area. This setting is not possible with an output, as the pixels cannot be used more than once.

The output mapper shows this as an error (outputs are now red and warnings have appeared in the mapping table).

Correct the problem by moving the maps into the correct positions.





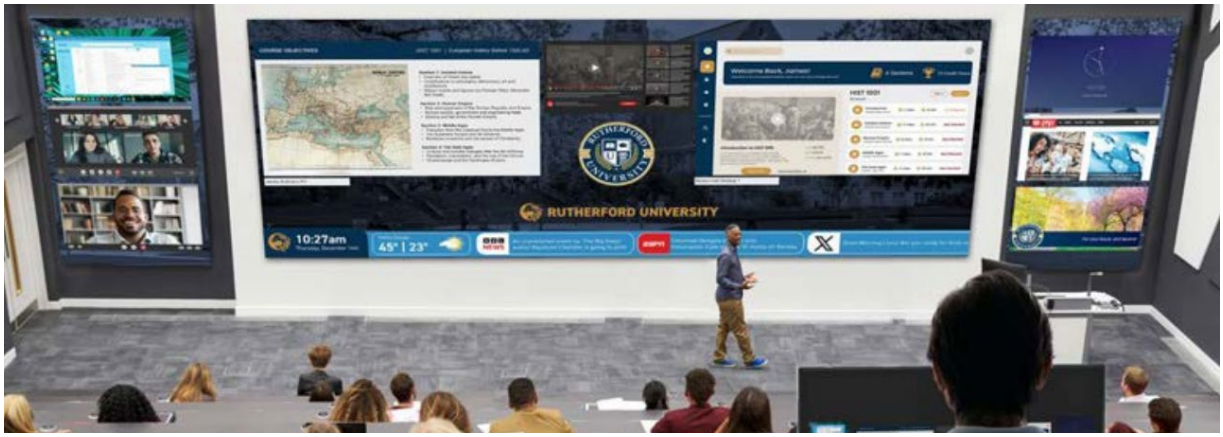
The maps here MUST match the mapping in the dvLED controller. Map layouts can be exported to a TSV (Tab Separated Values), or SVG (Scaled Vector Graphics), to help with setting up an LED controller.

Useful information:

- Each map can be a maximum of 3840 pixels wide, 2160 pixels high and not smaller than 16 x 16 pixels in size.
- Once created, the maps become virtual outputs and can be used anywhere on any of the four available canvases. The virtual outputs can also be rotated (360° in 1° increments) and re-sized to match the physical dimensions of the real-world displays, ensuring that content will always look correct.

Real world output mapping example

The lecture theatre shown in this example has three dvLED walls. The centre wall is a 4K wide by 1K high wall and the side walls are approximately 1k wide by 2K high.

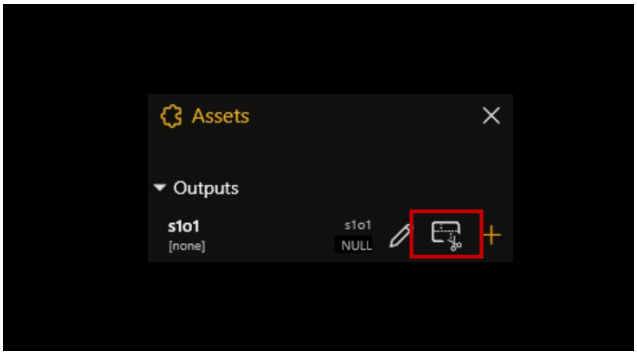


This wall is almost 6K wide plus 2K high and it is difficult to map this using a standard 4K dvLED controller. Two controllers or even three controllers might be needed. Content would also be tricky and could not easily be shared across all three walls.

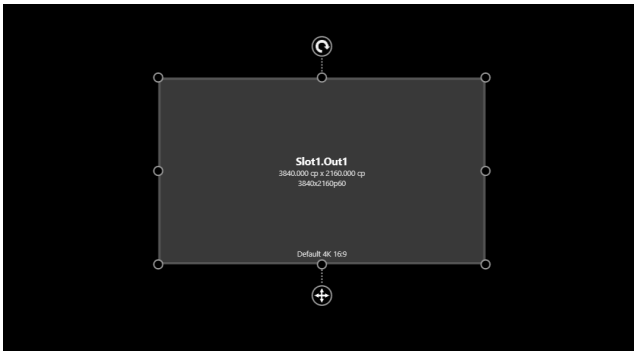
CALICO PRO can solve all these problems and deliver all three walls using a single 4K60 output to only one standard 4K led controller. The output mapper can efficiently pack all these areas together so that the minimum number of pixels in the controller go unused if any.

In the **Assets** panel in CALICO Studio, choose an output that you will map. This can be an output already added to a canvas or an available output from the list.

Select the Output Mapper icon next to the chosen output in the list

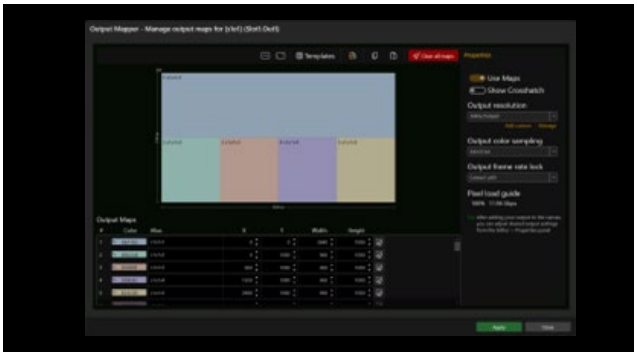


The chosen output as a single 4K



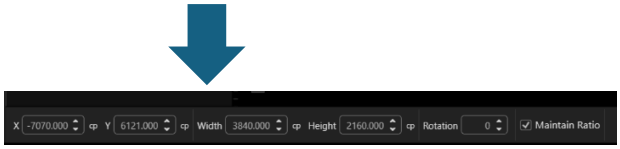
Using the output mapper, enter the mapping information to match the resolution and shape of the dvLED set-up. Here, the centre part of the wall is 3840 pixels wide x 1080 pixels high, and each side screen is 960 pixels wide x 1080 pixels high. In this example, the side screens have been mapped as two separate sections which will be stacked when added to the canvas.

Output mapper (5x mapped areas)



Apply and add the virtual outputs to the canvas

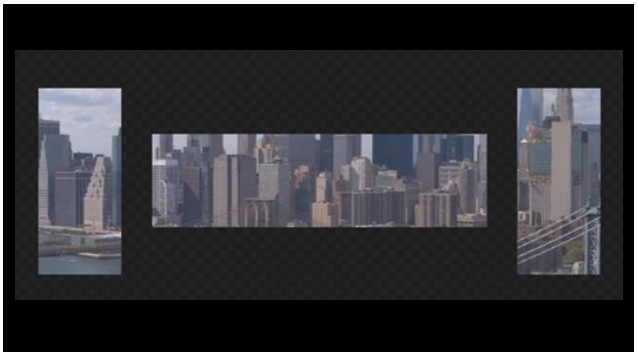
Drag and drop or enter the exact position of each output on the canvas. The position of any canvas item is shown, and can be adjusted when you set it in the bottom left side of the editor



The virtual outputs are rearranged on the canvas to match the real world

Add a source window and position it to cover the whole wall

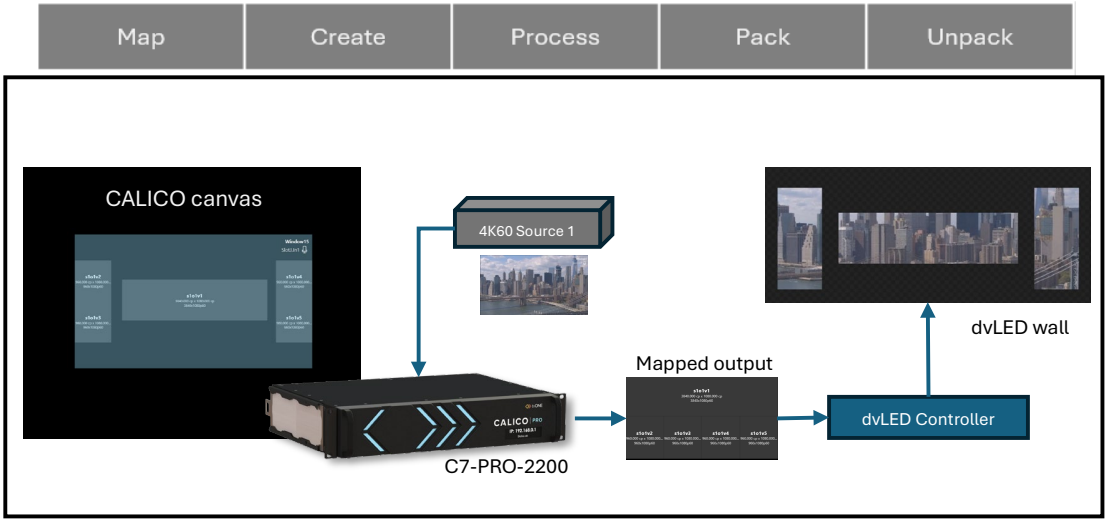
Real world dvLED walls with single content across all outputs



A more complicated set up showing a broadcast Studio with windows displaying different live sources.

Output mapper re-packages the output and sends it to the dvLED controller as shown below. The LED controller unpacks the maps again and sends each pixel to the correct place on the walls.

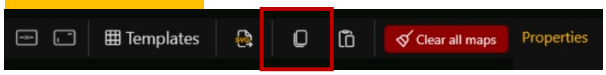
Workflow



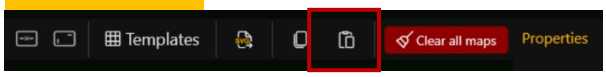
Importing and exporting output maps

Maps created with output mapper can be exported to a **TSV** (**Tab Separated Values**) file. This can be used by the installer to map the dvLED controller correctly, or you can use the maps in CALICO PRO to copy mapping co-ordinates from one out to another. You can load a TSV file to configure the output mapper by copying the table from Excel, you can paste this to create the maps by using the paste button in the output mapper. This is particularly useful if you are building an LED perimeter ribbon for example.

Copy



Paste



TSV file

#	Color	Alias	X	Y	Width	Height
1	0x8EA1B2	s1o1v1	0	0	3840	1080
2	0x8EB2AB	s1o1v2	0	1080	960	1080
3	0xB2988E	s1o1v3	960	1080	960	1080
4	0x938EB2	s1o1v4	1920	1080	960	1080
5	0xB2AC8E	s1o1v5	2880	1080	960	1080

Maps created with output mapper can also be exported to an **SVG** (**Scalable Vector Graphics**) file. This can be used by the installer to import into a graphics software package, to make it easier to create custom content.

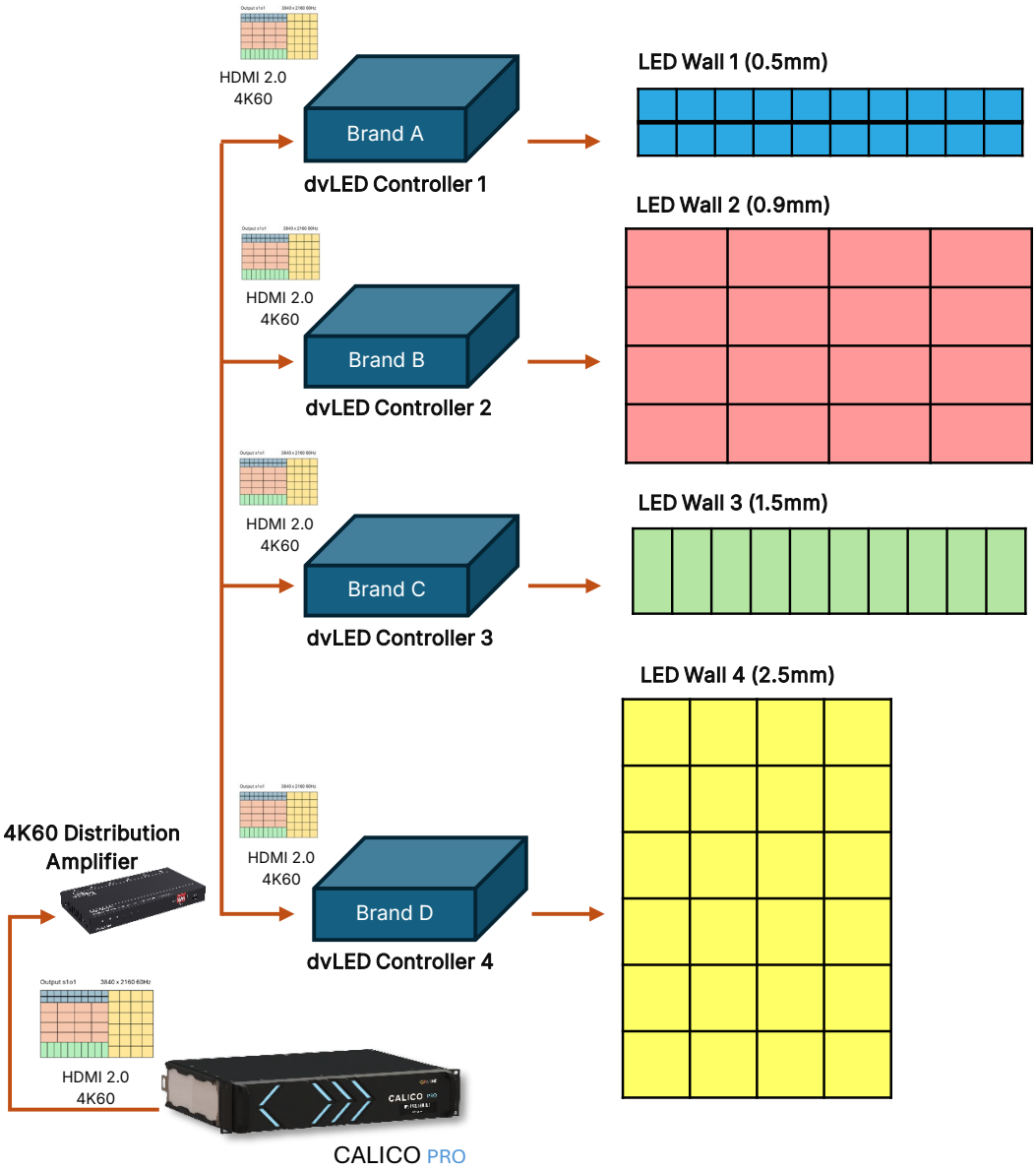
Export SVG

SVG file

Using a single mapped output to connect to multiple dvLED controllers

A single mapped output can also be used by several dvLED controllers, even if they are assorted brands and connected to different pixel pitches of dvLED.

In this case a single 4K60 output map from CALICO PRO can be copied multiple times by using a suitable distribution amplifier (DA) and then connected to each dvLED controller. If the controllers are mapped correctly, they will only use the part of a map that is relevant to them. With CALICO PRO by using its real-world canvases can deliver content across this whole environment, ignoring the fact that these controllers and walls are all different. CALICO PRO can control every pixel in an installation, regardless of how many types of displays, projectors or dvLED controllers are used.



Add inputs to a canvas

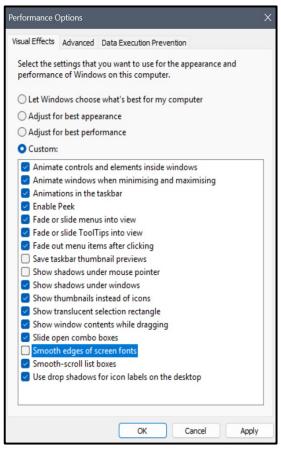
In CALICO PRO, inputs are called **Sources,** with available ones being listed in the Assets panel. Sources are video signals coming from external devices, such as media players, computers, cameras, other video devices like distributions amplifiers and switchers, video over IP sources and from the media playback module if you have them installed.

