PXL System User Manual

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BARCO

Visibly yours

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Introduction

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Welcome to the PXL System manual. An overview of the complete system is given in Chapter 1, subsequent chapters provide greater detail on individual components.

Version 4.6 Release Notes

Vizomo:

- Support Barco PXL brightness sensor
- Added C11 brightness boost
- Further improved quality of scaled images
- Reverted improved gamma control

RasterMAPPER:

- 4.6 compatibility

See the change log for previous revision history.

Safety Information

WARNING

Read the installation instructions before connecting the system to the power source.
Attention: Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.
Warnung: Vor dem Anschließen des Systems an die Stromquelle die Installationsanweisungen lesen.

Safety Guidelines for Human Eyes

WARNING

The panels shall be mounted 15-20 meter from the viewing place, depending on the configuration.
Lamp may pose a hazard even for momentary or brief exposure. Remove power before servicing. No servicing or maintenance with power to the LEDs switched on.
A warning label shall be added to the tile and in the manual stating the risk and how to avoid the risk.

WARNING

Use caution when viewing LEDs directly if driven at high current, which may greatly increase the hazard to your eyes. (IEC62471)

Electrical Safety Guidelines

DANGER

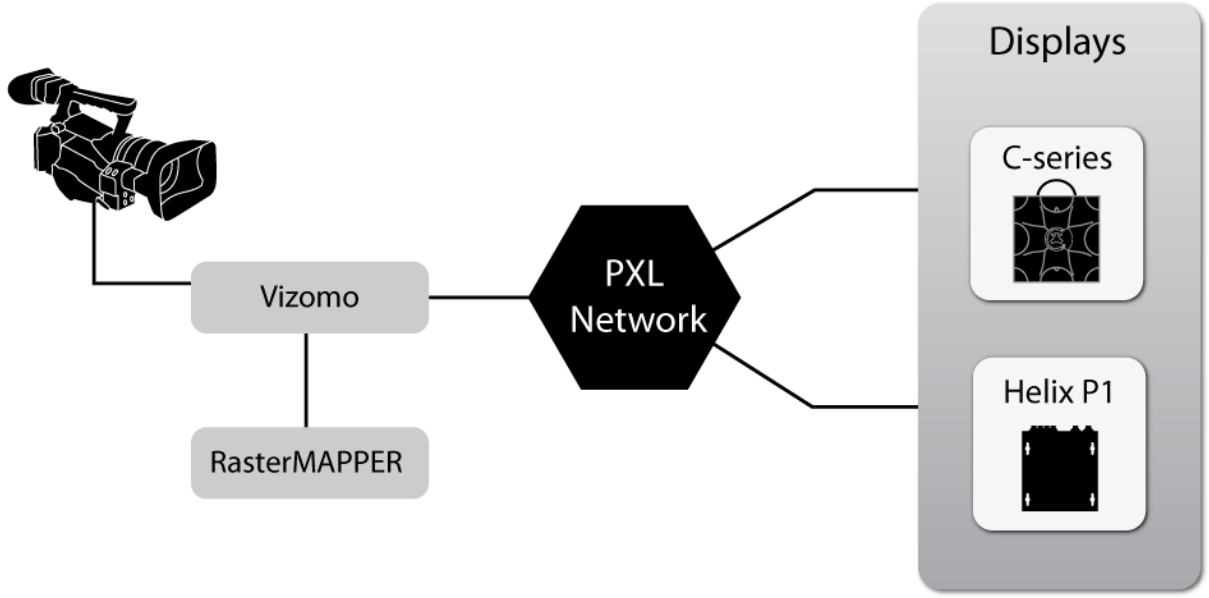
Risk of electrical shock. No user-serviceable parts inside.
Observe all applicable electrical codes.
The power outlet shall be installed near the equipment and shall be easily accessible.

WARNING

Do not hot plug any cables. Damage to the connector pins may occur. Resulting damage is not covered under warranty.
Unit shall not be exposed to dripping or splashing. To reduce the risk of electric shock, do not expose this apparatus to rain or moisture.

1. PXL System Overview

The PXL System is a family of components that consists of LED display devices, image processing, and data distribution. The following diagram provides a basic overview of how PXL is distributed.



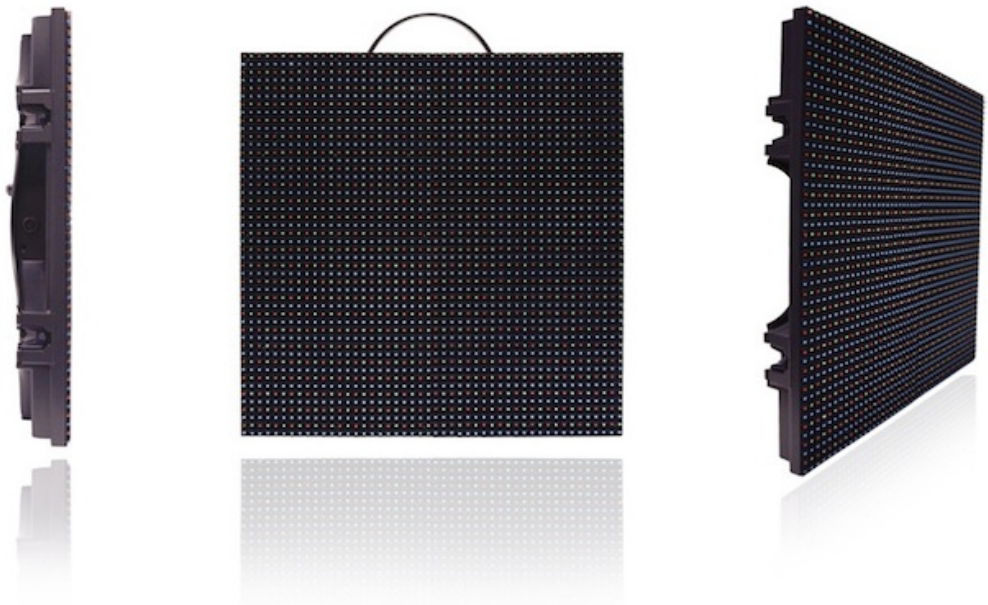
The Vizomo processor receives video data in a standard format such as DVI or SDI, and converts it to a special data format that may be used by the LED displays. This data is distributed over a star or hub style network to short daisy chains of the display components. By limiting the amount of data being forwarded through each daisy-chained LED display device the complexity of the devices is minimized, this results in low power consumption and passively cooled displays. To split the data stream, PXL switches are needed. Each of these topics is covered in detail in the remaining chapters of this guide.

2. C-series Tile

The C-series tile is the primary building block of a modular system that may be used to construct large format video displays with arbitrary shapes. With resolutions in the range of 7-16mm pixel pitch, C-series tiles are suited to a wide variety of indoor and outdoor rental and architectural applications.

The remainder of this chapter covers installation guidelines for C-series tiles.

C8v Tile:



The City of Dreams Macau pylon consists of 749 C8v tiles per side, illustrating how C-series tiles can be used to create a circular video display.

CITY OF
DREAMS

2.1 Tile Overview

C-series tiles are latched together along their edges to create large LED video displays with arbitrary shapes. Once a display shape has been decided upon, the display may be hung or attached to floor mounts for temporary rental applications, or permanently affixed to secondary steel in an architectural installation.

Horizontally curved C-series displays may be created with radii varying from 4m convex to -10m concave. Please contact your Barco project manager for further details.

C-series tiles are attached to truss or floor-mounts using header and footer blocks, as shown in the following figure. See sections 2.4 Assembly & Mounting and 2.5 Rigging Hardware & Methods.

Video data is provided to C-series tiles by a Vizomo LED processor, distributed through a PXL network. See chapters 4. Vizomo and 5. Power and Data Distribution.

2.2 Installation Guidlines

Rigging & Mounting Guidelines

- C11 and C8v C-series tiles have an IP66 rating and are suitable for use in most indoor and outdoor installations except where water immersion could occur. This conforms to the International Electrotechnical Commission (IEC) standard 60529.
- The C7 tiles have an IP50 rating and are suitable for indoor use only.
- Use caution when installing the display. C-series tiles weigh 6.4 kg (14.1 lbs)/tile.
- Ensure rigging hardware is able to handle the weight of the entire C-series system with appropriate safety factors.
- External rigging hardware must be properly installed prior to hanging C-series tiles.
- Do not hang more than 25 C-series tiles (10 m) tall with the integral rigging hardware.
- When rigging observe the maximum number of panels that can be hung or floor supported.
- Displays >10 m tall require an auxiliary frame system not supplied by Barco.
- Handle is intended for carrying a single tile only. Do not use for safety, tie-off, climbing, or lifting.

Power

Observe the following power guidelines when setting up your C-series display.

The table below indicates min/max power consumption.

Fixture	Max power consumed @ full white	Minimum power consumed in black	Maxiumum Brightness
C7	100 watts	12 watts	2000 nits
C11	85 watts	12 watts	5000 nits
C8v	55 watts	12 watts	8000 nits

When running typical video content, the duty cycle (average power consumption) is about 30% of maximum. See chapter 5 for more details on maximum daisy chain power consumption limits for PDB-5 and break-in cables.

NOTE
For installations where a residual current device (RCD) or similar device will be used on the mains power to the display, please take into account that C-series tiles have an earth leakage of 85 micro-amps per tile.

Data

Observe the following data limits when setting up your C-series display.

Fixture	Max panels per PDB-5 or switch output	Max Panels per Vizomo output	Max Panels per Vizomo
C7	8	80	320
C11	16	180	720
C8v	25	300	1200

Temperature

C-series installations must take into account the operating temperature of the tiles. The ambient operating temperature for a C-series tile is -20°C to 45°C.

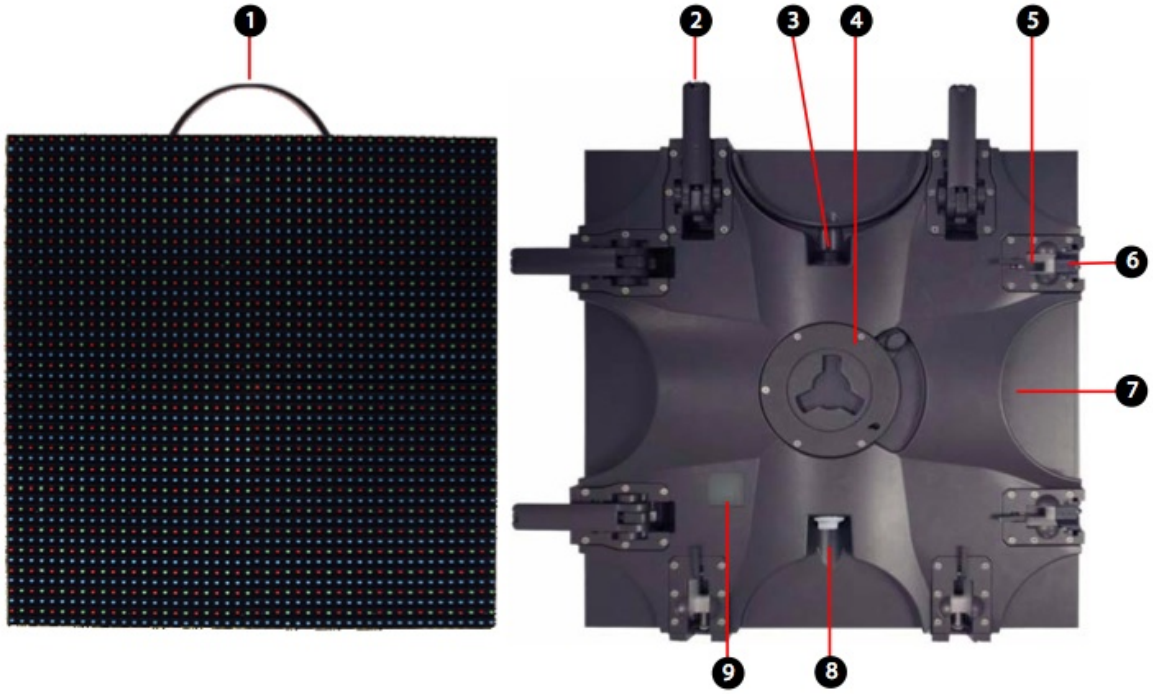
NOTE
C-series tiles have an internal temperature sensor that shuts down the tile's output (brightness is set to 0) when internal temperature is too high. The brightness will return to normal when the internal temperature has cooled sufficiently.

DANGER

Risk of electrical shock. No user-serviceable parts inside.
Observe all applicable electrical codes.
The power outlet shall be installed near the equipment and shall be easily accessible.
Do not hot plug any cables. Damage to the connector pins may occur. Resulting damage is not covered under warranty.

2.3 Assembly & Mounting

The rear of a C-series tile contains the rigging hardware necessary for temporary hanging or stacking in a staging application, as well as hardware for permanent installation in an architectural setting.



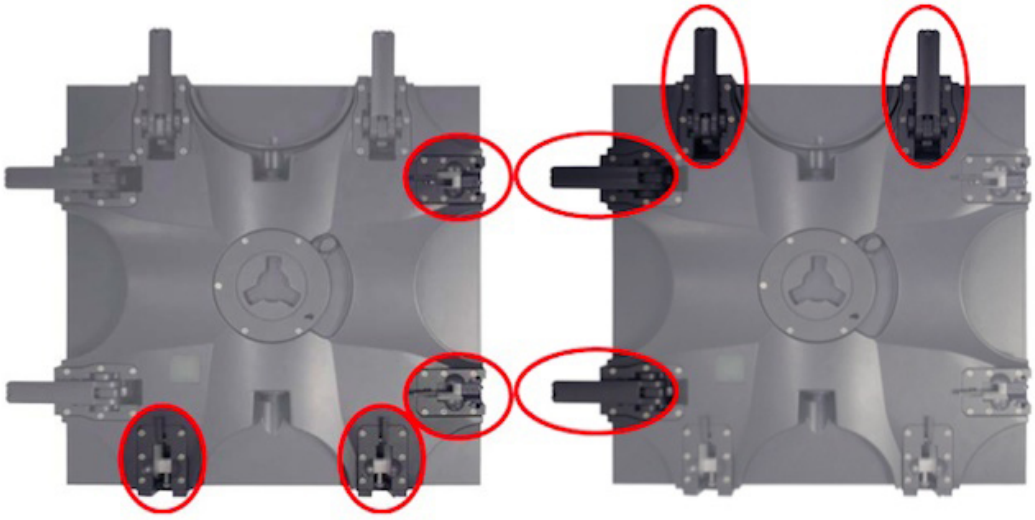
1 Carrying handle. Folds away when not in use.
2 Latch hook and lever. Locks multiple C-series tiles together.
3 Power & data input. Combined AC power & data input via black PXL Cable socket.
4 Center mount point with rotary latch. Attaches to secondary steel for fixed or architectural installations.
5 Latch catch receiver. Accepts the latch hook for locking multiple tiles together.
6 Radius adjustment dowel. Interchangeable pin available in differing angles to enable horizontally curved installations.
7 Breather valve. Allows air to breath through waterproof, gas-permeable membrane. One valve on each side of tile.
8 Power & data output. Combined AC power & data output via white PXL Cable socket.
9 Tile status indicator. Color indicates tile status.

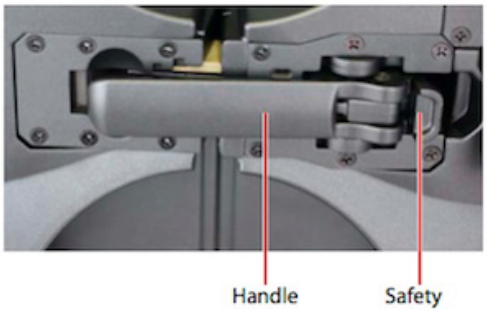
WARNING

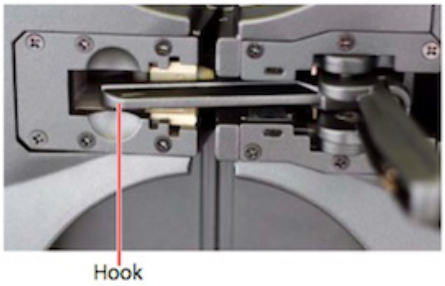
Do not hang more than 25 panels (10 m) tall with the integral rigging hardware.
No lifting point should support more than 100 tiles (1433 lb / 650 kg).
When using light duty headers, refer to Appendix 5, Light Duty Rigging Info to calculate the maximum number of panels.
Displays >10 m tall require an auxiliary frame system not supplied by Barco.
Failure to equalize the load among all pickup points could result in serious injury.

2.3.1 Latches

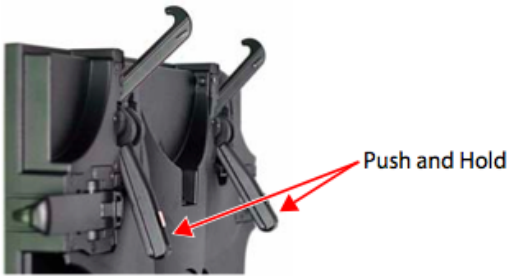
There are a total of 8 integrated locking components on each tile as shown below; 4 latches and 4 catches.







The photo below illustrates the optimal position of the handle and hook to allow for easy connection to other tiles.
With the hook in this position and your thumbs slightly pushing on the open handle, you can hang one tile on another, then lock the tiles together.



How to Lock C-series Tiles Together

Start with the latch fully open. Align the C-series tiles so the latch of one aligns with the catch of the other.

Place the latch hook in the catch. Ensure sure the hook is fully seated.

Push the handle towards the catch.

Ensure the hook is fully locked in the catch and that the safety is engaged.

CAUTION

Use light finger pressure when latching the tile. Do not force the lock handle. If resistance is felt as you lock the tiles, open the handle, ensure the hook is fully seated, check for proper alignment, and try again.

How to Unlock C-series Tiles

Push and hold the safety catch as you begin to pull the handle away from the tile.

Continue pulling the handle open.

Ensure the handle is all the way open so the hook is fully disengaged from the catch.

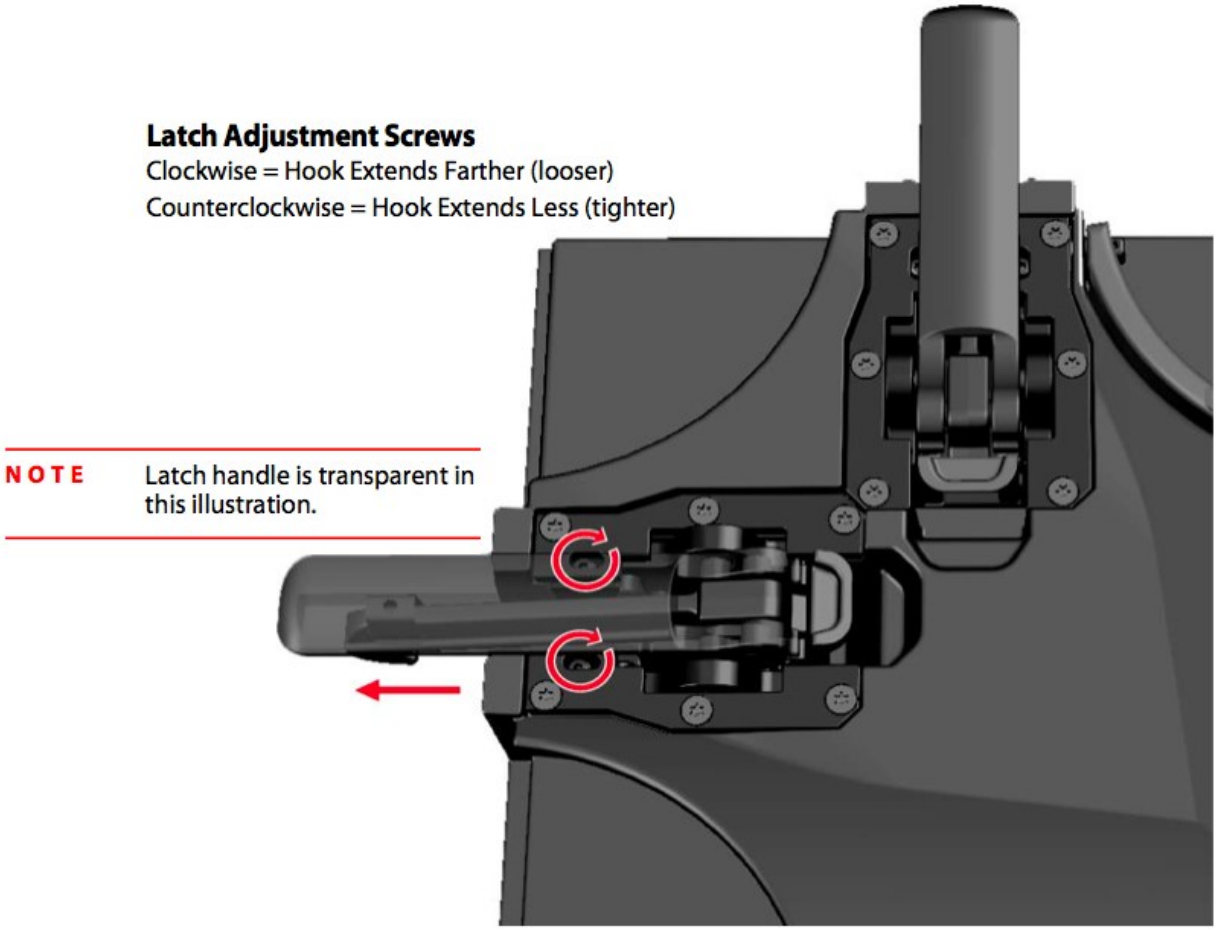
CAUTION

When mounting C-series units together, ensure the latches are fully engaged in the catch and lock in place before releasing the C-series tile from your grip.

2.3.2 Latch Adjustment

The latches on a C-series tile can be adjusted to provide optimal connection between tiles. This adjustment moves the hook closer to or farther from the edge of the adjacent tile.

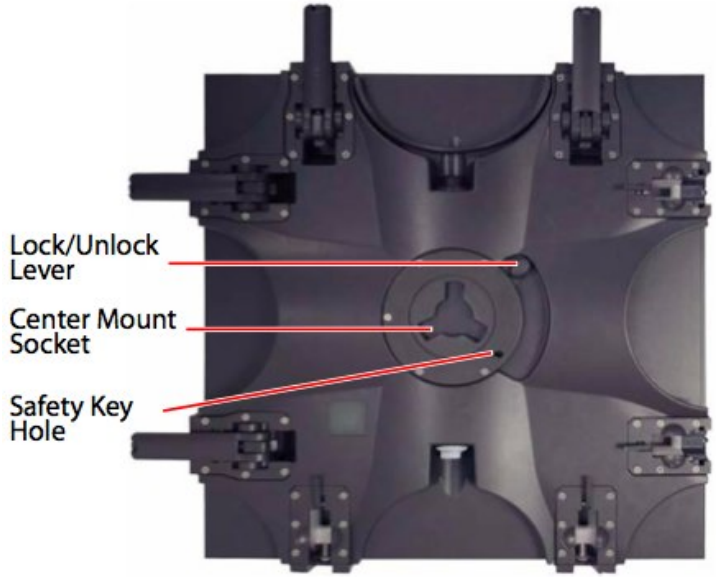
The adjustment screws are located under the latch handle and require a 2mm hex key.



2.3.3 Center Mount

Center Mount Detail

The center mount is used for attachment of vertical braces.



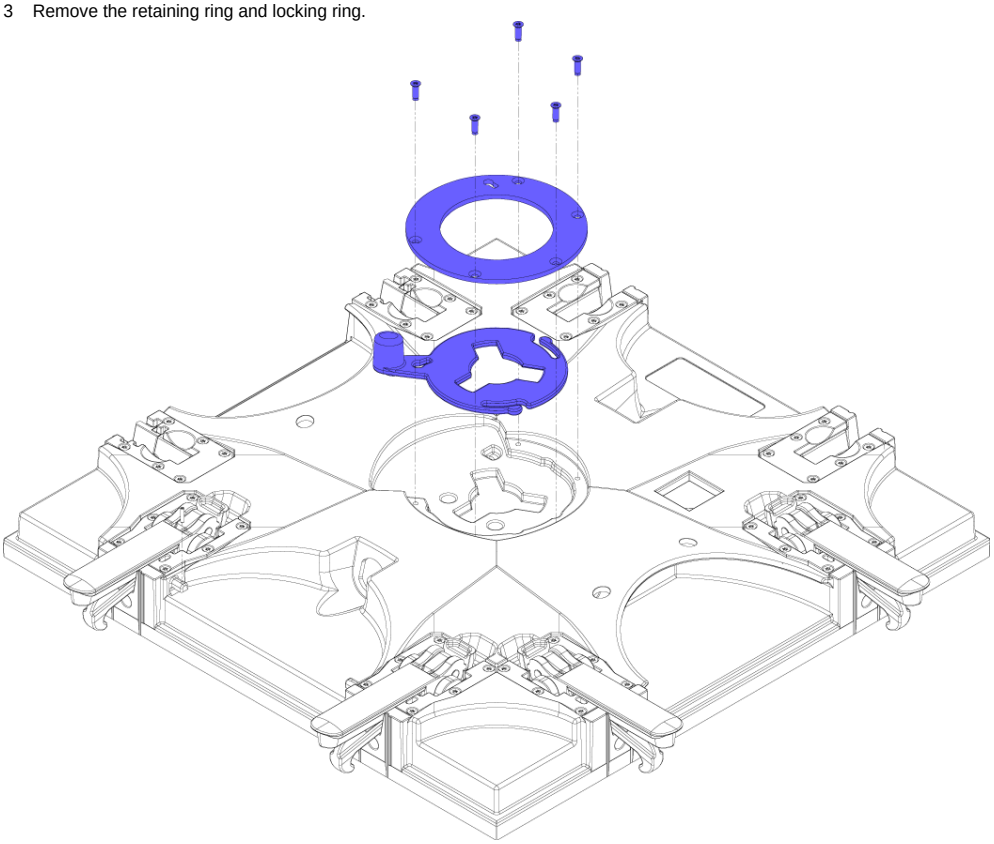
2.3.4 L-Bracket

In addition to the Center Mount there are two M10 threaded holes in the back of each C-series tile that may be used for permanent mounting or attaching other accessories.
The two threaded holes are located underneath the Center Mount.

Removing the Center Mount Socket

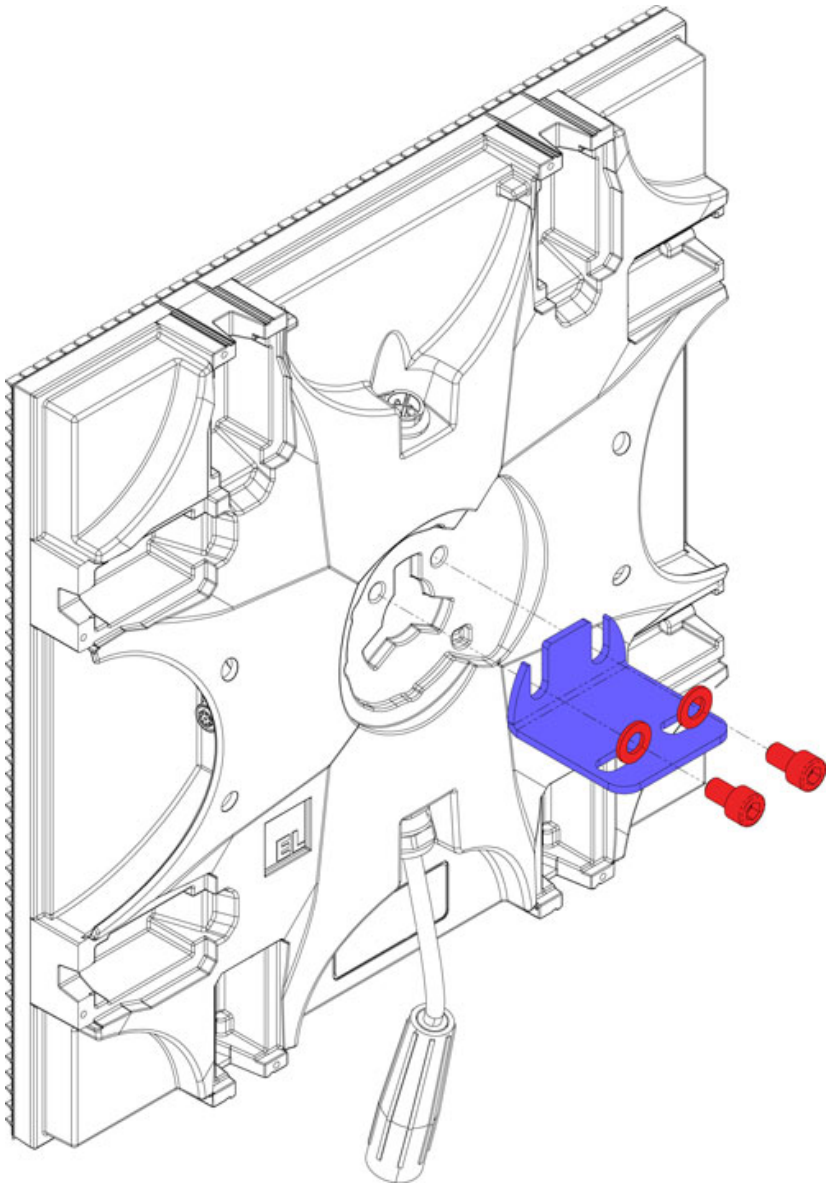
Use of the L-bracket require the removal of the center mount socket from the rear of the tile as described in the following steps.

1 Place the tile on a flat surface, protecting the front of the tile from damage to the LEDs.
2 Remove the 5 screws from the retaining ring.
3 Remove the retaining ring and locking ring.

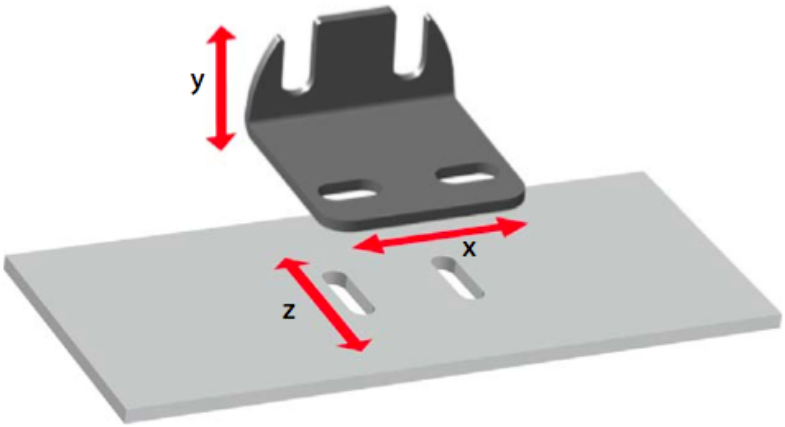


Installing the L-Bracket

The L-bracket mounts to the back of a C-series tile via 2x M10 threaded inserts.
Use M10-16 (16mm long) bolts only.
The torque specification for this M10-16 bolt is 16.9 N-m.



The L-bracket allows adjustability along the X and Y axis. To allow for Z axis adjustment the holes to which the L-bracket is attached should also be slotted as shown below:



CAUTION

Use M10-16 bolts for the threaded mounting holes on the back of the C-series tile. Longer lengths will cause damage to the tile. Resulting damage is not covered under warranty.

2.4 Rigging Hardware

A variety of rigging hardware is available for deploying C-series displays.

Headers are used for suspending displays from overhead, while feet are used for to create floor standing or "stacked" installations. Vertical pipe or truss are used to provide structure in stacked and heavy duty hanging configurations.

DANGER

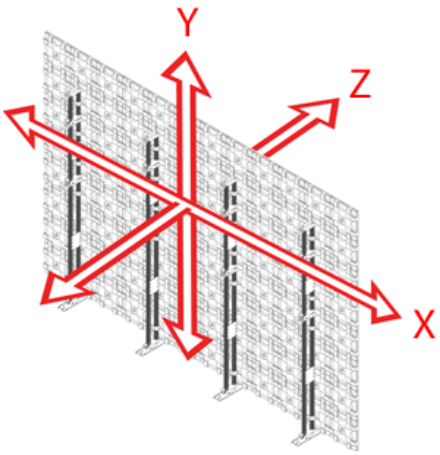
The user must accept responsibility for the correct application of products and methods based on local conditions.
Never exceed the working load limits.
Avoid shock loads.
Inspect products regularly.
If you are not sure of the proper use of a product consult with a rigging professional.

2.4.1 Stacked C-series Tiles

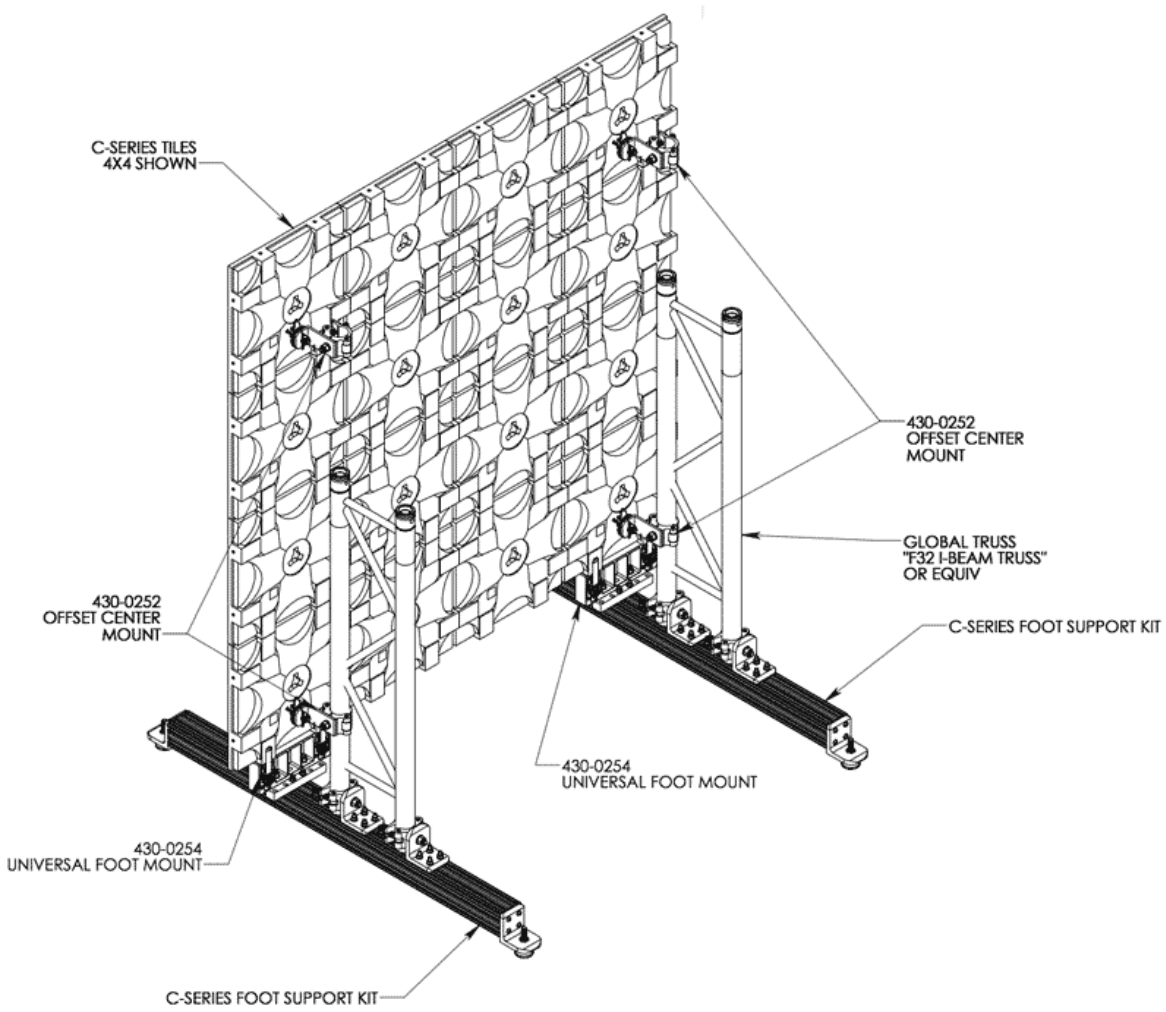
This page illustrates a example of a stacked C-series system. Before placing an order for rigging equipment consult with a Barco representative to evaluate your specific needs.

WARNING

Vertical bracing for C-series tiles is for Z axis loading only. X and Y axis loads are carried by the C-series tiles themselves.