- Sources: can be in any format, resolution and refresh rate that is supported in CALICO by the chosen input. This could be one of the pre-installed HDMI inputs or from an optional input module.
- Windows: Adding a source to a CALICO canvas requires a window. A window is a container for the source, and can be positioned, re-sized, re-scaled and transitioned using presets.
- CALICO PRO has the capability to manage 256 windows: in total, but that number will be reduced with the addition of labels and if any windows are keyed.
- Sources can be the complete source, a mapped source or a cropped source:
- Windows can be freely placed on any canvas and are layered (z-order): Layers can be used to place windows on top of or below other windows.
- Sources can be HDCP: (High-bandwidth Digital Content Protection) v1.4 and v2.2 as well as non HDCP sources. These can all be used in the same installation depending on the inputs used and displays used. In any case CALICO PRO can manage these and will process video in accordance with HDCP rules.
- Sources can also include audio: as well as video
- Sources can also be still images: coming from the on-board storage area or from a media playback module.
- Sources can also be used to create various kinds of labels:

Notes:

If your source is a windows PC and you intend to display graphics, especially text, tvONE recommends that you make an adjustment in your windows appearance settings to disable the smoothing of edges to screen fonts. This setting is designed to make text characters on a display screen easier to read but it creates a blurring effect with characters when they are scaled during video processing.

1. In Windows: Go to **Start**
2. In the search bar type **Appearance**
3. Go to Adjust the appearance and performance of Windows
4. Uncheck Smooth edges of screen fonts



Input mapper

The input mapper is a specific tool to create virtual inputs from a single source. The virtual inputs created can be used just like any other source, so they can be switched for any other input or virtual input, scaled, rotated, re-sized, copied, transitioned, and placed anywhere in your set-up.

Input mapper is extremely useful when you have composite sources, for example a matrix of camera inputs coming from a multiviewer or PC. Individual areas of the source can be mapped and used as separate virtual inputs.

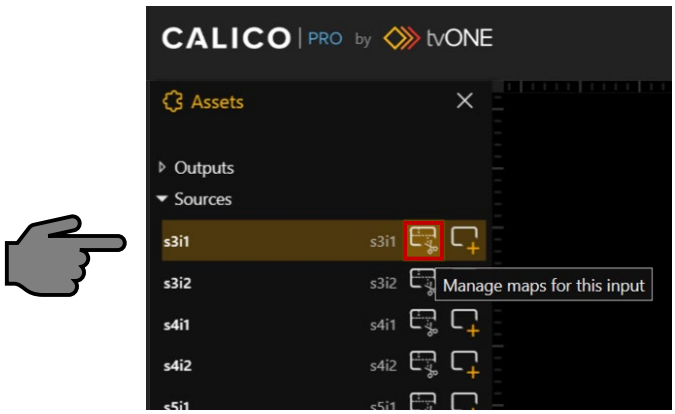
Example 1: Camera Matrix

In this example, a 4K source from a PC is showing four 1080p camera streams. The output from the PC is connected to CALICO using an HDMI cable to one of its 4K inputs. In this case **s3i1.**

S3i1 - 3840 x 2160p

We will use CALICO to split these camera streams in to separate **virtual sources.**

Navigate to the Assets list and expand the Sources section. Locate source **s3i1** and use the Input Mapper button to open the mapping tool.



The tool is like the Output mapper, explained in an earlier chapter.

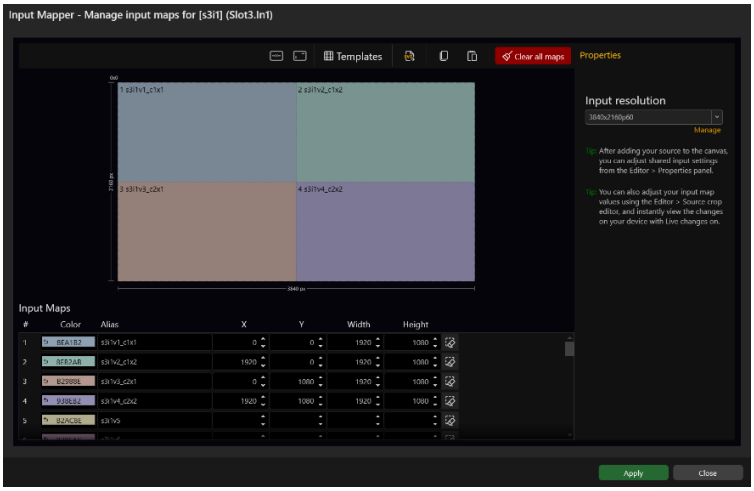
Use the tool to map the four 1080p areas using a template if available or by entering the co-ordinates and pixel values into the Input Maps list. Each area is given a separate color and is given a virtual source id.

In this example there are four virtual source id's, **s3i1v1, s3i1v2, s3i1v3 and s3i1v4**.

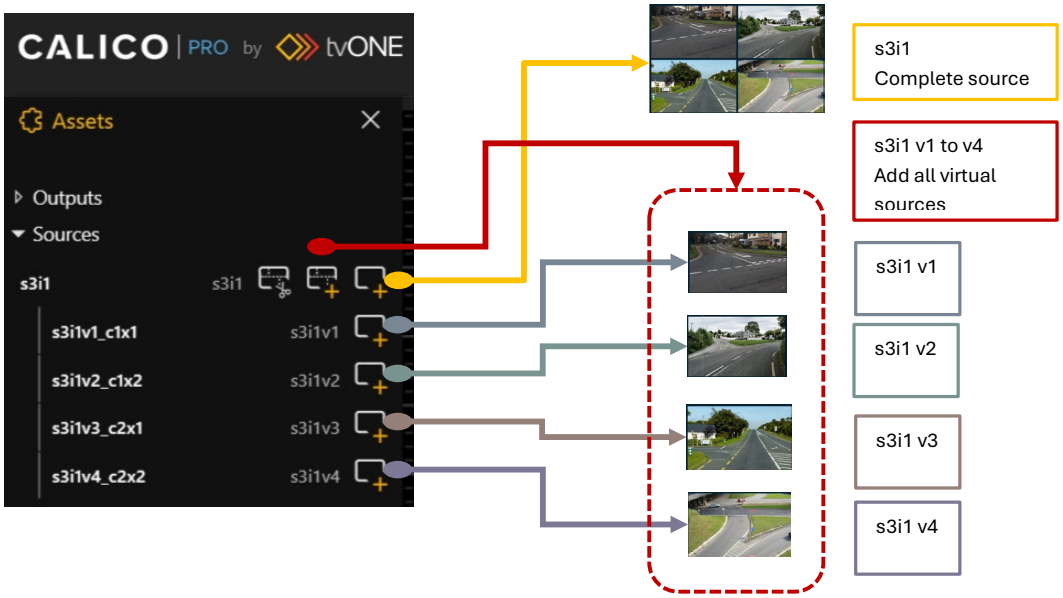
You can map each source up to 32 times, and unlike the output mapper, the input maps can overlap each other.

Use the input maps list to optionally name your virtual sources with a friendly name (**Alias**).

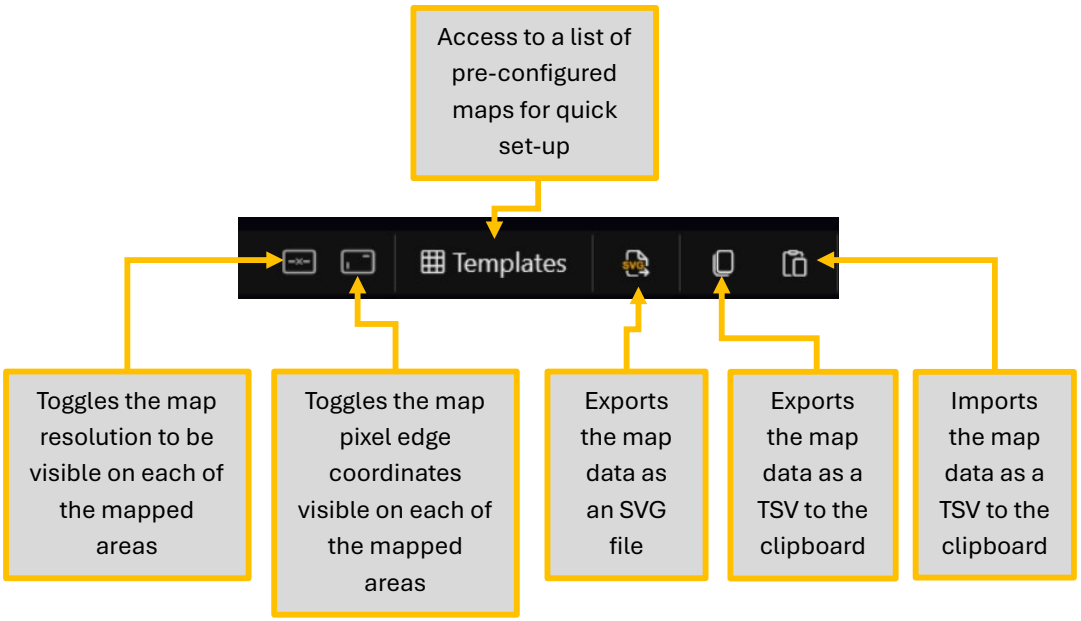
When you have finished mapping and naming your virtual sources, select **Apply** to create them.



The Assets list now shows the original source plus an extra four virtual sources, which can be individually added or added all at once to your canvases.



Other input mapping features



Example 2: Digital Signage / Public Space

In this example, a public space has three vertical columns that each have an LED wall. The venue hosts different events and requires a changing mix of content and advertising for each event. Each wall is **720 pixels wide and 3840** pixels high.

Sometimes the content needs to be delivered across all three columns, and sometimes it's completely different content on each column.

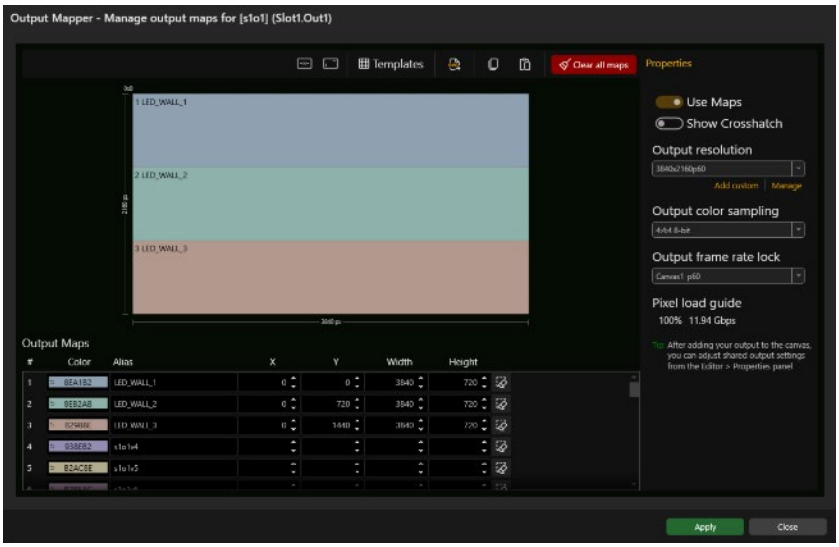
Using CALICO PRO's **output mapper** can mean that only a single LED controller is needed to run all three walls, and content creation and delivery becomes straightforward by making use of CALICO PRO's **input mapper**, making it easier and faster as well as less expensive to create.

Configuration

We will use a single 4K60 output to the dvLED controller 3840 x 2160. CALICO PRO will create the output map for the installation as below.

In this case the three LED walls are mapped rotated counterclockwise by 90 degrees.

Each map is 720 high by 3840 wide. CALICO PRO will rotate these maps on the canvas so that the content can be correctly displayed on each wall.

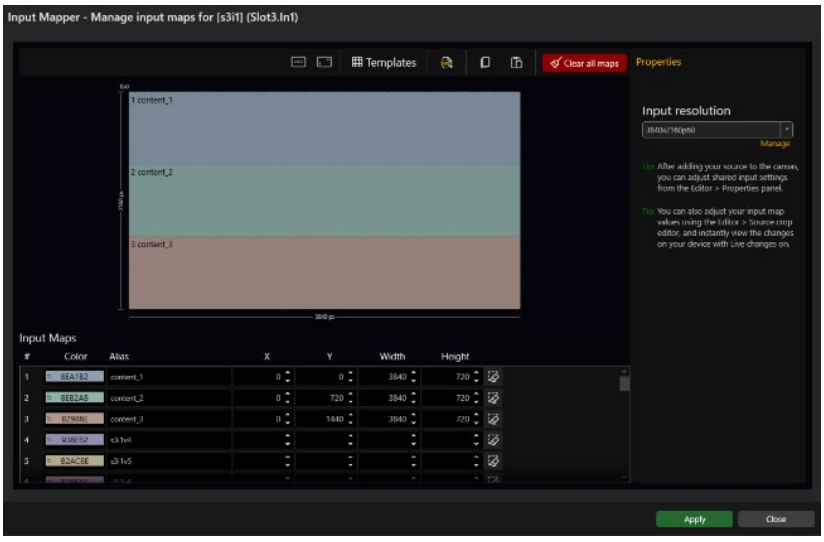


In the editor showing canvas 1 we have the three virtual outputs (mapped outputs). Any window can now be placed over any of the outputs to see on the LED screens, but in this example, we will also map the source content.

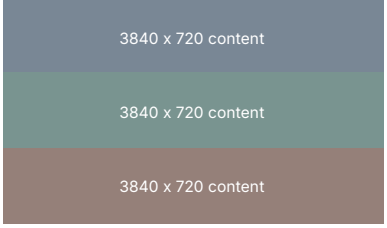
Mapping the sources

Source s3i1 has been mapped in the same way as the output. Doing this will create three windows of the correct size and aspect ratio for the walls.

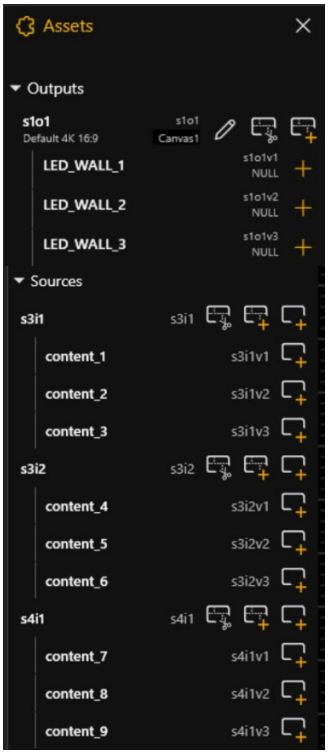
The virtual sources have been renamed content_1, 2 and 3.



3840 x 2160 content template (SVG file)



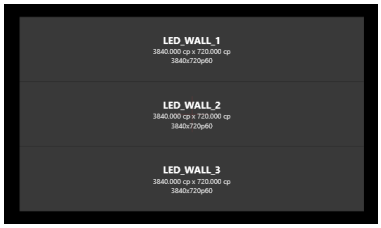
An SVG file has been exported and can be used by a content creator as a template.



Looking at the Assets panel shows we have mapped an output into three virtual outputs and three sources have also been mapped, s3i1, s3i2 and s4i1. This allows for nine virtual sources, labelled as content_1 to 9

Content can be played using a PC, media player, media server or digital signage player.

Output s1o1 virtual outputs added to the canvas

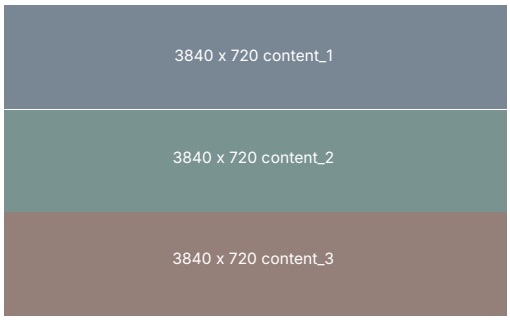


Virtual outputs correctly positioned on the canvas

Content creation

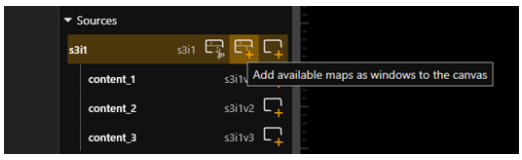
A content creator can use an exported SVG file to use as a template for content creation.

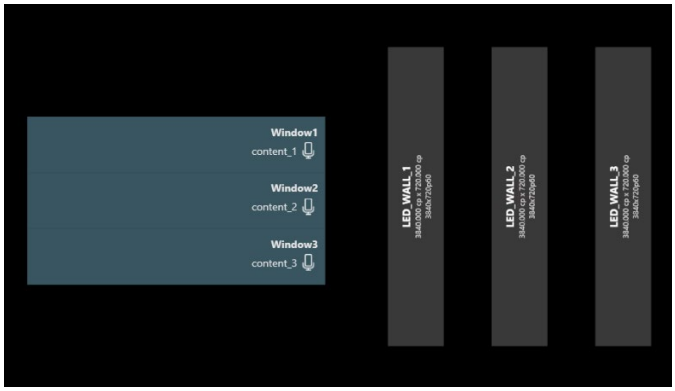
3840 x 2160 content template (SVG file)



3840 x 2160 example signage content

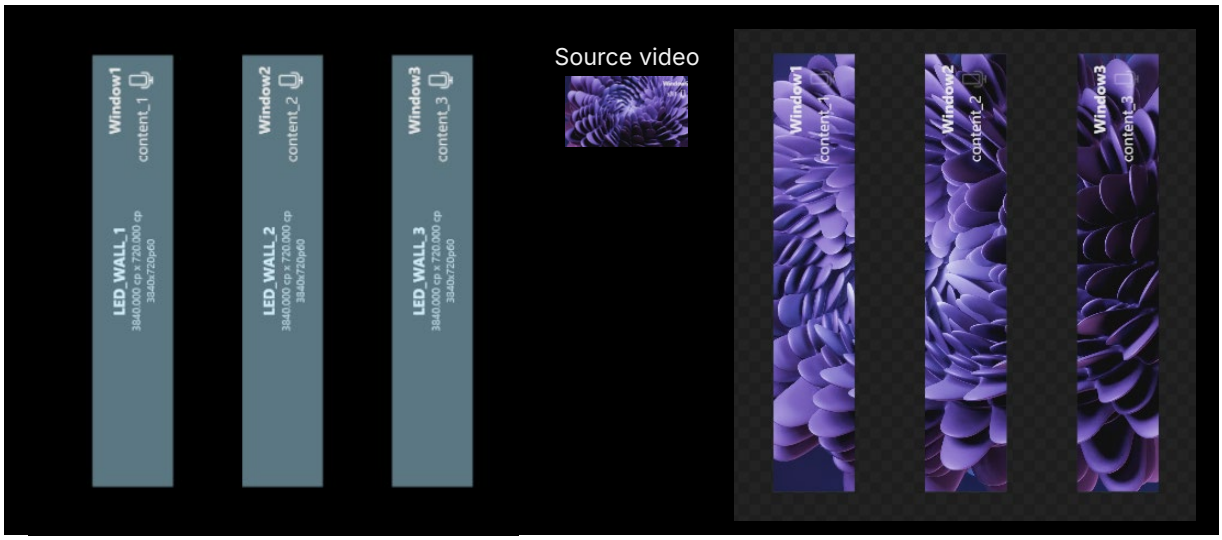
Here the virtual sources from s3i1 have been added to the CALICO canvas





And now positioned correctly on to the outputs

Use Preview to check if everything looks correct



How the content looks on the walls

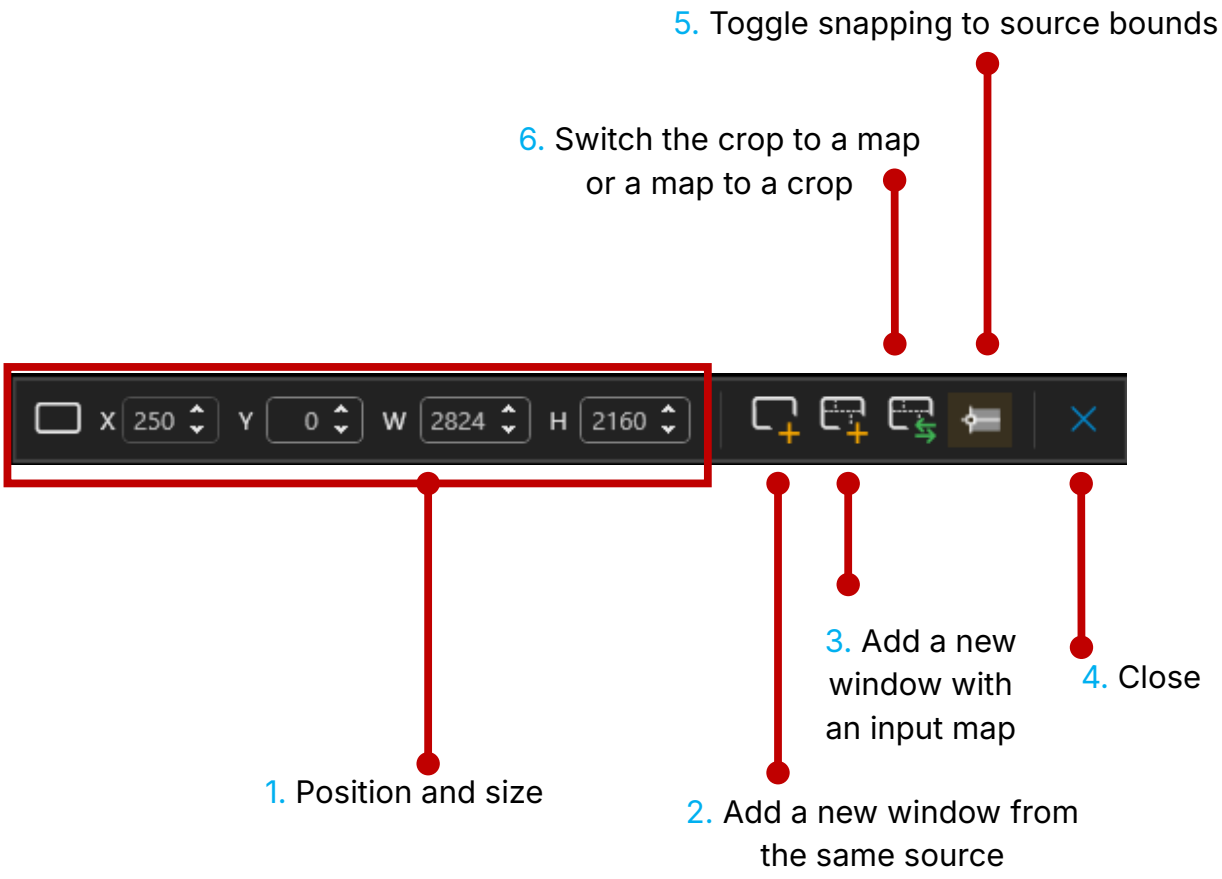
Using window source switching, any of the nine virtual inputs can be switched to any of the walls using presets.

This example shows a major benefit in using mapped inputs. There are nine virtual sources in this example that can be switched to any of the three walls using only three windows on the canvas. The sources can also be changed, so options are endless.

Source crop

Any source connected to CALICO PRO can be cropped to provide a live source for a video window. This is useful when you need to display only a section of a live input, for example the news feed of your live web page, or a ticker. Multiple crops can be taken from the same source (up to 256), which can then be used as you wish on any canvas. Crops can also be "nested," overlap each other. Once a crop is used as a source for a video window, it can be scaled and rotated as desired and used in transitions during presets.

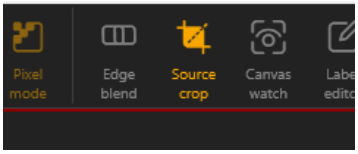
Crop tools



1. Use to accurately create the crop by x and y co-ordinates and by pixel height and width.
2. Create a new window from the windows source crop.
3. Create a new window from the windows source crop with an input map.
4. Closes the source crop editor.
5. Toggle snapping to the bounds of the source bounds.
6. Make the current crop into an input map (if available) / switch the current map into a crop.

How to use the source crop feature

1. Go to the **Assets** panel and scroll down to **Sources**.
2. Select the source to be cropped by adding a video window using the  button.
3. Click on the window on the canvas to highlight it, then go to the top menu ribbon and select the **Source crop**, or by right-clicking on the window and select **Crop**.
4. The window will now have grab handles at each corner and in the middle of each side. There is also a manual input for x and y coordinates and resolution of the crop.



5. Use either the grab handles, to quickly crop a section or input the crop values directly for more accuracy. The original source will appear as a green box and the area that will be cropped out will be highlighted.

6. Once the size of the crop is selected, it can be moved around by dragging and dropping to find the correct position. Use the mouse or keyboard arrows for finer positioning or enter the correct numbers for x and y.

7. If only a single crop is needed at this point, close the Input crop tool and the window will be cropped and can now be used as you wish. A cropped copy has been created leaving the original source intact.
8. With multiple crops from the same source, instead of using the close button, use the add window button to copy the crop to another window then move, resize that window to make a new crop. Repeat this as often as needed up to the maximum of 256 (depending on available resources)
9. Crops can be separately named and labelled (except source labels), but as multiple crops could be from the same source they do not have individual source Id's and therefore cannot be switched to another source or other crop.
10. You can easily edit a crop by selecting the window on the canvas, then clicking on the **Source crop** button in the menu ribbon, or by right-clicking on the window and selecting **Crop**. This will take you back to the original source window (green box) and you can freely edit the crop as needed. Select **Close** to exit the source crop editor. This will only affect the crop you selected and not any others that might be from the same source.
11. Cropping a source is also useful to crop mosaic content to use it separately in an installation. This is useful if you have many smaller resolutions or odd resolution content. To save on inputs and playback devices, the contents can be packed in to a single HD or 4K input. CALICO PRO can then crop each piece of the content as a separate video window, which can then be used wherever it is needed.

The below shows an example of “mosaic” content. This single 4K video is eight different pieces of content that have been stitched together. CALICO PRO can unstitch it using its cropping tool. The result will be eight different windows that can be used how you like.

If you want to use these crops multiple times or have the ability to switch the source of the cropped windows, convert these crops into maps. They will then appear as individual sources in the Assets sources list.

> **Note:**
>
> The view shown in these examples using **Show video** feature in CALCIO Studio to play the video image in the windows. If you are connected to a CALICO PRO, you will not see these videos on your outputs.
>
> To see a real image when connected to your device you need to use an output connected to a display. You can then view the crop live.

Using the source crop feature off-line

It is possible to use the crop tool to crop pre-loaded content stored within CALICO Studio.

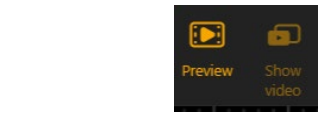
In the off-line mode, windows are automatically given a dummy source (looped video) so that previews can be viewed. This can be changed to a different video to provide a contrast between different sources.

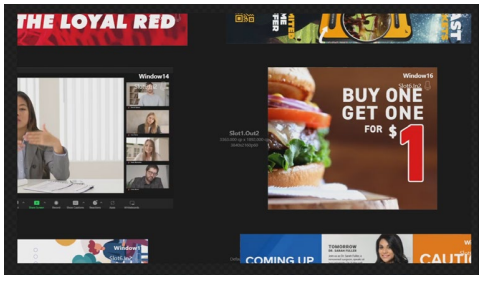
The video can be changed by selecting the window you want to change, then go to the **Properties** for that window, found on the right-hand side panel. Scroll down to **Input settings (shared)**, then find **Preview video**. You can then select a suitable video from the list. Any window added from the same source will now have the same preview video.

In **Preview** mode though only windows that are over an output on the canvas would be displayed. When cropping, it is essential to be able to see the whole of the video in the window, so that it can be cropped correctly. A feature has been added to help with this called **Show video**. This feature can be found next to the Preview button on the top menu ribbon.

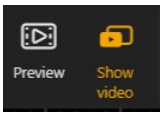
Once this feature is activated you will see the pre-loaded video content playing in all the windows visible on the canvas.

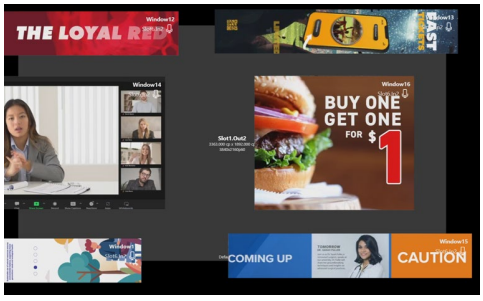
Select a window that you want to source crop, then select **Source crop** from the top menu ribbon, or right-click on the window and select **Crop**. The steps to crop the source content are now the same as if the source were a live one.





Preview shows the source that will be sent to an output





Show video shows the whole source in a window, regardless of the presence of an output

Presets

You can create and save up to 500 presets in CALICO Studio.

What is a preset?

A preset stores information about windows and labels, including positions, transitions, and effects such as borders or rotation. You can save presets and recall them later from the dashboard. Presets are canvas specific, not system specific.

What is included in a preset?

Presets store information about windows, input maps, crops and labels including:

- Source playing in the window
- Position
- Z-order / stacking order
- Size
- Rotation
- Border
- Flip
- Source change transitions
- Fade

What is not included in a preset?

- System settings
- Outputs and mapped outputs
- Canvases other than the one you are working on

For best results

To prevent your presets behaving unexpectedly, follow the advice below.

Build your busiest preset first

Build the preset with the highest number of windows / labels first. Include all the windows and labels you want to use in all your presets for the canvas you're working on. If you add windows and labels after creating some presets, it can cause unexpected behavior. The presets already created have no clue about the new assets added, which will require correction.

Don't use presets to add and remove windows or labels

If you want to remove a window from your outputs with a preset, don't delete the window.

- Move the window away from the outputs
- Reduce the physical size of the window to minimize its footprint on the canvas

- If you do delete a window from a canvas, that window is also deleted from any presets for that canvas.

In this example there are two windows from sources **s3i1 (Window1)**, and **s3i2 (Window2)**. They are placed on an output as a main image and a PiP as shown. A preset has been created with the windows in this position and has been named **Preset 1**.

The customer wants a preset to remove **Window2** and just show **Window1**. There are two examples shown that have been used by the installer to create that effect. These have been named **Preset 2**.

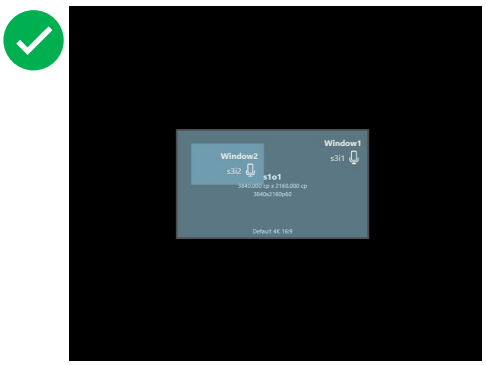
- **Example 1** – installer has deleted **Window2** and created **Preset 2**.
- **Example 2** – installer has moved **Window2** away from the output and created **Preset 2**.

Example 1 - is not correct. When the installer removes / deletes **Window 2** to create **Preset 2**, **Window 2** will be removed from the canvas and **Preset 1**. **Preset 1** and **2** are now broken.

Example 2 will work as the customer expects. **Preset 1** will show both windows and **Preset 2** will only show **Window1**. Firing **Preset 1** again will bring both windows back. Adding a transition to the preset such as a transition time, will have the effect of making **Window2** slide in and out of view during the preset, giving a professional effect.

Example 3 is another valid method, where Window2 is faded via a preset. This will also work and create a different visual effect.