Example stacked system:



NOTES

1 - "C-series Foot Support" 430-0256 required every 3 columns (up to 8 tiles high)

1 - "C-series Foot Support" 430-0256 required every 2 columns (for 9 or 10 tiles high)

1 - "Universal Foot Mount" 430-0254 required for each foot support

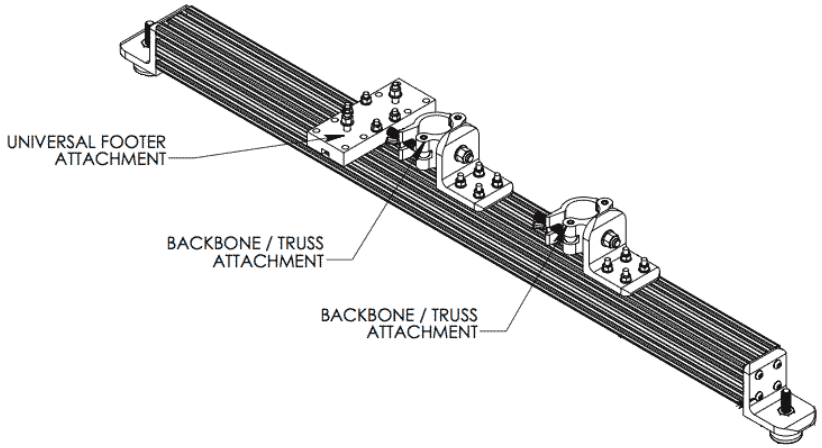
1 - "Offset Center Mount" 430-0252 required at each truss every 3rd tile

Assembly should not span more than 3 tiles between supports

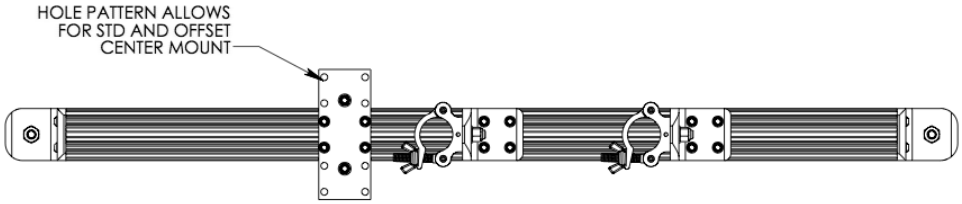
Max height is 10 tiles max wind load is 20 mph (see Appendix A: Beaufort Scale)

Should be assembled with tile in middle of support

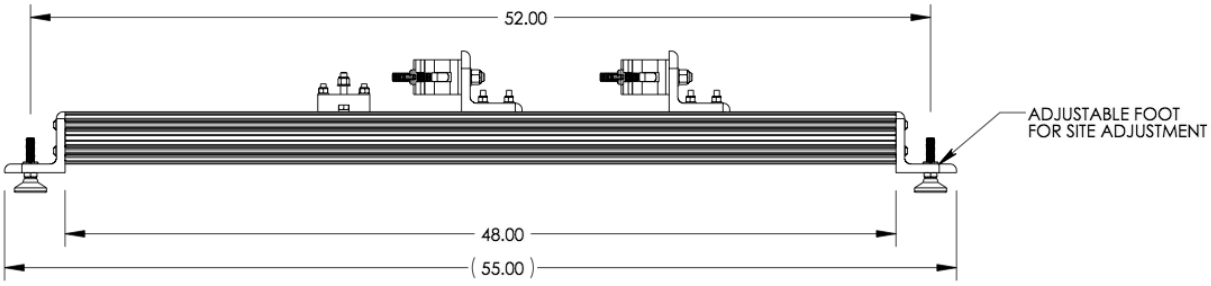
2.4.1.1 C-series Foot Support (430-0256)



Top View:



Side View:

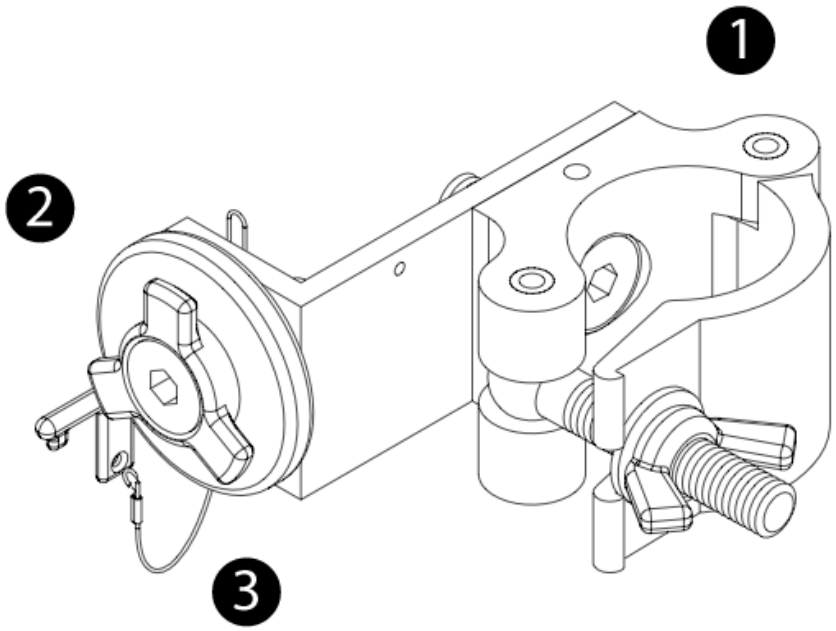


Dimensions are in inches.

NOTES

- SUPPORT OF C-SERIES LED WALL 10 TILE MAX COLUMN HEIGHT
- 1 FOOT SUPPORT REQUIRED EVERY 3 COLUMNS
- 20 MPH MAX WIND RATING - DO NOT EXCEED (see Appendix A: Beaufort Scale)

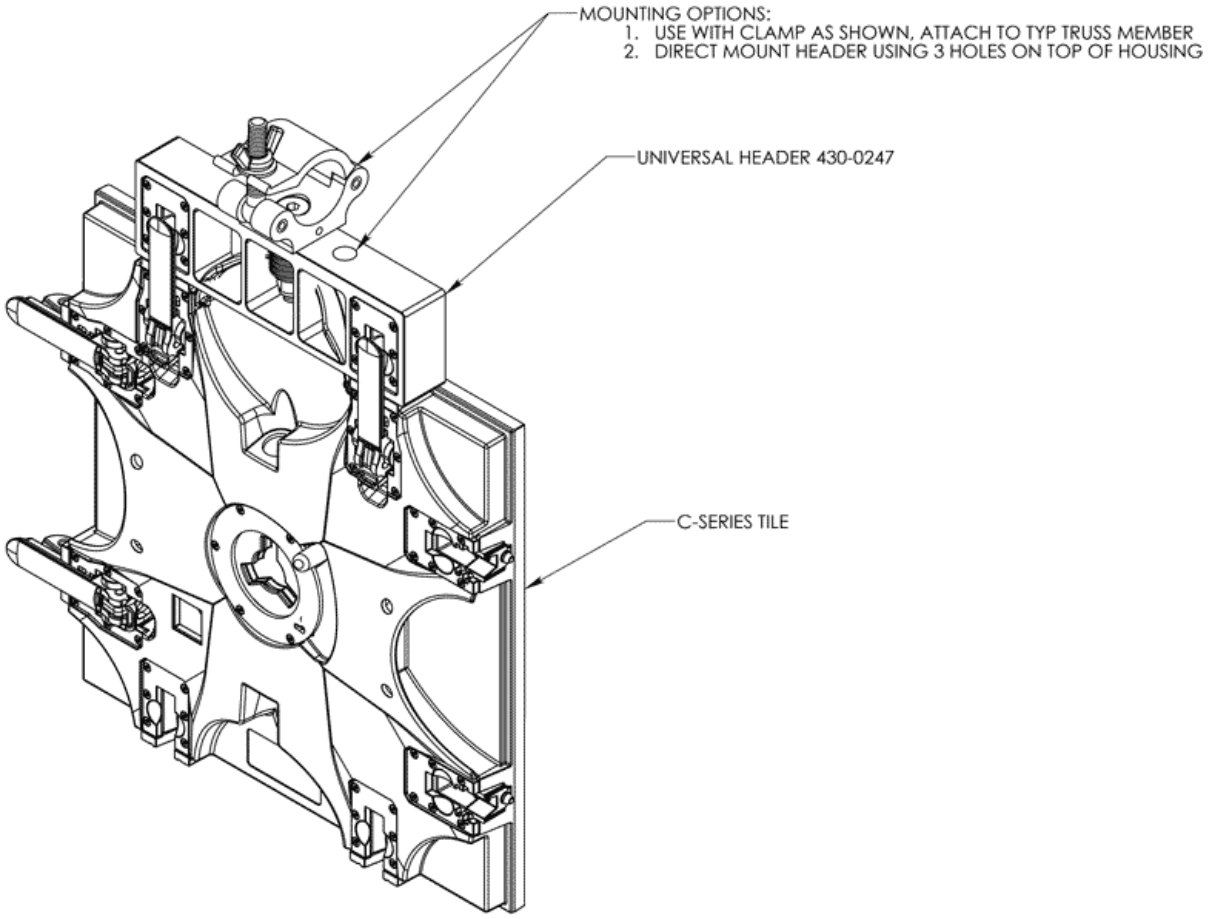
2.4.1.2 C-series Pipe Clamp (430-0252)



1 Chesebrough clamp - Truss mounting hardware
2 C-series center mount
3 Center mount safety key

2.4.2 Hanging C-series Tiles

This page illustrates an example of a hanging C-series system. Before placing an order for rigging equipment consult with a Barco representative to evaluate your specific needs.

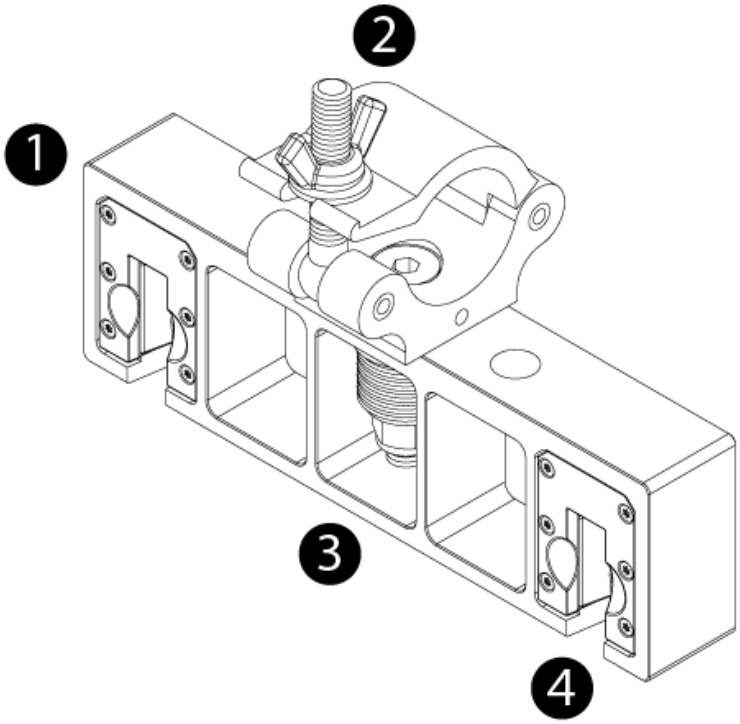


NOTES:

- One Universal Header supports max 25 tiles in height.
- Based on application, lateral support may be needed.
- Installation parameters should also be taken into account when determining the number of headers to use.

Examples:
6 high display would need header every 4th column (do not span more than 3 columns between headers)
10 high column would need header every-other column
13+ high display would need header every column

2.4.2.1 Universal Header (430-0247) Detail

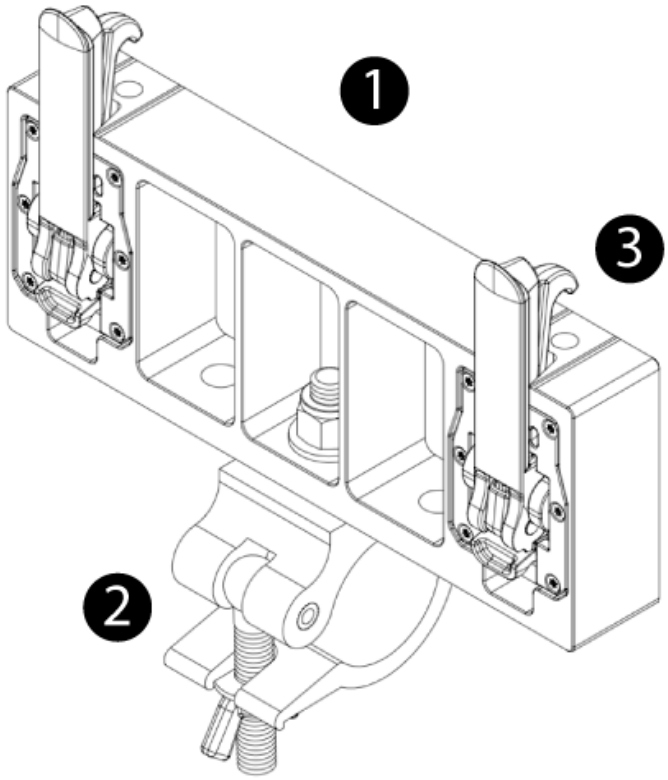


1 Machined 'Universal Header' chassis
2 Chesebrough clamp - Truss mounting hardware
3 Disk spring assembly - Load distribution mechanism
4 Latch Catch - Socket for locking C-series panels to header.

DANGER

Do not hang more than 25 panels (10 m) tall with the integral rigging hardware.
No lifting point should support more than 100 tiles (1411 lb / 640 kg).
Failure to equalize the load among all pickup points could result in serious injury.

2.4.2.2 Universal Footer (430-0254) Detail



1 Machined 'Universal Footer' chassis
2 Chesebrough clamp - Truss mounting hardware
3 Clamp and clamp adjust assembly

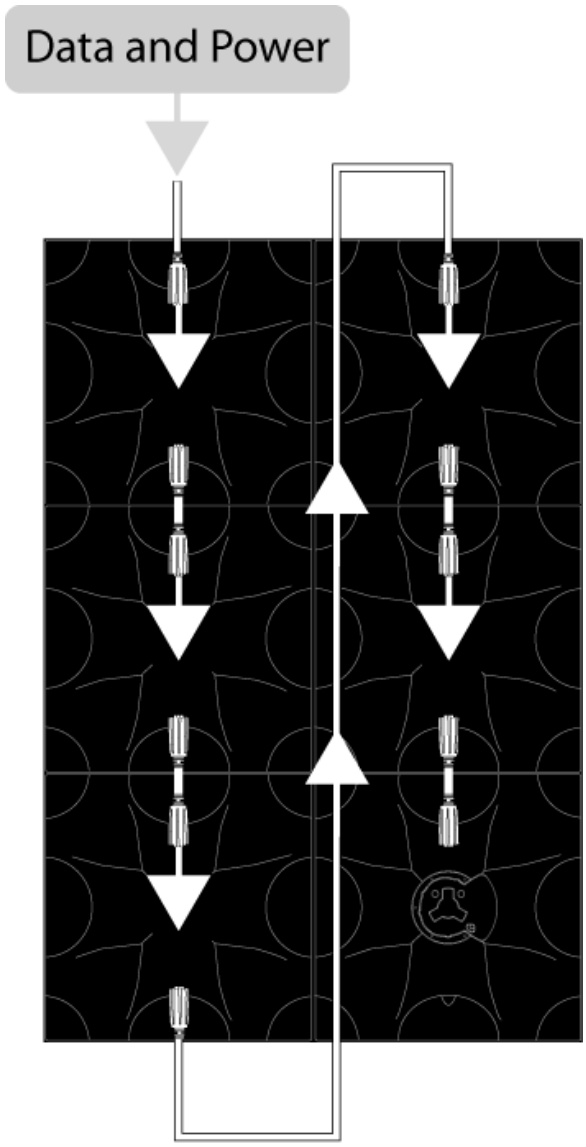
2.5 Power & Data Distribution

The C-series tiles receive power and data over a single daisy-chained PXL cable with color-coded male and female connectors. The length of the daisy-chain depends on the tile type - higher resolution tiles require shorter daisy-chains as discussed in chapter 5. Power and Data Distribution.

Connectors on the back of a tile are color-coded as follows:

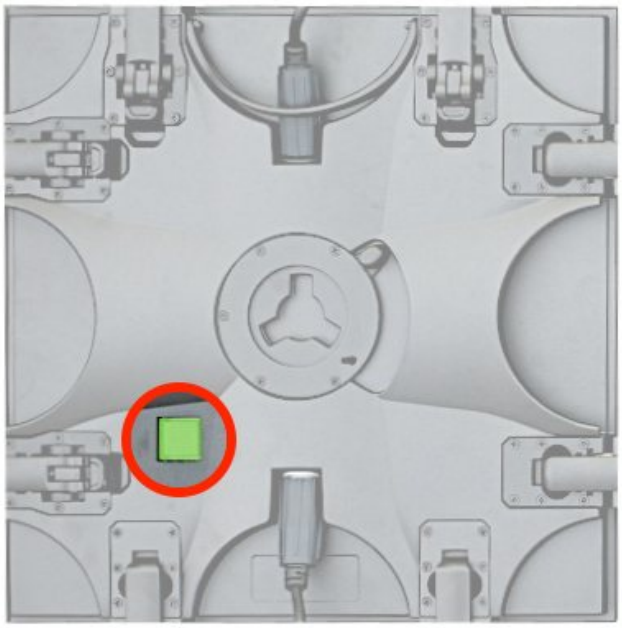
- Black PXL Connector = Power & Data In
- White PXL Connector = Power & Data Out

When interconnecting C-series tiles, always attach the black PXL cable plug to the black PXL tile socket and the white PXL cable plug to the white PXL tile socket.


Data and Power

2.5.1 Tile Status Indicator

The colored status indicator located on the back of the C-series tile allows you to easily monitor the state of each tile.



	Off	No Power (Note: the status indicator remains black for a few seconds when the tile is first powered on)
	Off	Optional. Operating normally in stealth mode, when the green "normal operation" indicator may interfere with the look of the back of the wall. In this mode, other states will still light up with the colors listed below. To enable stealth mode, the setting system.output.pxl.disable_status_indicator must be set to true on the Vizomo processor.
	White	Tile is powering up
	Magenta	Tile has booted, but not yet receiving data
	Orange	Top or bottom data link is working properly
	Blue	Both data links are working properly
	Green	**Video data is being received (normal operation)**
	Flashing Red	Error

Notes: Beaufort Scale

The following table is used as a reference for wind speed calculations throughout this guide.[1]

Beaufort Scale	Wind Speed (km/hr)	Wind Speed (miles/hr)	Wind Conditions
12	≥ 118	≥ 73	Very widespread damage to vegetation. Some windows may break; mobile homes and poorly constructed sheds and barns are damaged. Debris may be hurled about.
11	103 – 117	64 – 72	Widespread damage to vegetation. Many roofing surfaces are damaged; asphalt tiles that have curled up and/or fractured due to age may break away completely.
10	89 – 102	55 – 63	Trees are broken off or uprooted, saplings bent and deformed. Poorly attached asphalt shingles and shingles in poor condition peel off roofs.
9	75 – 88	47 – 54	Some branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies.
8	62 – 74	39 – 46	Some twigs broken from trees. Cars veer on road. Progress on foot is seriously impeded.
7	50 – 61	31 – 38	Whole trees in motion. Effort needed to walk against the wind. Swaying of skyscrapers may be felt, especially by people on upper floors.
6	39 – 49	25 – 30	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult. Empty plastic garbage cans tip over.
5	29 – 38	18 – 24	Branches of a moderate size move. Small trees begin to sway.
4	20 – 28	13 – 17	Dust and loose paper raised. Small branches begin to move.
3	12 – 19	8 – 12	Leaves and smaller twigs in constant motion.
2	5.6 – 11	4 – 7	Wind felt on exposed skin. Leaves rustle.
1	1.1 – 5.5	1 – 3	Wind motion visible in smoke.
0	< 1	< 1	Calm. Smoke rises vertically.

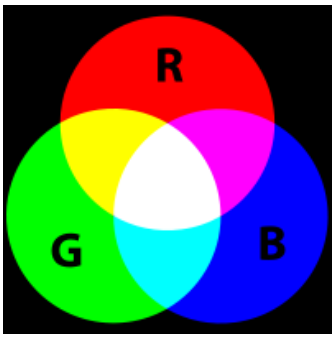
1. Beaufort scale, http://en.wikipedia.org/w/index.php?title=Beaufort_scale&oldid=303100822 (last visited July 20, 2009).
2. The names "storm" and "hurricane" on the Beaufort scale refer only to wind strength, and do not necessarily mean that other severe weather (for instance, a thunderstorm or tropical cyclone) is present.
   To avoid confusion, strong wind warnings will often speak of e.g. "hurricane-force winds".

Notes: C-series Color

Additive Color Mixing

Like TVs and computer screens, each pixel of a C-series display emits light. Because the LED pixels emit light, different colors are created additively; that is, the color of each pixel is created by mixing one or more primary colors together. This is in contrast with printed or painted images, which reflect light from a surface and use a subtractive color model. In the additive model, the three primary colors for human vision are defined to be red, green, and blue. By mixing together each component in different amounts, different hues and intensities can be produced. For example, mixing red and green in equal amounts produces a yellow color. Keeping the ratio of red to green equal and varying their intensity together allows different brightnesses of yellow to be made.

Additive Color:



A C-series screen takes advantage of additive color mixing by grouping three or more differently colored LEDs to form a pixel. Each LED can then be set to a corresponding brightness to provide the required color mix.

Luminance Correction

Understanding LED light output is an important factor for creating precise colours. Not all LEDs are created equally, and have many characteristics controlling both the emitted color and intensity. This is further complicated by how the human eye actually perceives the emitted light. For example, at equal intensities, green LEDs typically appear much brighter than red or blue LEDs as the human eye is more sensitive to green. This means that illuminating red and green LEDs equally does not generate yellow as expected, as the sensitivity bias of the human eye towards green would result in a yellowish shade of green.

These luminance differences are compensated for by adjusting the LED brightnesses accordingly. This allows for LEDs within a pixel to mix correctly, and neighboring pixels to appear as if they have the same brightness.

Think of it as mixing paint. Where one bucket has a much stronger color than the other. i.e. you need more from the red bucket than the green bucket to get yellow.

Defining Color

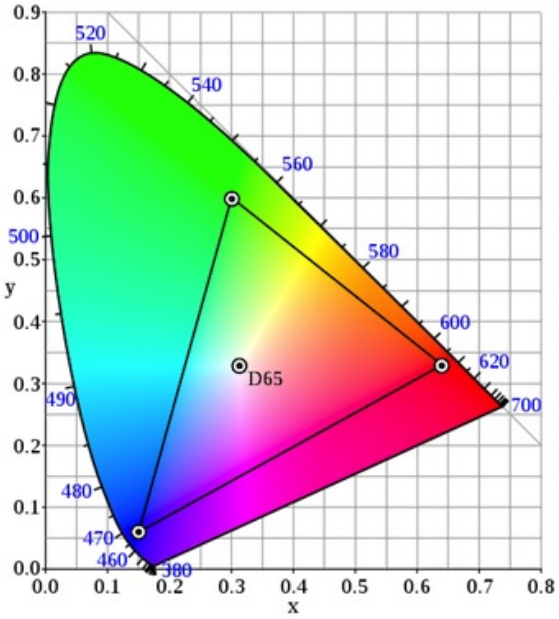
What is yellow? Is yellow the color of sunshine when seen through a low morning fog on a cold Sunday morning? Perhaps yellow is the color of Daffodils that line a nearby stream as it meanders through a calm meadow. While somewhat poetic nether of those help us define what yellow actually is.

Fortunately, the International Commission on Illumination (CIE) mathematically defined the ‘CIE 1931 XYZ color space’. Using this model we can define all visible colors.

So, now we can compare thee to a summer’s day... Yellow is as lovely as x=0.42, y=0.51.

Ahem.

CIE 1931 diagram with sRGB gamut:



The CIE 1931 XYZ color space lies within a horseshoe shaped locus on a two dimensional coordinate system. Points within the color space are uniquely defined with both an x and a y coordinate. These two values make up the "address" for a particular color. To find the yellow color referred to above, locate the intersection of x=0.42 and y=0.51 on the chart. This also works in reverse where the coordinate of any color can be determined by locating the color in the space, and then reading off the x and y values of that color.

Displaying True Color

These chromaticity coordinates allow us to define each color that we want to display. However, before we can begin to display a color we must define the actual colors we have from the LEDs in the C-series panels. Due to the variability in manufacturing tolerances and availability of dyes used to create LEDs, red, green, and blue LEDs are never going to perfectly match the CIE coordinates for true red, green, and blue. In order to create a color space that the C-series panel can display, each LED panel is measured by a specialized camera. This information allows the Vizomo processor to later compensate with the correct combinations of actual LED source colors that are needed to hit our true CIE target colors.

If you look closely at a C-series panel displaying the color yellow you will notice that the red, green, and blue LEDs are all on at various intensities. Why blue? The three primary colors, red, green, and blue, form a triangle on the CIE color chart. A contribution from each point of the triangle is needed to achieve a target color within the space. Colors along the edge of the triangle may be created by only mixing the two colors at the ends of that edge, and for each red, green, and blue primary, only that color contributes.

Our LED source color coordinates are fixed. We can only show a target color by adjusting (up or down) the brightness of our source colors. If we want a less red color we can either turn red down or both green and blue up.

To create true yellow, choosing a point between red and green is not enough. We must also apply some blue to pull the point down a bit in the triangle and reach the required target.

Similarly, if you create a pure red image on your computer you may see non red LEDs turn on when displayed on a color corrected LED screen. This is because red LEDs are not the same color as pure red in CIE coordinates. As such, the color correction is compensating by adjusting the output to match the color of the input.

Viewing True Color

In the discussion above, the additive color model was used to determine what quantities of the primary colors were needed to produce a specified color. To follow this model correctly, each primary color should be mixed optically. That is, the light generated by each primary color should be mixed so that they overlap, and no amount of closer examination should be able to separate one from the other. An example of this would be taking three primary colored lamps and projecting them onto a surface, where they mix.

To simplify their design, most direct view display devices such as CRTs, LCD and plasma panels, and LED displays, all place primary colored sub-pixels side by side, rather than mixing them into one dot per pixel. By shrinking the geometric size of the sub pixels (the individual color components) and placing them close enough together, at a specified viewing distance the eye can no longer resolve the individual sub pixels in space, and it blurs or fuses them together into one pixel. This is called color convergence.

C-series displays are designed to be viewed from a much larger distance than a TV or computer monitor, and as such, the minimum distance necessary for color convergence to occur is much larger. Because of the ease at which C-series displays can be closer, it may appear as though the colors don't look right when viewed from this distance. For example, as mentioned before, to display a specified "pure" red may require mixing in a small amount of blue or green, depending on the chromaticity coordinate of the red sub-pixel being used. Observing this "pure" color from less than the minimum viewing distance may seem incorrect, as the blue and green LEDs will clearly be illuminated. However, moving further away until color convergence is achieved will resolve this issue.

3. Helix P1

3.1 Installation Guidelines
3.2 Helix System Overview
3.3 Power & Data Distribution
3.4 Helix P1 Assembly & Mounting

3.1 Installation Guidelines

- Helix P1 pixel strings have an IP66 rating and are suitable for use in most indoor and outdoor installations except where water immersion could occur. This conforms to the International Electrotechnical Commission (IEC) standard 60529.
- Helix PXL Node Boxes have an IP65 rating and are suitable for use in most indoor and outdoor installations except where water immersion could occur. This conforms to the International Electrotechnical Commission (IEC) standard 60529.

Power Guidelines

DANGER

Risk of electrical shock. No user-serviceable parts inside.
Observe all applicable electrical codes.
The power outlet shall be installed near the equipment and shall be easily accessible.
Do not hot plug any cables. Damage to the connector pins may occur. Resulting damage is not covered under warranty.

Observe the following power guidelines when setting up your Helix P1 display:

Max current draw of one PXL Node with four (4) P1 pixels strings is 0.5A @ 200-240VAC 50/60Hz.
Maximum # of PXL Nodes per PDB-5 output = 20
Maximum # of PXL Nodes per PDB-5* w/ 1 x 16A input = 32
Maximum # of PXL Nodes per PDB-5* w/ 2 x 16A input = 64

* PDB-5 has 32A limit (2x 16A).

When running typical video content, the duty cycle (average power consumption) is about 30% of maximum.

Temperature

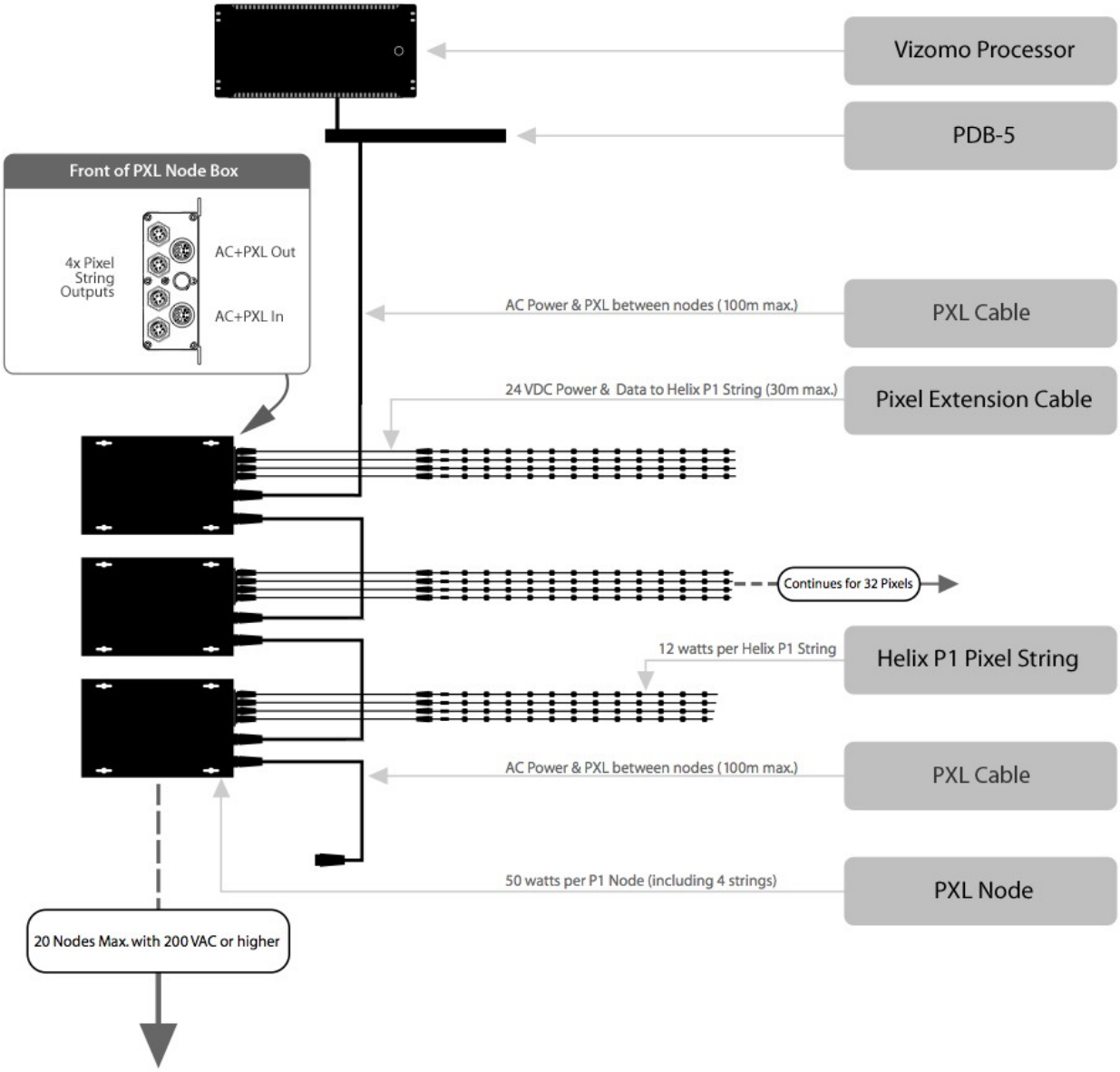
Helix installations must take into account the operating temperature of the PXL Nodes. The ambient operating temperature for a PXL Node is -20°C to 45°C.

NOTE
Helix PXL Nodes have an internal temperature sensor that shuts down the output (brightness is set to 0) when internal temperature is too high. The brightness will return to normal when the internal temperature has cooled sufficiently.

3.2 Helix System Overview

3.2.1 Basic System Info
3.2.2 Helix P1 Pixel String Overview
3.2.3 PXL Node Box Overview

3.2.1 Basic System Info



3.2.2 Helix P1 Pixel String Overview

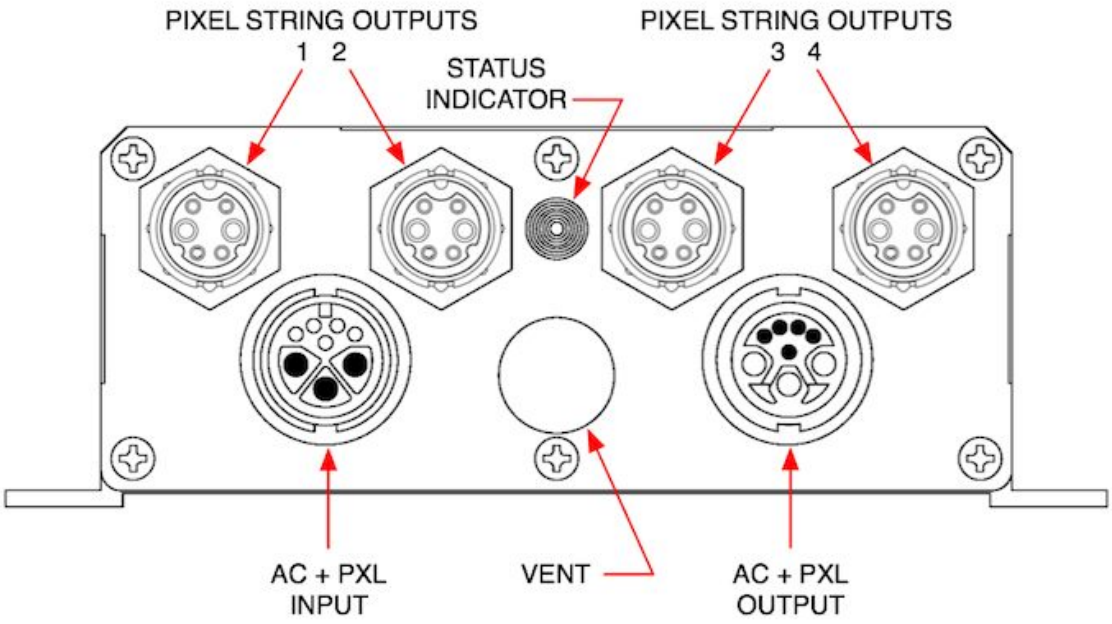
Each Helix P1 pixel string has three parts:

1. Input Connector - this connects to the outputs on a PXL Node Box
2. Pixel Zero - a small power and data converter
3. 32 Pixels - 75mm or 150mm spacing

3.2.3 PXL Node Box Overview

The PXL Node Box takes AC power and PXL data in, converts this to 24VDC and data out to four strings, and passes AC power and PXL data through to the next PXL Node Box.

All connections are on one end panel of the box:



1. AC + PXL INPUT - black body - This uses the standard PXL Cable Connector.
2. AC + PXL OUTPUT - white body - This uses the standard PXL Cable Connector.
3. PIXEL STRING OUTPUTS - Four independent outputs, each can feed one P1 pixel string
4. STATUS INDICATOR - Multicolor LED indicator
5. VENT - IP65 gas-permeable microporous membrane vent

3.3 Power & Data Distribution

3.3.1 Power & Data Overivew
3.3.2 Power Input
3.3.3 PXL Node Status Indicator
3.3.4 Pixel Extension Cables

3.3.1 Power & Data Overivew

The PDB-5 handles the power and data distribution for Helix P1 systems. All power & data cabling between the PDB-5 and PXL Node Boxes is done through integrated, cabling with color-coded male or female connectors.

Alternative installations without a PDB-5 can make use of a break-in cable which accepts AC power and Ethernet data connections (P/N 350-0660).

Connectors on the front of a PXL Node Box are color-coded as follows:

- Black Connector = Power & Data In
- White Connector = Power & Data Out

The connectors on the cables are also color-coded, so it's easy to connect black to black, and white to white.

3.3.2 Power Input

Each PDB-5 has 2x 16 amp inputs and 6x 10 amp outputs with breakers for AC power distribution.
The limit for each PDB-5 output is 10A, with a total output of 32A maximum per PDB-5.
Refer to the PDB-5 User's Guide for more information.

Observe the following power guidelines when setting up your Helix P1 display:

Max current draw of one PXL Node with four (4) P1 pixels strings is 0.5A @ 200-240VAC 50/60Hz.
Maximum # of PXL Nodes per PDB-5 output = 20
Maximum # of PXL Nodes per PDB-5* w/ 1 x 16A input = 32
Maximum # of PXL Nodes per PDB-5* w/ 2 x 16A input = 64

* PDB-5 has 32A limit (2x 16A).

When running typical video content, the duty cycle (average power consumption) is about 30% of maximum.

WARNING

Do not hot plug any cables. Damage to the connector pins may occur. Resulting damage is not covered under warranty.

3.3.3 PXL Node Status Indicator

The status indicator located on the front of the PXL Node Box allows you to easily monitor the status of the node.

Off	No Power (Note: the status indicator remains black for a few seconds when the PXL Node Box is first powered on)
White	PXL Node Box powering up
Magenta	PXL Node Box booted
Orange	Top or bottom data link working properly
Blue	Both data links working properly
Green	Video data is being received
Flashing Red	Error

3.3.4 Pixel Extension Cables

Helix P1 pixel strings can be located remotely from the PXL Node Box by using a Pixel Extension Cable.

These are available in four lengths and can be combined together.

Do not exceed 30m in total length from the PXL Node Box to the pixel string.

Part Number	Name
350-0654	Helix P1 Extension Cable - 1m
350-0490	Helix P1 Extension Cable - 3m
350-0491	Helix P1 Extension Cable - 10m
350-0636	Helix P1 Extension Cable - 30m

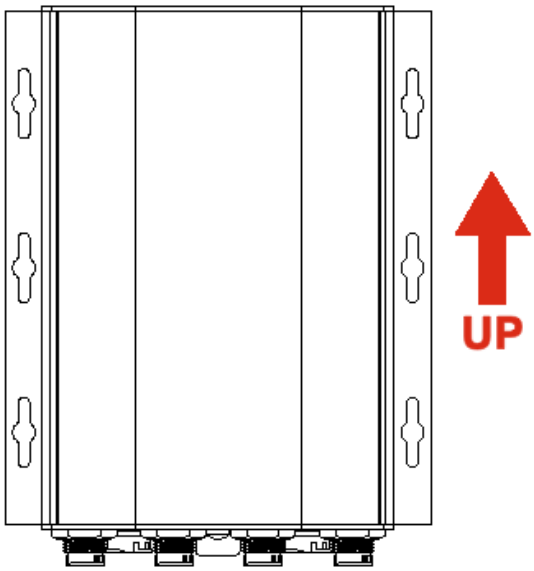
3.4 Helix P1 Assembly & Mounting

PXL Node Box Mounting

The PXL Node Box has six double-ended keyhole slots for mounting.
The center hole is 8.5mm in diameter
The slots are 4.5mm in diameter

When used indoors the PXL Node Box may be mounted in any orientation.

When used outdoors, or in any wet location, the PXL Node Box must be mounted with the connectors facing down, as follows:



The membrane vent located on the connector panel is rated for IP65 (all other components of the enclosure are rated for IP66 or better).
The vent will withstand standing water (up to IP67) for 30 minutes, so for continuous use in an outdoor or wet environment the box must me mounted so the connectors and membrane vent are facing down. This will prohibit and liquid water from pooling on or around the vent.

P1 Pixel String Mounting

The pixel strings are rated IP66 and can be mounted in any orientation, both indoors and outdoors.

Follow the following safety guidelines when mounting the strings:

- Do not flex the cable beyond its minimum bend radius of 10mm
- Do not flex the cable near the entry to the plastic pixel housing
- Do not deform the cable with mounting hardware
- If using a cable staple, use an insulated plastic version, like this:

NOT this:

- Do not puncture the cable or the pixel housing

4. Vizomo

4.1 Vizomo Quick Start Guides
4.2 General Overview
4.3 Configuration and Operation
Appendix A: Specifications
Appendix B: Video File Encoding

4.1 Vizomo Quick Start Guides

4.1.1 Installing Vizomo Controller
4.1.2 Connecting with Vizomo Controller
4.1.3 Upgrading Vizomo
4.1.4 Mapping
4.1.5 Licensing
4.1.6 Adding and Playing Media
4.1.7 Capturing Video
4.1.8 Troubleshooting Choppy Video

4.1.1 Installing Vizomo Controller

Vizomo Controller can be installed on any PC running Windows XP, Vista, or Windows 7 and is available from the Barco Creative LED support page: http://cled.barcousa.com

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NOTE:

If a previous version of Vizomo Controller exists use add/remove programs in the Windows Control Panel to remove it. If you do not do this the Vizomo Controller Installer will not be able to complete the installation.

To install the Vizomo Controller:

- Double click the VizomoControllerSetup.exe
- Follow the prompts.
- Microsoft's .Net Framework may need to be installed. If so, the machine will need to be connected to the internet to download the files. The installer will guide you through the process.

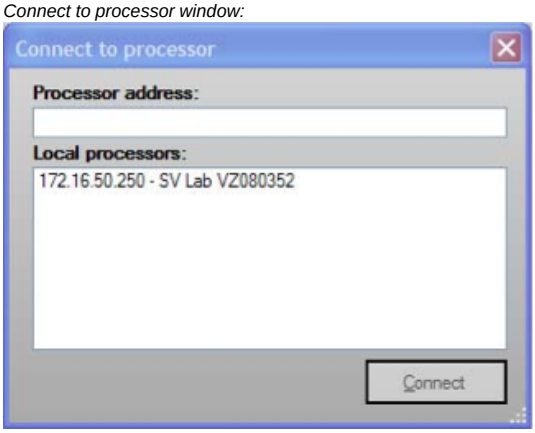
Once the installer has finished, Vizomo Controller can be found in the Start menu under "Programs\ Vizomo". By default the application is installed to:

c:\Program Files\Barco\VizomoController

4.1.2 Connecting with Vizomo Controller

When Vizomo Controller launches, the “Connect to processor” window opens listing processors found on your LAN. You can either select one of the processors listed or enter the IP address of another processor.

Connect to processor window:



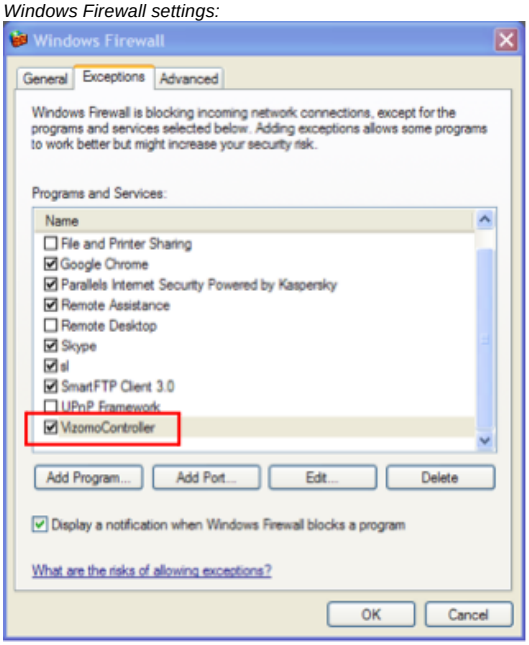
After you select a processor, you need to log in with a user name and password. By default, the Vizomo Controller has only an admin user with the following info:

- User Name = admin
- Password = vision

NOTE:

If you know that you have an active Vizomo on your LAN but you can not see it listed in the processor window, check that Windows Firewall has an exception to allow Vizomo Controller access to search for processors.

Windows Firewall settings:



NOTE: For information on connecting to a Vizomo with RasterMAPPER see 6.6.1 Processor List

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4.1.3 Upgrading Vizomo

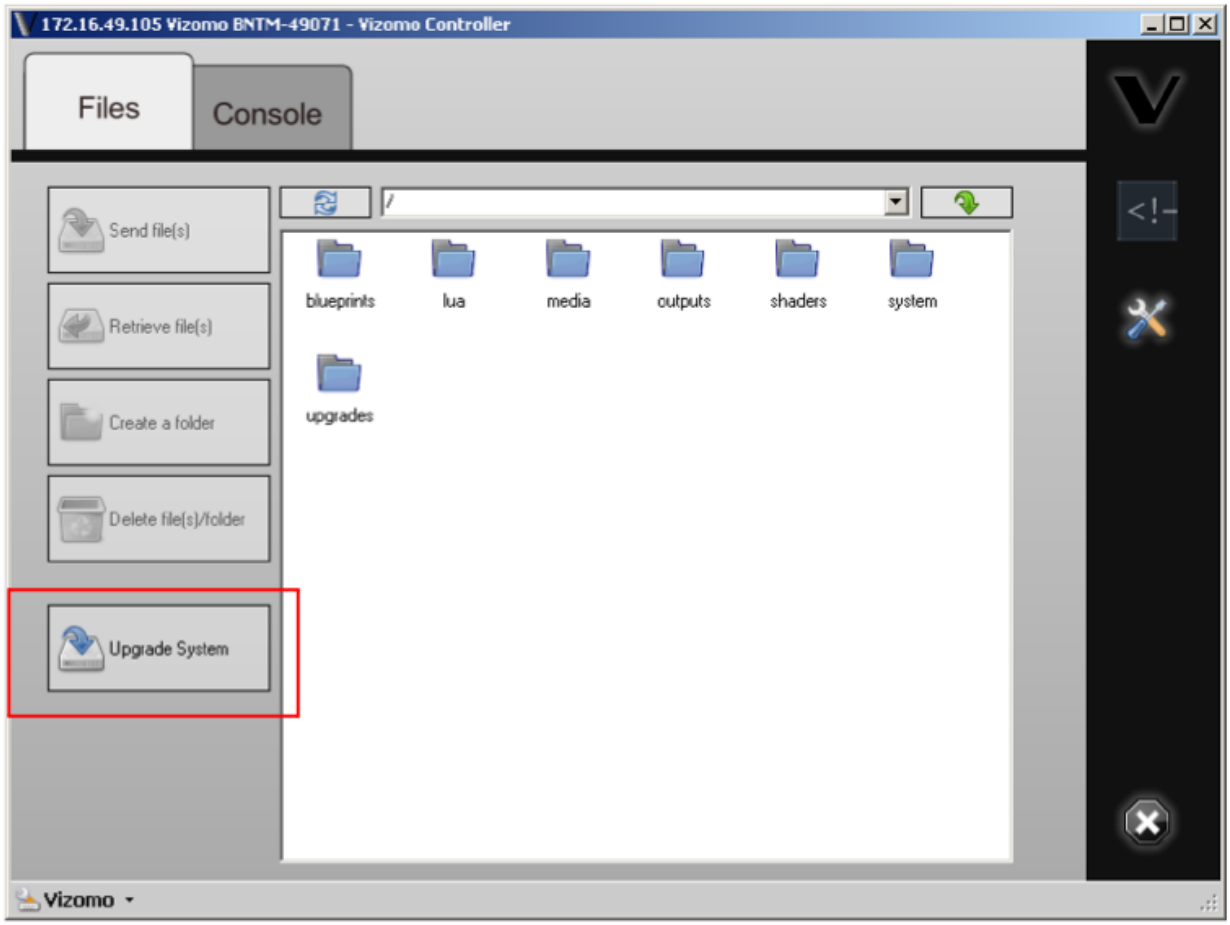
Vizomo upgrade files (labeled with a .vuz extension) can be downloaded from http://vizomo.com.

There are two methods for transferring .vuz files to a Vizomo.

1. Vizomo Controller method
2. RasterMAPPER method

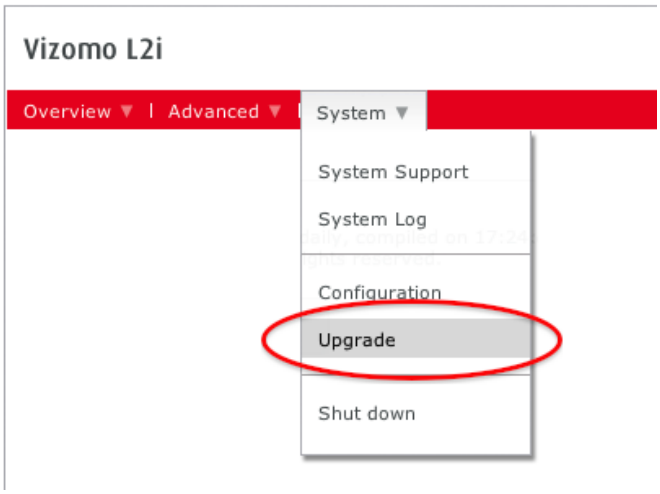
1. Vizomo Controller:

On the **System Settings** page on the **Files** tab, press the ***Upgrade System*** button. A file browser will appear. Select the .vuz to be transferred to the Vizomo. After the .vuz file is transferred, the upgrade automatically executes. If necessary the Vizomo will automatically restart.



2. RasterMAPPER:

Navigate to ***System > Upgrade*** on the webUI of RasterMAPPER.



Press ***Upgrade System*** to transfer a vuz file from the local computer running RasterMAPPER to the remote Vizomo. After the upgrade .vuz file is transferred, the upgrade automatically executes. If necessary the Vizomo will automatically restart.

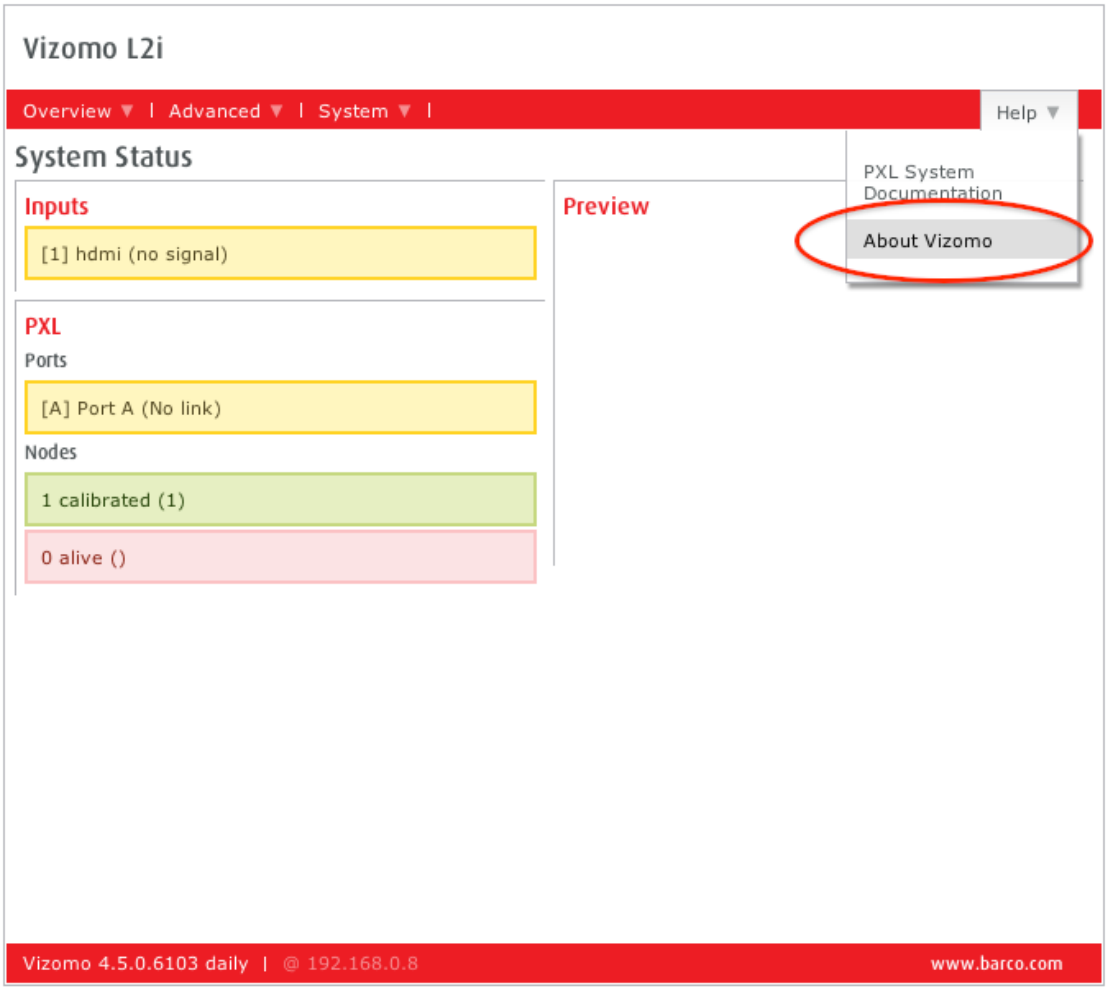
4.1.4 Mapping

Building and uploading maps for Vizomo is done with RasterMAPPER software available from Barco. For the quick start guide to RasterMAPPER, see the 6.4 RasterMAPPER QuickStart section.

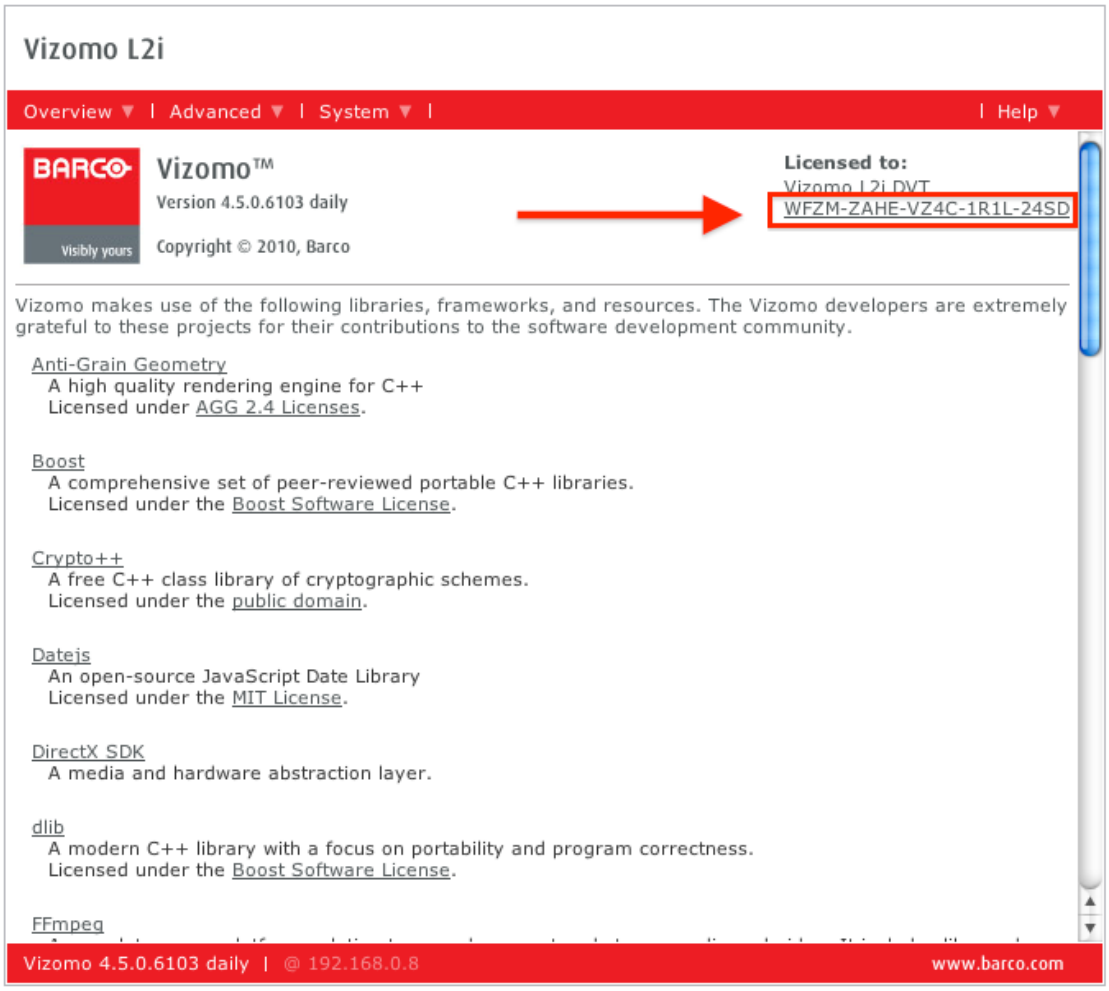
4.1.5 Licensing

Vizomos are all licensed when they are built. However, occasionally it becomes necessary to obtain a new license. The following steps describe the process of obtaining and loading a new license file.

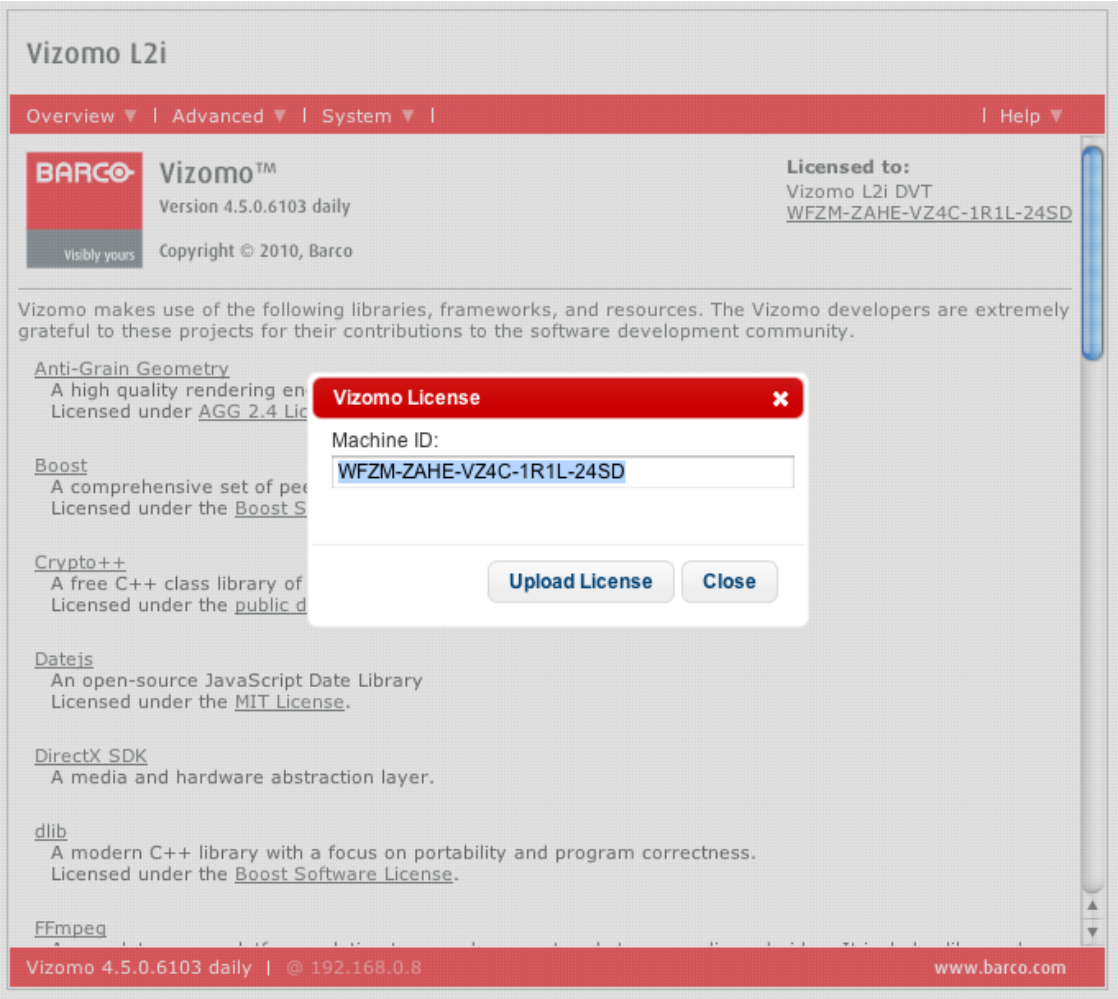
A Vizomo license is a unique text file that is loaded onto a Vizomo. A machine ID is required to generate a license for a Vizomo. When RasterMAPPER is connected to a remote Vizomo it can be used to retrieve a Vizomo's machine ID by navigating to the 'About' page in the 'Help' Menu.



The 'About' page will display the machine ID of the remote Vizomo.



Select the machine ID and another window will pop up from where the machine ID can be copied.



Send the code to customer support with you new license request. Customer support can be reached at 866-374-7878. When you have a new license from customer support press the 'Upload License' button, navigate to your new license and select it for upload. When the license has been transfered to the remote Vizomo the Vizomo software will soft restart.

If the machine ID does not match the unit to which the license is being transfered to, RasterMAPPER will warn with a pop up dialog box such as the one below. Confirm that the machine ID of the Vizomo matches the one in the license.

See also

4.1.1 Installing Vizomo Controller
4.1.2 Connecting with Vizomo Controller
4.1.3 Upgrading Vizomo

4.1.4 Mapping
4.1.6 Adding and Playing Media
4.1.7 Capturing Video
4.1.8 Troubleshooting Choppy Video

4.1.6 Adding and Playing Media

If you are not yet familiar with the type of video content that best suits Vizomo, read Appendix B: Video File Encoding.

Vizomo File formats:

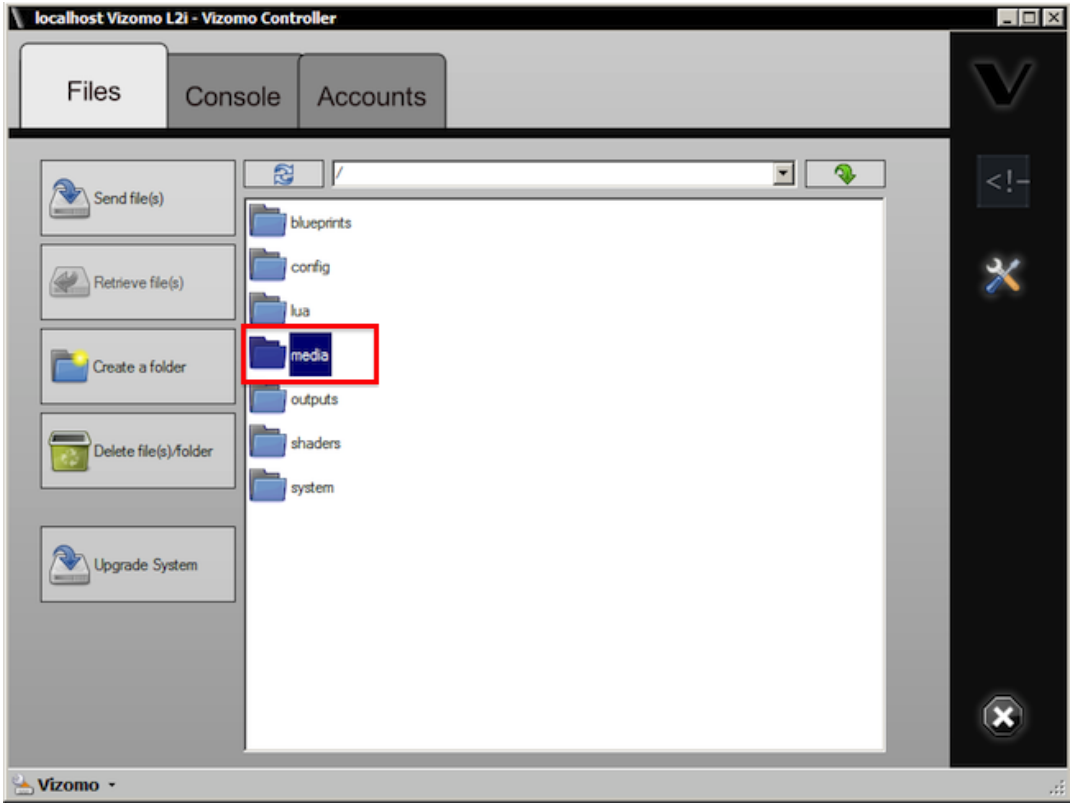
Motion Media
The Vizomo processor can decode H264, MPEG, and MPEG-2 encoded video stored in the following container formats:

- Quicktime Movie (.mov)
- Windows Media (.avi)

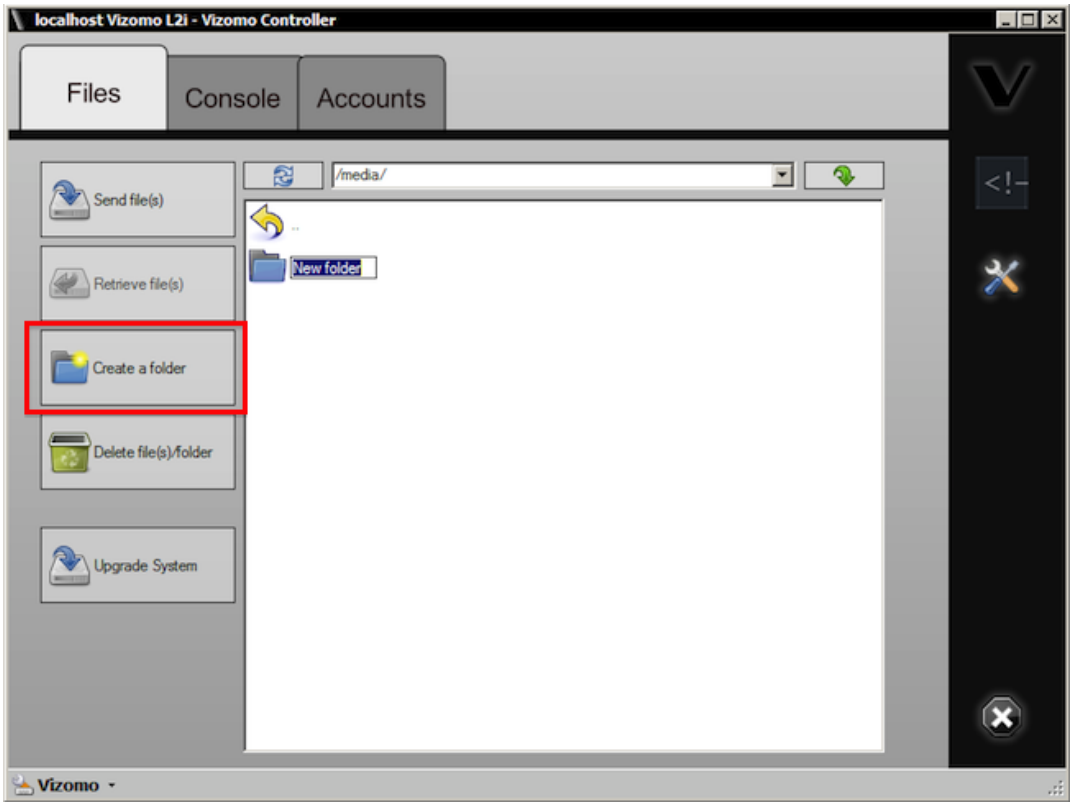
Still Media Formats
The following still image formats are supported:

- Portable Network Graphics (.png)
- Joint Picture Expert Group (.jpeg/.jpg)
- TIFF 8b & 16b (.tiff)

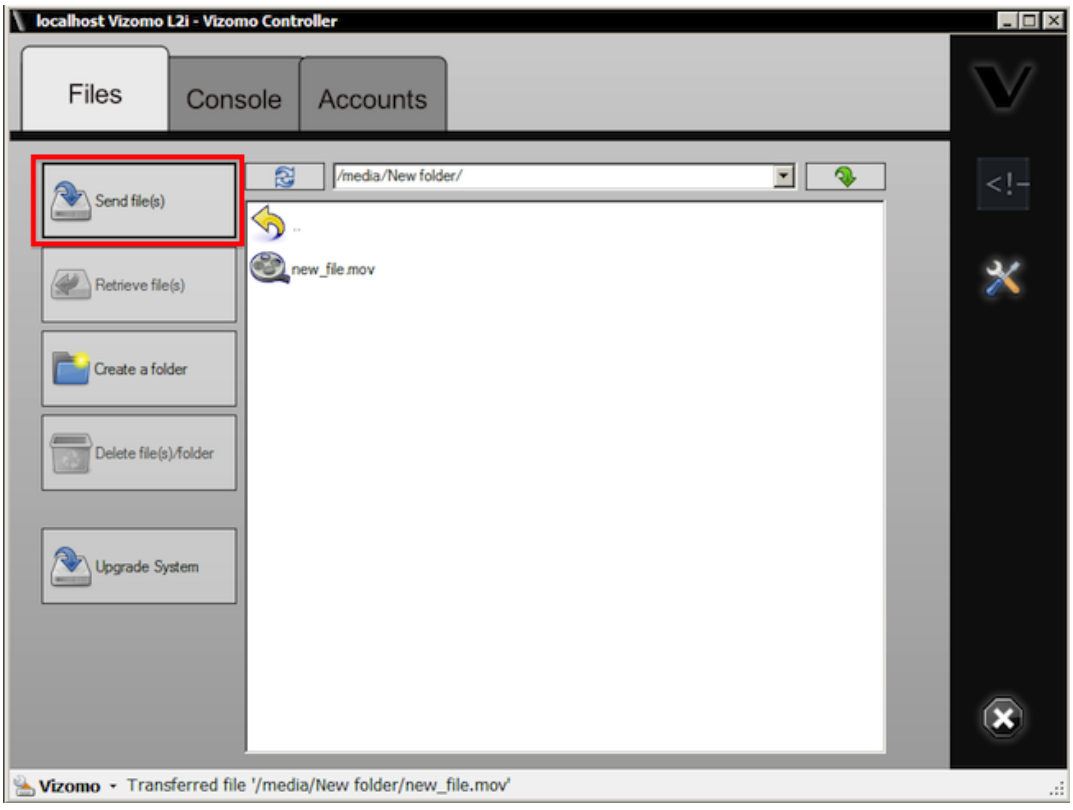
1. Media is added to Vizomo via the Vizomo Controller's file browser. Select the **media** folder.



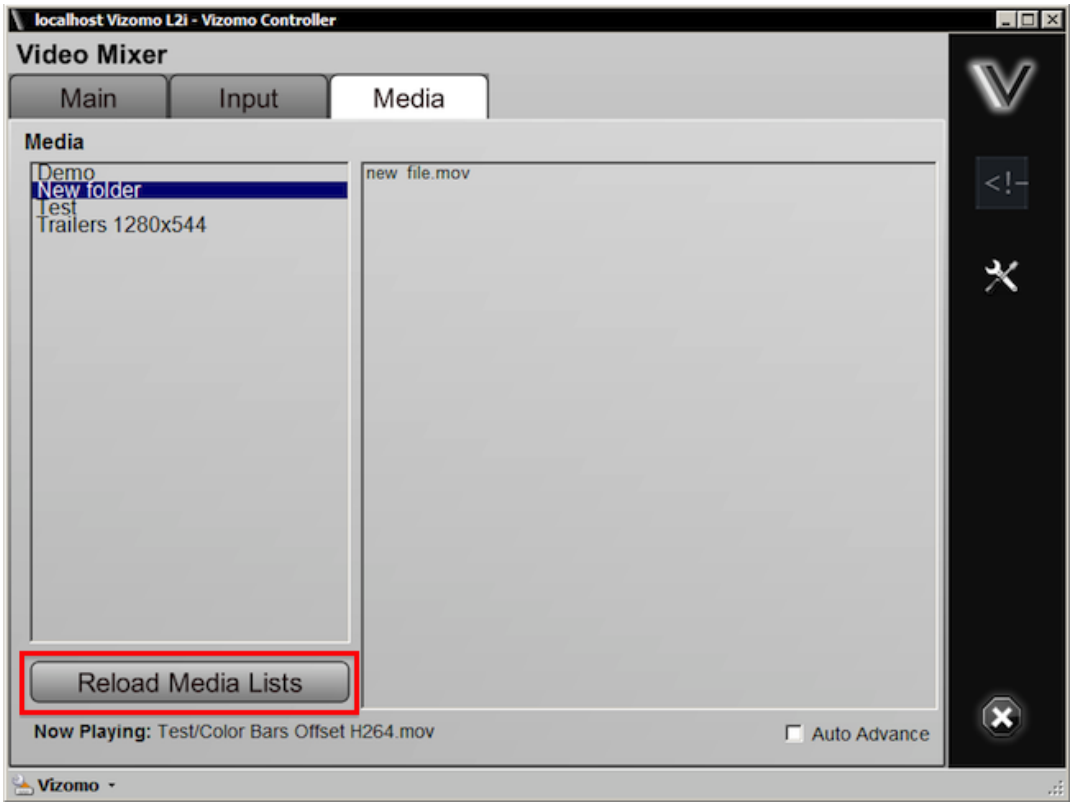
2. Use the **Create a folder** button to create a new folder. Media must be contained inside a folder or it will not be displayed.



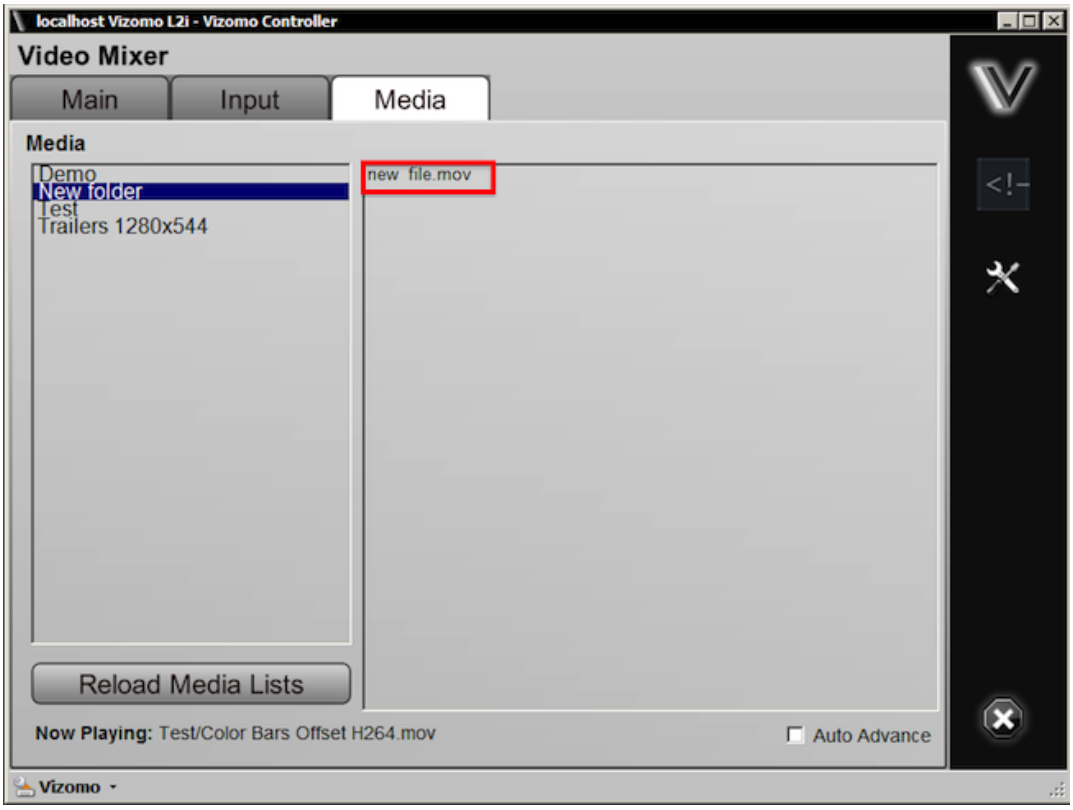
3. Navigate into the new folder and use the **Send file(s)** button to select/send the new file.



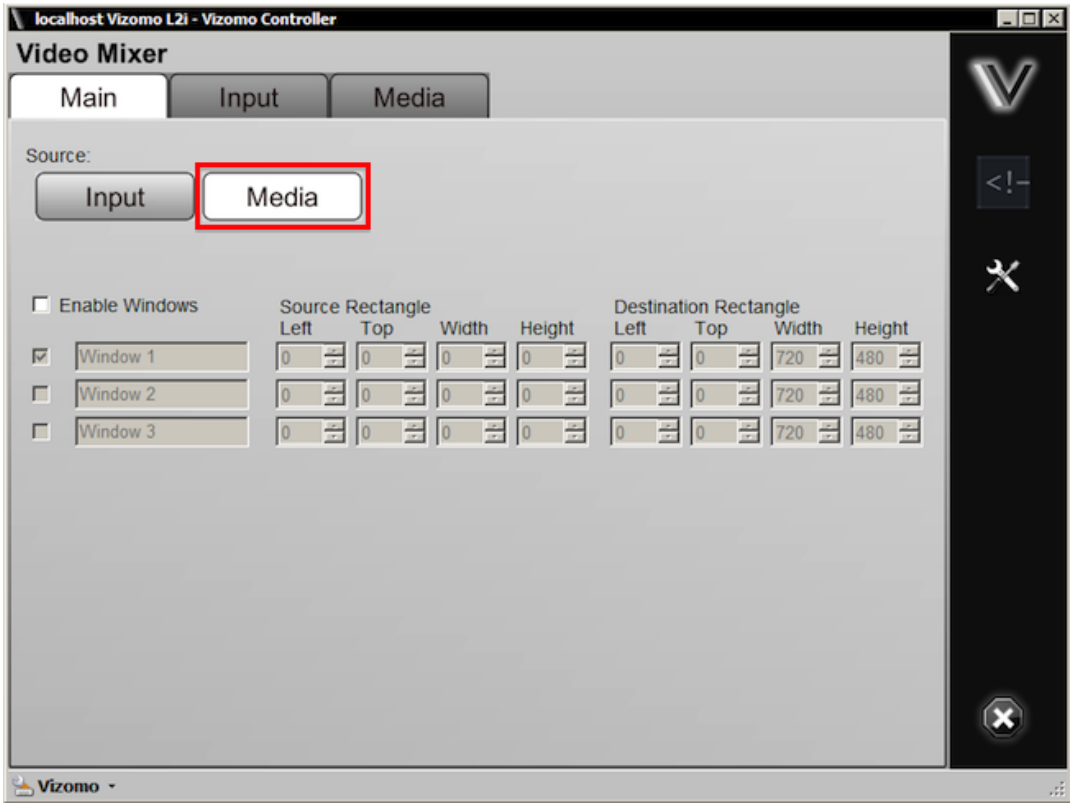
4. In the Video Mixer, the Reload Media Lists button needs to be pressed in order to see the new file(s) that were added.



5. Select the new file for playback.



6. On the ***Main*** tab select ***Media*** to be the source. Content should now be playing.



See also

4.1.1 Installing Vizomo Controller
4.1.2 Connecting with Vizomo Controller
4.1.3 Upgrading Vizomo
4.1.4 Mapping
4.1.5 Licensing
4.1.7 Capturing Video
4.1.8 Troubleshooting Choppy Video

4.1.7 Capturing Video

Capture formats vary by Vizomo model. See 4.2.3 Hardware Overview for a complete list of inputs and outputs by model type.

The current, in production Vizomo models and capture formats are:

L2i: HDMI

The lower HDMI port on the capture card is the input port (circled in red below). Although the connector is HDMI the Vizomo capture card is not HDCP compliant. As such it will not be able to capture the output of most devices that output in native HDMI. Best results are obtained when using a native DVI source with a DVI to HDMI cable.

R2i: SDI and HDMI

The lower HDMI port on the capture card is the input port (circled in red below). Although the connector is HDMI the Vizomo capture card is not HDCP compliant. As such it will not be able to capture the output of most devices that output in native HDMI. Best results are obtained when using a native DVI source with a DVI to HDMI cable.