Preset 1 – There are two windows



Preset 2 – Window2 was removed

Example 1

Preset 2 – Window2 has been moved

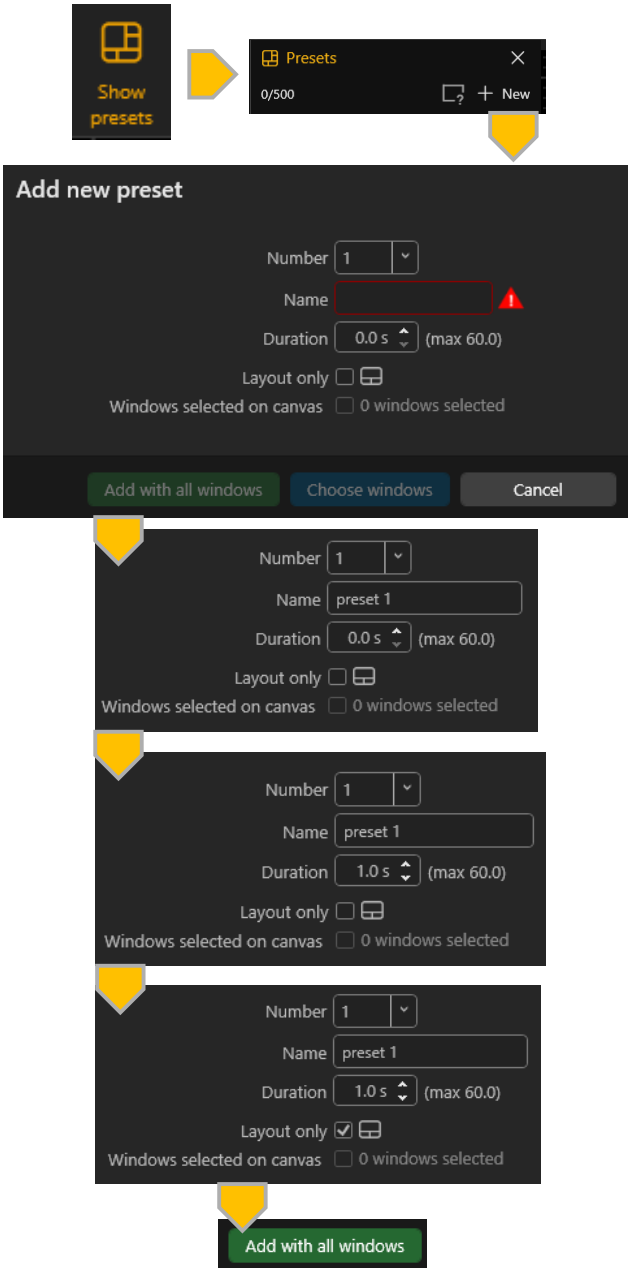
Example 2

Preset 2 – Window2 has been faded

Example 3

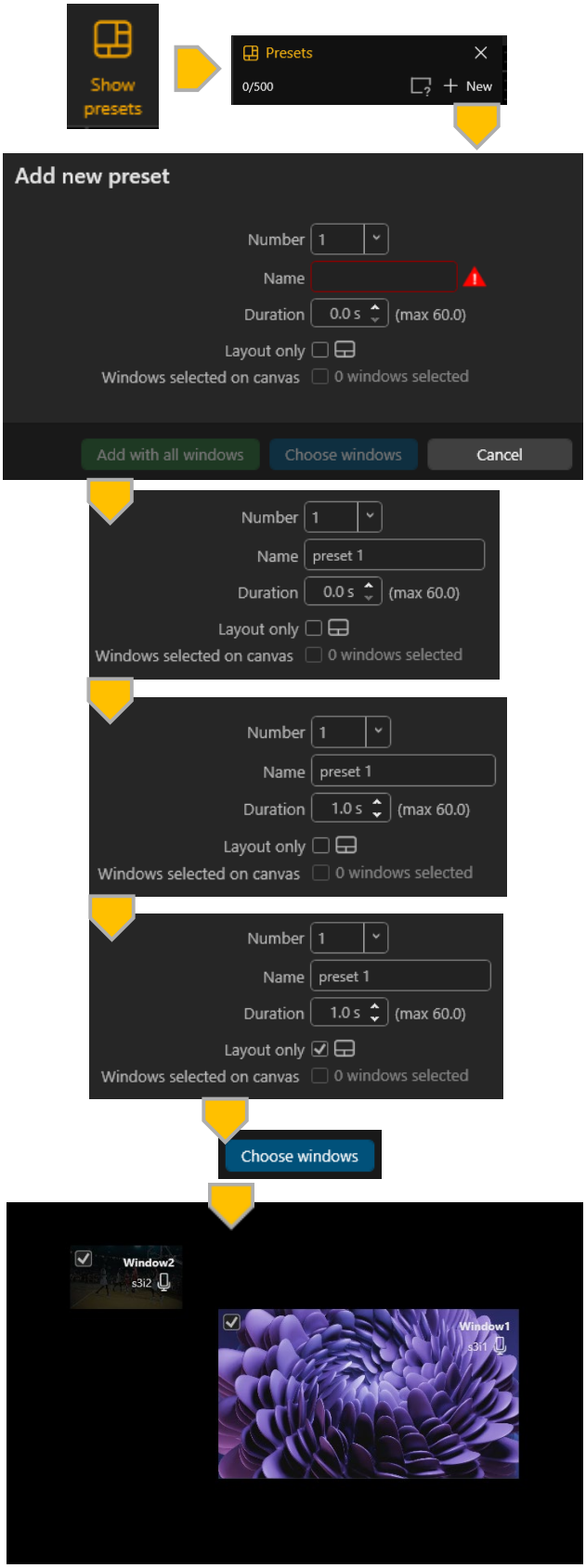
Creating a new preset with all windows on a canvas

1. In **Editor**, create an installation on one canvas and then select
2. **Show Presets** from the top menu ribbon
3. Select **+ New**
4. Select the preset **number** or leave this and it will automatically select the lowest available one.
5. Enter a **Name** for your preset – names can be up to 19 characters long
6. Enter a **Duration** for your preset (maximum time is 60 seconds) – The duration is the time taken to transition the preset.
7. Select **Layout only** to create a preset that will not change any selected window sources but can move and scale the windows around – If this is unchecked then the preset will switch the window sources to the source it was set to when it was created. Leave it unchecked if you want to create a preset with a known fixed condition, for example, reset everything to a standard state before the day starts.
8. Select **Add with all windows**



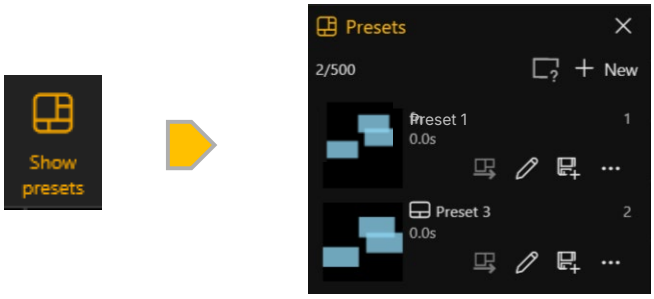
Creating a new preset and choosing which windows to include

1. In **Editor**, create an installation on one canvas and then select **Show Presets** from the top menu ribbon.
2. Select **+ New**
3. Select the preset **number** or leave this and it will automatically select the lowest available one.
4. Enter a **Name** for your preset – names can be up to 19 characters long.
5. Enter a **Duration** for your preset (maximum time is 60 seconds) – The duration is the time taken to transition the preset.
6. Select **Layout only** to create a preset that will not change any selected window sources but can move and scale the windows around – If this is unchecked then the preset will switch the window sources to the source it was set to when it was created. Leave it unchecked if you want to create a preset with a known fixed condition, for example, reset everything to a standard state before the day starts.
7. Select **Choose windows**
8. Check the tick box in the upper left corner of the windows that you want to include in this preset. Leave unchecked those that you do not want to be affected by this preset.
9. You can check the windows directly on the canvas or from the Items list on the right-hand side. This is the easier method as it will be difficult to select the correct windows if there are lots on the canvas, especially if they overlap.
10. Hovering over the items list will also highlight the window on the canvas.
11. When you have finished selecting the windows select **Save** and then **Close** to leave the editor.



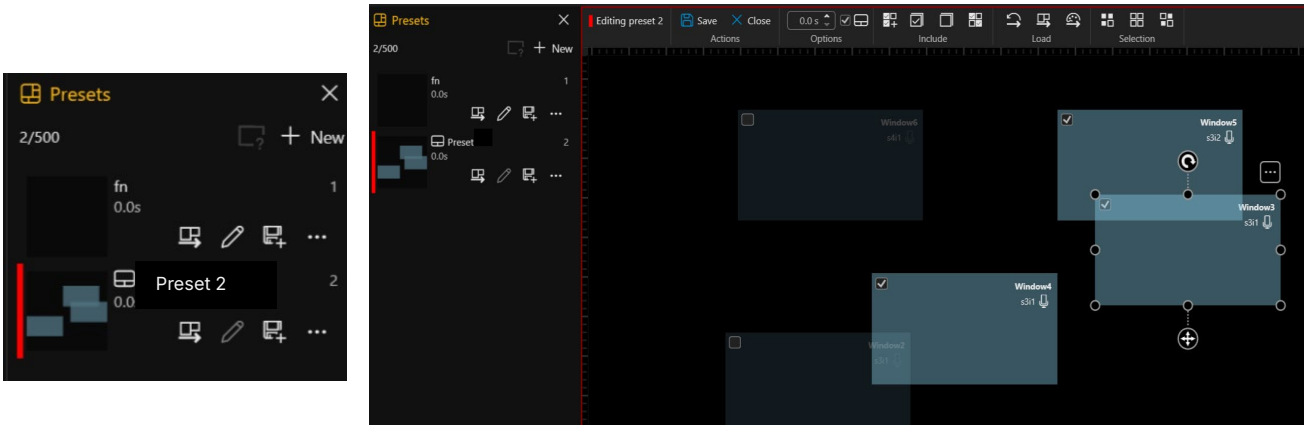
Saved presets

Presets that have been saved appear in the presets panel on the left side when you select **Show presets** from the top menu ribbon.



Edit a saved preset using the preset editor

1. In **Editor**, select **Show Presets** from the top menu ribbon
2. From the **Presets** panel, find the preset that you want to edit and select the 
3. A red bar indicates the preset that is being edited



4. **Preset 2** can now be edited – use the preset toolbar to help you.
5. Select or clear windows that you want to be included.
6. Change windows, for example positions, sources, and rotation.
7. When you have finished editing, select **Save** and then **Close** to leave the editor.

Quick edit, overwrite, cloning, and deleting presets

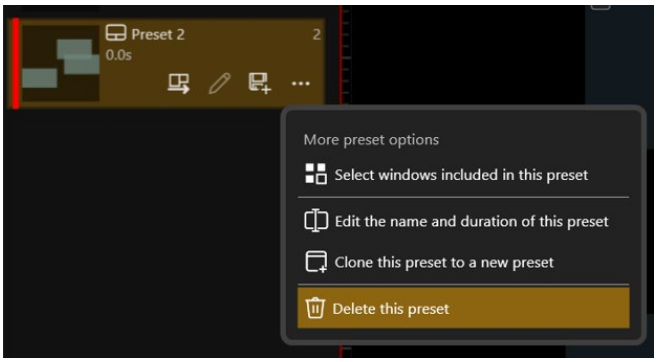
You can change the name and duration of a preset or overwrite a preset with a new configuration.

To quickly change a preset

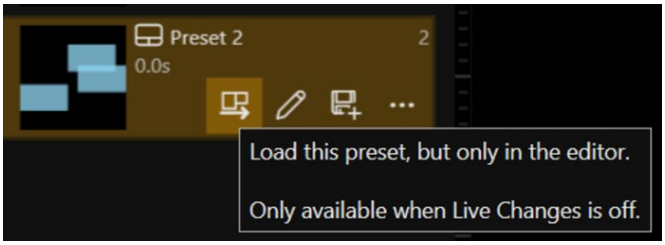
1. Select Show presets
2. In Presets find the preset you want to edit, then select more options

You can quickly edit:

- What windows are selected
- The preset name and duration
- You can clone the preset
- You can delete the preset



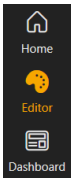
To quickly load a preset into the editor only



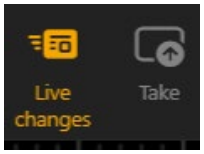
Loading a preset

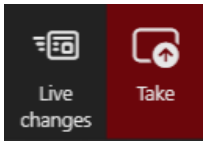
If you have saved one or more presets in CALICO Studio, you can choose a preset to load.

You can load presets in the **Editor** or from the **Dashboard**.

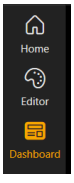


1. In Editor Select **Show presets.**
2. In **Presets** find the preset you want to load.
3. Click on the preset thumbnail to load.





From the dashboard



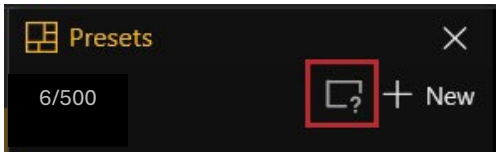
1. Select Dashboard
2. Select a Preset

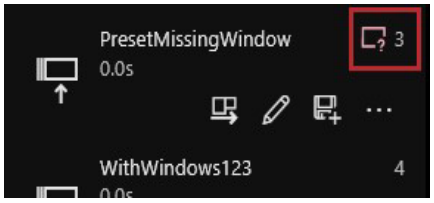
Adding new windows to a canvas with existing presets

If you are adding new windows after you have created presets, then existing presets will not know about the new windows. When you load a preset, these windows will not update. If this is undesirable behavior, you can include them in your presets.

You can use the preset window analyzer to help identify presets and windows that need your attention.

1. In Editor, select Show presets.
2. In Presets, select to enable or disable the analyzer.
3. Enable the analyzer.
4. Check each canvas for
5. If you have windows missing from presets, then a dialog will give you instructions on what you can do to identify presets and windows to indicate what needs your attention.





You can disable the preset window analyzer when you have finished. The analyzer is also disabled every time you load or read a device config.

Manually updating presets with the new windows

1. In Editor, select Show presets
2. In Presets, select to enable the analyzer
3. In Presets, choose a preset to update by looking for
4. Select to edit the preset. This will load the preset into the preset editor without changing the currently loaded preset on your device.
5. Include and reposition your windows if required
6. Select Save from the preset editor toolbar

Bulk updating presets

1. In Editor, select Show presets
2. In Presets, select to enable the analyzer
3. Select to bulk update all missing windows

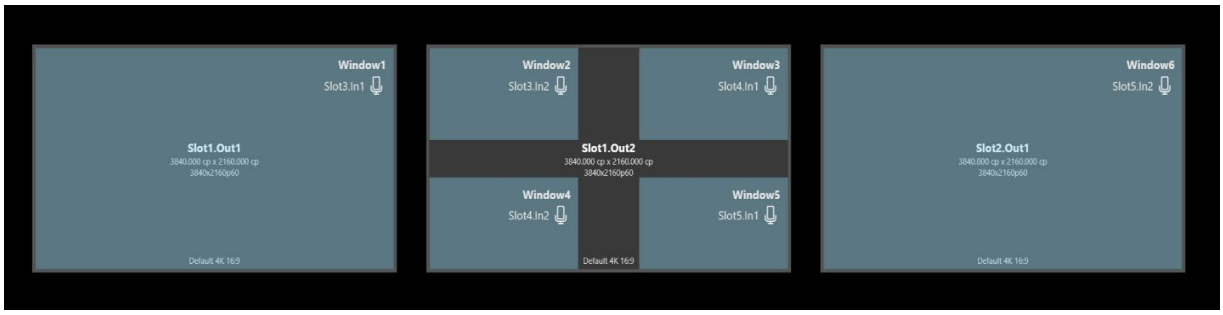
> **Note:**
> Do not bulk update presets if you are deliberately using selected windows in your presets.

Show me some preset scenarios

You can use presets to create installations for various scenarios, from simple to sophisticated. Using the presets correctly can dramatically reduce the number you will need to achieve your desired results.

All the windows presets

All the windows presets are great for resetting the canvas to a known state, for example at the start of the day, event, or meeting. You can put all the windows and source selections back to something you know is good to use.



Layout only presets

Presets can be created that do not change the source selection of windows. This can be used when you want to change the layout of the windows but keep your window sources as you have set them.