The middle BNC connector is the SDI input.

HDMI Hookup

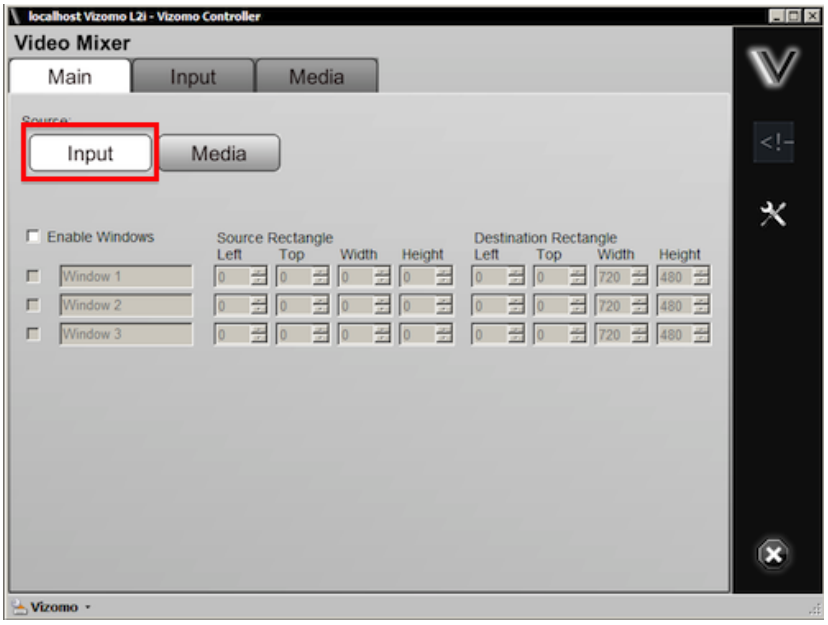
1. Ensure the DVI source is connected to the lower HDMI port on the rear of the Vizomo via a DVI to HDMI adapter cable.

2. Ensure the content is in one of the following resolutions and frequencies:

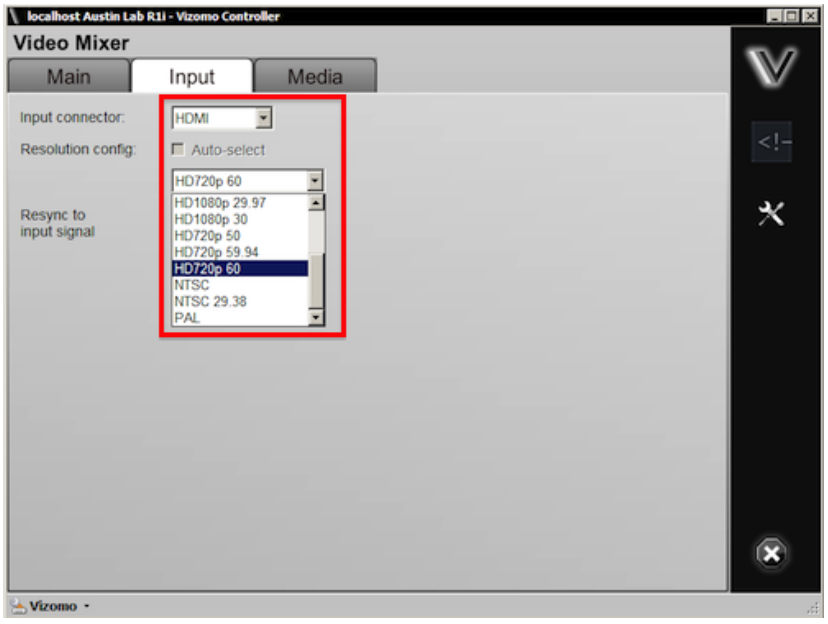
- 480/29.98 NTSC
- 480/29.97 NTSC
- 576/25 PAL
- 720p50
- 720p59.94
- 720p60

- 1080p23.98
- 1080p24
- 1080p25
- 1080p29.97
- 1080p30
- 1080i50
- 1080i59.94
- 1080i60

3. On the Vizomo blueprint ***Main*** tab, select ***Input*** as the source.



4. On the Vizomo blueprint ***Input*** tab, select HDMI and the appropriate resolution/frequency.



NOTE: Some 720p sources are not compliant with the Vizomo capture cards. If 720p does not seem to be working try 1080p@30.

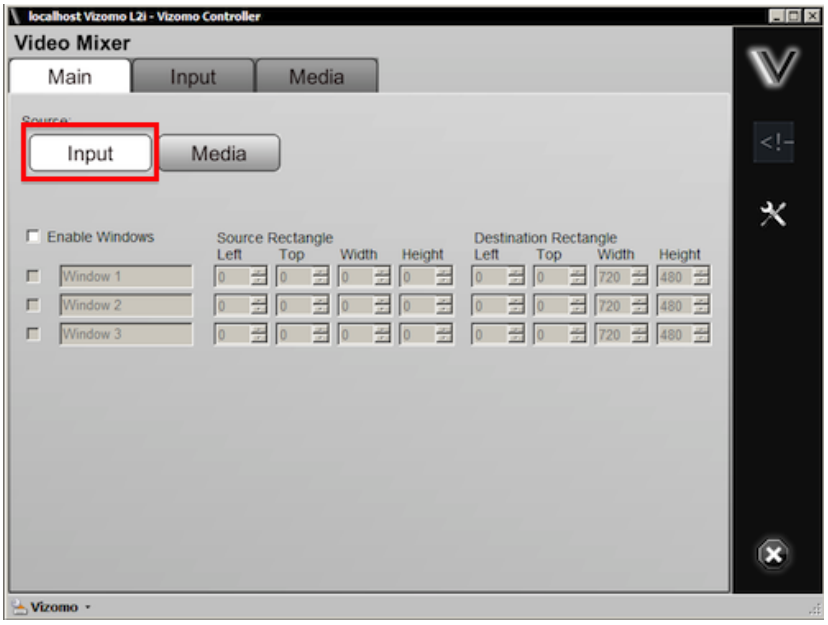
SDI Hookup

1. Ensure the SDI source is connected to the middle BNC port on the rear of the Vizomo via a RG59 cable terminated with true 75 ohm BNC connectors.

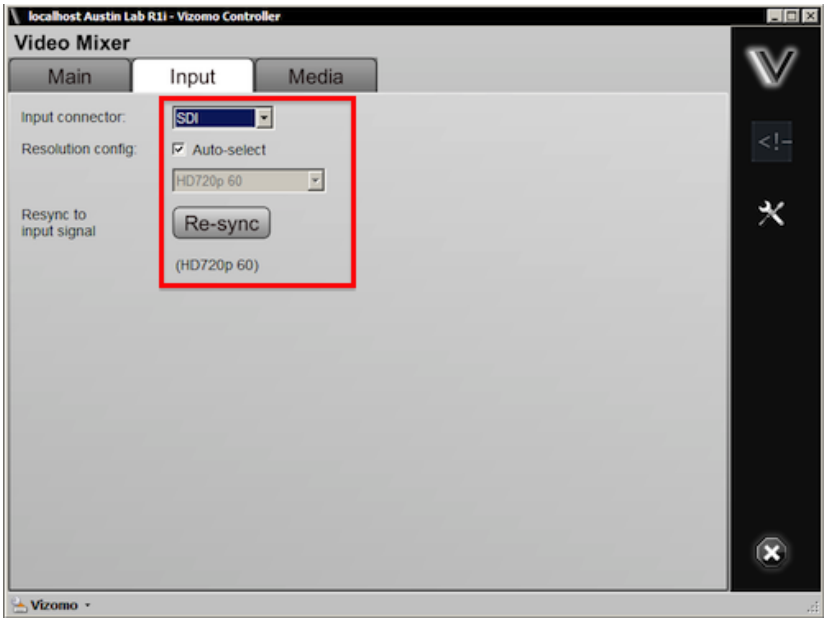
2. Ensure the content is in one of the following resolutions and frequencies:

- 480/29.98 NTSC
- 480/29.97 NTSC
- 576/25 PAL
- 720p50
- 720p59.94
- 720p60
- 1080p23.98
- 1080p24
- 1080p25
- 1080p29.97
- 1080p30
- 1080i50
- 1080i59.94
- 1080i60

3. On the Vizomo blueprint ***Main*** tab, select ***Input*** as the source.



4. On the Vizomo blueprint ***Input*** tab, select SDI and set resolution config to ***auto-select*** or manually set the appropriate resolution/frequency.



NOTE: The Re-sync button will restart the capture interface in the event that a problem has occurred.

See also

4.1.1 Installing Vizomo Controller
4.1.2 Connecting with Vizomo Controller
4.1.3 Upgrading Vizomo
4.1.4 Mapping
4.1.5 Licensing
4.1.6 Adding and Playing Media
4.1.8 Troubleshooting Choppy Video

4.1.8 Troubleshooting Choppy Video

A problem you may encounter during configuration of a Vizomo is the bottom part of the tile not updating as frequently as the top (seen in the image below).

Common Causes:

1**.** Vizomo PXL ports are not running at Gigabit

- Check Vizomo's Status page (see section 6.6.3 webUI) to confirm that all Vizomo PXL ports are running at Gigabit rates.
- Ensure Vizomo is connected to the last port of the PXL switch. The highest numbered port is the only Gigabit port on the switch, and is the one Vizomo should be plugged into.
- Ensure the cable between the Vizomo and the switch is capable of handling Gigabit Ethernet traffic. This means it must be rated as Category 5e (Cat 5e) or better and undamaged.

2. The map is incorrect

- Ensure the correct map is loaded and active on the Vizomo.
- The map should only contain the fixtures that you are actually using.

3. Too many fixtures have been daisy-chained per switch port. The output switch ports run at 100Mbit, and can be overloaded if too many tiles are driven from a single port.

Fixture	Max tiles per PDB-5 or switch output	Max tiles per Vizomo output	Max tiles per R2i Vizomo
C7	8	80	320
C11	16	180	720
C8v	25	300	1200

Note: Evenly load the switch outputs as much as possible. Even though a system of 40 C8v tiles may fit across only two PDB-5 outputs according to the capacity limits listed above (25 tiles on one port, 15 on the other), they should be balanced across all of the switch output ports. A system of 40 tiles should be placed on 6 ports as such: 7,7,7,7,6,6. It doesn't matter which ports are chosen to have fewer tiles.

If all of the above does not resolve the issue, customer support can be reached at 866-374-7878.

See also

4.1.1 Installing Vizomo Controller
4.1.2 Connecting with Vizomo Controller
4.1.3 Upgrading Vizomo
4.1.4 Mapping
4.1.5 Licensing
4.1.6 Adding and Playing Media
4.1.7 Capturing Video

4.2 General Overview

The Vizomo video processor is an advanced LED screen controller. Unsurpassed flexibility and configurability, together with the most advanced video processing technology available, conquers virtually any creative or technical challenge. Use the built-in set of tools to create intricate visual arrangements with real-time video streams. Massive computational power ensures smooth content delivery to your LED screen.

Control Vizomo remotely with Raster MAPPER 4.5.0 software. RasterMAPPER 4.5.0 presents users a clear cut interface with which to harness Vizomo's underlying complexity.

Robust hardware matches the processor's performance.

4.2.1 Key Features
4.2.2 Safety Information
4.2.3 Hardware Overview
4.2.4 Power Up

4.2.1 Key Features

Raster MAPPER

A simple TCP/IP connection between a computer running Raster MAPPER 4.5.0 and a Vizomo processor gives full remote control of multiple processors. A streamlined workflow provides one interface for mapping, PXL addressing, and screen control.

Scaling

Size multiple simultaneous windows with pixel-for-pixel accuracy.

Color processing

The Vizomo processor automatically calibrates C-series screens with selectable white point targets. Superior color reproduction is achieved with an extended color gamut and 128-bit per pixel accuracy.

Powerful

State of the art hardware for very low latency processing of multiple input formats to multiple output ports (on specific models).

Multi-Tap Windowing

Multiple simultaneous cropping. An entire source, or a portion of a source, can be simultaneously directed to several windows via the Multi-Tap function.

4.2.2 Safety Information

WARNING

- Keep connections free of stress to ensure proper operation.
- Do not open the Vizomo chassis, as there is risk of electric shock.
- Do not move the chassis while in operation. Internal components are susceptible to damage caused by vibration during operation.
- Do not block front or rear vents/fans to prevent overheating and/or damage.
- Do not place liquids on or around the unit.
- Do not insert objects through vent slots.
- Do not place magnetic devices near unit.
- Always connect chassis to a grounded power source.
- If using an extension cord, make sure all connections and cords are properly rated to the load.
- Refer all servicing to qualified personnel or Barco, Inc. directly.

4.2.3 Hardware Overview

This page helps to identify the various types of Vizomo processors and their capabilities.

Currently in Production

L2i (530-0319)

Front Items:

On the locking door:

- Product model name
- IP Address label
- Model number label
- Serial number barcode

Behind the door:

- Power on switch
- Reset switch
- 2 x USB 1.2/2.0 connectors
- Power indicator LED
- SSD activity indicator LED
- Intake fan filter

Rear Connections:

Power Input: IEC-C14 100-240V 50/60Hz 620W

Data connections:

- 8 x USB 1.1/2.0
- 2 x USB 3.0
- 1 x PS2
- 1 x PXL output dual 10/100/1000Mbps ethernet port
- 1 x User dual 10/100/1000Mbps ethernet port
- 1 x DVI monitoring output

- 1 x DVI over HDMI connector input (SMPTE 125M, SMPTE 170M, ITU-R BT.656-4, SMPTE 296M-2001, SMPTE 274M-2005)

R2i (R9052942)

Front Items:

On the locking door:

- Product model name
- IP Address label
- Model number label
- Serial number barcode

Behind the door:

- Power on switch
- Reset switch
- 2 x USB 1.2/2.0 connectors
- Power indicator LED
- SSD activity indicator LED
- Intake fan filter

Rear Connections:

Power Input: IEC-C14 100-240V 50/60Hz 620W

Data connections:

- 8 x USB 1.1/2.0
- 2 x USB 3.0
- 1 x PS2
- 4 x PXL outputs on dual 10/100/1000Mbps ethernet ports
- 1 x User Port on a dual 10/100/1000Mbps ethernet port
- 1 x Factory Port on a dual 10/100/1000Mbps ethernet port
- 1 x DVI monitoring output
- 1 x DVI over HDMI connector input (SMPTE 125M, SMPTE 170M, ITU-R BT.656-4, SMPTE 296M-2001, SMPTE 274M-2005)
- 1 x HD-SDI input (SMPTE 125M, SMPTE 170M, ITU-R BT.656-4, SMPTE 296M-2001, SMPTE 274M-2005)
- 1 x Genlock input

NOTE:

The Vizomo R2i unit has two video inputs. One for HDMI and another for SDI capture. Only one active input should be connected at any given time.

Out of Production

R1i (530-0314)

Rear Connections:

Power Input: IEC-C14 100-240V 50/60Hz 750W

Data connections:

- 6x USB 1.1/2.0
- 1 x PS2
- 4 x PXL outputs on dual 10/100/1000Mbps ethernet ports
- 1 x User Port on a dual 10/100/1000Mbps ethernet port
- 1 x Factory Port on a dual 10/100/1000Mbps ethernet port
- 1 x DVI monitoring output
- 1 x DVI over HDMI connector input (SMPTE 125M, SMPTE 170M, ITU-R BT.656-4, SMPTE 296M-2001, SMPTE 274M-2005)
- 1 x HD-SDI input (SMPTE 125M, SMPTE 170M, ITU-R BT.656-4, SMPTE 296M-2001, SMPTE 274M-2005)
- 1 x Genlock input

NOTE:

The Vizomo R1i unit has two video inputs. One for HDMI and another for SDI capture. Only one active input should be connected at any given time.

L1i (530-0317)

Rear Connections:

Power Input: IEC-C14 100-240V 50/60Hz 350W

Data connections:

- 6x USB 1.1/2.0
- 1 x PS2
- 1 x PXL output dual 10/100/1000Mbps ethernet port
- 1 x User dual 10/100/1000Mbps ethernet port
- 1 x DVI monitoring output
- 1 x DVI over HDMI connector input (SMPTE 125M, SMPTE 170M, ITU-R BT.656-4, SMPTE 296M-2001, SMPTE 274M-2005)

4.2.4 Power Up

Follow the steps below to power up the processor:

1. Attach the included IEC-C13 power cord to the unit via the IEC-C14 socket.
2. Plug the other end of the cord into a grounded 100-240V power source.
3. Attach any other cables that are relevant to your setup.
4. Ensure the power switch of the PSU is in the ON position.
5. Press the Vizomo's power switch on the front of the unit behind the locking door.
6. Once Vizomo has finished booting, it can be administered by Vizomo Controller and RasterMAPPER.

4.3 Configuration and Operation

Overview

Vizomo processors are configured over a network connection via two different client applications, RasterMAPPER and Vizomo Controller. RasterMAPPER is responsible for initial setup, including creating maps and setting operating parameters. Vizomo Controller is then used for configuring windowing, media selection, and file management. Once configured, Vizomo processors are operated by both RasterMAPPER and Vizomo Controller, depending on the task.

RasterMAPPER is described in more detail in chapter 6: RasterMAPPER.

4.3.1 Vizomo Configuration
4.3.2 Video Mixer

4.3.1 Vizomo Configuration

The following sections will cover:

4.3.1.1 Software Installation
4.3.1.2 Vizomo Controller Overview
4.3.1.3 Blueprints
4.3.1.4 System Settings
4.3.1.5 Mapping

4.3.1.1 Software Installation

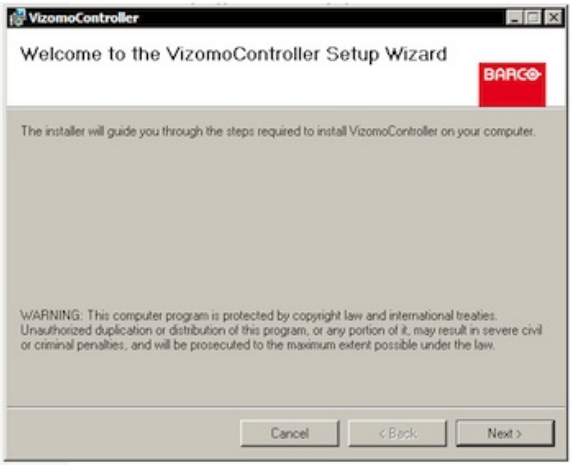
Vizomo Controller can be installed on any PC running Windows XP, Vista, or Windows 7 and is available from the Barco Creative LED support site.

NOTE:

If a previous version of Vizomo Controller exists use add/remove programs in the Windows Control Panel to remove it. If you do not do this the Vizomo Controller Installer will not be able to complete the installation.

The installer ensures all software components that are required are installed.

Vizomo Controller's Installer:



Once Vizomo Controller has been installed, it can be found in the Start menu under

Programs\ Vizomo

By default the application is installed to:

c:\Program Files\Barco\Vizomo Controller

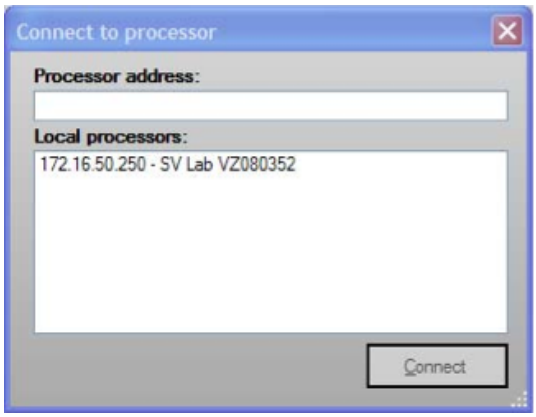
NOTE:

In order to communicate via TCP/IP for laptop control the Vizomo and the laptop must be set to the same IP and subnet range (i.e. 10.0.X.Y).

4.3.1.2 Vizomo Controller Overview

When Vizomo Controller launches, the “Connect to processor” window opens listing processors found on your LAN. You can either select one of the processors listed or enter the IP address of another processor.

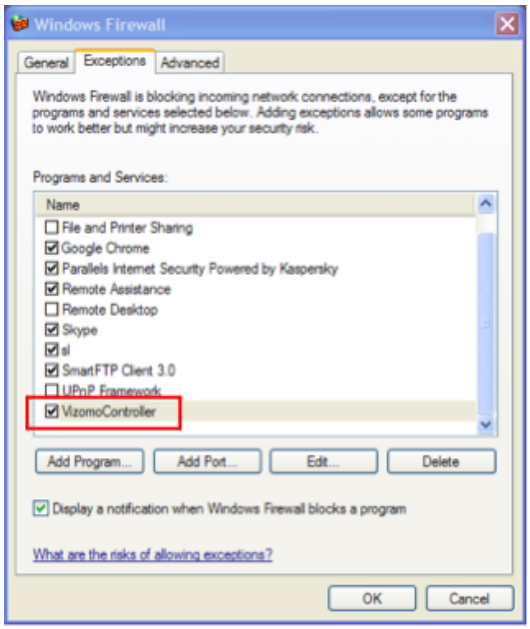
Connect to Processor Window:



NOTE:

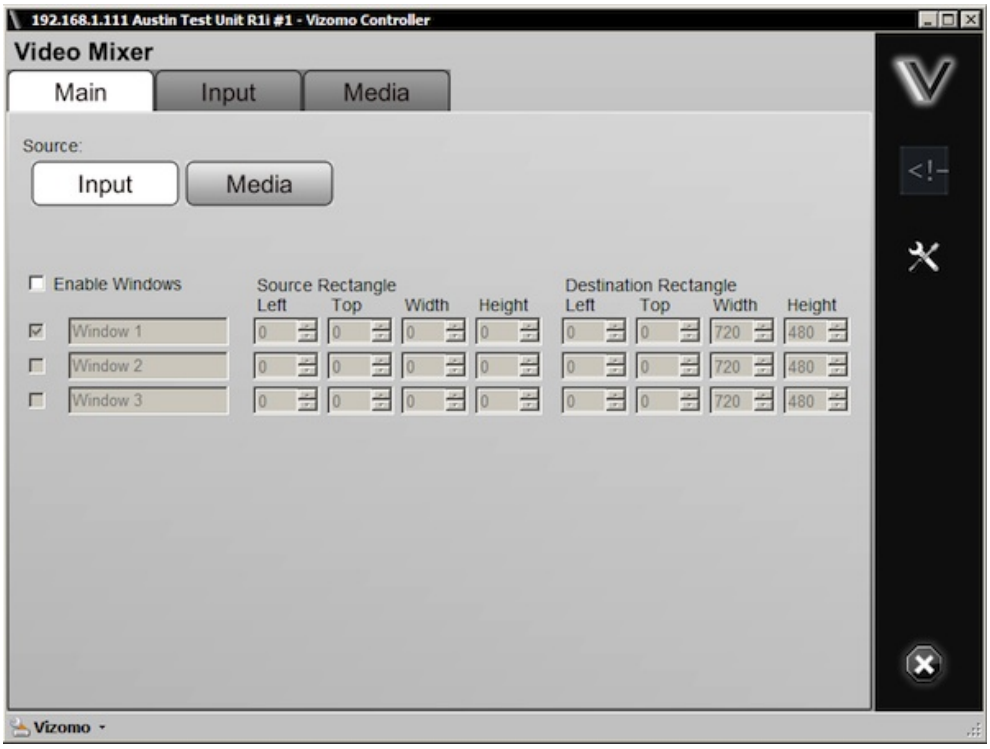
If you know that you have an active Vizomo on your LAN but you can not see it listed in the processor window, check that Windows Firewall has an exception to allow Vizomo Controller access to search for processors.

Windows Firewall Setting



After login, the Video Mixer Blueprint operation screen is displayed.

Video Mixer Blueprint:



The various parts of Vizomo Controller may be navigated using the bar to the right of the window.

Navigation Bar

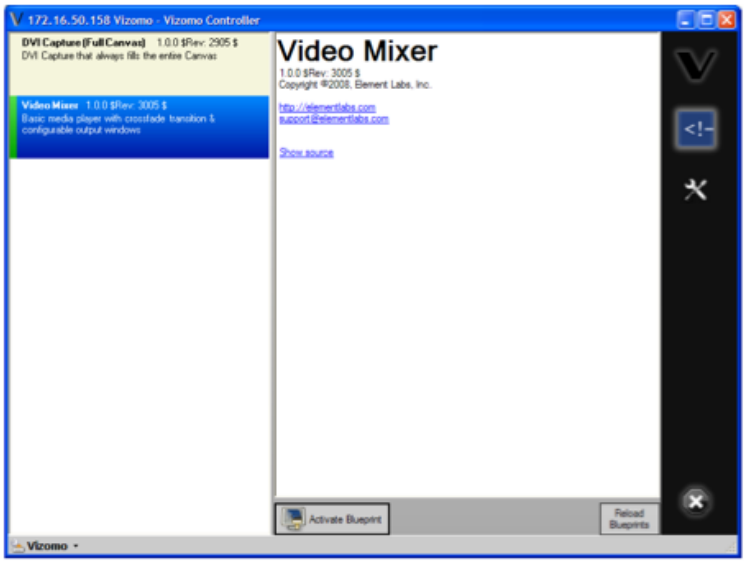
1. Blueprint Operation - Specific controls for the current blueprint.
2. Blueprint Chooser – Selection and activation of blueprints.
3. System Settings – File management (copy, update processor)
4. Stop - Toggles the output to video black.

4.3.1.3 Blueprints

A "blueprint" is a control script for the media engine of the Vizomo processor. A stock Vizomo has only one blueprint, the **Video Mixer**.

The blueprint chooser can be used to re-load the current blueprint if necessary.

Blueprint Chooser:

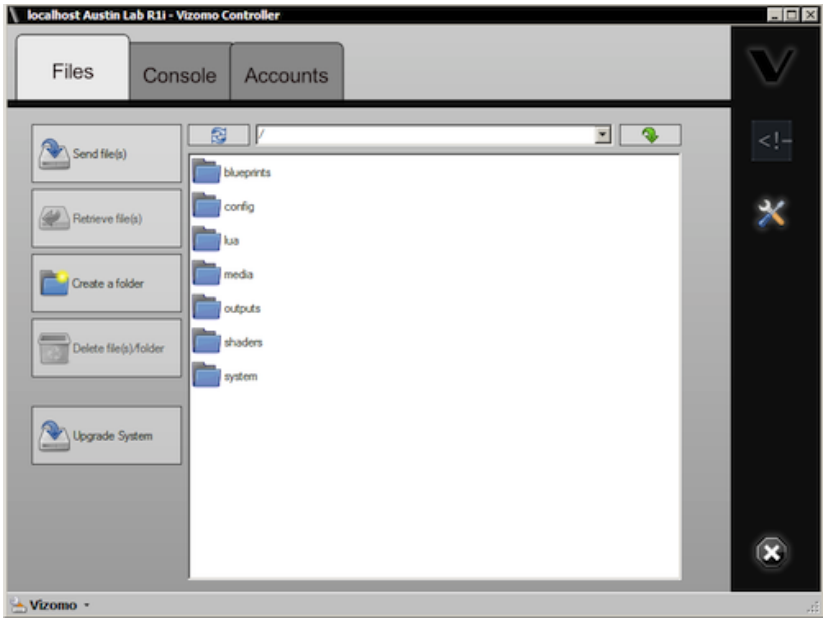


4.3.1.4 System Settings

File Management

The file management interface consists of action buttons on the left and a file browser on the right. At the topmost level of the file browser the folders have the names of all of the different categories of files available (e.g., media).

File Management Window:



Media

Media is laid out in a one-level directory hierarchy, folders reflect categories. To copy or retrieve a file, drag and drop the file or use the function buttons on the left of the window.

Motion Media

The Vizomo processor can decode H264, MPEG, and MPEG-2 encoded video stored in the following container formats:

- Quicktime Movie (.mov)
- Windows Media (.avi)

Still Media Formats

The following still image formats are supported:

- Portable Network Graphics (.png)
- Joint Picture Expert Group (.jpeg/.jpg)
- TIFF 8b & 16b (.tiff)

Upgrades

To upgrade the Vizomo firmware, you need a ".vuz" file. Press the 'Upgrade System' button. A file browser appears. Navigate to the ".vuz" file that is to be used and click 'Open'. The upgrade file is transferred and the upgrade automatically executes. If necessary the destination machine automatically restarts.

4.3.1.5 Mapping

The remainder of Vizomo setup, including mapping, is accomplished with the RasterMAPPER utility. Please see chapter 6: RasterMAPPER for details.

4.3.2 Video Mixer

The Video Mixer Blueprint is the mechanism by which content is controlled in Vizomo. The Video Mixer Blueprint consists of three tabs; Main, Input, and Media. These tabs contains the controls to manage image playback and captured input. The selected content can be scaled with three possible windows.

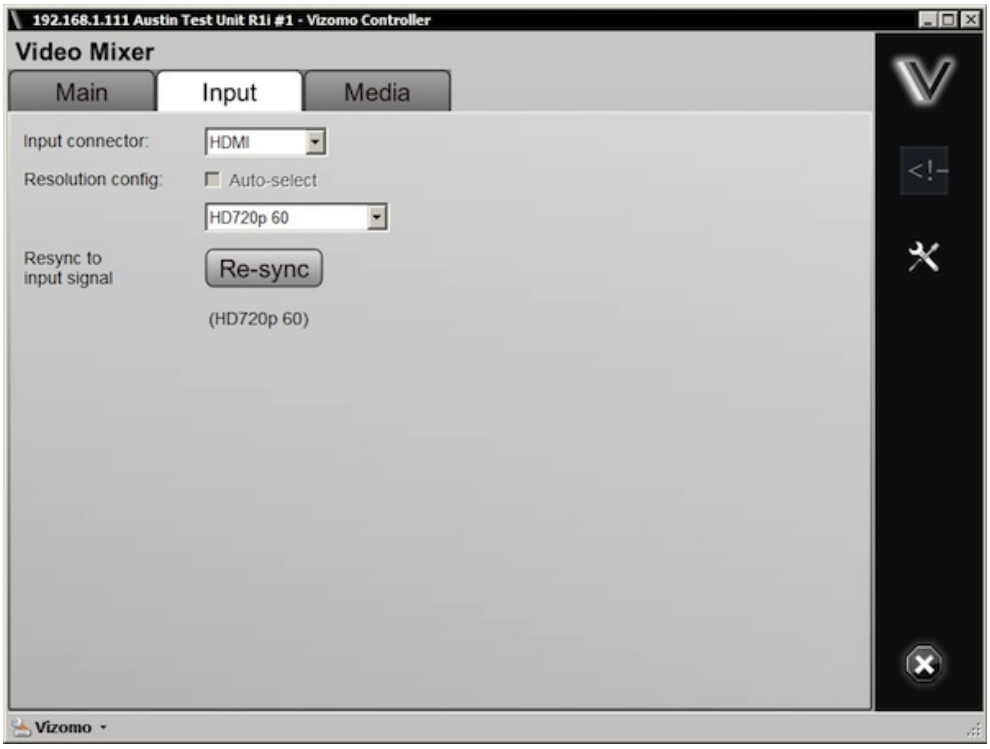
Main Tab

In the Main tab the user is able to choose between displaying a captured Input or on board media. The chosen content can be windowed into 3 copies of the original, all with independent crop, scale, and x, y location.

For a detailed discussion see 4.3.2.1 Windowing

Input Tab

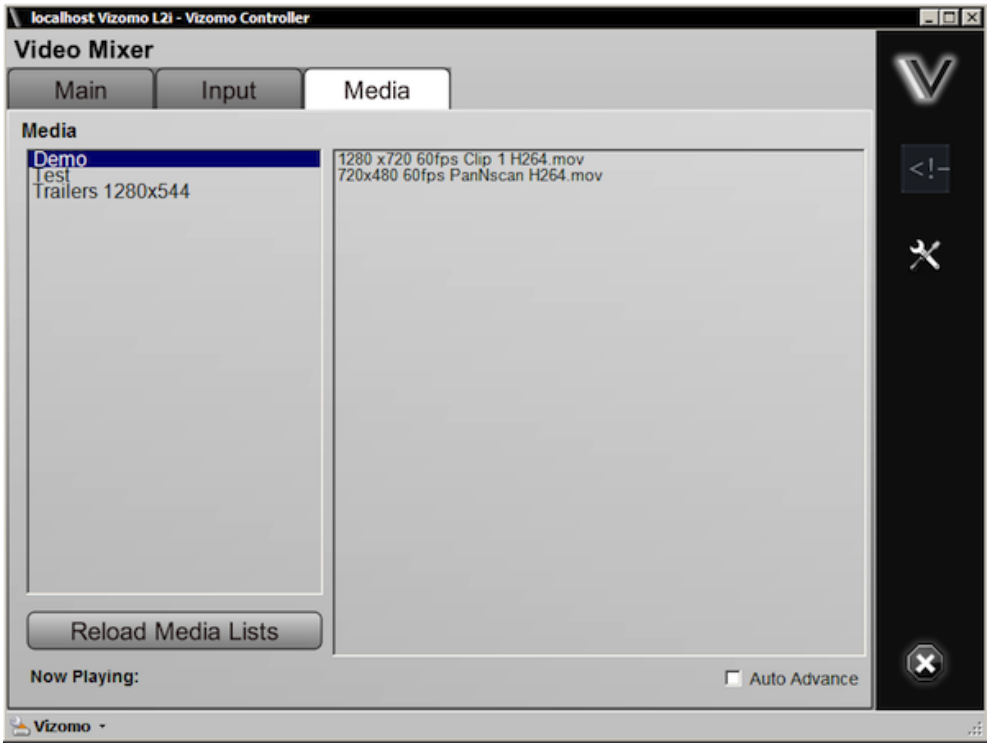
Select between multiple input types on Vizomo R1 units. When using the HDMI input the input resolution must be manually selected.



The Vizomo R1i unit has two video inputs to allow for HDMI and SDI capture. Only one active input should be connected at any given time.

Media Tab

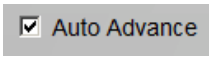
To play a file, select from the folder/file selection window.



When new media has been loaded press the Reload Media Lists button to see the changes. (see section 4.1.6 Adding Media to learn how to load content)

Auto Advance

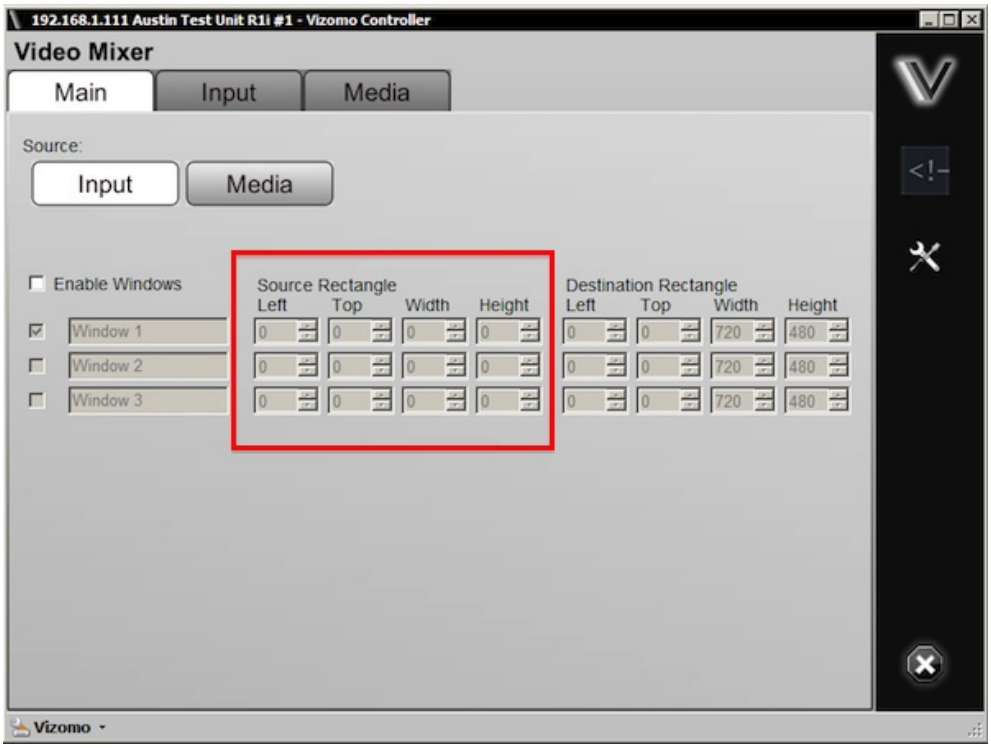
To play all of the media in a selected folder in succession, enable *Auto Advance* by selecting the checkbox at the bottom of the Media tab.



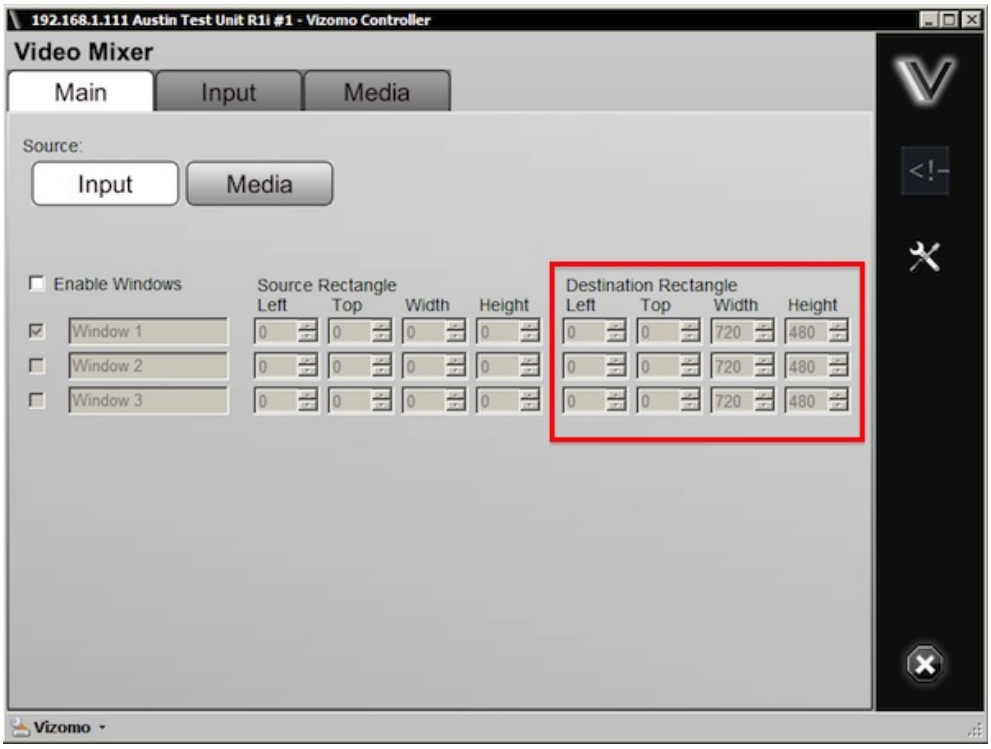
- Vizomo will play each piece of video media for the duration of the clip.
- Vizomo will play still media for 5 seconds.
- When the last clip in the folder is reached Vizomo will loop back to the top of the list.

4.3.2.1 Windowing

In order to create a window, enable windows with the checkbox. Next, define the original size and position of content with the *Source Rectangle* controls...



...next, define the new size and position of content with the *Destination Rectangle* controls.



Keep in mind the following points about source and destination windows:

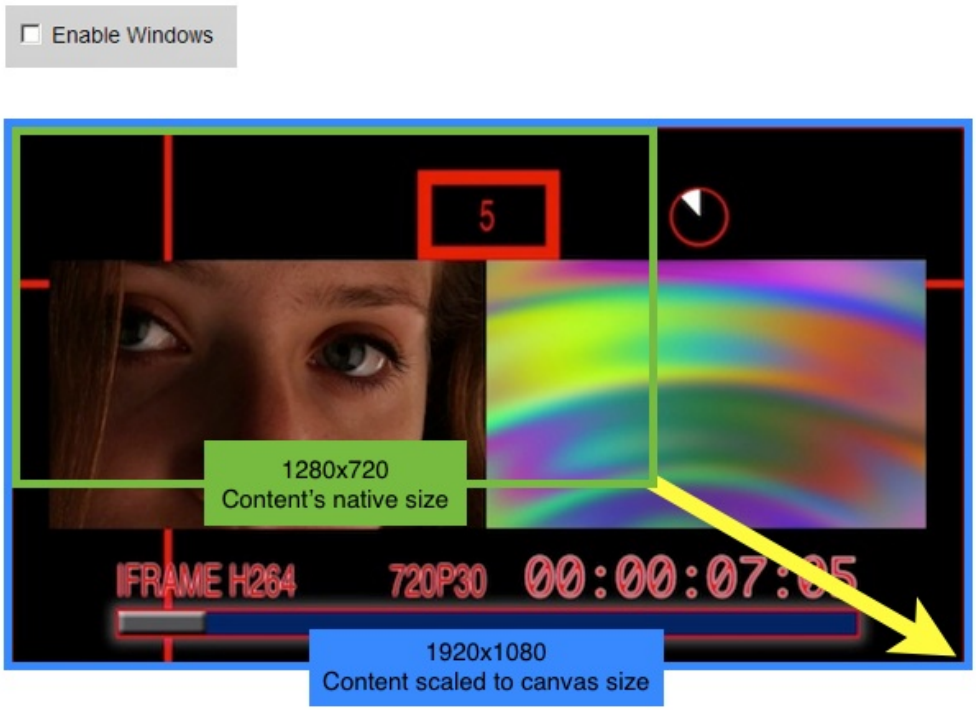
- The source for a window needs to be within the boundaries of the media.
- A value of zero for the source width and height will result in an automatic selection of the entire source.
- Differences in source versus destination size results in automatic scaling.
- Windows can overlap sources and destinations. In the case of an overlap, the order of the window definition row (1-3) dictates the Z-axis position of the window. In other words, window #1 creates the lowest level window and all other windows are on top and might obscure the lower window(s).

Below are illustrations of common windowing scenarios. The large black area in the images represents the background canvas of the Vizomo. The content in the examples below was created at a resolution of 1280x720.

Disabled Windows:

• Enable Windows checkbox unchecked.

With windows disabled, the Vizomo will size content to the canvas size. Beginning with version 4.5 the Vizomo canvas is automatically sized to the map dimensions of the RasterMAPPER map.

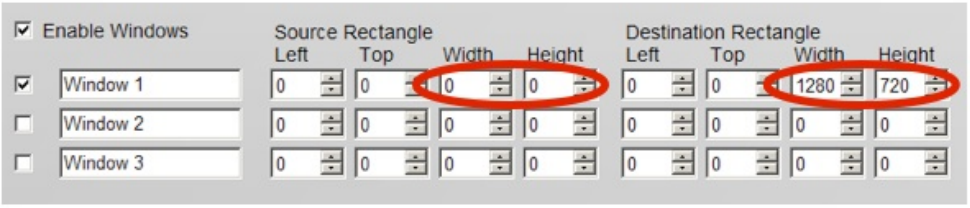


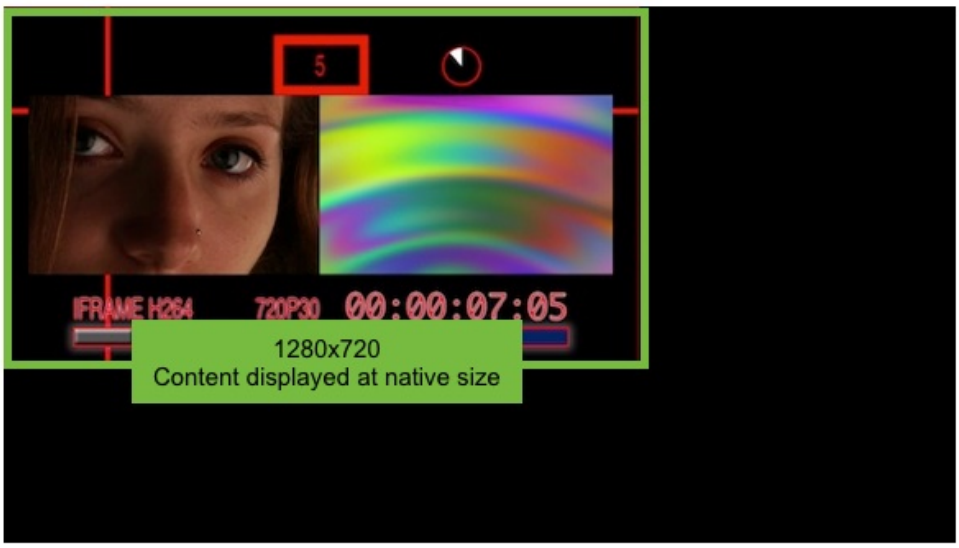
See the processor geometry section in 6.6.2 Setup Inspectors for the canvas size controls.

Unity Scale:

• Set ***Source Rectangle*** to 0,0

• Set ***Destination Rectangle*** to the content's native width and height



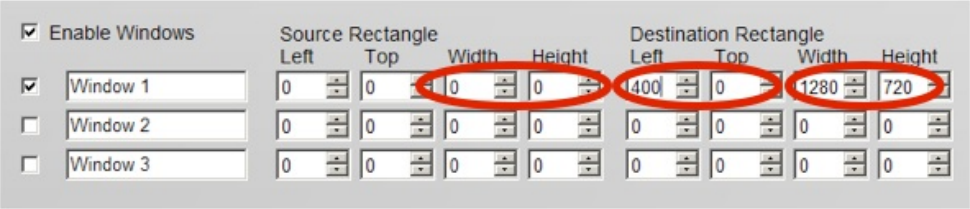


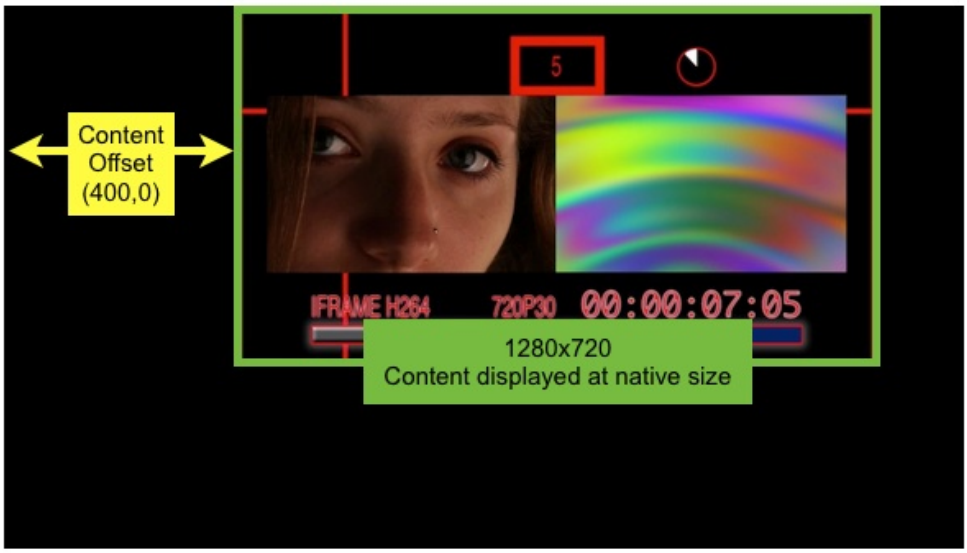
Unity Scale Destination Offset:

• Set ***Source Rectangle*** to 0,0.

• Set ***Destination Rectangle*** to the content's native width and height.

• Set an image offset

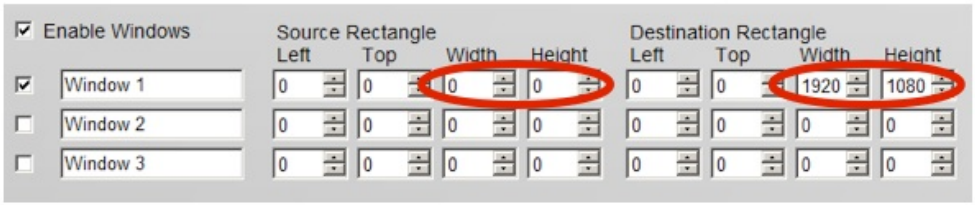


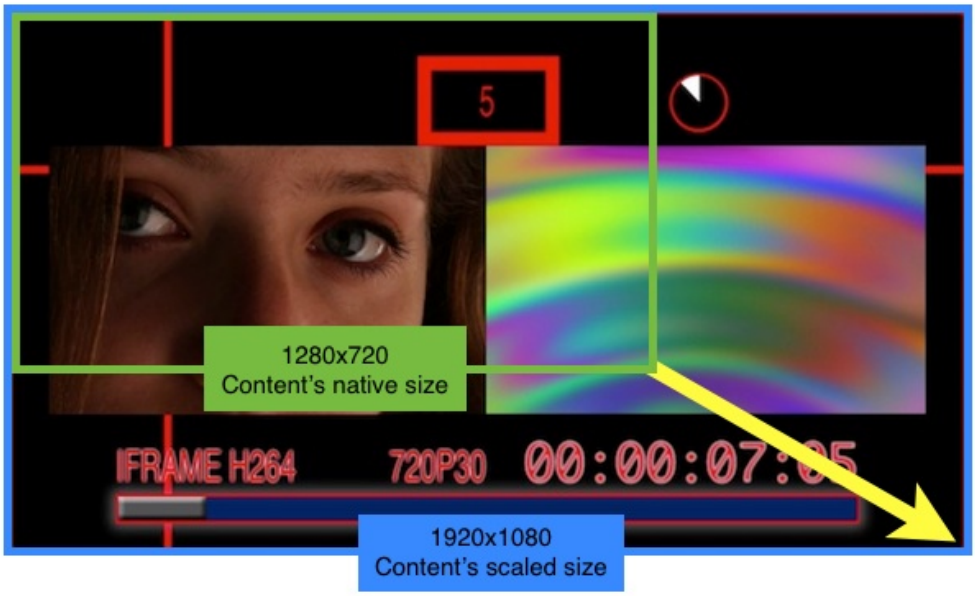


Scale Up:

• Set ***Source Rectangle*** to 0,0.

• Set ***Destination Rectangle*** to the desired width and height.

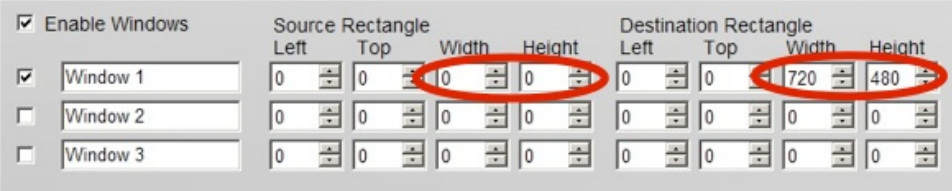


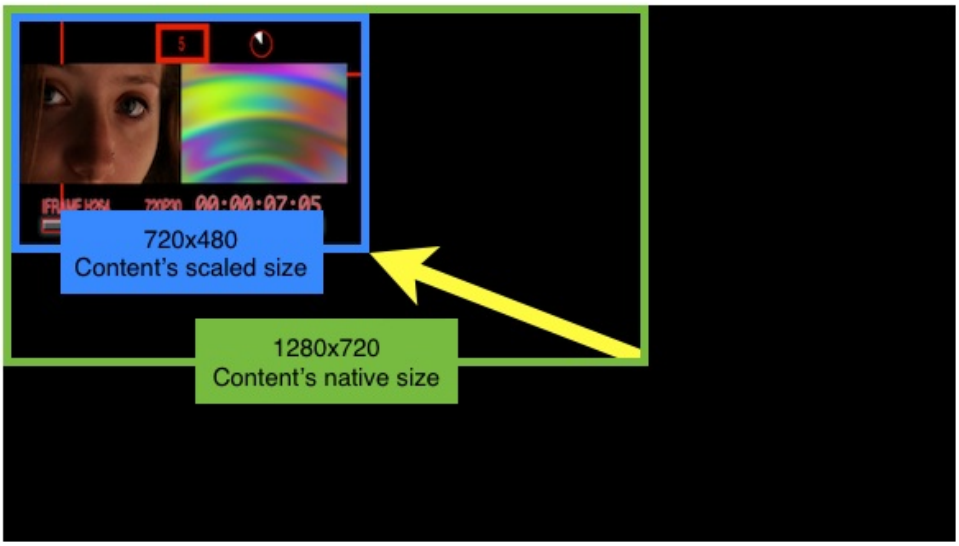


Scale Down:

• Set ***Source Rectangle*** to 0,0.

• Set ***Destination Rectangle*** to the desired width and height.

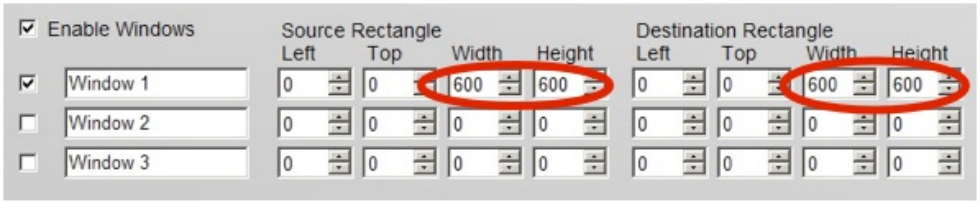


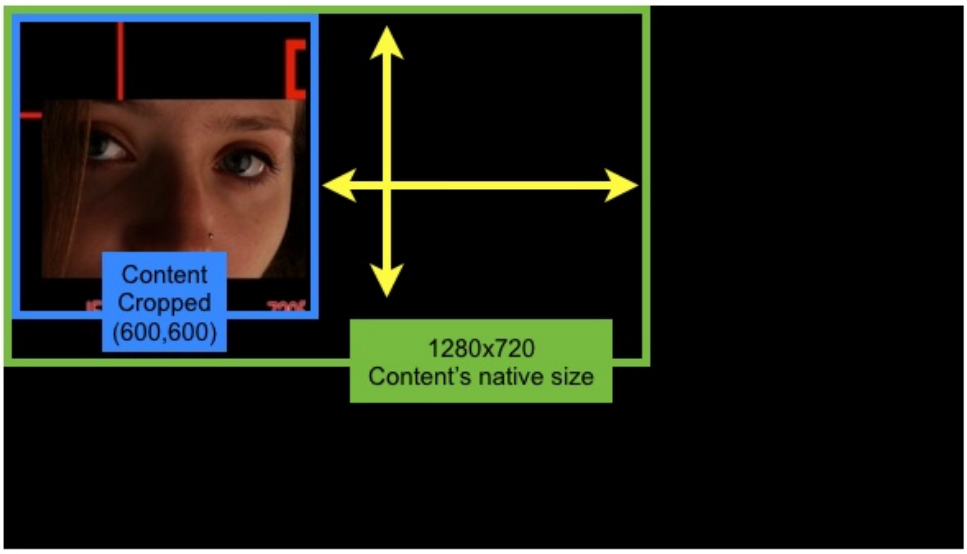


Unity Scale Cropped Source:

• Set ***Source Rectangle*** to desired size.

• Set ***Destination Rectangle*** to the same size as the ***Source Rectangle***.


Enable Windows
Source Rectangle
Left
Top
Width
Height
Destination Rectangle
Left
Top
Width
Height
Window 1
Window 2
Window 3
0
600


Content
Cropped
(600,600)
1280x720
Content's native size

Appendix A: Specifications

PXL outputs

- Vizomo R1i / R2i: 4 PXL outputs
- Vizomo L1i / L2i: 1 PXL output

Dimensions

- Vizomo R1i / R2i: 4U 19" rack chassis (480 x 178 x 618 mm)
- Vizomo L1i: 2U 19" rack chassis (480 x 88.9 x 618 mm)
- Vizomo L2i: 4U 19" rack chassis (480 x 178 x 618 mm)

Power

- 100-240 VAC, 50-60 Hz

Maximum Power Consumption

- Vizomo R1i: 750W
- Vizomo R2i: 620W
- Vizomo L1i: 350W
- Vizomo L2i: 620W

Internal Storage

- Solid state

Connectivity

- Vizomo R1i / L1i USB 2.0, Gigabit Ethernet
- Vizomo R2i / L2i USB 2.0 / 3.0, Gigabit Ethernet

Genlock

- Vizomo R1i / R2i: Frame lock in/out
- Vizomo L1i / L2i: none

DVI (HDMI connector) and SDI (R1i / R2i models only) Input

- 480/29.98 NTSC
- 480/29.97 NTSC
- 576/25 PAL
- 720p50
- 720p59.94
- 720p60
- 1080p23.98
- 1080p24
- 1080p25
- 1080p29.97

- 1080p30
- 1080i50
- 1080i59.94
- 1080i60

NOTE:

- **The Vizomo HDMI input does not support HDCP**
- **DVI input is supported by the use of a passive DVI to HDMI adapter such as Monoprice P/N 2404**
- **Dual link DVI is not supported**

DVI Preview Monitoring

- 1024 x 768 @ 60 Hz
- 1280 x 720 @ 50/60 Hz (720p)
- 1920 x 1080 @ 24/25/30/50/60 Hz (1080p)

Appendix B: Video File Encoding

Video files must be encoded and saved in a specific format and file naming structure for playback on a Vizomo processor. This section outlines the simple steps to convert your source material to a Vizomo-compatible format (H.264, MPEG-4 Part 10) and file name.

Requirements:

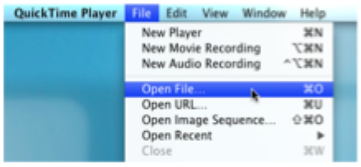
QuickTime Player with Pro License, v7.5.0 or later (Mac or PC) For more information go to: http://www.apple.com/quicktime/pro/.

Procedure:

Follow the steps below to ensure your source video is saved and encoded properly to play back on a Vizomo processor.

1. Launch QuickTime Player and open your media file by selecting “Open File” from the File menu.

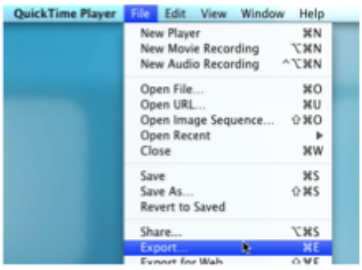
File, Open Menu:



2. Browse to the location of your source media and select “Open”. Verify that your source media plays correctly by playing it in the QuickTime window before proceeding.

3. Choose “Export” from the File menu.

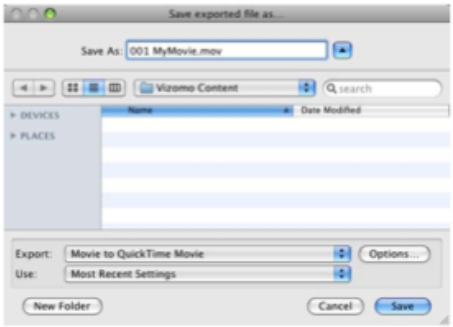
File, Export Menu:



4. Enter an appropriate name in the “Save As” field. Note, for default Vizomo blueprints, you must start the filename with a three digit num- ber. For example, a valid movie name would be “001 MyMovie.mov”.

5. Select “Movie to QuickTime Movie” from the “Export” selections.

Save Exported File Menu:

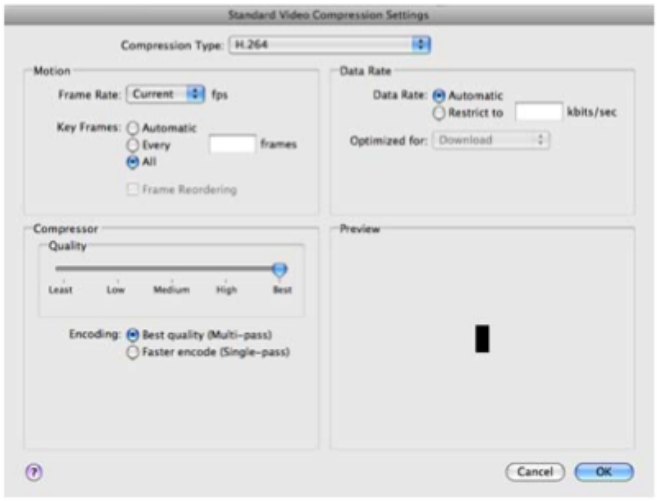


6. Press the “Options” button to open the Movie Settings window.

Movie Settings Window:

7. Press the “Settings” button to open the Standard Video Compression Settings window:

Standard Video Compression Settings Window:



8. Confirm the following settings.

Category	Parameter	Setting	Notes
Compression Type		H.264	
Motion	Frame Rate	30 fps	This is typically 30, however it can be as high as 60 for high fps footage.
	Key Frames	All	
Compressor	Quality	Best	
	Encoding	Best quality	
Data Rate	Data Rate	Automatic	

9. Press the “OK” button to return to the Movie Settings window.

10. Press the “Size” button to open the Export Size Settings window and confirm the dimen- sions for your output size are correct.

Export Size Settings Window:

11. If your source footage is interlaced, be sure to check the “Deinterlace Source Video” checkbox.

12. Press the “OK” button to return to the Export window.

13. Press the “Save” button and your video will begin the encoding process. This process may take several minutes, depending on the length of

your video.

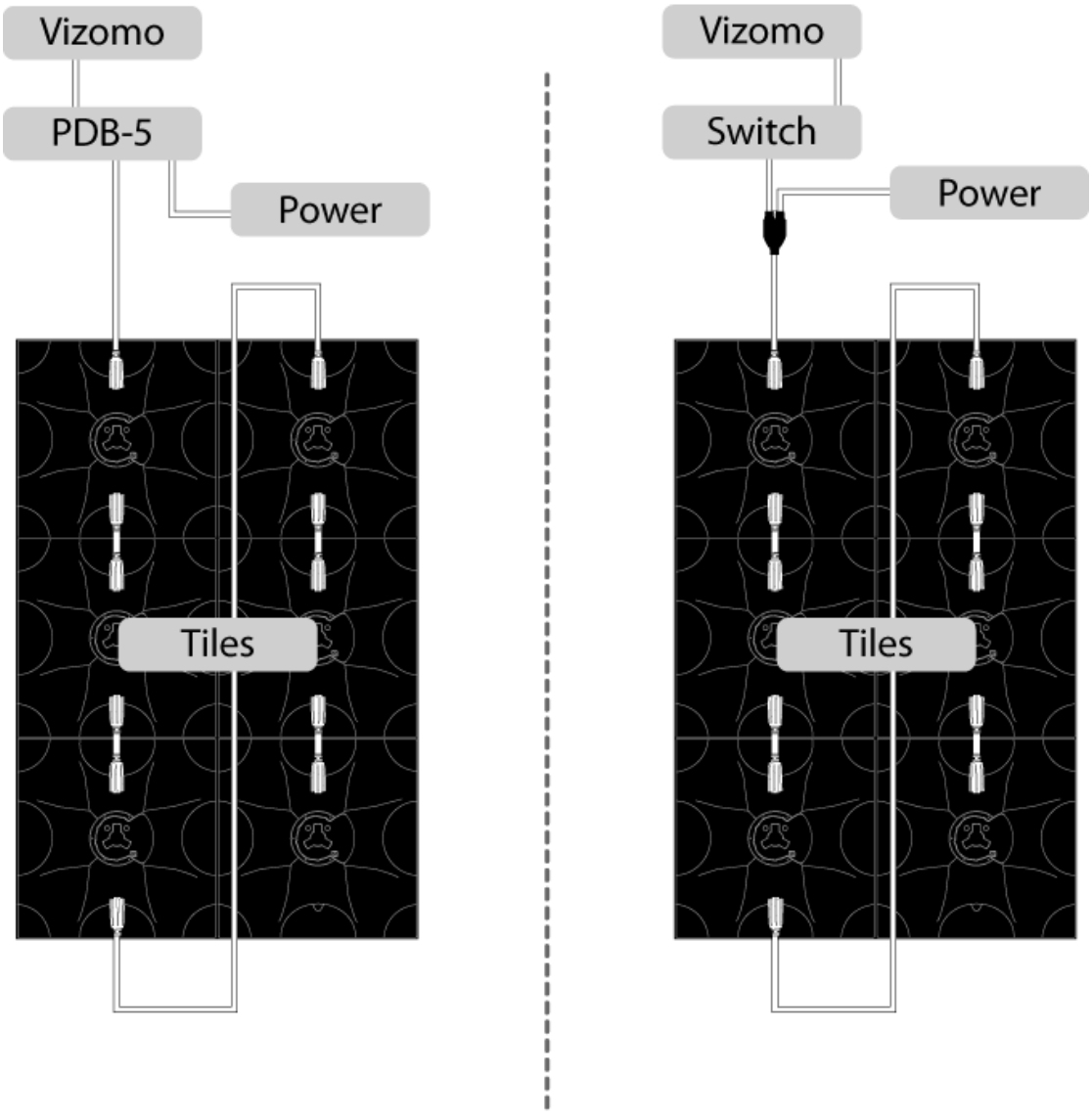
When the encoding process is finished, you will have a new file with the proper codec, bit rate, and file name for playback on Vizomo processor.

For information on transferring files to the Vizomo processor for playback, see File Management.

For information on playing back video files, see Newly added blueprints are not displayed until the list has been manually rebuilt by pressing the ‘Reload Blueprints’ button. See File Management for information on adding new Blueprints.

5. Power and Data Distribution

For rental and staging applications, using the integrated power and data distribution of a PDB-5 is recommended (configuration on the left). For fixed installations, it may be preferable to use a Cisco 2960G network switch and external power distribution instead of PDB-5 power injectors (configuration on the right). Both configurations are described in this section. If you need assistance determining the appropriate power and data configuration for your needs, please contact a Barco representative.



5.0 Warnings

WARNING

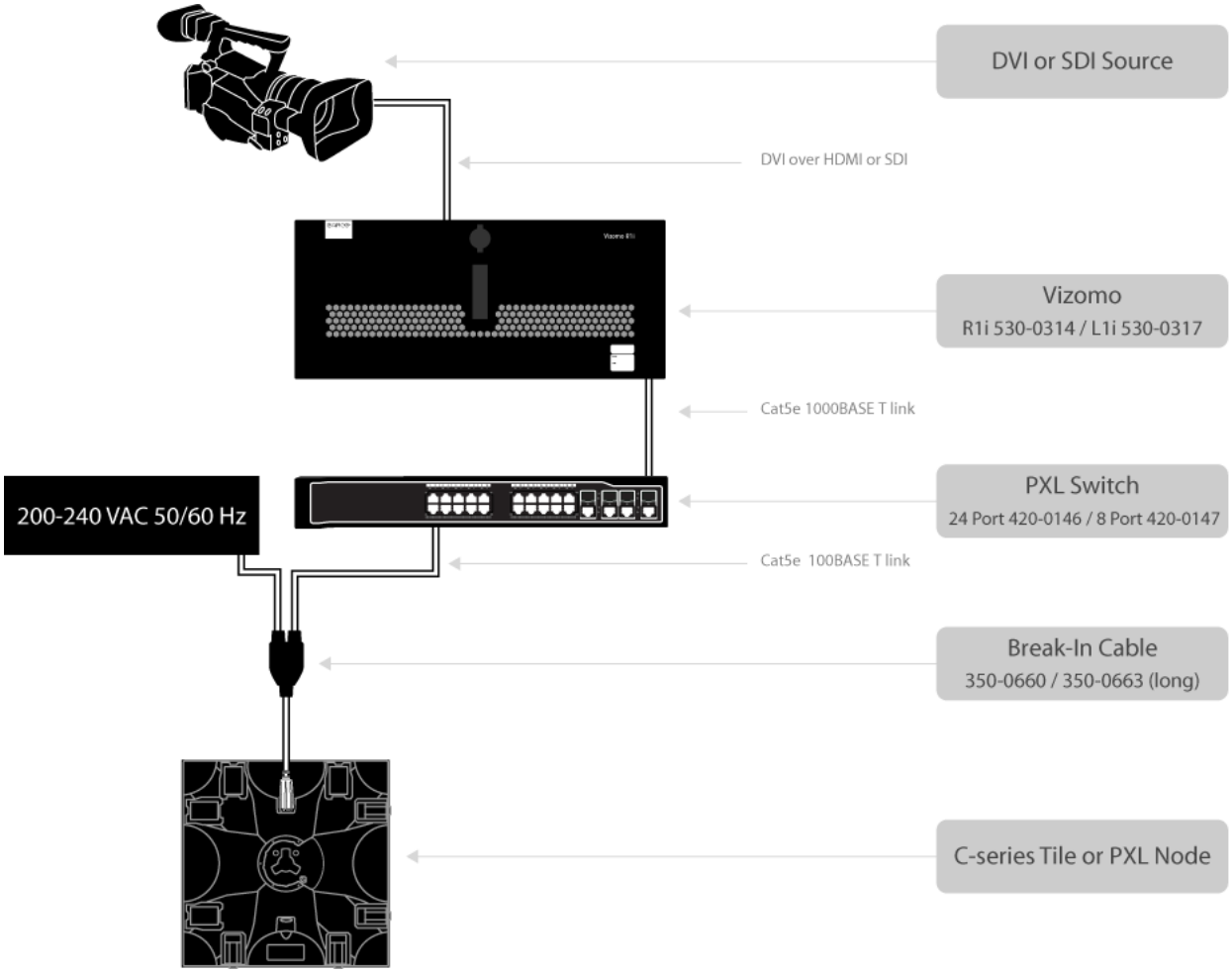
- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

5.1 Hookup with a PXL Switch

The image below illustrates the data flow of a C-series system from image capture to tile using a PXL switch for data and power routing.

Connections Checklist

- DVI over HDMI or SDI (to a R1i only) signal connected to Vizomo capture card
- Network cable from a Vizomo PXL output to a switch PXL input
- Break-in cable from switch PXL output to tiles. Observe maximum tiles per line limit
- 100-240V 50/60Hz VAC power source to Vizomo and PXL Switch(es)
- 200-240V 50/60Hz VAC power source to PXL tiles



Observe the following data limits when setting up your C-series display.

Fixture	Max panels per PDB-5 output
C7	8
C11	16
C8v	25

WARNING

• Never attach more than one PXL switch to a Vizomo output.

• Never attach more than one Vizomo PXL output to a switch.

5.2 PXL Switch Overview

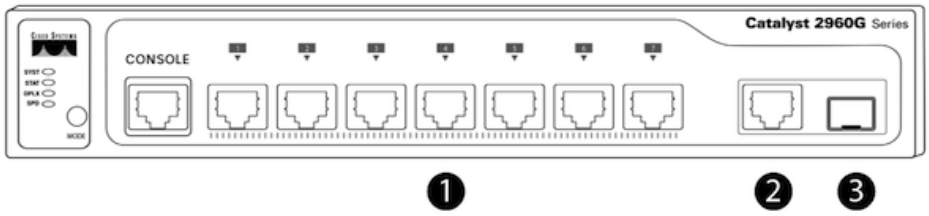
For fixed installations, it may be preferable to use a Cisco 2960G network switch and external power distribution instead of PDB-5 power injectors. Pre-configured 8 and 24 port switches are available from Barco (P/N 420-0147 and 420-0146). Note that Cisco equipment provided by third party suppliers are not configured to route PXL correctly, and are unsupported by Barco for use in PXL systems.

This switch supports PXL input via both copper UTP Cat 5e terminating at an RJ-45 socket, as well as fiber optic cable using the SFP transceiver. The SFP interface should be used if a distance of greater than 100m must be covered between the Vizomo and the PXL display. Please contact your Barco representative for more information on this configuration.

There are two PXL switches available, depending on the capacity required. These Cisco Catalyst 2960G switches are pre-configured by Barco to act as PXL distribution devices. Note that Cisco equipment provided by third party suppliers are not configured to route PXL correctly, and are unsupported by Barco for use in PXL systems.

8 port

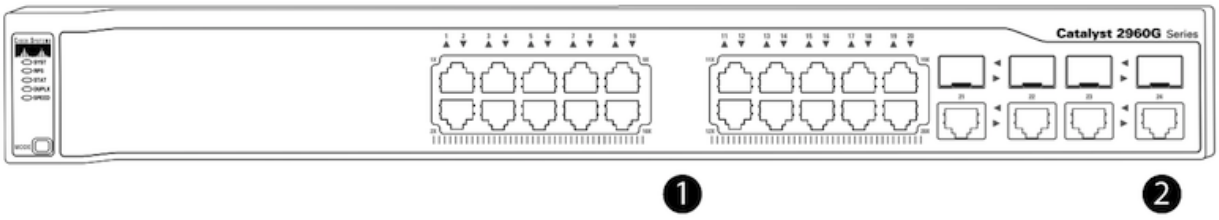
The 8 port PXL Switch has 7 PXL output ports and 1 PXL Input port.



1. Seven ports for connecting tiles
2. PXL input port (Ethernet)
3. PXL input port (SFP)

24 Port

The 24 Port PXL Switch has 20 PXL output ports and 1 PXL input port. Ports 21,22, and 23 are unused.



1. Twenty output ports for connecting tiles
2. PXL input port (Ethernet/SFP)

NOTE
A Vizomo's PXL port must always be connected to the highest number port on a switch. On a 8 port switch this is port 8. On a 24 port switch this is port 24. Using any other port as an input is unsupported. Only one PXL output of a Vizomo may be connected to a switch at any time.

System Status Indicator

The System LED on the front left of the PXL Switch indicates system status as follows:

Color	State	Description

Off	Steady	System is not powered on
Green	Blinking	System is booting up
Green	Steady	System is operating correctly
Amber	Steady	System is receiving power, but not operating correctly

Port Status Indicators

The LEDs above each port on a switch indicate each port's status as follows:

Color	State	Description
Off	Steady	No link
Green	Steady	Link present
Green	Blinking	Activity - port is sending or receiving data
Amber/Green	Alternating	Link fault
Amber	Steady	Port is blocked and not forwarding data
Amber	Blinking	Port is blocked and is not sending or receiving packets

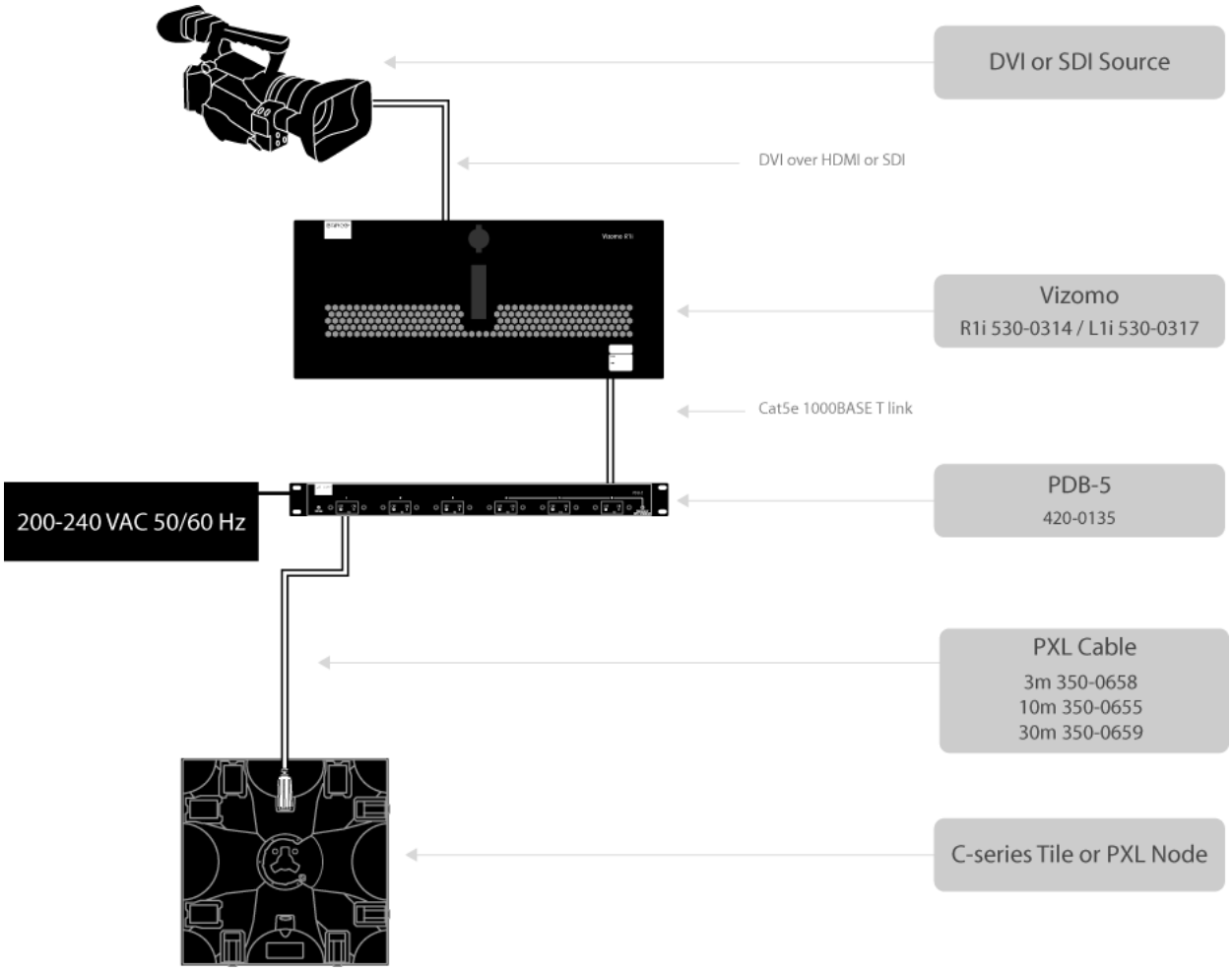
Cabling Limits

The length of the daisy chain of tiles per switch PXL output is determined by tile pixel density and thus the amount of data required per tile. The following table describes the number of each tile type that may be chained per PXL output.