Selected window presets

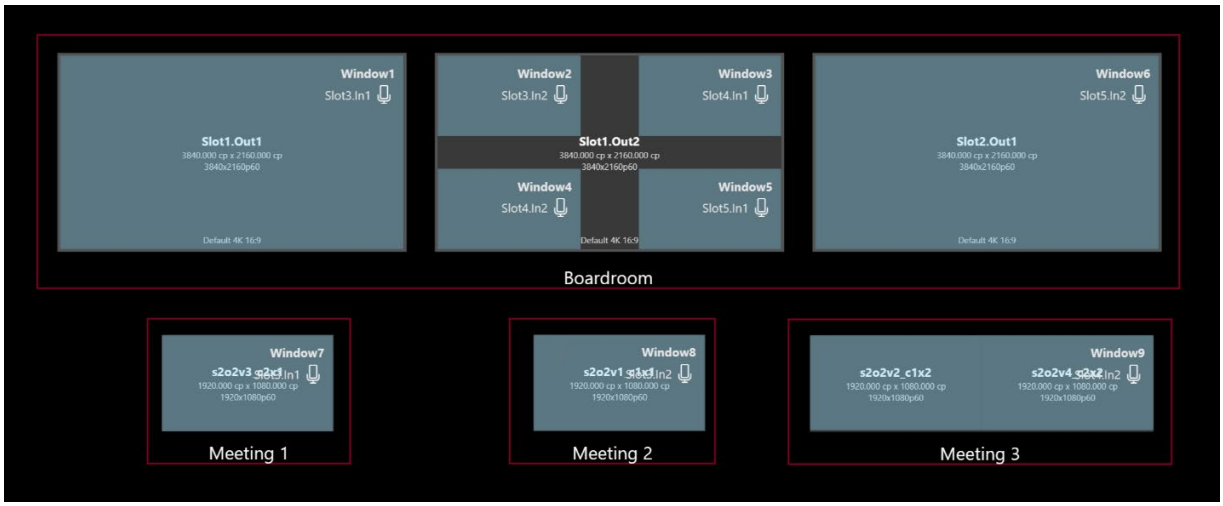
You can control different groups of windows in your installation on the same canvas, for example you have a main presenter display and two side displays, you can create presets that only change the windows you want.

Zone your canvas

If using different canvases is not possible then you can extend the concept of controlling different areas to zoning your canvas.

Make use of Markers to create zoning labels.

Space is important



The zones are positioned too closely together, leaving minimal space to move windows during any preset transitions. This layout might be more suitable for a canvas watch setup. However, you can use output maps to merge distant zones back into a single output.

A better layout for presets as there is more room between zones

Recommendations when naming presets

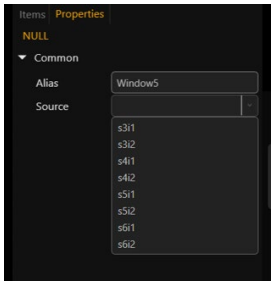
- Create prefixes for the different zones, for example Meeting_1_ and Meeting_2_.
- Prefix your displays with the same zone as your presets to help organize the canvas, for example Meeting_ 3_LED_1.
- Have a 'reset all' preset that puts the whole canvas back to a known good state, for example 'Default Start Up'.
- Have a 'reset zone' preset for example Meeting_1_Reset or Meeting_1_Default.
- Leave enough space between the zones for window transitions on and off the displays.
- Third-party controllers can use the prefix to filter by zone, so you only see the presets you are interested in.

Changing the source playing in a window

You can choose which source plays in any window in CALICO Studio.

Changing the source in CALICO Studio from the Properties panel

Assuming you already have a layout with windows on your canvas:



1. From **Editor,** select any window whose source you want to change.
2. Go to its **Properties** using the panel on the right side.
3. Choose a new window source from the dropdown list.

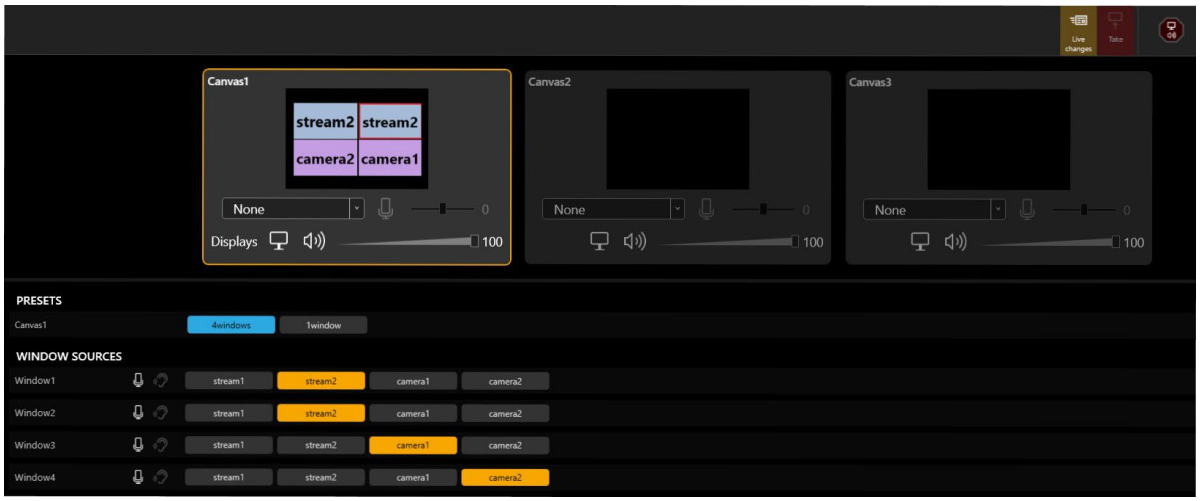
Changing the source in CALICO Studio from the window

1. From **Editor,** select any window whose source you want to change.
2. Select ••• then select a new source from the dropdown list.

Changing the source using the dashboard

You can change the source playing in any window from the dashboard in CALICO Studio

From Dashboard find a window that you want to change and select a source.



Useful information:

You can change the window source for specific windows from CALICO Studio or with a third-party controller using the API

Keying

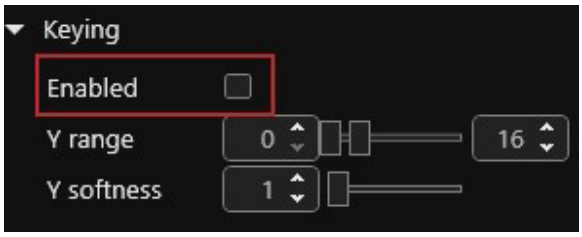
CALICO PRO supports luminance keying on all outputs. Keying makes parts of a window or label become transparent in real time.

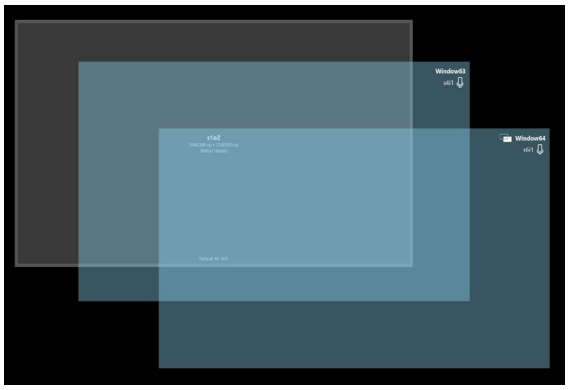
What is luminance keying?

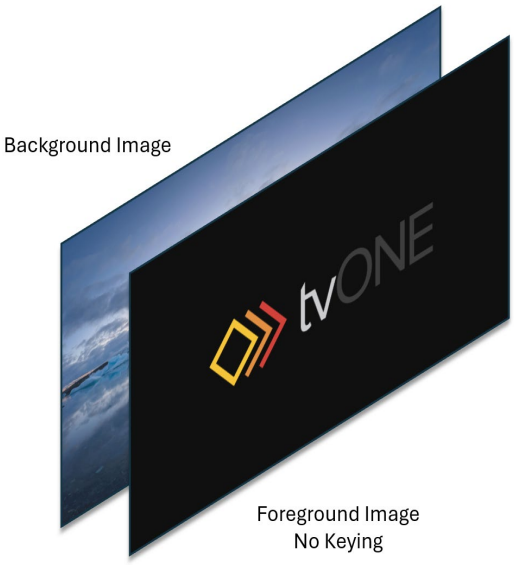
Luminance keying determines background objects from foreground objects by the difference in the luminance (brightness) levels.

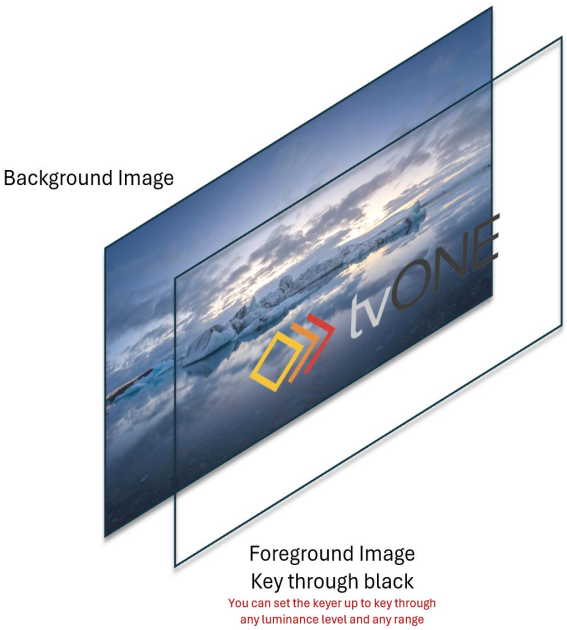
How to enable keying on a window?

1. From **Editor**, select the window you want to enable keying on
2. From the window **Properties** panel, open **Keying** then check the **Enable** box
3. The symbol  will be shown in the top right corner of a window that has keying enabled.

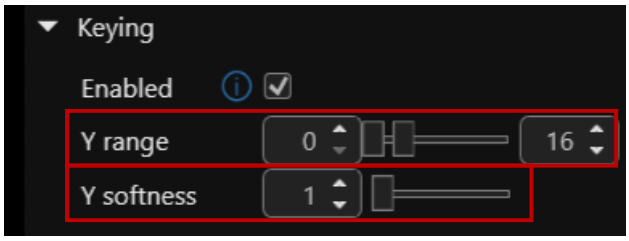








4. Set the luminance **Y range** that you want to key out.
   a. If keying through black set up the lower slider to zero and increase the upper one until the black area in your content is keyed out. If you are unsure, then set to 16.
   b. If keying through white set up the upper slider to 255 and increase the lower one until the white area in your content is keyed out. If you are unsure, then set to 240.
   c. Set the slider range to key out other ranges for different effects.
5. If you get aliasing around the edges of the key use the luminance **Y softness** control to blur the edges and improve. The higher the number, the stronger the blur.



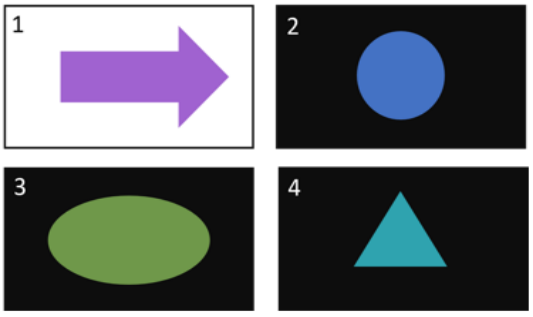
Notes:

- Keyed windows may use more bandwidth that windows that are not keyed.
- Sources that have very thin lines may show scaling artifacts at certain window sizes. Try adjusting the window size a little
- Window borders can be used on keyed windows, but will not be keyed themselves

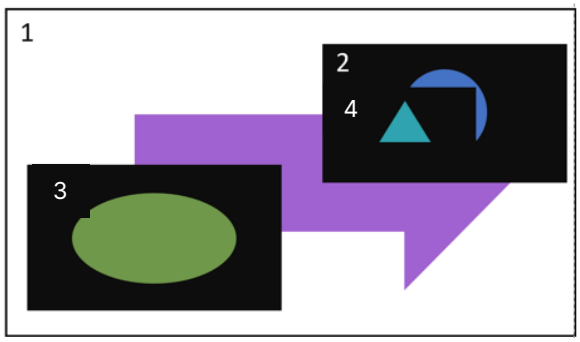
Why are my overlapping windows and labels not keying how I expected?

Window keying is only between two layers, which may include windows, labels or the black background of the canvas. If your keyed windows overlap, then you may get undesirable results.

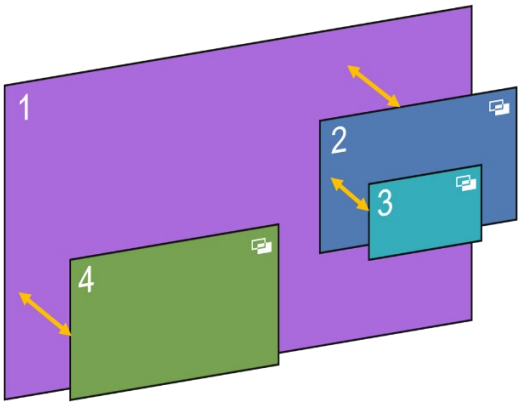
Here is an example of what you might see. **Window 1** is the background, **Windows 2 and 3** are overlapping keyed windows, and **Window 4** does not overlap other keyed windows.

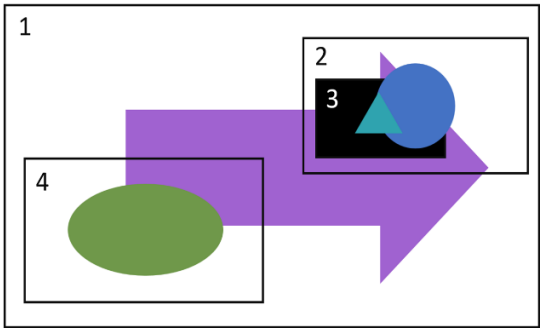


Sources of the windows



Output with all window keying turned off





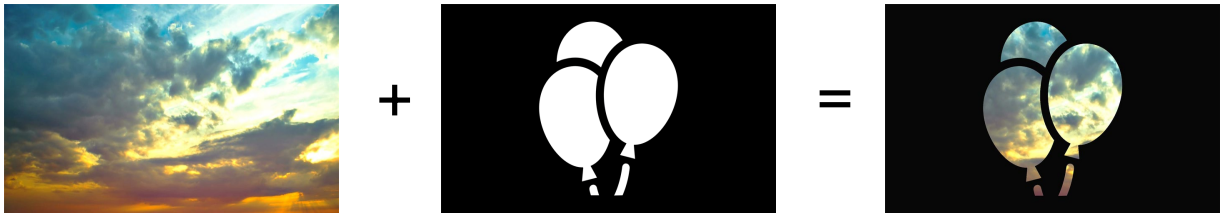
In this example, **Window 2** and **Window 4** key through black to show **Window 1**

Overlapped keyed **Windows 2 and 3** show black areas of **Window 2** instead of showing **Window 1**

Show me some examples of keying

White logo keyed using black to remove the background

Cut out keyed through white



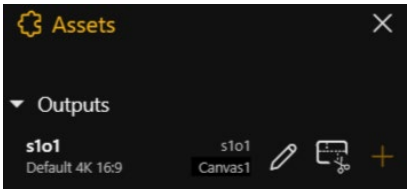
Canvas watch

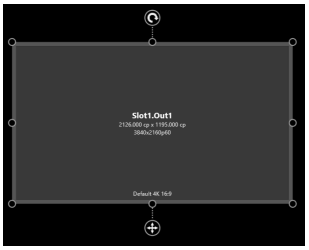
Canvas watch is a feature that allows a special type of output that “watches” and area of a canvas that you have chosen.

- This could be an entire video wall set up or even the whole canvas if needed.
- Any available output including mapped outputs can be used as canvas watchers.
- Canvas watch can be used for monitoring purposes, as a multiviewer or for program and preview use.
- ANY available output, including mapped outputs can be used as canvas watchers.