Tile type	Maximum tiles per switch PXL output
C7	8
C11	16
C8v	25

5.3 Hookup with a PDB-5

The image below illustrates the data flow of a C-series system from image capture to tile using a PDB5 for data and power routing.

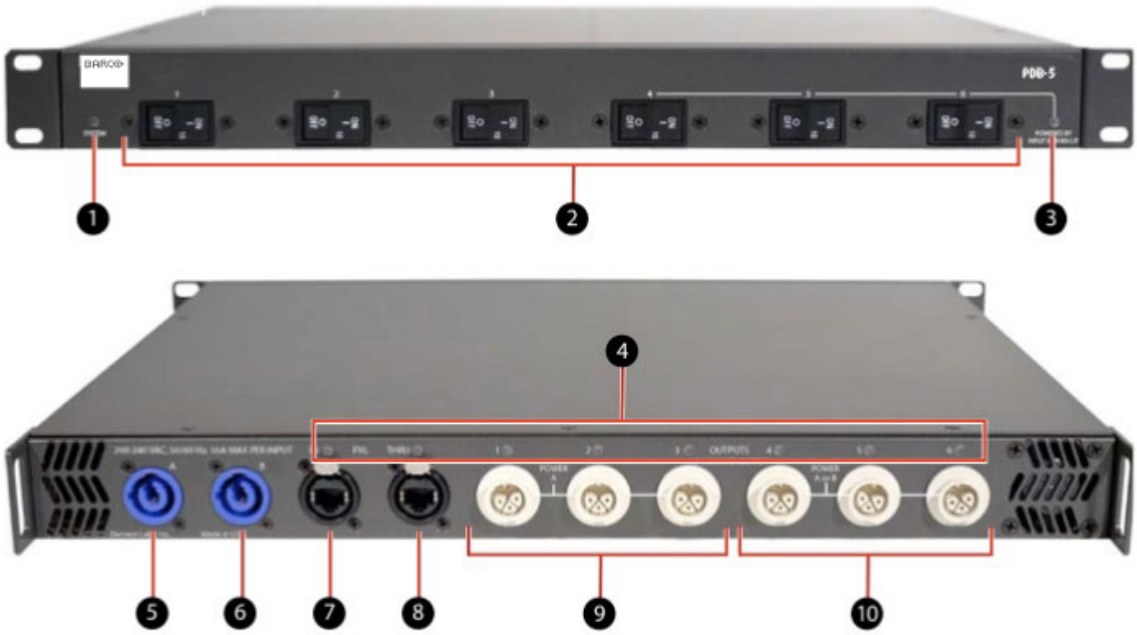


Observe the following data limits when setting up your C-series display.

Fixture	Max panels per PDB-5 output
C7	8
C11	16
C8v	25

5.4 PDB-5 Overview

The PDB-5 has been designed primarily for rental and staging applications. The PDB-5 handles the power and data distribution for C-series tiles and P1 nodes.



1. System Status Indicator. Indicates power and boot status.
2. Circuit Breakers. 2-pole, 10A magnetic hydraulic circuit breakers for each of the 6 PXL cable outputs.
3. Power Input B Indicator. Indicates presence of power input through connector B on the back panel. Input B powers outputs 4-6.
4. Port Status Indicators. Indicates link integrity, disabled, activity, speed, full-duplex.
5. AC Power Input A 200-240 VAC, 50/60 Hz, 16 A max. via PowerCon (blue) connector.
6. AC Power Input B 200-240 VAC, 50/60 Hz, 16 A max. via PowerCon (blue) connector.
7. PXL Data Input via RJ45 EtherCon (shown) or optional Fiber Optic (not shown) connector.
8. PXL Data Thru (pass through) via RJ45 EtherCon connector.
9. PXL Cable Outputs 1-3. Integrated power and data outputs 1-3 via custom PXL Cable connectors. Powered by AC Power Input A.
10. PXL Cable Outputs 4-6. Integrated power and data outputs via custom PXL Cable connectors. Powered by AC Power Input A, or B if present.

NOTE
When first powered on, the PDB-5 will take several minutes to be fully booted and configured.

System Status Indicator

The LED on the front of the PDB-5 or PXL Switch indicates system status as follows:

Color	State	Description
Off	Steady	System is not powered on
Green	Blinking	System is booting up
Green	Steady	System is operating correctly
Amber	Steady	System is receiving power, but not operating correctly

Port Status Indicators

The LEDs on the rear of the PDB-5 or next to each port on a switch indicate each port's status as follows:

Color	State	Description
Off	Steady	No link
Green	Steady	Link present
Green	Blinking	Activity - port is sending or receiving data
Amber/Green	Alternating	Link fault
Amber	Steady	Port is blocked and not forwarding data
Amber	Blinking	Port is blocked and is not sending or receiving packets

5.5 PDB-5 Input & Output

Connections Checklist

- DVI over HDMI or SDI (to a R1i only) signal connected to Vizomo capture card
- 100-240 50/60 VAC power to Vizomo
- PXL data cable from a Vizomo to the PXL Data Input jack on the back of the PDB-5.
- Power and data cable(s) from the fixture(s) to the appropriate PXL Cable output(s) on the back of the PDB-5.
- PowerCon end of the PDB5 power cable to the AC Power Input A jack on the back of the PDB-5.
- IEC end of the PDB5 power cable to a 200-240 VAC power source.

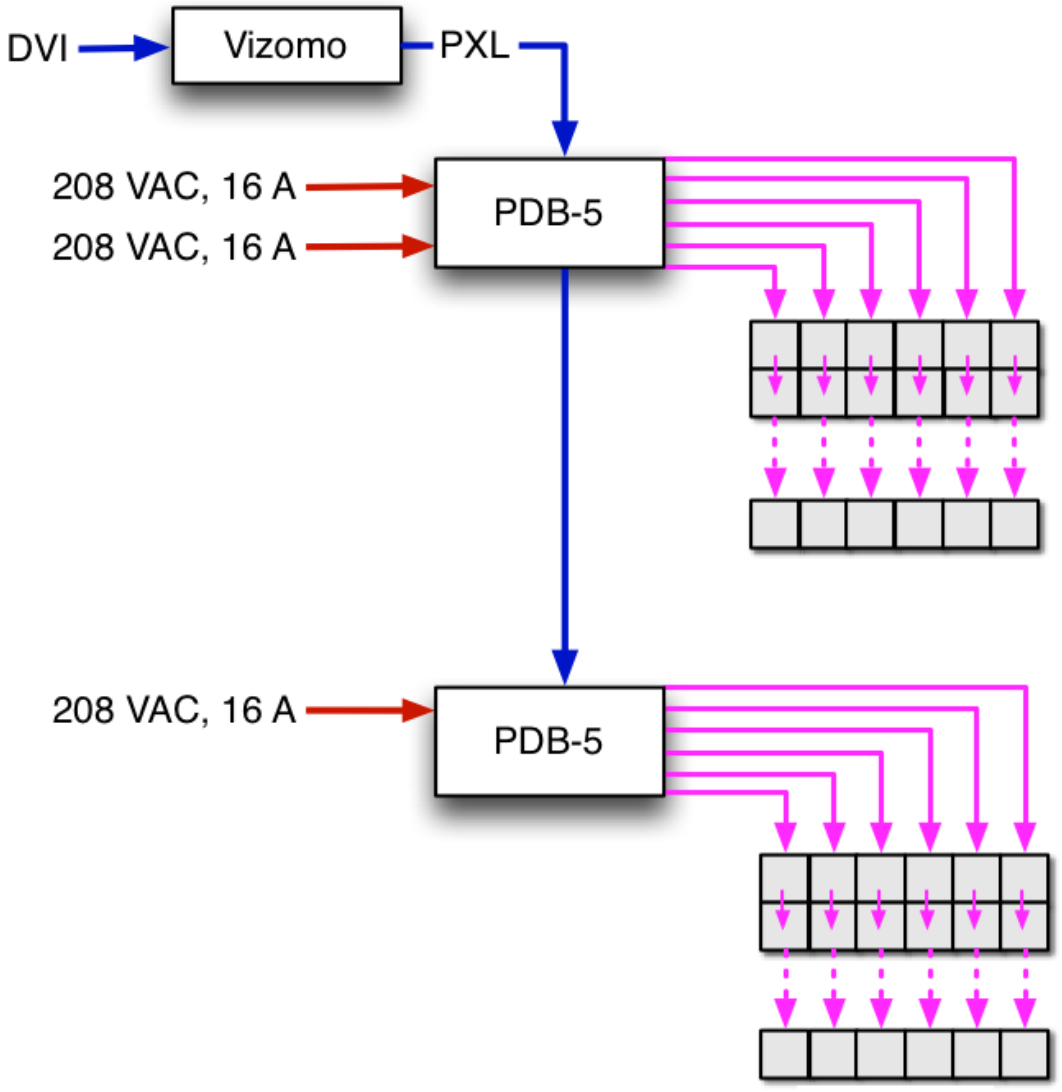
Power Inputs A & B

The PDB-5 has two power 16A inputs on the rear panel labeled A and B.
Input A must always be used as it powers the electronics inside the PDB-5.
If only input A is used then all outputs (1 through 6) will be powered by input A.
When input B is used in addition to A, then outputs 4, 5, and 6 automatically switch over and become powered by input B. This doubles the PDB-5's total capacity.
A green indicator on the front panel shows when input B is being used.

PXL Cable Outputs

The PDB-5 has 6x 10 amp outputs with breakers for AC power distribution.
The limit for each PDB-5 output is 10 A, with a total output of 32 A maximum per PDB-5, if both inputs A and B are used.
The maximum number of C8v tiles per PDB-5 port is 25 (this is limited by data, not power).
The maximum number of C11 tiles per PDB-5 port is 16 (this is limited by data, not power).

For additional information on the PXL Cable, see "Cables & Connectors" in the C-series Tile Manual.



WARNING - Do not hot plug any cables. Damage to the connector pins may occur. Resulting damage is not covered under warranty.

Observe the following power guidelines when setting up your C-series display. The tables below indicate maximum power consumption.

C7
Max Power = 100 watts (@2,000 nits, full white)

Voltage	Max Panels per PDB-5²w/ 1 x 16A input	Max Panels per PDB-5²w/ 2 x 16A input
240VAC	23	46
220VAC	21	42
208VAC	20	78
200VAC	19	75

1. PDB-5 has 32A limit (2x 16A).
2. Maximum C7 panels per PDB-5 Port is 8.

C11
Max Power = 85 watts (@5,000 nits, full white)

Voltage	Max Panels per PDB-5[2] w/ 1 x 16A input	Max Panels per PDB-5[2] w/ 2 x 16A input
240VAC	45	90
220VAC	41	83
208VAC	39	78
200VAC	38	75

1. PDB-5 has 32A limit (2x 16A).
2. Maximum C11 panels per PDB-5 Port is 16.

C8v
Max Power = 55 watts (@8,000 nits, full white)

Voltage	Max Panels per PDB-5[2] w/ 1 x 16A input	Max Panels per PDB-5[2] w/ 2 x 16A input
240VAC	70	140
220VAC	64	128
208VAC	61	122
200VAC	58	116

1. PDB-5 has 32A limit (2x 16A).
2. Maximum C8v panels per PDB-5 Port is 25.

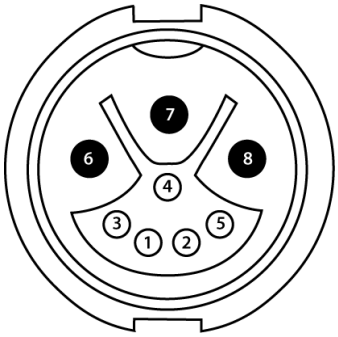
When running typical video content, the duty cycle (average power consumption) is about 30% of maximum.

5.2 Cables & Connectors

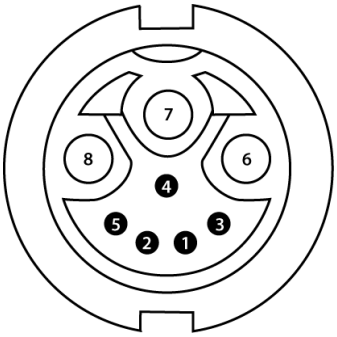
PXL Cable

PXL cables are designed to carry both power and data, and are available in a variety of lengths to span the distance from a PDB-5 or switch to the display, as well as between each tile within the display. The gender of a PXL cable connector is determined by the power pins (the 3 large pins), each cable has a male and a female connector.

Male PXL Connector - The male plug end of a PXL cable connects to an upstream **source** such as a PDB-5 or upstream tile. The male end of a PXL cable has a white shell, and mates with a white female socket.

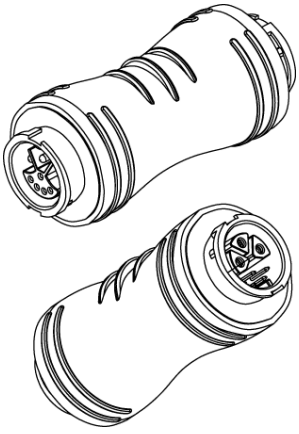


Female PXL Connector - The female plug end of a PXL cable connects to a downstream **sink** such as a tile. The female end of a PXL cable has a black shell, and mates with a black male socket.

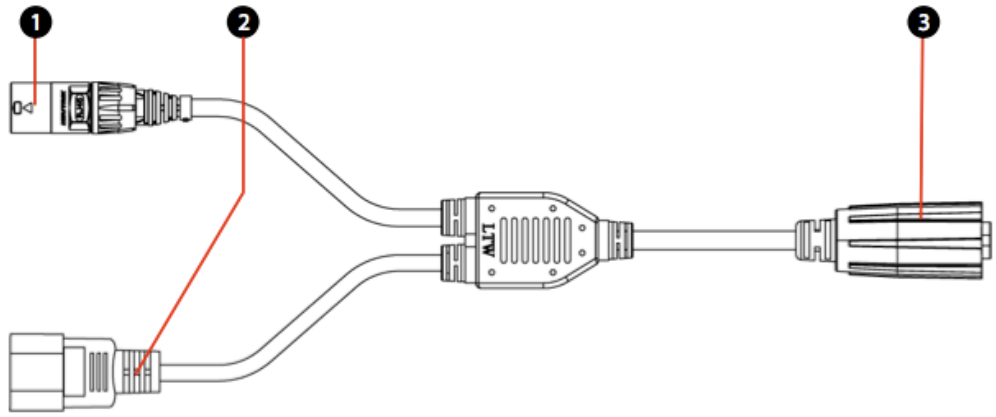


PXL Cable Coupler (P/N 656-0500)

The male-female coupler can be used to extend the length of a PXL cable.

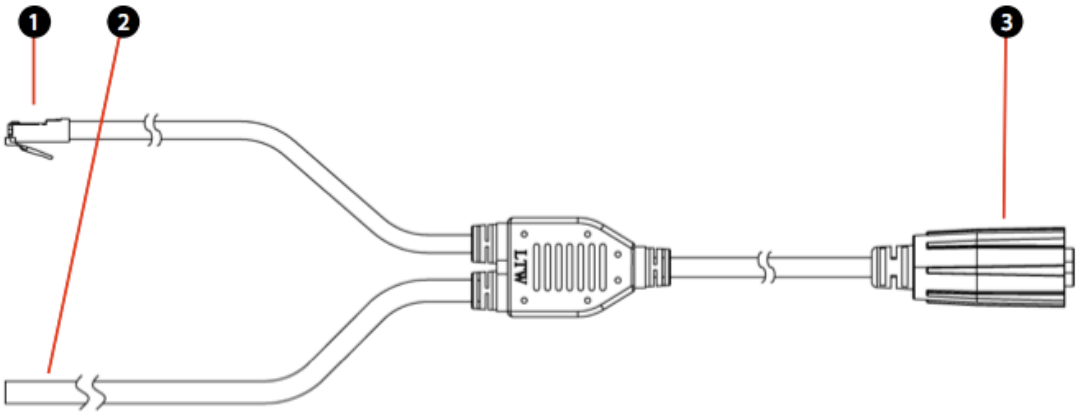


Break-In Cable - Standard (P/N 350-0660)



1. Data Input - PXL data input via Neutrik EtherCon (RJ45) connector.
2. Power Input - AC power input via IEC C14 (male) connector.
3. Power and Data Output - Combined power and data via black female PXL cable connector.

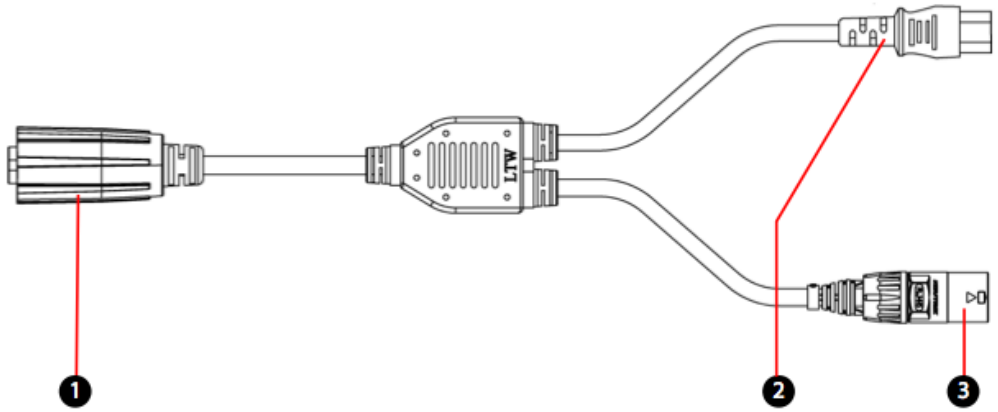
Break-In Cable - Fixed Install (P/N 350-0663)



1. Data Input - PXL data input via Ethernet (RJ45) connector.
2. Power Input - Unterminated AC power harness to be hardwired in fixed installations. (see table below for wire colors)
3. Power and Data Output (female) - Combined power and data via PXL cable connector.

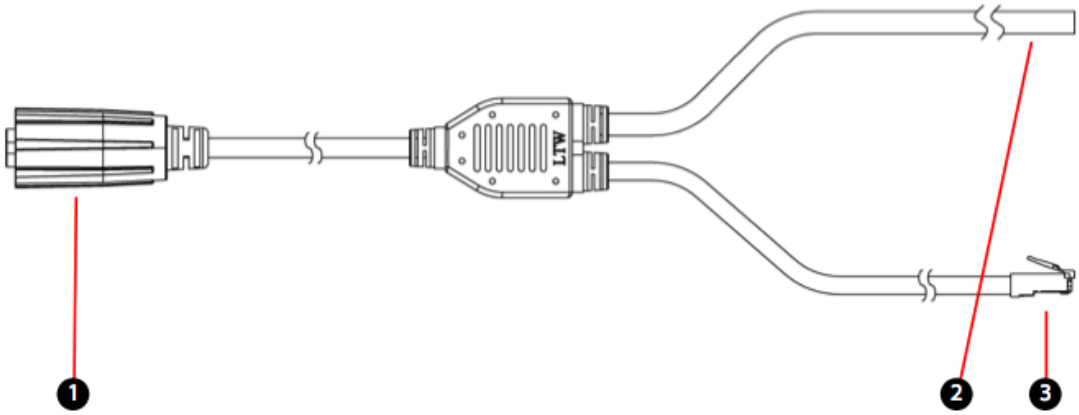
PXL Break-In Cable AC Pinout		
PXL CONNECTOR PIN	INTERNAL WIRE COLOR	FUNCTION
6	Brown	AC Power - Line
7	Green / Yellow	AC Power - Earth Ground
8	Blue	AC Power - Neutral

Break-Out Cable - Standard (P/N 350-0675)



1. Power and Data Input (Male) - Combined power and data via PXL cable connector.
2. Power Output - AC power output via IEC C13 (female) connector.
3. Data Output - PXL data output via Neutrik EtherCon (RJ45) connector.

Break-Out Cable - Fixed Install (P/N 350-0678)



1. Power and Data Input (Male) - Combined power and data via PXL cable connector.
2. Power Output - Unterminated AC power harness to be hardwired in fixed installations. (see table below for wire colors)
3. Data Output - PXL data output via Neutrik EtherCon (RJ45) connector.

PXL Break-Out Cable AC Pinout		
PIN	INTERNAL WIRE COLOR	FUNCTION
6	Brown	AC Power - Line
7	Green / Yellow	AC Power - Earth Ground
8	Blue	AC Power - Neutral

6. RasterMAPPER

RasterMAPPER is a Windows and Apple OS X application used for mapping C-series tiles to the Vizomo processor and for making settings to remote Vizomo processors. The latest version of RasterMAPPER can be downloaded from http://vizomo.com

6.1 Software Installation
6.2 Basic Workflow
6.3 RasterMAPPER QuickStart Guides
6.4 UI Overview
6.5 Mapping
6.6 Processor Control
6.7 Software Update
Appendix A: Notes

6.1 Software Installation

System Requirements

RasterMAPPER software requires the following:

- Microsoft Windows® XP or
- Mac OS X v10.5+, Intel Processor (PowerPC not supported) with
- 1024 x 768 display (or larger), • 10 MB of disk space minimum • an ethernet port (to connect to a Vizomo processor)

Download/Install Info

Follow the steps below to install and run RasterMAPPER:

Windows

1. Download RasterMAPPER software for Windows from the Barco support site.
2. Extract/un-zip the files to the same folder.
3. Double-click the file named **RasterMAPPER.exe.**
4. Note: If RasterMAPPER fails to launch, you need to download and install Microsoft Visual C++ 2005 SP1 Redistributable Package (x86) available free from the following link: http://www.microsoft.com/downloads/ details.aspx?familyid=200B2FD9-AE1A-4A14-984D-389C36F85647&displaylang=en

Macintosh

1. Download RasterMAPPER software for Mac OS X from the Barco support site.
2. Extract/un-zip the files to the same folder.
3. Double-click the file named **RasterMAPPER.**

NOTE:

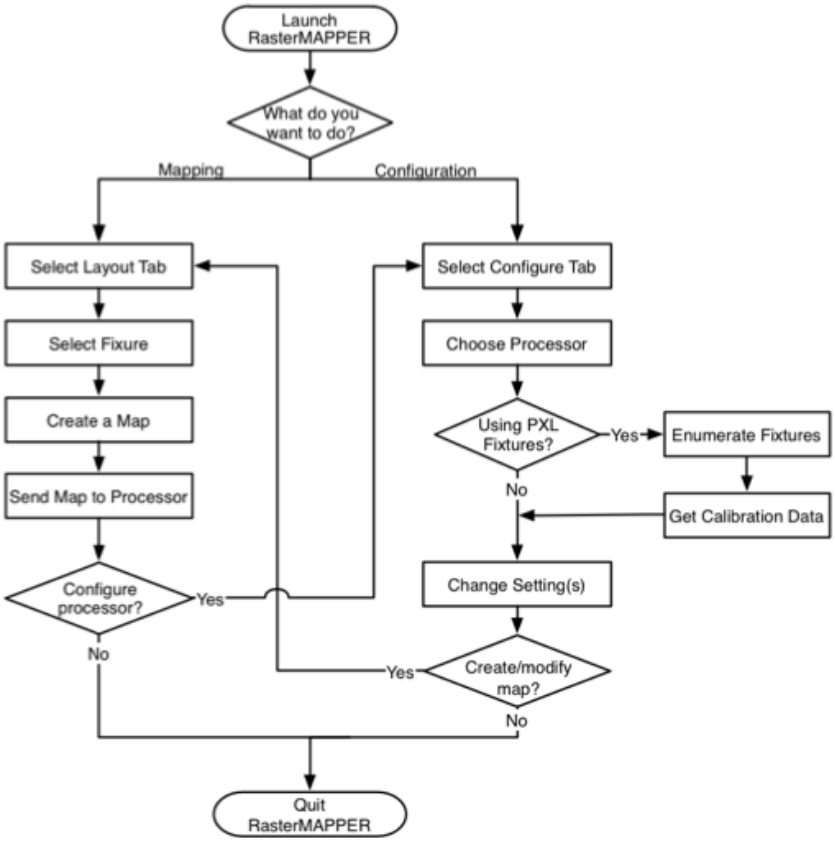
The downloaded files must all be extracted to the same folder to run properly.

6.2 Basic Workflow

RasterMAPPER has two main functions:

- Create a map which defines the relationship between pixels from the video source and the actual pixels on the modular LED fixtures. After creating the map in RasterMAPPER it is uploaded and stored on the processor.
- Control and adjust the processor as needed. With C-Series fixtures, it is necessary to enumerate the fixtures to tell the Vizomo where they are, as well as to retrieve calibration data from the fixtures for Vizomo to use in its color correction algorithms.

The chart below illustrates the basic RasterMAPPER workflow.



NOTE:

When using PXL protocol fixtures such as C-series, each time a map is changed enumerate and retrieve the calibration data.

6.3 RasterMAPPER QuickStart Guides

The following basic information will get you up and running quickly with RasterMAPPER version 4.0 and greater. The steps detailed below are only those necessary to create a map, send it to the processor, and ensure the fixtures are configured properly on the processor. These steps are based on the RasterMAPPER Basic Workflow using the Vizomo video processor and C11 fixtures.

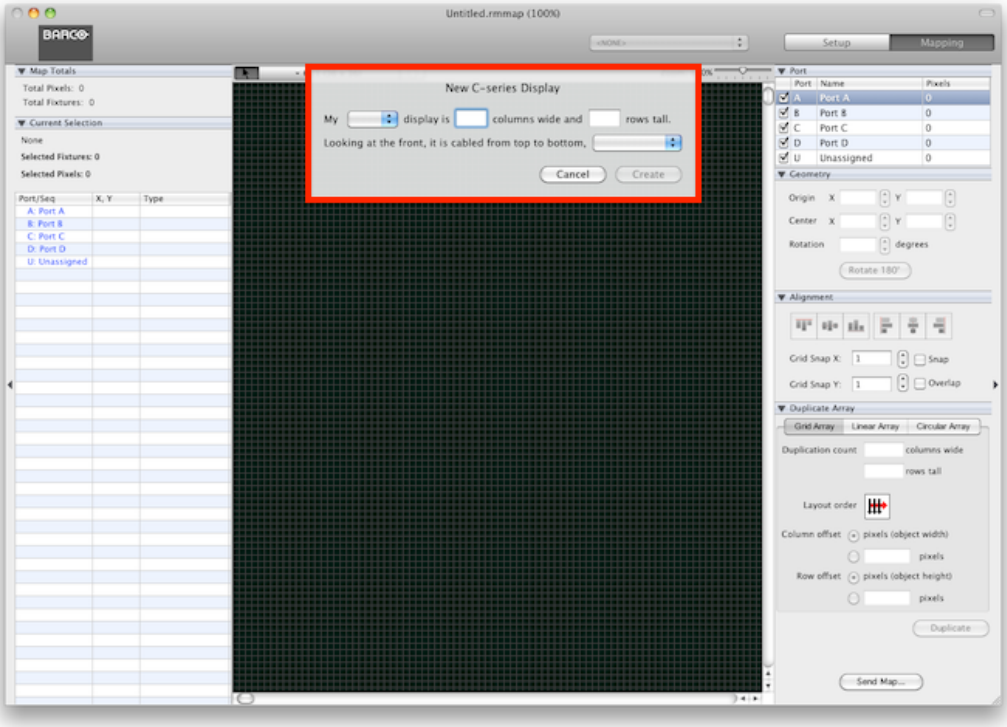
6.3.1 Mapping
6.3.2 Enumeration
6.3.3 Calibration

6.3.1 Mapping

The mapping step is necessary to tell the Vizomo the relationship between pixels in the input signal, and where those pixels are located on the modular LED fixtures. This is accomplished by building a **map** of fixtures in a space representing the input pixels.

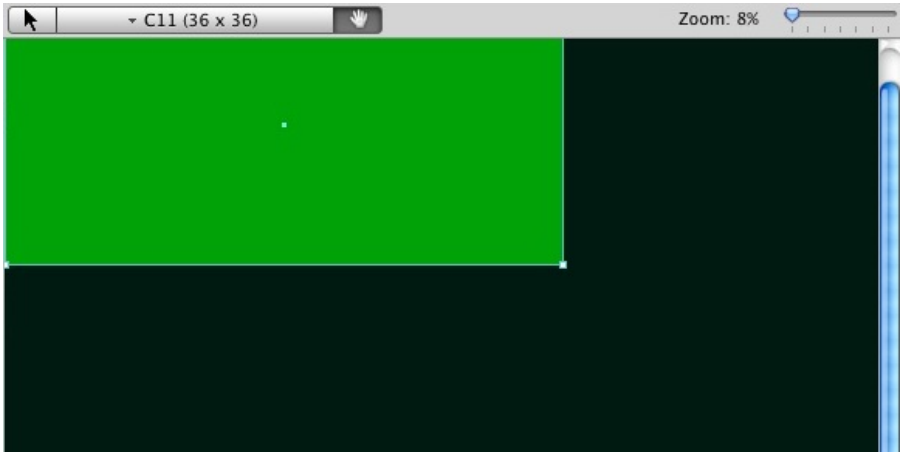
Create and Send Map

1. Download and Install RasterMAPPER.
2. Launch RasterMAPPER. A new window opens with a blank map and a 'New C-series Display' tool.



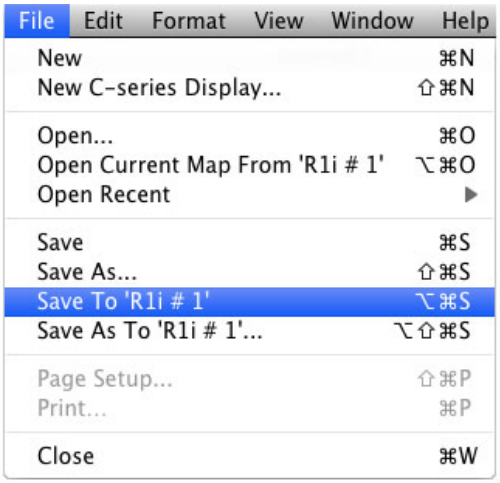
3. Define screen specifics then press ***Create***.

4. A grid will be generated in the top left position.

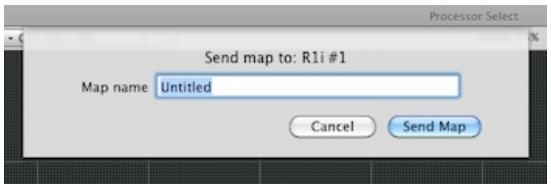


5. Select a processor.

6. Select **Save To...** from the File menu .



7. Name the map and click **Send Map** to send the map to the Vizomo.



NOTE:

Each time a map on the Vizomo is changed perform the steps of 6.1.2 Enumeration and 6.1.3 Calibration.

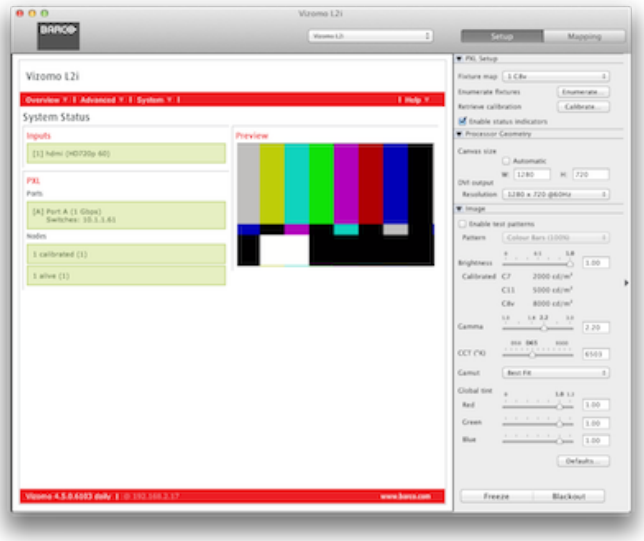
6.3.2 Enumeration

The **enumeration** step associates fixtures in their physical cabled order with their logical position within the map. This is necessary to ensure that each fixture gets the correct video data that it needs to display an image when combined with all of it's neighbors. Failing to do this step may result in a display that has an image that is broken into randomly arranged squares.

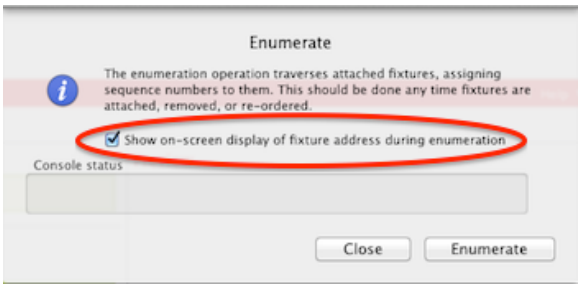
Enumerate PXL Fixtures

1. Click on the button for **Setup** inspectors.

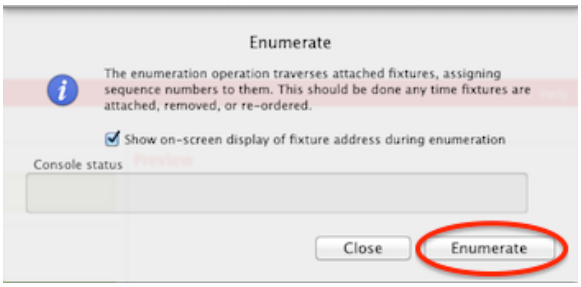
2. In the *PXL Setup* section, click **Enumerate**.



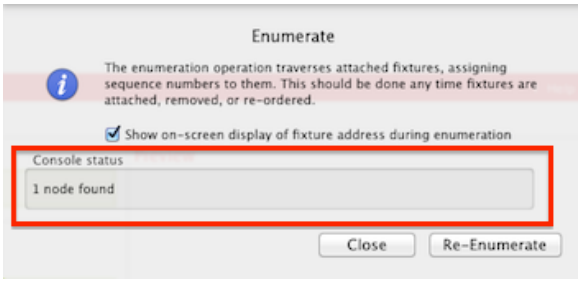
3. The Vizomo will ask tiles to show their enumerated address as the system is addressed. To enumerate without this 'on screen display' check the *Hide OSD* checkbox.



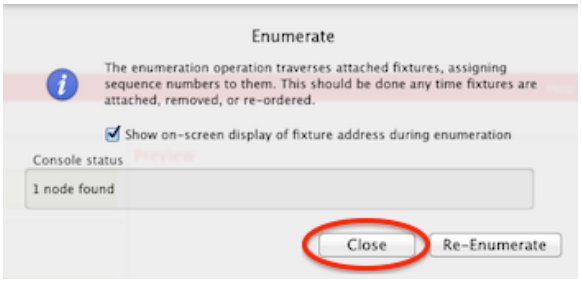
4. Click the **Enumerate** button.



5. Check the status report to see activity during enumeration and the final outcome.



6. When the status area reads *xxx nodes found*, enumeration is complete click the **Close** button to close the window.



NOTE:

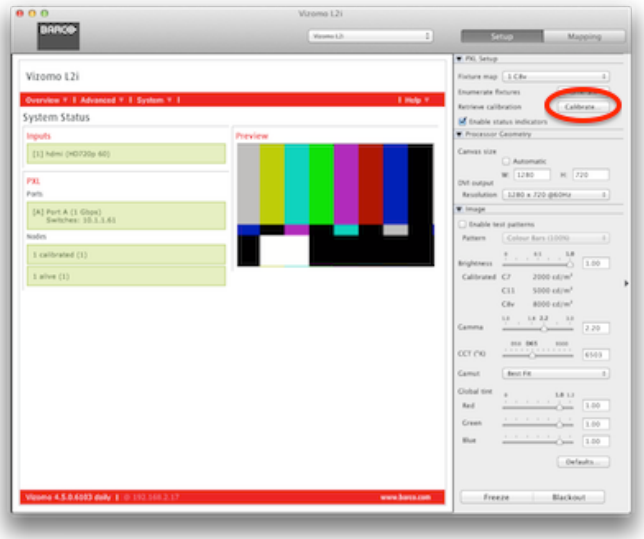
Each time a map on the Vizomo is changed perform the steps of 6.1.2 Enumeration and 6.1.3 Calibration.

6.3.3 Calibration

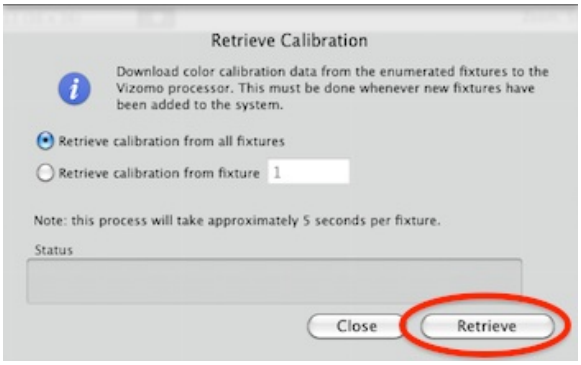
The **calibration** step is necessary to copy LED calibration data from each fixture back to the Vizomo processor, where the calibration algorithms are run. Failing to do this step may result in a speckled looking image, or fixtures that have a different color cast than their neighbors.

Retrieve Calibration Data from PXL Fixtures

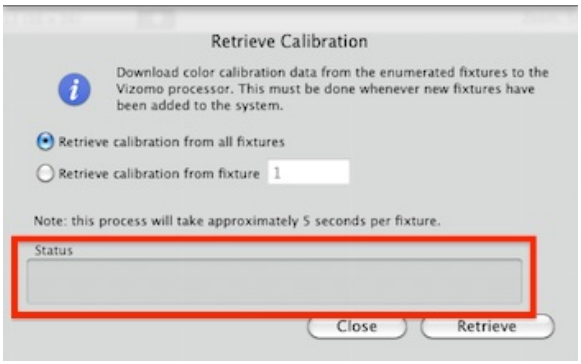
1. Click the **Calibrate...** button.



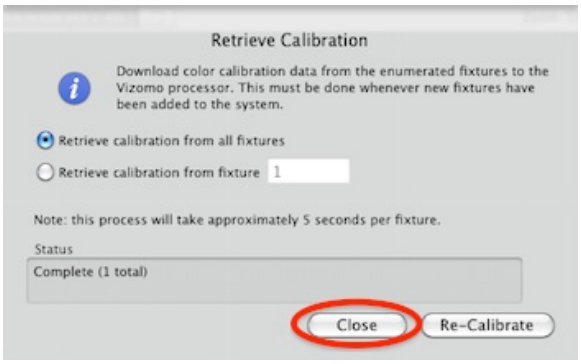
2. Click the **Retreive** button to begin the process.