Set up an output to use as a canvas watcher

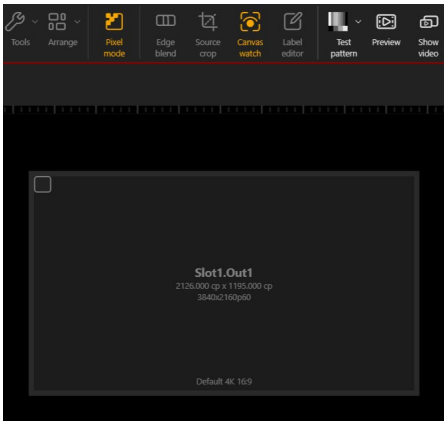
1. Open the Assets panel and choose an available output. (You can configure it by assigning equipment to match the display you are using for monitoring).
2. Add the output to your canvas.
3. Select the display on the canvas by left clicking.

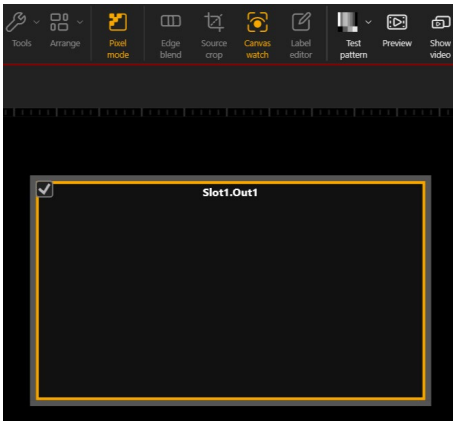




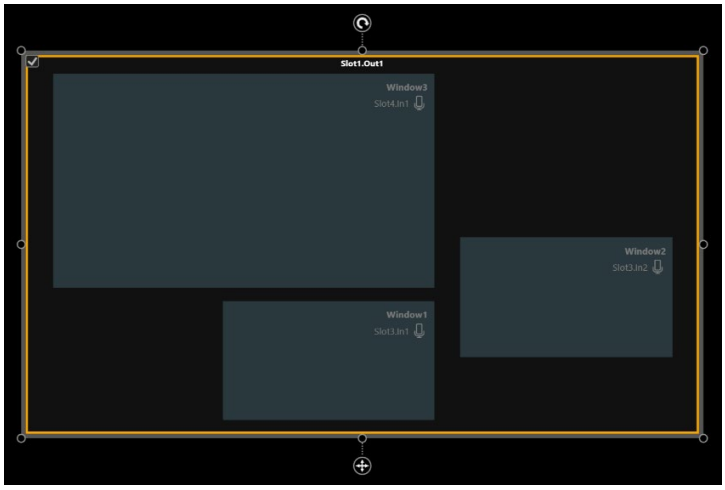
4. Select Canvas watch from the top menu ribbon. This will open the canvas watch editor.
5. The output will grey out and a check box will appear in the top left-hand corner.

(This will happen with every output and virtual output on the canvas. You can select one or multiple outputs to be canvas watchers)

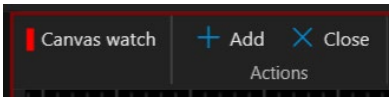


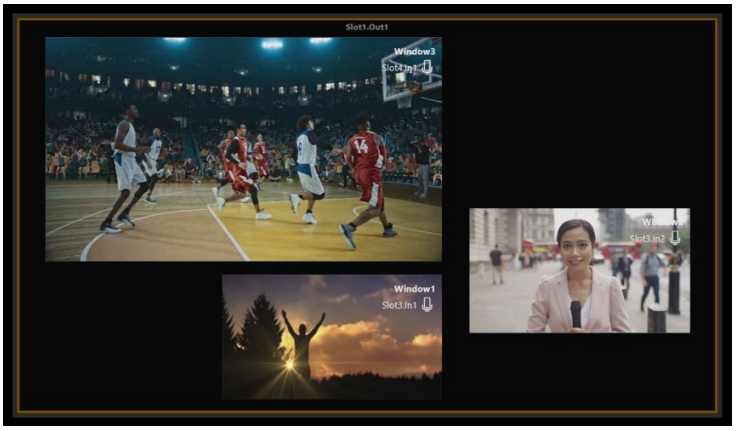


7. Tick the check box. The display will change to a yellow bordered box.
8. Select the box and position, scale and rotate to a canvas area that you wish to watch.



9. Select Close from the menu in the canvas watch editor when you have placed your canvas watchers in the correct positions.
10. This will exit the editor and lock the canvas watchers on the canvas to prevent accidental selection and movement.





11. You can edit the watchers by accessing the Canvas watch editor, then select the watcher you want to edit.

In off-line mode, you can preview the canvas watch by selecting the Show video button from the top menu ribbon. Pre canned video clips will then play in the windows that are visible in the canvas watch box. Each source can have its own video as shown in the example.

This view is exactly what your canvas watch display will see when the installation is all running.

You can set up as many canvas watchers as you wish and have available outputs for.

Set up an output to use as a canvas watcher for multiple areas

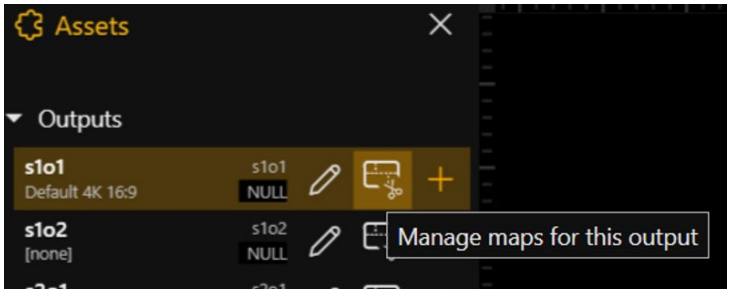
The earlier example showed how a canvas watcher can be set up to watch an area of the canvas, but what if you want to monitor several areas across the same, or even all 4 canvases?

Combining **Canvas watch** with **Output mapper**, can solve this dilemma.

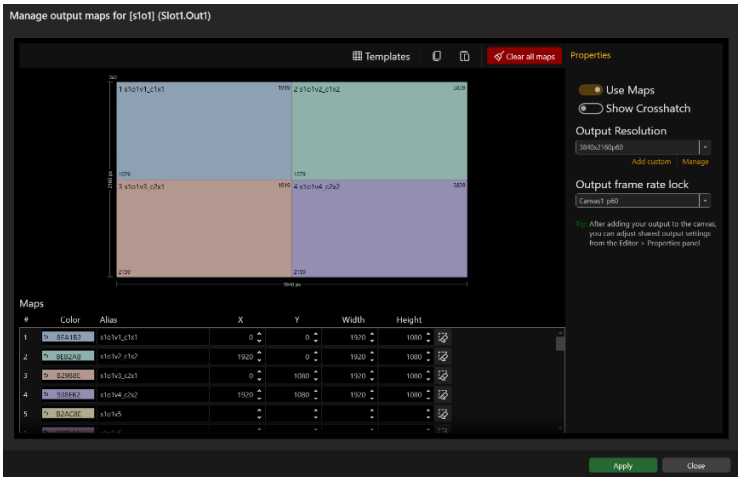
For example, using the output mapping feature, map a 4K output into four 1080p quads. This will give you four separate canvas watch virtual outputs (1920 x 1080), that can be used on any canvas and at any scale or position. These virtual outputs are then re-packaged and delivered to a connected display at a supported resolution.

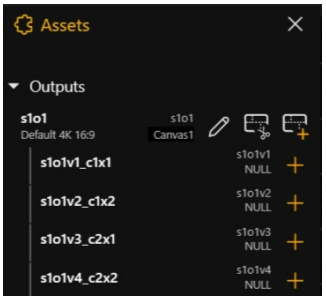
One 4K display could then be used to monitor or watch four different areas of your set up in a quad split screen all in 1080p. Monitor four different scenarios, even split between all four different canvases. Up to 32 mapped sections can be used for a single output.

To set this up, follow the steps to add a canvas watcher as in the earlier example, but instead of adding a whole output to the canvas, first access its output mapper.



Refer to the Output mapper section, then map this output to have four 1080p maps as shown below.

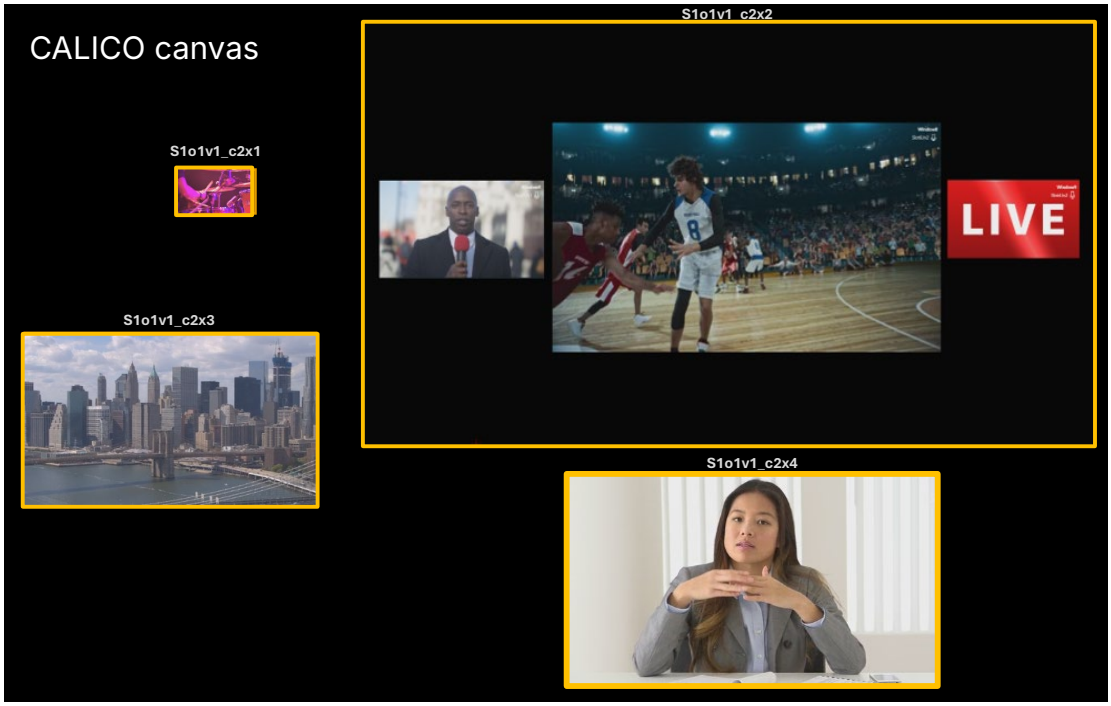




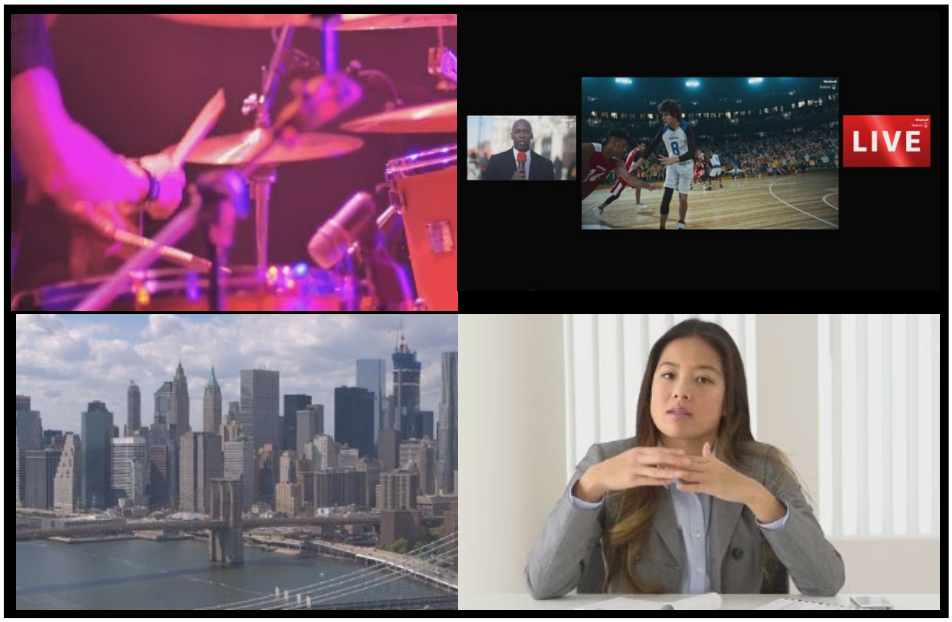
There are now four virtual outputs that can be used as canvas watchers. You can map up to 32 times for a single physical output.

Example of how this feature might be used

This example shows all four canvas watchers looking at different views in a broadcast Studio.



View at the output connected to a 4K monitor.



CALICO has mapped the output, scaled and re-sized the content to match.

Labelling

CALICO PRO can create four different types of labels, which can be used for many applications. Any window, display or layout can have multiple labels **parented** to it.

1. **Text labels** – create a text label and change its font, font color and background color, as well as being able to add a border
2. **Source labels** – apply a text label that changes to reflect the selected source
3. **Image labels** – use an image from the on-board image store and apply as a label. This could also be a background for a video window (up to 4096 x 2160 resolution)
4. **Live sources as labels** – this is usually a crop of a source and is applied as a label to fix its position, move and scale it with an item it is parented to.

Labels can be rotated, scaled, and parented to any other canvas item such as a video window, window crop, outputs, including mapped outputs and canvas layouts.

Multiple text, image and live source labels can be used together, but only one source label can be used for each source.

Labels can be keyed by using the luminance keying feature.

Labels can also fade to black or have transparency applied, in the same way as video windows.

Labels can be created and saved to the image store to be used later or can be created and used at once.

Label editor

The label editor is used to apply, create and add labels. Labels can only be added to the canvas when you are in the label editor.

1. In the canvas **Editor** go to the top menu bar and click **Label editor.**

Any labels created here will be added to the internal storage and will appear on the Assets list.

Useful information:

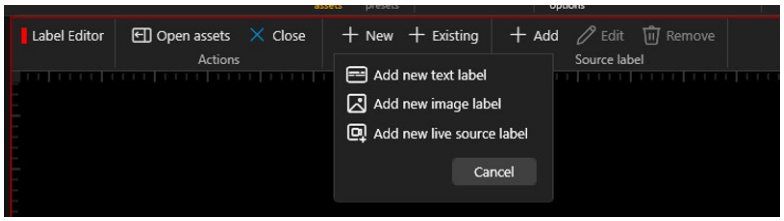
CALICO PRO has an internal storage area which is 3GB (three giga-bytes) in size. This is where any labels, background images are stored. When you first configure a system, this store will be empty. When you create any labels, they appear in this store and can be accessed and applied to a configuration.

Images uploaded to the store will not appear in the labels list unless you have used them to create a label.

Note:

If the label editor is used to edit an already used label CALICO Studio will show a warning message. If the label has already been used, then all copies of that label will also be changed.

In the label editor, the following menu is displayed



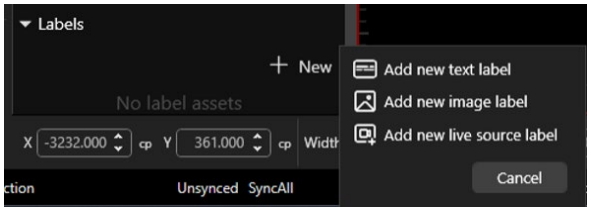
2. Click on the **+ New** button to create a label. If a source label is needed, click on the **+ Add** button in the source label section of the menu. Only one source label can be added per source, but multiple text, image and live source labels can be added.

Image labels can be added from here, provided that:

- Suitable images have been uploaded to use as labels
- You upload a suitable image when prompted during the label creation process

Create a label from the Assets panel

1. Click on the **+ New** button to create and add a new label.



Text labels

These are fixed text labels and can be used as on-screen visual elements, or as off-screen elements to be used in canvas watch.

When creating a text label, the following settings can be used

- Label name – How the label appears in the storage area list
- Label text – what the label will say
- Text and background color – Change the color of the label text and its background
- Font – Apply a stored font to the label
- Size – Font size of the text
- Alignment – positioning of the text within its box
- Auto – This auto sizes the text box to fit the text typed in.