3. Check the status area for any errors.



4. When the status area reads *Complete*, click the **Close** button to close the window.

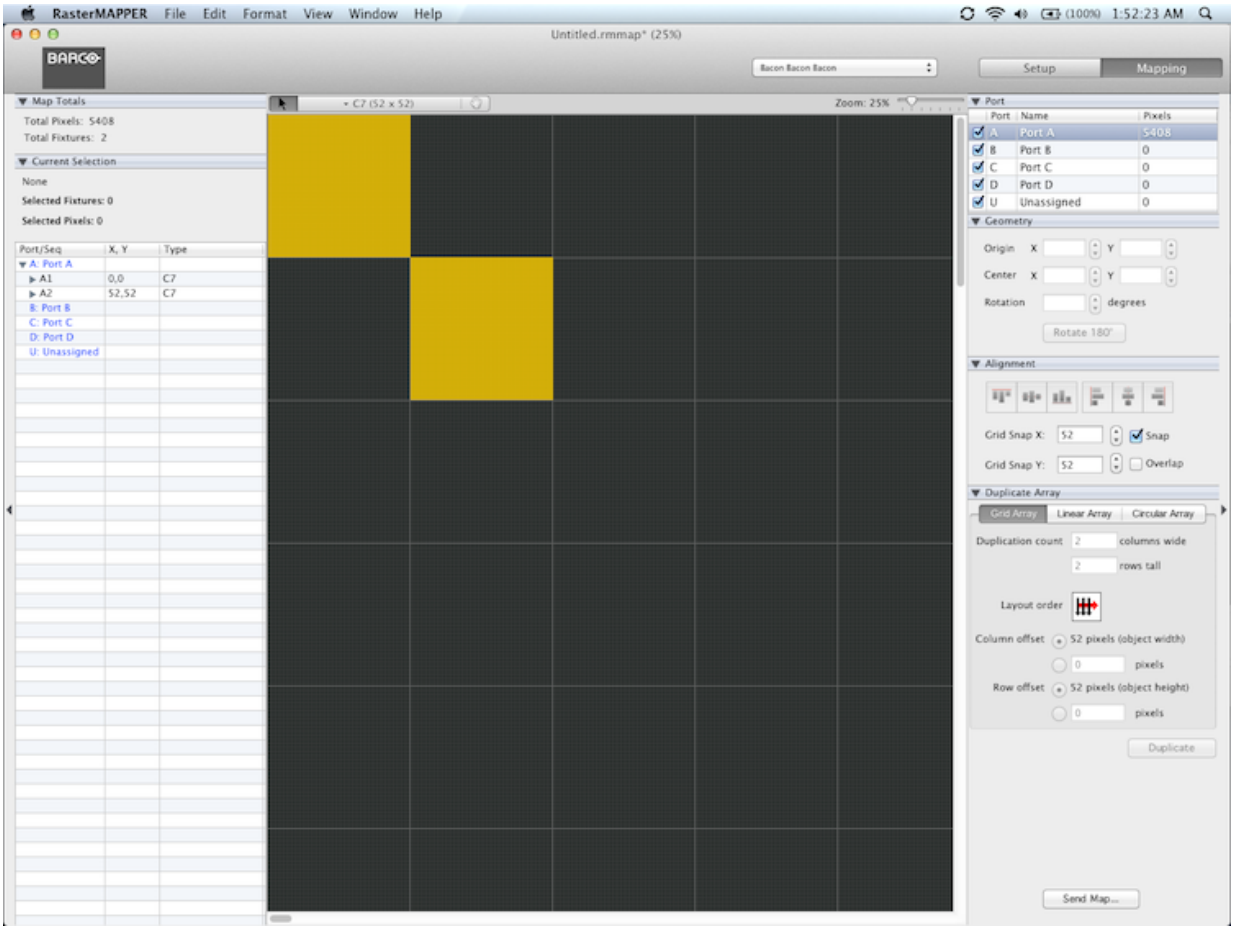


NOTE:

Each time a map on the Vizomo is changed perform the steps of 6.1.2 Enumeration and 6.1.3 Calibration.

6.4 UI Overview

OS X version of the RasterMAPPER user interface:

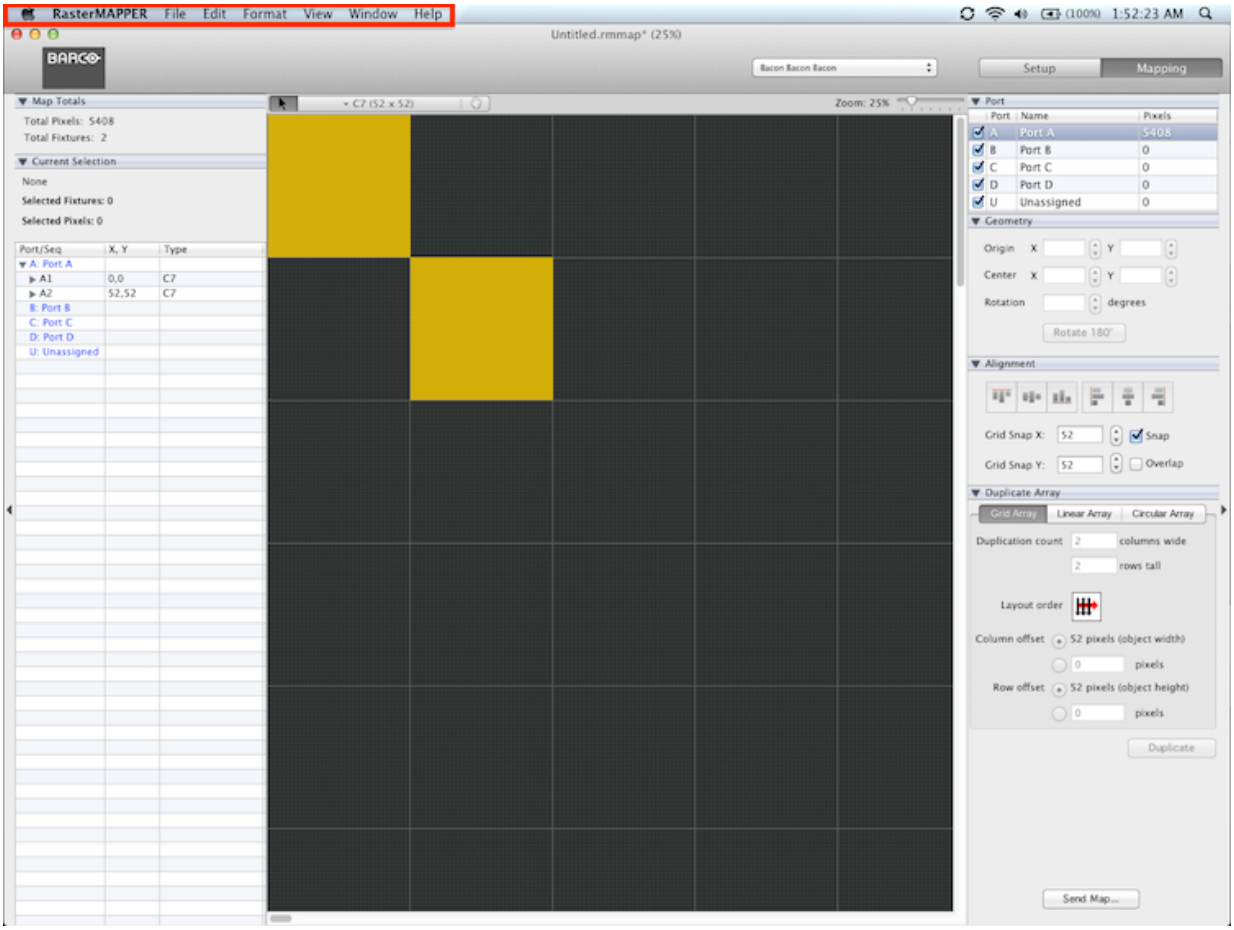


Interface Sections

The following illustrations identify the major sections of the RasterMAPPER user interface.

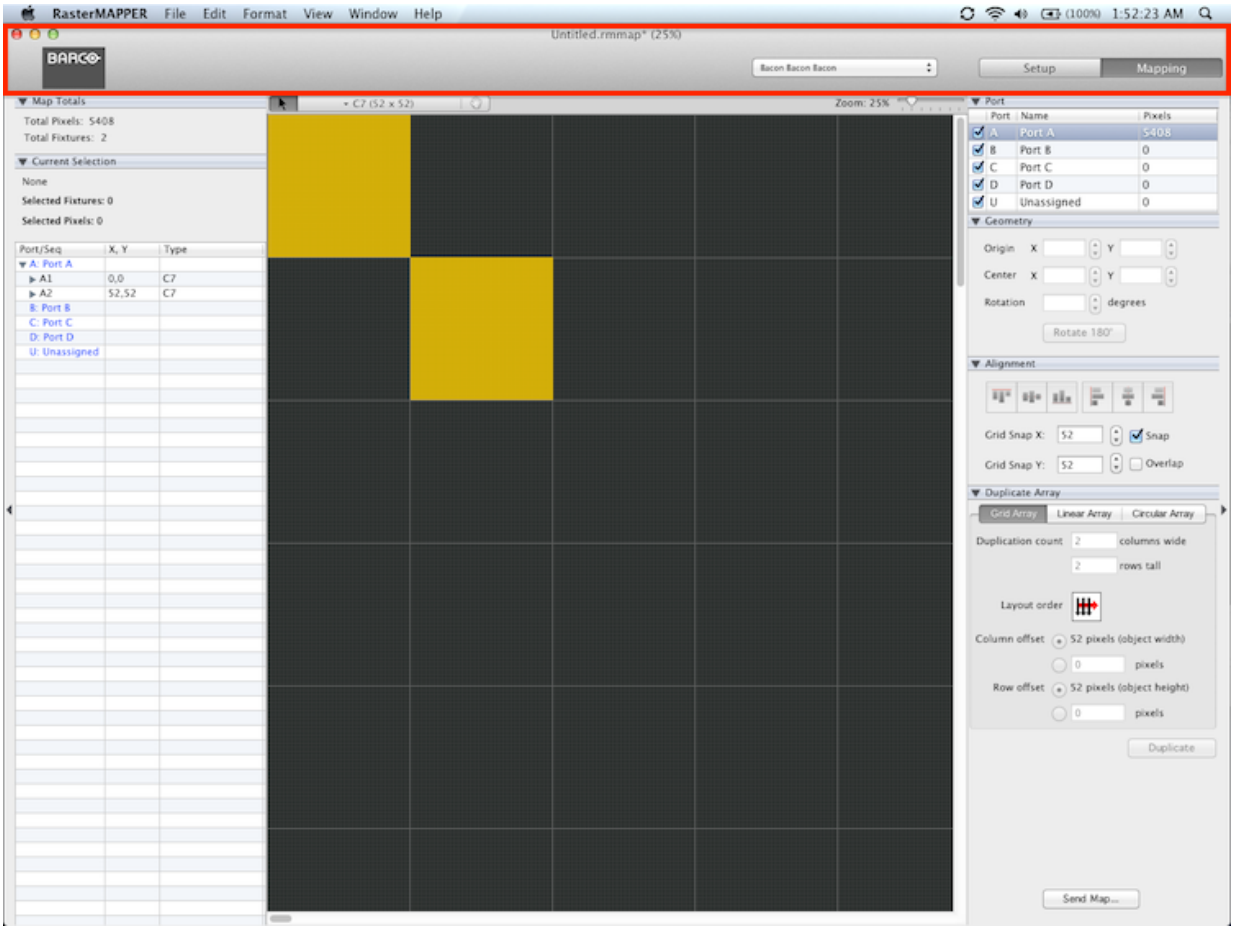
Menu Bar

Menus of common RasterMAPPER functions, including loading and saving map files, changing the view, and editing preferences.



Mode Selections

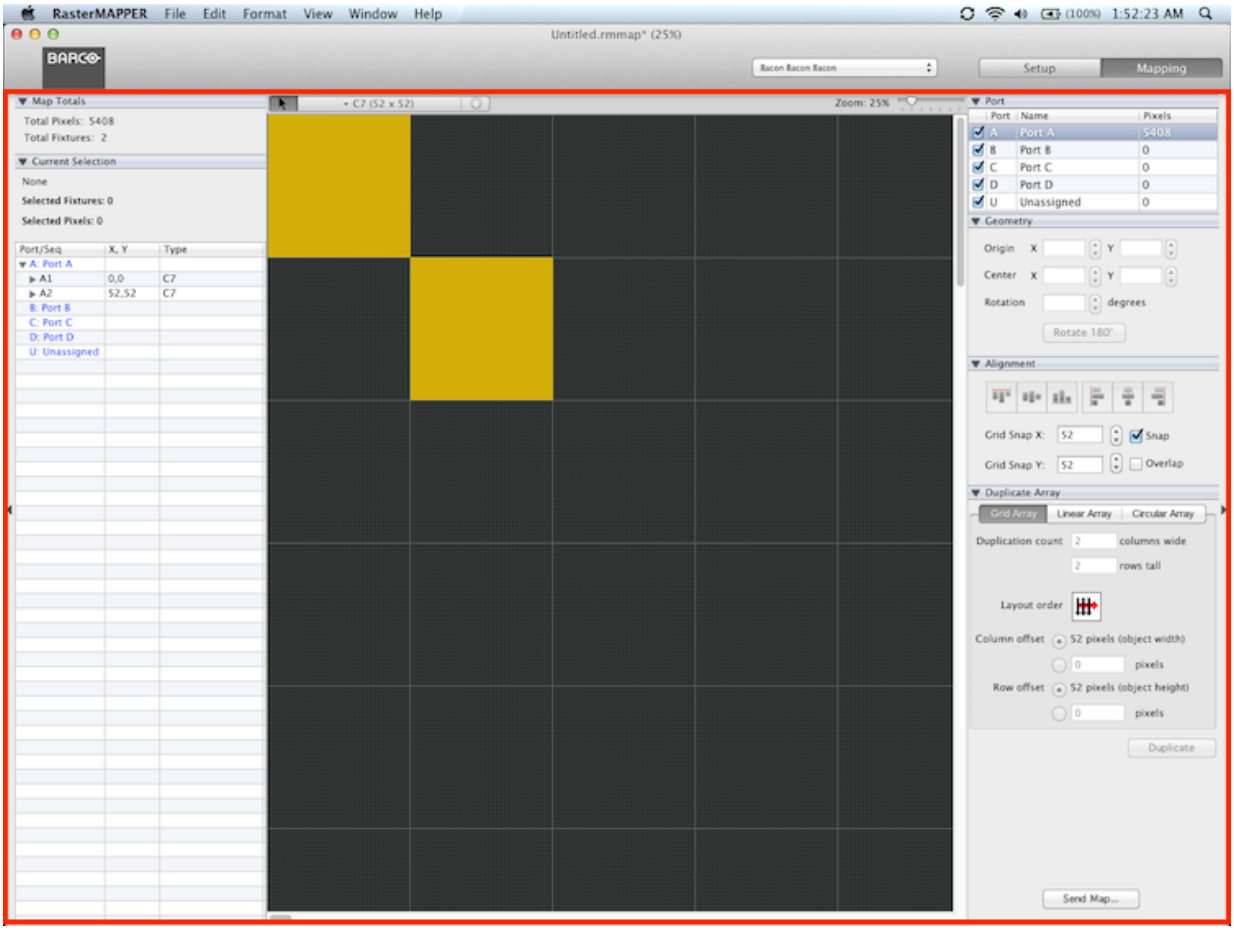
Select views, processors, and operational modes. More detail is provided in section 6.3.1 Mode Selection.



Map Editing

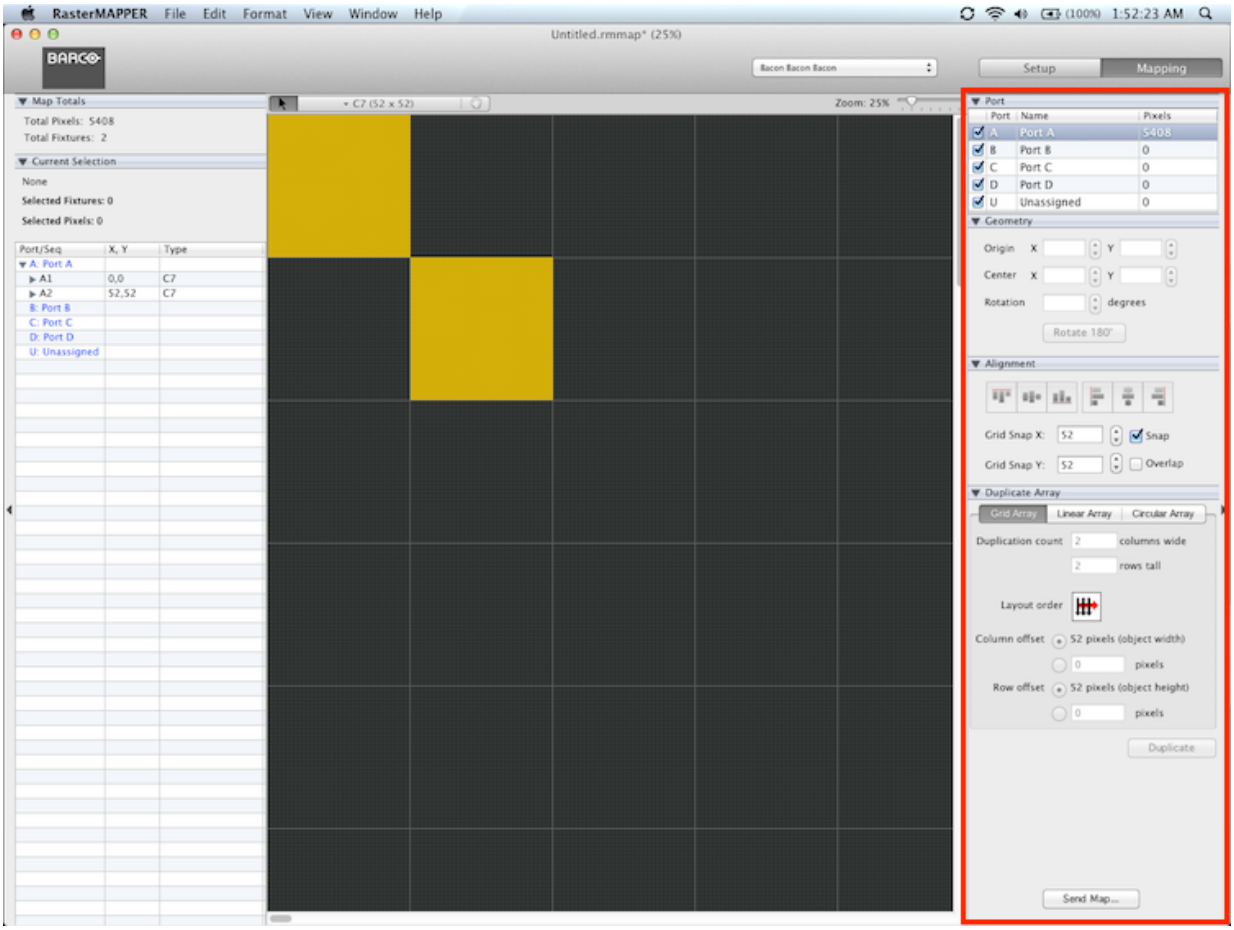
Everything for adding and editing of the fixtures on the map.

More detail is provided in section 6.3.2 Map Editing.



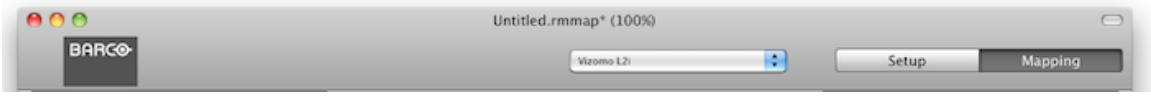
Inspectors

The Mapping/Setup buttons toggle this inspector pane between information about either the map or the selected processor.
More detail is provided in sections 6.4.2 Mapping Inspectors and 6.5.2 Setup Inspectors.


RasterMAPPER File Edit Format View Window Help
Untitled.rmmap* (25%)
Setup
Mapping
Map Totals
Total Pixels: 5408
Total Fixtures: 2
Current Selection
None
Selected Fixtures: 0
Selected Pixels: 0
Port/Seq X, Y Type
A: Port A
A1 0,0 C7
A2 52,52 C7
B: Port B
C: Port C
D: Port D
U: Unassigned
Zoom: 25%
Port
Port Name Pixels
A Port A 5408
B Port B 0
C Port C 0
D Port D 0
U Unassigned 0
Geometry
Origin X Y
Center X Y
Rotation degrees
Rotate 180°
Alignment
Grid Snap X: 52 Snap
Grid Snap Y: 52 Overlap
Duplicate Array
Grid Array
Linear Array
Circular Array
Duplication count 2 columns wide
2 rows tall
Layout order
Column offset 52 pixels (object width)
0 pixels
Row offset 52 pixels (object height)
0 pixels
Duplicate
Send Map...

6.4.1 Mode Selection

The Mode selection region contains tools for the overall setup of the application.



Map Title & Zoom Level

At the top center of the application window the title of the map is displayed along with the current zoom level.

Processor Select

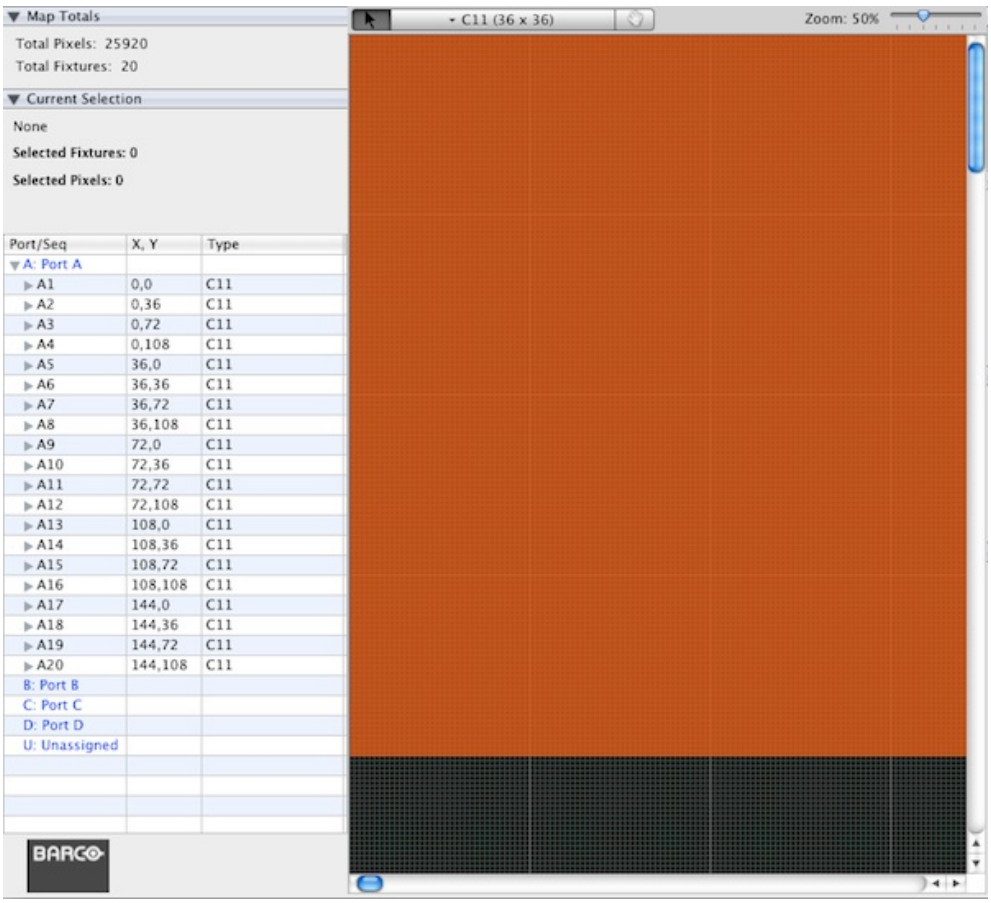
Select a processor from a drop down menu.

Inspector Toggle

The Setup/Mapping buttons toggle the inspector panels below.

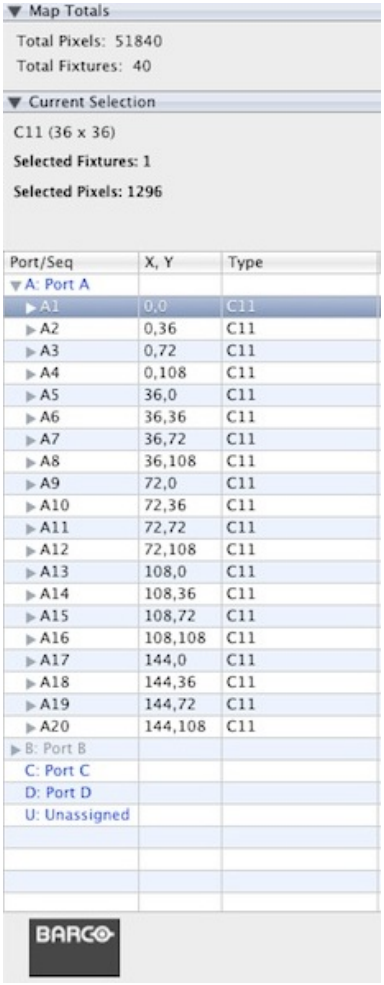
6.4.2 Map Editing

The map editing section shows information about fixtures and provides the tools for making changes.



Map Info Pane

Shows port, sequence, XY coordinates and fixture type information for all fixtures in the map.

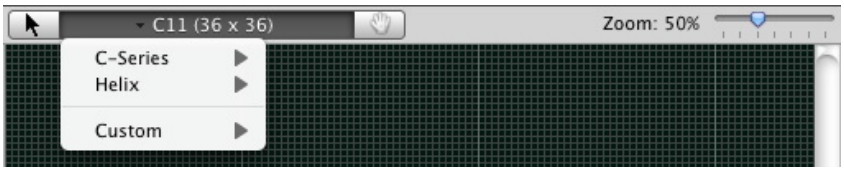


In the image above from the top down:

- Map Totals: Information about the current map
- Current Selection: Information about the selected fixture(s)
- The currently selected fixture is highlighted in the sequence list.
- Fixtures on hidden ports are displayed in gray. In the example above Port B is 'grayed out'.

Note: Click on any fixture to highlight it both in the list and in the map view. Click the triangle to the left of a port or fixture to show or hide details. Navigate the list quickly with keyboard arrow keys. Up/down to move through the list right/left to reveal / hide details.

Map Editing Tools



- Selection Cursor
- Fixture select drop down menu
- Move map hand tool
- Map zoom level selection

6.5 Mapping

Mapping involves choosing existing fixtures or creating new ones and placing them on the work grid in the same order as they are cabled in the system.

The processing equipment may contain multiple output ports for fixtures. Always be aware of which port fixtures are being assigned to. Additional functionality allows the changing of the wiring order of the fixtures in the map by re-sequencing.

With RasterMAPPER Version 4.0 and above multiple maps can be open at the same time. Each can be saved or opened independently of each other and fixtures can be copied between maps.

6.5.1 Canvas

The work grid or canvas in RasterMAPPER is where you place fixtures. When you first launch RasterMAPPER, a blank canvas is displayed. Once you begin placing fixtures, they appear in a unique color. Fixtures on an inactive port are slightly transparent.

Below are descriptions of the tools specific to the canvas.

Select Tool

The select tool highlights any fixture or group of fixtures on an active port.

Fixtures can be selected by:

- Starting in an empty section of the grid, click and drag across the canvas.
- Click on the first fixture, then press and hold Shift (Win or Mac) or Command (Mac) or Control (Win) and click on the next fixture. Only those two fixtures will be selected.

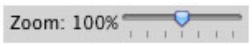
Hand Tool

The hand tool moves the canvas.

Note: Scroll bars can also be used to move the canvas.

Zoom

Adjust the zoom slider to increase or decrease the viewable canvas in preset values from 8-800%.



Zoom can also be adjusted by:

- Zoom In/Zoom Out from the view menu
- Command +/- (Mac)
- Control +/- (Win)

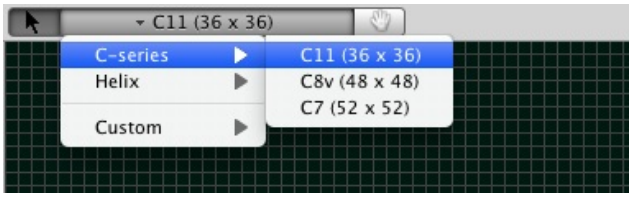
Add fixture tool

To place the default C11 fixture, click the the add tool button so that it is highlighted. A yellow add cursor will be displayed when mousing over the map area.

Fixture select Menu

To select another type of fixture click and hold the triangle next to the fixture name to display the 'Fixture Select Menu'. Mouse over the desired fixture and

release to select a fixture.

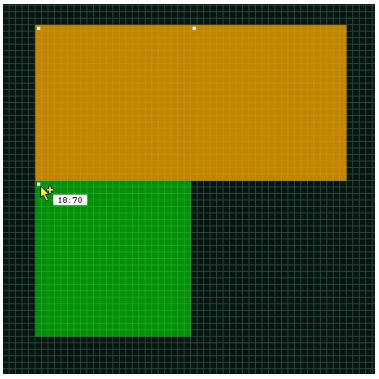


Building the Map

Click the map grid area to add the fixture to the map. Fixtures will be added to the selected port.

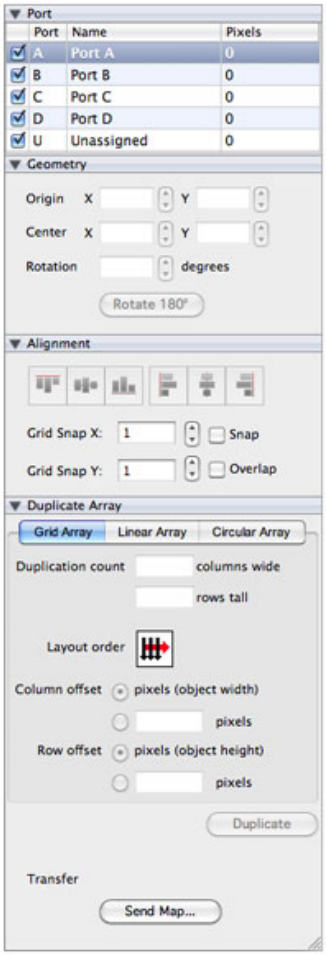
Add fixtures to the canvas in the order they are wired (sequence). The sequence can be changed later, if desired (see Sequencing, p. 21 for more information).

When placing fixtures, the x and y location is displayed adjacent to the cursor. The white square at the top left of each fixture aids in determining the fixture's Z rotation.



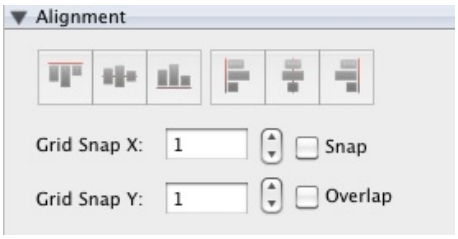
6.5.2 Mapping Inspectors

The Mapping pane's inspectors are a collection of tools to help with map editing.



Alignment Pane

Use the buttons as the top of the alignment pane to align objects either Vertically or Horizontally. Select the fixtures or groups to be aligned and then press the button for the type of alignment desired.

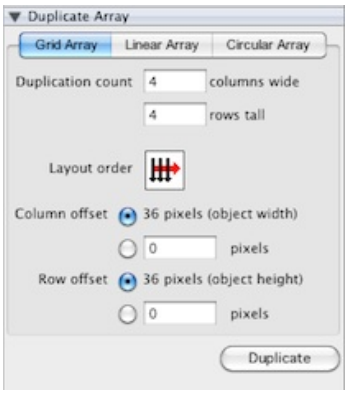


The alignment pane also contains tools to set x and y snap values and enable/disable grid snap and overlay. Snapping limits the placement of fixtures to within only a certain number of pixels, commonly the width/height of the fixture. Overlap allows fixtures to be placed on top of or behind another fixture.

Duplicate Array

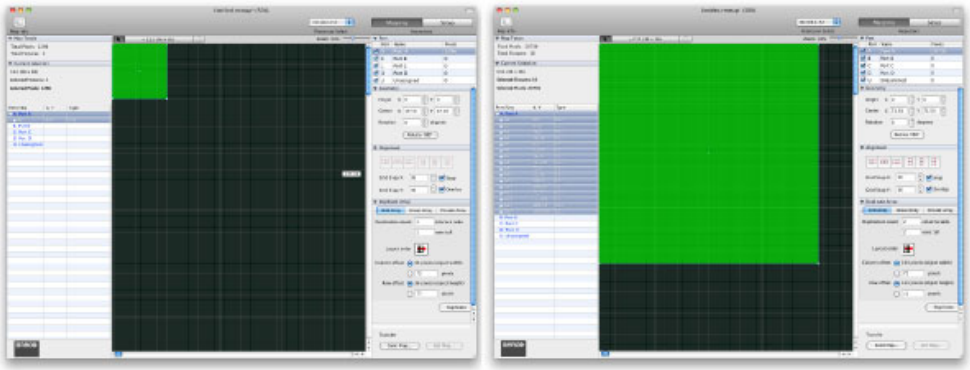
The *Duplicate Array* inspector of the Layout tab displays the options for three Array Duplication modes.

Grid Array

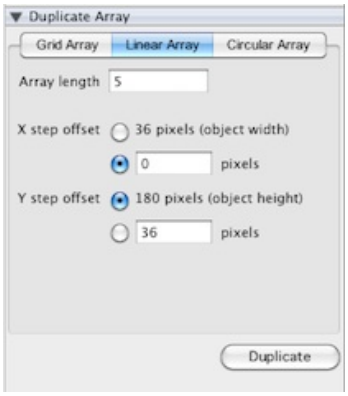


1. Enter the number of rows and columns the resulting array will be.
2. Choose the new scan order for the resulting array.
3. Enter the desired column and row offset between each duplicated array.

RasterMAPPER automatically sets the offsets based on the width and height of the selected fixtures (objects), but you can enter your own, if desired.

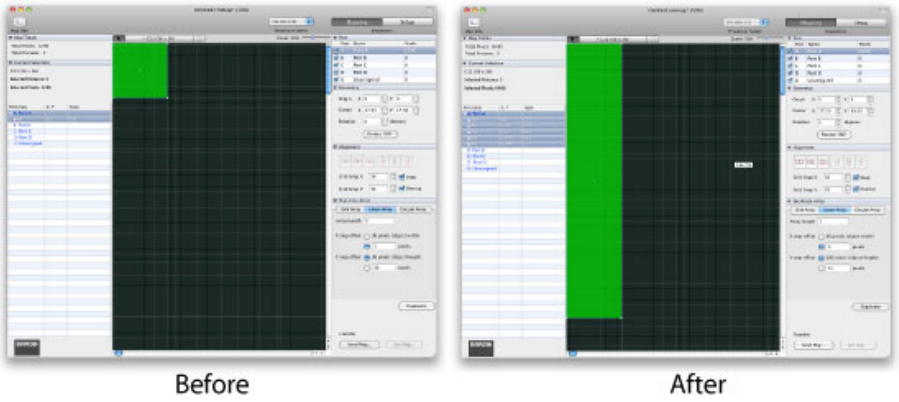


Linear Array

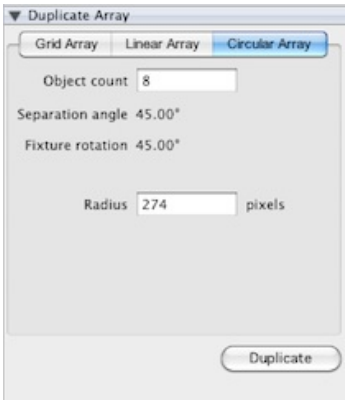


- Enter the total number of fixtures for the resulting array.
- Enter the X (horizontal) and/or Y (vertical) offsets for the resulting array. Each new fixture will be this number of pixels away from each other. RasterMAPPER automatically sets the offsets based on the width and height of the selected fixtures (objects), but you can enter your own, if

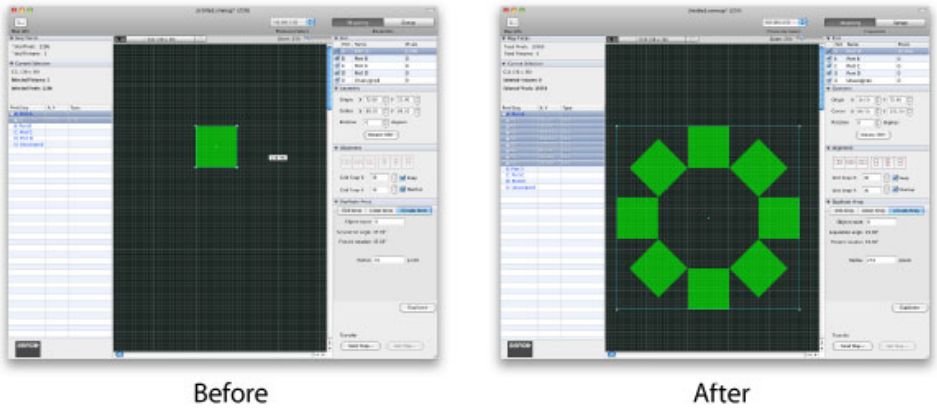
desired.



Circular Array



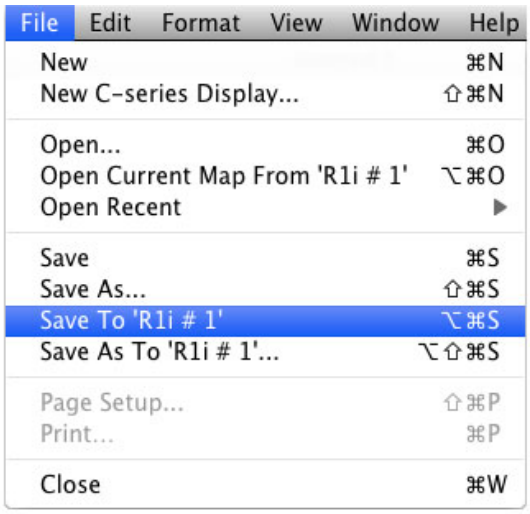
- Enter the total number of fixtures for the new array.
- Based on the count, the Separation angle and Fixture rotation will be automatically computed.
- Enter the desired Radius (in pixels) for the new array.



Map Transfers

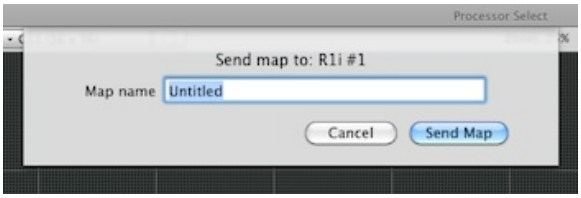
Sending maps to Vizomo

Select the **Save to...** menu item to open the **Send Map** window.



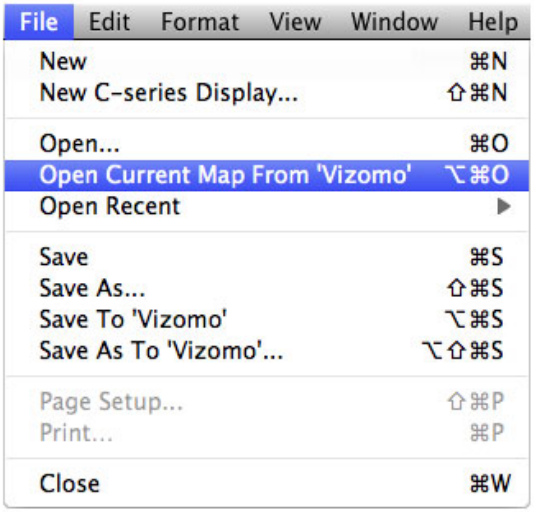
Send map window

Name the map here and press ***Send Map*** to transfer the map to the Vizomo. Maps are sent to the processor selected in the Processor Select menu.



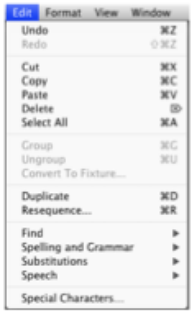
Getting maps from Vizomo

Select the ***Open Current Map*** menu item to retrieve a map from a remote Vizomo.



6.5.3 Sequencing

The wiring order or sequence determines the order of the pixels output from the processor. Individual fixtures are assigned an address as they are added to the grid but the sequence may be changed afterwards.



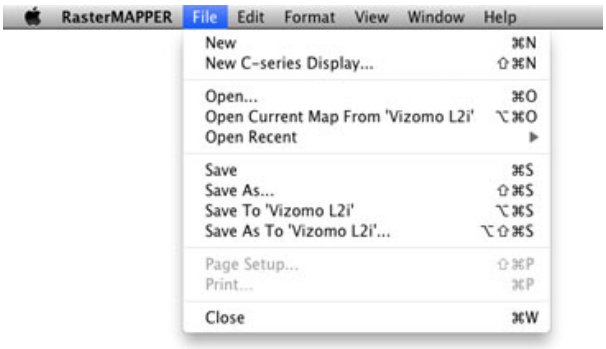
Select the fixture(s) you wish to resequence and choose ***Resequence...*** from the Edit menu or press **`Command + R`** (Mac), **`Control + R`** (Win). The current sequence number is displayed.

Options for resequencing include:

1. New port to which the selected fixtures will be moved.
2. New sequence number to start the resequencing. The current sequence number is displayed.
3. Press **SHIFT UP / DOWN** to have the newly sequenced fixture "inserted" into its new sequence location. All of the other fixtures between the two locations are shifted up or down accordingly.
4. Press **SWAP** to have the selected fixture(s) sequence number exchanged with fixture(s) that already had that port/sequence information.
5. Press **CANCEL** to close the window without resequencing.

6.5.4 Map Save/Open

RasterMAPPER launches with a new, empty map. You can open existing maps and save the current map by using the ***File*** menu.



NOTE:

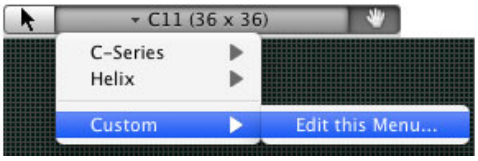
Don’t forget that in RasterMAPPER v4.0 and later you can have multiple maps open at the same time. This enables enhanced functionality like copying and pasting fixtures from one map to another.

6.5.5 Advanced Fixture Options

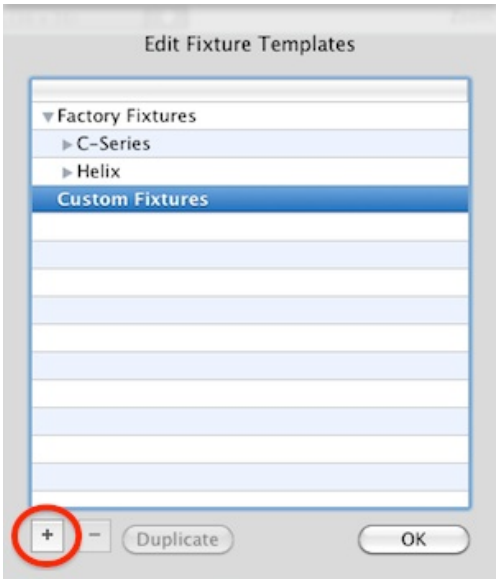
Creating Custom Fixtures

RasterMAPPER provides a default list of PXL fixtures to use. You can also create new fixtures that can be saved with the current map or as a template fixture to be used with any map. If a custom fixture is created in a map and opened on another computer without that custom fixture, it will be automatically added to the current map.

Select **Edit this Menu...** from the fixture menu to add or remove custom fixtures from the menu.



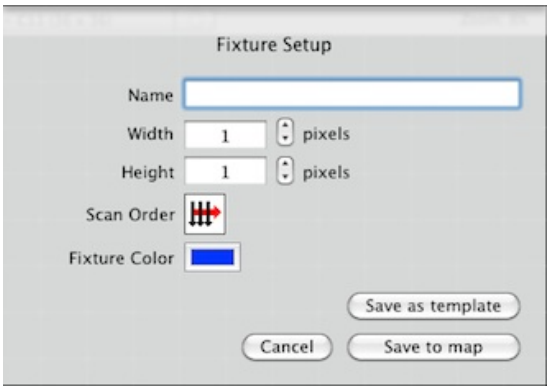
Then press the **+** button at the bottom.



Note: Editing existing fixtures is not yet supported.

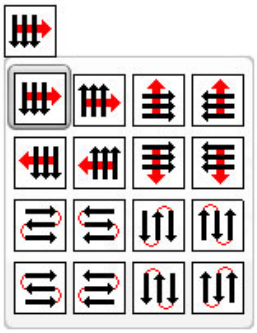
Fixture Setup Window

Provide the name, pixel dimensions, scan order and desired fixture color. Then, select save to template or map.



Scan Order

Click the Scan Order icon to select a scan order for the new fixture.



Save to Map

Saves the custom fixture to the current map. This fixture will not be loaded the next time RasterMAPPER is launched. However, if a map with a custom fixture is loaded, it will be placed in the Custom section of the fixture menu.

Save to Template

Template fixtures load whenever RasterMAPPER is launched and are saved to the following locations:

- Win: “Documents and Settings\user\Application Data\RasterMAPPER\Templates\” (ensure “Show hidden files and folders” is enabled)
- Mac: “~/Library/Application Support/RasterMAPPER/templates/”

Moving Fixtures

X/Y Coordinate movement

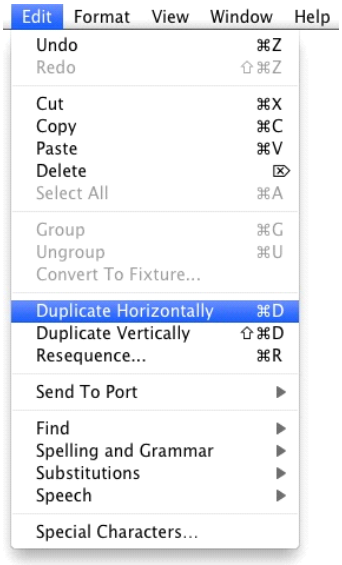
- Mouse: click on a fixture and drag it to a new location. If Overlap is turned off, you will not be able to place one fixture over another (see Alignment Pane)
- Keyboard: press the desired arrow key to move the selected fixture(s) in any direction on the canvas.
- Geometry Pane: enter explicit x-axis and y-axis values for the fixture(s). (See Geometry Pane)

Z Rotation

- Mouse: position the cursor over one of the corners of the box surrounding the selection and click and drag to rotate the selected fixture(s). The cursor changes to indicate the possible direction of rotation.
- Geometry Pane: enter an explicit rotation value for the fixture(s). (See Geometry Pane)

Duplicating Fixtures

Fixtures can be duplicated both Horizontally and Vertically.



1. Choose ***Duplicate Horizontally*** from the Edit menu, or press Command + D(Mac), Control + D (Win) to place a copy of the fixture(s) on the canvas to the right of the selected fixture(s). If there is no space in the default location the duplicated fixture(s) will be placed in the next available area.

2. Choose ***Duplicate Vertically*** from the Edit menu, or press Shift + Command + D (Mac), Shift + Control + D (Win) to place a copy of the fixture(s) on the canvas to the bottom of the selected fixture(s). If there is no space in the default location the duplicated fixture(s) will be placed in the next available area.

Note: Press and hold the Option key to duplicate drag a copy of the fixture(s) to a new location.

6.6 Processor Control

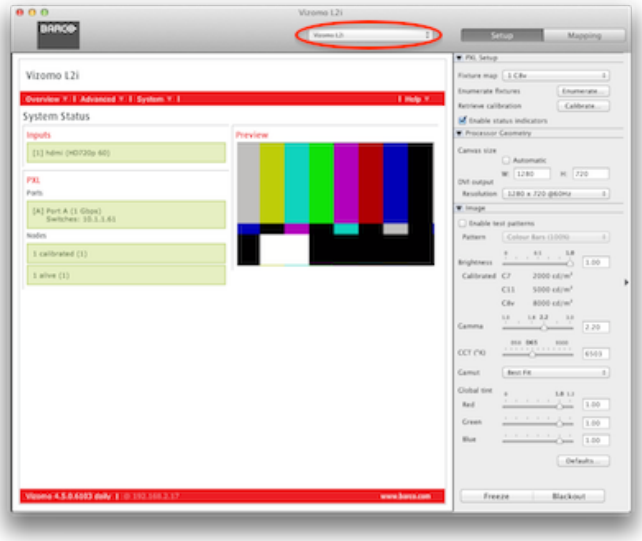
RasterMAPPER provides control over many functions on the Vizomo processor via the Configure Inspectors. Some parameters are sent instantly to the processor resulting in an immediate change. Other parameters are not sent until you expressly push a button or otherwise commit the changes.

For more information on the Vizomo processor, please refer to the Vizomo User Guide.

6.6.1 Processor List

RasterMAPPER provides the functionality to control different processors from the same interface. A processor select drop-down menu is presented at the top of the main program window and also displayed, when saving a map.

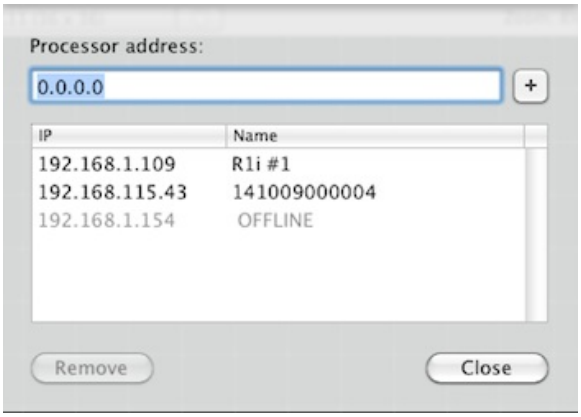
Main Processor Select



Edit Processor List

To manually add a processor, select ***Edit Menu...*** to open the Processor List window

A list of both automatically discovered and manually added processors will be displayed.



Add Processor

Type the IP address of a remote processor and press the **+** button to add a processor to the list. If a connection can not be established RasterMAPPER will

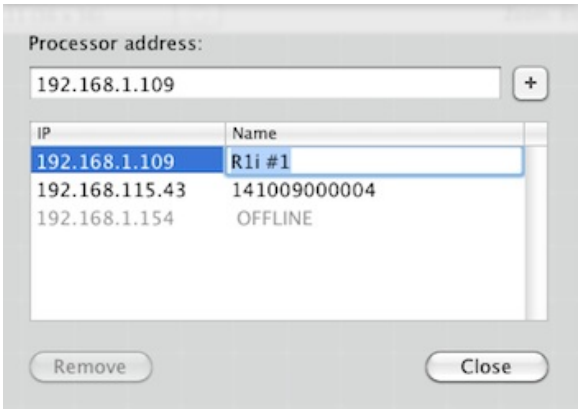
indicate *OFFLINE*.

Remove Processor

Highlight the processor to be removed and press the button with the **-** symbol

Rename a Processor

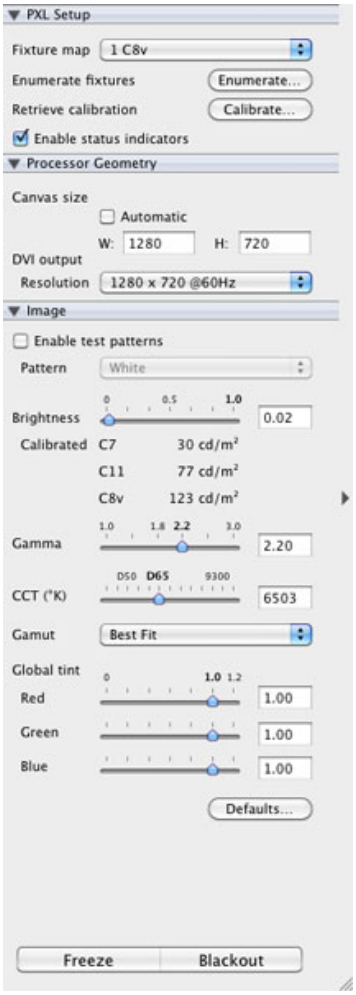
Edit a processor name by double clicking the name, click on the list when done.



6.6.2 Setup Inspectors

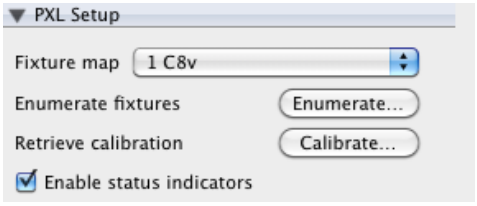
Overview

The inspectors in the Setup pane provide access to Vizomo processor functions. Most sections of the pane contain a triangle to the left of the section name allowing you to close or open that section. This gives you the flexibility to hide seldom used sections while ensuring frequently used ones remain visible. Additionally, if the screen size does not accommodate all the inspectors, scrollbars will appear. The top and bottom sections are always visible and will not scroll out of view.



PXL Setup

Select the active map on the processor



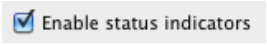
Opens the Enumerate window.

See: 6.1.1 Enumeration for details

Opens the Retrieve Calibration window.

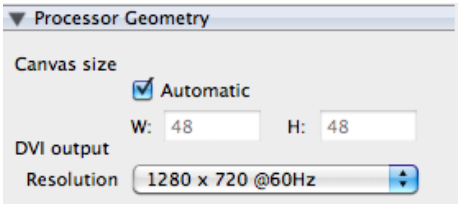
See: 6.1.2 Calibration for details

Enables the status indicators on the rear of the C-series tiles



Processor Geometry

The Processor Geometry inspector pane:

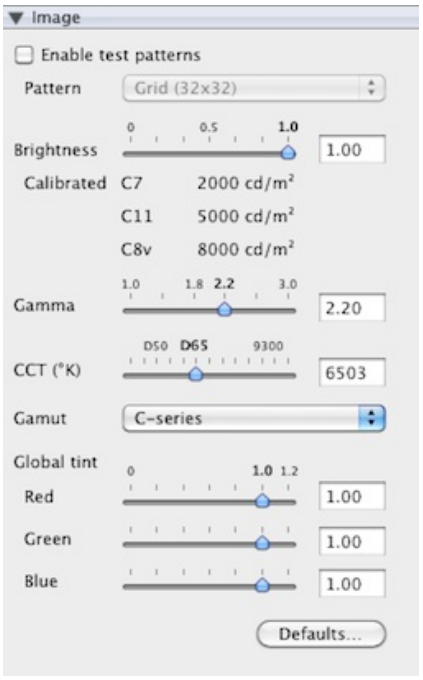


Specify the width and height of the Vizomo canvas manually or let Vizomo automatically set it based on the map (recommended).

Below the Canvas size settings are the settings for the DVI output resolution and frequency.

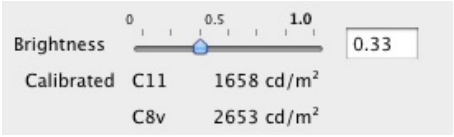
Image Controls

The Image inspector pane:



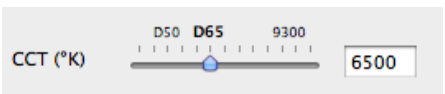
Test pattern - Select from among 14 patterns. Use the checkbox to enable/disable.

Brightness - Range is 0-1 defaults to 1

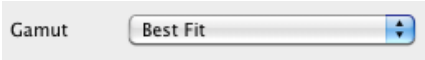


Gamma - Range is 1.0 to 3.0 defaults to 2.2

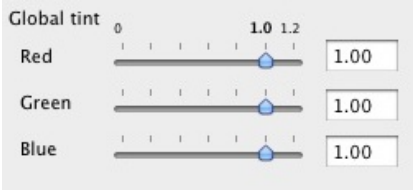
CCT - Range is 4000K to 10,000K defaults to 6,500K



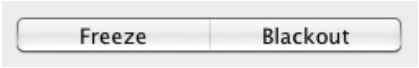
Gamut - Selections are; HDTV Rec 709, PAL, NTSC, Digital Cinema, Best Fit, C-Series. The default is C-Series.



Global tint - Ranges are 0 to 1.2 defaults to 1.0



Freeze and Blackout

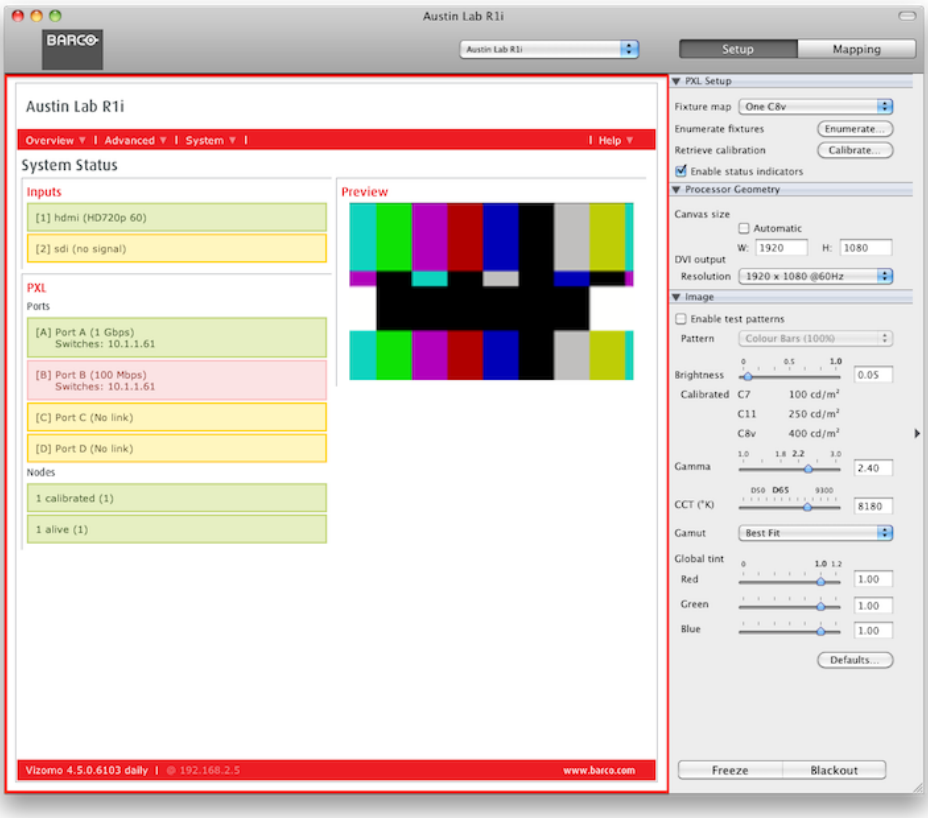


Freeze the current image on-screen while allowing playback and other functions to continue in the background.

Blackout displays video black on the PXL output, all playback and other functions continue as normal in the background.

6.6.3 webUI

The Vizomo webUI is a web based User Interface that contains information about the system and other advanced features such as Vizomo's command line interface.



The pages of the webUI are accessible via the red navigation bar across the top:

Overview >> System Status and Content Preview

The System Status section displays current information about the video Input devices, PXL ports of the Vizomo, Switches connected to PXL ports and nodes. In addition to system heartbeat information, a Preview of the content is also provided.

In the image below we see all 3 indicator colors present (red, green and yellow)

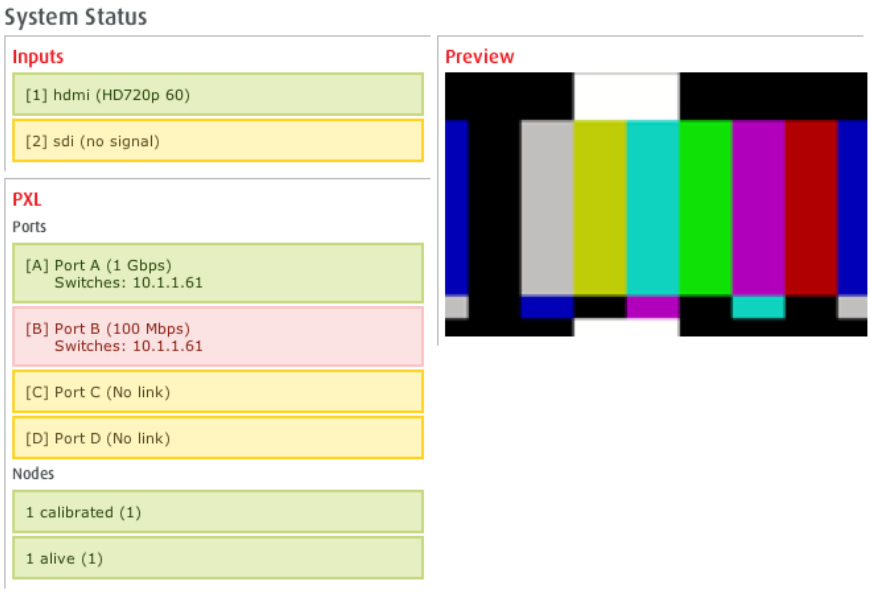
• A green color rectangle indicates that the system component is functioning as expected. In the example below, there is 1 C-series tiles in the map. The Vizomo sees that the tile is alive and all calibration data has been received. So, the nodes indicator bars are green.

• A yellow color rectangle indicates an abnormal condition. In the example below, the SDI input does not detect a signal and both port 'C' and port "D' have been unplugged.

• A red color rectangle indicates a failure. In the example below, Port B has been connected to a 100 Mbps port of a switch rather than the Gigabit port.

Preview

To the right of the status section is a low frame rate preview of the Vizomo content.

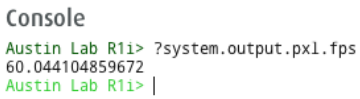


Overview >> PXL Nodes

The PXL nodes page displays current information about the status of nodes (tiles). At the bottom of the page a download button allows for this information to be saved as a csv file.

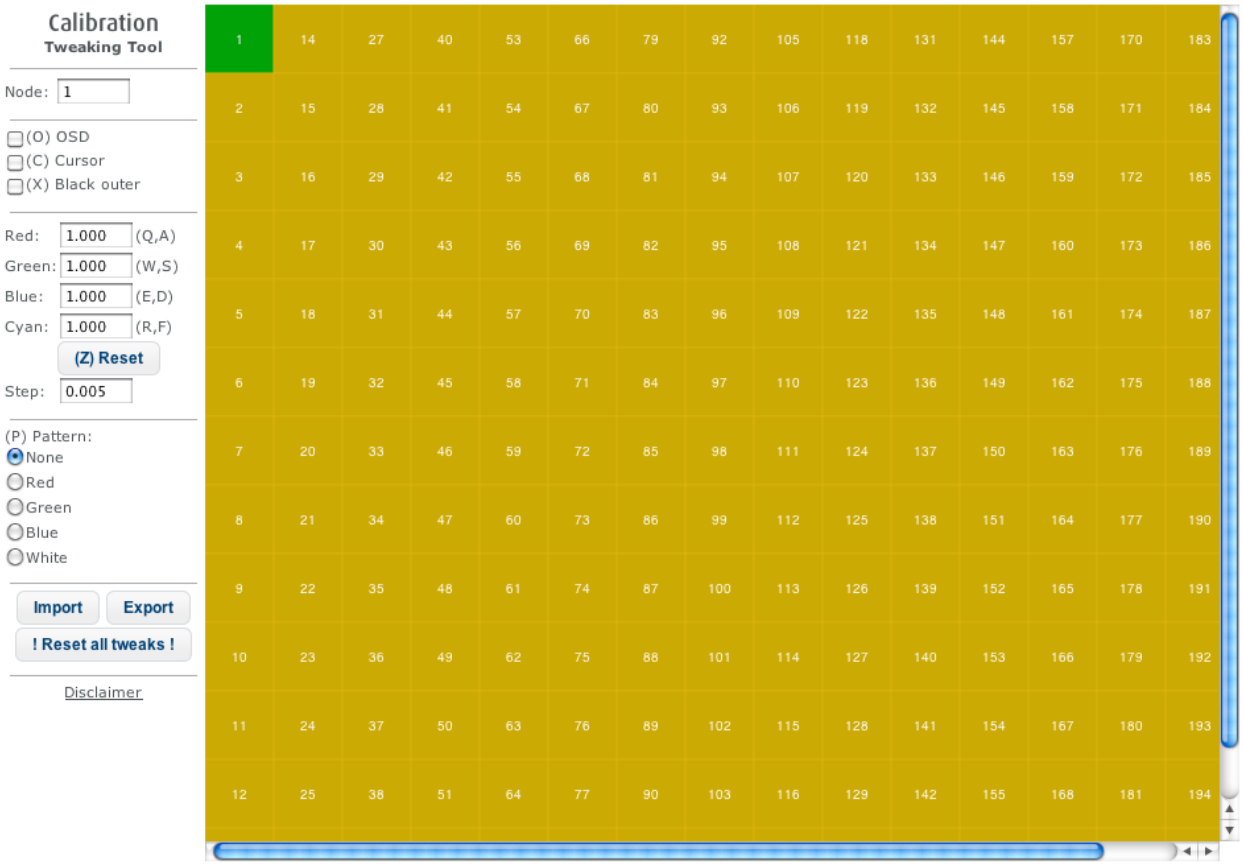
Advanced >>Console

The console page is a tool for advanced users. Here, text commands are used to control a Vizomo. In the example below the brightness property is queried with the command '?system.output.pxl.fps'. The Vizomo responded with the current frame rate.



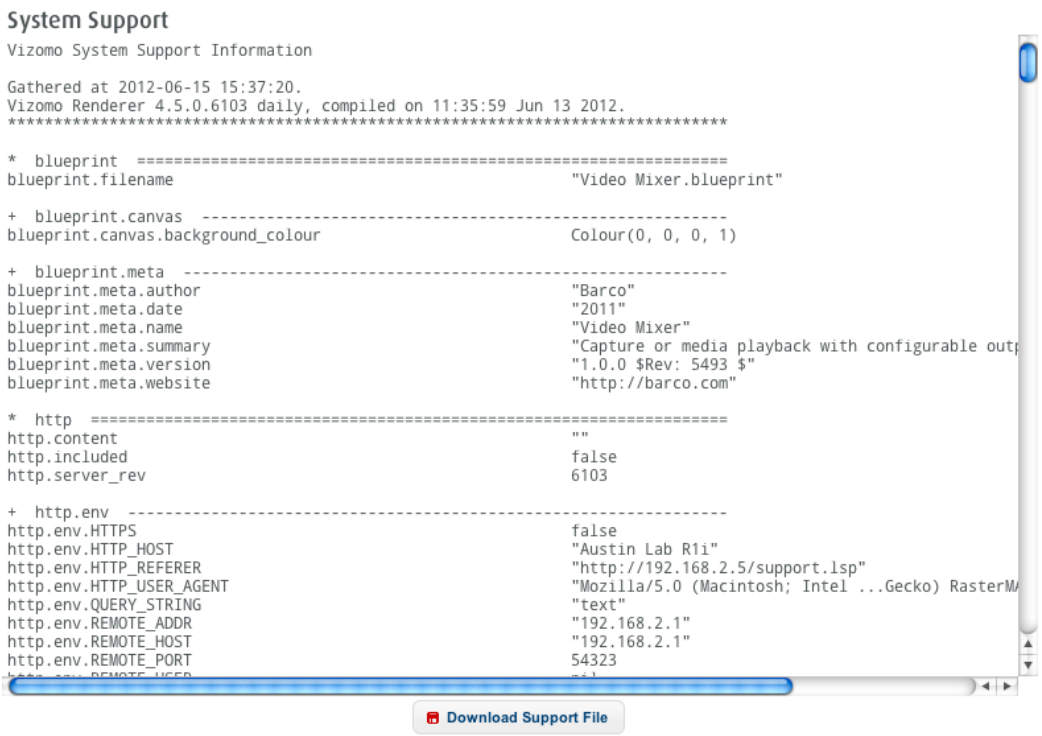
Advanced >> Calibration

The calibration page is an experimental tool for manually adjusting the appearance of tiles. It is easy to make screens look much worse. As such, it is strongly recommended that only trained operators make use of this feature.



System >> Support

The Support page contains a detailed summary of the system. It automatically updates every 10 seconds. The 'Download Support File' button at the bottom can be used to download the whole report as a file that can be emailed to customer support.

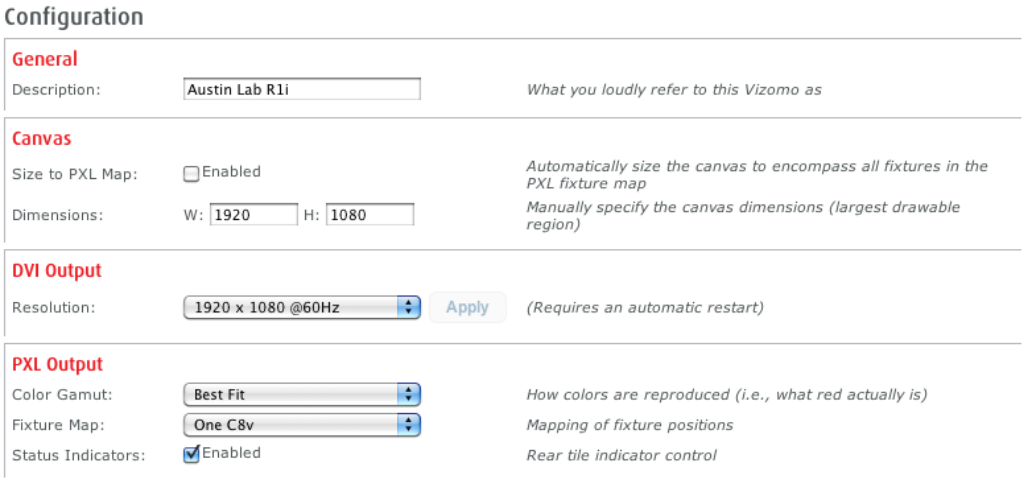


System >> Log

The log page displays the full system log.

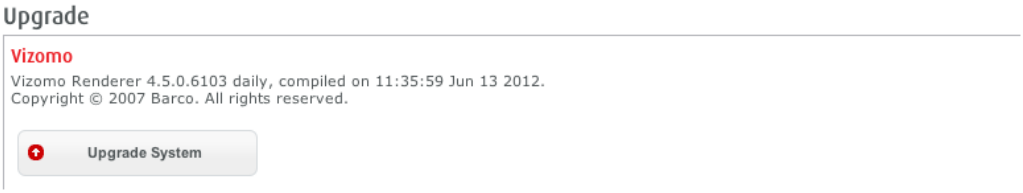
System >> Configuration

Some of the Vizomo parameters can be adjusted on the configuration page of the webUI. For the full set of controls use the RasterMAPPER interface.



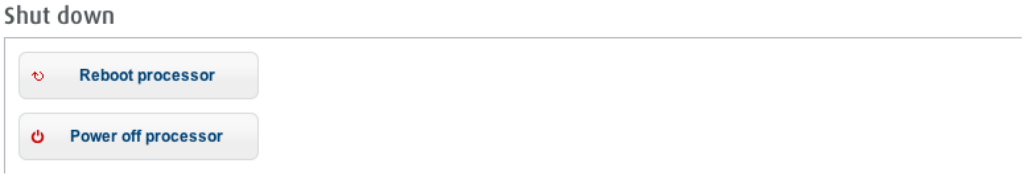
System >> Upgrade

Transfer .vuz files to a remote Vizomo in order to perform an upgrade.



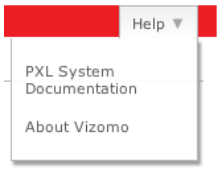
System >> Shutdown

Reboot or shutdown the Vizomo with the buttons on this page.



Help

The Help menu contains a link to the PXL system documentation and the Vizomo About Menu



Footer

The Footer of the webUI contains four elements.

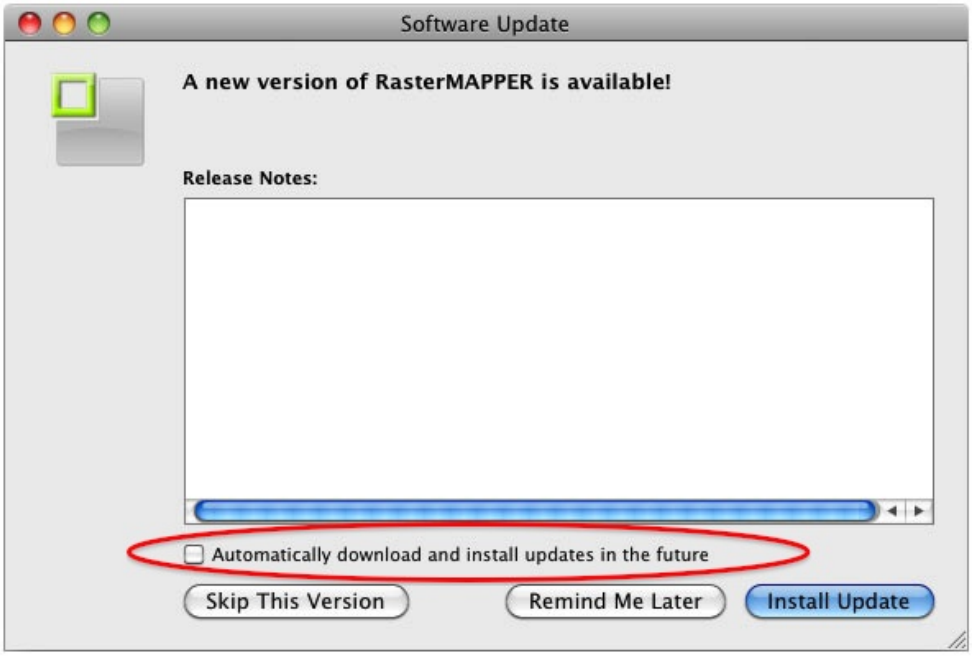
1. The current software version

2. The IP address(s) of the Vizomo
3. The Barco.com URL

6.7 Software Update

RasterMAPPER automatically checks for software updates when it is started. Update checks may also be manually triggered with the ***Check for Updates...*** function:

RasterMAPPER Version 4.0 and newer includes automatic software upgrade functionality. If a new version is available, it can be downloaded and installed automatically.



Automatic update settings can be managed in the preferences window.

Appendix A: Notes

Typographic Information

This User's Guide uses the following typographic conventions:

- menu items are displayed in ***Bold Italics***
- clickable buttons are displayed in **Bold Title Case**.
- on-screen text is displayed in *italics*
- filenames & application names are displayed between "quote marks"
- keyboard keystrokes are displayed in **`Courier Font`**

7. Change Log

PXL System 4.6

C-series / Helix Firmware:

- No changes

Vizomo:

- Support Barco PXL brightness sensor
- Added C11 brightness boost
- Further improved quality of scaled images
- Reverted improved gamma control

RasterMAPPER:

- Vizomo 4.6 compatibility

PXL System 4.5

C-series / Helix Firmware:

- Improved bulk transfer speed (calibration, firmware)
- Fixed issue with downgrading below 4.4
- Fixed tile runtime bug

Vizomo:

- Redesigned webUI
- Capture device status
- Live preview
- PXL nodes (tiles) status report page
- Experimental color calibration page
- Vizomo configuration page
- Upgrade and license Vizomo software from the webUI
- Updated Video Mixer blueprint
- Window source rectangle now optional
- Content can now be auto advanced
- Canvas now automatically sizes to map
- Automatically deinterlace interlaced content
- Improved quality of scaled images
- Best fit PXL gamut dynamically determines the "best"/"widest" available color space for the attached screen

RasterMAPPER:

- Enumeration and calibration bug fixes

PXL System 4.4.1

C-series / Helix Firmware v4.4.0:

- Enumeration speed gain

Vizomo v4.4.0:

- C7 support
- Auto-complete for web console
- Improved gamma control
- Added detection of unrecognized tiles
- Make use of new nVidia EDID mechanism to force DVI-D resolutions

RasterMAPPER v4.4.1:

- Maps can now be retrieved from Vizomos
- C7 support
- Improved network connection to Vizomo
- Improved Vizomo UI

PXL System 4.3

Vizomo v4.3.0:

- Enumerate on all four PXL ports
- Make use of tile PWM brightness control
- Improved network awareness
- RasterMAPPER v4.3:
- Added webUI
- C-series setup tool

PXL System 4.2.2

C-series / Helix Firmware:

- No changes

Vizomo:

- PXL timing improvements for 'choppy' tiles

RasterMAPPER:

- New C-series Display tool pops up when RM is opened
- Disable status indicators on the back of C-series tiles
- 14 new test patterns
- Separate brightness values for C11 and C8v
- Pixel quantities for C8v now reported correctly

PXL System 4.2.1

C-series / Helix Firmware:

- No changes

Vizomo:

- Increased pixel capacity

RasterMAPPER:

- Fixed IE script error
- Mapping for P1 fixed
- Show correct release notes in auto update mechanism

PXL System 4.2.0

C-series / Helix Firmware:

- C-series 'On Screen Enumeration', sequence numbers are now displayed during enumeration
- Improved PXL error handling

Vizomo:

- New Video Mixer blueprint.
- Implemented new capture devices to support HD-SDI and DVI over HDMI
- DVI monitor now warns if the system is in 'Blackout'
- Improved the way Vizomo interacts with the PXL network
- Improved logs and reports for trouble shooting
- Support for placing C11 and C8v in the same map

RasterMAPPER:

- Adjusted interface elements to aid workflow
- Numerous 'behind the scenes' components to support future features

8. PXL System Online Help Notes

C-series Online Help System

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Safety Information

The symbols below are used throughout this manual to identify important safety information.
Heed all warnings and safety information.

Symbol	Meaning
	Warning, Danger, or Caution Risk of injury to yourself or the product.
	Risk of Electrical Shock Risk of severe electrical shock.

Risk of electrical Shock. No user-serviceable parts inside. Observe all applicable electrical codes. The power outlet shall be installed near the equipment and shall be easily accessible.

Warranty Information

Barco, Inc. warrants C-series, Helix, and Vizomo hardware products against defects in materials and workmanship under normal use for a period of one (1) year from the date of retail purchase by the original end-user purchaser.

Barco, Inc. does not warrant that the operation of any product will be uninterrupted or error free. Barco Inc. is not responsible for damage arising from failure to follow instructions relating to the product's use.

Federal Communications Commission (FCC Statement)

C-series and Helix have been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes

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