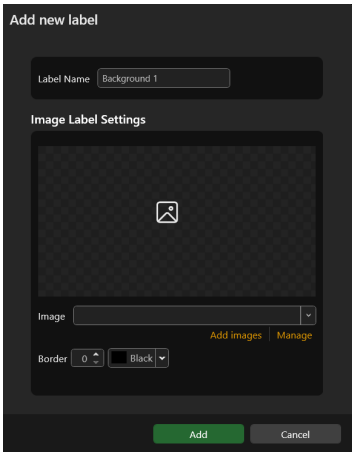
- Size – Physical dimensions of the text box. Only available if auto is unchecked
- Margin – Padding area between the text and the inside of the text box
- Border – Will the text box have a border, how much weight does it have and what color will it be

After creating the label click **Add** to apply it to the canvas and add it to the internal storage.

Creating image labels

These are fixed image labels and can be used as on-screen visual elements such as background images and keys, or as off-screen elements to be used in canvas watch, for example warning symbols.

When creating an image label, the following settings can be used:

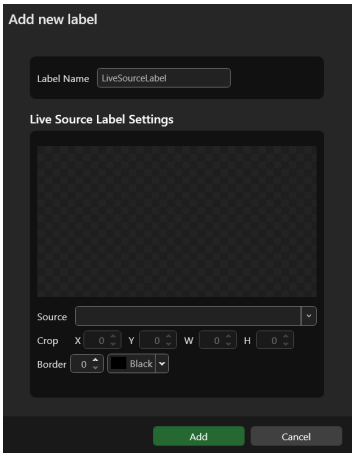


- Label name – Name used to identify a label in the Assets list.
- Image – Dropdown to access images stored on the device or upload new images
- Border – Does the image have a border and if so, what is its weight and color.

Creating live source labels

These are source windows that are parented to another source window. The benefit of them being created as a label is that they can move, scale, transition with their parent window. This feature is especially good for tickers and live crops from sources such as a PC showing a company website for example. A scrolling product or news feed from a website. An on-screen scoreboard or news feed.

When creating a live source label, the following settings can be used:

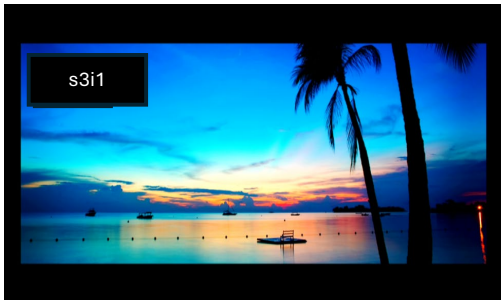


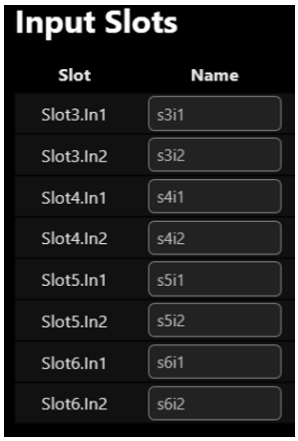
- Label name – Name used to identify a label in the Assets list.
- Source – Which source will be used for the label
- Crop – Crop out a section of a live source to use as a label
- Border - Does the live source need a border and if so, what is its weight and color.

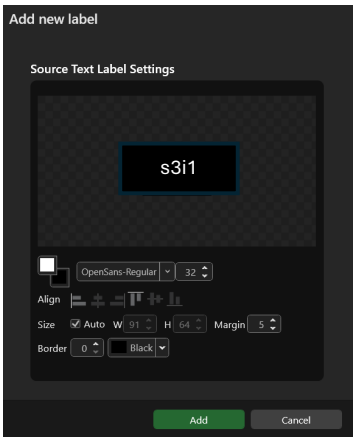
Creating source text labels

These are text labels that will change to show a source alias name when source of a window is changed. The default is the input slot number, but this can be changed to a more practical name by clicking on **Settings** then **Slot status**.

The source text label is like a regular text label in the way it is set up. The difference being that this label is dynamic.







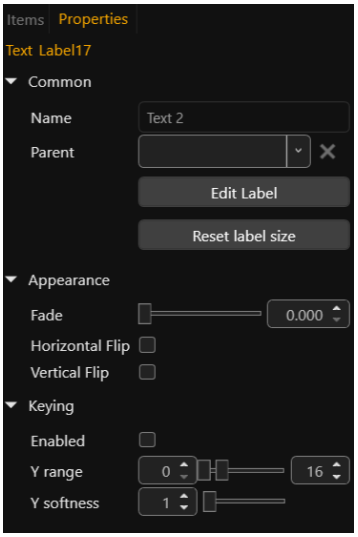
Label properties

Selecting any label on the canvas will access its **Properties**. This will open on the right-hand side of the editor. You can also double click on the label in the **Items** list.

There are several other label settings that can be changed as label properties.

The settings that can be changed here are:

- Parent – Set a parent element for the label or change its current parent.
- Edit Label – Returns to the label editor for this label.
- Reset label size – Returns the label to the size it was when it was created.
- Fade – Set the brightness of the label or make it transparent if the keyer is active
- Horizontal flip – Flip the label horizontally 180 degrees.
- Vertical flip – Flip the label vertically 180 degrees
- Keying enabled – Switch the keyer on or off for this label
- Y range – Sets the luminance range that will be keyed out.
- Y softness – Anti-aliasing



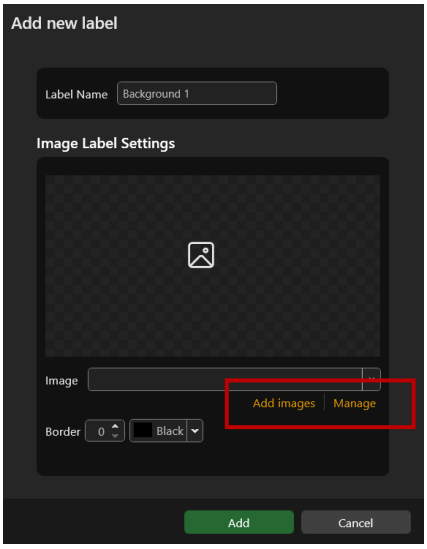
Internal Image and label Store

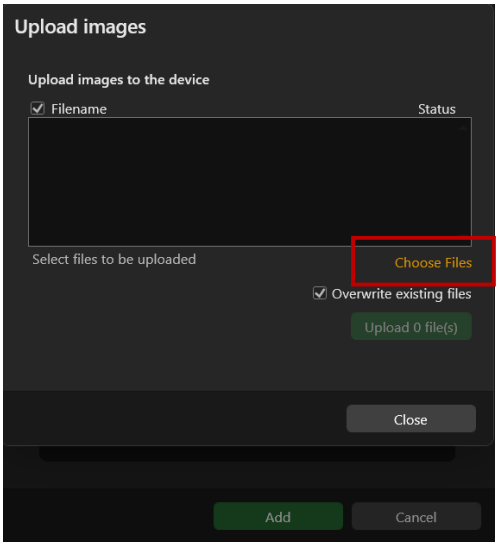
CALICO PRO has 3GB of memory available to store images, backgrounds, and labels. Images can be uploaded to CALICO PRO remotely using CALICO Studio, using the labelling feature. Created text labels are also stored here.

Access to the images and labels stored here is via the Assets panel or the label editor. When uploading files to CALICO PRO, CALICO Studio sets up a secure FTP connection.

How do you upload images into CALICO?

Access the label editor or Assets panel and add a new image label. Under the **Image** dropdown field find the two links **Add images** and **Manage**





Manage is used to access the on-board storage file browser and remove any images that are no longer used and take up space on the drive.

1. To add images to the internal storage drive, click on **Add images**
2. In the **Upload** images window, click **Choose files.** This will take you to the file explorer of your PC.
3. Search for the files you want to upload. The selected files will appear in the list of images.
4. Choose the files to upload from the list by clicking on the file's checkbox
5. Choose to tick check box if you want to automatically **Overwrite existing files** with the same filename
6. After selecting all the files to upload, press the Upload files (green) button. The files will now be transferred to your CALICO PRO.
7. The admin password will need to be typed in again before the files can be uploaded.

Firmware Update

CALICO PRO's firmware can easily be updated in the field using CALICO Studio.

Firmware updates may be necessary to allow added features or options to be used, or for the purpose of fixing a reported bug.

New firmware for your CALICO PRO can be downloaded from the tvONE support website, help.tvone.com/tech-support/firmware

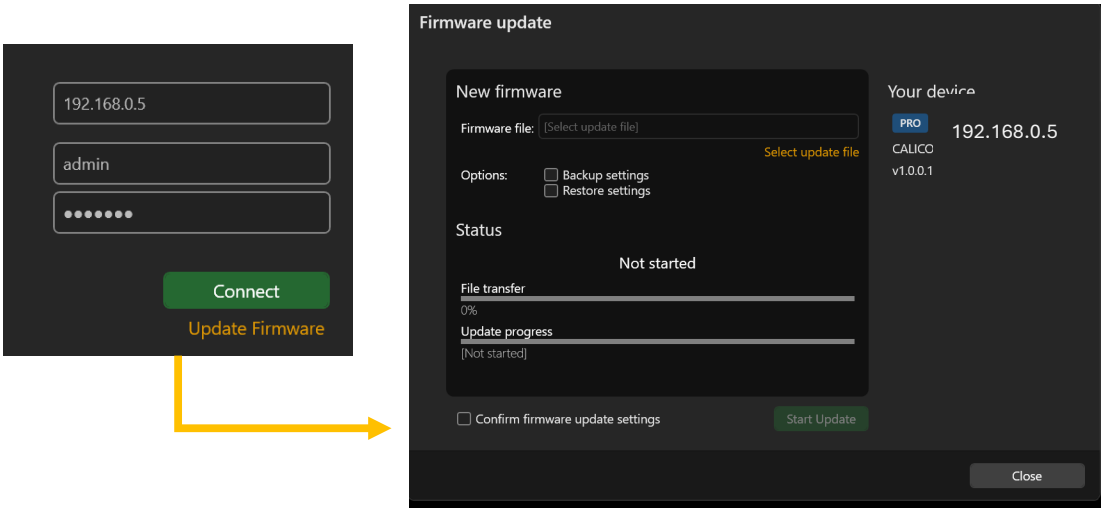
Select your specific model carefully so that the correct firmware can be downloaded. The download will be in the form of a .zip file.

To install the new firmware:

1. Open CALICO Studio and select **Connect to your device**.
2. Locate your device on the network using its name and/or IP address. Verify at this stage that the already installed firmware is not the same one as you are trying to upload.
3. Once the correct CALICO PRO is found and you have decided that a firmware update is needed, enter the administrator username and password.
4. Select the **Update Firmware** button.
5. Follow the prompts to find the new firmware .zip file, select the backup and restore options. If all is set correctly check **Confirm firmware update settings**, then select **Start Update**.

The update will take few minutes to complete.

> **Note:**
> Ideally, this should be done when the system is not being used as the unit will re-boot after the update to complete it.



Returning a product for repair

You can request to return your product to tvONE for repair. When you contact tvONE support, have the following information ready:

1. Product type
2. Serial number of the faulty unit (this is on the underside or sides of the unit)
3. Full details of the issue
4. Invoice number (if available)

Contact tvONE support for your area

Customers in North, Central, and South America (NCSA), email

tech.usa@tvone.com

Customers in Europe, the Middle East, and Africa (EMEA), email

tech.europe@tvone.com

Customers in Asia, email

tech.asia@tvone.com

Customers in EMEA and Asia receive an RMA Request form from tvONE support. Complete the form and return it to tvONE support for your area.

All customers

tvONE support decides if your product needs to be returned for repair, and, if needed, provide a return authorization number.

Send your product to tvONE by insured carrier or registered mail. Write your return authorization number on the outside of the packaging, and on any documents that you send with your product.

You must arrange and pay for shipping and insurance. Products in transit are your responsibility. tvONE does not accept responsibility for products lost in transit.

Important note:

Do not return a product for warranty repair without a return authorization number. tvONE will not repair your product under these circumstances

Contact us

tvONE.com info@tvone.com

tvONE NCSA

North, Central and South America

621 Wilmer Avenue, Cincinnati, Ohio 45226 USA

Tel: +1 513-666-4210

Sales: sales@tvone.com

Support: tech.usa@tvone.com

tvONE EMEA

Europe, Middle East, Africa, and Asia Pacific

Unit V Continental Approach, Westwood Industrial Estate, Margate, Kent, CT9 4JG, UK

Tel: +44-1843-873311

Sales: sales.europe@tvone.com

Support: tech.europe@tvone.com

tvONE Asia

Asia

Sales: sales.asia@tvone.com

Support: tech.asia@tvone.com

Regulatory compliance for CALICO PRO and all modules

This product has been tested for compliance with appropriate **FCC** and **CE** rules and regulations.

The power adapter or supply has been tested for compliance with appropriate **UL, CUL, CE, PSE, GS,** rules, regulations and/or guidelines.

This product and its power adapter or supply is **RoHS** compliant.

This product and its optional expansion modules are designed and manufactured in the **United Kingdom**.

WEEE directive

The wheelie bin symbol on this product or its packaging indicates that this product shall not be treated as household waste. In line with EU Directive 2012/19/EU for waste electrical and electronic equipment (**WEEE**), this electrical product must not be disposed of as unsorted municipal waste.

Dispose of this product by returning it to the point of sale, or to your local municipal collection point for recycling. Doing this helps conserve our environment.

Specifications C7-PRO-1200

Main Features	
FPGA video processing	CALICO core (patented video processing)
Set up and control Software	CALICO Studio (free download and free to use. From https://tvone.com/tech-support/software
Included inputs and outputs	6x Inputs, 2x outputs (4K60 HDMI 2.0, HDCP 2.2)
Video windows	Up to 256 per system (no canvas restrictions)
Four design canvases (over 16 Gigapixels of design space)	4.1 gigapixels per canvas. Canvases are massive real world design spaces. Place displays and contents freely and accurately.
Field upgradable	Firmware updates using CALICO Studio
Output mapper	32 maps per output (used for DVLED mapping and for monitoring to create virtual outputs)
Input mapper	32 maps per input (create virtual / cropped sources from a single input)
HDR (High Dynamic Range)	HDR10 and HLG (Hybrid Log Gamma) - freely convert any input to any output **coming with firmware update June 2025**
Custom resolution engine	Available for inputs and outputs (with restrictions)
Window source cropping	Any input, max 256 crops / dependent on system bandwidth (live crops from any input source)
Canvas watch	Used for monitoring, multiviewing. Any output including mapped outputs. Any and/or all available outputs can be set to canvas watchers.
Labelling	Max 222 labels, source, text and images (upload images via CALICO Studio for backgrounds, keys, graphics and labels). Labels can be linked to video windows, crops, and outputs
Presets	Up to 500 with effects and transitions
Any output any canvas	Any output including mapped outputs on any canvas in any position and orientation
Internal storage	3GB (images, EDID's, fonts and labels)
Synchronization	BNC ref input and loop, Framelock to any input video source, Synclock using internal clock
Audio	One stereo pair per canvas. Input (44.1kHz and 48kHz) Output (48kHz)
Display agnostic	Designed for DVLED controllers / displays / projectors
1U compact size	Rack mount or desktop (removable rack ears and feet are included)
EDID manager	Up to 20 custom EDID's can be uploaded and applied to inputs in addition to the provided system EDID's
Secure access	User login with 3 levels of access available (Admin / Power-user / User)
Secure connection	HTTPS
Low power consumption	Typically, around 150W
OLED display	IP address, device name and status messages (customizable using CALICO Studio, content, brightness and ON/OFF)
Integrated carry handles	Easy rack installation and transport.
Rugged all metal cabinet and chassis	Solid aluminum front panel and powder coated steel cabinet
Front panel illumination	Fully controllable via CALICO Studio (brightness level and ON/OFF)
Designed for continuous use	24/7, 365 days a year operation, with 5-year limited warranty. Perfect for mission critical applications
Smart cooling system	Automatic fan control with option to fix a fan profile if required.
Stainless steel fan filter included	For dusty operating environments. It only requires cleaning periodically, no need to replace, removable from the rear without de-installation.

Video Processing	
CALICO video processing	CALICO FPGA core (10-bit)
Parallel processing architecture	Yes
Video / graphics layers	256 (max including video windows, keys, graphics, labels, background images)
Video latency (input to output)	Min 1 frame, max 2 frames regardless of I/O
Up/down/cross conversion	Yes (all inputs and outputs)
Number of canvasses	4
Canvas size	(64,000 x 64,000) pixels per canvas
Keying	Luminance Keying (any layer to layer below / keys cannot be overlapped). Adjustable key-range and focus adjustment
Fading	Fade to Black / fade to transparent
Display size compensation	Yes, different physical sizes in video walls (Physical Mode)
Output rotation	Yes for any outputs, windows and labels (360° rotation 1° increments)
Output mapper	Yes (All outputs)
Projector edge blending	Yes (all outputs)
HDCP key handling	Yes, HDCP 2.2 (Expansion modules may have different specifications depending on connectivity)
Video Inputs	
HDMI 2.0	6x 2160p (4096x2160) 60Hz
HDCP	2.2 / 1.4
Chroma sub-sampling (10-bit)	4:2:2
Chroma sub-sampling (8-bit)	4:4:4
Color space	YCbCr BT.601, YCbCr BT.709, RGB, RGB limited range
Supported Input Resolutions (for standard unit 6x HDMI 2.0 IN)	
720p (1280x720)	50, 59.94, 60Hz
1080i (1920x1080)	50, 59.94, 60Hz
1080p (1920x1080)	23.98, 24, 25, 29.97, 30, 50, 59.94, 60, 100, 119.88, 120Hz
2160p (3840x2160)	23.98, 24, 25, 29.97, 30, 50, 59.94, 60Hz
2160p (4096x2160)	23.98, 24, 25, 29.97, 30, 50, 59.94, 60Hz
Video Outputs	
HDMI 2.0	2x 2160p (3840x2160) 60Hz
HDCP	2.2 / 1.4
Chroma sub-sampling (10-bit)	4:2:2
Chroma sub-sampling (8-bit)	4:4:4
Color space	YCbCr BT.709, RGB, RGB limited range and auto detect
Supported Output Resolutions (for standard unit 2x HDMI 2.0 out)	
720p (1280x720)	50, 59.94, 60Hz
1080i (1920x1080)	50, 59.94, 60Hz
1080p (1920x1080)	23.98, 24, 25, 29.97, 30, 50, 59.94, 60, 100, 119.88, 120Hz
2160p (3840x2160)	23.98, 24, 25, 29.97, 30, 50, 59.94, 60Hz

Images (Backgrounds / Labels)	
Still Image formats supported (internal image store)	BMP, PNG,JPG,JPEG, TIF, TIFF, PPM, PGM, PBM, HDR
Interfaces	CALICO Studio, File transfer supported (FTP). USB-3 on rear of unit

Control Methods	
Network interface	RJ45 - Gigabit Ethernet (for IT use – do not connect to building or external wiring)
Network standard	IPv4
API protocols	REST using HTTP or HTTPS, CLI using TCP/IP
API specification	Available from https://api.tvone.com
Control Software	CALICO Studio
Control App	CALICO Studio mobile (Android / IOS)
Plug-in's	Q-SYS, Crestron

Warranty	
Limited warranty	5 years parts and labor
Regulatory Compliance	
System	FCC, CE, RoHS, UL, UKCA
Mechanical	
Height	44mm (1.73"), 55mm (2.165") including feet
Width	435mm (17") / including rack ears 482mm (19")
Depth	391mm (15.39")
Weight	4.4kg net (9.7 lbs.)
Environmental	
Operating temperature	32° to 104°F (0° to +40°C)
Operating humidity	10% to 85%, Non-condensing
Storage temperature	14° to +158°F (-10° to +70°C)
Storage humidity	10% to 85%, Non-condensing
Fan noise	Nominal 39.5dBA - max 63dBA (@0.5m)
Power	
Internal PSU	160w
Power consumption	120w nominal
Input voltage	100 to 240v (+/- 10%) AC auto detecting 50/60Hz 1.5 - 0.75A

Specifications C7-PRO-2200

Main Features	
FPGA video processing	CALICO core (patented video processing)
Set up and control Software	CALICO Studio (free download and free to use. From https://tvone.com/tech-support/software
Included inputs and outputs	8x Inputs, 4x outputs (4K60 HDMI 2.0, HDCP 2.2)
Video windows	Up to 256 per system (no canvas restrictions)
Four design canvases (over 16 Gigapixels of design space)	4.1 gigapixels per canvas. Canvases are massive real world design spaces. Place displays and contents freely and accurately.
Field upgradable	Firmware updates using CALICO Studio
Output mapper	32 maps per output (used for DVLED mapping and for monitoring to create virtual outputs)
Input mapper	32 maps per input (create virtual / mapped sources from a single input)
HDR (High Dynamic Range)	HDR10 and HLG (Hybrid Log Gamma) - freely convert any input to any output **coming with firmware update June 2025**
Custom resolution engine	Available for inputs and outputs (with restrictions)
Window source cropping	Any input, max 256 crops / dependent on system bandwidth (live crops from any input source)
Canvas watch	Used for monitoring, multiviewing. Any output including mapped outputs. Any and/or all available outputs can be set to canvas watchers.
Labelling	Max 222 labels, source, text and images (upload images via CALICO Studio for backgrounds, keys, graphics and labels). Labels can be linked to video windows, crops, and outputs
Presets	Up to 500 with effects and transitions
Any output any canvas	Any output including mapped outputs on any canvas in any position and orientation
Optional expansion modules (Increase the number and/or type of I/O connections, and add new features and functionality)	3x slots (1x high bandwidth input, 1 standard input, 1x high bandwidth output). It can be fitted as a future upgrade. Installable from the rear of the unit.
Internal storage	3GB (images, EDID's, fonts and labels)
Synchronization	BNC ref input and loop, Framelock to any input video source, Synclock using internal clock
Audio	One stereo pair per canvas. Input (44.1kHz and 48kHz) Output (48kHz). Expansion module available for analog and digital audio ingest and break-out
Display agnostic	Designed for DVLED controllers / displays / projectors
2U compact size	Rack mount or desktop (removable rack ears and feet are included)
EDID manager	Up to 20 custom EDID's can be uploaded and applied to inputs in addition to the provided system EDID's
Secure access	User login with 3 levels of access available (Admin / Power-user / User)
Secure connection	HTTPS
Low power consumption	Typically, around 250W including optional modules
OLED display	IP address, device name and status messages (customizable using CALICO Studio, content, brightness and ON/OFF)
Integrated carry handles	Easy rack installation and transport.
Rugged all metal cabinet and chassis	Solid aluminum front panel and powder coated steel cabinet
Front panel illumination	Fully controllable via CALICO Studio (brightness level and ON/OFF)
Designed for continuous use	24/7, 365 days a year operation, with 5-year limited warranty. Perfect for mission critical applications
Smart cooling system	Automatic fan control with option to fix a fan profile if required. 3x 80mm fans fitted
Optional stainless steel fan filter kit available	For dusty operating environments. It only requires cleaning periodically, no need to replace, removable from the rear without de-installation.

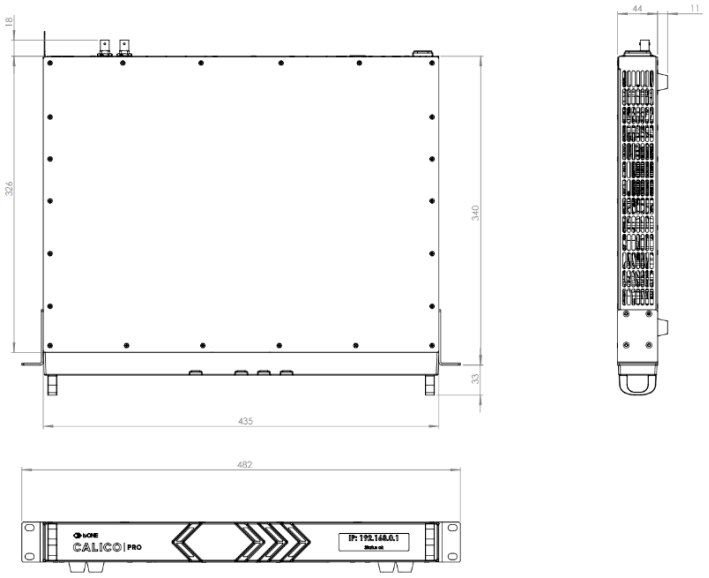
Video Processing	
CALICO video processing	CALICO FPGA core (10-bit 4:4:4)
Parallel processing architecture	Yes
Video / graphics layers	256 (max including video windows, keys, graphics, labels, background images)
Video latency (input to output)	Min 1 frame, max 2 frames regardless of I/O
Up/down/cross conversion	Yes (all inputs and outputs)
Number of canvasses	4
Canvas size	(64,000 x 64,000) pixels per canvas
Keying	Luminance Keying (any layer to layer below / keys cannot be overlapped). Adjustable key-range and focus adjustment
Fading	Fade to Black / fade to transparent
Display size compensation	Yes, different physical sizes in video walls (Physical Mode)
Output rotation	Yes for any outputs, windows and labels (360° rotation 1° increments)
Output mapper	Yes (All outputs)
Projector edge blending	Yes (all outputs)
HDCP key handling	Yes, HDCP 2.2 (Expansion modules may have different specifications depending on connectivity)
Video Inputs	
HDMI 2.0	8x 2160p (4096x2160) 60Hz
HDCP	2.2 / 1.4
Chroma sub-sampling (10-bit)	4:2:2
Chroma sub-sampling (8-bit)	4:4:4
Color space	YCbCr BT.601, YCbCr BT.709, RGB, RGB limited range and auto detect
Supported Input Resolutions (for standard unit 8x HDMI 2.0 IN)	
720p (1280x720)	50, 59.94, 60Hz
1080i (1920x1080)	50, 59.94, 60Hz
1080p (1920x1080)	23.98, 24, 25, 29.97, 30, 50, 59.94, 60, 100, 119.88, 120Hz
2160p (3840x2160)	23.98, 24, 25, 29.97, 30, 50, 59.94, 60Hz
2160p (4096x2160)	23.98, 24, 25, 29.97, 30, 50, 59.94, 60Hz
Video Outputs	
HDMI 2.0	4x 2160p (3840x2160) 60Hz
HDCP	2.2 / 1.4
Chroma sub-sampling (10-bit)	4:2:2
Chroma sub-sampling (8-bit)	4:4:4
Color space	YCbCr BT.709, RGB, RGB limited range
Supported Output Resolutions (for standard unit 4x HDMI 2.0 out)	
720p (1280x720)	50, 59.94, 60Hz
1080i (1920x1080)	50, 59.94, 60Hz
1080p (1920x1080)	23.98, 24, 25, 29.97, 30, 50, 59.94, 60, 100, 119.88, 120Hz
2160p (3840x2160)	23.98, 24, 25, 29.97, 30, 50, 59.94, 60Hz
Images (Backgrounds / Labels)	
Still Image formats supported (internal image store)	BMP, PNG,JPG,JPEG, TIF, TIFF, PPM, PGM, PBM, HDR
Interfaces	CALICO Studio, File transfer supported (FTP). USB-3 on rear of unit

Control Methods	
Network interface	RJ45 - Gigabit Ethernet (for IT use – do not connect to building or external wiring)
Network standard	IPv4
API protocols	REST using HTTP or HTTPS, CLI using TCP/IP
API specification	Available from https://api.tvone.com
Control Software	CALICO Studio
Control App	CALICO Studio Mobile (Android / IOS)
Plug-in's	Q-SYS, Crestron
Warranty	
Limited warranty	5 years parts and labor
Regulatory Compliance	
System / modules	FCC, CE, RoHS, UL, UKCA
Mechanical	
Height	88mm (3.46")
Width	435mm (17") / including rack ears 482mm (19")
Depth	364mm (14.33")
Weight	10Kg (22 lbs.)
Available Accessories (Field Upgradable / Replaceable)	
Quad 4K60 HDMI input module 2160p (4096x2160) 60Hz 4:4:4	C7-PRO-HDMI-4K4IN
Dual 4K30 HDMI input module 2160p (4096x2160) 30Hz dual, or single 60Hz 4:2:0	C7-PRO-HDMI-4K2IN
Quad 2K60 HDMI input module 1080p (1920x1080) 60Hz 4:4:4	C7-PRO-HDMI-2K4IN
Quad 12GSDI input module 2160p (3840x2160) 60Hz 4:2:2	C7-PRO-12GSDI-4IN
Quad 3GSDI input module 1080p (1920x1080) 60Hz 4:2:2	C7-PRO-3GSDI-4IN
Dual 4K30 HDBT input module 2160p (4096x2160) 30Hz dual, or single 60Hz 4:2:0	C7-PRO-HDBT-4K2IN
Dual 4K30 + 1080p/60Hz streaming input and media playback module	C7-PRO-MEDIA
Audio external input and output module	C7-PRO-AUD-2IN-4OUT
Quad 4K60 HDMI output module 2160p (3840x2160) 60Hz 4:4:4	C7-PRO-HDMI-4K4OUT
Eight 2K60 HDMI output module 1080p (1920x1080) 60Hz 4:4:4	C7-PRO-HDMI-2K8OUT
Quad 12GSDI output module 2160p (3840x2160) 60Hz 4:2:2	C7-PRO-12GSDI-4OUT
Optional fan filter kit	C7-PRO-2U-FILTER
Hot swappable, dual-redundant power supply	C7-PRO-400RPS
Environmental	
Operating temperature	32° to 104°F (0° to +40°C)
Operating humidity	10% to 85%, Non-condensing
Storage temperature	14° to +158°F (-10° to +70°C)
Storage humidity	10% to 85%, Non-condensing
Fan noise	Nominal 45dBA - max 57dBA (@1m)
Power	
Dual-redundant hot-swappable PSU	400w load balancing (One supplied - additional PSU optional)
Power consumption	250w nominal with all expansion modules fitted
Input voltage	100 to 240v (+/- 10%) AC auto detecting 50/60Hz 6-3A

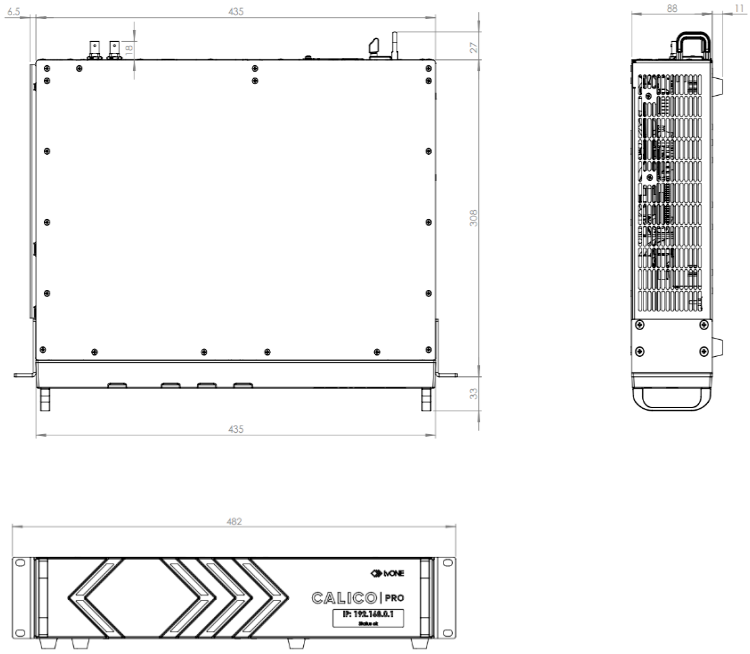
Dimensional drawings

C7-PRO-1200

Sizes in mm



C7-PRO-2200

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